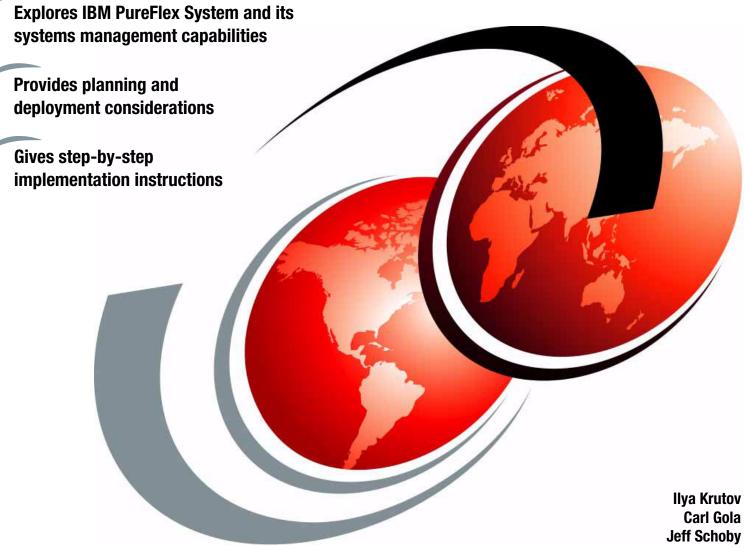


Implementing Systems Management of IBM PureFlex System



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Implementing Systems Management of IBM PureFlex System

April 2014

Note: Before using this information and the product it supports, read the information in "Notices" on page ix.

Second Edition (April 2014)

This edition applies to the following products:

- ► IBM PureFlex System
- ► IBM Flex System
- ► IBM Chassis Management Module firmware 1.50.0D
- ► IBM Flex System Manager software Version 1.3.0
- ► IBM Flex System V7000 Storage Node software Version 7.1

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Preface

To meet today's complex and ever-changing business demands, you need a solid foundation of compute, storage, networking, and software resources. This system must be simple to deploy and be able to quickly and automatically adapt to changing conditions. You also need to be able to take advantage of broad expertise and proven guidelines in systems management, applications, industry solutions, and more.

IBM® PureFlex® System combines no-compromise system designs along with built-in expertise and integrates them into complete, optimized scalable solutions. With IBM Flex System® Manager, multiple solution components that include compute nodes, network and storage infrastructures, storage systems, and heterogeneous virtualization environments can be managed from a single panel.

This IBM Redbooks® publication introduces IBM PureFlex System and IBM Flex System and their management devices and appliances. It provides implementation guidelines for managing Linux kernel-based virtual machine (KVM), IBM PowerVM®, VMware vSphere, and Microsoft Hyper-V virtualization environments.

This book is intended for the IT community of clients, IBM Business Partners, and IBM employees who are interested in planning and implementing systems management of the IBM PureFlex System.

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Carl Gola is an IT Specialist with IBM, and works in the Boulder PureFlex Center of Competency supporting both internal and external clients. His areas of expertise include the IBM PureFlex System, IBM Power Systems[™], AIX®, Linux, IBM X-Architecture®, and virtualization. He is certified in Red Hat Linux and is proficient in security policies, auditing, performance tuning, and backup/restore technologies. He has worked for IBM since 1997 and is based in Boulder, CO.



Jeff Schoby has been with IBM since 2012 as a Subject Matter Expert for a UNIX team in the Columbia, Missouri, Delivery Center. He has 20 years of experience in System x and Power server operating systems and administration, networking, storage, and virtualization technologies. In 2013, he was chosen to assist with IBM PureSystems® support. His end-to-end knowledge of IT systems has enabled him to quickly familiarize himself with much of the IBM PureSystems environment and help multiple clients and IBM teams with a wide range of configuration scenarios.

Thanks to the following people for their contributions to this project:

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Summary of changes

This section describes the technical changes made in this edition of the book and in previous editions. This edition might also include minor corrections and editorial changes that are not identified.

Summary of Changes for SG24-8060-01 for Implementing Systems Management of IBM PureFlex System as created or updated on April 22, 2014.

April 2014, Second Edition

This revision reflects the addition, deletion, or modification of new and changed information described below.

New information

- ► IBM Flex System ManagerTM (FSM) Explorer
- Configuration patterns
- Operating system deployment
- IBM Fabric Manager
- Mobile management
- Integrated V7000 Storage Node management
- Network System Pools

Changed information

- PureFlex System overview
- ► FSM software features
- ► FSM ordering information
- Flex System Feature on Demand (FoD) upgrades
- Centralized FSM security

Part 1

Introduction

This book is divided into multiple parts. This part introduces IBM PureFlex System and IBM Flex System, and describes their management architecture, devices, and appliances.

This part includes the following chapters:

- ► Chapter 1, "Introduction to IBM PureFlex System and IBM Flex System" on page 3
- Chapter 2, "IBM PureFlex System and IBM Flex System management devices and appliances" on page 13

1

Introduction to IBM PureFlex System and IBM Flex System

In today's ever-changing marketplace, IT solutions are driving business – making it faster, more nimble, and ultimately, more successful. Users want access to data and applications on their terms. They want full service from mobile devices. They rely on social networks to drive ever increasing numbers of transactions.

Cloud computing solutions from IBM can help you meet these demands. IBM PureFlex System and IBM Flex System offerings and solutions are optimized for cloud deployments. With the latest IBM PureFlex System technology enhancements, you can accelerate system deployment while simplifying cloud service delivery and improving efficiency in your IT environment.

IBM PureFlex System is a complete, flexible cloud infrastructure system with integrated expertise. The system integrates and optimizes all compute, storage, and networking resources to deliver infrastructure-as-a-service (IaaS) out of the box. To simplify acquisition of your solution, you can choose one of the predefined and fully integrated, optimized configurations as the starting point.

IBM Flex System offers a broad range of x86 and IBM POWER® compute nodes in an innovative chassis design that goes beyond blade servers with advanced networking and system management, to support extraordinary simplicity, flexibility, and upgradeability.

If you want a pre-configured, pre-integrated infrastructure with integrated management and cloud capabilities, that is factory tuned from IBM with an x86 and Power hybrid solution, IBM PureFlex System is the answer.

If you want to build and tune a custom configuration with efficient x86 compute and memory performance, or on the latest IBM POWER and POWER7+[™] processors for maximum performance and efficiency, IBM Flex System is the right fit.

This chapter covers the following topics:

- 1.1, "IBM PureFlex System" on page 4
- 1.2, "IBM PureFlex System capabilities" on page 6
- 1.3, "IBM Flex System overview" on page 7

1.1 IBM PureFlex System

To meet today's complex and ever-changing business demands, you need a solid foundation of server, storage, networking, and software resources. Furthermore, it must be simple to deploy and able to quickly and automatically adapt to changing conditions. You also need access to, and the ability to take advantage of, broad expertise and proven guidelines in systems management, applications, hardware maintenance, and more.

IBM PureFlex System is a comprehensive infrastructure system that provides an expert-integrated computing system. It combines servers, enterprise storage, networking, virtualization, and management into a single structure. Its built-in expertise enables organizations to manage and flexibly deploy integrated patterns of virtual and hardware resources through unified management. These systems are ideally suited for clients who want a system that delivers the simplicity of an integrated solution with the capability to tune middleware and the runtime environment.

IBM PureFlex System uses workload placement that is based on virtual machine compatibility and resource availability. By using built-in virtualization across servers, storage, and networking, the infrastructure system enables automated scaling of resources and true workload mobility.

IBM PureFlex System has undergone significant testing and experimentation so that it can mitigate IT complexity without compromising the flexibility to tune systems to meet business demands. By providing flexibility and simplicity, IBM PureFlex System can provide extraordinary levels of IT control, efficiency, and operating agility. This combination enables businesses to rapidly deploy IT services at a reduced cost. Moreover, the system is built on decades of expertise. This expertise enables deep integration and central management of the comprehensive, open-choice infrastructure system. It also dramatically cuts down on the skills and training that are required for managing and deploying the system.

IBM PureFlex System combines advanced IBM hardware and software along with patterns of expertise. It integrates them into three optimized configurations that are simple to acquire and deploy so that you get fast time to value.

IBM PureFlex System is built and integrated before shipment so it can be quickly deployed into the data center. PureFlex System is shipped complete, integrated within a rack incorporating all the required power, networking, and SAN cabling together with all the associated switches, compute nodes, and storage.

Figure 1-1 shows an IBM PureFlex System 42U rack, complete with its distinctive PureFlex door.



Figure 1-1 IBM PureFlex System

The PureFlex System includes the following configurations:

- IBM PureFlex System Express, which is designed for small and medium businesses and is the most affordable entry point for PureFlex System.
- IBM PureFlex System Standard, which is optimized for application servers with supporting storage and networking, and is designed to support your key ISV solutions.
- IBM PureFlex System Enterprise, which is optimized for transactional and database systems. It has built-in redundancy for highly reliable and resilient operation to support your most critical workloads.

These configurations are summarized in Table 1-1.

Component	IBM PureFlex System Express	IBM PureFlex System Standard	IBM PureFlex System Enterprise		
IBM PureFlex System 42U Rack	1	1	1		
IBM Flex System Enterprise Chassis	1	1	1		
IBM Flex System Fabric EN4093 10 Gb Scalable Switch	1	1	2 with both port-count upgrades		
IBM Flex System FC3171 8 Gb SAN Switch ^a	1	2	2		
IBM Flex System FC5022 24-port 16Gb ESB SAN Scalable Switch ^a	1	2	2		
IBM Flex System Manager Node	1	1	1		
IBM Flex System Manager software license	IBM Flex System Manager with 1-year service and support	IBM Flex System Manager Advanced with 3-year service and support	Flex System Manager Advanced with 3-year service and support		
Chassis Management Module	2	2	2		
Chassis power supplies (standard /maximum)	2/6	4/6	6/6		
Chassis 80 mm fan modules (standard /maximum)	4/8	6/8	8/8		
IBM Flex System V7000 Storage Node ^b	Yes (redundant controller)	Yes (redundant controller)	Yes (redundant controller)		
IBM Storwize V7000 Disk System ^b	Yes (redundant controller)	Yes (redundant controller)	Yes (redundant controller)		
IBM Storwize V7000 Software	 Base with 1-year software maintenance agreement Optional Real Time Compression 	 Base with 3-year software maintenance agreement Real Time Compression 	 Base with 3-year software maintenance agreement Real Time Compression 		

Table 1-1 IBM PureFlex System configurations

a. Select the IBM Flex System FC3171 8 Gb SAN Switch or IBM Flex System FC5022 24-port 16Gb ESB SAN Scalable Switch module.

b. Select the IBM Flex System V7000 Storage Node that is installed inside the Enterprise chassis or the external IBM Storwize® V7000 Disk System.

1.2 IBM PureFlex System capabilities

The PureFlex System offers these advantages:

- ► Configurations that ease acquisition experience and match your needs
- Optimized to align with targeted workloads and environments

- Designed for cloud with SmartCloud Entry included on Standard and Enterprise
- Choice of architecture, operating system, and virtualization engine
- Designed for simplicity with integrated, single-system management across physical and virtual resources
- Simplified ordering that accelerates deployment into your environments
- Ships as a single integrated entity directly to you
- Includes factory integration and lab services optimization

IBM PureFlex System has three preintegrated offerings that support compute, storage, and networking requirements. You can select from these offerings, which are designed for key client initiatives and help simplify ordering and configuration. As a result, PureFlex System reduces the cost, time, and complexity of system deployments.

The IBM PureFlex System is offered in these configurations:

- Express: The infrastructure system for small-sized and midsized businesses, and the most cost-effective entry point.
- Standard: The infrastructure system for application servers with supporting storage and networking.
- Enterprise: The infrastructure system that is optimized for scalable cloud deployments. It has built-in redundancy for highly reliable and resilient operation to support critical applications and cloud services.

A PureFlex System configuration has these main components:

- Preinstalled and configured IBM Flex System Enterprise Chassis
- ► Compute nodes with either IBM POWER or Intel Xeon processors
- IBM Flex System Manager, preinstalled with management software and licenses for software activation
- IBM Flex System V7000 Storage Node or IBM Storwize V7000 external storage unit
- All hardware components that are preinstalled in an IBM PureFlex System 42U rack
- Choice of the following options:
 - Operating system: IBM AIX, IBM i, Microsoft Windows, Red Hat Enterprise Linux, or SUSE Linux Enterprise Server
 - Virtualization software: IBM PowerVM, KVM, VMware vSphere, or Microsoft Hyper V
 - SmartCloud Entry
- Complete pre-integrated software and hardware
- Onsite services included to get you up and running quickly

The fundamental building blocks of the three IBM PureFlex System solutions are the compute nodes, storage nodes, and networking of the IBM Flex System Enterprise Chassis.

1.3 IBM Flex System overview

IBM Flex System is a full system of hardware that forms the underlying strategic basis of IBM PureFlex System and IBM PureApplication® System and forms the underlying hardware basis of other IBM PureSystems offerings. IBM Flex System optionally includes a management appliance, known as *Flex System Manager*.

IBM Flex System is the next generation blade chassis offering from IBM that features the latest innovations and advanced technologies.

The major components of the IBM Flex System are described next.

1.3.1 IBM Flex System Manager

IBM Flex System Manager (FSM) is a high-performance scalable systems management appliance with a preinstalled software stack. It is designed to optimize the physical and virtual resources of the Flex System infrastructure while simplifying and automating repetitive tasks. Flex System Manager provides easy system setup procedures with wizards and built-in expertise, and consolidated monitoring for all of your resources, including compute, storage, networking, and virtualization resources.

It is an ideal solution that allows you to reduce administrative expense and focus your efforts on business innovation.

A single user interface controls the following features:

- Intelligent automation
- Resource pooling
- Improved resource usage
- Complete management integration
- Simplified setup

As an appliance, Flex System Manager is delivered preinstalled onto a dedicated compute node platform, which is designed to provide a specific purpose. It is intended to configure, monitor, and manage IBM Flex System resources in up to 16 IBM Flex System Enterprise Chassis, which optimizes time-to-value. FSM provides an instant resource-oriented view of the Enterprise Chassis and its components, which provides vital information for real-time monitoring.

An increased focus on optimizing time-to-value is evident in the following features:

- Setup wizards, including initial setup wizards, provide intuitive and quick setup of the Flex System Manager.
- The Chassis Map provides multiple view overlays to track health, firmware inventory, and environmental metrics.
- Configuration management for repeatable setup of compute, network, and storage devices.
- ► Remote presence application for remote access to compute nodes with single sign-on.
- Quick search provides results as you type.

Beyond the physical world of inventory, configuration, and monitoring, IBM Flex System Manager enables virtualization and workload optimization for a new class of computing:

- Resource usage: Detects congestion, notification policies, and relocation of physical and virtual machines that include storage and network configurations within the network fabric.
- Resource pooling: Pooled network switching, with placement advisors that consider virtual machine (VM) compatibility, processor, availability, and energy.
- Intelligent automation: Automated and dynamic VM placement that is based on usage, hardware predictive failure alerts, and host failures.

Figure 1-2 shows the IBM Flex System Manager appliance.



Figure 1-2 IBM Flex System Manager

1.3.2 IBM Flex System Enterprise Chassis

The IBM Flex System Enterprise Chassis is the foundation of the Flex System offering, which features 14 standard (half-width) Flex System form factor compute node bays in a 10U chassis that delivers high-performance connectivity for your integrated compute, storage, networking, and management resources.

Up to a total of 28 independent servers can be accommodated in each Enterprise Chassis, if double-dense x222 compute nodes are deployed.

The chassis is designed to support multiple generations of technology and offers independently scalable resource pools for higher usage and lower cost per workload.

With the ability to handle up 14 nodes, supporting the intermixing of IBM Power Systems and Intel x86, the Enterprise Chassis provides flexibility and tremendous compute capacity in a 10U package. Additionally, the rear of the chassis accommodates four high-speed I/O bays that can accommodate up to 40 GbE high-speed networking, 16 Gb Fibre Channel or 56 Gb InfiniBand. With interconnecting compute nodes, networking, and storage that uses a high-performance and scalable mid-plane, the Enterprise Chassis can support latest high-speed networking technologies.

The "ground-up" design of the Enterprise Chassis reaches new levels of energy efficiency through innovations in power, cooling, and air flow. Simpler controls and futuristic designs allow the Enterprise Chassis to break free of "one size fits all" energy schemes.

The ability to support the workload demands of tomorrow's workloads is built in with a new I/O architecture, which provides choice and flexibility in fabric and speed. With the ability to use Ethernet, InfiniBand, Fibre Channel (FC), Fibre Channel over Ethernet (FCoE), and iSCSI, the Enterprise Chassis is uniquely positioned to meet the growing and future I/O needs of large and small businesses.



Figure 1-3 shows the IBM Flex System Enterprise Chassis.

Figure 1-3 The IBM Flex System Enterprise Chassis

1.3.3 Compute nodes

IBM Flex System offers compute nodes that vary in architecture, dimension, and capabilities.

Optimized for efficiency, density, performance, reliability, and security, the portfolio includes a range of IBM POWER and Intel Xeon-based nodes that are designed to make full use of the full capabilities of these processors that can be mixed within the same Enterprise Chassis.

Power Systems nodes are available in either a two and four socket variety that uses the IBM POWER7® and IBM POWER7+ processors. Also available is a POWER7 node that is optimized for cost-effective deployment of Linux.

Compute nodes that use Intel processors are available that range from the two-socket Intel Xeon E5-2400 product family and the two-socket Intel E5-2600 product family to the four-socket Intel E5-4800 product family.

Up to 28 two-socket Intel Xeon E5-2400 servers can be deployed in a single Enterprise Chassis where high-density cloud, virtual desktop, or server virtualization is wanted.

Figure 1-4 shows a four-socket IBM POWER7 compute node, the p460.



Figure 1-4 IBM Flex System p460 Compute Node

The nodes are complemented with leadership I/O capabilities of up to 16 channels of high-speed I/O lanes per standard wide node bay and 32 lanes per full wide node bay. Various I/O adapters and matching I/O modules are available.

1.3.4 Expansion nodes

Expansion nodes can be attached to certain standard form factor (half-width) Flex System compute nodes. This attachment allows the expansion of the nodes' capabilities with locally attached storage or PCIe adapters.

The IBM Flex System Storage Expansion Node provides locally attached disk expansion to the x240 and x220. SAS and SATA disks are supported.

With the attachment of the IBM Flex System PCIe Expansion Node, an x220 or x240 can have up to four PCIe adapters attached. High-performance graphics processing units (GPUs) can also be installed within the PCIe Expansion Node from companies, such as Intel and NVIDIA.

1.3.5 Storage nodes

The storage capabilities of IBM Flex System give you advanced functionality with storage nodes in your system and make full use of your existing storage infrastructure through advanced virtualization.

Storage is available within the chassis by using the IBM Flex System V7000 Storage Node that integrates with the Flex System Chassis or externally with the IBM Storwize V7000.

IBM Flex System simplifies storage administration with a single user interface for all your storage. The management console is integrated with the comprehensive management system. These management and storage capabilities allow you to virtualize third-party storage with nondisruptive migration of your current storage infrastructure. You can also make use of intelligent tiering so that you can balance performance and cost for your storage needs. The solution also supports local and remote replication and snapshots for flexible business continuity and disaster recovery capabilities.

Flex System can also be connected to various external storage systems.

1.3.6 I/O modules

The range of available modules and switches to support key network protocols allows you to configure IBM Flex System to fit in your infrastructure. However, you can do so without sacrificing the ability to be ready for the future. The networking resources in IBM Flex System are standards-based, flexible, and fully integrated into the system. This combination gives you no-compromise networking for your solution. Network resources are virtualized and managed by workload. These capabilities are automated and optimized to make your network more reliable and simpler to manage.

IBM Flex System gives you the following key networking capabilities:

- Supports the networking infrastructure that you have today, including Ethernet, FC, FCoE, and InfiniBand
- Offers industry-leading performance with 1 Gb, 10 Gb, and 40 Gb Ethernet, 8 Gb and 16 Gb Fibre Channel, and quad data rate (QDR) and fourteen data rate (FDR) InfiniBand
- ► Provides pay-as-you-grow scalability so you can add ports and bandwidth when needed

Networking in data centers is undergoing a transition from a discrete traditional model to a more flexible, optimized model. The network architecture in IBM Flex System was designed to address the key challenges clients are facing today in their data centers. The key focus areas of the network architecture on this platform are unified network management, optimized and automated network virtualization, and simplified network infrastructure.

Providing innovation, leadership, and choice in the I/O module portfolio uniquely positions IBM Flex System to provide meaningful solutions to address client needs.

Figure 1-5 shows the IBM Flex System Fabric EN4093R 10Gb Scalable Switch.



Figure 1-5 IBM Flex System Fabric EN4093R 10Gb Scalable Switch

2

IBM PureFlex System and IBM Flex System management devices and appliances

The IBM Flex System hardware and software features can help you accomplish these tasks:

- Optimize your resource and power utilization
- Track and deploy your assets
- Maintain a secure environment
- Simplify the overall management of your data center

The Chassis Management Module (CMM), integrated compute node management controllers, and the IBM Flex System Manager (FSM) management node are designed to help simplify the overall management of your IBM Flex System resources.

This chapter includes the following sections:

- 2.1, "Management network" on page 14
- 2.2, "Chassis Management Module" on page 15
- ► 2.3, "Compute node management" on page 17
- ► 2.4, "I/O modules" on page 19
- 2.5, "IBM Flex System Manager" on page 20

2.1 Management network

The management network is a private and secure Gigabit Ethernet network. It is used to complete management-related functions throughout the chassis, including management tasks that are related to the compute nodes, switches, and the chassis itself.

The management network is shown in Figure 2-1 as the blue line. It connects the Chassis Management Module (CMM) to the compute nodes, the switches in the I/O bays, and the Flex System Manager (FSM). The FSM connection to the management network is through a special Broadcom 5718-based management network adapter (Eth0). The management networks in multiple chassis can be connected together through the external ports of the CMMs in each chassis by using a GbE top-of-rack switch.

The yellow line in the Figure 2-1 shows the production data network. The FSM also connects to the production network (Eth1) so that it can access the Internet for product updates and other related information.

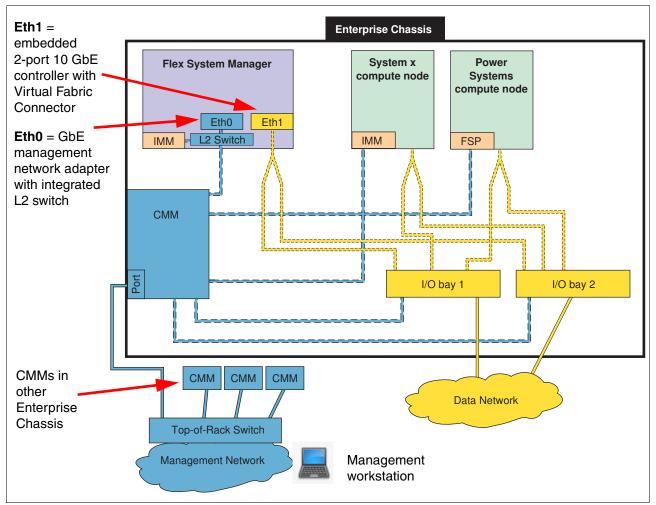


Figure 2-1 Separate management and production data networks

One of the key functions that the data network supports is discovery of operating systems on the various network endpoints. Discovery of operating systems by the FSM is required to support software updates on an endpoint such as a compute node. The FSM Checking and Updating Compute Nodes wizard assists you in discovering operating systems as part of the initial setup.

2.2 Chassis Management Module

The CMM provides single-chassis management, and is used to communicate with the management controller in each compute node. It provides system monitoring, event recording, and alerts; and manages the chassis, its devices, and the compute nodes.

The chassis supports up to two chassis management modules. If one CMM fails, the second CMM can detect its inactivity, activate itself, and take control of the system without any disruption. The CMM is central of the management of the chassis, and is required in the Enterprise Chassis.

An Enterprise chassis comes with at least one CMM installed. Table 2-1 lists the ordering information for the second CMM if required.

Table 2-1 Chassis Management Module ordering information

Part number	Feature code ^a	Description		
68Y7030	A0UE/3592 IBM Flex System Chassis Management Module			
		· · · · · · · · · · · · · · · · · · ·		

a. The first feature code listed is for x-config configurations. The second feature code is for e-config configurations.

Figure 2-2 shows the location of the CMM bays on the back of the Enterprise Chassis.

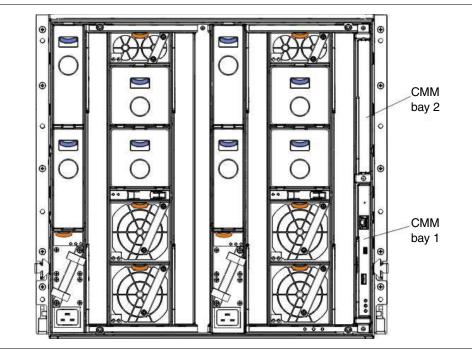


Figure 2-2 CMM Bay 1 and Bay 2

Figure 2-3 shows the CMM connectors and LEDs.

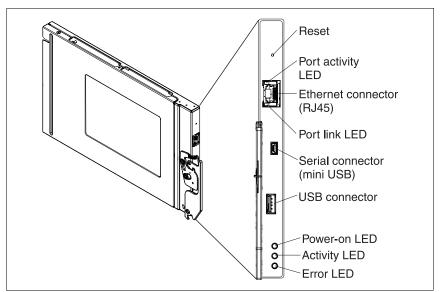


Figure 2-3 Chassis Management Module

The CMM has the following connectors:

- USB connection: Can be used for insertion of a USB media key for tasks such as firmware updates.
- 10/100/1000 Mbps RJ45 Ethernet connection: For connection to a management network. The CMM can be managed through this Ethernet port.
- Serial port (mini-USB): For local serial (command-line interface (CLI)) access to the CMM. Use the cable kit that is listed in Table 2-2 for connectivity.

Part number	Feature code ^a	Description
90Y9338	A2RR/None	 IBM Flex System Management Serial Access Cable Contains two cables: Mini-USB-to-RJ45 serial cable Mini-USB-to-DB9 serial cable

a. The first feature code listed is for x-config configurations. The second feature code is for e-config configurations.

The CMM has the following LEDs that provide status information:

- Power-on LED
- Activity LED
- Error LED
- Ethernet port link and port activity LEDs

The CMM also incorporates a reset button. It has two functions, dependent upon how long the button is held in:

- When pressed for less than 5 seconds, the CMM restarts.
- When pressed for more than 5 seconds (for example 10-15 seconds), the CMM configuration is reset to manufacturing defaults and then restarts.

Through an embedded firmware stack, the CMM implements functions to monitor, control, and provide external user interfaces to manage all chassis resources. The CMM allows you to perform these functions:

- Define login IDs and passwords
- Configure security settings such as data encryption and user account security
- Select recipients for alert notification of specific events
- Monitor the status of the compute nodes and other components
- Find chassis component information
- Discover other chassis in the network and enable access to them
- Control the chassis, compute nodes, and other components
- Access the I/O modules to configure them
- Change the startup sequence in a compute node
- Set the date and time
- Use a remote console for the compute nodes
- Enable multi-chassis monitoring
- Set power policies and view power consumption history for chassis components

2.3 Compute node management

Each node in the Enterprise Chassis has a management controller that communicates upstream through the CMM-enabled 1 GbE private management network that enables management capability. Different chassis components that are supported in the Enterprise Chassis can implement different management controllers. Table 2-3 details the different management controllers that are implemented in the chassis components.

Table 2-3	Chassis com	ponents and the	eir respective	management controllers

Chassis components	Management controller
Intel Xeon processor-based compute nodes	Integrated Management Module II (IMM2)
Power Systems compute nodes	Flexible service processor (FSP)

The management controllers for the various Enterprise Chassis components have the following default IPv4 addresses:

- CMM: 192.168.70.100
- Compute nodes: 192.168.70.101-114 (corresponding to the slots 1-14 in the chassis)
- I/O Modules: 192.168.70.120-123 (sequentially corresponding to chassis bay numbering)

In addition to the IPv4 address, all I/O modules also support link-local IPv6 addresses and configurable external IPv6 addresses.

2.3.1 Integrated Management Module II

The Integrated Management Module II (IMM2) is the next generation of the integrated service processors for the IBM x86-based server family. The IMM2 enhancements include a more responsive user interface, faster power on, and increased remote presence performance. The IMM2 incorporates a new web user interface that provides a common interface across all IBM System x software products.

The IMM2 provides the following major features as standard:

- IPMI v2.0-compliance
- Remote configuration of IMM2 and UEFI settings without the need to power on the server
- Remote access to system fan, voltage, and temperature values
- Remote IMM and UEFI update
- UEFI update when the server is powered off
- Remote console by way of a serial over LAN
- Remote access to the system event log
- Predictive failure analysis and integrated alerting features (for example, by using Simple Network Management Protocol (SNMP))
- Remote presence, including remote control of server by using a Java or Active x client
- Operating system failure window (blue screen) capture and display through the web interface
- Virtual media that allow the attachment of a diskette drive, CD/DVD drive, USB flash drive, or disk image to a server
- Syslog alerting mechanism that provides an alternative to email and SNMP traps
- Support for Features On Demand (FoD) enablement of server functions, option card features, and System x solutions and applications

For more information, see these resources:

Integrated Management Module II User's Guide

http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5086346

IMM and IMM2 Support on IBM System x and BladeCenter Servers, TIPS0849: http://www.redbooks.ibm.com/abstracts/tips0849.html

2.3.2 Flexible service processor

Several advanced system management capabilities are built into POWER7-based compute nodes. The flexible service processor (FSP) handles most of the server-level system management. The FSP used in Enterprise Chassis compatible POWER-based nodes is the same service processor that is used on POWER rack servers. It has system alerts and Serial over LAN (SOL) capability.

The FSP provides out-of-band system management capabilities, such as system control, runtime error detection, configuration, and diagnostic procedures. Generally, you do not interact with the FSP directly. Rather, you interact by using tools such as IBM Flex System Manager and Chassis Management Module.

The FSP provides an SOL interface, which is available by using the CMM and the console command. The POWER7-based compute nodes do not have an on-board video chip, and do not support keyboard, video, and mouse (KVM) connections. Server console access is obtained by a SOL connection only.

SOL provides a means to manage servers remotely by using a CLI over a Telnet or SSH connection. SOL is required to manage servers that do not have KVM support or that are attached to the FSM. SOL provides console redirection for both Software Management Services (SMS) and the server operating system.

The SOL feature redirects server serial-connection data over a LAN without requiring special cabling by routing the data through the CMM network interface. The SOL connection enables POWER7-based compute nodes to be managed from any remote location with network access to the CMM.

SOL offers the following functions:

- Remote administration without KVM
- ► Reduced cabling and no requirement for a serial concentrator
- Standard Telnet/SSH interface, eliminating the requirement for special client software

The Chassis Management Module command-line interface (CLI) provides access to the text-console command prompt on each server through a SOL connection. This configuration allows the POWER7-based compute nodes to be managed from a remote location.

2.4 I/O modules

The I/O modules have the following base functions:

- Initialization
- Configuration
- Diagnostic tests (both power-on and concurrent)
- Status reporting

In addition, the following set of protocols and software features are supported on the I/O modules:

- Supports configuration method over the Ethernet management port.
- A scriptable SSH CLI, a web server with SSL support, Simple Network Management Protocol v3 (SNMPv3) Agent with alerts, and a sFTP client.
- Server ports that are used for Telnet, HTTP, SNMPv1 agents, TFTP, FTP, and other insecure protocols are DISABLED by default.
- LDAP authentication protocol support for user authentication.
- For Ethernet I/O modules, 802.1x enabled with policy enforcement point (PEP) capability to allow support of Trusted Network Connect (TNC).
- The ability to capture and apply a switch configuration file and the ability to capture a first-failure data capture (FFDC) data file.
- Ability to transfer files by using URL update methods (HTTP, HTTPS, FTP, TFTP, sFTP).
- Various methods for firmware updates are supported including FTP, sFTP, and TFTP. In addition, firmware updates by using a URL that includes protocol support for HTTP, HTTPs, FTP, sFTP, and TFTP are supported.
- Supports SLP discovery in addition to SNMPv3.

- Ability to detect firmware/hardware hangs, and ability to pull a 'crash-failure memory dump' file to an FTP (sFTP) server.
- Supports selectable primary and backup firmware banks as the current operational firmware.
- Ability to send events, SNMP traps, and event logs to the CMM, including security audit logs.
- IPv4 and IPv6 on by default.
- The CMM management port supports IPv4 and IPv6 (IPV6 support includes the use of link local addresses.
- Port mirroring capabilities:
 - Port mirroring of CMM ports to both internal and external ports.
 - For security reasons, the ability to mirror the CMM traffic is hidden and is available only to development and service personnel
- Management virtual local area network (VLAN) for Ethernet switches: A configurable management 802.1q tagged VLAN in the standard VLAN range of 1 - 4094. It includes the CMM's internal management ports and the I/O modules internal ports that are connected to the nodes.

2.5 IBM Flex System Manager

IBM Flex System Manager (FSM) is a systems management appliance that drives efficiency and cost savings in the data center. IBM Flex System Manager provides a pre-integrated and virtualized management environment across servers, storage, and networking that is easily managed from a single interface. A single focus point for seamless multichassis management provides an instant and resource-oriented view of chassis and chassis resources for both IBM System x and IBM Power Systems compute nodes. FSM provides these advantages:

- Reduce the number of interfaces, steps, and clicks it takes to manage IT resources
- Intelligently manage and deploy workloads that are based on resource availability and predefined policies
- ► Manage events and alerts to increase system availability and reduce downtime
- Reduce operational costs

The IBM Flex System Manager management appliance is shown in Figure 2-4.



Figure 2-4 IBM Flex System Manager management appliance

IBM Flex System Manager is designed to help you get the most out of your IBM PureFlex System while automating repetitive tasks. IBM Flex System Manager can reduce the number of manual navigational steps for typical management tasks. IBM Flex System Manager provides core management functions along with automation so you can focus your efforts on business innovation. These functions include simplified system setup procedures with wizards and built-in expertise to consolidated monitoring for all of your physical and virtual resources (compute, storage, and networking).

IBM Flex System Manager has the following key features:

Optimizing your workload management through built-in expertise

With a workload-optimized approach, you can decrease infrastructure costs and improve service levels. You can create and modify system pools using virtual workloads, make dynamic virtual workload adjustments, and move workloads within system pools. These features result in an optimized virtual environment with increased resilience to cope with planned or unplanned downtime. A system pool is a group of virtualized system components that are managed as a single entity. This configuration allows you to manage the pools as easily as managing a single system, which is an essential capability for moving to cloud computing and a dynamic infrastructure.

Managing all of your resources with one solution

IBM Flex System Manager is designed to provide all of the key management functions for your integrated IT resources from a single, easy to use interface. This support begins with deployment through maintenance, upgrades, and problem resolution. From your office or remotely through a secure connection, you can manage your compute, storage, network, and virtualized resources:

- Compute

Auto discovery and setup wizards make deploying compute nodes quick and easy using the IBM Flex System Manager. After it is deployed, IBM Flex System Manager provides real-time updates for compute node "health" summaries. With the ability to define performance thresholds to trigger alerts, you can automate responses to potential problems help keep your critical business applications running at peak performance. IBM Flex System Manager can detect many problems with essential system resources and recover automatically. IBM Flex System Manager can also run trend analysis to forecast and prevent future problems that otherwise might lead to expensive system outages.

Storage

IBM Flex System Manager helps you address storage management challenges from device deployment and through the data lifecycle. Storage deployment capabilities in the IBM Flex System Manager include storage device discovery and simple logical and physical device configuration from a single interface. IBM Flex System Manager can provide physical and logical storage topology views, and show relationships between storage and server resources. These features give you the ability to track key resources based on their business usage. Provisioning capabilities include image management for simple virtual machine creation, deployment, and cloning. You can also manage storage system pools for data lifecycle management and storage placement based on business policies.

- Networking

Networking resources allow your virtualized compute and storage resources to communicate and function in the cloud. IBM Flex System Manager delivers end-to-end network management for your PureFlex System from a single tool. IBM Flex System Manager supports automated network discovery to speed deployments. It also offers a graphical view of the network from the integrated user interface. Network resources are pooled and virtualized. With logical network profiles, you can quickly and easily specify the network connectivity characteristics of a virtual machine.

IBM Flex System Manager supports automatic provisioning and simple movements of virtual LANs for virtual machines. You can manage MAC addresses for virtual network interface cards. IBM Flex System Manager provides detailed network usage and performance statistics for virtual machines and physical compute nodes. Theses statistics allow you to track valuable network resources and manage them based on your business needs.

Virtualization

The basic virtualization functions in the IBM Flex System Manager begin with the ability to create and manage virtual servers from pooled resources. IBM Flex System Manager takes this capability further through the application of built-in expertise to make provisioning and deployment of virtual machines fast and easy. After virtual machines are deployed, the virtualization features of IBM Flex System Manager are designed to help you manage these virtualized resources efficiently. Automation features such as dynamic virtual machine placement, automated optimization, and resource balancing simplify virtualization management. IBM Flex System Manager also helps keep your virtual machines up and running with support for nondisruptive updates, virtual machine mobility, and a range of other resilience features.

The IBM Flex System Manager appliance is based on an x86 compute node that comes with preloaded management software. The software contains a set of components that are responsible for running certain management functions. These components must be activated by using the available IBM FoD software entitlement licenses. They are licensed on a per-chassis basis, so you need one license for each chassis you plan to manage. The management node comes standard without any entitlement licenses, so you must purchase a license to enable the required FSM functions.

The part number to order the management node is shown in Table 2-4.

	Part number	Description	
8731A1x ^a IBM Flex System Manager node		IBM Flex System Manager node	
	a. The x in the Part number represents a country-specific letter (for example, the EMEA part		

Table 2-4 Ordering information for IBM Flex System Manager node

a. The x in the Part number represents a country-specific letter (for example, the EMEA part number is 8731A1G, and the US part number is 8731A1U). Ask your local IBM representative for specifics. The part numbers to order FoD software entitlement licenses are shown in the following tables. The part numbers for the same features are different in different countries. Ask your local IBM representative for specifics. Table 2-5 shows the information for the United States, Canada, Asia Pacific, and Japan.

Part number	Description	
Base feature set		
90Y4217 IBM Flex System Manager Per Managed Chassis with 1-Year SW S&S		
90Y4222 IBM Flex System Manager Per Managed Chassis with 3-Year SW S&S		
Advanced feature set upgrade ^a		
90Y4249	IBM Flex System Manager, Advanced Upgrade, Per Managed Chassis with 1-Year SW S&S	
00D7554	IBM Flex System Manager, Advanced Upgrade, Per Managed Chassis with 3-Year SW S&S	

Table 2-5 Ordering information for FoD licenses (United States, Canada, Asia Pacific, and Japan)

a. The base feature set is a prerequisite for the Advanced Upgrade.

Table 2-6 shows the ordering information for Latin America and Europe/Middle East/Africa.

Part number	Description	
Base feature se	et	
95Y1174	IBM Flex System Manager Per Managed Chassis with 1-Year SW S&S	
95Y1179	IBM Flex System Manager Per Managed Chassis with 3-Year SW S&S	
Advanced feature set upgrade ^a		
94Y9219	IBM Flex System Manager, Advanced Upgrade, Per Managed Chassis with 1-Year SW S&S	
94Y9220	IBM Flex System Manager, Advanced Upgrade, Per Managed Chassis with 3-Year SW S&S	

 Table 2-6
 Ordering information for FoD licenses (Latin America and Europe/Middle East/Africa)

a. The base feature set is a prerequisite for the Advanced Upgrade.

IBM Flex System Manager base feature set offers the following functions:

- Support for up to 16 managed chassis
- Support for up to 5,000 managed elements
- Auto-discovery of managed elements
- Overall health status
- Monitoring and availability
- ► Hardware management
- Security management
- Administration
- Network management (Network Control)
- Storage management (Storage Control)
- Virtual machine lifecycle management (VMControl Express)
- ► I/O address management (IBM Fabric Manager)

The IBM Flex System Manager advanced feature set upgrade offers the following advanced features:

- Image management (VMControl Standard)
- Pool management (VMControl Enterprise)

Requirement: IBM Flex System Manager base license is a prerequisite for the Advanced Upgrade license.

2.5.1 Hardware overview

The IBM FSM Manager Node has the following fixed hardware specifications:

- ► One Intel Xeon processor E5-2650 8C 2.0 GHz 20 MB Cache 1600 MHz 95 W
- 32 GB of memory with eight 4 GB (1x4 GB, 1Rx4, 1.35 V) PC3L-10600 CL9 ECC DDR3 1333 MHz LP RDIMMs
- ► Integrated LSI SAS2004 RAID controller
- ► Two IBM 200 GB SATA 1.8" MLC SSD configured in a RAID 1
- One IBM 1 TB 7.2 K 6 Gbps NL SATA 2.5" SFF HS HDD
- Dual-port 10 Gb Ethernet Emulex BladeEngine 3 (BE3) network controller for data network connections
- Dual-port Broadcom 5718-based network adapter with integrated Broadcom 5389 8-port basic L2 switch for internal chassis management network connections
- Integrated Management Module II (IMM2)

The FSM Manager Node ships with a preinstalled software management stack based on RHEV-H.

Figure 2-5 shows the internal layout of the FSM.

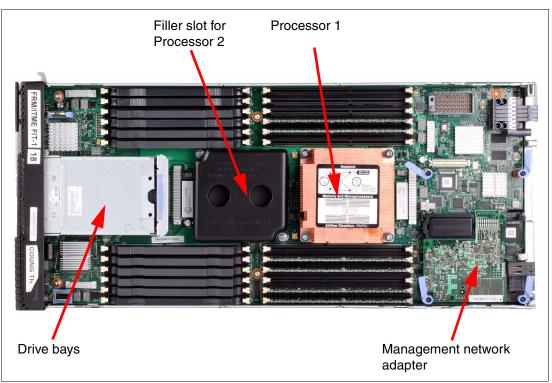


Figure 2-5 Internal view that shows the major components of IBM Flex System Manager

Front controls

The diagram in Figure 2-6 shows the front of an FSM with the location of the controls and LEDs.

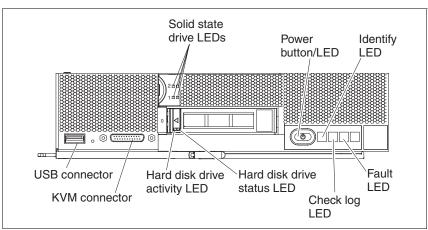


Figure 2-6 FSM front panel showing controls and LEDs

Local storage

The FSM ships with 2 x IBM 200 GB SATA 1.8" MLC SSD and 1 x IBM 1 TB 7.2K 6 Gbps NL SATA 2.5" SFF HS HDD drives. The 200 GB SSD drives are configured in an RAID-1 pair that provides roughly 200 GB of usable space. The 1 TB SATA drive is not part of a RAID group.

The partitioning of the disks is listed in Table 2-7.

Physical disk	Virtual disk size	Description
SSD	50 MB	Boot disk
SSD	SSD 60 GB OS/Application disk	
SSD	80 GB	Database disk
HDD	40 GB	Update repository
HDD	40 GB	Dump space
HDD	60 GB	Spare disk for OS/Application
HDD	80 GB	Spare disk for database
HDD	30 GB	Service Partition

Table 2-7 Detailed SSD and HDD disk partitioning

Management network adapter

The management network adapter is a standard feature of the FSM, and provides a physical connection into the private management network of the chassis. The adapter contains a Broadcom 5718 Dual 1GbE adapter and a Broadcom 5389 8-port L2 switch. This card is one of the features that makes the FSM unique compared to all other nodes supported by the Enterprise Chassis. The management network adapter provides a physical connection into the private management network of the chassis. The connection allows the software stack to have visibility into both the data and management networks. The L2 switch on this card is automatically set up by the IMM2. It connects the FSM and the onboard IMM2 into the same internal private network.

2.5.2 Software features

The IBM Flex System Manager management software has these main features:

- Monitoring and problem determination:
 - A real-time, multichassis view of hardware components with overlays for more information.
 - Automatic detection of issues in your environment through an event setup that triggers alerts and actions.
 - Identification of changes that might affect availability.
 - Server resource utilization by virtual machine or across a rack of systems.
- Hardware management:
 - Automated discovery of physical and virtual servers and interconnections, applications, and supported third-party networking.
 - Inventory of hardware components.
 - Chassis and hardware component views:
 - Hardware properties.
 - Component names/hardware identification numbers.
 - Firmware levels.
 - Utilization rates.

- Network management:
 - Management of network switches from various vendors.
 - Discovery, inventory, and status monitoring of switches.
 - Graphical network topology views.
 - Support for KVM, pHyp, VMware virtual switches, and physical switches.
 - VLAN configuration of switches.
 - Integration with server management.
 - Per-virtual machine network usage and performance statistics that are provided to VMControl.
 - Logical views of servers and network devices that are grouped by subnet and VLAN.
- Storage management:
 - Discovery of physical and virtual storage devices.
 - Support for virtual images on local storage across multiple chassis.
 - Inventory of the physical storage configuration.
 - Health status and alerts.
 - Storage pool configuration.
 - Disk sparing and redundancy management.
 - Virtual volume management.
 - Support for virtual volume discovery, inventory, creation, modification, and deletion.
- Virtualization management (base feature set):
 - Support for VMware, Hyper-V, KVM, and IBM PowerVM.
 - Creates virtual servers.
 - Edits virtual servers.
 - Manages virtual servers.
 - Relocates virtual servers.
 - Discovers virtual server, storage, and network resources and visualize the physical-to-virtual relationships.
- Virtualization management (advanced feature set):
 - Creates new image repositories for storing virtual appliances and discover existing image repositories in your environment.
 - Imports external, standards-based virtual appliance packages into your image repositories as virtual appliances.
 - Captures a running virtual server that is configured the way that you want, complete with a guest operating system, running applications, and virtual server definition.
 - Imports virtual appliance packages that exist in the Open Virtualization Format (OVF) from the Internet or other external sources.
 - Deploys virtual appliances quickly to create new virtual servers that meet the demands of your ever-changing business needs.
 - Creates, captures, and manages workloads.
 - Creates server system pools, which enable you to consolidate your resources and workloads into distinct and manageable groups.

- Deploys virtual appliances into server system pools.
- Manages server system pools, including adding hosts or more storage space, and monitoring the health of the resources and the status of the workloads in them.
- Groups storage systems together by using storage system pools to increase resource utilization and automation.
- Manages storage system pools by adding storage, editing the storage system pool policy, and monitoring the health of the storage resources.
- I/O address management:
 - Manages assignments of Ethernet MAC and Fibre Channel WWN addresses.
 - Monitors the health of compute nodes, and automatically replaces a failed compute node from a designated pool of spare compute nodes without human intervention.
 - Preassigns MAC addresses, WWN addresses, and storage boot targets for the compute nodes.
 - Creates addresses for compute nodes, saves the address profiles, and deploys the addresses to the slots in the same or different chassis.
- Additional features:
 - Resource-oriented chassis map provides an instant graphical view of chassis resources, including nodes and I/O modules:
 - A fly-over provides an instant view of an individual server's (node) status and inventory.
 - A chassis map provides an inventory view of chassis components, a view of active statuses that require administrative attention, and a compliance view of server (node) firmware.
 - Actions can be taken on nodes, such as working with server-related resources, showing and installing updates, submitting service requests, and starting the remote access tools.
 - Remote console:
 - Open video sessions and mount media, such as DVDs with software updates, to the servers from local workstation.
 - Remote KVM connections.
 - Remote Virtual Media connections (mount CD/DVD/ISO/USB media).
 - Power operations against servers (Power On/Off/Restart).
 - Hardware detection and inventory creation.
 - Firmware compliance and updates.
 - Automatic detection of hardware failures:
 - Provides alerts.
 - Takes corrective action.
 - Notifies IBM of problems to escalate problem determination.
 - Health status (such as processor utilization) on all hardware devices from a single chassis view.
 - Administrative capabilities, such as setting up users within profile groups, assigning security levels, and security governance.

For more information, see the IBM Flex System Manager product publications available from the IBM Flex System Information Center at this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp

Part 2

Chassis Management Module

This part describes how to implement systems management of IBM PureFlex System using the Chassis Management Module.

This part includes the following chapters:

- ► Chapter 3, "Planning for Chassis Management Module-based management" on page 33
- Chapter 4, "Chassis Management Module operations" on page 41

Planning for Chassis Management Module-based management

This chapter describes the systems management capabilities of the Chassis Management Module (CMM). It includes things that you need to take into account when you are planning for CMM-based management in your infrastructure.

Topics that are covered include CMM tasks, management network, CMM configuration interfaces, and options for securing your chassis management components.

This chapter includes the following sections:

- ► 3.1, "Chassis Management Module management network" on page 34
- ► 3.2, "Chassis Management Module interfaces" on page 35
- ► 3.3, "Chassis Management Module security" on page 36
- ► 3.4, "Features on Demand planning" on page 40

3.1 Chassis Management Module management network

The internal chassis management network topology for CMM-based deployments is shown in Figure 3-1 as the blue line. It connects CMM to the compute nodes and the switches in the I/O bays. The CMM interfaces with the integrated management module (IMM) or flexible service processor (FSP) integrated in each compute node in the chassis through the management network. The management networks in multiple chassis can be connected together through the external ports of the CMMs in each chassis by using a GbE top-of-rack switch. The yellow line in Figure 3-1 shows the production data network.

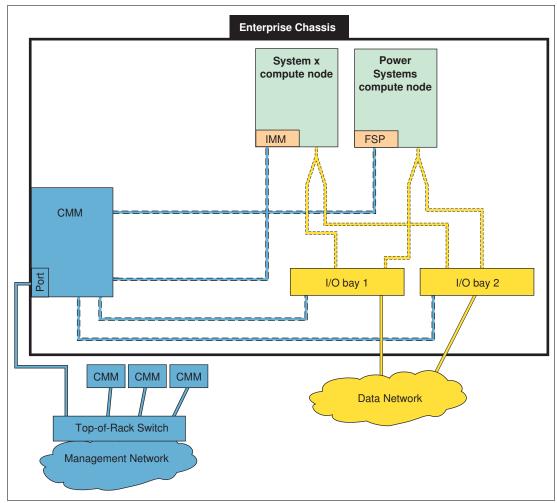


Figure 3-1 CMM-based management network topology

The CMM-based management function is limited to the hardware management and alerting capabilities that are provided by the CMMs themselves and IMMs or FSPs. For more information, see 2.2, "Chassis Management Module" on page 15, and 2.3, "Compute node management" on page 17.

3.2 Chassis Management Module interfaces

The Chassis Management Module supports a web-based graphical user interface and command-line interface (CLI). Both the web-based and CLI interfaces are accessible through the single RJ-45 Ethernet connector on the CMM, or from any other system that is connected to the same (management) network.

The CMM has the following default IPv4 settings:

- IP address: 192.168.70.100
- Subnet: 255.255.255.0
- User ID: USERID (all capital letters)
- Password: PASSW0RD (all capital letters, with a zero instead of the letter O)

The CMM does not have a fixed static IPv6 IP address by default. Initial access to the CMM in an IPv6 environment can be done by either using the IPv4 IP address or the IPv6 link-local address. The IPv6 link-local address is automatically generated based on the MAC address of the CMM. By default, the CMM is configured to respond to DHCP first before it uses its static IPv4 address. If you do not want this operation to take place, connect locally to the CMM and change the default IP settings. You can connect locally, for example, by using a mobile computer.

Requirement: Network interfaces on the devices that are connected to the management network must be on a same IP subnet. These devices include CMMs, IMMs, FSPs, and I/O modules.

The web-based GUI brings together all the functions that are needed to manage the chassis elements in an easy-to-use fashion with consistency across all System x IMM2 based platforms.

For more information about how to use the web-based interface to connect to the default CMM address, see 4.1.1, "Connecting to Chassis Management Module" on page 42. The CMM CLI provides direct access to IBM Flex System management functions as an alternative to using the web-based user interface.

Using the CLI, you can issue commands to control the power and configuration of the CMM and other components in an IBM Flex System Enterprise Chassis. The command-line interface also provides access to the text-console command prompt on each compute node through a Serial over LAN (SOL) connection.

You can access the CMM CLI through these connections:

- A direct serial or Ethernet connection to the CMM
- A Telnet connection to the IP address of the CMM
- A Secure Shell (SSH) connection to the CMM

You can initiate connections from the client system by using standard remote communication software. No special programs are required.

You do not need any special hardware to use the CMM command-line interface.

3.3 Chassis Management Module security

Unsecured systems management tools can represent a threat to the hardware and software, and place your data at risk. The CMM offers advanced security capabilities and user management settings to help you secure your environment.

Important: All security and user-management settings are replicated to the IMMs that CMM manages.

The following security enhancements and features are provided in the chassis:

- Single sign-on (centralized user management)
- End to end audit logs
- Secure boot: TPM and CRTM
- Intel TXT technology (Intel Xeon-based compute nodes)
- Signed firmware updates to ensure authenticity
- Secure communications
- Certificate authority and management
- Chassis and compute node detection and provisioning
- Role-based access control
- Security policy management
- The same management protocols that are supported on BladeCenter AMM for compatibility with earlier versions
- Insecure protocols are disabled by default in CMM, with "Locks" settings to prevent user from inadvertently or maliciously enabling them
- Supports up to 84 local CMM user accounts
- Supports up to 32 simultaneous sessions
- Planned support for DRTM

3.3.1 Security policies

A CMM security policy is a set of security-related characteristics that define a particular level of protection from security exposures. The CMM security policies include hardware-related communication-protocol controls and account-related access controls.

The CMM offers two levels of security policy: *Legacy* and *Secure*. Security policies are not customizable. However, you can modify the user account policies that the security policies access. For more information, see 3.3.2, "User account policies" on page 37.

An administrator or a user with administrative privileges can use the CMM CLI or web interface to change the security policy settings. For more information about how to configure Security Policies, see "Security policies" on page 58.

Remember: If the security policy settings are changed after the compute nodes are up and running, the security policy status will remain in Pending state. This state persists until the compute nodes in the chassis are restarted.

Secure security policy

The CMM Secure security policy is the most secure and least flexible setting that is available for your configuration. The Secure security policy establishes a more restrictive chassis infrastructure with a higher level of control over users and chassis configuration. It helps secure the chassis environment and enforces the following conditions:

- Complex password policies for CMM user accounts.
- ► Mandatory change of password for all user accounts at first login.
- Disabling of communication protocols that are not secure: FTP, SNMPv1, Telnet, TFTP, FTP, and non-secure TCP command mode. Only secure communication protocols such as SSH, SSL, and HTTPS are allowed.
- Certificates to establish secure, trusted connections for applications that run on the management processors.

Restriction: You cannot access the CMM CLI through Telnet while you are using the Secure security policy setting.

Legacy security policy

The CMM Legacy security policy is the least secure and most flexible setting that is available for your configuration.

The Legacy level of management software security policy provides flexibility in managing the chassis infrastructure. It allows the use of the following conditions:

- Weaker password policies for CMM user accounts
- ► No requirement that passwords for user accounts be changed at first login
- Availability of all communication protocols, both secure and unencrypted (Telnet, SNMP v1, TCP command mode, CIM-XML, FTP, and TFTP).

3.3.2 User account policies

A CMM user account policy is a set of criteria that determines how CMM user account security, including passwords, is implemented.

User account policy conditions affect all users of the CMM. They help enforce the security policy that is chosen for the IBM Flex System Enterprise Chassis environment. For more information, see 3.3.1, "Security policies" on page 36.

The CMM offers two initial user account policy choices: *Legacy* and *High*. You can customize the default values of each of these choices to create a *Custom* user account policy for your IBM Flex System Enterprise Chassis chassis environment.

You can change individual user account policy settings from the default values for each user account policy type. However, the security policy of the CMM might require that specific user account policy settings have secure values. For example, if you attempt to change the CMM security policy level from Legacy to Secure, the CMM might require that you change some user account policy settings. However, if you change the CMM security policy from Secure to Legacy but do not manually modify the user account policy settings, some of them retain their previous secure values.

High user account policy

The CMM user account policy must have a High setting to be used with a CMM that has a Secure security policy.

The High user account policy establishes a higher level of control over users. It provides a more secure chassis environment than the Legacy setting. If the High user account policy is selected, you can override its default values to create a Custom policy. You can do so by using the CMM web interface or the CMM CLI.

Legacy user account policy

When the CMM password policy is configured for use with the Legacy security policy, it allows more flexible, and less secure, accounts.

The Legacy user account policy establishes a lower level of control over users. It provides a less secure chassis environment than the High setting. If the Legacy user account policy is selected, you can override its default values to create a Custom policy. You can do so by using the CMM web interface or the CMM CLI.

Table 3-1 provides some examples of user account policy settings.

User account policy setting	Description		
User authentication method	The method for authenticating CMM users (local, LDAP, or both)		
Maximum simultaneous user sessions	The number of concurrent login sessions that are allowed for each user through all CMM interfaces		
Maximum login failures	The maximum number of failed login attempts by a user before the account is locked out		
Lockout period login failure	The amount of time a user account is locked out after the maximum number of unsuccessful login attempts is reached		
Complex password	Whether the CMM follows more secure complex password rules		
Password change on first access	The requirement that users change their password the first time they log in to the CMM		
Password expiration period	The amount of time a user password remains valid before it must be changed		
Minimum password change interval	The minimum amount of time between user password changes		
Password reuse cycle	The number of password changes before a password can be reused		

Table 3-1 Account policy settings

Depending on the initial user account policy you selected, the user account policy settings are configured with different values. For example, the user account policy settings "Complex password" and "Password change on first access" are **On** if you select High user account policy. They are **Off** if you select Legacy user account policy.

For more information about user account policies, see this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc.cmm
.doc/cmm_password_policies.html

3.3.3 External authentication of certificates

Certificates are used to establish secure, trusted connections to the CMM and from the CMM to other servers.

For an application to trust the server that it is connecting to, it must have the correct certificate in its trust store. This certificate must be a copy of either the server certificate or the certificate of the *certificate authority* (CA) that signed the server certificate. The CMM has a CA that signs certificates for the LDAP, HTTPS, and CIM servers of all systems management processors in the IBM Flex System Enterprise Chassis. You can create trust between your web browser and the HTTPS servers on the management processors in the chassis by importing the CA certificate into your web browser. When you work with an external LDAP server, you can use the CMM web interface or CLI to configure either non-mutual (server only) or mutual certificate authentication.

The CA certificate in each IBM Flex System Enterprise Chassis is unique. Download CA certificates through the primary CMM in each chassis by using the CMM web interface or CLI.

After you download each CA certificate, import it into your web browser. This configuration ensures that the web browser trusts websites that have a certificate that is signed by the CA. If there are multiple users who access the management processors in the IBM Flex System Enterprise Chassis, you can share the CA certificates with the other users. Each user that receives a CA certificate must also import it into their web browser. If your organization has a process for pushing trusted authority certificates to users, you can also use that process.

If you change a CA certificate, you must download the new certificate and import it into the following locations:

- Your web browser
- ► The Certificate Trust Store of your IBM Flex System Manager management software
- Any IBM Systems Director servers that might be in your network
- ► Any external LDAP servers that might be configured for mutual authentication

This process applies for all activities that can change a CA certificate: Manual changes, resetting the CMM to defaults, or restoring a CMM configuration from a backup image.

If your web browser advises you that a connection is untrusted or a security certificate is invalid, or has any other issue that indicates a certificate exception issue relating to a certificate exception, download and import the CA certificate. Make sure to clear all old certificates from the IBM Flex System Enterprise Chassis on all tabs in the certificate pages. You can also try clearing the browser cache. Because some certificate issues affect only certain web browsers, you might be able to correct the condition by switching to a different web browser.

Importing an LDAP certificate with non-mutual authentication

Import a certificate by using non-mutual external authentication when you need to authenticate only the LDAP server with the CMM. You can authenticate the LDAP server with the CMM by using the CMM command-line interface (CLI) or web interface.

Requirement: Certificates must be signed using SHA-1 hashes, SHA-2 hashes are not supported.

Importing an LDAP certificate with mutual authentication

Import certificates for mutual authentication when you need the external LDAP server to authenticate the CMM and the CMM to authenticate the external LDAP server.

There are two ways to establish mutual authentication between the CMM and an external LDAP server. When you use either method, you must also perform the steps for non-mutual authentication.

- Export the chassis CA certificate and import it into the trust store for your external LDAP server. This process allows mutual authentication between the LDAP server and all elements in the chassis that have their security configuration automatically provisioned.
- Export a certificate signing request (CSR) from the CMM and have it signed by a certificate authority that the LDAP server already trusts. This method provides mutual authentication between the CMM and the LDAP server.

For more information about external authentication of certificates, see this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc.cmm .doc/cli_ext_cert_authentication.html

3.4 Features on Demand planning

Features on Demand (FoD) is the capability to activate or "unlock" features that are integrated in IBM products. The feature is in the firmware or software, but is "locked" until the activation key is installed.

You can purchase activation keys to activate the FoD for your CMMs, I/O modules, and compute nodes, if your components support these features.

You can use CMM to view activated license keys. For more information, see 4.2.4, "Chassis Management Module Features on Demand" on page 68.

To activate the keys, perform these actions:

- Do it directly on your I/O modules
- Do it directly on the compute nodes by using the IMM or Advanced Settings Utility (ASU).
- Use Flex System Manager to manage all your FoD keys. For more information, see 5.1.3, "Planning for Features on Demand" on page 90.

For a list of available FoD keys for IBM Flex System, see 5.1.3, "Planning for Features on Demand" on page 90.

4

Chassis Management Module operations

This chapter describes the steps that are required for initial configuration of the Chassis Management Module, and shows how to manage the Enterprise chassis with the CMM.

This chapter includes the following sections:

- 4.1, "Initial configuration of Chassis Management Module" on page 42
- ► 4.2, "Chassis Management Module management tasks" on page 62

4.1 Initial configuration of Chassis Management Module

This section describes how to initially configure the Chassis Management Module to enable chassis management tasks. For more information about CMM capabilities, see 2.2, "Chassis Management Module" on page 15.

The following tasks are described:

- ► 4.1.1, "Connecting to Chassis Management Module" on page 42
- 4.1.2, "Configuring Chassis Management Module by using Initial Setup Wizard" on page 44
- ▶ 4.1.3, "Preparing for Chassis Management Module redundancy" on page 56
- ▶ 4.1.4, "Configuring Chassis Management Module user authority" on page 58
- ► 4.1.5, "Restoring a Chassis Management Module" on page 62

4.1.1 Connecting to Chassis Management Module

You can cable the CMM to support a management connection that best matches your site configuration. You must connect a client system to the CMM to configure and manage operation of the IBM Flex System Enterprise Chassis.

By default, the CMM does not have a fixed static IPv6 IP address. For initial access to the CMM in an IPv6 environment, you can either use the IPv4 IP address or the IPv6 link-local address.

By default, the CMM is configured to respond to DHCP first before it uses its static IP address.

The HTTP connection is not available when the CMM security policy is set to Secure (the manufacturing default setting). When the security policy is set to Secure, Ethernet connections must be made by using HTTPS.

To connect to the CMM, perform the following steps:

- Make sure that the subnet of the client computer is set to the same value as in the CMM (the default CMM subnet is 255.255.255.0). The IP address of the CMM must also be in the same local domain as the client computer. To connect to the CMM for the first time, you might have to change the Internet Protocol properties on the client computer.
- Open a web browser on the client computer, and direct it to the CMM IP address. For the first connection to the CMM, use the default IP address of the CMM, as shown in Figure 4-1.

https://192.168.70.100



Clarification: The Chassis Management Module has the following default settings:

- Subnet: 255.255.255.0
- User ID: USERID (all capital letters)
- Password: PASSW0RD (note the number zero, not the letter O, in PASSW0RD)
- ► IP address: 192.168.70.100

3. Log in to the CMM by using the default credentials: USERID/PASSW0RD. Click Log In as shown in Figure 4-2.

		IBM.
I	BM Chassis Management Module	
	User name: USERID Password: <password> Inactive session timeout no timeout</password>	
	Use automatic refresh	
Licensed tradema	Log In d Materials - Property of IBM Corp. © IBM Corporation and other(s) 201 ark of the IBM Corporation in the United States, other countries, or both	3. IBM is a registered

Figure 4-2 CMM login

The Chassis Management Module main window opens as shown in Figure 4-3.

IBM Chassis Management Module	USERID Settings Log Out Help 語論。
System Status Multi-Chassis Monitor Events - Service and Support - Search	 Chassis Management Mgt Module Management Fri, 8 Nov 2013, 13:43
itsoFlex1 Change chassis name System Information 💌	-
Chassis Graphical View Chassis Table View Active Events	

Figure 4-3 CMM main window

4.1.2 Configuring Chassis Management Module by using Initial Setup Wizard

The next step is the initial configuration of the Chassis Management Module. The initial setup wizard can help you configure the CMM through a web interface. The wizard starts automatically when you first access the web interface of a new CMM or a CMM that has been reset to its default settings.

Follow these steps to manually start the Initial Setup Wizard and perform the initial configuration:

1. From the CMM web interface home window, click **Mgt Module Management** as shown in Figure 4-4.

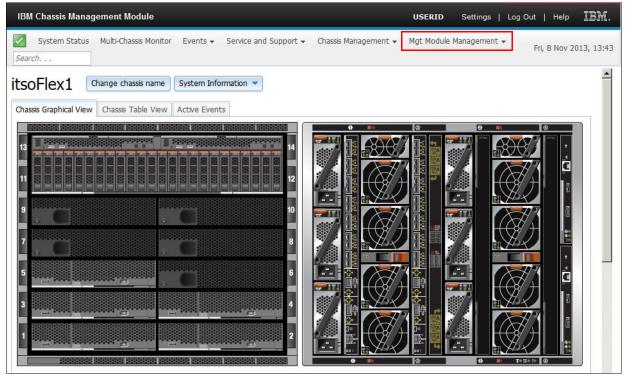


Figure 4-4 CMM main window: Mgt Module Management

The initial setup wizard is contained in the **Configuration** menu, as shown in Figure 4-5.

Mgt Module Management 👻	Search			
User Accounts	Create and modify user accounts that will have access to this web console			
Firmware	View CMM firmware information and update firmware			
Security	Configure security protocols such as SSL and SSH			
Network	Network settings such as SNMP and LDAP used by the CMM			
Configuration	Backup current configuration and restore a configuration			
Properties	Properties and settings such as Date and Time and Failover			
License Key Management	Licenses for additional functionality			
Restart	Restart the CMM. Typically only needed when experiencing problems			
Reset to Defaults	Sets all current configuration settings back to default values			
File Management	View or delete files in the CMM local storage file system.			

Figure 4-5 Mgt Module Management window

Several options are displayed for managing the Chassis Management Module configuration.

2. For the first time connection, click Initial Setup Wizard as shown in Figure 4-6.

Manage Configuration The CMM web console configuration settings can be exported to and imported from an external file. This is primarily for backup purposes so that you can easily restore your configuration if you need to.		
Backup Configuration to File Restore Configuration from File	Initial Setup Wizard	

Figure 4-6 Manage Configuration window

3. When the wizard starts, the first window displays the steps that to be performed on the left side of the window. The basic description of the steps is displayed in the main field.

Figure 4-7 shows the Welcome window of the Initial Setup Wizard. Navigation buttons for the wizard are in the lower left corner of each window. Click **Next**.

Welcome	Welcome
Inventory and Health	Description
Import Existing Configuration	
General Settings	Getting Started
Date and Time	Some of the information provided by the wizard is based on the hardware components
IP Configuration	inserted into your chassis. At this time, ensure that all the required hardware is properly installed, then click Next.
IO Modules	
Security Policy	Also at this time you may wish to make note of the informaton that will be needed to complete this wizard:
DNS	1. Inventory and Health - Shows the currently detected inventory and health of your
Event Recipients	components
	2. Import Existing Configuration - Import a configuration file that you previously saved to
Confirm	either a file or the chassis
	3. General Settings - General settings for the chassis and management module
	4. Date and Time - Indicate how you wish the date and time to be set on the management module
	 IP Configuration - IP configuration for the management module IO Modules - Configure basic settings for your IO modules
	7. Security Policy - Set the overall chassis security policy
	8. DNS - Relevant IP addresses for Domain Name Server
	9. Event Recipients - Set up email address where you wish to be notified of events
	10. Confirm - View a summary of the configuration you have created
< Back Next > Finis	Cancel

Figure 4-7 Welcome window

a. The Inventory and Health window shows the detected components and their current health status, as shown in the Figure 4-8. Click **Next**.

🗹 Welcome	Inventory and Health					
Inventory and Health	Shows the currently detected inventory and health of your components					
Import Existing Configuration	Examine the list of your components below and confirm that all components are present and have a normal health statu					
General Settings						
Date and Time	Health status Active events					
IP Configuration	Device Name	Device Type	Health Status	Bay	Machine Type/Model	Serial Number
	SN#Y011BG24H0BB	Management Module	Normal	1		Y011BG24H0BB
Security Policy	SN#Y011BG24H0BB	Management Module	Normal	2		Y011BG25302F
DNS	Node 01 (node01-x240)	Compute Node	Normal	1	8737AC1	Y011BG25Y09Y
Event Recipients	Node 02 (node02-x240)	Compute Node	Normal	2	8737AC1	Y011BG26603W
Confirm	Node 03 (node03-x240)	Compute Node	Normal	3	8737AC1	Y011BG25Z02N
commun.	Node 04 (node04-x240)	Compute Node	Normal	4	8737AC1	Y011BG26704K
	Node 05 (node05-FSM)	Compute Node	Vormal	5	8731AC1	Y010BG24B03K
	Storage Control Enclosure 11-1	Storage Control Enclosure	🛃 Normal	11-14	4939A49	YM12BG25E00G
	Node 11 - 01	Canister 1 (left)	Normal	11-14	4939A49	YM12BG25N02E
	Node 11 - 02	Canister 2 (right)	Normal	11-14	4939A49	YM12BG25N00T
	Disk Drives	Drive				
	Power Module 1	Power Module	🔽 Normal	1		ZK108123809C
	Power Module 2	Power Module	Normal	2		ZK108123808H

Figure 4-8 Inventory and Health window

b. If you have saved a configuration file, the Import Existing Configuration window allows you to upload this file to the CMM, as shown in Figure 4-9.

Welcome	Import Existing Configuration		
Inventory and Health	To facilitate your task of setting up the management module, you can import a configuration file that you previously saved to either a file or the chassis. Importing a configuration will automatically fill in the fields of this wizard with the appropriate values.		
Import Existing Configuration			
General Settings	If this is your first time setting up a chassis, you will not have a configuration file to import. These files are useful as a backup of your management module settings, or for configuring multiple chassis. To create a configuration file, you can use the main		
Date and Time	console under Mgt Module Management -> Configuration.		
IP Configuration	Some restore operations may cause a temporary loss of web connectivity. Under these circumstances, the final confirmation popup and restore log may not be available. If web connectivity is lost, clear the browser cache (Ctrl+F5)		
IO Modules	and restart your session. At this point, check the event log for messages related to the configuration restore operation.		
Security Policy	Passphrase:		
DNS	Confirm pass:		
Event Recipients	Upload configuration file:		
Confirm	Browse for file		
< Back Next > Fini	sh Cancel		

Figure 4-9 Import Existing Configuration window

4. The General Settings window prompts you to enter some descriptive information about the chassis, including location and contact person, as shown in the Figure 4-10. Click **Next**.

☑ Welcome	General Settings		
Inventory and Health	General settings for the chass	is and management module	
Import Existing Configuration	Management module name	cmm1	
	Chassis description	itsoFlex1	
General Settings	Contact person	No Contact Configured	
Date and Time	Chassis location	No Location Configured	
IP Configuration	Room ID		
IO Modules	Rack ID		
	Lowest U-position	0	
Security Policy	Unit height of chassis	10	
DNS			
Event Recipients			
Confirm			
< Back Next > Finish	Cancel		

Figure 4-10 General Settings window

c. Set the date and time for the CMM in the Date and Time window, as shown in the Figure 4-11. There are two options to sync the time: Using NTP or setting manually. Click **Next**.

G Welcome	Date and Time
Inventory and Health	Date and time settings for the management module
Import Existing Configuration	Indicate how you wish the date and time to be set on the management module. The management module date and time values are used in the event log, for example.
General Settings	Select method Synchronize with an NTP server
Date and Time	
IP Configuration	NTP server host name and/or IP address 9.42.170.223 Synchronization frequency (minutes) 20
IO Modules	
Security Policy	Enable NTP v3 Authentication
DNS	NTP v3 Authentication key index 2
Event Recipients	NTP v3 Authentication key (M - MD5) 3291FC94
Confirm	NTP last updated the clock on 10/03/2013 19:35:05 by 0 s. The last 1704 update attempt(s) have failed.
	GMT Offset: -5:00 - Eastern Standard Time (Eastern USA, Ontario, Quebec) 💌
	Unable to automatically determine the daylight saving time to use. Please provide the DST scheme.
	Selected GMT offset -5:00 - Eastern Standard Time (Eastern USA, Ontario, Quebec)
	Available schemes USA and Canada 👻
	Automatically adjust for daylight savings time (DST)
< Back Next > Finish	Cancel

Figure 4-11 Date and Time window

d. Each CMM is configured with the same static IP address. You must create a unique static IP address for each CMM. If DHCP is not used, only one CMM at a time can be added onto the network for discovery. Adding more than one CMM to the network without a unique IP address assignment for each results in IP address conflicts.

Figure 4-12 shows the IP configuration window.

I Welcome	IP Configuration	n the management modul	e		
 Inventory and Health Import Existing Configuration 	Host name	ule management modu	СММ]	
General Settings	Domain name Register this inte	erface with DNS			
Date and Time	IPv4 II	Pv6			
IP Configuration IO Modules Security Policy DNS Event Recipients Confirm	IP address: Subnet mask: Default gateway:	gned IPv4 addro 9.42.170.215 255.255.254.0 9.42.170.1 nent methods: Use			¥
	Static IP Addr *Changing setting	ess Settings as requires a CMM re	start.		
	Static address:	9.42.170.215			
	Subnet mask:	255.255.254.0			
	Default gateway:	9.42.170.1			
< Back Next > Finish	Cancel				

Figure 4-12 IPv4 configuration window

e. If you need to set up IPv6, you can use IPv6, as shown in the Figure 4-13. Click Next.

Welcome	IP Configuration			
Inventory and Health	IP configuration for the management	ent module		
Import Existing Configuration	Host name Domain name	СММ		
General Settings	Register this interface with	DNS		
Date and Time				
IP Configuration	IPv4 IPv6			
IO Modules	Enable IPv6			
Security Policy	Link local address: fe80::5ef3 Stateless address: None assig			
DNS	Default gateway: 0::0 Stateful address:			
Event Recipients	IP address assignment meth			
Confirm	Use stateless address au Use stateful address cor Use statically assigned If	nfiguration (DHCPv6)		
< Back Next > Finish	Cancel			

Figure 4-13 IPv6 configuration window

f. You can view the status and configure the options for the I/O modules that are connected to the CMM, as shown in Figure 4-14. Click **Next**.

 Welcome Inventory and Health 	IO Modules Configure basic settings	for your IO modules				
 Import Existing Configuration General Settings 	Device Name	Health Status	Enable external ports	Enable external manag. over all ports	Preserve new IP conf. on all resets	Enable Protected Mode
☑ Date and Time	IO Module 1	Normal		poits		
IP Configuration	IO Module 3	Normal				
IO Modules						
Security Policy						
DNS						
Event Recipients						
Confirm						
< Back Next > Finish	Cancel					

Figure 4-14 I/O Modules window

✓ Welcome	Security Policy Set the overall chassis see	a vity policy				
Inventory and Health		trol below to adjust the security policy level.				
Import Existing Configuration						
General Settings	Secure	Policy Setting: Legacy				
Date and Time		The Legacy level of security policy provides the user with the greatest level of flexibility and				
IP Configuration	1	responsibility for managing platform security, but this policy is least secure overall. Some of the				
☑ IO Modules	-Legacy	attributes of Legacy security policy level are listed below:				
Security Policy		Weak password policies are permitted				
DNS		 Well-known passwords for network login are not required to be changed Unencrypted communication protocols may be enabled 				
Event Recipients						
Confirm						
< Back Next > Finish	Cancel					

g. Select the security policy for your CMM as shown in Figure 4-15. Click Next.

Figure 4-15 Security Policy window

Restriction: When the CMM is set to *Secure* security mode, only the secure file transfer methods HTTPS and SFTP can be used for firmware updates and other tasks that involve file transfers. These other tasks include transferring a backup configuration file to restore a configuration. The insecure file transfer protocols HTTP, FTP, and TFTP are disabled when security is set to the *Secure* mode.

For more information about security policies, see 3.3, "Chassis Management Module security" on page 36.

5. Select the appropriate Domain Name Server (DNS) options for your CMM, as shown in the Figure 4-16. Click **Next**.

G Welcome	DNS
Inventory and Health	Relevant IP addresses for Domain Name Server (DNS)
Import Existing Configuration	
🕑 General Settings	Preferred DNS address type: IPv4
Date and Time	Send DDNS updates to these servers
☑ IP Configuration	
IO Modules	
Security Policy	
DNS	
Event Recipients	
Confirm	
< Back Next > Finish	Cancel

Figure 4-16 DNS setup window

h. Enter the email addresses where notifications are to be sent as CMM events occur, as shown in Figure 4-17. Click **Next**.

☑ Welcome	Event Recipients
Inventory and Health	Set up email address where you wish to be notified of events.
Import Existing Configuration	E-mail address
General Settings	Simple Mail Transfer Protocol (SMTP) settings
Date and Time	Specify either the IP address or, if DNS is enabled and configured, the hostname of a desired SMTP server. This will be used if you configure alerts to be sent via E-Mail.
IP Configuration	
IO Modules	IP address or host name:
Security Policy	SMTP E-mail domain name:
☑ DNS	
Event Recipients	
Confirm	
<pre>< Back Next > Finish</pre>	Cancel

Figure 4-17 Event Recipients window

i. Confirm all of the information that has been entered in the setup wizard, as shown in the Figure 4-18. Click **Finish**.

☑ Welcome	Confirm					
Inventory and Health	View a summary of the configuration you have o	reated				
 Import Existing Configuration General Settings 	You have completed entry of all the information necessary to get your chassis running and communicating with your network.					
Date and Time	Step 4 - General Settings					
IP Configuration	Management module name:	cmm1				
IO Modules	Chassis description:	itsoFlex1				
Security Policy	Contact person:	No Contact Configured				
	Location:	No Location Configured				
DNS	Room ID:					
Event Recipients	Rack ID:					
Confirm	Lowest U-position:	0				
Commit	Unit height of chassis:	10				
	Step 5 - Date and Time					
	Select method:	Synchronize with an NTP server				
	Date:					
	Fri Nov 08 2013 00:00:00 GMT-0500	(Eastern Standard Time)				
	Time:	2:21 PM				
	GMT Offset:					
	-5:00 - Eastern Standard Time (Easter	rn USA, Ontario, Quebec)				
< Back Next > Finish	Cancel					

Figure 4-18 Confirm window

Updating the Chassis Management Module firmware

This section explains how to manage the Chassis Management Module firmware.

Some IBM Flex System solutions require specific code levels or coordinated code updates. If the CMM is part of one of these solutions, verify that the level of code is supported for the solution before you update the code.

If your IBM Flex System Enterprise Chassis is configured for redundant operations and the second CMM is installed, both will have the same level of firmware after the primary CMM pushes the updates to the standby CMM. The latest level of CMM firmware is available at this website:

http://www-947.ibm.com/support/entry/portal/Downloads?lnk=mhsd

To update the CMM firmware, follow these steps:

1. In the CMM web interface, select **Firmware** from the **Mgt Module Management** menu, as shown in Figure 4-19.

Chassis Management 👻	Mgt Module Management 👻	Search					
	User Accounts	Create and modify user accounts that will have access to this web console					
	Firmware	View CMM firmware information and update firmware					
	Security	Configure security protocols such as SSL and SSH					
	Network	Network settings such as SNMP and LDAP used by the CMM					
	Configuration	Backup current configuration and restore a configuration					
	Properties	Properties and settings such as Date and Time and Failover					
	License Key Management	Licenses for additional functionality					
	Restart	Restart the CMM. Typically only needed when experiencing problems					
	Reset to Defaults	Sets all current configuration settings back to default values					
	File Management	View or delete files in the CMM local storage file system.					

Figure 4-19 Mgt Module Management menu

2. Check the current firmware level on the CMMs as shown in Figure 4-20.

Firn	nware						
Click U level.	pdate Firmware to load	a new level of firmware on the	primary management mod	ule. If a standby CMM is i	nstalled, the primary CMM v	will automatically upda	te it to the new firmware
Upda Bay	ate Firmware Name	Firmware Type	Build ID	File Name	Release Date	Revision	Role
		Firmware Type CMM firmware	Build ID 2PET12D	File Name cmefs.uxp	Release Date 08/28/2013	Revision 12	Role Primary

Figure 4-20 Checking the current firmware level

3. Click Update Firmware.

4. The update Firmware window opens as shown in Figure 4-21. Proceed through each step of the wizard by clicking **Next** and entering the information as required.

Update Firmware		х
Choose File Source	Select File Source	
Choose Firmware File	Choose whether you will be performing an update using a local or remote file.	
Choose Behavior	 A local file is uploaded from your workstation to the CMM. A remote file is given as a URL that your CMM can download. 	
Perform Firmware Flash	● Local ○ Remote	
< Back Next > Fi	nish Cancel	

Figure 4-21 Select File Source window

5. Click **Browse**, and select CMM firmware file in your local directory, as shown in the Figure 4-22. Click **Next**.

Update Firmware X	
Choose File Source	Select Firmware File Indicate the firmware file that you wish to use to flash the CMM
Choose Firmware File	
Choose Behavior	
Perform Firmware Flash	Selected firmware file: cmefs.uxp Browse
< Back Next > Fin	ish Cancel

Figure 4-22 Select Firmware File window

- 6. Select the behavior that you want after updating the CMM firmware, as shown in Figure 4-23:
 - Restart CMM manually
 - Restart CMM automatically after updating

Update Firmware	x
 ☑ Choose File Source ☑ Choose Firmware File 	Choose Post Update Behavior Choose whether an automatic restart of MM should occur after updating the firmware on the Management Module. The automatic restart does not require any further user interaction after flashing is complete.
Choose Behavior	
Perform Firmware Flash	Automatically restart Management Module
< Back Next > Fin	nish Cancel

Figure 4-23 Choose Post Update Behavior window

Click Next. Monitor the firmware update progress as shown in Figure 4-24.

Update Firmware			х
 ✓ Choose File Source ✓ Choose Firmware File 		rming Firmware Flash mware is being updated now. Please do not leave this page until the update is complete.	
Choose Behavior	1	1%	
Perform Firmware Flash	- 21/	Retrieving firmware update file	
< Back Next > Fir	nish Car	ncel	

Figure 4-24 Performing Firmware Flash update progress window

Verify that update is completed, as shown in the Figure 4-25. Click **Finish** to restart the CMM or to go back to the CMM management interface if you chose to restart the CMM manually.

Update Firmware		х
 ☑ Choose File Source ☑ Choose Firmware File 	Performing Firmware Flash The firmware is being updated now. Please do not leave this page until the update is complete.	
Choose Behavior	100%	
Perform Firmware Flash	Firmware has been updated, but you have to restart to update to the new image. Use Mgt Module Management > Restart from menu.	
< Back Next > Fi	inish Cancel	

Figure 4-25 Performing Firmware Flash update status window

4.1.3 Preparing for Chassis Management Module redundancy

This section addresses how to set up fail over between two Chassis Management Modules.

To prepare your CMM for redundancy, complete the following steps:

- 1. Install the standby CMM in the available CMM bay.
- 2. Wait approximately 2 minutes while the primary CMM transfers the firmware and configuration information to the standby CMM.

Clarification: Whenever power is restored to an IBM Flex System Enterprise Chassis that has two functional CMMs, the CMM in CMM bay 1 is designated as the primary CMM. This process occurs even if the CMM in CMM bay 2 was the primary CMM before power was removed.

3. Configure Chassis Management Module failover response.

There are two options to configure CMM failover. The first case is that the hardware failure or some malfunction resulted in failure of the primary CMM. The second case is the primary CMM operates properly, but there is a network problem. For example, a network switch might go down, resulting in loss of connectivity to the primary CMM.

To configure failover response for the loss of the primary CMM:

1. Select **Properties** from the **Mgt Module Management** menu to reach the Management Module Properties window.

2. Click the **Advanced Failover** tab in the Management Module Properties window, as shown in Figure 4-26.

Management Module Properties
General Date and Time Advanced Failover
Normally, when a primary management module fails, the standby module assumes control automatically, takes the IP address of the primary module, and causes no downtime.
In some situations, however, control might not fail over to the standby management module when it in fact should. This includes, for example, situations in which the primary module is running but not reliably responding. To protect against these situations, you can configure additional network settings for failovers that will allow you to manually access the standby module when automatic failover does not happen. Specifically, this means you will assign a distinct IP address to the standby module, instead of just specifying a single IP address to be used for both.
Indicate below whether or not you wish to use advanced failover.
Advanced failover current setting is Off
Use Advanced Fallover
Do not swap Management Module IP addresses - In a failover situation, you will need to log on to the management module using the IP address that you have specified below for the standby module.
Swap Management Module IP addresses - In a failover situation, the IP address that you use for the management module will remain the same. The IP address of the failed management module will be transferred to the standby module, and back from the standby module to the primary module.
Apply

Figure 4-26 Failover menu

3. Check **Use Advanced Failover** check box, specify CMM IP address behavior, and click **Apply**.

To configure failover response for loss of the management network (uplink) connection to the primary CMM:

- 1. In the CMM web interface, click the **Ethernet** tab in the **Network Protocol Properties** window.
- 2. Select **Network** from the **Mgt Module Management** menu, then click **Advanced Ethernet** tab, as shown in Figure 4-27.

Networ	k Proto	col Pro	perties		
Apply					
Ethernet	SNMP	DNS	SMTP	LDAP Client	т
	et Con			hernet	
Host name		M	M5CF3FC25E3	B7	
Domain nam	e				
Register this	interface with	DNS			
IPv4	IPv6	Advanc	ed Ethernet		

Figure 4-27 Network Protocol Properties window

IPv4	IPv6	Advanced Ethernet			
Data rate			Auto	-	
Duplex			Auto	*	
MAC addres	s type		Use burned in M	AC address	
Maximum T	ransmission	units	Burned-in MAC ad	Idress 5C:F3:FC:25:E3	:B7
Failover on	loss of physic	cal network link			
Failover dela	ay for physic	al link loss (seconds)	60 🔶		
Failover on	loss of logica	l network link			
Failover dela	ay for logical	link loss (seconds)	1,800 🔶		
IPv4 addres	s for logical l	ink check	0.0.0		
IPv6 address for logical link check			0::0		
Use Alert	and failover	if:			
either IP	4 or IPv6 lin	k check fails	0		
	and IPv6 lin				

Define the failover condition based on your requirements, as shown in Figure 4-28.

Figure 4-28 Network Failover setup menu

4.1.4 Configuring Chassis Management Module user authority

Configuring Chassis Management Module user authority requires you to set security policies and user account policies.

Security policies

The IBM Flex System Enterprise Chassis takes a new approach to security with a ground-up Chassis management design to meet the new Trusted Computing Group (TCG) security standards.

The Enterprise Chassis ships with secure settings by default, with two security policy settings supported: *Secure* and *Legacy*. For more information about each security policy, see 3.3.1, "Security policies" on page 36.

The centralized security policy makes the Enterprise Chassis easy to configure. In essence, all components run the same security policy that is provided by the Chassis Management Module.

To set the specific security policy level, perform these steps:

1. In the CMM web interface, select **Security** from the **Mgt Module Management** menu, as shown in Figure 4-29.

Mgt Module Management 👻	Search
User Accounts	Create and modify user accounts that will have access to this web console
Firmware	View CMM firmware information and update firmware
Security	Configure security protocols such as SSL and SSH
Network	Network settings such as SNMP and LDAP used by the CMM
Configuration	Backup current configuration and restore a configuration
Properties	Properties and settings such as Date and Time and Failover
License Key Management	Licenses for additional functionality
Restart	Restart the CMM. Typically only needed when experiencing problems
Reset to Defaults	Sets all current configuration settings back to default values
File Management	View or delete files in the CMM local storage file system.

Figure 4-29 Mgt Module Management: Security

2. In the Security Policies window, use the slider bar to select **Secure**, and click **Apply** as shown in Figure 4-30.



Figure 4-30 Security window

User account policies

A CMM user account policy is a set of criteria that determine how CMM user account security, including passwords, is implemented.

User account policy conditions affect all users of the CMM. They help enforce the security policy that is chosen for the IBM Flex System Enterprise Chassis environment.

The CMM offers two initial user account policy choices: Legacy and High. You can customize the default values of each of these choices to create a Custom user account policy for your IBM Flex System Enterprise Chassis environment.

Remember: You can change individual user account policy settings from the default values for each user account policy type. However, the security policy of the CMM might require that specific user account policy settings have secure values. For example, if you attempt to change the CMM security policy level from Legacy to Secure, the CMM might require that you change some user account policy settings to secure values. However, if you change the CMM security policy from Secure to Legacy but do not manually modify the user account policy settings, some retain their previous secure values.

In the CMM web interface, user account security policy settings are on the **General** tab of the Account Security Level window in the Global Login Settings window. To set the user account policies, perform these steps:

1. Select User Accounts from the Mgt Module Management menu, as shown in Figure 4-31.

Mgt Module Management 👻	Search
User Accounts	Create and modify user accounts that will have access to this web console
Firmware	View CMM firmware information and update firmware
Security	Configure security protocols such as SSL and SSH
Network	Network settings such as SNMP and LDAP used by the CMM
Configuration	Backup current configuration and restore a configuration
Properties	Properties and settings such as Date and Time and Failover
License Key Management	Licenses for additional functionality
Restart	Restart the CMM. Typically only needed when experiencing problems
Reset to Defaults	Sets all current configuration settings back to default values
File Management	View or delete files in the CMM local storage file system.

Figure 4-31 Mgt Module Management: User Accounts

2. Click **Global Login Settings** on the Accounts tab in the User Accounts window, as shown in Figure 4-32.

ccour Creat	nts Pe	rmission G			Logged in U	sers Delete Enab	le Unlock]	
	UserN	lame	Permission G	Group	# Active	Last Login	Dormant	Days to Expiration	State
	03er IV				Sessions				
0	USERI	D	supervisor		Sessions 0	11/08/13 15:05:43		Never	Disabled,Locked

Figure 4-32 User account window

3. Click the **Account Security Level** tab in the Global Login Settings window, as shown in Figure 4-33.

Global Login Settings X
Global Login Settings
General Account Security Level Automatic refresh
User authentication method:
External authentication server only <
Web inactivity session timeout: User selects timeout period CLI inactivity session timeout (seconds): 0 Number of simultaneous active sessions for LDAP users: 0 Do not log new authentication events for the same user for:
5 minutes
Ignore client IP address when tracking user authentication events OK Cancel

Figure 4-33 Global Login Settings window

4. Select **Custom Security Settings**, **High Security Settings**, or **Legacy Security Settings** from the menu and click **OK**, as shown in Figure 4-34.

Global Login	Settings			х
Global	Login Setting	S		
General	Account Security Level	Automatic refresh		
	vel: curity Settings 👻 ecurity Settings 🍞 s Rules			
High Secu	rity Settings		Value	
Legacy S	ecurity Settings ^{riod} (da	ys)	None	
Minir	num password reuse cycle		None	
Minir	num password change inte	erval (hours)	None	
Acco	ount is locked for 2 minute	s after 20 login failures	Yes	
Simp	le password rules		Yes	
Acco	ount inactivity monitoring		None	
OK Car	ncel			

Figure 4-34 Global Login Settings: Security Settings

For more information about the CMM security, see 3.3, "Chassis Management Module security" on page 36.

4.1.5 Restoring a Chassis Management Module

Restoring a CMM differs depending on whether you are restoring the default configuration or restoring from a saved configuration.

Restoring the CMM manufacturing default configuration

You can restore the CMM to its manufacturing default configuration in these ways:

 In the CMM web interface, select Reset to Defaults from the Mgt Module Management menu, as shown in Figure 4-35.

Mgt Module Management 👻	Search
User Accounts	Create and modify user accounts that will have access to this web console
Firmware	View CMM firmware information and update firmware
Security	Configure security protocols such as SSL and SSH
Network	Network settings such as SNMP and LDAP used by the CMM
Configuration	Backup current configuration and restore a configuration
Properties	Properties and settings such as Date and Time and Failover
License Key Management	Licenses for additional functionality
Restart	Restart the CMM. Typically only needed when experiencing problems
Reset to Defaults	Sets all current configuration settings back to default values
File Management	View or delete files in the CMM local storage file system.

Figure 4-35 Mgt Module Management: Reset to Defaults

 If you have physical access to the CMM, push the reset button and hold it for approximately 10 seconds.

Restoring a saved CMM configuration

In the CMM web interface, a saved configuration is applied from the Manage Configuration window, as shown in Figure 4-36. Select **Configuration** from the Mgt Module Management menu to open the Manage Configuration window.



Figure 4-36 Manage Configuration window

4.2 Chassis Management Module management tasks

This section addresses how to use the CMM to run specific systems management tasks:

- 4.2.1, "Monitoring the chassis" on page 63
- ► 4.2.2, "Monitoring multiple chassis" on page 64
- ► 4.2.3, "Event notifications" on page 65

- ► 4.2.4, "Chassis Management Module Features on Demand" on page 68
- 4.2.5, "Chassis management" on page 70
- ► 4.2.6, "Using the Chassis Management Module CLI" on page 80

4.2.1 Monitoring the chassis

The System Status window is the default window when you enter the CMM web interface, as shown in Figure 4-37. You can also access it by clicking **System Status** on the menu bar.

itsoFlex1	Change chassis nam	e System I	nformation Sele	ected Active	Resource S	elected Reso	urce Actions
itsoFlex1 chassis Graphical View	_		ents	mpute Node 0 uct Name IBM File 4	4 (node04-x240) x System x240 Compute Nod mal 21 36		Actions for Node 04 (node04-x240) Power On Power Off Shutdown OS and Power Off Restart Immediately Restart with Non-maskable Interrupt (NMI) :em Mgmt Processor ipute Node Console
	04 (node04-x24	40) - IBM Fk	ex System x240 Compu Power Environmentals	te Node with embe		ic LEDs Boot Mode	Active Resource Details
Severity	Source	Sequence #	Date	Event ID	Message		
Informational	Node_04	00001E83	Oct 15, 2013 01:36:26 PM	00216002	Node Node 04 system-m	anagement processor res	et. Persistent events will be regenerated.
Informational	Node_04	00001E7A	Oct 15, 2013 01:36:06 PM	35010884	The system-management the security service.	t processor on Node 04 w	as reset by the Chassis Management Module f
Informational	Node_04	00001C67	Oct 11, 2013 08:03:19 AM	00216002	Node Node 04 system-m	anagement processor res	et. Persistent events will be regenerated.
Informational	Node_04	00001BB4	Sep 17, 2013 07:23:05 PM	400F0004	Node Node 04 VPD was	changed.	

Figure 4-37 Chassis status

The graphical view of the Chassis is active, so the changes are reflected immediately. The following selections are available (matching callouts in Figure 4-37):

- Selected Active Resource: All major components of the Chassis can be clicked for more information. Select a component of interest (in Figure 4-37, the IBM Flex System p260 Compute Node), and a pop-up displays information about that component, such as serial number, name, or bay. You can power a component on or off from this window by right-clicking, or view other details about the component.
- 2. Selected Active Resource Details: With a component selected, this box displays several tabs for additional information, such as events, hardware, firmware, and LEDs.
- 3. Selected Resource Actions: I/O modules and compute nodes activate the Actions menu, from which you can power on/off, restart, and perform other tasks.

4.2.2 Monitoring multiple chassis

You can view multiple networked Chassis from the CMM web interface, as shown in the Figure 4-38.



Figure 4-38 Selecting Multi-Chassis Monitor

Use the Multi-Chassis Monitor window to view the state of all compute nodes and management nodes in multiple networked chassis from one location. Monitor the status of installed compute nodes and management nodes in multiple chassis, and discover recently connected ones in the Multi-Chassis Monitor window, as shown in Figure 4-39.

CMM Name	Health	Manage	Firmware Version	Firmware Release
SN#Y030BG168025	Normal	9.27.20.54	2PET09B	2012-04-06, rev. 9
SN#Y034BG16F03A	Normal	9.27.20.53	2PET09G	2012-05-07, rev. 9
SN#Y030BG22F07T	Normal	9.27.22.149	2PET09J	2012-05-31, rev. 9
AMM-268813665	Normal	9.27.22.192	2PET09J	2012-05-31, rev. 9
SN#Y034BG16E08P	🔽 Normal	9.27.20.61	2PET09D	2012-04-20, rev. 9
SN#Y030BG168028	Normal	9.27.20.52	2PET09G	2012-05-07, rev. 9
CMM704124673	🔽 Normal	9.27.21.224	2PET07M	2011-12-23, rev. 7
SN#Y034BG16E06Y	Normal	9.27.20.196	2PET11E	2012-04-25, rev. 17
SN#Y034BG16F077	🔽 Normal	9.27.20.218	2PET09G	2012-05-07, rev. 9
SN#Y034BG16F06M	Normal	9.27.20.211	2PET11G	2012-05-30, rev. 17
AMM-268813665	🔽 Normal	9.27.22.193	2PET438	2012-05-03, rev. 67
SN#Y034BG17L016	Normal	9.27.22.191	2PET643	2012-05-22, rev. 100

Figure 4-39 Monitoring multiple chassis

Clicking the name of the CMM in the **CMM Name** column shows the managed resources in the selected chassis, as shown in Figure 4-40.

Extended Chassis Inf	formation	х
Chassis Propert	ies for SN#Y030BG168025	^
Device Type	CME	
Name	SN#Y030BG168025	
Service Address	service:management-hardware.IBM:chassis- management-module://9.27.20.54	
Туре	chassis-management-module	
Serial Number	Y030BG168025	
FRU	68Y7032	=
MM UUID	\FF\39\89\36\29\98\19\11\E0\82\45\88\7E\6D\8D\7F\A0	
Slot	1	
MID PID	00004F4D	
	0041	
MAC Address	5c:f3:fc:25:d6:89	
	5c:f3:fc:25:d6:8a	
Chassis Serial	23DWN35	
Chassis FRU	81Y2893	
Chassis MTM	8721HC1	
Status	0	
Chassis UUID	<pre></pre>	
Chassis MID PID	00004F4D	
	0150	
Chassis ID		
Chassis Location Info	No Location Configured	
Chassis Room ID	A SU CONTRACTO DE SUBSTITUTO DE CONTRACTO DE CONTRACTO DE CONTRACTO DE CONTRACTO DE CONTRACTO DE CONTRACTO DE C	
Chassis Rack ID		
Chassis U Info	0:10	

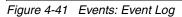
Figure 4-40 Extended Chassis Information window

Clicking the IP address of the chassis in the **Manage** column (Figure 4-39 on page 64) redirects you to another Chassis Management Module's web interface.

4.2.3 Event notifications

Click Event Log in the Events menu to check events, as shown in the Figure 4-41.

IBM Chassis Management Module		
System Status Multi-Chassis Monitor	Events 👻	Service and Support 🗸 Chassis Management 🗸 Mgt Module Mar
	Event Log	Full log history of all events
Event Log	Event Recip	pients Add and modify E-Mail, SNMP, and Syslog recipients



The CMM event log contains a list of all events that are received from all devices in the chassis, as shown in Figure 4-42. These events are also sent by the CMM to the IBM Flex System Manager, if one is installed.

				Event a	ctions		
EVe	ent Log						
Exp	ort 🔻 Delete Eve	nts Settings	Search Event	<i>G</i> o F	Refresh		
▶ Fi	ter Events		-				
olt-I			and the second second second	Ever	• • • • • • • • • •		
	c on any header cell t following the Event			criteria. Ever	nt overvie	W	
	Severity	Source	Sequence #	Date	Event ID	Message	
	🛐 Informational	Audit	00001EB9	Today 02:53:02 PM	00285000	The name of Chassis Management USERID from Web at IP address 9.44	Nodule in CMM Bay 01 was changed to 4.157.218.
		Audit	00001EB8	Today 02:40:38 PM	00285000	The name of Chassis Management USERID from Web at IP address 9.44	Nodule in CMM Bay 01 was changed to
	🔢 Informational						+. 137.210.
	Informational	Audit	00001EB7	Today 01:43:33 PM	000007A	Login successful. User ID USERID fr	
	-		00001EB7	Today 01:43:33 PM Today 01:38:53 PM	0000007A 0001601A		
	Informational	Audit			0.200.000000000000000000000000000000000		om Web at IP address 9.44.157.218. rom Web at IP address 9.44.157.218.
	Informational	Audit Audit	00001EB6	Today 01:38:53 PM	0001601A	Logoff successful. User ID USERID f	om Web at IP address 9.44.157.218. rom Web at IP address 9.44.157.218. CMM SN#Y011BG24H0BB.

Figure 4-42 Event Log window

You can see general information about the event, including severity, source, sequence, date, and event message, as shown in Figure 4-42. In addition, several options are available to manage logs:

- The Export option allows you to export your event log in various formats (csv, XML, or pdf).
- Use the Delete Events option to delete all selected items, with the additional option of selecting audit, systems, or both.
- ▶ With the Settings option, you can add a log event when a log is 75% full.
- The Open Service Request option is enabled when you select one of the events from the table.

To configure event recipient notifications in the CMM web interface, open the **Events** menu and click **Event Recipients** as shown in Figure 4-43.

Event Recip	pients			
Create Create	Global Settings Sys	slog Settings	Generate Test Event]
Name	Notification Method	Events to F	Receive	Status
	No) Data Availabl	e	

Figure 4-43 Event Recipients window

Select the E-mail Recipient as shown in Figure 4-44.

Event Recipie	ents			
Create 🔻 Delete	Global Settings	Syslog Settings	Generate Test Event	
Create E-mail Recipient	ification Method	Events to R	leceive	Status
Create SNMP Recipient		No Data Available	e	

Figure 4-44 Event Recipients window continued

Enter the recipient name and email address, select which events to receive, and click **OK**, as shown in Figure 4-45.

Create E-mail Recipient ×
Use this dialog to configure specified E-mail recipients to receive critical, warning or informational notifications Note: To enable an E-mail recipient, you need to go to the SMTP tab on the Network page to configure the email server correctly.
Descriptive name:
CMM administrator
E-mail address: CMM@test.ibm.com
Status: Disable this recipient
Events to receive: © Use the global settings Only receive critical alerts
OK Cancel

Figure 4-45 Create E-mail Recipient window

Click **Global Settings** in the Event recipients window and select the type and severity of the alerts to be sent, as shown in Figure 4-46.

Event Recipient Global Settings				х
These settings will apply to all event recipients				
Retry limit:				
Delay between attempts (minutes):				
Send event log with e-mail notification	ons			
Cr	itical Events	Warning Events	Informational Events	
Chassis/System Management				
Cooling Devices				
Power Modules				
Compute Nodes				
I/O Modules				
Event Log				
Power On/Off				
Inventory change				
Network change				
User activity				
OK Cancel				

Figure 4-46 Event Recipient Global Settings window

4.2.4 Chassis Management Module Features on Demand

You can check Feature on Demand (FoD) features activated on your CMM and I/O modules.

Check current Feature on Demand in Chassis Management Module. Select **License Key Management** from the **Mgt Module Management** menu, as shown in Figure 4-47.

Mgt Module Management 👻	Search			
User Accounts	Create and modify user accounts that will have access to this web console			
Firmware	View CMM firmware information and update firmware			
Security	Configure security protocols such as SSL and SSH			
Network	Network settings such as SNMP and LDAP used by the CMM			
Configuration	Backup current configuration and restore a configuration			
Properties	Properties and settings such as Date and Time and Failover			
License Key Management	Licenses for additional functionality			
Restart	Restart the CMM. Typically only needed when experiencing problems			
Reset to Defaults	Sets all current configuration settings back to default values			
File Management	View or delete files in the CMM local storage file system.			

Figure 4-47 License Key Management

Figure 4-48 shows the activated licensed features for I/O modules.

icer	ise Ke	ey Ma	inagement	1
OM Lice	nse Keys M	lanageme	nt Chassis License	Keys Management
Cert	Index	Bay	Valid Through	Description
1	1	1	N/A	IBM Flex System EN4093 10Gb ScSE 24-46 Port Upgrade
2	2	1	N/A	IBM Flex System EN4093 10Gb ScSE 46-64 Port Upgrade

Figure 4-48 License Key Management: I/O Module

In the previous example, two IOM features are activated on IBM Flex System EN4093 Fabric 10Gb Scalable Switch.

Chassis License Keys Management tab shows the activated licenses on CMM itself, for example, IBM Fabric Manager, as shown in Figure 4-49.

icen	se Key Mana	agement		
IOM Lice	nse Keys Management	Chassis License Keys Managemen	nt	
Index	Feature	Feature Type	Description	System
1	IBM Fabric Manager	0014	IBM SYSTEM X FEATURE ON DEMAND ACTIVATION KEY	IBM Flex System Chassis

Figure 4-49 License Key Management: Chassis

For more information about Features on Demand, see the IBM Features on Demand website at this website:

https://www-304.ibm.com/systems/x/fod/index.wss

Figure 4-50 shows Features on Demand main http window. You need an IBM ID to get the features that you want to activate.

Features on Demand	Features on Demand
Sign in	
Help	Systems >
Contacts	Welcome to the Features on Demand web application.
	Use the following options to administer your Features on Demand.
	Request activation key : Generate activation keys from authorization codes.
	· Retrieve history : Retrieve existing activation keys.
	· Hardware replacement : Replace existing activation keys installed in planar with new UIDs.
	 Adapter mobility : Transfer existing activation keys installed in machine type (model) serial number to a new MT(M)SN.
	• Trial key : Request a 90-day trial key for a trial-enabled feature.
	 Profile management : Assign additional profiles for email delivery and manage distributor access (internal only).
	 Retrieve authorization code : Retrieve any previously shipped authorization code using sale information.
	 Generate report : Generate report based on a customer number and an optional authorization code.
	Inventory management : Manage inventory (distributor only).
	Sign in
	You must use your IBM ID to sign in to this site. If you have not previously registered for an IBM ID, please <u>register</u> now.

Figure 4-50 Features on Demand main window

4.2.5 Chassis management

This section describes the management of the configured resources in the chassis.

The **Chassis Management** menu is used for reviewing or changing the properties of the components in the chassis. The menu is shown in Figure 4-51. Click **Chassis**.

Chassis Management 👻 Mgt M	odule Management 🗸	Search
Chassis	Properties and settings fo	r the overall chassis
Compute Nodes	Properties and settings for	r compute node in the chassis
I/O Modules	Properties and settings for	r I/O Modules in the chassis
Fans and Cooling	Cooling devices installed in	your system
Power Modules and Management	Power devices, consumpti	on, and allocation
Component IP Configuration	Single location for you to v	view and configure the various IP address setting of chassis components
Chassis Internal Network	Provides internal connection	vity between compute node ports and the internal CMM management port
Hardware Topology	Hierarchical view of compo	ments in your chassis
Reports	Generate Reports of hard	ware information

Figure 4-51 Chassis Management menu

Operating the chassis

You can check the hardware addition or removal history through **Hardware Activity** tab, as shown in Figure 4-52.

dentification	LEDs	Hardware Activity	Temperature	Air Flow	Air Filter		
Shows a summa	ary of chassis	hardware activity.					
Bay	Module N	lame	FRU Num	ber	Serial Number	Manufacturer ID	Action
3	4 X86 CP	U Blade Server	88Y6237		Y130BG1CM003	IBM Corporation	B> Added
3	4 X86 CP	U Blade Server	88Y6237		Y130BG1CM003	IBM Corporation	Removed
7	2 X86 CP	U Blade Server	81Y5128		Y030BG18X00K	IBM Corporation	B> Added
7	2 X86 CP	U Blade Server	81Y5128		Y030BG18X00K	IBM Corporation	Removed
7	2 X86 CP	U Blade Server	81Y5128		Y030BG18X00K	IBM Corporation	S⇒ Added
7	2 X86 CP	U Blade Server	81Y5128		Y030BG18X00K	IBM Corporation	Removed
7	2 X86 CP	U Blade Server	81Y5128		Y030BG18X00K	IBM Corporation	😤 🔁 Added
7	2 X86 CP	U Blade Server	81Y5128		Y031BG19R01E	IBM Corporation	Removed

Figure 4-52 Hardware Activity tab

Also, you can see chassis temperature and cooling status by clicking the **Temperature** tab, as shown in Figure 4-53.

Temperature Warning Temperature Threshold Warning Temperature Reset 19.50 °C (67.1 °F) 43.00 °C (109.4 °F) 38.00 °C (100.4 °F) The chart below shows the average temperature history for this chassis Rear LED Card component. The range of the vertical axis the period selected. Temperature View © Celsius © Fahrenheit Trend Period Previous hour •
The chart below shows the average temperature history for this chassis Rear LED Card component. The range of the vertical axis the period selected. Temperature View Celsius Fahrenheit Trend Period Previous hour
Temperature View Celsius Fahrenheit Trend Period Previous hour
Trend Period Previous hour -
Trend Period Previous hour -
Refresh

Figure 4-53 Temperature tab

You can check fan and cooling status by selecting the **Chassis Management** \rightarrow **Fans and Cooling** menu item in the CMM menu as shown in Figure 4-54.

ooling Device	s Cooling Zones	Acoustic Attenuation			
Fan	Speed (RPM)	Speed (% of maximum)	Zone	Status	Controller State
Fan 1	3072	27%	1	Normal	Operational
Fan 2	3136	27%	1	Normal	Operational
Fan 3	3136	27%	1	Normal	Operational
Fan 4	3136	27%	1	Normal 🔤	Operational
Fan 5	9472	43%	3	Normal	Operational
Fan 6	3136	27%	2	Normal	Operational
Fan 7	3136	27%	2	Normal	Operational
Fan 8	3136	27%	2	Normal	Operational
Fan 9	3136	27%	2	Normal	Operational
Fan 10	9344	42%	4	Normal	Operational

Figure 4-54 Fans and Cooling window

Selecting the individual fan shows you events and power usage statistics that are associated with it, as shown in Figure 4-55.

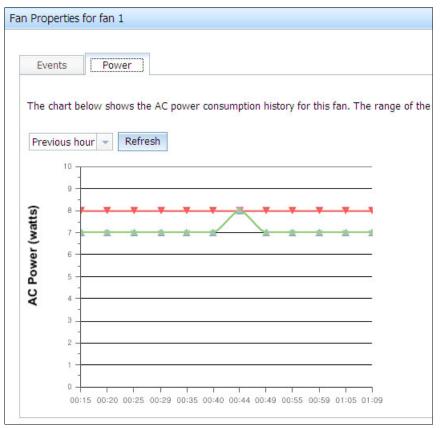


Figure 4-55 Power consumption window

Cooling zone status can also be checked from the Fans and Cooling window by clicking the **Cooling Zone** tab and then clicking the zone number, as shown in Figure 4-56 (Zone 1 is shown).

Sans Fans	and Coo	lina					
0		5	Fans C	components			
Cooling Devices	Cooling Zones	Acoustic Attenuation	Fan	Speed (RPM)	Speed (% of maximum)	Status	Controller State
Zone	Status		Fan 1	4032	36%	Normal	Operational
Zone 1	🛃 Norm	al	Fan 2	4032	36%	🔽 Normal	Operational
Zone 2	Norm	al	Fan 3	3328	33%	🛃 Normal	Operational
Zone 3	Norm	al	Fan 4	3328	33%	🔽 Normal	Operational
Zone 4	🔽 Norm	al					

Figure 4-56 Cooling Zones status

You can select the power module policy that meets your specific needs by selecting **Power Modules and Management** menu item from the Chassis Management menu. On the Policies tab, click **Change** near the Current policy, as shown in Figure 4-57.

	Power Management Policies			
Power Modules		Power Supply Failure Limit [†]	Maximum Power Limit (Watts)	Estimated Utilization [†]
Policies Hardware Input Power and Allocation Power History	Power Source Redundancy Intended for dual power sources into the chassis. Maximum power is limited to the capacity of half the number of installed power modules. This is the most conservative approach and is recommended when all power modules are installed. When the chassis is correctly wired with dual power sources, one power source can fail without affecting compute node server operation. Note that some compute nodes may not be allowed to power on if doing so would exceed the policy power limit.	3	7515	12%
Set policies for how or if you wish to protect your chassis in the case of p Current policy: Basic Power Management Change	Power Source Redundancy with Compute Node Throttling Allowed Very similar to the Power Source Redundancy. This policy allows for a higher power limit, however capable compute nodes may be allowed to throttle down if one power source fails.	3	10614	8%
Power Limiting/Capping Policy Set policies for how or if you wish to limit the total amount of power that Current policy: No Power Limiting Change	Power Module Redundancy Intended for a single power source into the chassis where each Power Module is on its own dedicated circuit. Maximum power is limited to one less than the number of Power Modules when more than one Power Module is present. One Power Module can fail without affecting compute node operation. Multiple Power Module failures can cause the chassis to power off. Note that some compute nodes may not be allowed to power on if doing as would exceed the policy power limit.	1	12525	7%
Current policy: No Power Limiting Change	Power Module Redundancy with Compute Nodes Throttling Allowed Very similar to Power Module Redundancy. This policy allows for a higher power limit; however, capable compute nodes may be allowed to throttle down if one Power Module Fails.	1	15030	6%
	Basic Power Management Maximum power limit is higher than other policies and is limited only by the nameplate power of all the Power Modules combined. This is the least conservative approach, since it does not provide any protection for power source or Power Module failure. If any single power supply fails, compute node and/or chassis operation may be affected.	0	15030	6%
	[†] This is the maximum number of power supplies that can fail while still guaranteeing the operation ^{††} The estimated utilization is based on the maximum power limit allowed in this policy and the curr components in the chassis. OK Cancel	of the sele ent aggreg	cted policy. ated power in	use of all

Figure 4-57 Power Modules and Management window

To monitor power allocation and power consumption history, click the **Input Power and Allocation** tab in the Power Modules window, as shown in Figure 4-58.

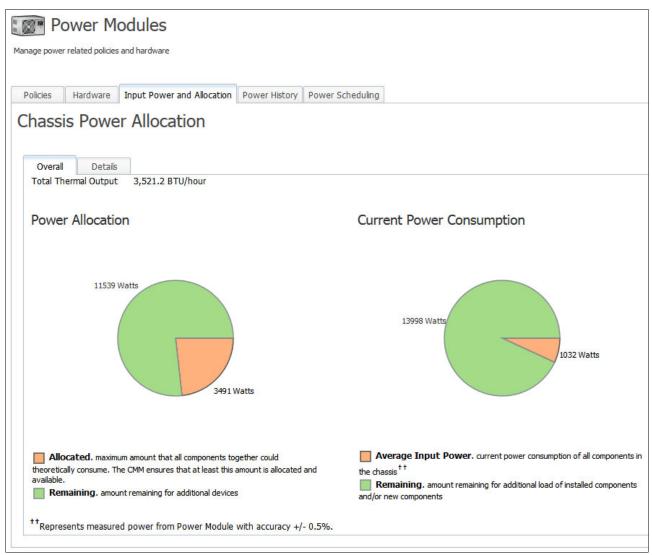


Figure 4-58 Power consumption

Component IP Configuration menu allows you to set the IP parameters on I/O modules and compute nodes, as shown in Figure 4-59.

	dules		
Bay	Device Name	IPv4 Enabled	IP Address
1	IO Module 1	Yes	View
3	IO Module 3	Yes	View
	The set deliver of the allowed base over the set		
	The set deliver of the allowed base over the set		
2	Node 02 (node02-x240)	Yes	View
2 3	Node 02 (node02-x240) Node 03 (node03-x240)	Yes	View
57	The second se	0.575	(20271))

Figure 4-59 Component IP Configuration window

Click the I/O module or compute node link to open its IP properties window, then click the **IPv4** or **IPv6** tab to verify or configure IP parameters, as shown in Figure 4-60.

IP Address Configuration	node01	х
General Setting IPv4	IPv6	
Current IP Config	guration	
the state of the s	9.27.20.36 255.255.252.0	
Enable IPv4 Configuration Method	Use Static IP Address	
IP Address Subnet Mask	Obtain IP Address from DHCP server Try DHCP server, if it fails use Static IP Configuration	
Gateway Address		
Close		

Figure 4-60 IP Address Configuration node01 window

Click **Hardware Topology** in the Chassis Management menu to check all the components in the chassis and their hierarchy, as shown in Figure 4-61.

itsoFlex1		
🖭 🚦 Management Modules	Compute	e Nodes » Node 01 (node01-x240) » Processors >
🖃 📟 Compute Nodes	Descent	
🖃 📟 Node 01 (node01-x240)	Processor 1	
Processors	Bass	
Processor 1	Bay Bay Type	1 Processor
Processor 2	Туре	Processor
 Drives 	Device Name	Processor 1
+ m Memory	Bay Width	1
	Module Description Manufacturer	CPU 1 Intel(R) Corporation
Panel	Speed	2.00 GHz
\pm 👹 Expansion Card	Product Version	Intel(R) Xeon(R) CPU E5-2650 0 @ 2.00GHz
 Interconnect Cable 	Part ID	D706 0200 FFFB EBBF
 Storage-Backplane 	Туре	CENTRAL
± 📟 Node 02 (node02-x240)	Family	Intel Xeon
🕂 🚥 Node 03 (node03-x240)	Cores	8
+ m Node 04 (node04-x240)	L1 ICache Size	10 64K
+ m Node 05 (node05-FSM)	L2 Cache Size	256K
Storage Control Enclosure	L3 Cache Size	20480K
	Voltage	1.2 V
+ Dever Modules	External Clock Maximum Data Width	100 MHz
🛨 🏶 Cooling Devices	Maximum Data Width	64-bit Capable
\pm 🚥 Rear LED Cards		
🛨 🚥 Fan Muxes		

Figure 4-61 Chassis Hardware Topology window

Click **Reports** in the Chassis Management menu to see hardware information in the chassis, as shown in Figure 4-62.

AC Addresses U	nique IDs					
if a device contains	more than 8 MAC addresses, ple	ease click the "Module name" link to se	ee all of them			
Туре	Module name	Description	MAC 1	MAC 2	MAC 3	MAC 4
Compute Nodes						
	[1] Node 01 (node01-x240)	IBM Flex System x240 with 10Gb	34:40:B5:BE:7D:00	34:40:B5:BE:7D:04	34:40:B5:BE:7D:01	34:40:B5:BE:7D:0
	Expansion Card	FC3052 8Gb FC Adapter	(<u></u>)			3 <u></u> 0
	[2] Node 02 (node02-x240)	IBM Flex System x240 with 10Gb	34:40:B5:BE:8E:90	34:40:B5:BE:8E:94	34:40:B5:BE:8E:91	34:40:B5:BE:8E:9
	Expansion Card	FC3052 8Gb FC Adapter				
	[3] Node 03 (node03-x240)	IBM Flex System x240 with 10Gb	34:40:B5:BE:83:D0	34:40:B5:BE:83:D4		1
	Expansion Card	FC3052 8Gb FC Adapter	2 -11-11 -1			
	[4] Node 04 (node04-x240)	IBM Flex System x240 with 10Gb	34:40:B5:BE:9D:58	34:40:B5:BE:9D:5C	-	s alal o
	Expansion Card	FC3052 8Gb FC Adapter			1	1
	[5] Node 05 (node05-FSM)	IBM Flex System Manager Node	5C:F3:FC:5F:5E:86			
	Add-in Card	Network Adapter	5C:F3:FC:5F:09:90	5C:F3:FC:5F:09:91	(<u></u>)	3 <u></u> 0
I/O Modules						
	[1] I/O Module	EN4093 10Gb Ethernet Switch	34:40:B5:34:AD:EF			2 P
	[3] I/O Module	FC3171 8Gb SAN Switch	00:C0:DD:24:41:1C			

Figure 4-62 Reports window

Operating the compute node

Selecting **Compute Nodes** from the Chassis Management menu shows a window that lists the servers that are installed in the chassis (Figure 4-63). You can power on/off compute nodes, access them through a remote console, set properties such as Wake on LAN, and perform other actions.

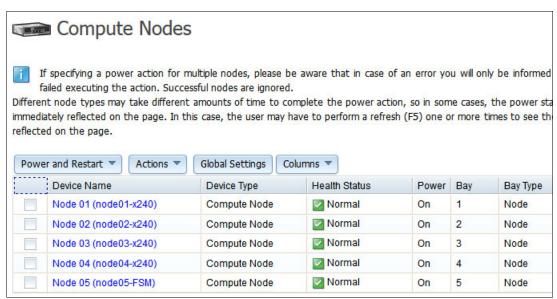


Figure 4-63 Compute Nodes window

Operating the I/O module

The I/O Modules window is similar to the Compute Nodes window. After clicking **I/O Modules** in the Chassis management, a table is displayed that shows the I/O modules. Clicking the module name opens a pop-up window with the properties of that module as shown in Figure 4-64.

Device N	lame	Health	Status	Bay	Power	Serial Numbe	er Part Num
IO Modul	e 1	🗹 No	rmal	1	On	Y250VT1BW1	111 49Y4272
IO Modul	e 3	No No	rmal	3	On	Y251NY26K0	54 69Y1932
		1		-		10Gb Scalable	
Details for I/C Events	O Module 'IO General	Module 1' - 1 Hardware	IBM Flex Syste	m Fabric Powe			Switch Port Info
	General	1		-		Connectivity	

Figure 4-64 I/O Modules window

Start the switch module remote console by clicking **Launch IOM Console**, as shown in Figure 4-65.

÷	I/O Modu	lles				
Powe	er and Restart 💌	Actions 🔻				
	Device Name	Restore Factory Defaults	Bay	Power	Serial Number	Part Number
	IO Module 1	Send Ping Requests	1	On	Y250VT1BW111	49Y4272
	IO Module 3	Launch IOM Console	3	On	Y251NY26K054	69Y1932
		Identify LED				

Figure 4-65 Launch I/O module console menu

Check or type the IP address of the managed I/O module, select the protocols, and click **Launch** as shown in Figure 4-66.

Launch IOM Console	Х
Interface IP: Protocol:	Ŧ

Figure 4-66 Launch IOM Console window

This process prompts for user ID and password and then displays the selected I/O module's management user interface (UI), in this example the web UI for the network switch, as shown in Figure 4-67.

Switch Dashboard						
Switch Name						
Switch Location						
Switch Type	IBM Flex System Fabric EN4093 10Gb Scalable Switch(Upgrade					
Switch Up Time	92 days, 6 hours, 3 minutes and 26 seconds.					
Last Boot Time	15:24:00 Thu Aug 8, 2013 (power cycle)					
Time and date	21:19:50 , 11/8/2013					
Timezone Location						
Daylight Savings Time Status	disabled					
MAC Address	34:40:b5:34:ad:00					
IP Address	9.42.171.8					
PCBA Part Number	BAC-00072-01					
Hardware Part Number	49¥4272					
Serial Number	Y250VT1BW111					
Manufacturing Date	48/11					

Figure 4-67 Network I/O module main window

4.2.6 Using the Chassis Management Module CLI

This section addresses configuring the CMM and managing components that are installed in an IBM Flex System Enterprise Chassis by using the command-line interface.

The IBM Flex System Chassis Management Module (CMM) command-line interface (CLI) provides direct access to IBM Flex System management functions as an alternative to using the web-based user interface.

Using the CLI, you can issue commands to control the power and configuration of the CMM and other components that are in an IBM Flex System Enterprise Chassis. The command-line interface also provides access to the text-console command prompt on each compute node through a Serial over LAN (SOL) connection.

You can access the CMM CLI through the following connections:

- An Ethernet connection to the CMM
- A Telnet connection to the IP address of the CMM
- A Secure Shell (SSH) connection to the CMM

You can initiate connections from the client system by using standard remote communication software. No special programs are required. You must authenticate with the CMM before you issue commands.

Use telnet or ssh program, enter the IP address, and select the protocol. You can then log in to the Chassis Management Module CLI interface, as shown in the Figure 4-68.

```
login as: USERID
Using keyboard-interactive authentication.
password:
Hostname: MM5CF3FC25E3B7
Static IP address: 9.27.20.56
Burned-in MAC address: 5C:F3:FC:25:E3:B7
DHCP: Disabled - Use static IP configuration.
Last login: Wednesday June 27 2012 12:07 from 9.27.20.38 (CIM)
system>
```

Figure 4-68 Chassis Management Module login

Command-line interface guidelines

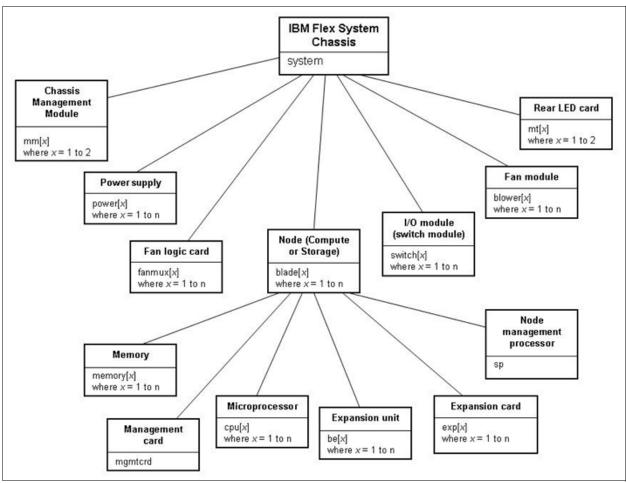
All commands have the basic structure as shown in Example 4-1.

```
Example 4-1 Command usage
```

command -option parameter

Selecting the command target

You can use the command-line interface to target commands to the CMM or to other devices in the IBM Flex System Enterprise Chassis. The command-line prompt indicates the persistent command environment, which is where commands are directed unless another target is specified. You can specify a command target by using the full target name or by using a target name that is relative to the persistent command environment.



Command targets are specified hierarchically, as shown in Figure 4-69.

Figure 4-69 Command target hierarchic view

Example 4-2 show how to use CLI commands.

```
Example 4-2 Command target usage
```

```
Use the -T system:mm[1] option to redirect a command to the CMM in bay 1.
Use the -T system:switch[1] option to redirect a command to the I/O module in I/O bay 1.
```

Using the command-line interface

This section addresses how the CLI works with Chassis Management Module. Two CLI commands are run in the example environment:

1. list command

This command displays a list of devices present within the command target. It can be used to determine the physical configuration of the IBM Flex System Enterprise Chassis. This information includes how many CMMs are installed in the IBM Flex System Enterprise Chassis, and which CMM is set as primary.

To view all the components in the Chassis, run this command as shown in Figure 4-70.

system> system	list -l 2	
-	blade[1]	node01
	blade[2]	node02
	blade[3]	node03
	blade[4]	node04
	blade[5]	node05
	blade[6]	node06
	blade[8]	node08
	blade[9]	node09
	blade[10]	node10
	blade[11]	node11
	blower[1]	
	blower[2]	
	blower[3]	
	blower[4]	
	blower[5]	
	blower[6]	
	blower[7]	
	blower[8]	
	blower[9]	
	blower[10]	1
	power[1]	
	power[2]	
	power[3]	
	power[4]	
	power[5]	
	power[6]	
	mm [1]	primary
	switch[1]	
	switch[2]	
	switch[3]	
	mt[1]	
	fanmux[1]	
	fanmux[2]	
system>	•	

Figure 4-70 list command output

2. info command

This command displays information about IBM Flex System components and their configuration. To view the information about a compute node in bay 6, issue the **info** command as shown in Figure 4-71.

```
system> info -T blade[6]
Name: node06
UUID: 60C2 2B07 2C58 4C62 C18B 164D 19B0 60C0
Manufacturer: IBM (Not Available)
Manufacturer ID: 20301
Product ID: 305
Mach type/model: 789522X
Mach serial number: 101D88B
Manuf date: Not Available
Hardware rev: 0.0
Part no.: 00E0910
FRU no.: 00E0740
FRU serial no.: YL1011243000
```

Figure 4-71 info command output

For more information about the CLI, see the IBM Flex System Information Center: http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp

Part 3

IBM Flex System Manager

This part describes how to implement systems management of IBM PureFlex System using the IBM Flex System Manager.

This part includes the following chapters:

- ► Chapter 5, "Planning for IBM Flex System Manager management" on page 85
- Chapter 6, "IBM Flex System Manager initial configuration" on page 121
- Chapter 7, "Managing chassis components with IBM Flex System Manager" on page 259
- Chapter 8, "IBM Fabric Manager" on page 305
- Chapter 9, "Managing the KVM environment with IBM Flex System Manager" on page 319
- Chapter 10, "Managing the PowerVM environment with IBM Flex System Manager" on page 401
- Chapter 11, "Managing the VMware environment with IBM Flex System Manager" on page 495
- Chapter 12, "Managing the Hyper-V environment with IBM Flex System Manager" on page 555
- Chapter 13, "Mobile management" on page 571

5

Planning for IBM Flex System Manager management

This chapter describes general planning information about IBM Flex System Manager (FSM). It also addresses specific virtualization solution management prerequisites and considerations when you build certain virtual infrastructure that is managed through IBM Flex System Manager.

The following topics are covered:

- 5.1, "Planning for IBM Flex System Manager" on page 86
- ▶ 5.2, "Planning for the management of virtualized environments" on page 100

5.1 Planning for IBM Flex System Manager

This section describes general planning considerations for the implementation of FSM-based systems management.

The following subtopics are covered:

- ► Flex System Manager network integration architecture
- Planning for security
- Planning for Features on Demand
- Agents and tasks supported
- Planning for the management of networking infrastructure
- Planning for the management of storage infrastructure
- Planning for IBM Fabric Manager

For more information about FSM hardware and software, see 2.5, "IBM Flex System Manager" on page 20.

5.1.1 Flex System Manager network integration architecture

In an IBM Flex System Enterprise Chassis, you can configure separate management and data networks.

The management network is a private and secure Gigabit Ethernet network. It is used to complete management-related functions throughout the chassis, including management tasks that are related to the compute nodes, switches, and the chassis itself.

The management network is shown in Figure 5-1 on page 87 as the blue line. It connects the Chassis Management Module (CMM) to the compute nodes, the switches in the I/O bays, and the FSM. The FSM connection to the management network is through a special Broadcom 5718-based management network adapter (Eth0). The management networks in multiple chassis can be connected together through the external ports of the CMMs in each chassis by using a GbE top-of-rack switch.

The yellow line in the Figure 5-1 shows the production data network. The FSM also connects to the production network (Eth1) so that it can access the Internet for product updates and other related information.

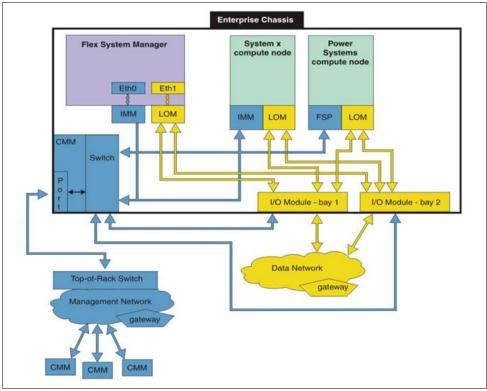


Figure 5-1 Management and production data network

One of the key functions that the data network supports is discovery of operating systems on the various network endpoints. Discovery of operating systems by the FSM is required to support software updates on an endpoint such as a compute node.

Management and production data networks are usually separate subnets. In such a case, the FSM management node uses both interfaces (Eth0 and Eth1). If data and management networks are combined into a single subnet, only Eth0 port must be configured with the IP address, and Eth1 must remain unconfigured.

5.1.2 Planning for security

The IBM Flex System products include features that can help you secure your environment. The following sections provide basic information about how some of these features work. You can use this information along with the documentation that comes with your IBM Flex System products to help you evaluate and implement the security plan for your environment.

As you evaluate the security requirements of your environment, remember that unsecured systems-management tools can damage hardware and software. It is important that you understand all security risks in your system environment and what you can do to minimize these risks.

An IBM Flex System Manager management software security policy is a set of security-related characteristics that define a particular level of protection from security exposures. Depending on its level, the security policy might include account-related policies, communication-protocol enablement, and event-tracking levels.

The management software enforces a chosen security policy only for the management node itself. The management software offers two types of security policy:

- ► *Legacy* Security Policy
- ► Secure Security Policy

Legacy Security Policy

The IBM Flex System Manager management software Legacy security policy is the least secure and most flexible setting that is available for your configuration.

The Legacy level of management software security policy provides flexibility in managing platform security, but this policy is the least secure. It allows the use of the following conditions:

- Weak password policies with minimal controls
- Manufacturing default passwords that do not have to be changed
- Unencrypted communication protocols such as Telnet, SNMPv1, TCP Command Mode, CIM-XML, FTP Server, and TFTP Server

Secure Security Policy

The IBM Flex System Manager management software Secure security policy is the most secure and least flexible setting that is available for your configuration.

The Secure security controls setting, or Secure policy, is the default security setting. It helps to ensure a secure chassis infrastructure and enforces the following conditions:

- Strong password policies with automatic validation and verification checks
- Updated passwords that replace the manufacturing default passwords after the initial setup
- Only secure communication protocols such as SSH and SSL
- Certificates to establish secure, trusted connections for applications that run on the management processors

Users, groups, and roles

Flex System Manager management software offers authentication and user administration options that enable you to specify user privileges for specific tasks and resources. User registry integration, integrity, confidentiality, and Secure Sockets Layer (SSL)-supported secure data transmission are other key elements of the management software security.

Management software user accounts are subjected to two interdependent processes: authentication and authorization. *Authentication* is used to determine the identity of the user and verify and validate that identity. *Authorization* checks the permissions of the authenticated user and controls access to resources according to the roles that are assigned to the user. User authentication is the security mechanism by which a user's credentials that are used to access a system are verified. After authentication, a user can access the system. However, to access a specific resource or perform a specific task, the user must also have the appropriate authorization. Authentication prevents unauthorized management servers or rogue managed-system applications from accessing the resources.

To be authenticated, users are required to enter a user ID and password for the system that they want to access. The authentication process uses the configured user registry, which is from either the operating system, Lightweight Directory Access Protocol (LDAP), or the domain controller.

User authorization occurs when an authenticated user uses IBM Flex System Manager to perform a task on a resource. The authorization mechanism compares the user account, or the group to which the user belongs, to the role-based access control (RBAC) settings for that user or group. If a role exists that contains the authorizations necessary to complete that task on that specified resource, the task proceeds.

Users can access only the applications, tasks, and resources that their user accounts are authorized to access. The authorities that you grant to a user determine the console and resource information that the user can access, and the tasks that the user can perform on those resources.

The authorization process that IBM Flex System Manager performs when accessing a resource is independent of the authentication that is required to access that resource. For example, a user might be able to authenticate to and therefore access IBM Flex System Manager web interface or another resource by using IBM Flex System Manager web interface, but to perform a task on that resource, both the task and the resource must be authorized in the role settings that are assigned to that user or the authorization group to which the user belongs.

Centralized user management

A centralized management configuration uses a single user authentication repository for all of the Chassis Management Modules (CMMs) in a management domain. The user accounts that are created for the IBM Flex System Manager management software are used by all of the CMMs and compute node service processors in the chassis.

When you use the IBM Flex System Manager management software to place a chassis under centralized management, the Chassis Management Module (CMM) is configured to use the registry that is stored on the management node. The local user accounts in the CMM registry are disabled, and the new user account RECOVERY_ID is created for future authentication to the CMM (as long as it is configured to use the centralized user registry on the management node).

After the CMM detects the management node user registry, it uses the management node registry configuration to provision all of the managed resources in the chassis (except for network switches) so that they also use the central management node user registry. When you log in to an IMM or FSP on a compute node in a centrally managed chassis, you must use a user name and password that are stored in the IBM Flex System Manager user registry.

With centralized management, a single security policy is distributed and enforced on all of the Chassis Management Modules in a management domain. In addition, a single set of user accounts and a single password policy is in effect.

Chassis that are not centrally managed might have different security policies, different user accounts, and different passwords from those that are set for the management domain. If chassis are centrally managed, user accounts can be edited only by the management software.

For more information about IBM Flex System Manager security, see the Security topic in the IBM Flex System Information Center:

http://pic.dhe.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc.8731.doc/s
ecurity.html

5.1.3 Planning for Features on Demand

IBM Features on Demand (FoD) is the capability to activate or "unlock" features integrated in IBM products. The feature is in the firmware or software, but is "locked" until the activation key is installed. There are several benefits from using FoD:

- You buy the features that you need now with the ability to grow your system later without costly rip and replace (Pay as You Grow).
- Allows for upgrades in the field.
- Feature activation can be done on server or chassis at the time of the server/chassis sale or later.
- ► FoD enables ease of installation, reduced inventory, and faster fulfillment of options.

Fulfillment process

You can activate Features on Demand by using these methods:

1. An FoD option ordered with server and installed during manufacturing (Figure 5-2).

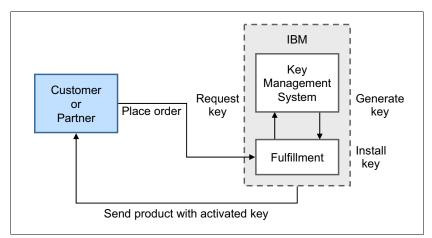


Figure 5-2 Features on Demand field order option

 An FoD option that you purchase separately or after the system sale (Figure 5-3 on page 91).

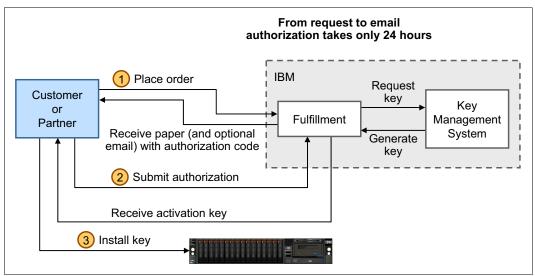


Figure 5-3 Features on Demand Post or respective order option

Features on Demand for IBM Flex System Manager

IBM Features on Demand (FoD) provides optional software that is available for IBM Flex System Manager Types 7955, 8731, and 8734, and IBM Flex System Manager management software. You can also use the management software to enable optional features for managed compute nodes.

FoD provides a convenient way to order and activate optional features from IBM through the management software web interface. You can also upload compute node Features on Demand keys to the management node and distribute the keys to managed compute nodes by using the management software.

Any Features on Demand software that you ordered with your IBM Flex System Manager Types 7955, 8731, and 8734 management node are preactivated. They do not require manual activation through the management software interface. If you did not order an FoD when you purchased your system, you can purchase it just like any other software and hardware option. You can redeem Features on Demand for the management software at this website:

http://www.ibm.com/systems/x/fod/

The IBM Flex System Manager management node ships with a preinstalled IBM Systems management stack. The part numbers to order Features on Demand (FoD) software entitlement licenses are shown in Table 5-1 on page 92 (for United States, Canada, Asia Pacific, and Japan) and Table 5-2 on page 92 (for Latin America and Europe/Middle East/Africa). The part numbers for the same features are different across geographies. Ask an IBM representative for specifics.

Table 5-1 FoD part numbers (United States, Canada, Asia Pacific, and Japan)

Description	Part number
Base feature set license	
IBM Flex System Manager Per Managed Chassis with 1 Year SW S&S	90Y4217
IBM Flex System Manager Per Managed Chassis with 3 Year SW S&S	90Y4222
Advanced feature set upgrade ^a	
IBM Flex System Manager, Advanced Upgrade, Per Managed Chassis with 1 Year SW S&S	90Y4249
IBM Flex System Manager, Advanced Upgrade, Per Managed Chassis with 3 Year SW S&S	00D7554
Fabric provisioning feature upgrade ^a	
IBM Flex System Manager Service Fabric Provisioning w/1 Yr S&S	90Y4221
IBM Flex System Manager Service Fabric Provisioning w/3 Yr S&S	90Y4226

a. The Advanced Upgrade and Fabric Provisioning licenses are applied on top of the IBM Flex System Manager base license.

Table 5-2 FoD part numbers (Latin America and Europe/Middle East/Africa)
--

Description	Part number
Base feature set license	
IBM Flex System Manager Per Managed Chassis with 1 Year SW S&S	95Y1174
IBM Flex System Manager Per Managed Chassis with 3 Year SW S&S	95Y1179
Advanced feature set upgrade ^a	
IBM Flex System Manager, Advanced Upgrade, Per Managed Chassis with 1 Year SW S&S	94Y9219
IBM Flex System Manager, Advanced Upgrade, Per Managed Chassis with 3 Year SW S&S	94Y9220
Fabric provisioning feature upgrade ^a	
IBM Flex System Manager Service Fabric Provisioning w/1 Yr S&S	95Y1178
IBM Flex System Manager Service Fabric Provisioning w/3 Yr S&S	95Y1183

a. The Advanced Upgrade and Fabric Provisioning licenses are applied on top of the IBM Flex System Manager base license.

The IBM Flex System Manager base feature set offers the following functionality:

- Support for up to 16 managed chassis
- Support for up to 5,000 managed elements
- Auto-discovery of managed elements
- Overall health status
- Monitoring and availability
- ► Hardware management
- Security management
- Administration
- Network management (Network Control)
- Storage management (Storage Control)
- Virtual machine lifecycle management (VMControl Express)
- ► I/O address management (IBM Fabric Manager)

The IBM Flex System Manager advanced feature set upgrade offers the following advanced features:

- Image management (VMControl Standard)
- Pool management (VMControl Enterprise)
- Advanced network monitoring and quality of service (QoS) configuration (Service Fabric Provisioning)

The Fabric Provisioning upgrade offers the following functionality:

 Advanced network monitoring and quality of service (QoS) configuration (Service Fabric Provisioning)

Fabric provisioning functionality is included in the advanced feature set. It is also available as a separate Fabric Provisioning feature upgrade for the base feature set. The Advanced Upgrade and the Fabric Provisioning feature upgrade are mutually exclusive; that is, either the Advance Upgrade or the Fabric Provisioning feature upgrade can be applied on top of the base feature set license, but not both.

Important: The Advanced Upgrade and Fabric Provisioning licenses are applied on top of the IBM Flex System Manager base license.

5.1.4 Features on Demand for components in the Chassis

There are many Features on Demand on the components. For example, there are a few options to activate to the I/O modules. Table 5-3 shows Features on Demand for I/O modules.

Description	Part number
IBM Flex System EN2092 1Gb Ethernet Scalable Switch (10Gb Uplinks)	49Y4298
IBM Flex System EN2092 1Gb Ethernet Scalable Switch (Upgrade 1)	90Y3562
IBM Flex System EN4023 10Gb Scalable Switch (FoD 1)	94Y5158
IBM Flex System EN4023 10Gb Scalable Switch (FoD 2)	94Y5159
IBM Flex System Fabric CN4093 Converged Scalable Switch (Upgrade 1)	00D5845
IBM Flex System Fabric CN4093 Converged Scalable Switch (Upgrade 2)	00D5847
IBM Flex System Fabric EN4093 10Gb Scalable Switch (Upgrade 1)	49Y4798
IBM Flex System Fabric EN4093 10Gb Scalable Switch (Upgrade 2)	88Y6037
IBM Flex System Fabric SI4093 System Interconnect Module (Upgrade 1)	95Y3318
IBM Flex System Fabric SI4093 System Interconnect Module (Upgrade 2)	95Y3320
IBM Flex System FC5022 16Gb Fabric Watch Upgrade	00Y3320
IBM Flex System FC5022 16Gb ISL/Trunking Upgrade	00Y3322
IBM Flex System FC5022 16Gb SAN Scalable Switch-Upgrade 1	88Y6382
IBM Flex System FC5022 16Gb SAN Scalable Switch-Upgrade 2	88Y6386
IBM Flex System IB6131 InfiniBand Switch (FDR Upgrade)	90Y3462

Table 5-3 Part numbers for ordering Feature on Demand entitlement licenses for I/O modules

Table 5-4 on page 94 shows Features on Demand for compute nodes.

Description	Part number
IBM Flex System CN4054 Virtual Fabric Adapter (SW Upgrade)	90Y3558
IBM Virtual Fabric Advanced Software Upgrade (LOM)	90Y9310
ServeRAID M5100 Series RAID 6 Upgrade for IBM Flex System	90Y4410
ServeRAID M5100 Series Performance Upgrade for IBM Flex System	90Y4412
ServeRAID M5100 Series SSD Caching Enabler for IBM Flex System	90Y4447

Table 5-4 Part numbers for ordering Feature on Demand entitlement licenses for compute nodes

For more information about managing Features on Demand, see 6.10, "Manage Feature-on-Demand keys" on page 216.

5.1.5 Agents and tasks supported

IBM Flex System Manager provides four tiers of agents for managed systems. For each managed system, you need to select the tier that provides the amount and level of capabilities that you need for that managed system. Select the level of agent capabilities that you need for the type of managed system and the management tasks in your system.

IBM Flex System Manager has four agent tiers:

Agentless in-band

Managed systems without any Flex System Manager client software installed. Flex System Manager communicates with the managed system through the operating system.

Agentless out-of-band

Managed systems without any Flex System Manager client software installed. Flex System Manager communicates with the managed system through something other than the operating system, such as a service processor or a hardware management console.

Platform Agent

Managed systems with Platform Agent installed. Flex System Manager communicates with the managed system through the Platform Agent.

Common Agent

Managed systems with Common Agent installed. Flex System Manager communicates with the managed system through the Common Agent.

Table 5-5 on page 95 lists the agent tier support for the managed systems. Managed system types include x220, x222, x240, and x440 compute nodes supporting Windows, Linux, and VMware, p24L compute node supporting Linux, and p260, p270, and p460 compute nodes supporting IBM AIX, IBM i, and Linux.

Agent tier Managed system type	Agentless in-band	Agentless out-of-band	Platform Agent	Common Agent
Compute nodes that run AIX	Yes	Yes	No	Yes
Compute nodes that run IBM i	Yes	Yes	Yes	Yes
Compute nodes that run Linux	No	Yes	Yes	Yes
Compute nodes that run Linux and supporting SSH	Yes	Yes	Yes	Yes
Compute nodes that run Windows	No	Yes	Yes	Yes
Compute nodes that run Windows and supporting SSH or DCOM	Yes	Yes	Yes	Yes
Compute nodes that run VMware	Yes	Yes	No	No
Other managed resources that support SSH or SNMP	Yes	Yes	No	No

Table 5-5 Agent tier support by management system type

Table 5-6 summarizes the management tasks that are supported by the compute nodes, depending on the agent tier.

Agent tier Managed system type	Agentless in-band	Agentless out-of-band	Platform Agent	Common Agent
Command automation	No	No	No	Yes
Hardware alerts and status	No	Yes	Yes	Yes
Platform alerts	No	No	Yes	Yes
Health and status monitoring	No	No	Yes	Yes
File Transfer	No	No	No	Yes
Inventory (hardware)	No	Yes	Yes	Yes
Inventory (software)	Yes	No	Yes	Yes
Process Management	No	No	No	Yes
Power Management	No	Yes	No	Yes
Remote Control	No	Yes	No	No
Remote Command Line	Yes	No	Yes	Yes
Resource Monitors	Yes ^a	No	Yes	Yes
Update Manager (firmware)	Yes ^b	Yes	Yes	Yes
Update Manager (agent updates)	No	No	Yes	Yes

Table 5-6 Compute node management tasks that are supported by the agent tier

a. Supported for VMware and Hyper-V virtualized environments.

b. Supported for Windows environments

5.1.6 Planning for the management of networking infrastructure

IBM Flex System Manager management software Network Control provides advanced network management functions for IBM Flex System Enterprise Chassis network devices. Functions include discovery, inventory, network topology, health and status monitoring, and configuration of network devices. Network Control is a preinstalled plug-in that builds on the base management software capabilities. It integrates the launch of vendor-based device management tools, topology views of network connectivity, and subnet-based views of servers and network devices.

Network Control offers the following network-management capabilities:

- Discover network devices in your environment
- Review your network device inventory in tables or a network topology view
- Monitor the health and status of network devices
- ► Manage devices by groups: Ethernet switches, Fibre Channel over Ethernet, or Subnet
- View network device configuration settings, and apply templates to configure devices, including Converged Enhanced Ethernet quality of service (QoS), VLANs, and Link Layer Discovery Protocol (LLDP)
- View systems according to VLAN and subnet
- Run network diagnostic tools like ping and traceroute
- Create logical network profiles to quickly establish VLAN connectivity
- Simplified management of VM connections by configuring multiple characteristics of a network when virtual machines are part of a network system pool
- With management software VMControl, maintain network state (VLAN, ACLs) as a virtual machine is migrated (KVM)
- Management of virtual switches, including virtual Ethernet bridges
- Configuration of port profiles, a collection of network settings that is associated with a virtual system
- Automatic configuration of devices in network systems pools

IBM Flex System Manager Network Control provides facilities to discover, inventory, and monitor network devices, start vendor applications for configuration of network devices, and view groups of network devices. IBM Flex System Manager Network Control extends the network management functions of the IBM Flex System Manager product.

Table 5-7 on page 97 shows supported network switches and their management tasks.

I/O module Management task	EN2092 1 Gb Ethernet	EN4023 10 Gb Ethernet	EN4093 EN4093R 10 Gb Ethernet	CN4093 10 Gb Converged	SI4093 10 Gb Interconnect
Discovery	Yes	Yes	Yes	Yes	Yes
Inventory collection	Yes	Yes	Yes	Yes	Yes
Monitoring	Yes	Yes	Yes	Yes	Yes
Alerts	Yes	Yes	Yes	Yes	Yes
Protocol configuration	Yes	No	Yes	Yes	No
VLAN configuration	Yes	No	Yes	Yes	No
CEE configuration	No	No	Yes	Yes	No
EVB configuration	No	No	Yes	Yes	No
Stacked switch management	No	No	Yes	Yes	No

Table 5-7 Supported I/O switches and management tasks

5.1.7 Planning for the management of storage infrastructure

Storage management with IBM Flex System Manager management software involves two software components: Storage Manager and Storage Control. Both components are included with the management software. Storage Manager is a standard management software capability that provides basic storage lifecycle management (Discovery, Inventory, Health, and Alerts). Storage Control is a preinstalled plug-in for the management software that expands storage support to mid-range and high-end storage devices. It is based on technology from IBM Tivoli® Storage Productivity Center.

IBM Flex System Enterprise Chassis and the management software offer these storage-management capabilities:

- Discovery of physical and virtual storage devices
- Support for virtual images on local storage across multiple chassis
- Inventory of physical storage configuration
- Health status and alerts
- Storage pool configuration
- Disk sparing and redundancy management
- Virtual volume management
- Support for virtual volume discovery, inventory, creation, modification, and deletion

Table 5-8 shows supported storage systems and their management tasks.

Storage system Management task	Flex System V7000	Storwize V3500 V3700 V7000	IBM SAN Volume Controller	IBM DS8000®	IBM XIV® Gen3
Discovery	Yes	Yes	Yes	Yes	Yes
Inventory collection	Yes	Yes	Yes	Yes	Yes
Monitoring	Yes	Yes	Yes	Yes	Yes
Physical topology	Yes	Yes	Yes	Yes	Yes
Logical topology	Yes	Yes	Yes	Yes	Yes
Server-to-storage mappings ^a	Yes	Yes	Yes	Yes	Yes
VMControl provisioning	Yes	Yes	Yes	Yes	Yes
NPIV support	Yes	Yes	Yes	No	Yes ^b
Monitor virtualized storage capacity ^c	Yes	Yes	Yes	No	No
Chassis Map	Yes	No	No	No	No
Software updates	Yes	No	No	No	No
IBM Electronic Service Agent™	Yes	No	No	No	No

Table 5-8 Supported storage systems and management tasks

a. Applies only to compute nodes running AIX, KVM, RHEL, and VMWare ESX.

b. VMControl provides limited support for IBM XIV storage that is connected through the N-Port ID Virtualization (NPIV) protocol to Power Systems compute nodes.

c. Ability to view and monitor capacity of IBM or non-IBM storage that is virtualized behind a V7000 array or the IBM SAN Volume Controller.

Table 5-9 shows supported Fibre Channel switches and their management tasks.

Table 5-9Supported Fibre Channel I/O switches and management tasks

	Flex System integrat	ted switches	External switches
I/O module Management task	FC3171 8 Gb FC	FC5022 16 Gb FC	IBM SAN24B-4 8 Gb FC
Discovery	Yes	Yes	Yes
Inventory collection	Yes	Yes	Yes
Monitoring	Yes	Yes	Yes
Alerting	Yes	Yes	Yes
Protocol configuration	Yes	No	No
Logical topology	Yes	Yes	Yes
NPIV support	Yes	Yes	Yes
Chassis Map	Yes	Yes	No
Software updates	Yes	Yes	No
Electronic Service Agent	Yes	Yes	No

With the Storage Control plug-in, you can manage an expanded set of storage subsystems and Fibre Channel switches. You can use Storage Control to discover and collect inventory, and monitor devices health.

Depending on the firmware levels of these devices, Storage Control supports native interfaces to the device, which simplifies configuration setup and improves device management reliability. These interfaces use Secure Shell (SSH) credentials. For information about configuring these credentials, see this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.directo
r.cli.helps.doc/fqm0_r_cli_storage_cmds.html

After they are discovered, these devices are listed as being managed by Storage Manager in Flex System Manager.

Storage Control uses IBM Tivoli Storage Productivity Center technology. Therefore, several of the device support and operating environment conditions are related to IBM Tivoli Storage Productivity Center.

For more information, see the IBM Flex System Information Center:

http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp

5.1.8 Planning for IBM Fabric Manager

IBM Fabric Manager (IFM) is a solution that you can use to quickly replace and recover compute nodes in your environment. It provides the following capabilities:

- ► I/O address assignment for initial compute node deployment and redeployment
- Slot-based I/O address assignment Ethernet and FCoE MAC, FC WWNs, SAS WWNs, FC and SAS boot targets
- Pre-assignment allows LAN/SAN configuration before compute node installation
- Automatic reassignment on compute node swap (also called rip/replace)
- Failover Monitors or Event Automation Plans for automatic compute node failover
- Create standby compute node pools
- Configure boot target settings
- Provides I/O parameter and VLAN migration to standby compute nodes in case of hardware failure

IBM Fabric Manager is preinstalled on the FSM. It is also licensed as part of the FSM chassis license. If the FSM is not purchased, the stand-alone IBM Fabric Manager application can be licensed and installed in the environment to use against the Flex systems.

Because a management module failure results in a configuration loss, it is common to install a standby management module when using IBM Fabric Manager.

The IBM Fabric Manager configuration is not included in the management module configuration backup. The IBM Fabric Manager configuration is chassis based and does not transfer with the physical management module. When a management module is moved to a new chassis, it clears out its IBM Fabric Manager configuration, and the IBM Fabric Manager configuration must be reapplied on the new management module.

If the primary management module fails, the standby management module contains the IBM Fabric Manager configuration and takes over.

Boot from SAN: To take full advantage of the IBM Fabric Manager solution, consider setting up your server environment to boot from SAN.

For IBM Fabric Manager support on specific Flex System components, see the IBM Flex System Interoperability Guide:

http://www.redbooks.ibm.com/fsig

For more information about using IBM Fabric Manager, see the IBM Flex System Information Center:

http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc.iof
m.doc/dw1li_product_page.html

5.2 Planning for the management of virtualized environments

This section describes the planning steps for setting up the management of the specific virtual infrastructure that is deployed on IBM Flex System or IBM PureFlex System by using the Flex System Manager appliance. The following subtopics are covered:

- 5.2.1, "Virtualization and task supported" on page 100
- 5.2.2, "Planning for Linux KVM virtualization" on page 102
- 5.2.3, "Planning for PowerVM virtualization" on page 111
- ► 5.2.4, "Planning for VMware virtualization" on page 115
- ► 5.2.5, "Planning for Hyper-V virtualization" on page 118

5.2.1 Virtualization and task supported

System virtualization-management products and components in the IBM Flex System Enterprise Chassis integrate and interact to support the management of virtualized server, storage, and network resources.

Virtualization management is the software that enables the use and management of virtual server, storage, network, and image resources. With virtualization management, you can use your compute resources fully, deploy new workloads rapidly, monitor resource consumption, and maintain the availability of workloads. IBM Flex System Manager management software automates this complex set of tasks through administrator-defined policies. IBM VMControl is the single point of control for managing virtualized resources in one or more IBM Flex System Enterprise Chassis.

VMControl virtualization capabilities can help you simplify the management of virtual resources (server, storage, network, virtual appliance images) and pools of virtual resources. This simplification is achieved through the integrated provisioning of server, storage, and network resources when new workloads are deployed to the systems and system pools.

With VMControl, you can complete the following tasks:

- Discover existing image repositories in your environment and import external, standards-based images into your repositories as virtual appliances.
- Capture a running virtual server that is configured just the way you want, complete with guest operating system, running applications, and virtual server definition. When you capture the virtual server, a virtual appliance is created in one of your image repositories with the same definitions. This appliance can be deployed multiple times in your environment.

- Import virtual appliance packages that are in Open Virtualization Format (OVF) from the Internet or other external sources. After the virtual appliance packages are imported, you can deploy them in your data center.
- Deploy virtual appliances quickly to create new virtual servers that meet the demands of your changing business needs.
- ► Create, capture, and manage workloads.
- Create server system pools, which can be used to consolidate your resources and workloads into distinct and manageable groups.
- Deploy virtual appliances into server system pools.
- Manage server system pools, including adding hosts or more storage space and monitoring the health of the resources and the status of the workloads in them.
- Group storage systems together by using storage system pools to increase resource utilization and automation.
- Manage storage system pools by adding storage, editing the storage system pool policy, and monitoring the health of the storage resources.

There are three editions of VMControl:

- VMControl Express Edition manages virtual machines
- VMControl Standard Edition adds the ability to manage complete libraries of virtual images
- VMControl Enterprise Edition creates and enables the management of system pools. These pools are dynamic collections of computing resources that are used to support multiple virtual images that run concurrently

When you activate VMControl through the IBM Flex System Manager management software, a 90-day trial of VMControl Standard and Enterprise Editions begins. After the trial period ends, VMControl Express Edition remains, but VMControl Standard and Enterprise Edition are disabled. VMControl Standard and Enterprise Editions are available as an optional Features on Demand (Advanced Upgrade) in the IBM Flex System Manager management software.

VMControl discovery and inventory of virtual resources is supported for these hypervisor platforms:

- ► KVM RHEL 6.x
- VMware vCenter and VMware ESX
- Microsoft Hyper-V Server
- PowerVM

Table 5-10 on page 102 shows supported virtualization environments and their management tasks.

Virtualization environment Management task	AIX and Linux ^a	IBM i	VMware ESXi with vCenter	Microsoft Hyper-V	Linux KVM
Deploys virtual servers	Yes	Yes	Yes	Yes	Yes
Deploys virtual farms	No	No	Yes	No	Yes
Relocates virtual servers	Yes	Yes ^b	Yes	No	Yes
Maintenance mode	Yes	No	Yes	No	Yes
Imports virtual appliance packages	Yes	Yes	No	No	Yes
Captures virtual servers	Yes	Yes	No	No	Yes
Captures workloads	Yes	Yes	No	No	Yes
Deploys virtual appliances	Yes	Yes	No	No	Yes
Deploys workloads	Yes	Yes	No	No	Yes
Deploys server system pools	Yes	No	No	No	Yes
Deploys storage system pools	Yes	No	No	No	No

Table 5-10 Supported virtualization environments and management tasks

a. Linux on IBM Power Systems compute nodes.

b. Supported only for virtual servers that are running IBM i v7.1, TR4 PTF group SF99707 level 4, or later.

5.2.2 Planning for Linux KVM virtualization

The IBM FSM appliance can provide a set of capabilities to easily manage a KVM virtual infrastructure. It includes features such high availability, virtual server relocation, capture, deployment, import appliance, and network multitenancy.

This section describes the requirements and support for the Linux kernel-based virtual machine (KVM) virtualization environment on IBM Flex System Manager VMControl.

There are two implementation models to manage a KVM virtual infrastructure:

- SAN storage-based model: A supported storage system that acts as the shared storage device.
- ► NFS storage-based model: The NFS server that acts as the shared storage device.

Network File System storage-based model

The Network File System (NFS) storage-based model has the following requirements:

- IBM Flex System Manager VMControl is activated
- An NFS x86_64 Red Hat Enterprise Linux (RHEL) server is set up and configured. Figure 5-4 shows the KVM virtualization environment with NFS storage.

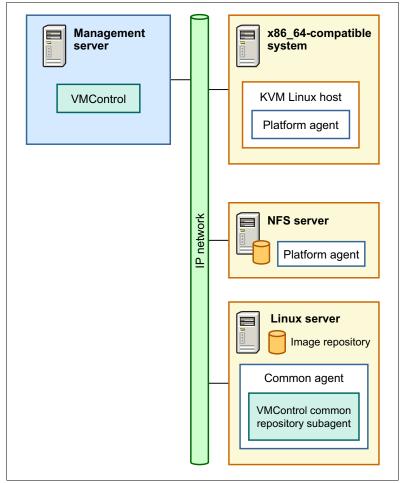


Figure 5-4 KVM virtual environment with NFS storage

- At least one NFS export on the NFS server is defined:
 - For image and disk inventory to work, the export path must end with /images, for example, /share/kvm/images.
 - If you are not setting up additional security in your environment, use the no_root_squash export option. For example, cat /etc/exports as shown Figure 5-5.

```
[root@kvm15 ~]# cat /etc/exports
/nfs/kvm/images 192.168.0.0/255.255.0.0 (rw,no_root_squash,sync,no_subtree_check)
[root@kvm15 ~]#
```

Figure 5-5 no_root_squash export option

If you cannot change your NFS export setup, you can have image files that are inventoried from an export path ending in something other than /images. To do so, complete the following steps:

 In the file /opt/ibm/director/lwi/conf/overrides/USMIKernel.properties, add a line for the following property: director.services.extendeddiscovery.nfs.suffix. For example, director.services.extendeddiscovery.nfs.suffix=/img-kvm.

This addition results in inventorying the image files within NFS export paths that end in /img-kvm instead of the default, /images.

2. Restart the IBM Flex System Manager after adding or changing the USMIKernel.properties file.

Remember: For consistency, image and disk files that are stored on NFS must have a .dsk, .img, or .raw extension.

3. Ensure that the NFS services are started. For example, you can run the command **service nfs start** as shown Figure 5-6.

```
[root@kvm15 ~] # service nfs restart
                                                       [ OK ]
Shutting down NFS mountd:
Shutting down NFS daemon:
                                                       [ OK ]
Shutting down NFS quotas:
                                                       [ OK ]
Shutting down NFS services:
                                                       [ OK ]
Starting NFS services:
                                                          OK
                                                              1
                                                        [
                                                        [ OK
Starting NFS quotas:
                                                              1
Starting NFS daemon:
                                                        [ OK ]
                                                        [ OK ]
Starting NFS mountd:
[root@kvm15 ~]#
```

Figure 5-6 NFS service restart

- 4. The administrator must perform the following prerequisite tasks:
 - a. KVM Platform Agent is downloaded and installed as addressed in 9.2, "KVM platform agent installation" on page 320.
 - b. The NFS server is discovered, accessed, and inventoried by IBM Flex System Manager.
 - c. The image repository is set up as explained in 9.3, "Image repository for KVM" on page 328:
 - d. IBM Flex System Manager Common Agent is installed as explained in 9.3, "Image repository for KVM" on page 328."
 - e. VMControl Common Repository subagent is installed as explained in 9.3, "Image repository for KVM" on page 328

f. The shared NFS exported storage is mounted on the Image Repository server as shown in Figure 5-7.

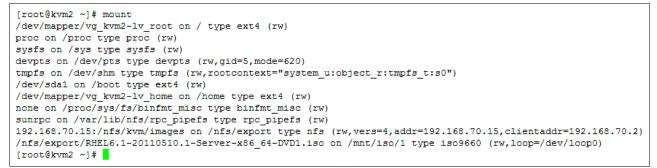


Figure 5-7 NFS export that is mounted on the image repository server

g. The image repository server is discovered and inventory is collected as shown Figure 5-8. For more information, see 9.3, "Image repository for KVM" on page 328.

mage F	Repositories (View Members				
	ions 🔻 Search the table			Desidentia	(
Select	Name 🗘	Image Count 🗘	Managed By 🗘	Description	
	Name 💠	Image Count 0	Managed By C PF-KVM03	Image Repository	
Select	-	Image Count 2 1		•	

Figure 5-8 Images Repositories window

The image repository is created from VMControl. For instructions to create an image repository, as shown chapter 9.3, "Image repository for KVM" on page 328

- h. One or more RHEL KVM hosts are set up and available:
 - The KVM Platform Agent is downloaded and installed on the KVM hosts. For more information, see 9.2, "KVM platform agent installation" on page 320.
 - The KVM hosts are discovered, accessed, and inventoried from your IBM Flex System Manager. For more information, see 9.4, "Creating KVM storage system pools" on page 350.

5. Set up storage by right-clicking a KVM host, selecting **System Configuration**, and selecting **Edit Host**, as shown in Figure 5-9.

1	Performance Summary	Actions 👻 Search	the ta	sble	Search			
Select	Name	Related Resources	•	Ŷ	OS Type and Version \$	Access 🗘	Problems	
	PF-ESXi-Node1	Topology Perspectives			Hypervisor 5.0.0	ОК	Ок	
	🗸 vm001	Remove from Server System Pool			Windows® Server 2008	ОК	Information	
	J vm002				Windows® Server 2008	ОК	Information	
	PF-ESXi-Node2				Hypervisor 5.0.0	ОК	Information	
	PF-HyperV-Noc				Windows® Server 2008	ОК	ОК	
	🗸 VMWindo					🔳 ОК	ОК	
	<pre> PF-KVM-Node1 </pre>	Add to	•		Linux 6.2	ОК	ОК	
	VMRHEL6	Automation				ОК	Пок	
	PF-KVM-Node2	Inventory Power On/Off Release Management			Linux 6.2	ОК	Ск	
	RHEL62vr			Backup and Restore (Configuration Plans (Configuration Templates (Create Virtual Server (Пок	
	RHEL62VS						ОК	
	🗸 vmRHEL6						ОК	
	PF-PowerVM-N						Ск	
	JAIX-SCS	Security System Configuration			urrent Configuration	k	ОК	
	PF-Node1				Deployment History		OK	
0		System Status and Health	•	Edit Host				
▲ Page 1 of 2 🕨 1		Task Management	•	s	erver to Storage Mapping View	w		
		Service and Support) S		Storage			
		Properties		Е	dit Location			
	L		-	~	onfiguration Settings	100		

Figure 5-9 Edit KVM host

- 6. Click Storage Pools.
- 7. Select the pool to create your virtual server disk as shown in Figure 5-10.

torage	Pools					
Ac	tions 🔻 Search the table.	. Search				
Select	Pool Name 🔶	Pool Locati 🗅	Size (GB) 🗘	Available (10	Pool Type 🗘	Image Repository
0	P-NGP01-Deploy	Storwize V700	7817	7317	SAN	Yes
0	P-NGP01-Infrastructure	Storwize V700	557	292	SAN	Yes
0	P-NGP01-Repository	Storwize V700	1116	331	SAN	Yes
0	P-NGP02-Deploy	Storwize V700	7817	7487	SAN	Yes
0	P-NGP02-Infrastructure	Storwize V700	557	487	SAN	Yes
0	P-NGP02-Repository	Storwize V700	1116	1030	SAN	Yes
0	RBrenneman-Test	Storwize V700	3482	2074	SAN	Yes
0	RSL-Shared	Storwize V700	58039	56621	SAN	Yes
) • Pag	e1of1 ▶₩ 1 ♦ Se	elected: 0 Tota	III al: 8 Filtered:	8		

Figure 5-10 Create a KVM disk in a storage pool

Remember: When you configure KVM hosts, specify the fully qualified name as the host name, for example, hostname.company.com. Use the **hostname** command on the host to determine the system name. If the host is not configured with its fully qualified host name, the IBM Key Exchange providers might fail to exchange SSH keys during relocation. Also, ensure that the host name and IP address for the target system are recorded correctly in the Domain Name System (DNS) records.

SAN storage-based model

The SAN storage configuration looks more complex than the NFS solution but the block storage-based model offers better performance and more flexibility.

The picture in Figure 5-11 shows a KVM virtualization environment with SAN storage.

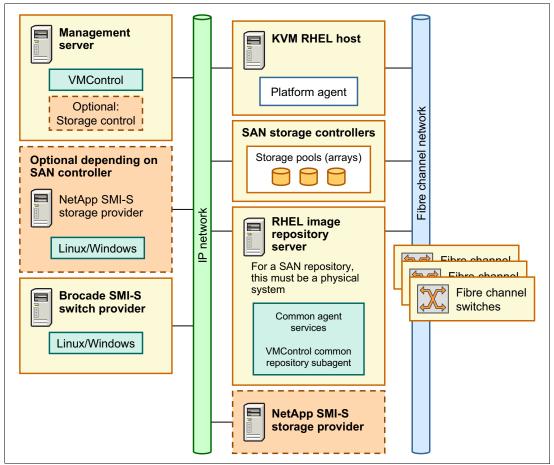


Figure 5-11 KVM virtualization environment with SAN storage

Implementing a SAN storage-based model has the following requirements:

- ► IBM Flex System Manager VMControl is activated.
- The Fibre Channel storage network is correctly cabled and configured with the appropriate Fibre Channel switches. KVM virtualization with VMControl supports only SAN storage over Fibre Channel. Typically, one of the fabric switches is configured with the zoning information. Additionally, VMControl requires that the Fibre Channel network has hard zoning enabled.

- One or more RHEL KVM hosts are set up and available:
 - Ensure that the RHEL KVM host is connected to the Fibre Channel network with a supported adapter.
 - The KVM Platform Agent is downloaded and installed.
 - KVM hosts are discovered, accessed, and inventoried from your IBM Flex System Manager.
- The SAN storage controllers (storage subsystems) are configured and storage pools are set up with the wanted storage space and RAID levels for virtual disk images. Neither VMControl or Storage Control will provision these RAID storage pools for you.

Requirement: Host definitions must include all worldwide port names (WWPNs) for the host (or hosts) they represent. The WWPNs are needed even if some ports are not physically connected or active. This process avoids the potential problem of mapping a single volume under different LUN IDs to the same host.

For example, assume that a KVM host has a Fibre Channel card with host ports WWPN1 and WWPN2. An IBM Storwize V7000 storage subsystem defines host definition KVM_Host1 for that host. Then, the host definition must contain both WWPN1 and WWPN2.

- A Fibre Channel switch provider is configured in environments where Brocade switches are used. This role can be handled by the Brocade SMI-S Agent or the Brocade Network Advisor.
- Storage subsystems, storage pools, and the Fibre Channel switch fabric are discovered and inventoried by Flex System Manager for shared access from endpoints in the KVM environment. These endpoints include KVM hosts and image repository servers as shown in Figure 5-11 on page 107.
 - Encryption keys are needed for the IBM Storwize V7000. The encryption keys are used for discovery enablement and to enable IBM FlashCopy®. If necessary, generate an encryption key file in OpenSSH format for your SAN device and store this file on your Flex System Manager server. For more information about generating an encryption key file for your storage, see your SAN storage device's documentation.
 - Use the manage7000 command to define your storage data source. This command pushes your pub key and enables SAN storage discovery and inventory collection through Storage Control. For more information, see 6.12, "Discover and manage external Storwize V7000" on page 234.

Tip: If you have many switches, zones, or zone groups that are defined on a fabric switch, the inventory collection task might show an error after the default Flex System Manager timeout period expires. However, zone inventory collection continues to run in the background.

The image repository is set up and meets all of the following requirements. The image repository is used for storing and deploying virtual appliances.

The image repository server is connected to the Fibre Channel network with a supported Fibre Channel HBA. For more information about adapters, see this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.sdnm .adv.helps.doc/fnc0_r_network_ctrl_planning.html

- Common Agent is installed on your image repository server. For more information, see 9.3, "Image repository for KVM" on page 328.
- VMControl Common Repository subagent is installed on the image repository server.
 For more information, see 9.2, "KVM platform agent installation" on page 320.
- The image repository server is discovered and inventory is collected on it.
- The image repository is created from VMControl. For more information about creating an image repository, see 9.3, "Image repository for KVM" on page 328.
- Verify that Flex System Manager and VMControl can manage the environment.
 - Run **dumpstcfg** to see the storage configuration information.

Example output:

Host Accessible Containers

NAME: STORAGE SUBSYSTEM/POOL IBM HostO1: Storwize V7000-2076/RAID5_Pool_KVM Storwize V7000-2076/RAID0 Pool 800GB

IBM Host01 is a KVM host, Storwize V7000-2076 is the storage subsystem, and the KVM host can access both the RAID5_Pool_KVM and RAID0_Pool_800GB storage pools. This output indicates that inventory collection has correctly modeled connectivity from the host to the storage.

Additionally, verify that the image repository server can access the SAN storage containers in the same way.

- Run testluncreate to verify that the SAN storage configuration is complete. The command tries to allocate a volume on a subsystem and storage pool, then attach it to a host. This host can be your image repository server.
- If dumpstcfg or testluncreate shows problems, there might be a configuration problem. Correct the problem and collect inventory again on each endpoint, farm, storage, and switch resource.

Supported hosts, Linux versions, and firmware versions

KVM virtualized environments must run on X-Architecture compute nodes. Hosts require Red Hat Enterprise Linux version 6.2, 6.3, or 6.4 with KVM installed.

Supported networks

VMControl supports the following network configurations for the KVM hypervisor:

- Virtual Ethernet Bridging (VEB)
- Virtual Ethernet Port Aggregator (VEPA) network (requires IBM Flex System Manager Network Control and that the host is in a network system pool)
- Limited support for KVM hypervisor networks

Tip: Use paravirtualized (virtio) drivers for enhanced performance. Use Virtio and e1000 model configurations for virtual network server adapters.

Supported storage

The model includes the following image repository and virtual disk storage options:

- NFS version 3 server running on RHEL version 6.2 and 6.3.
- ▶ NFS version 3 server running on RHEL version 6.2, 6.3, and 6.4 with KVM installed.
- Supported SAN devices. For more information about storage products support, see this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc. common.nav.doc/network_integration_planning.html

Supported tasks

In the KVM virtualization environment, you can perform these tasks:

- Create and delete NFS storage pools on a host
- Create and delete NFS or SAN virtual disks
- Suspend or resume virtual servers and workloads (without release of resources)
- Create, edit, and delete virtual servers
- Power operations for virtual servers
- Relocate virtual servers
- Turn maintenance mode on and off for hosts that are in server system pools
- Import a virtual appliance package that contains one or more raw disk images
- Capture a workload or virtual server into a virtual appliance
- Deploy a virtual appliance package to a new virtual server with hardware and product customizations
- Deploy a virtual appliance package to an existing virtual server with adequate resources
- Start, stop, and edit a workload
- Create, edit, and delete server system pools
- Create, edit, and delete network system pools (if you are using IBM Flex System Manager Network Control with VMControl)
- Adjust the virtualization monitor polling interval for KVM by using the KvmPlatformPollingInterval parameter

Tip: To enable remote control access on your KVM, follow the instructions at this website:

```
http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2
Fcom.ibm.director.vim.helps.doc%2Ffsd0_vim_t_access_kvm_remotely.html
```

KVM requirements

In addition to the packages required by the KVM platform agent, the genisoimage.x86_64 package must also be installed for VMControl support. For more information, see 9.2, "KVM platform agent installation" on page 320.

Remember: These packages might be available from your installation software.

The following commands open required ports in the IPv4 firewall on the KVM host:

- ▶ iptables -A INPUT -p tcp --dport 427 -j ACCEPT
- ▶ iptables -A INPUT -p udp --dport 427 -j ACCEPT
- ▶ iptables -A INPUT -p tcp --dport 22 -j ACCEPT

- ▶ iptables -A INPUT -p tcp --dport 15988 -j ACCEPT
- ▶ iptables -A INPUT -p tcp --dport 15989 -j ACCEPT
- service iptables save

Considerations:

- The SSH service must be configured and running on the KVM host so that an SSH remote service access point for port 22 gets created for each host. These access points are in addition to the CIM RSAP on ports 15988 and 15989.
- When a SAN storage solution is being used, you must have at least several megabytes of free file system space under /var/opt/ibm and /var/lib/libvirt on the KVM host. The user that is employed to request access to the host from ISD must have authority to write to these directories.

Restrictions

For more information, see the Restrictions section at this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fco m.ibm.director.vim.helps.doc%2Ffsd0_vim_r_kvm.html

5.2.3 Planning for PowerVM virtualization

This section describes the requirements and support for AIX and Linux virtual appliances, virtual servers, and workloads in the Power Systems virtualization environment.

There are two types of architectures to implementing PowerVM base virtualization through Flex System Manager:

- Requirements and support for AIX using Network Installation Manager (NIM)
- Requirements and support for AIX, IBM i, and Linux using Storage Copy Services (SCS)

Requirements and support for AIX using Network Installation Manager

This section describes the requirements and support for AIX virtual appliances, virtual servers, and workloads in a Power Systems virtualization environment that relies on AIX NIM.

Requirements for AIX using NIM

The following diagram shows an example Power Systems virtualization environment for AIX virtual appliances, virtual servers, and workloads that rely on NIM.

Figure 5-12 shows an example Power Systems virtualization environment for AIX virtual appliances, virtual servers, and workloads that rely on NIM.

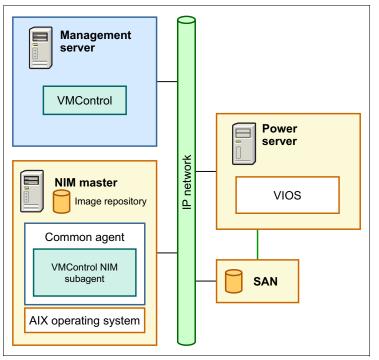


Figure 5-12 AIX using NIM system diagram

Implementation of a virtualization environment based on PowerVM has the following requirements:

- ► IBM Flex System Manager is installed on a supported server.
- IBM Flex System Manager VMControl Standard Edition or IBM Flex System Manager VMControl Enterprise Edition is activated.
- At least one NIM master is available.
- IBM Flex System Manager Common Agent and the VMControl NIM subagent are installed on the NIM master.

IBM Flex System Manager recognizes this NIM master as a VMControl image repository. The /export/nim filesystem in which the virtual appliances are stored must not be NFS mounted to the NIM master. The NIM master exports this file system itself, and NFS does not support export of a mounted file system.

Remember: The image repository is shown as a stand-alone server in the diagram. However, the image repository can also be on the same Power Systems server that hosts the AIX virtual servers that you can capture from and deploy to using VMControl.

 At least one IBM POWER7 compute node exists to host virtual servers that you can capture from and deploy to using VMControl.

- The IBM Power server is typically attached to a SAN as shown in the diagram. The SAN is used for the virtual disks of the virtual servers that are hosted by the IBM Power server. If you expect to use VMControl Enterprise Edition server system pools or do virtual server relocation on your own, a SAN is required. If not, disks that are local to the IBM Power server and virtualized by the Virtual I/O Server (VIOS) can be used as an alternative.
- Though not shown in the diagram, multiple VIOS virtual servers and multipath I/O (MPIO) are supported.

Supported operating systems and firmware versions

You must use the following AIX and firmware versions in this environment:

▶ NIM master: The NIM master must be AIX 6.1 TL03 or newer.

Requirement: The level of AIX on the NIM master must be the same or higher than the level of AIX on the virtual servers that you capture or the virtual appliances that you deploy.

- Virtual I/O Server (VIOS): For POWER7, use a minimum of VIOS 2.2.1.0 and all available updates.
- Virtual appliances: You can capture any AIX Version 5.3, AIX Version 6.1, or AIX Version 7.1 virtual server or workload as a virtual appliance. You can import or deploy any AIX Version 5.3, AIX Version 6.1, or AIX Version 7.1 virtual appliance.

Supported tasks

In this environment, you can perform these tasks:

- Create, edit, and delete virtual servers
- Relocate virtual servers
- Import a virtual appliance package that contains an AIX mksysb image
- Capture an AIX workload or virtual server, an AIX mksysb image file or NIM resource, or an IX lpp_source directory or NIM resource
- Deploy an AIX mksysb or lpp_source virtual appliance
- Group virtual servers to create a workload
- Start, stop, and edit a workload
- Create, edit, and delete system pools

Requirements for AIX, IBM i, and Linux using storage copy services

This section describes the requirements and support for AIX, IBM i, and Linux virtual appliances, virtual servers, and workloads in a Power Systems virtualization environment that relies on storage copy services (SCS).

Figure 5-13 shows an example Power Systems virtualization environment for AIX, IBM i, and Linux virtual appliances, virtual servers, and workloads that rely on SCS.

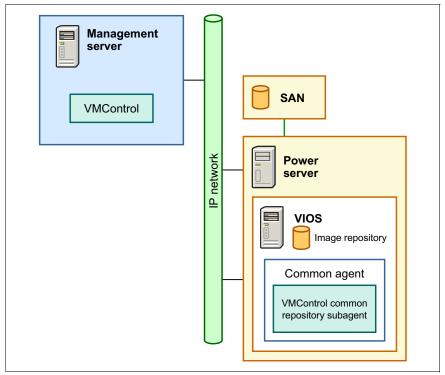


Figure 5-13 AIX, IBM i, and Linux using storage copy services system diagram

These environments have the following requirements:

- ► IBM Flex System Manager is installed on a supported server.
- IBM Flex System Manager VMControl Standard Edition or IBM Flex System Manager VMControl Enterprise Edition is activated.
- A Virtual I/O Server (VIOS) virtual server exists on an IBM Power server to host the image repository. The repository is used to store the raw disk images that are associated with your AIX, IBM i, and Linux virtual appliances.

Tip: You can have multiple repositories. However, repositories that are on separate IBM Power servers require special configuration. The image repository virtual servers must have access through a VIOS to the same shared SAN as the AIX, IBM i, and Linux virtual servers that they will capture and deploy.

- The IBM Flex System Manager Common Agent and VMControl Common Repository subagent are installed on the VIOS that you want to use as an image repository.
- At least one IBM POWER7 compute node exists to host virtual servers that you can capture from and deploy to using VMControl.

Consideration: If manual or automated virtual server relocation capabilities are needed, multiple IBM Power 6 or 7 servers are required.

- All AIX, IBM i, and Linux virtual servers to be captured from or deployed to using VMControl have their storage allocated from the SAN. They also must be provided through one or more VIOS virtual servers. These virtual servers must use virtual Ethernet connections that are provided through one or more VIOS virtual servers. These virtual servers must not have any physical devices that are allocated from the IBM Power server.
- ► For Virtual I/O Server Version 2.2, any virtual servers that you capture and any virtual appliances you deploy use the same storage pool as the image repository in which you store the virtual appliances.

Supported operating systems and firmware versions

You must use the following operating systems and firmware versions in this SCS-based Power Systems virtualization environment:

- IBM Flex System Manager: You can use any IBM Flex System Manager with VMControl Standard Edition or VMControl Enterprise Edition activated.
- Virtual I/O Server (VIOS): For POWER7, use a minimum of VIOS 2.2.1.0 and all available updates.
- IBM Power firmware: For POWER7 processor-based servers, use a minimum of FW7.2 and all available updates.

Supported tasks

In a Power Systems virtualization environment for AIX, IBM i, and Linux that relies on SCS, you can perform the following tasks:

- Create, edit, and delete virtual servers
- ► Import virtual appliance packages that contain an AIX, IBM i, or Linux raw disk image
- ► Capture an AIX, IBM i, or Linux workload or virtual server (logical partition)
- Deploy an AIX, IBM i, or Linux raw disk image virtual appliance
- Group virtual servers to create a workload
- Start, stop, and edit a workload

In a Power Systems virtualization environment for AIX and Linux that relies on SCS, you can perform the following additional tasks:

- Relocate virtual servers
- Create, edit, and delete system pools

5.2.4 Planning for VMware virtualization

This section describes the requirements and support for the VMware virtualization environment on IBM Flex System Manager VMControl.

VMware ESX and VMware ESXi hosts managed by VMware vCenter

Figure 5-14 shows a virtualization environment with VMware vCenter managing VMware ESX and VMware ESXi hosts.

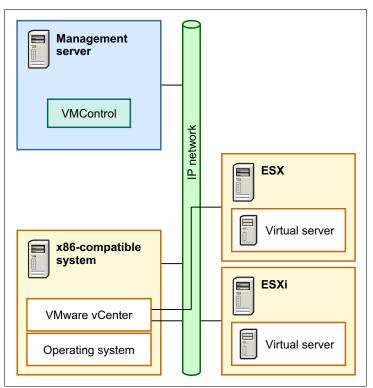


Figure 5-14 Diagram of VMware vCenter virtualization environment

This scenario has the following requirements:

- ► IBM Flex System Manager is installed on a supported server.
- ► IBM Flex System Manager VMControl is activated.

Remember: To start the VMware Infrastructure Client or the VMware vSphere Client from IBM Flex System Manager VMControl, the client must be installed on the IBM Flex System Manager system. It must also be on any system that you use to log in to the IBM Flex System Manager web interface.

- VMware vCenter is installed on an x86-compatible system. IBM Flex System Manager and VMControl require that the operating system (OS) that VMware vCenter is running on is an x86-compatible system with an OS based on Microsoft Windows.
- VMware ESXi exists to host virtual servers that you can manage by using VMControl. VMware ESXi is managed by VMware vCenter.
- VMware vCenter system is discovered and the request access task is complete. After the request access task completes, the Configure Access task shows the vCenter protocol in OK state.

Requirement: If you installed VMware vCenter with a non-default port number, you must create a VMware vCenter Server Discovery profile by using the Discovery Profile wizard. Specify the unique port number in the profile that you create. Then, use the profile to discover the VMware vCenter system. For more information, see "Managing discovery profiles" at this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.dire
ctor.discovery.helps.doc/fqm0_t_managing_discovery_profiles.html

Supported versions

VMControl supports the following virtualization software:

- VMware vCenter 4.x (capable of managing the following supported hosts): VMware ESX 4.x and VMware ESXi 4.x
- VMware vCenter 5.x (capable of managing the following supported hosts): VMware ESX 4.x, VMware ESXi 4.x, and VMware ESXi 5
- VMware ESX 4.x stand-alone software

Supported tasks

In the VMware vCenter virtualization environment, you can perform the following tasks:

- Create, edit, and delete virtual servers
- Create a DataCenter or Cluster by using the Create Virtual Farm wizard
- Add a host to a DataCenter or Cluster by using the Add host to farm function
- Remove a host from a DataCenter or Cluster by using the Remove host from farm function
- Relocate virtual servers
- > Put a host into maintenance mode
- Remove a host from maintenance mode

VMware ESX stand-alone software

Figure 5-15 shows the VMware ESX virtualization environment.

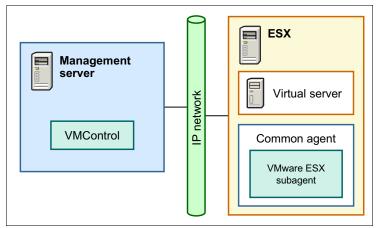


Figure 5-15 Diagram of the VMware ESX virtualization environment

This scenario has the following requirements:

- ► IBM Flex System Manager is installed on a supported server.
- ► IBM Flex System Manager VMControl is installed on the IBM Flex System Manager.
- ► VMware ESX exists to host virtual servers that you can manage by using VMControl.

- IBM Flex System Manager Common Agent and the VMware ESX subagent are installed on the VMware ESX system.
- Using IBM Flex System Manager Network Control network system pools with VMware to provision new network configurations and provide automated network relocation requires special configuration. SNMP must be enabled on all the VMware hosts to be included in the network system pool. To enable SNMP, log on as root and issue the following command:

service snmpd start

Supported versions

VMControl supports the VMware ESX 4.x stand-alone virtualization software.

Supported tasks

In a VMware ESX virtualization environment, you can perform the following tasks:

- ► Create, edit, and delete virtual servers
- Create, edit, and delete virtual farms
- Relocate virtual servers

5.2.5 Planning for Hyper-V virtualization

Flex System Manager is able to manage basics tasks for the Microsoft Hyper-V hypervisor. You can start, stop, restart, suspend, create, and delete your virtual servers that are running on Microsoft hypervisors with same tool that manages the other hypervisors on the market.

This section describes the requirements and support for the Windows Server 2008 and Windows Server 2012 Enterprise, Standard, and Datacenter x64 Editions with Hyper-V role enabled virtualization environment on IBM Flex System Manager VMControl.

Figure 5-16 shows the Windows Server 2008 and Windows Server 2012 with Hyper-V role enabled virtualization environment that is managed by IBM Flex System Manager.

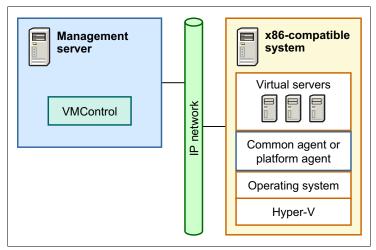


Figure 5-16 Hyper-V architecture that is managed by FSM

This scenario has the following requirements:

- ► IBM Flex System Manager is available in your PureFlex chassis.
- ► IBM Flex System Manager VMControl is activated.

- Windows Server 2008 Standard, Enterprise, and Datacenter x64 Editions with Hyper-V role enabled is installed on an x86-compatible system.
- Windows Server 2012 Standard and Datacenter x64 Editions with Hyper-V role enabled is installed on an x86-compatible system.
- IBM Flex System Manager Common Agent or Platform Agent is installed on the host. For more information, see 12.1, "Initial setup tasks for a Hyper-V node" on page 556.

Supported versions

VMControl supports the following software virtualization versions:

- Windows Server 2008 Standard, Enterprise, and Datacenter x64 Editions with Hyper-V role enabled, Release 2 virtualization software.
- Windows Server 2012 Standard and Datacenter x64 Editions with Hyper-V role enabled, Release 3 virtualization software.

Supported tasks

In this environment, you can create, edit, and delete virtual servers, then start, stop, restart, and suspend your virtual servers.

6

IBM Flex System Manager initial configuration

This chapter describes the initial setup steps that are required for IBM Flex System Manager (FSM)-based systems management. This process includes the following tasks:

- Initial configuration of the FSM
- Discovery and inventory collection:
 - Chassis components
 - Operating systems
 - External storage devices
- Firmware updates:
 - The FSM
 - Chassis Management Module (CMM)
 - Compute nodes
 - I/O modules
- Operating system deployment

This chapter discusses the following topics:

- 6.1, "IBM Flex System Manager Setup Wizard" on page 123
- 6.2, "Updating Flex System Manager" on page 137
- 6.3, "Selecting chassis to manage" on page 138
- 6.4, "Configuring centralized user management" on page 142
- 6.5, "Configuring chassis components" on page 144
- 6.6, "Configuring compute nodes using Configuration Patterns" on page 150
- 6.7, "Deploying compute node images" on page 168
- 6.8, "System discovery, access, and inventory collection" on page 176
- 6.9, "Updating chassis components" on page 189

- ▶ 6.10, "Manage Feature-on-Demand keys" on page 216
- ► 6.11, "Flex System V7000 Storage Node initial configuration" on page 223
- ► 6.12, "Discover and manage external Storwize V7000" on page 234
- 6.13, "Overview of Flex System V7000 and Storwize V7000 systems management (Storage Control)" on page 241
- ▶ 6.14, "External Fibre Channel SAN switch discovery" on page 247
- ► 6.15, "Configuring network parameters (Network Control)" on page 256

6.1 IBM Flex System Manager Setup Wizard

IBM Flex System Manager (FSM) is an appliance that comes with all required software preinstalled. When this software stack is started for the first time, a startup wizard is initiated. This wizard guides you through the required configuration process, such as licensing agreements and Transmission Control Protocol/Internet Protocol (TCP/IP) configuration for the appliance.

When configuration is complete, the FSM is ready to manage the chassis in which it is installed and other chassis, up to four. After the chassis is managed, individual components, such as compute nodes and switches, can also be managed.

Requirement: At the time of writing, IBM Flex System Manager is required for any configuration that contains a Power Systems compute node.

It is also anticipated that IBM Flex System Manager is preconfigured to manage the initial chassis. In that event, the steps in this section are not required unless IBM Flex System Manager is being reinstalled.

FSM is based on an x86 compute node, and it has the same options for obtaining an initial console. You can use the Integrated Management Module II (IMM2) remote console. Or, use the supplied dongle and front port on the FSM node to connect directly to a keyboard, display, and mouse or a console manager unit.

To monitor the FSM startup process, connect a console to the FSM management node:

1. From the IBM Chassis Management Module web interface, right-click the **Flex System Manager node** in the Chassis Map, then select **Launch Compute Node Console**, as shown in Figure 6-1.

	tem Information Ve Events		
	ve Events		
9 Power On 7 Power On 9 Power Off 3 Power Off 9 Shutdown OS and Power 1 Restart Immediately Restart With Non-maskab Restart System Mgmt Pro Details for Node Of Manage LEDs	ocessor	li l	

Figure 6-1 Launching Flex System Manager Console

2. The Launch Node Console window opens. Select **HTTPS** in the Protocol field and click **Launch**, as shown in Figure 6-2.

Launch Node Conso)le X
Interface IP:	9.42.171.15 -
Context:	Remote Presence 👻
Protocol:	HTTPS 💌
	edentials expire in 46 second(s) ch button is not clicked.
L	aunch Close

Figure 6-2 Launch Node Console window

Accept all security certificate exceptions if any. FSM's Remote Control window opens.

3. In the Remote Control window, click **Start remote control in single-user mode**, as shown in Figure 6-3. Clicking this button starts a Java applet on the local desktop that will be a console session to the FSM.

IBM I	ntegrated Mana	gement Mo	dule II			USERID	Settings
	System Status	Events 🗸	Service and Support \star	Server Management 🗸	IMM Management 🗸	Search	
Allow: function not		e server at th Disk function	ne operating system level. nality is launched from the onsole				
Use	the ActiveX Clier	nt@					
() Use	the Java Client						
	Your current brow	vser Java versi	on (1.6.0.0) is supported for u	use with remote control.			
	rypt disk and KVM w others to reque	n en ann an 1997 - 199	cransmission @ e session disconnect @				
and the second second	remote control i es you exclusive acce	3					
Start	remote control i	in multi-use	r mode				
Remo	ote Control S sions are currently	ession in	ions while your session is active Progress you can send a request to		ailable sessions.		
Userl	Name	▲ Active	Sessions	Availability for Disconn	ection Timeout	Value	
			No active session	is in progress.			

Figure 6-3 Starting remote console from IMM2

Figure 6-4 shows the Java console window opened to the FSM appliance before powering on.



Figure 6-4 FSM console in power off state

4. The FSM can be powered on from several locations, including the physical power button on the FSM, or from the CMM. For this example, the **Tools** → **Power** → **On** option from the remote console menu, as shown in Figure 6-5, is used.

File View Macros	Tools Help		
	Session Options		
	Power •	On	
	Single Cursor	Off	
	Stats	Reboot	
	Sync LED Status	Cycle	
	Launch RDP		
	Launch Virtual Media		
<<	< <videos< th=""><th>topp</th><th></th></videos<>	topp	

Figure 6-5 Powering on the FSM from the remote console session

While the FSM powers up and boots, the process can be monitored. No input is accepted until the License Agreement window, which is shown in Figure 6-6, is displayed.

IBM Flex System Manager License Agreement					
By clicking on I agree , you agree this transaction. If you do not agre	that (1) you have had the opportunity to review the terms of all agreements presented below and (2) such terms g ee, click I do not agree .	overn			
Agreements: IBM Programs: IBM Flex System Manager Separately Licensed Code	License agreement language:				
Third Party Licenses:					
Red Hat EULA	International Program License Agreement				
	Part 1 - General Terms				
	BY DOWNLOADING, INSTALLING, COPYING, ACCESSING, CLICKING ON AN "ACCEPT" BUTTON, OR OTHERWISE USING THE PROGRAM, LICENSEE AGREES TO THE TERMS OF THIS AGREEMENT. IF YOU ARE ACCEPTING THESE TERMS ON BEHALF OF LICENSEE, YOU REPRESENT AND WARRANT THAT YOU HAVE FULL AUTHORITY TO BIND LICENSEE TO THESE TERMS. IF YOU DO NOT AGREE TO THESE TERMS,				
	* DO NOT DOWNLOAD, INSTALL, COPY, ACCESS, CLICK ON AN "ACCEPT" BUTTON, OR USE THE PROGRAM; AND				
	* PROMPTLY RETURN THE UNUSED MEDIA, DOCUMENTATION, AND PROOF OF ENTITLEMENT TO THE PARTY FROM WHOM IT WAS OBTAINED FOR A REFUND OF THE AMOUNT PAID. IF THE PROGRAM WAS DOWNLOADED, DESTROY ALL CODIES OF THE PROGRAM	•			
You can view and print copies of th	e above referenced agreements by selecting an agreement and clicking Print.				
l agree I do not agree	Print				

Figure 6-6 FSM license agreement

5. Click **I agree** to continue. The startup wizard's Welcome window opens as shown in Figure 6-7. Click **Next**.

⇒ Welcome	Welcome
Date and Time	Use this wizard to complete the following set up tasks to install and configure the system:
Password	
Network Topology	Setup Prerequisites
IP Address (eth0)	Date and Time
IP Address (eth1)	Set the system level User ID and password
Host and Gateway	 Configure IP Addresses
DNS	
Summary	 Configure host name and gateway
	 Configure Domain Name System (DNS)
	1

Figure 6-7 FSM Welcome window

6. From the Date and Time window that is shown in Figure 6-8, set the time, date, time zone, and Network Time Protocol server, as needed. Click **Next**.

Welcome	Date and Time
Date and Time Password	Set the date and time and select the correct time zone for the system, if necessary.
Network Topology IP Address (eth0) IP Address (eth1) Host and Gateway DNS Summary	Date: Oct 4, 2013 Time: 4:48:18 PM Time zone: America V New York
	 ✓ Automatically adjust clock for Daylight Saving Time (DST) Network Time Protocol (NTP) Server Specify an NTP server to automatically synchronize the system clock periodically. Time server hostname or IP address: Add > Remove Use NTP authentication Key index: Key type: M - MD5 Key: Learn more about a network time protocol server
	< Back Next > Finish Cancel

Figure 6-8 Setting the FSM date and time

 Create a user ID and password for accessing the GUI and CLI, as shown in Figure 6-9. User ID and password maintenance, including creating more user IDs, is available in IBM Flex System Manager after the startup wizard completes. Click Next.

Welcome Date and Time Password Network Topology IP Address (eth0) IP Address (eth1) Host and Gateway DNS Summary	System-Level User ID and Password Enter a user ID and password for the system-level access user. The default user ID is USERID, which matches the CMM user ID. This password will be applied to all local administrative accounts, including pe (product engineer) and root. Password quality rules. *User ID: USERID *New password: Confirm password: Group: smadmin Note: You can change this password and add additional users after setup is complete.
	< Back Next > Finish Cancel

Figure 6-9 FSM system level user ID and password step

8. Network topology options include separate networks for management and data, or a single network for both data and management traffic from the chassis. Generally, have separate management and data networks. To simplify this example, a combined network is configured, as shown in Figure 6-10.

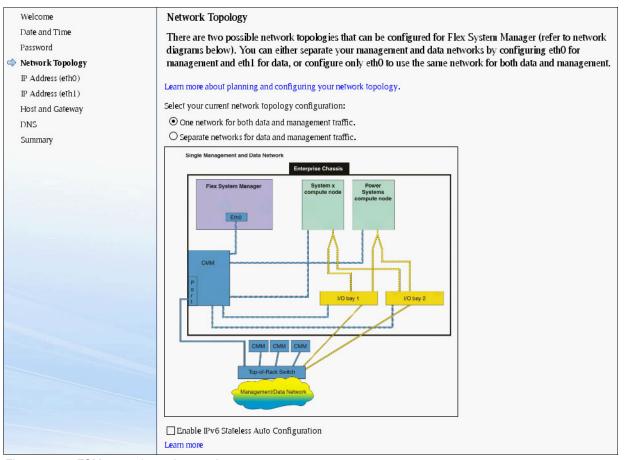


Figure 6-10 FSM network topology options

9. Click Next to continue to the IP network configuration.

The LAN adapter (eth0) is from the FSM management network that allows FSM to communicate on the chassis management network. Traffic from this adapter flows through the Chassis Management Module and uses the CMM physical connection to the network.

The LAN adapter for data network (eth1) is not available because we selected **One network for both data and management traffic** in the previous step. Eth1 represents the integrated Ethernet ports or LAN on motherboard (LOM) on the FSM management node. Traffic from this adapter flows through the Ethernet switch in the first I/O switch bay of the chassis. The IP configuration for the eth0 interface is shown in Figure 6-11. This window allows the selection of Dynamic Host Configuration Protocol (DHCP) or static IP options for IPv4 and IPv6 addressing. Select the options that you want, enter the information as required, then click **Next**.

Welcome Date and Time Password	Configure IP Address for eth0 Configure the IP addresses for LAN adapter (eth0). If the adapter is configured for DHCP and is unable to get an IP address, the management server will not start.
Network Topology P Address (ethi) Host and Gateway DNS	LAN interface address: 5C:F3:FC:5F:5E:8C eth0 (Management/Data Network) Configured IPv6 Link-Local address: fe80:0:0:0:5ef3:fcff:fe5f:5e8c I Pv4 address:
Summary	 Obtain an IP address automatically Use the following IPv4 address: Static IP address: 9.42.170.223 Network mask: 255.255.254.0 IPv6 address: Use DHCPv6 to configure IP settings Use DHCPv6 to configure IP settings Use the following IPv6 address: Specify new static IPv6 address information and click Add: IPv6 address: Prefix length:
	< Back Next > Finish Cancel

Figure 6-11 FSM LAN adapter configuration

10. After IP address assignment, the host name and gateway are configured as shown in Figure 6-12. Enter the host name, domain name, and default gateway address. Ensure that the IP address and the default gateway adapter are correct. Click **Next** to continue.

Tip: The host name of the FSM must be available on the domain name server.

Welcome Date and Time	Configure Host and Gateway Specify host name, domain name and the default gateway address.
Password Network Topology IP Address (etho)	*Host name: fsm1 *Domain name: itso.ral.ibm.com
Host and Gateway DNS Summary	*Default Gateway address: 9.42.170.1
	< Back Next > Finish Cancel

Figure 6-12 FSM host name and gateway configuration

11. You can enable the use of a Domain Name System (DNS) service and add the address of one or more servers and a domain suffix search order. Enter the information as shown in Figure 6-13 and click **Next** to continue.

Welcome Date and Time Password	Configure Domain Name System (DNS) Enable DNS services and configure the search order for DNS servers and domain suffixes. See a list of services that require a working DNS.
Network Topology IP Address (eth0)	
Host and Gateway	DNS server:
Summary	List of DNS servers:
	Domain suffix: Add List of domain suffixes: Down Remove
	Note: If you enable DNS services and are not using DHCP, make sure you update your DNS server with your specified host name, or network validation will fail.
	< Back Next > Finish Cancel
Eisens 0.40 EOM DNO	· · · · ·

Figure 6-13 FSM DNS services configuration

12. The summary window of all configured options is displayed as shown in Figure 6-14. To change a selection, click **Back**. If no changes are needed, click **Finish**.

Welcome	Summary							
Date and Time	Review the following settings, then click Finish. To change any other settings, click Back.							
Password								
Network Topology	Date and Time							
IP Address (eth0)	Date: Oct 4, 2013							
Host and Gateway	ime: 4:54:28 PM							
DNS	Time zone: America/New York Time servers: None							
🔿 Summary								
	Adapter eth)							
	LAN interface address: eth0 5CF3FC5F5E8C							
	IP address: 9.42.170.223							
	Network mask: 255.255.254.0							
	Host and Gate way							
	*Host name: fsml							
	*Domain name: itso.ral.ibm.com							
	*Default Gateway address: 9.42.170.1							
	Configure Domain Name System (DNS)							
	Enable DNS services: false							
	Perform network validation when the wizard is complete. If errors are detected, you will be returned to the welcome page to correct them.							
	Warning: The management server requires a working network configuration when it starts for the first time. If you choose not to perform							
	network validation and recovery when the setup wizard is complete, the management server might not start, or might fail to function properly. If							
	This occurs, you must have a physical connection to the console to correct the problem before using the management server.							
	< Back Next > Finish Cancel							

Figure 6-14 FSM startup wizard summary window

Important: Do not check the **Perform network validation** check box if the Domain Name System (DNS) is not available or not configured.

Next, the final configuration and setup proceeds automatically without the need for more input. Figure 6-15 shows the processing status display.

System Setup Processing					
This page shows pro	This page shows processing information for the Setup wizard. After the setup tasks are completed, click Continue to proceed.				
The system s	etup is in progre	ss			
Setup task status and	progress details:	:			
Setup task	Status	Start time	Stop time		
Date and Time	🞯 🖬 Success	10/4/13 4:55:44 PM	10/4/13 4:55:44 PM		
Setting password	🤏 In Progress	10/4/13 4:55:44 PM			
Host and Gateway	🕓 Not Started				

Figure 6-15 FSM system setup processing status

Figure 6-16 shows the message	when the	processing	is complete.

System Setup Pro	cessing		
This page shows processing info	rmation for the Setup w	vizard. After the setup ta	sks are completed, click Continue to proceed.
~~~	C	ongratulations A	Il setup tasks completed.
		ong acalación or /	Continue
Setup task status and progress de	ails:		<u></u>
Setup task Status	Start time	Stop time	
Date and Time	10/4/13 4:55:44 PM	10/4/13 4:55:44 PM	
Setting password	10/4/13 4:55:44 PM	10/4/13 4:56:24 PM	
Host and Gateway	10/4/13 4:56:24 PM	10/4/13 4:56:24 PM	

Figure 6-16 FSM system setup processing completed

Figure 6-17 shows the message when the server is being started.

Attention: The web server is being restarted as part of the setup process. Network setup and validation can take up to 15 minutes, after which the setup process will continue for approximately 30 minutes. If there are network errors, you will receive notification within 15 minutes, after which the setup process can continue unattended. Do not close this page or refresh your browser window.

st Please wait while the network settings are being applied

Figure 6-17 FSM startup

Figure 6-18 shows the startup process display.

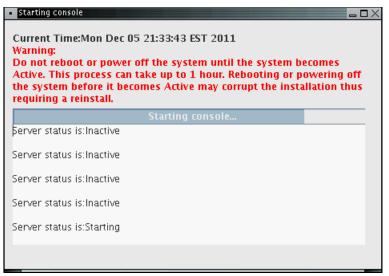


Figure 6-18 FSM startup status

13. When the startup is completed, the local browser on the FSM also starts. Accept any security certificate exceptions. With the security exceptions cleared, the login window of the IBM Flex System Manager GUI is displayed. Enter the credentials that you entered in the startup wizard, and click **Log in** as shown in Figure 6-19.

	IBM.	
IBM Flex System Manager™ User ID: Password: Log in Log in	User ID: Password: Log in roperty of IBM Corp. IBM Corporation and other(s) 2008, red trademark of the IBM Corporation, in the United	

Figure 6-19 FSM login window

The Home window with the initial setup tasks that must be completed to configure the FSM for the first time opens as shown in Figure 6-20.

< System Manager™		Welcome US	ERID Problems	0	0	Compliance	0	0	Help
me ×							s	elect Act	on
me									
Use these tabs to p administration task				ins, perfo	rm	Check and U	pdate Fl		m Mana ition Cei
Initial Setup	Additional Setup	Plug-ins	Administration	Appli	cations	Learn			
Perform the f	ollowing initial setup	p tasks to set up	IBM Flex System	Manager™	for the	first time.			1
	Check and Up Obtain and install				s will rea	uire a restart		Step one Step two	
	of IBM Flex System	n Manager™.						Step three	
	0	-	updating IBM Flex	c System I	Manager	"" firmware.		V	-
<u> 2</u>	Select Chassis View all chassis an			vironmen	t and se	lect which to			
	manage. You are currently r	nanaging 1 chas	eie Viewchaesie						
	Configure Ch								
	Configure basic se nodes, and I/O m	ttings for chassis		ding comp	oute nod	les, storage			
<b>4 0 0</b>	Deploy Comp					(1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.			
COS P	For Red Hat Enterp Kernel-based Virtu	al Machine (KVM	) and VMware vSph	nere 5.1 wi	th IBM (	Customization,			
	you can deploy the compute nodes. To compute nodes, se	o deploy other of	perating systems,	or to depl					
	② Learn more a	bout deploying o	perating systems.						
9	Update Chass Update chassis con modules.			;, storage	nodes, a	and I/O			
6 ::	Launch IBM F								
	IBM FSM Explorer i events, and launch			esources,	monitor	status and			

Figure 6-20 FSM Home window with the initial setup tasks

The startup wizard and initial login are complete. The FSM is ready for further configuration and use. The example used a console from the remote console function of the IMM2 initiated through the CMM. A secure browser session can now be started directly to the FSM management IP interface (eth0).

## 6.2 Updating Flex System Manager

When you first log in to the FSM web console, the Initial Setup window opens as shown in Figure 6-21. The goal of this window is to provide the logical steps to follow to update Flex System components.

	o perform some initia sks, and access addit					ate Flex System Manag Information Cent
Initial Setup	Additional Setup	Plug-ins	Administration	Applications	Learn	
Perform the	following initial setu:	o tasks to set up	IBM Flex System M	anager™ for the fir	st time.	
0	Check and Up Obtain and install of IBM Flex System	updates for IBM Manager™.	ystem Managel Flex System Manag updating IBM Flex	er™. This will requi	re a restart	✓ Step zee ✓ Step two ✓ Step two ✓ Step twos ✓ Step twos
2	Select Chassis View all chassis an manage.		aged anagers in your env	ironment and selec	t which to	America
⁰ ×	Configure Ch Configure basic se nodes, and I/O m	ttings for chassis	onents components includ	ing compute nodes	, storage	
3 05 05 05	Kernel-based Virtu you can deploy the compute nodes. To	orise Linux 6.2-6 al Machine (KVM a image directly f o deploy other o	1ages 4, Red Hat Enterpris ) and VMware vSphe rom the Flex System perating systems, or for more informatic	re 5.1 with IBM Cu n Manager to Syste to deploy to Syste	stomization, em x	
	② Learn more al	bout deploying o	perating systems.			
9	Update Chass Update chassis cor modules.		e <b>nts</b> ng compute nodes,	storage nodes, an	d I/O	
<b>(</b>	Launch IBM I IBM FSM Explorer i events, and launch	s an easy way to	find and browse res	ources, monitor st	atus and	

Figure 6-21 FSM initial setup

Step 1 is to check for updates for the FSM. When you select this option, the FSM attempts to contact the IBM Fix Central site to download updates. If a connection to the Internet is not available, a message is displayed that prompts for a local directory on the FSM from which to import the updates. The updates can be downloaded manually from the IBM Fix Central website and then manually copied to the FSM. For more information, see 6.9.1, "Acquiring updates for chassis components" on page 191. FSM updates include both software and hardware stack updates. If the firmware is updated through an FSM update, the FSM needs to be rebooted to activate the installed updates.

## 6.3 Selecting chassis to manage

Most tasks in IBM Flex System Manager can be performed with more than one method when you are using the GUI. In this example, the most common method is shown.

After FSM is set up initially, it discovers any available chassis. Selections can then be made as to which chassis are managed by the current FSM. To select chassis, perform these steps:

1. From the Initial Setup tab in the Home window, click the **Select Chassis to be Managed** link, as shown in Figure 6-22.

ninistration tas	sks, and access addit	ional information				Information C
nitial Setup	Additional Setup	Plug-ins	Administration	Applications	Learn	
Perform the		date Flex Sy	stem Manage	-		Step toe
	of IBM Flex System	Manager™.	Flex System Manag updating IBM Flex			✓ Step three ✓ Step tode
2	Select Chassis View all chassis and manage.		<b>iged</b> anagers in your env	ironment and sele	ct which to	A second
⁰ ×	Configure Char Configure basic set nodes, and I/O mo	ttings for chassis	onents components includ	ing compute node:	s, storage	
<b>3</b> 05 05 05	Kernel-based Virtua you can deploy the compute nodes. To	rise Linux 6.2-6. al Machine (KVM) image directly f deploy other op	4, Red Hat Enterpris ) and VMware vSphe rom the Flex System perating systems, or for more informatic	re 5.1 with IBM Cu n Manager to Syste to deploy to Syste	istomization, em x	
	(?) Learn more at	oout deploying o	perating systems.			
9	Update Chass Update chassis cor modules.		<b>nts</b> ng compute nodes,	storage nodes, an	id I/O	
<b>@</b>	Launch IBM F IBM FSM Explorer is events, and launch	s an easy way to	find and browse res	ources, monitor st	tatus and	

Figure 6-22 FSM Initial Setup tab

A list of available chassis is displayed as shown in Figure 6-23.

M Flex System Manager™	Welcome USERID	Problems	0	0	Compliance
Home X Chassis Man X Managemen	nt ×				
Management Domain					
Select one or more chassis from the tal changes the Flex System Manager that		manageme	ent domain	. Chang	ing the managem
<ul> <li>(?) Learn more about management do</li> </ul>					
Discover New Chassis					
Discover New Chassis					
Filter chassis list: All known chassis	-				
Filter chassis list: All known chassis	Jaged.				
Select one or more chassis to be mana		10.1114 • A			
Select one or more chassis to be mana		ne table		Search	
Select one or more chassis to be mana	ions 🔻 🛛 Search t	ne table	Managed		Status

Figure 6-23 FSM chassis selection for management

 Select the check box for the chassis that you want to manage and click Manage. The Manage Chassis window opens, which lists the selected chassis as shown in Figure 6-24. An option is available to choose Centralized User Management (see "Centralized user management" on page 89). Another option allows you to automatically assign IPv6 Unique Local Addresses (ULAs) to the chassis components. Click Manage.

BM Flex System Manager™		Welcome USERI	Problems	0	۵Â	Compliance
Home X Chassis Man	Management	×				
Manage Chassis	11 be meaned by the	e legel IBM Flow Su	storn Manager	TM . Ear == 1	Manager	
Chassis Name \$	Serial Number 💠	Managed By ᅌ	Status	; 151111.	Manage	may take up to 2
9.42.170.215	KQ5X28V		Unmanaged			
4						
I∢ ◀ Page 1 of 1 ▶ ▶I	1 🔶   Tota	al: 1				
Allows you to man	ng the Flex System I nage the Flex Syster centralized user ma	n Manager, CMM, a				
	<b>t an IPv6 Unique Lo</b> o Chassis Manageme			•		selected chassis h
(?) Learn more about	setting ULAs for cha	assis components.				
Use the followin	ng 64-bit prefix: fdf	4:af95:954f:0000:	Y			
Manage Cancel						

Figure 6-24 FSM Manage Chassis options

3. If you choose "Authenticate using the Flex System Manager user registry", you need to specify current CMM credentials to authenticate to the selected chassis and CMM recovery credentials to allow access to the chassis in case the FSM management node becomes unavailable, as shown in Figure 6-25. Optionally, you can also specify the FSM administrative account that will be associated with the managed chassis. Click **OK**.

	Management Credentials
CMM (	Credentials
CHILI	
	enter a User ID and Password with administrator or supervisor authority to authenticate to the ed chassis: 9.42.170.215
*CMM	User ID:
USERI	D
*CMM	Password:
CMM I	Recovery Credentials
create unavai passwo	a chassis is centrally managed, local credentials are disabled and the RECOVERY_ID account is d to allow local access to the CMM in the event that the IBM Flex System Manager™ is lable. Provide a password for initial use of the RECOVERY_ID account, and ensure that this ord is kept current as part of your recovery plan. You will be required to change this password the ne you use it.
Recove	ary User ID:
RECO	/ERY_ID
*Reco	very Password:
*Verif	y Password:
IBM F	SM Management Credentials (optional)
	nge the administrator account that will be associated with the CMM in audit and error logs,
	a the account credentials below.
Edit	Credentials
ок	Cancel
- C.	

Figure 6-25 CMM Management Credentials: Centralized user management

4. FSM begins to establish management relationships with the selected chassis as shown in Figure 6-26. In the Message column, FSM displays the current phase of the process.

IBM Flex System Manager™	Welcome USERII	Problems	0	0	Compliance
Home X Chassis Man X Managemen	nt ×				
Manage Chassis The indicated chassis will be managed b	by the local IBM Flex Sy	ystem Manager'	": fsm1.	Manage	may take up to 2
Chassis Name 🗘	Serial Number 🗘	Status		\$	Message
itsoFlex1	KQ5X28V	* Processing			Unlock Pending
T					
I	Total: 1				
Done					

Figure 6-26 FSM manage chassis process

5. After the successful completion of the manage chassis process, click **Done** as shown in Figure 6-27.

BM Flex System Manager™	Welcome USERID	Problems	0	0	Compliance
Home X Chassis Man X Managemen	nt ×				
Manage Chassis					
The indicated chassis will be managed I Chassis Name	oy the local IBM Flex Sy	stem Manager' Status	™: fsm1.	Manage C	may take up to Message
itsoFlex1	KQ5X28V	Success		~	Managed
र					
I I Page 1 of 1 ▶ I 1 → 1	Total: 1				
	locall 1				

Figure 6-27 FSM manage chassis steps completed

The original IBM Flex System Manager Management Domain window opens with the target chassis as the chassis managed by IBM Flex System Manager (Figure 6-28).

BM Flex System Manager™	Welcome USERID	roblems	0	0	Complia	nce
Home X Chassis Man X M.	anagement ×					
Management Domain						
Select one or more chassis from	m the table to be managed in a m	nanagement	domain.	Changin	g the man	ageme
changes the Flex System Mana	ger that is managing it.					
② Learn more about manage	ment domains.					
Discover New Chassis						
	1 1000					
Filter chassis list: All known	chassis					
Select one or more chassis to	be managed.					
Manage Unmanage	Actions	e table	S	earch		
Select Chassis Name 💠	CMM IP	Serial Nun	nber	<	; Manage	ed By
itsoFlex1	9.42.170.215	KQ5X28V			fsm1	

Figure 6-28 FSM management domain with the managed chassis

The Enterprise Chassis is now managed by the IBM Flex System Manager.

## 6.4 Configuring centralized user management

Use the Flex System Manager management software to change centralized management settings for a chassis.

The option to manage a chassis with the centralized management node user registry is available when you first select a chassis for management on the Management Domain page in the Flex System Manager management software web interface (see 6.3, "Selecting chassis to manage" on page 138).

When you use the management software to place a chassis under centralized management, the Chassis Management Module (CMM) is configured to use the registry that is stored on the management node. The local user accounts in the CMM registry are disabled, and the new user account RECOVERY_ID is created on the CMM for future authentication to the CMM (as long as it is configured to use the centralized user registry on the management node).

If you make changes to the disabled local CMM accounts (for example, if you change a password), the changes have no effect on the RECOVERY_ID account. In centralized user management mode, the RECOVERY_ID account is the only CMM account that is activated and operational.

After the CMM detects the management node user registry, it uses the FSM management node registry configuration to provision all of the managed resources in the chassis (except for network switches) so that they also use the central management node user registry.

After a chassis is managed in centralized user management mode, the management node becomes the account manager for the chassis; you can log in to the CMM using accounts from the management node user registry. If a chassis is in centralized management mode, and the management node fails, you can use the RECOVERY_ID account to log in to the CMM to take recovery actions to restore account-management functions on the CMM until the management node is restored or replaced.

#### Changing from decentralized to centralized user management

A centralized management configuration uses a single user authentication repository for all of the Chassis Management Modules (CMMs) in a management domain.

The command-line interface (CLI) is used to update a managed chassis from decentralized to centralized user management mode.

**Note:** You cannot change a chassis from decentralized to centralized user management mode in the management software web interface; you must use the CLI. The web interface enables you to unmanage a chassis, and re-manage the chassis in centralized user management mode. However, unmanaging a chassis deletes all of the chassis settings, and is more complicated than using the **manageChassis** command and its options to change the chassis user management mode to centralized.

To update the chassis from decentralized to centralized user management mode in the management software CLI, run the following command:

```
smcli manageChassis --Uc -c <userid:password@x.x.x.x> --Cu <centralized user ID>
--Cp <centralized password> --Rp <RECOVERY_ID password>
```

The following variables in the command are defined:

- <userid:password@x.x.x.x> represents the administrator credentials and IP address for the target chassis.
- <centralized user ID> is an administrator user ID with supervisor authority on the management node. This account is used to request access to the CMM on behalf of the management node and managed nodes after the CMM is centrally managed.
- <centralized password> is the password for the centralized user ID.
- <RECOVERY_ID password> is the password for the CMM recovery account, which has the user ID RECOVERY_ID.

#### Changing from centralized to decentralized user management

User management is decentralized when a CMM uses its own user registry (and not that of the management node) or uses an external user registry, such as an external Lightweight Directory Access Protocol (LDAP) server.

**Note:** You cannot change a chassis from centralized to decentralized user management mode in the management software web interface; you must use the CLI. The web interface enables you to unmanage a chassis, and re-manage the chassis in decentralized user management mode. However, unmanaging a chassis deletes all of the chassis settings, and is more complicated than using the rmCentrallyManagedChassis command and its options to change the chassis user management mode to decentralized.

To change the chassis to decentralized user management mode from the management software CLI, run the rmCentrallyManagedChassis command, as shown in Example 6-1.

Example 6-1 CLI commands to decentralize a chassis

```
USERID@fsm1:~> smcli lsCentrallyManagedChassis
List of centrally managed chassis:
Chassis 1:
Hostname: 9.42.170.215
UUID: 2C684A86292E3D288C23725C87D0E7C7
OID: 23,680
USERID@fsm1:~>smcli rmCentrallyManagedChassis -u 2C684A86292E3D288C23725C87D0E7C7
Chassis unmanaged successfully
```

**Note:** When the **rmCentrallyManagedChassis** command completes, the chassis is still managed. The chassis no longer uses the management node user registry. You must now request access to the chassis again using the chassis credentials.

## 6.5 Configuring chassis components

The next step in the initial setup tasks is to configure chassis components. Before the component can be configured, it must be discovered by the FSM, access must be granted to the component object in the FSM, and inventory must be collected on it.

The following tasks are typically associated with the configuration of chassis components:

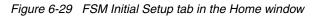
- Request access to the compute nodes, I/O modules, and storage nodes
- Collect inventory on the chassis components
- Configure compute nodes using Configuration Patterns
- Configure the Chassis Management Module using Configuration Patterns
- Configure I/O modules using Configuration Templates

During the Manage Chassis configuration task (see 6.3, "Selecting chassis to manage" on page 138), the FSM discovers the components inside the managed chassis, requests access to them, and collects inventory on the components on which access was granted successfully.

If you are unable to grant access to a specific component, you can manually initiate an access request and then inventory collection. You can use the Initial Setup tab to verify access to the components and request access and collect inventory, if needed, by performing the following steps:

1. From the Initial Setup tab in the Home window, click **Configure Chassis Components**, as shown in Figure 6-29.

	perform some initial se ks, and access addition			ns, perioriti	check and op	date Flex System Mana Information Cen
Initial Setup	Additional Setup	Plug-ins	Administration	Applications	Learn	
Perform the	following initial setup ta	sks to set up	IBM Flex System M	anager™ for the fi	rst time.	
	Check and Upda Obtain and install upd of IBM Flex System M	lates for IBM			ire a restart	<ul> <li>✓ Step one</li> <li>✓ Step two</li> <li>✓ Step three</li> </ul>
	② Learn more about		updating IBM Flex	System Manager™	firmware.	Step fodes
2	Select Chassis to View all chassis and Fl manage.			ironment and sele	ect which to	
	Configure Chass Configure basic settin nodes, and I/O modu	gs for chassis		ing compute node	s, storage	
<b>3</b> 00 000	Deploy Compute For Red Hat Enterprise Kernel-based Virtual M you can deploy the im compute nodes. To de compute nodes, see t	Linux 6.2-6. Machine (KVM) age directly f	4, Red Hat Enterpri ) and VMware vSphe rom the Flex System perating systems, o	ere 5.1 with IBM Cu m Manager to Syst r to deploy to Syst	istomization, em x	
	② Learn more abou	t deploying o	perating systems.			
9	Update Chassis Update chassis compo modules.			storage nodes, ar	nd I/O	
<b>(</b>	Launch IBM FSI IBM FSM Explorer is an events, and launch m	n easy way to	find and browse re	sources, monitor s	tatus and	



2. In the Configure Chassis Components window, you can verify how many compute nodes have been discovered, and how many nodes have full access, as shown in Figure 6-30. If you do not have access to some compute nodes, click **Request Access to Compute Nodes** to request full access to them.

Configure	Chassis Components	
	gure Chassis Components he steps below to configure the components in your managed chassis.	
<b>①</b>	Request Access to Compute Nodes Supply credentials and create access to compute nodes. 4 compute nodes discovered, 4 with access 2 Learn more about requesting access to resources.	
2	Access I/O Modules Supply credentials and configure SNMP access to the I/O Modules you want to configure.	
3	<b>Collect Inventory</b> Gather details about the components of your managed chassis that you want to configure.	
<b>@</b>	Configure Chassis Components using Configuration Patterns Use Configuration Patterns to configure System x compute nodes and Chassis Manageme settings for System p compute nodes and storage nodes. 4 System x compute nodes without an assigned pattern and profile 1 Chassis management module without an assigned pattern and profile	nt Modules, alo
5	Configure I/O Modules Advanced Settings Use configuration templates to configure I/O modules in your managed chassis. (?) Learn more about configuring I/O module advanced settings using configuration temp	plates.
6	Configure Additional Components System storage and System p compute node advanced settings must be configured outsic help links below provide detailed instructions for configuring these settings.	le of Flex System
	<ul> <li>(?) Learn more about configuring storage.</li> <li>(?) Learn more about configuring System p compute node advanced settings.</li> </ul>	

Figure 6-30 Configure Chassis Components window

In the same Configure Chassis Components window, you can also verify how many I/O modules have been discovered, and how many of them have full access, as shown in Figure 6-30.

If some I/O modules do not have access or have partial access, click **Access I/O Modules** to request access to them.

Select an I/O module and click Request Access, as shown in Figure 6-31.



Figure 6-31 I/O Modules Access window

From the Configure Access window, you can request access, verify that management protocols are enabled, and verify their access status, as shown in Figure 6-32.

igure Acc	ess				
				anager users is specified below in e of the individual access points t	
overall st	tatus.				
		nter a user ID and e identified system		access to the identified system, Se	elect Revok
System:	9.42.171.9				
Access:	📄 ок	Request Access	Revoke Ac	iess	
users acc authentic	ess to individual a ation on the selec	access points. Click	c an Access Type lir Certain types of acc	ntial is needed to grant all author Ik to view the list of manageable ess point credentials might not b	credentials
users acc authentic Some ex 9.42.171	ess to individual a cation on the selec amples include CA	access points. Click ted access point. AS and IPC creden ce Access Point)	<pre>&lt; an Access Type lir Certain types of acc tials.</pre>	ik to view the list of manageable ess point credentials might not b	credentials
users acc authentic Some ex 9.42.171	ess to individual a ation on the selec amples include CA	access points. Click cted access point. ( AS and IPC creden)	c an Access Type lir Certain types of acc	ik to view the list of manageable ess point credentials might not b	credentials
users acc authentic Some ex 9.42.171	ess to individual a cation on the selec amples include CA	access points. Click ted access point. AS and IPC creden ce Access Point)	<pre>&lt; an Access Type lir Certain types of acc tials.</pre>	ik to view the list of manageable ess point credentials might not b	credentials
users acc authentic Some ex 9.42.171 Certif	ess to individual a cation on the select amples include CA 1.9 (Remote Servio ficate Trust Store	access points. Click cted access point. AS and IPC creden ce Access Point)	c an Access Type lir Certain types of acc tials. Search the tr Trust State \$	ak to view the list of manageable tess point credentials might not be able	credentials
9.42.171 Certif	tess to individual a tation on the select amples include CA 1.9 (Remote Servin ficate Trust Store Access Type 🔶	access points. Click ted access point. ( AS and IPC creden ce Access Point) Actions  Access St	c an Access Type lir Certain types of acc tials. Search the tr Trust State Not applicable	able Search	credentials
9.42.171 Certif	tess to individual a tation on the selec amples include CA L.9 (Remote Servio ficate Trust Store Access Type ≎ HTTP	Access Points. Click ted access point. (AS and IPC creden ce Access Point) Actions Access St Not applica	c an Access Type lir Certain types of acc tials. Search the tr Trust State Not applicable	able Search Access Information http://9.42.171.9:80	credentials
9.42.171 Certif	Access Type Access Type HTTP	Access Points. Click ted access point. (AS and IPC creden ce Access Point) Actions Access St Not applica	c an Access Type lir Certain types of acc tials. Search the tr Trust State Not applicable Not applicable	able Search Access Information http://9.42.171.9:80	credentials
users acc authentic Some ex 9.42.171 Certif Select	tess to individual a cation on the select amples include CA I.9 (Remote Servin ficate Trust Store Access Type ◆ Access Type ◆ HTTP HTTPS SMIS	Access St Access St Not applica	c an Access Type lir Certain types of acc tials. Search the tr Trust State Not applicable Not applicable Not applicable	able Search Access Information https://9.42.171.9:443 https://9.42.171.9:5989	credentials

Figure 6-32 Configure access for I/O modules

**Requesting access:** If there is no access to the I/O module or access is partial (No access or Partial access is listed in the Access Status column), the Request Access button will be unlocked, and you can request access to the I/O module by clicking **Request Access** and supplying I/O module credentials.

 Collect inventory on all chassis components by clicking Collect Inventory in the Configure Chassis Components window, as shown in Figure 6-33.

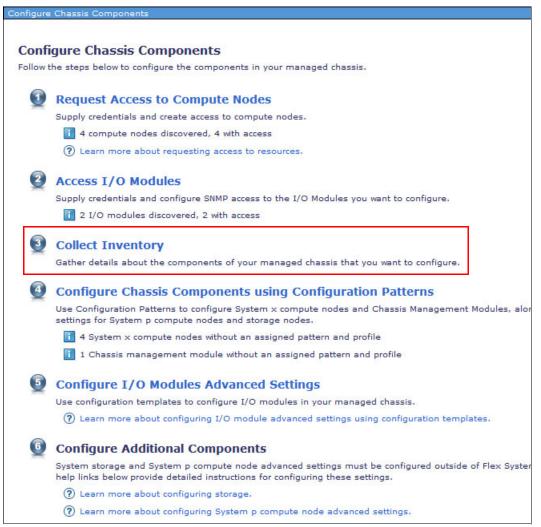


Figure 6-33 Configure Chassis Components window

				Launch Job		
Schedule	Notification	Options				
Job name an	d schedule					
*Job Name:						
Collect Inver	ntory - November	13, 2013 2:06	:36 PM EST			
Choose when	n to run the job.					
Run Now	<i>,</i>					
C Schedule	2					
OK Ca	ancel Help					

Click **OK** in the Launch Job window to start the task, as shown in Figure 6-34.

Figure 6-34 Launch the Collect Inventory job

Check that the job started successfully, as shown in Figure 6-35. You can monitor job progress by clicking **Display Properties**.

i	ATKCOR102I
	The following job has been created and started successfully: Collect Inventory - November 13, 2013 2:0 PM EST
	Display Properties Close Message

Figure 6-35 Job launch informational message

Check the job status and progress as shown in Figure 6-36.

e and Scheduled	l Jobs				
tive and Schedu			2:06:36 PM ES	Actions 🔻	
General	Targets	History	Logs		
Status: Progress: Last Run Stat	Active 259 cus: Running	%			
Description: Next Run:	Run once	on 11/13/13 at	2:06 PM		
Last Run:	11/13/13	at 2:06 PM			
Task:	Collect In	ventory			
Created By:	USERID				
Edit					

Figure 6-36 Job properties

Wait until the job is completed. You are now ready to perform configuration tasks on the compute nodes and I/O modules.

## 6.6 Configuring compute nodes using Configuration Patterns

This section describes the following topics:

- ► 6.6.1, "Overview of Configuration Patterns" on page 150
- ► 6.6.2, "Creating and applying compute node Configuration Patterns" on page 153
- ► 6.6.3, "Automating compute node failover with Configuration Patterns" on page 161

#### 6.6.1 Overview of Configuration Patterns

You can use Configuration Patterns to provision or pre-provision X-Architecture compute nodes using a common Configuration Pattern that can be deployed to multiple compute nodes. Configuration Patterns enable you to configure local storage, network adapters, boot order, and Integrated Management Module (IMM) and Unified Extensible Firmware Interface (UEFI) settings.

#### The diagram in Figure 6-37 illustrates the concept of Configuration Patterns.

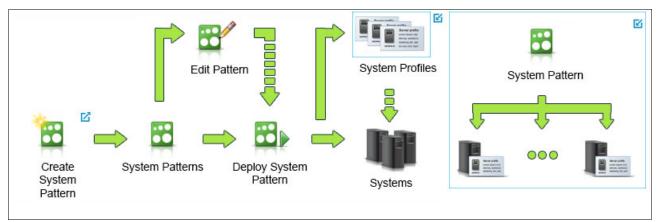


Figure 6-37 Configuration Patterns concept

Use Configuration Patterns to define and manage the server patterns, server profiles, policies, and standby server pools. Before you create a new server pattern on the Configuration Patterns page in the IBM Flex System Manager web interface, consider the following suggestions:

- A server pattern represents a compute node configuration that is deployed before an operating system is installed. It includes local storage configuration, network adapter configuration, boot settings, and other IMM and UEFI firmware settings.
- Server profiles are generated automatically when a server pattern is deployed. One profile is created for each target compute node. Each server profile represents the specific configuration of a single compute node and contains system-unique information (for example, assigned IP addresses and Media Access Control (MAC) addresses).
- Identify compute nodes for configuration that have a common hardware configuration.
   A server pattern is used to apply the same configuration settings to compute nodes with the same hardware.
- If you want to create a server pattern from an existing compute node, make sure that the compute node is discovered and unlocked.
- Identify the aspects of configuration that you want to customize for the server pattern (for example, local storage, network adapters, boot settings, IMM settings, and UEFI settings).

#### Server patterns

A server pattern represents a compute node configuration that is deployed before an operating system is installed. It includes local storage configuration, network adapter configuration, boot settings, and other IMM and UEFI firmware settings.

When you define a server pattern, select the category patterns and address pools that you need for the configuration that you want for a specific group of compute nodes. You can define multiple server patterns to represent different configurations in your data center. When a server pattern is deployed to multiple compute nodes, multiple server profiles are generated automatically (one profile for each compute node). Each profile inherits settings from the parent server pattern, which enables you to control a common Configuration Pattern from a single place.

**Note:** When you create a new server pattern from scratch, you are required to define the boot settings for compute nodes. If you deploy the new server pattern to compute nodes, the existing boot order on the compute nodes is overwritten with the default boot order settings in the new server pattern.

When you create server patterns, make sure that you create them for each compute node type. For example, create a server pattern for all IBM Flex System x240 compute nodes and a server pattern for all IBM Flex System x440 compute nodes. Do not apply a server pattern created for one compute node type to a different compute node type.

To ensure that your Configuration Patterns are not lost if the management node fails, back up the management software after you create or modify Configuration Patterns.

The category patterns within a server pattern correspond to the firmware settings for a compute node type. Most of the firmware settings that you might configure directly on the compute node IMM and UEFI can also be configured through Configuration Patterns in the management software web interface. However, some settings are not supported by Configuration Patterns, and other settings are not yet available.

#### Server profiles

Server profiles are generated automatically when a server pattern is deployed. One profile is created for each target compute node. Each server profile represents the specific configuration of a single compute node and contains system-unique information (for example, assigned IP addresses and MAC addresses).

When a pattern is deployed, an individual system profile is generated for each target system. You can edit a pattern and save changes, and any dependent system profiles are automatically updated and redeployed to their associated systems. You can move an existing profile from one system to another by unassigning the profile, and then redeploying the profile to another system.

**Important:** Systems retain their identification information (for example, host name, IP address, and virtual MAC address) when a profile is unassigned. To avoid name and address conflicts, any identification information about the original system must be cleared before the unassigned profile is deployed to a different system.

Each server profile represents the specific configuration of a single compute node and contains information that is unique to a compute node. The server profile is activated as part of the IMM startup process. After a server profile is activated for a compute node, any subsequent configuration changes are done by editing the appropriate server pattern or category pattern associated with the profile. This enables you to control a common Configuration Pattern from a single place.

If a compute node needs to be moved or repurposed, you can reassign a server profile from one compute node to another.

You can deploy a server pattern to a compute node or to an empty chassis bay. In either case, the profile is associated with the chassis bay. If you replace an existing compute node, you must redeploy the server profile associated with that bay to activate the profile on the new compute node. If you first deploy a server pattern to an empty bay, you must redeploy the server profile associated with that bay after a compute node is installed.

**Note:** To ensure that your Configuration Patterns are not lost if the management node fails, back up the management software after you create or modify Configuration Patterns.

### 6.6.2 Creating and applying compute node Configuration Patterns

Use the following procedure to create and apply a Configuration Pattern on the compute node:

1. From the Initial Setup tab in the Home windows, select **Configure Chassis Components**, then click **Configure Chassis Components using Configuration Patterns**, as shown in Figure 6-38.

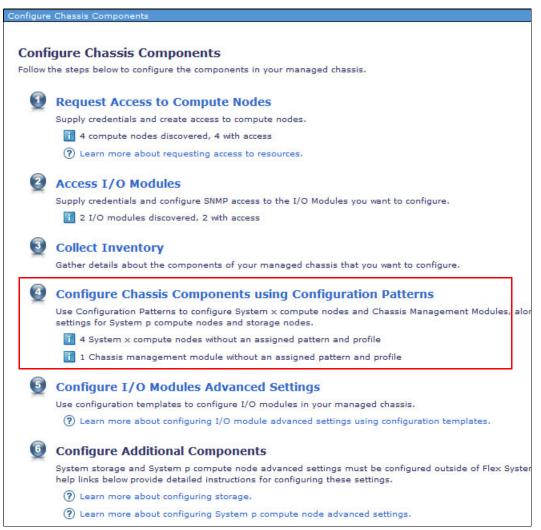


Figure 6-38 Configure Chassis Components window

IBM Flex System Manager web interface (FSM Explorer) opens in a new window, as shown in Figure 6-39. Click Create a new server pattern from an existing compute node to continue.

IBM Flex System M	lanager™ - 1.3.0	
Getting Start	ed	
Suggested Tasks (2)	Concept Overview	
	Configuration Patterns Concept Overview concepts and learn more about using Conf	guration Patterns to configure compute nodes an
Configure loca	ystem x Compute Nodes I storage, I/O adapters, boot order, and other nodes without an assigned pattern and prof server pattern from an existing compute n	
Configure CMI	hassis Management Modules (CMMs) and I management interface, users and security, management modules without an assigned chassis pattern from an existing chassis	power and acoustics settings, and basic I/O mod
Continue Initia Return to Flex	I Setup System Manager to continue initial setup ste	ps
and context menus.	n to help you get started. Once a recommendation Patterns: Getting Started	ded task has been completed, it will no longer be :

Existing compute node: If you plan to create your new Configuration Pattern from the existing compute node, you need to configure node settings first using its UEFI user interface. Node settings include local storage, network adapters, boot order, and Integrated Management Module (IMM) and Unified Extensible Firmware Interface (UEFI) settings.

#### 2. Choose the node on which the pattern will be based as shown in Figure 6-40. Click Next.

General * Local Stora	age I/O Ac	dapters [*] Boot	Firmware Se	ttings
) Before you begin this wizard				
Select a starting point				
Create a new pattern from an exi	sting server			
Select server to pull from as a	base configuratio	n <u> </u>		
Select server to pull from as a Chassis and Servers	base configuratio	IP Address	Туре	Form Factor
			Туре	Form Factor
Chassis and Servers			<b>Туре</b> IBM System x	Form Factor
Chassis and Servers	Bays	IP Address		

Figure 6-40 Select the node on which to base the pattern

**New pattern from scratch:** If you want to create a server pattern from scratch, click the pencil icon in the "Select a starting point" box to show an expanded starting point view, as shown in Figure 6-41.

Select a starting point	
	1
Create a new pattern from an existing server	Create a new pattern from scratch

Figure 6-41 Select a starting point expanded view

### 3. Choose a name for the new pattern as shown in Figure 6-42. Click Next.

	Pattern Wizard				
General	* Local Storage	I/O Adapters	* Boot	Firmware Settings	
) Before you	u begin this wizard				
- Select a sta		1			
Create a nev	w pattern from an existing se	rver			
- Select serv	ver to pull from as a base co	onfiguration – 🥖 –			
chassis — n	ode01-x240				
Specify pat	tern name and description				
* Name:	node 1 pattern				
* Name:	limit of 500 characters)				
* Name:					
* Name:		]			
* Name:					
* Name:					

Figure 6-42 Name the new server pattern

4. The next window provides options for local storage configuration. You can specify a new storage configuration or keep the existing storage configuration on the target, or disable local disks as shown in Figure 6-43. Choose the required option and click **Next**.

New Server F	Pattern Wizard					
* General	* Local Storage	I/O Adapters	* Boot	Firmware	Settings	
Define the stora	ge configuration that will be	applied to target serve	rs when this pa	attern is deploy	ed.	
Select local sto	rage configuration					
N.	3	Ø				
Specify configu		-	al disk			
This option mal	kes no changes to existing	storage configuration	on target syst	ems when this	s pattern is deployed.	
		Back		Next	Save	Save and Deploy

Figure 6-43 New Server Pattern Wizard: Local Storage

# 5. The next window provides options for IO adapters as shown in Figure 6-44. The I/O adapters based on the original model are the same for the new pattern. Click **Next**.

General * Local Stora	age I/O Adapters	* Boot	Firmware Settings	
<ol> <li>If desired you can modify adap</li> </ol>	tor addressing and define add	ditional adaptors	to match the hardware you av	nect to configure with this :
Graphic view 🗹	nel autressing and denne aut	ullional adapters		ddressing: ⑦ Burned I
💼 🕞   🔲 Advanced Settir	ngs   🏹   More 🕶			
Location	Туре	I/O Bay	Configuration Pattern	I/O Addressing
<ul> <li>Compute Node</li> </ul>				
<ul> <li>Compute Node</li> <li>LOM Fabric Connector</li> </ul>	Virtual Fabric	1-2	Learned-Adapter-4.1	
	Virtual Fabric Virtual Fabric	1-2	Learned-Adapter-4.1 Learned-Port-4.1	Burned in Addres
LOM Fabric Connector		()***).		Burned in Addres
<ul> <li>LOM Fabric Connector</li> <li>Port 1</li> </ul>	Virtual Fabric	1		

Figure 6-44 New Server Pattern Wizard: I/O Adapters

6. The next window allows changes to the boot mode or allows you to keep the same as the original node as shown in Figure 6-45. Click **Next**.

	Storage I/C	r for Legacy Onl	* Boot y boot environm Then Legacy	Firmware Setting ents, and SAN boot targe OLegacy Only Boot	ts for UEFI or Legacy environn
System boot mode: 🕐					
System boot mode: 🕐					
Primary Boot Order					
	Wake on LAN (Wol	L) Boot Order	SAN Boot		
	0		2004 - N. C. 200 1998-9		
🚺 Boot order can o	nly be configured if	Legacy Only Bo	ot is selected a	is the system boot mode	е.
		Bac	•	Next	Save Save and D

Figure 6-45 New Server Pattern Wizard: Boot

# 7. The next window provides the ability to use firmware settings from the original node or to update those settings as shown in Figure 6-46. Click **Next**.

General	* Local Sto	rage	I/O Adapters	* Boot	Firmware Settings			
			a		a a a a a a a a a a a	tarar	10	
A Some I	learned System l	nformat	tion pattern information	n was set to th	e default and might need to be	modifie	d.	
A Some l	learned Managen	nent Inte	erface pattern informa	tion was set to	) the default and might need to	be mod	ified.	
	our in an an agon		endee pattern mend					
	-				' and learned patterns have be	en auto	-gener	ated. Any
Integrated Man	agement Module	(IMM) a	and Server Firmware S atterns as desired to inc	ettings (UEFI)	-	en auto	-gener	ated. Am
Integrated Man Select existing	agement Module	(IMM) a egory pa Patte	and Server Firmware S atterns as desired to inc	ettings (UEFI)	-	en auto	-gener	ated. Any
Integrated Man Select existing Category	agement Module or create new cate nation:	(IMM) a egory pa Patte ? Le	and Server Firmware S atterns as desired to inc ern	ettings (UEFI)	-		gener	ated. Am 1 Am
<b>ntegrated Man</b> Select existing Category System Inform Management	agement Module or create new cate nation:	(IMM) a egory pa Patte ? Le ? Le	and Server Firmware S atterns as desired to inc ern earned-System_Info-4	ettings (UEFI)	-		-gener	ated. Any *] (A) *] (A) *]
<b>ntegrated Man</b> Select existing Category System Inform Management	agement Module or create new cate nation: Interface: ule And Capping:	(IMM) a egory pa Patte ? Le ? Le	and Server Firmware S atterns as desired to inc ern earned-System_Info-4 earned-Management-4	ettings (UEFI)	-		-gener	ated. Any *] (A) *] (A) *]
ntegrated Man Select existing Category System Inform Management Power Schedu	agement Module or create new cate nation: Interface: ule And Capping: And Recovery:	(IMM) a egory pa Patte ? Le ? Le ? Le	and Server Firmware S atterns as desired to inc ern earned-System_Info-4 earned-Management-4 earned-Power-4	ettings (UEFI)	-		gener	ated. Any *] (A) *] *] *]

Figure 6-46 New Server Pattern Wizard: Firmware Settings

# 8. Choose **Save and Deploy** to store the new server pattern and deploy it. The new server pattern can be deployed to one or more nodes as shown in Figure 6-47.

		1 pattern				
eploy the server pattern to on	e or more	individual servers, or	r groups of serve	rs (e.g. chassis). On deploy, one	e server profile	is created for ea
∗Pattern To Deploy: nod	e 1 pattern	🔹 (1 bay comp	ute pattern)			
Profile Activation: ⑦ Full	— start/res	start server now 💌				
wailable Servers				Selected Servers		
Add Placeholder Chassis	×					
Name	Bay	Deploy Status		Name	Bay	Deploy Statu
chassis				▼ chassis		
node01-x240	1	🗹 Ready		node04-x240	4	🗹 Ready
node03-x240	3	🗹 Ready	= >>			
			- «			
Empty Bay	6	🗹 Ready				
Empty Bay Empty Bay	6	Ready	<			

Figure 6-47 One node is selected to which to deploy the new pattern

If the node that you are planning to deploy is powered on, you receive the following message as shown in Figure 6-48.

Δ	Some of the servers you selected are online. To fully activate the profile, these servers will be restarted after deployment: node04-x240							
Do y	ou want to deploy the pattern an	d restart the servers?						
		Deploy	Cancel					

Figure 6-48 Choose to deploy the new pattern and restart the node

### 6.6.3 Automating compute node failover with Configuration Patterns

Configuration Patterns can be set up to monitor for a hardware fault and fail the node over to another one that is in the standby server pool.

**Note:** Each of the nodes must be configured to use SAN storage only and must be compatible with virtual addressing for its I/O adapters.

Follow these steps to set up a node in the standby server pool:

1. Open the FSM Explorer web interface by clicking **Launch IBM FSM Explorer** on the Initial Setup tab in the Home window. The main FSM Explorer window opens, as shown in Figure 6-49.

IBM Flex System	Manager™ - 1.3.0		🗹 Status (0) 👻	🗹 Jobs (0) 👻	USERID - (	o - Ien	
Home • System	ns • Monitor • Security •	Utilities 🔻		ſ	ind a System or Tasl	k Q	
-	Chassis	Managed Chassis					
	All Compute Nodes						
Ener	All Storage Nodes	📑 - 🚔 -	Actions -	F	Filter		
hassis (1)	E All Chassis						
	itsoFlex1	Chassis Name	Access	Hardware Status	Problems	Compliance	
	BM 8731AC1 KQ5F02D	itsoFlex1	OK OK	Information	OK OK	OK OK	
	node01-x240						
osts and VSs (0)	node02-x240						
	node03-x240						
	node04-x240						
etwork (1)							
orage (1)							
avorites (0)							
Systems (12)							

Figure 6-49 FSM Managed Chassis window

 Select Systems → Configuration Patterns to open the Configuration Patterns window. Within the Configuration Patterns window, on the left column under Servers heading, choose Policies as shown in Figure 6-50.

IBM Flex System Manager™ - 1.3.0		
Home * Systems * Monitor *	Security *	Utilities 🔹
Configuration Patterns	Serv	ers – Policies
Common	(7) Failove	r policies are used with failover monitoring to control v
<ul> <li>Getting Started</li> <li>Address Pools</li> </ul>	By Type	- 🛃 - 🧭 隊   Actions -
Servers		New Failover Policy
🔡 Patterns 📧 Profiles	Name	<ul> <li>Description</li> </ul>
8 Policies		
Standby Server Pools		
Chassis		
<ul> <li>Patterns</li> <li>Profiles</li> <li>Placeholder Chassis</li> </ul>	I	

Figure 6-50 Create new failover server policy

3. Choose the criteria for when a failover will be triggered. Both a CPU failure and Memory failure are set up as shown in Figure 6-51.

								New Fai	lover Po	olicy	
Specify	y nan	e and	descri	ption							
⊧Name:	Cor	npute N	lode ha	rdware f	ailure						
Descripti	on (lin	iit of 50	0 chara	cters):							-
lonitor f											
	or the	followi	ng cona	<b>litions</b> to	o initiat	e failovei					
		followi	ng cona	litions to	o initiat	e failovei					
Powe	er off		ng cona	litions to	o initiat	e failovei					
Powe	er off failure e com	nunica	n <b>g con</b> a tion erra		o initiat	e failovei					
Powe CPU Blade Blade	er off failure e com e remi	nunica Ival			o initiat	e failovei					
Powe CPU Blade Blade HDD	er off failure e com e remi failuri	munica Ival			o initiat	e failover					
Powe CPU Blad Blad HDD Deni	er off failure e com e rem failun ed pov	munica Ival Ver			o initiat	e failovei					
Powe CPU Bladu Bladu HDD Deni Mem	er off failure e com e rem failur ed pov	munica wal ver ure			o initiat	e failovei					
Powe CPU Blad Blad HDD Deni Deni Volta	er off failure e com e rem failure d pov ory fai ge wa	munica wal ver ure nings	tion erro			e failovei					
Powe CPU Blad Blad HDD Deni Mem Volta Pred	er off failure e com e rem failur ed po ory fai ge wa ictive f	munica wal ver ure nings ailure a	tion erro	ors		e failovei					
Powe CPU Blad Blad HDD Deni Volta Volta Pred	er off failure e com e rem failur ed pov ory fai ge wa ictive f <b>ailove</b>	munica wal ver ure nings ailure a	tion erro nalysis( <b>IS</b>	ors (PFA) ev	ents						
Power CPU Bladd Bladd HDD Deni Volta Pred Choose f	er off failure e com e rem failure ed po ory fai ge wa ictive f <b>ailove</b> failove	munica ival ver ure nings ailure a <b>optio</b> r	tion erro nalysis( <b>IS</b> ndby se	ors (PFA) ev	ents at are p	e failovei owered o iry defaul	ff 🕐				

Figure 6-51 Choose criteria for when a failover will be triggered

Select Create when finished.

4. Choose servers to be in the standby pool by selecting **Standby Server Pools** under **Servers** in the left column as shown in Figure 6-52.

IBM Flex System Manager™ - 1.3.0	
Home • Systems • Monitor • 9	Security - Utilities -
Configuration Patterns	Servers – Standby Server Pools
Common	⑦ Standby server pools are used with failover monitoring to pro
<ul> <li>Getting Started</li> <li>Address Pools</li> </ul>	🛃 🧭 Actions 🕶
Servers	Create Standby Server Pool
Patterns Profiles Policies	Stanuny server Poor V Description
G Standby Server Pools	
Chassis	
<ul> <li>Patterns</li> <li>Profiles</li> <li>Placeholder Chassis</li> </ul>	

Figure 6-52 Creating a new standby server pool

5. In the New Standby Server Pool window, name the new pool and choose the servers to add into the pool as shown in Figure 6-53. Click **Create**.

w Standby Server Po	ool				
Specify name and description					
Name: X-Architecture serve	irs				
Description ( limit of 500 chara	cters ):			٦	
Choose one or more servers t	o include in this s	tandby pool to use as fa	ailover target:	s	
Available Servers				Selected Servers	
	_				
Name	Bay	Form Factor		Name	Bay
• chassis		Form Factor	>	Name  chassis	Bay
		1 Bay Compute No	>		Bay 1
▼ chassis			>	▼ chassis	
▼ chassis node03-x240		1 Bay Compute No	> >> </td <td>▼ chassis</td> <td></td>	▼ chassis	

Figure 6-53 Select Create after naming the new pool and adding nodes

6. From the main Configurations Pattern window, choose **Start Failover Monitoring** as shown in Figure 6-54.



Figure 6-54 Select to start failover monitoring

7. From the drop-down menus, choose the failover policy and the target standby server pool. Then, choose the server to monitor from the list. We selected node 3 as shown in Figure 6-55. Click **Start**.

				a standby s	erver, the failed server will	ne bowelea	i uir and	1:3
elect a failover policy and	1000000	andby serve	r pool		*]			
X-Architecture servers			- 7		*]			
noose one or more serve vailable Servers	ers to monit	or for failove	r based on above po	licy	Selected Servers			
Name	Bay	Access	Form Factor		Name	Bay	Access	For
▼ chassis		🗹 ок		>	chassis			
node02-x240	2	🗹 ок	1 Bay Compute №	>>	node03-x240	3	🗹 ок	1 E
node04-x240	4	🗹 ок	1 Bay Compute N	~				

Figure 6-55 Start Failover Monitoring

The failover configuration is now completed. To verify failover operations, within the Chassis Manager tab in the FSM, select the node and right-click for the option to fail over to the standby server pool as shown in Figure 6-56.

Home 🗙 Chassis Man 🗙 🔪		
7 5 1BM 8731AC1 KQ5	F02D	
3O	)etails	Performance Summary
1node0	Create Group Deploy Compute Node Image Rename	Monitors
🔊 🔺 🛃   🛃 🔺 🖡	add to Automation	Thresholds Turn off Check Log LED Compliance Policy
	nventory Power On/Off	Compliance Issues
General Active Status	Release Management Remote Access	Edit Failover Monitoring     Failover To Standby Server Pool     Support     Config
Type:	Security System Configuration	<ul> <li>Remove Failover Monitoring</li> <li>Stop Failover Monitoring</li> </ul>
	ystem Status and Health	System Identification     System Identification
Slots Occupied:	ask Management	•
	ervice and Support	▶-b5-bf-50-d9, 34-40-b5-be-83-d0, 34-40-b5-bf-50-da
Agent Time Zone Offset:	dvanced Properties	
Architecture:	x86_64	00-10-030305FEE30

Figure 6-56 Trigger a failover to the standby server pool

Return to the Initial Setup tasks window.

# 6.7 Deploying compute node images

The Flex System Manager provides the ability to deploy operating system images to one or more X-Architecture compute nodes. The Deploy compute node image task is capable of mass operating-system deployment. The management software supports up to 56 X-Architecture compute nodes for concurrent deployment.

#### **Considerations:**

- You can use the Deploy compute node image task to install operating systems on X-Architecture compute nodes only.
- At this time, the Deploy compute node image task only provisions to local (internal) disks. SAN disks are not supported at this time.
- If you deploy an image to a compute node that already has an operating system installed, the existing operating system will be overwritten.

The following operating systems are supported:

- VMware vSphere Hypervisor (ESXi) 5.1 with IBM customization. A version of the IBM-customized VMware vSphere Hypervisor is preloaded on the IBM Flex System Manager management node.
- Red Hat Enterprise Linux 6.2, 6.3, and 6.4. When you import the Red Hat Enterprise Linux ISO image, it will generate three different OS image profiles: Minimal, Basic, and Virtualization. You can deploy any of these images to X-Architecture compute nodes.

When you deploy the Virtualization OS image profile, the Kernel-based Virtual Machine (KVM) Platform Agent is automatically installed and configured on the compute node. If the VMControl plug-in is active on the IBM Flex System Manager management node, the deployed operating system will be added automatically as one of the virtual servers or hosts that VMControl can manage.

If the VMControl plug-in is not activated before you deploy the image and you want to manage the virtual server or host through VMControl, you must activate the VMControl plug-in and then collect inventory on the virtual server or host manually for the deployed operating system.

#### 6.7.1 Importing operating system images

The IBM Flex System Manager management node supports a maximum of two operating system images in local storage. A version of the IBM-customized VMware vSphere Hypervisor is preloaded on the IBM Flex System Manager management node. Therefore, you can import one additional operating system image on the IBM Flex System Manager management node and then deploy that image to X-Architecture compute nodes.

**Multiple images:** If you already have two images loaded on the IBM Flex System Manager management node, you will need to first delete one of those images before attempting to import another image. For example, you can delete the IBM customized VMware vSphere image if needed to allow for two versions of Red Hat Enterprise Linux 6.2 and 6.3.

Complete the following steps to delete an operating system image from the IBM Flex System Manager management node:

- 1. Access the management node using Secure Shell (SSH).
- 2. Log in to the IBM Flex System Manager CLI user interface using a user account with administrator privileges, such as USERID.
- 3. Use the smcli lsosimages command to list all stored images, as shown in Example 6-2.

```
Example 6-2 List all stored images on the IBM Flex System Manager management node
```

```
USERID@fsm1:~> smcli lsosimages

OS Name: esxi5.1

OS Profiles:

esxi5.1-x86_64-install-Virtualization

OS Name: rhels6.3

OS Profiles:

rhels6.3-x86_64-install-Basic

rhels6.3-x86_64-install-Minimal

rhels6.3-x86_64-install-Virtualization

USERID@fsm1:~>
```

4. Use the smcli deleteosimage -o <os image name> command to delete an image, as shown in Example 6-3.

Example 6-3 Delete an OS image from the IBM Flex System management node

```
USERID@fsm1:~> smcli deleteosimage -o rhels6.3
```

Complete the following steps to import an operating system to the IBM Flex System Manager management node:

- 1. Obtain a licensed ISO image of the operating system.
- Use one of the following methods to copy the ISO image to an accessible directory on the management node, such as /home/USERID:
  - a. Use Secure Copy Protocol (SCP)

Use an SCP tool on a notebook or workstation attached to the management or data network to send the ISO image to the management node, as shown in Example 6-4. Send the ISO image from the IBM Flex System Manager management node where you are logged in using a user account with administrator privileges, such as USERID.

Example 6-4 SCP command from a remote workstation

scp * USERID@<management node host name>:/home/USERID/*

- b. Copy the ISO image from a USB storage device:
  - i. Insert a USB storage device into the USB port on the front of the management node.
  - ii. Access the management node using SSH.
  - iii. Log in using a user account with administrator privileges, such as USERID.
  - iv. Use the command 1smediadev to list the storage media devices that are available for use on the system and identify the USB storage device. The resulting output will be similar to Example 6-5, where vdi1 is the USB storage device.

Example 6-5 List media devices and mount USB storage device

```
USERID@fsm1:~>lsmediadev
device=/dev/vdi1,mount_point=/media/vdi1,type=3,description=USB flash memory
device
USERID@fsm1:~>mount /dev/vdi1
```

v. Copy image file from the USB storage device to the FSM node as shown in Example 6-6.

Example 6-6 Copy image file from USB storage device to the Flex System management node

USERID@fsm1:~>cp /media/vdi1/RHEL6.3-2012.0-Server-x86_64.iso /home/USERID/.

3. Import the ISO image using the command smcli importosimage.

Example 6-7 Importing as OS image into the Flex System management node

USERID@fsm1:~>smcli importosimage /home/USERID/RHEL6.3-2012.0-Server-x86_64.iso

After importing the image, it will be displayed in the Image to Deploy column (within the Flex System Manager GUI).

### 6.7.2 Deploying a new image

You can launch the "Deploy Compute Node Images" task from the Initial Setup tab on the Home page, the Chassis Map view, or the IBM FSM Explorer console in the management software web interface. All three ways to launch the "Deploy Compute Node Images" task are shown:

► On the Initial Setup tab, click **Deploy Compute Node Images**, as shown in Figure 6-57.

ministration ta	sks, and access additi		n.	-		Information C
Initial Setup	Additional Setup	Plug-ins	Administration	Applications	Learn	
Perform the	following initial setup	tasks to set up	) IBM Flex System M	anager™ for the f	first time.	
	Obtain and install u of IBM Flex System	pdates for IBM Manager™.	<b>ystem Manage</b> Flex System Manag d updating IBM Flex	er™. This will requ		<ul> <li>✓ Rep coe</li> <li>✓ Rep twe</li> <li>✓ Rep twee</li> <li>✓ Rep twee</li> <li>✓ Rep twee</li> </ul>
2	Select Chassis View all chassis and manage.		<b>aged</b> Managers in your env	rironment and sel	ect which to	A month of
⁹ ×	Configure Cha Configure basic sett nodes, and I/O mo	ings for chassi	onents s components includ	ing compute node	es, storage	
	Kernel-based Virtua you can deploy the compute nodes. To compute nodes, see	ise Linux 6.2-6 l Machine (KVM image directly deploy other o a the link below	nages .4, Red Hat Enterpri 1) and VMware vSphe from the Flex System perating systems, o v for more information operating systems.	ere 5.1 with IBM C m Manager to Sys r to deploy to Sys	ustomization, tem x	
9	Update Chassi	s Compone		storage nodes, a	nd I/O	
<b>©</b>	Launch IBM F IBM FSM Explorer is events, and launch	an easy way to	o find and browse re	sources, monitor :	status and	

Figure 6-57 FSM Initial Setup: Deploy Compute Node Images

 In the Chassis Map view, right-click the compute node and select Deploy Compute Node Images, as shown in Figure 6-58.

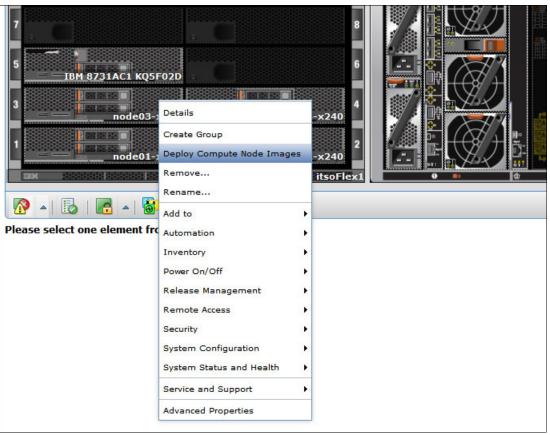


Figure 6-58 Chassis Map: Deploy Compute Node Images

In the FSM Explorer, click Systems → Deploy Compute Node Images, as shown in Figure 6-59.

Home 👻	Systems *	Monitor - Securit	y • Utilities •	
		Systems	Configuration	Firmware
-		All Groups 🗗	Configuration Patterns	Show Update
1 ±		All OSs		
Chassis (1)		Power Systems Man	agement	
	Discover	Deploy Compute Node Imag	ges Deploy Virtual Appliance	

Figure 6-59 FSM Explorer: Deploy Compute Node Images

Perform the following steps to deploy a new operating system image (the numbers correspond to the numbers in Figure 6-60):

1. From the Deploy Compute Node Images window that is shown in Figure 6-60, select the compute nodes that you want to deploy. Multiple nodes can be selected.

IBM Flex System M	lanag	er™ - 1.3.	0		🗹 Statu	s (0) 🔹 🗾 🔽	Jobs (0) 🔹	USERID -
Home - Systems	•	Monitor	<ul> <li>Security</li> </ul>	• Ut	ilities 👻		(	Find a System
Deploy Comp	ute	Node	Images					
Select one or more X-Arch	nitectur	re compute	nodes to which ye	ou want to	deploy images. Learn	More		
Note: Before you begin, va as the network ports on th				r network	port being used to atta	ach to the data netv	vork is configured	to be on the sa
•		•			Looro moro d	bout importing of	ditional images	
Apply this image to all			86_64-install-Virtu			about importing ad	se the images	to deploy
			Remote Control	Actions		2. 01100	se the mage	
Chassis and Node	Bay	Access State	Discovered Operating System	Deploy Status	MAC Address	Image to Deploy		
itsoFlex1								
node01-x240	1	📄 ОК	Not Discovered	Ready	34:40:B5:BE:7D:00	esxi5.1-x86_64	1-install-Virtualizat	ion 🔻
node02-x240	2	ОК	Not Discovered	Ready	34:40:B5:BE:8E:90	esxi5.1-x86_64	4-install-Virtualizat	ion 🔻
node03-x240	3	ОК	Not Discovered	Ready	34:40:B5:BE:83:D0	esxi5.1-x86_64	4-install-Virtualizat	ion 💌
node04-x240	4	ОК	Not Discovered	Ready	34:40:B5:BE:9D:58	esxi5.1-x86_64	1-install-Virtualizat	ion 🔻
1. Select com				liteady	0.110.00.02.00.00			

Figure 6-60 Deploy Compute Node Images window

- 2. Choose the image to deploy from the Image to Deploy column. Alternatively, you can specify one image for multiple nodes by selecting the "Apply this image to all rows" check box.
- 3. Click **Global Settings** to set operating system administrative credentials (password for user root). This password will be used across all OS deployments through the FSM.
- 4. Click **Deploy Images** to begin the deployment process. In the Warning window that opens, click **Deploy**.

5. In the Deploy Compute Node Images job window (see Figure 6-61), you can choose to deploy the image immediately (Run Now) or at a scheduled time. You can also enter options to be notified when the job completes. Click **Submit**.

* Schedule	Notifications	Options	
* Job Name:			
Deploy Compu	ite Node Images - Thu	irsday, September 12, 2013 - 11:52:15 AM Mountain Daylight Time	
When to run: Run Now Schedule			
Back	Next	Submit Cancel	I

Figure 6-61 Deploy Compute Node Images job window

6. The status of the job can be viewed in the Jobs menu in the IBM Flex System Manager Explorer view as shown in Figure 6-62.

IBM Flex Syste						
Deployment i	n progress DNZFM83061			Errors	(0)   <b>Active(3)</b>   Complete	ed(153)   Scheduled(3)
	Deploy Compute Node Ima	iges - Thursday, September 12	2013 - 11:52:15 AM Moun	tain Davlight Ti	Collection : node03-x240 (I	Di Started: 09-12 11:52 AM
Name:	me			ST 50	Collection : node03-x240 (I	B Started: 09-12 11:52 AM
Status: Last Run Status:		ogress: Ist Run: 9/12	25% /13 11:49 AM	Denis	y Compute Node Images -	T Started: 09-12 11:49 AM
Created By:		ext Run:	/13 11.43 AM	Depic	y compute node images -	1 Started, 03-12 11.43 AW
Task:	Deploy Compute Node Ima	17.20.00 m		Sho	ving 3 most recently updated of	13
Description:	Run once on 9/12/13 at 1:4	9 PM		Viev	/ All Jobs	
The following job	has been created and starte	d successfully: Deploy Compu	ite Node Images - Thursda			
elect one or more ) ote: Before you be	gin, validate the IBM Flex Sys	es to which you want to deploy i stem Manager network port bein	ng used to attach to the dat		be on the same network as	the network ports on the compu
elect one or more ) ote: Before you be	X-Architecture compute node gin, validate the IBM Flex Sys to all rows: esxi5.1-x86_6	es to which you want to deploy i stem Manager network port bein	·			the network ports on the compu
elect one or more ) ote: Before you be Apply this image Deploy Images	X-Architecture compute node gin, validate the IBM Flex Sys to all rows: esxl5.1-x86_6 Global Settings Remo	es to which you want to deploy i stem Manager network port bein 4-install-Virtualization 🔹 ote Control Actions 👻	ng used to attach to the dat Learn more about importi Discovered	ng additional images		
elect one or more ) ote: Before you be Apply this image Deploy Images s and Node	X-Architecture compute node gin, validate the IBM Flex Sys to all rows: esxl5.1-x86_6 Global Settings Remo	es to which you want to deploy i stem Manager network port bein 4-install-Virtualization 🔹 ote Control Actions 👻	ng used to attach to the dat Learn more about importi Discovered	ng additional images	MAC Address In	
elect one or more ) <b>ote:</b> Before you be Apply this image Deploy Images <b>s and Node</b> Flex1	X-Architecture compute node gin, validate the IBM Flex Sys to all rows: esxl5.1-x86_6 Global Settings Remo	es to which you want to deploy i term Manager network port bein 4-install-Virtualization ote Control Actions Access State	Discovered Operating System	ng additional images	MAC Address In	nage to Deploy

Figure 6-62 Deploy Compute Node Images job status

The Deploy Status column is updated with the installation steps as the job runs, including the following steps:

- Node created
- Bootable ISO mounted
- Boot order updated
- Compute node restarted
- Installing OS compute node
- OS successfully installed
- Node ready

**Note:** The deployment method currently supports the allocation of IPv6 addresses or the use of Dynamic Host Configuration Protocol (DHCP) for IPv4 (if a DHCP server is available on the same network as the Flex System management node).

After deployment, if you are not using the listed network address allocations or the OS is not reachable, follow these steps to configure network settings:

- 1. Right-click the target node from the Deploy Compute Node Images page.
- 2. Choose Remote Control.
- 3. The process uses the IMM to access the node console and then logs in to the OS using the password entered through the Global deployment settings.
- 4. Configure the networking as required to communicate with the Flex System management node (either VMWare or Red Hat network configuration steps).

# 6.8 System discovery, access, and inventory collection

To manage a resource within an environment or view inventory data about it, that resource must first be discovered. After access is granted, an inventory must be collected. The resource is recognized and added to the comprehensive list of native resources and native attributes for the system. Discovery and inventory collection are the two primary tasks that are used to connect to supported network resources and collect information about them.

The following topics are covered:

- ► 6.8.1, "Discovery basics" on page 176
- ► 6.8.2, "Operating system discovery" on page 179
- ► 6.8.3, "Requesting access to the discovered operating system" on page 182
- ► 6.8.4, "Collecting operating system inventory" on page 184

#### 6.8.1 Discovery basics

*Discovery* is the process by which IBM Flex System Manager identifies and establishes connections with network-level resources that IBM Flex System Manager can manage. These resources include compute nodes, operating systems, switches, and external storage devices. Use system discovery to identify resources within your environment, collect data about those resources, and establish connections with them.

A *discovery protocol* is any network communication protocol that IBM Flex System Manager uses during the discovery process to discover a resource. The default discovery profile uses a predetermined list of protocols. When you specify a single IP address, a single host name, or a single range of IP addresses, system discovery uses one or more protocols. These protocols are based on the selected target resource type. With a discovery profile, you can refine the target resource type and configure specific protocols that you want to use.

The communication protocols that IBM Flex System Manager uses during discovery depend on the protocols that are used by the target resource type. You need to decide about the different protocols only when you create or edit a discovery profile. The Discovery Profile wizard helps you select and configure the correct protocol for the type of resource that you want to discover.

When you are discovering many resources, network traffic that is associated with the discovery process might cause timeouts. These timeouts might result in some discoverable resources remaining undiscovered. To help prevent this problem, use one or more discovery profiles. With a discovery profile, you can target specific resources and limit the number of communication protocols that are used during discovery.

By default, IBM Flex System Manager supports the following discovery protocols:

Agent manager discovery

Agent manager discovery specifically targets the discovery of Tivoli Common Agents. In the Tivoli paradigm, Service Location Protocol (SLP) is not supported. Management nodes must contact an agent manager that knows about the agents in their environment. You can select the agent managers that you want to use in discovery.

Common Agent Services discovery

This discovery uses SLP discovery, with which clients can locate servers and other services in the network.

Common Information Model (CIM) discovery

CIM discovery uses the Service Location Protocol (SLP) for discovery. With CIM discovery, clients can locate servers and other services in the network.

Interprocess communication (IPC) discovery

IPC is the process by which programs send messages to each other. Sockets, semaphores, signals, and internal message queues are common methods of interprocess communication. IPC is also a mechanism of an operating system that enables processes to communicate with each other within the same computer or over a network. IPC uses services that IBM Flex System Manager provides that components use to communicate with each other. By using these services, a server task can communicate with an agent task that is running on a target.

► Secure Shell (SSH) discovery

*Secure Shell* is a command interface and protocol that is based on UNIX for securely accessing a remote computer. With SSH discovery, you can specify either a single IP address or a range of IP addresses upon which to run discovery.

Simple Network Management Protocol (SNMP) discovery

SNMP is a network management standard that is widely used in Internet Protocol networks. SNMP runs management services by using a distributed architecture of management systems and agents. SNMP provides a method of managing network hosts, such as workstation and server computers, routers, bridges, and hubs from a centrally located computer that runs the network-management software.

Storage Management Initiative Specification (SMI-S) discovery

With SMI-S discovery, clients can locate servers and other services in the network. This design specification was developed by the Storage Networking Industry Association (SNIA). It specifies a secure and reliable interface with which storage management systems can identify, classify, monitor, and control physical and logical resources in a storage area network (SAN). The interface integrates the various devices to be managed in a SAN and the tools that are used to manage them.

Windows distributed component object model (DCOM) discovery

Use Windows DCOM (an extension of the Microsoft Component Object Model (COM)) to support objects that are distributed across a network configuration. Use DCOM to specify either a single IP address or a range of IP addresses on which to run discovery.

The system discovery task can be started in one of the following ways:

 From the FSM Explorer web interface using the search capabilities: Type system discovery in the search box in the upper-right corner of the window, then click System Discovery in the Tasks panel, as shown in Figure 6-63.

IBM Flex System I	Manager™ - 1.3.0	🗹 S	tatus (0) 🔹 📘	🛛 Jobs (0) 👻	USERID -
Home 🔹 System	is • Monitor • Security	<ul> <li>Utilities •</li> </ul>			system discovery
-	Chassis	Managed Cha		0	Techo(4)
H H H	All Compute Nodes		Resources(0)	Groups(0)	Tasks(1)
Chassis (1)	All Storage Nodes	🖾 - 🖨 -	Inventory		
	itsoFlex1	Chassis Name	System Discov	ery	
		itsoFlex1	🔲 ОК	Information	📄 ОК
Hosts and VSs (0)					

Figure 6-63 FSM Explorer: System Discovery

From the Plug-ins tab in the Home window: Click System Discovery under Discovery Manager, as shown in Figure 6-64.

BM Flex	System Manager™		Welcome USERI	Problems	0	0	Compliance	0	0	Help   I
Hom	ne × I/O Modules.	× Chassis Man ×						s	elect Act	ion
Hon	ne									? - 1
		perform some initial s cs, and access additio		r activate plug-i	ns, perfo	orm	Check and Upd			Manager n Center
	Initial Setup	Additional Setup	Plug-ins	Administration	Ap	plications	s Learn			
		em Manager™ contain:				Addition	al plug-ins to acti	vate		
	setup and cont		ady to use, or mig	y to use, or might require additional			There are no plug-ins to activate.			
	Refresh	Last refreshed: Nov	mber 13, 2013 10:10:52 AM EST			After purchasing a plug-in, click Manage Features on Demand Keys to add the ne key.				and a second sec
	IBM Fle Ready	ex System Manag	er™ 1.3.0			Manage Features on Demand Keys				
	IBM FSM	Explorer - Manage yo	ur Flex Resources	Chassis Mana	iger					
		nent Domain Manag	e Power Systems	Resources						
	IBM FSM	Capacity Utilization								
	IBM Fle Ready Manage U	ex System Manag	er™ Server 6.3.	3.1						
		ery Manager 6.3.3.1 s to 1 system.								
	System D		ms needing acces	S						
	Resource	Explorer View and	Collect Inventory							

Figure 6-64 FSM Home window: System Discovery

### 6.8.2 Operating system discovery

One of the most common uses of the discovery tasks is the operating system discovery and inventory collection. This task must be completed every time that a new operating system, hypervisor, or guest virtual machine is deployed when it needs to be managed by the Flex System Manager.

Perform the following steps to discover an operating system or hypervisor:

- 1. Open the System Discovery window by using one the methods described in 6.8.1, "Discovery basics" on page 176.
- 2. In the System Discovery window, select a required discovery option, enter an IP address or a range of IP addresses, and select a resource type to discover (or leave **All** to discover all resource types), as shown in Figure 6-65. Click **Discover Now**.

Jse system discovery to discover manageable resources nov ingle IP address or host name, discover resources of the sa profiles enable you to customize discoveries, including impo	me type for a range of IP addresses, or use a dis
liscovered resources.	
P Learn more about using discovery	Advanced Tasks
elect a discovery option: Single IPv4 address	Create new profile Manage discovery profiles Discovery jobs
IP address: 9 . 42 . 171 . 21	
Select the resource type to discover: Operating System	
Discover Now	

Figure 6-65 Enter IP address to discover

3. A blue informational message is displayed that indicates that the job is started, and the Processing discovery protocols status is displayed, as shown in Figure 6-66. Click **Display Properties** to check the job status, if needed.

System Discovery	
2013 1:13:20 PM EST	ed and started successfully: System Discovery - 9.42.171.21 - Noven
a single IP address or host name, discov	eable resources now or schedule your discovery to run later. You can dis er resources of the same type for a range of IP addresses, or use a dis e discoveries, including importing IP addresses, and requesting access Advanced Tasks
Select a discovery option:	Create new profile
Single IPv4 address	Manage discovery profiles Discovery jobs
IP address: 9 . 42 . 171 . 21 Select the resource type to discover: Operating System ▼ Discover Now	y protocols Stop New Discovery

Figure 6-66 Discovery job information

Wait until the progress bar reaches 100%, which indicates that the discovery is complete, as shown in Figure 6-67.

tive and Schedule	d Jobs				
Active and Sched	uled Jobs (Prop	erties)			
Name: System	Discovery - 9.42	2.171.21 - Nover	mber 18, 2013	1:13:20 PM EST Actio	ns 🔻
					<u>krow</u>
General	Targets	History	Logs	Discovered Systems	
		Concernant and Concernat and Concernant and Concernant and Concernant and Concern			
Status:	Complete				
Progress:	100	0%			
Last Run Sta	tus: Complete	(view log)			
Description:	Run once	on 11/18/13 at	1:13 PM		
Next Run:					
Last Run:	11/18/13	at 1:13 PM			
Task:	System D	iscovery			
Created By:	USERID				

Figure 6-67 Discovery completed

4. The list of discovered systems will be displayed under Discovered Manageable Systems, as shown in Figure 6-68.

System Discovery						
Use system discovery to discover a single IP address or host name. Discovery profiles enable you to c inventory for the discovered resou	discover resources ustomize discoveries	of the san	ne type for a	range of IP addre	sses, or use a	disco
② Learn more about using discovery	very			Advanced Tasks	5	
Select a discovery option:				Create new pro	ofile	
Single IPv4 address	-			Manage discov	ery profiles	
IP address:				Discovery jobs		
9 . 42 . 171 . 21						
Select the resource type to disco Operating System 💌 Discover Now Schedule						
Discovered Manageable Systems	21 21					
Actions	table	Search				
Select Name	2 Discovere	d î Ty	/pe 🗘	Access 🗘	Problems	٥
9.42.171.21	New	Op	perating Sys	No access	ок	

Figure 6-68 Discovered Manageable Systems

#### 6.8.3 Requesting access to the discovered operating system

The discovered manageable operating systems (see 6.8.2, "Operating system discovery" on page 179) are displayed in the System Discovery window as shown in Figure 6-68 on page 181. Perform the following steps to request access to the newly discovered object:

 Select one or multiple discovered systems with no access (No access is listed in the Access column). Then, click Actions → Security → Request Access, as shown in Figure 6-69.

System Discovery		
Use system discovery to discover a single IP address or host name Discovery profiles enable you to c inventory for the discovered resou	discover resources of the same type fo ustomize discoveries, including importin rces.	your discovery to run later. You can disco or a range of IP addresses, or use a disco g IP addresses, and requesting access to
(?) Learn more about using disco	rery	Advanced Tasks
Select a discovery option:	-	Create new profile
Single IPv4 address	•	Manage discovery profiles Discovery jobs
9 . 42 . 171 . 21 Select the resource type to disco Operating System  Discover Now Schedule Related Resources Topology Perspectives Dis Create Create	ver:	
Create Group	. Search	
Password Expiration Notification	- Beater	
Se Rename	Discovered 1 Type	Access
Add to Automation Inventory	New Operating S	ys 🛃 No access
Security	Request Access	
System Configuration	Configure Access	
System Status and Health	Verify Connection	
Service and Support	•	

Figure 6-69 Newly discovered systems

2. In the Request Access window, enter operating system credentials and click **Request Access**, as shown in Figure 6-70.

obecity the user ID and D		
	System Manager users access t	ystem Manager to one or more target systems. Ther to the target system(s).
*User ID:		
root		
*Password:		
Request Access C	lose	
Selected targets:	Access	Trust State
Selected targets:	Access	Trust State

Figure 6-70 Granting access to the object

3. After you request access to the object, ensure that access is granted (0K is displayed in the Access column), as shown in Figure 6-71. Click **Close**.

Specify the user ID an	d password to authenticate Fle	x System Manager to one or more target systems. Then
	ex System Manager users acce	
User ID:		
root		
Password:		
*******		
Request Access	Close	Trust State
Name		
Name 9.42.171.21	OK	Not applicable

Figure 6-71 Access is granted

**Object discovery:** Additional objects that are associated with the discovered OS might also be discovered, such virtual switches in the hypervisors.

### 6.8.4 Collecting operating system inventory

The manageable operating systems with access granted (see 6.8.2, "Operating system discovery" on page 179 and 6.8.3, "Requesting access to the discovered operating system" on page 182) are displayed in the System Discovery window, as shown in Figure 6-72.

System Dis	covery					
single IP profiles e discovere	em discovery to discover manage address or host name, discover r nable you to customize discoveri d resources.	esources of the sa	ame type for a ran	ge of IP addresse	s, or use a discov	ery p
(?) Learn	more about using discovery			Advanced Task	s	
Select a d	discovery option:			Create new pr	ofile	
Single II	Pv4 address 💌			Manage disco		
IP addre	2551			Discovery jobs		
9.	42 . 171 . 21					
Discover Schedu Discover	le ed Manageable Systems: ons		1		Problems	
Select	Name 2	Discovered 1	Туре 🗘	Access 🗘	~	Co
	9.42.171.21	New	Operating Sys	Ск	Ск	
	wSwitch0-9.42.171.21	New	Switch	ОК	Ск	
	www.itchUSB0-9.42.171.21	New	Switch	ок	🗾 ок	
	node01-x240	Previous	Server	📕 ок	Ск	
	-					

Figure 6-72 Discovered objects with access granted

Perform the following steps to collect inventory on the newly discovered object:

1. In the System Discovery window, select the discovered objects and click Actions  $\rightarrow$  Inventory  $\rightarrow$  Collect Inventory, as shown in Figure 6-73.

System	Discovery							
a sin Disco	system discovery to discover manag gle IP address or host name, discov very profiles enable you to customi tory for the discovered resources.	ver resources of t	he same typ	e for a r	ange of IP	addres	ses, or use a	disco
? L	earn more about using discovery				Advanced	Tasks		
Selec	t a discovery option:				Create n	ew pro	file	
-	le IPv4 address						ery profiles	
-					Discover	y jobs		
	ddress:							
9	. 42 . 171 . 21							
Sele	ect the resource type to discover:							
Ор	erating System 💌							
_								
Dis	Related Resources	1						
S	Topology Perspectives	-						
_	Create Group							
Dis	Password Expiration Notification							
	Remove							
	Rename	. Sea	rch					
Se	Add to	Discovered	Туре	٥	Access	٥	Problems	٢
	Automation 🕨	New	Orantia	g Sys	Ок		Пок	
	Inventory	Collect Inventor		y 3ys	Пок	-	ОК	
-	Release Management	View and Collect	t Inventory					
-	Remote Access	View Network To	pology		ОК		ОК	
	Security 🕨	Frevious	Jerver	•	ОК		ОК	
	System Configuration							
	System Status and Health	-						
	Service and Support							
	Properties							
	Columns							
	Export							
1	Select All							
14 -	Deselect All	ected: 1 Total:	4 Filtered:	4				
	Show Filter Row							
	Clear All Filters							

Figure 6-73 Inventory collection

2. In the Launch Job window, to begin the inventory collection, select **Run Now** and click **OK**, as shown in Figure 6-74.

				Launch Job		
Schedule	Notification	Options				
Job name an	d schedule					
*Job Name:						
Collect Inve	ntory - November	18, 2013 2:04	23 PM EST			
Choose when	n to run the job.					
€ Run Now	rs.					
C Schedule						
ОК Са	ncel Help					

Figure 6-74 Run collect inventory

3. A blue informational message is displayed that indicates that the job is started, as shown in Figure 6-75. You can click **Display Properties** to check the job status.

Syste	em Disc	overy									
	Т	TKCOR102I he following job has been create M EST Display Properties Close M		arted suc	cessfully: Collect	Inventory - N	ove	mber 18, 201	3 2:(		
a s Dis inv	Use system discovery to discover manageable resources now or schedule your discovery to run later. You can disco a single IP address or host name, discover resources of the same type for a range of IP addresses, or use a disco Discovery profiles enable you to customize discoveries, including importing IP addresses, and requesting access to inventory for the discovered resources.										
?	Learn	more about using discovery				Advanced Ta	sks				
Se	lect a d	iscovery option:				Create new	pro	file			
Si	ingle IP	v4 address 💌				Manage dis	cove	ery profiles			
T	P addre					Discovery jo	bs				
	elect th										
Di	scovere	d Manageable Systems:									
	Actio	Search the table		Search							
S	elect	Name 2	Discove	red 1	Type 🛟	Access	٥	Problems	\$		
		9.42.171.21	New		Operating Sys	🖉 ок		🖉 ОК			
		wSwitch0-9.42.171.21	New		Switch	🖉 ок		ок			
		wSwitchUSB0-9.42.171.21	New		Switch	ОК		ОК			
		node01-x240	Previous	5	Server	🖉 ок		🖉 ок			

Figure 6-75 Collect inventory information

4. Wait until the job is completed.

The inventory is now collected. You can view collected inventory in the View and Collect Inventory window (shown in Figure 6-76) by selecting one or more systems and clicking **Actions**  $\rightarrow$  **Inventory**  $\rightarrow$  **View and Collect Inventory** in the System Discovery window.

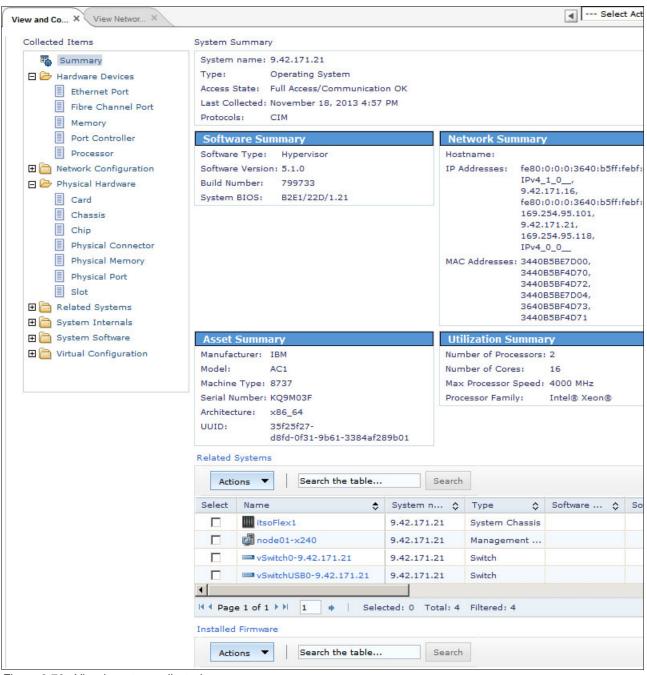


Figure 6-76 View inventory collected

IBM Flex System Manager™ - 1.3.0 🗹 Status (0) 🔹 🗹 Jobs (0) Home • Monitor • Security • All Systems Actions -Chassis (1) Problems Name Туре Access Co 9.42.171.11 Storage Control Enclos 🛛 🕅 OK OK 📄 9.42.171.21 Onersting System OK Hosts and VSs (0) Details 9.42.171.8 🔲 OK Create Group 9.42.171.9 OK Password Expiration Notification 🖪 fsm1.itso.ral.ibm.o 🔲 OK Remove... 😑 fsm1.itso.ral.ibm.o 🔲 OK Rename... Network (3) BM 8731AC1 KQ5 📄 OK Add to ۲ IBM Flex System V OK Automation ۲ itsoFlex1 Inventory • Collect Inventory Power On/Off node01-x240 ٠ View and Collect Inventory 0 Storage (2) **Release Management** node02-x240 ۲ View Network Topology a **Remote Access** node03-x240 OK OK Security ۲ node04-x240 1 🔲 OK System Configuration ۲ wSwitch0-9.42.171 Favorites (0) 🔲 OK System Status and Health . wSwitchUSB0-9.42 🔲 OK Service and Support ۲ Advanced Properties All Systems (15)

**Tip:** You can also invoke Collect Inventory and View and Collect Inventory tasks for any managed object from the IBM Flex System Manager Explorer user interface, as shown in Figure 6-77.

Figure 6-77 Flex System Manager Explorer: View and Collect Inventory

## 6.9 Updating chassis components

The next step in the FSM initial configuration tasks is to update firmware or software on the chassis components including compute nodes, storage nodes, and I/O modules. The following topics are covered:

- ▶ 6.9.1, "Acquiring updates for chassis components" on page 191
- ► 6.9.2, "Updating the CMM firmware" on page 199
- ► 6.9.3, "Updating compute node firmware" on page 201
- ► 6.9.4, "Updating I/O module firmware" on page 205
- ▶ 6.9.5, "Compliance policies" on page 211

Chassis components can be updated from the Update Chassis Components window (see Figure 6-79 on page 191) which can be opened by clicking Update Chassis Components on the Initial Setup tab in the Home window, as shown in Figure 6-78.

Initial Setup	Additional Setup	Plug-ins	Administration	Applications	Learn	
Perform the first time.	following initial setup	) tasks to set up	IBM Flex System M	anager™ for the	↓ Step one	٦
0	Obtain and install require a restart of	updates for IBM IBM Flex System out checking and	<b>/stem Manager</b> Flex System Manager n Manager™. updating IBM Flex :	er™. This will	✓ Step two ✓ Step three ✓ Step totee	7
2	Select Chassis View all chassis and select which to mar You are currently m	d Flex System M nage.	anagers in your env	ironment and		
⁰ ×	Configure Char Configure basic set nodes, storage nod	ttings for chassis	components includi	ing compute		
	with Kernel-based IBM Customization System Manager to	rise Linux 6.2-6. Virtual Machine ( , you can deploy o System x comp , or to deploy to	A, Red Hat Enterpris 4, Red Hat Enterpris KVM) and VMware v the image directly t the image directly t sute nodes. To deplo System p compute	Sphere 5.1 with from the Flex by other		
	② Learn more at	oout deploying o	perating systems,			
9	Update Chass Update chassis cor and I/O modules.		<b>nts</b> ng compute nodes,	storage nodes,		
<b>6</b>	Launch IBM F IBM FSM Explorer is status and events,	s an easy way to	find and browse res	sources, monitor		

Figure 6-78 Initial Setup: Update Chassis Components

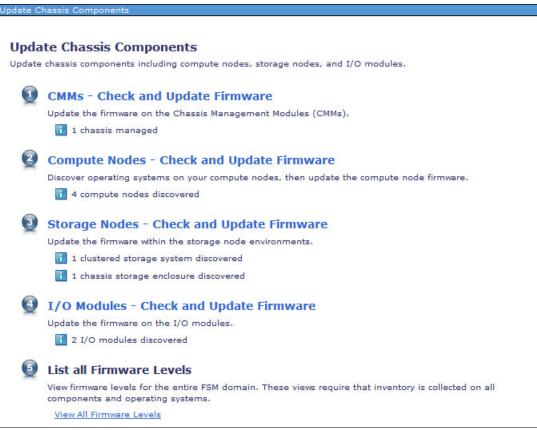


Figure 6-79 Update Chassis Components window

## 6.9.1 Acquiring updates for chassis components

The IBM Flex System Manager Update Manager is responsible for obtaining and applying chassis, switch, system firmware, and certain operating system updates from IBM. In addition, the Update Manager is used to update the FSM itself. The updates can be obtained by Internet connection from the FSM. They can also be downloaded manually from IBM to another workstation, then copied to the FSM by FTP or Secure Copy Protocol (SCP) connection. After the files are copied to the FSM, they must be imported into the Update Manager. First, you need to set up the Internet connection.

#### **Direct Internet connection**

To set up and test the Internet connection, perform these steps:

1. Starting from the Home page, click the **Plug-ins** tab. The Plug-ins window lists all of the managers that are available on the FSM, as shown in Figure 6-80.

IBM Flex System Mana	ger™		Welcome USERID			Help   L	
Home × Chassis	Man × Management	X Active and	X Update Chas X			Select Action	
Home						2 - 0	
	s to perform some initial s tasks, and access additio			perform (	Check and Upda	te Flex System Manager Information Center	
Initial Setu	p Additional Setup	Plug-ins	Administration	Applications	Learn		
	System Manager™ contain c', the plug-in might be re			Additiona	l plug-ins to activ	ate	
setup and	configuration.				There are no plug-ins to activate.		
Refresh	Refresh       Last refreshed: November 13, 2013 10:10:52 AM EST         IBM Flex System Manager™ 13.0         Ready					in, click Manage ys to add the new	
Read						mand Keys	
	FSM Explorer - Manage yo agement Domain Mana		and the second				
	FSM Capacity Utilization	ge Poner bysten	is Resources				
Read	Flex System Manag ly age Users	jer™ Server (	5.3.3.1				
	covery Manager 6.3.3.1 ccess to 1 system.						
	em Discovery View syste						
Reso	urce Explorer View and	Collect Inventor	У				
Stat Read	t <mark>us Manager</mark> 6.3.3.1 ly						
Healt	th Summary Monitors						
Vpd Read	ate Manager 6.3.3.1 ly						
	k and Update Flex System	n Manager Acc	quire Updates				
Show	and Install Updates						

Figure 6-80 FSM list of manager plug-ins

2. From the list of manager plug-ins, click **Update Manager** to display the window that is shown in Figure 6-81.

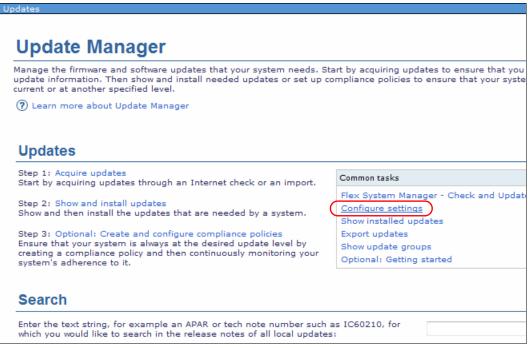


Figure 6-81 FSM Update Manager window

3. In the Common task box, click the link for **Configure settings** to open the window that is shown in Figure 6-82.

IBM Flex System Manager	Welcome USERIE	Problems	0	۵Ô	Compliance	0	٥۷
Home × Updates ×	Settings(1) ×						
Settings							
	Location AIX	System X an	d BladeC	enter	UXSPi	VIO	s
Specify settings f	for the Internet connectivity t	hat IBM Flex S	ystem Ma	nager u:	ses to obtain up	dates.	
Choose the met	nod to use to access the Inte	rnet.					
Connect to t	he Internet directly						
Connect to t	he Internet through an HTTP	proxy server					
Proxy server	host name:	Port nur	nber:				
Proxy se	erver requires authentication						
Vser na	me:						
Passwor	d:						
Test Internet C	Connection						
OK Cance							

This window allows for the configuration of a direct Internet connection, or the configuration settings to use an existing proxy server.

Figure 6-82 FSM Update Manager Internet connection settings

4. With the settings complete, click **Test Internet Connection** to verify the connection.

The test attempts to make a connection to a target IBM server. During the test, a progress indicator displays, as shown in Figure 6-83.

IBM FI	ex System Manag	er	Welcome USERI	<b>D</b> Problems	0	0	Compliance	0	04
н	ome × Updates	× Settings(1) ×	·						
S	ettings								
	Connection	Location	AIX	System X an	d BladeC	enter	UXSPi	VIO	s
	Specify setting	gs for the Intern	et connectivity t	hat IBM Flex S	ystem Ma	nager us	ses to obtain up	dates.	
	Choose the m	nethod to use to	access the Inte	rnet.					
	Oconnect t	to the Internet d	lirectly						
	Connect t	to the Internet t	hrough an HTTP	proxy server					
	Proxy ser	rver host name:		Port nur	nber:				
	Prox	y server requires	s a	Test Int	ernet Cor	inection		×	
T	User	name:	Testing the	Internet conn	ection				
	Pass	word:							
	Test Interne	et Connection	Cancel						
	ОК Са	ncel							

Figure 6-83 FSM testing Internet connection for Update Manager

IBM FI	ex System Manag	er	Welcome USER	RID Problems	0	0Â	Compliance	o <b>⊗</b> o4
н	lome × Updates	Settings(1) ×						
S	ettings							
	Connection	Location	AIX	System X ar	nd BladeCo	enter	UXSPi	VIOS
		UPD149I rnet connection t	test complete	d successfully.				
		gs for the Intern			iystem Ma	nager us	ses to obtain upo	dates.
		nethod to use to		ternet.				
		to the Internet d						
	Connect f	to the Internet th	rough an HTT	TP proxy server				
•	Proxy se	rver host name:		Port nu	mber:			
	Prox	y server requires	authenticatio	'n				
	User	name:						
	Pass	word:						
	Test Intern	et Connection						
	ОК Са	ncel						

A message is displayed upon successful completion, as shown in Figure 6-84.

Figure 6-84 Successful Internet connect test for Update Manager

With the test successful, the Update Manager can obtain update packages directly from IBM.

If a direct Internet connection is not allowed for the FSM, the following steps show how to import updates files into Update Manager.

#### Importing update files

If the FSM does not have Internet connection, all updates can be downloaded from IBM Fix Central and then imported into the FSM manually. The process includes downloading firmware packages to the local administrator's workstation, then copying them to the FSM node using scp protocol, and then importing them into the FSM repository through the CLI.

Perform the following steps:

1. Go to IBM Fix Central (http://www.ibm.com/support/fixcentral), log in using your IBM ID and password (IBM ID is required to download firmware from IBM Fix Central). If you do not have an IBM ID, you can register at this website: http://www.ibm.com/account.

2. Select required PureFlex System components, as shown in Figure 6-85. Click Continue.

Select product	Find product
Select the product	below.
When using the key the selection lists.	yboard to navigate the page, use the Alt and down arrow keys to navigate
Product Group	
PureSystems	
Select from Pures	Systems
PureFlex System	<b>•</b>
Select from Pure	
Chassis	•
Select from Chase	is
Enterprise Chassi	s 💌
Select from Enter	prise Chassis
8721 💌	
Operating system	
All	•
Continue	

Figure 6-85 Fix Central: Component selection

3. From the Select Fixes page select the firmware packages that you want to download as shown in Figure 6-86.

Select fixes Enterprise Chassis, 8			
Download options			
- Download method: HTTP			🖷 <u>Change d</u>
<ul> <li>Include requisites: Yes</li> </ul>			
Select fixes category	view		
The following results match	h your request. Select the fixe	es you want to download.	$\rightarrow$ Share th
- To try a different query, g	o to the <u>Identify fixes</u> page.		
- To view previous versions	of the fixes, rerun the query t	o include superseded fixes.	
View results:			
Component 🗘	>		
Continue	Clear selections		Show fix details   Hide
- <u>CMM</u>	- Firmware Update	- <u>Switches</u>	- <u>Utility</u>
СММ			
	gement Module [CMM] Firm 2d-1.50.0d_anyos_noarch	ware v1.50.0D [2PET12D] GA4	<u>[ES]</u> →
Change History		I Readme	
2. IBM Chassis Manag	gement Module [CMM] Firm	ware v1.40.2Q [2PET10Q] FP3	. <u>1.1</u> ⇒
	0q-1.40.2q_anyos_noarch		
Change History		Readme	

Figure 6-86 Select firmware packages

- 4. Enter you chassis machine type and serial number and click **Continue**. Agree with Terms and Conditions.
- 5. Download required files from the Fix Central.
- 6. Copy downloaded files from your local workstation to the /home/<username> directory on the FSM node using the scp protocol.

7. Import the updates from the /home/<*username*> directory into the FSM repository using **smcli importupd** command, as shown in Example 6-8.

```
Example 6-8
```

```
USERID@fsm1:~> smcli importupd -v /home/USERID
ATKUSC206I Generating SDDs for path: "/home/USERID".
ATKUPD293I Update "ibm_fw_imm2_laoo42y-2.60_anyos_noarch" was successfully
imported to the library.
ATKUPD293I Update "ibm_fw_uefi_b2e126e-1.31_anyos_32-64" was successfully
imported to the library.
ATKUPD573I Running compliance for all new updates that were found.
ATKUPD286I The import updates task has completed successfully.
USERID@fsm1:~>
```

The updates are now ready to be applied to the chassis components.

### 6.9.2 Updating the CMM firmware

The FSM can push firmware updates to the Chassis Management Module (CMM). When a Flex Chassis is set to managed, inventory is collected automatically. For more information about setting the Flex Chassis to be managed, see 6.3, "Selecting chassis to manage" on page 138. From this point, when updates are imported (either manually or from the IBM site) a compliance check is run against the CMM. This process compares any new CMM firmware with the currently installed CMM firmware. If a newer firmware is found, a message is displayed in the Update Chassis Components window as shown in Figure 6-87.

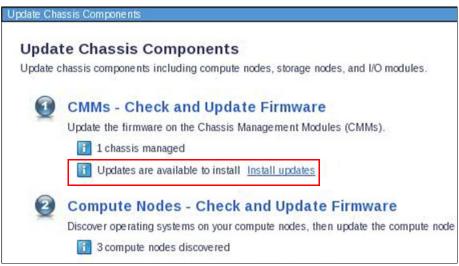


Figure 6-87 Update Chassis Components: CMMs

To update the firmware, perform these steps:

1. Click **Install updates** (see Figure 6-87 on page 199). A list of newer available firmware is displayed that can be deployed to the CMM, as shown in Figure 6-88. Select the update, and click **Install**.

Chou	w and In	stall Updates	
Т	his page	shows the current updates that are needed for the selected systems. Superavailable updates" link below.	erseded or optional
S	how all a	available updates	
U	pdates r	meeded for "r2-c2-ch4-mm.rtp.stglabs.ibm.com":          Actions       Search the table	
	Select	Name 🗢	System
	V	🝳 IBM Chassis Management Module [CMM] Firmware v0.09J [2PET09J]	r2-c2-ch4-mm.rtp.s

Figure 6-88 CMM Show and Install Updates window

2. An installation wizard is displayed. Click **Next** through the initial Welcome window. The Restarts section shows whether restart of the device is required, as shown in Figure 6-89. Click **Next**.

🗸 Welcome	Restarts		
Restarts	Review the restart requirements for the sel	systems.	
Summary	Automatically restart as needed during in Restarts:	nstalla	ation
	System Name	٥	Restarts Required
	r2-c2-ch4-mm.rtp.stglabs.ibm.com		Yes

Figure 6-89 Install Wizards Restarts window

3. The Summary window opens as shown in Figure 6-90. Click Finish.

<ul> <li>✓ Welcome</li> <li>✓ Restarts</li> <li>⇒ Summary</li> </ul>	Summary						
	The updates will now be installed on the selected systems. Verify the installa						
	Selected updates:						
	Name	\$	Version	\$	Severity	\$	Ρ
	🔍 IBM Chassis Ma	anagement M	Version v0	00i -	Low		С

Figure 6-90 Install Wizard Summary window

4. Select to either **Run Now** or **Schedule** as shown in Figure 6-91, and click **OK**.

			Launch Job	
Schedule	Notification	Options		
lob name and	l schedule			
	schedule			
*Job Name:	oc Juno 26 201	2 11:58:20 PM EDT		
		2 11.30.20 PM EDT		
Choose wher	n to run the job.			
@				
Run Now				

Figure 6-91 Install Wizard Schedule Job window

The update is deployed to the CMM, which is then restarted as part of the job. After the CMM is restarted, inventory will be run against it, and a compliance check to compare the newly installed firmware against the FSM update repository. This process ensures that the firmware is up to date, and the CMM has a compliant version.

#### 6.9.3 Updating compute node firmware

Firmware updates for the compute nodes are applied in-band, i.e. through the operating system (OS). For this reason, you must first discover and inventory the OS or hypervisor that is running on the compute node (see 6.8, "System discovery, access, and inventory collection" on page 176).

After the OS is discovered, accessed and inventoried, firmware updates can be pushed. After updates are imported as addressed in 6.9.1, "Acquiring updates for chassis components" on page 191, a compliance check will occur automatically against all discovered systems. With discovered operating systems, the FSM compares its repository of updates against the firmware inventory available.

To determine whether a compute node needs updates and apply these updates if needed, perform these steps:

1. In the Update Chassis Components window, click **Compute Nodes - Check and Update Firmware**, as shown in Figure 6-92.

Update C	hassis Components
Upda	te Chassis Components
Update	chassis components including compute nodes, storage nodes, and I/O modules.
1	CMMs - Check and Update Firmware Update the firmware on the Chassis Management Modules (CMMs). 1 chassis managed
2	Compute Nodes - Check and Update Firmware Discover operating systems on your compute nodes, then update the compute node firmware.
3	Storage Nodes - Check and Update Firmware Update the firmware within the storage node environments. 1 clustered storage system discovered 1 chassis storage enclosure discovered
<b>@</b>	I/O Modules - Check and Update Firmware Update the firmware on the I/O modules.
5	List all Firmware Levels View firmware levels for the entire FSM domain. These views require that inventory is collected on all components and operating systems. <u>View All Firmware Levels</u>

Figure 6-92 Update Chassis Components window: Check for compute node updates

2. In the Compute Nodes - Check and Update Firmware window, click **Check for Updates**, as shown in Figure 6-93.

**Discovery, access, and inventory:** We already discovered operating systems, granted access to them, and collected their inventory, as described in 6.8, "System discovery, access, and inventory collection" on page 176. Alternatively, you can discover, request access, and collect inventory for the operating systems from the Compute Nodes - Check and Update Firmware window.

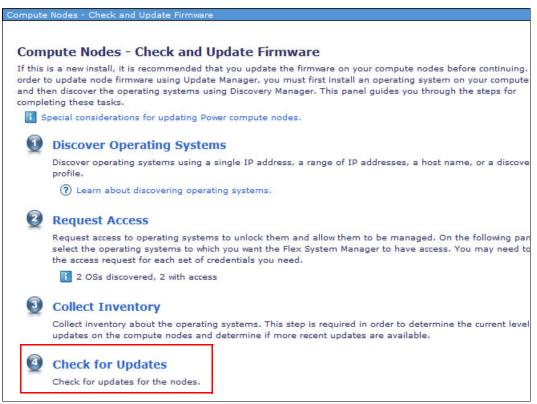


Figure 6-93 Compute Nodes - Check and Update Firmware window: Check for Updates

3. In the Acquire Updates window (see Figure 6-94), select the method of acquiring updates and click **OK** to start the Acquire Updates job.

**Previously imported updates:** If you already imported updates (see "Importing update files" on page 196) you still need to specify a valid path in the Acquire Updates window. If no updates will be found, an error message appears indicating that no updates were found, but it can be safely ignored.

Acquire Updates	
Select the method to use to acquire the updates. If the IBM F connection, select the "Import updates from the filesystem" of	
C Check for updates (Internet connection required)	
• Import updates from the file system	
Learn more about acquiring updates	
After you download the updates, type the path to the dir updates. The updates to import must reside on the man /USERID/updates".	
/home/USERID	Browse
Click OK to launch or schedule an import task. This task library. OK Cancel	will copy the updates from the given path to the upd

Figure 6-94 Acquire Updates window

4. After the Acquire Updates job is completed, click **Show and Install Updates**, as shown in Figure 6-95.

Acquire Updates
A job was scheduled. To monitor the progress of this job, click Display Properties in the preceding message.
When the job is complete, click Show and Install Updates to view the updates needed by a system.
Show and Install Updates Close

Figure 6-95 Acquire Updates window: Show and Install Updates

5. Review the list of available updates as shown in Figure 6-96. The updates can be selected individually or all at one time, and deployed by clicking **Install**.

	nstall Updates				
shown. T	e shows the current updates tha o view superseded or optional u " link below.				
Show all	installable updates				
Undates	needed for "9 42 171 21".				
	needed for "9.42.171.21":	n met za kolena od Umora s			
Updates Insta		arch the table	Search		
			Search	: Severity 🗘	Product \$
Insta	II Actions 🔻 🛛 Se	; System 🛟			Product 🗘

Figure 6-96 Show and Install Updates list

6. Use the Install Wizard that is shown in 6.9.2, "Updating the CMM firmware" on page 199 to run the updates immediately or schedule them.

#### 6.9.4 Updating I/O module firmware

Downloading updates for I/O modules (for example, Ethernet and Fibre Channel switches) is similar to downloading updates for compute nodes. This example shows updates for an IBM Flex System Fabric EN4093 10Gb Scalable Switch.

Compute node firmware updates are pushed through the Operating System (OS) by using specific OS protocols (DCOM for Windows, SSH for Linux). Updates for I/O modules are pushed out over SFTP. For this reason, the I/O module must support SFTP, otherwise an external FTP or TFTP server might need to be provided.

#### Ethernet I/O modules:

- EN2092, EN4093/EN4093R, and CN4093 switches require a TFTP server to host updates before applying them. The FSM node can be configured as a TFTP server for these purposes.
- EN2092, EN4093/EN4093R, and CN4093 switches must be configured to use the menu-based CLI (ibmnos-cli).

Perform the following steps to prepare the EN2092, EN4093/EN4093R, and CN4093 switches for the software updates through the FSM management node:

1. Enable ibmnos-cli on the switch by issuing the commands listed in Example 6-9.

Example 6-9 Enabling ibmnos-cli on the Ethernet switch

```
EN4093>enable
EN4093#config t
EN4093(config)#boot cli-mode ibmnos-cli
EN4093(config)#copy running-config startup-config
EN4093(config)#reload
```

2. Enable TFTP server on the FSM management node. Open Update Manager settings (see "Direct Internet connection" on page 192), then click **System x and BladeCenter** tab, as shown in Figure 6-97. Click **OK**.

Connection	Location	VIOS	AIX	System X and BladeCenter	UXSPi
You must ins more of the further requi Note: Ensure	following file ser red settings. that the length	nd IBM BladeCe vers. Select the of the combina	nter updates appropriate tion of the re	i. from a TFTP or FTP server, so yo option for each file server type ar lative path to updates field, the s ceed 64 characters.	nd then specify
O Use the	use a TFTP serve management s other system as	erver as a TFTP		asfer the updates directly.	
	use an FTP serve		upported, trar	sfer the updates directly.	
<u> </u>					

Figure 6-97 Update Manager settings: System x and BladeCenter

**External TFTP server:** You can configure FSM to use an external TFTP server to host software updates for the EN2092, EN4093/EN4093R, and CN4093 switches.

To update the I/O module firmware, perform these steps:

1. In the Update Chassis Components window, click **I/O Modules - Check and Update Firmware**, as shown in Figure 6-98.

Update C	hassis Components
	<b>te Chassis Components</b> chassis components including compute nodes, storage nodes, and I/O modules.
0	CMMs - Check and Update Firmware Update the firmware on the Chassis Management Modules (CMMs). 1 chassis managed
2	Compute Nodes - Check and Update Firmware Discover operating systems on your compute nodes, then update the compute node firmware. 4 compute nodes discovered
3	Storage Nodes - Check and Update Firmware Update the firmware within the storage node environments. 1 clustered storage system discovered 1 chassis storage enclosure discovered
<u>@</u>	I/O Modules - Check and Update Firmware Update the firmware on the I/O modules.
9	List all Firmware Levels View firmware levels for the entire FSM domain. These views require that inventory is collected on all components and operating systems. <u>View All Firmware Levels</u>

Figure 6-98 Update Chassis Components window: Check for I/O module updates

2. In the I/O Modules - Check and Update Firmware window, click **Check for Updates**, as shown in Figure 6-99.

**Discovery, access, and inventory:** We already discovered I/O modules, granted access to them, and collected their inventory, as described in 6.5, "Configuring chassis components" on page 144. Alternatively, you can discover, request access, and collect inventory for the I/O modules from the I/O Modules - Check and Update Firmware window.

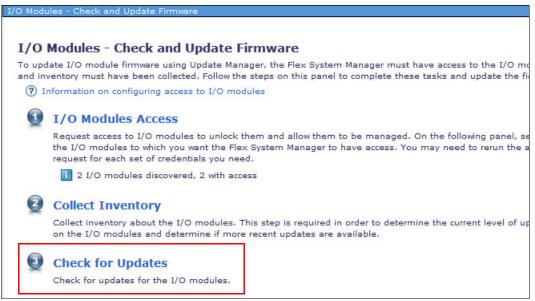


Figure 6-99 I/O Modules - Check and Update Firmware window: Check for Updates

3. In the Acquire Updates window (see Figure 6-100), select the method of acquiring updates and click **OK** to start the Acquire Updates job.

**Previously imported updates:** If you already imported updates (see "Importing update files" on page 196) you still need to specify a valid path in the Acquire Updates window. If no updates will be found, an error message appears indicating that no updates were found, but it can be safely ignored.

Acquire Updates	
Select the method to use to acquire the updates. If the IBM connection, select the "Import updates from the filesystem"	
$^{ m O}$ Check for updates (Internet connection required)	
Import updates from the file system	
Learn more about acquiring updates	
After you download the updates, type the path to the di updates. The updates to import must reside on the mar /USERID/updates".	
/home/USERID	Browse
Click OK to launch or schedule an import task. This task library. OK Cancel	will copy the updates from the given path to the upd

Figure 6-100 Acquire Updates window

4. After the Acquire Updates job is completed, click **Show and Install Updates**, as shown in Figure 6-95 on page 204.

Acquire Updates
A set was a builded. To an effect the annual of this is to dist. Disalar, Depending is the annualized an endow
A job was scheduled. To monitor the progress of this job, click Display Properties in the preceding message.
When the job is complete, click Show and Install Updates to view the updates needed by a system.
Show and Install Updates Close

Figure 6-101 Acquire Updates window: Show and Install Updates

5. Review the list of available updates as shown in Figure 6-96 on page 205. The updates can be selected individually or all at one time, and deployed by clicking **Install**.

shown. T	e shows the current updates that o view superseded or optional up " link below.				
Show all	installable updates				
Undator	needed for "9.42.171.8,9.42.171	1.9":			
opuates					
Insta	II Actions 🔻 Sea	rch the table	Search		
	II Actions V Sea	System	Search Version \$	Severity 🗘	Product
Insta		System 🛟			Product Switches

Figure 6-102 Show and Install Updates list: I/O modules

Use the Install Wizard that is shown in 6.9.2, "Updating the CMM firmware" on page 199 to run the updates immediately or schedule them.

# 6.9.5 Compliance policies

You can also track and determine needed updates for systems by configuring a compliance policy. To create a compliance policy, perform these steps:

1. Click the **Update Manager** link from the Plug-ins tab on the Home page, as shown in Figure 6-103.

Initial Setup	Additiona	al Setup	Plug-ins	Administration	Applications	Learn
IBM Flow Syste	m Manager	™ contains	the following p	lug-ins, Depending o	n ite	
	-			ight require addition	Additional	plug-ins to activate
setup and con	figuration.	-			There	are no plug-ins to
Refresh	Last refres	hed: Nove	ember 13, 2013	10:10:52 AM EST		hasing a plug-in, o on Demand Keys t
IBM Fle	ex Systen	n Manag	er™ 1.3.0		Manage F	eatures on Deman
IBM FSM	Explorer - M	anage you	Ir Flex Resource	s Chassis Manage	r	
	nent Domair		e Power System	the second s		
	Capacity Uti	200	e roner bystern	5 Hesources		
IBM Fle Ready Manage (		n Manag	er™ Server ∈	.3.3.1		
	ery Mana					
			ms needing acce	255		
Resource	Explorer	View and (	Collect Inventory	(		
Status Ready	Manager	6.3.3.1				
	mmary M	Ionitors				

Figure 6-103 Plug-ins window: Update Manager

2. The main Update Manager window opens. This window provides a jumping point for many options such as acquiring updates, creating compliance policies and viewing currently downloaded updates. Click **Optional: Create and configure compliance policies** to create a compliance policy, as shown in Figure 6-104.

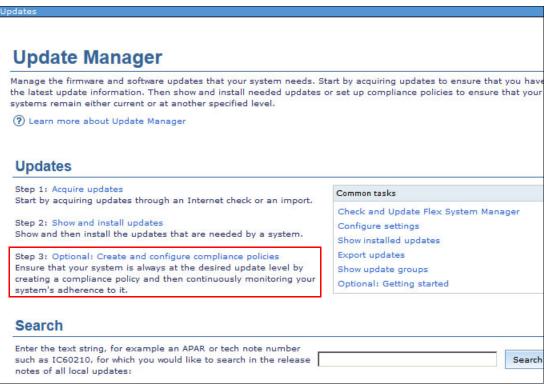


Figure 6-104 Show Update Groups

3. Select a system or group of systems to apply the updates to. Keep in mind that for compute nodes, the OS is required to push updates. Generally, create compliance policies against specific devices, and not the All Systems group. For compute nodes, create a compliance policy against the All Operating Systems group or just against a group of Chassis. In this example, navigate to the All Operating Systems group and click Show Compliance Policies. This process displays any previously created compliance policies. Figure 6-105 shows that a policy does not yet exist, so add one by clicking Add.

Compliance Policy
Select a system and then click "Show Compliance Policies" to display the compliance policies for the syste Selected system: All Operating Systems
Show Compliance Policies
The following compliance policies are used to monitor "All Operating Systems". The system group is desig Compliance is determined using inventory information, so ensure that your inventory is current and comp Update compliance policies:
Add Edit Remove Actions  Search the table Search
Select Name 2 Type 1 Version
There is no data to display.
Image 1 of 1     Image 1     Image 1     Selected: 0     Total: 0     Filtered: 0
Save Cancel
Figure 6-105 Window with no compliance policy

# 4. In this example, select **All IBM System x and BladeCenter updates** and click **Add** as shown in Figure 6-106.

No. of Acres of Acres of		Add		
tem will	lid target type to display updates or update groups of that type. The be designated as out of compliance if it is missing a selected update pdate Groups 💌			
ailable:				
pdate G	roups			Add >
Actio	Search the table Search			
Select	Name \$	Type 🗘	Des	< Remove
V	All "IBM® System x" and "BladeCenter" updates ()	Dynamic: Update	Cont	
	🔒 All AIX Recommended Updates (0)	Dynamic: Update	Cont	
	🔁 All appliance updates ()	Dynamic: Update	Cont	
	All Critical "IBM® System x" and "BladeCenter" updates (0)	Dynamic: Update	Cont	
	🔒 All HMC Recommended Updates (0)	Dynamic: Update	Cont	
	🔓 All IBM Flex System Manager™ 6.3 Updates (32)	Dynamic: Update	Cont	
	All IBM® i Recommended Updates (0)	Dynamic: Update	Cont	
	🔓 All Power System Firmware Recommended Updates (0)	Dynamic: Update	Cont	
	🔒 All RHEL Updates (0)	Dynamic: Update	Cont	
	All SLES Updates (0)	Dynamic: Update	Cont	

Figure 6-106 Policy Group

5. The selection is moved to the right column as shown in Figure 6-107. Click **OK**.

	Add		
			groups on the left and click "Add >" to add them to the compliance policy. The rom a selected update group.
			Selected:
			Add > All "IBM® System x" and "BladeCenter" upd
			< Remove
\$	Type 🗘	Des	
	Dynamic: Update	Cont	
	Dynamic: Update	Cont	
	Dynamic: Update	Cont	
0)	Dynamic: Update	Cont	
	Dynamic: Update	Cont	

Figure 6-107 Policy Group moved to the Selected box

6. In the next window, select **Save for the Compliance** to take effect.

The main Update Manager window opens with a new compliance graph as shown in Figure 6-108.

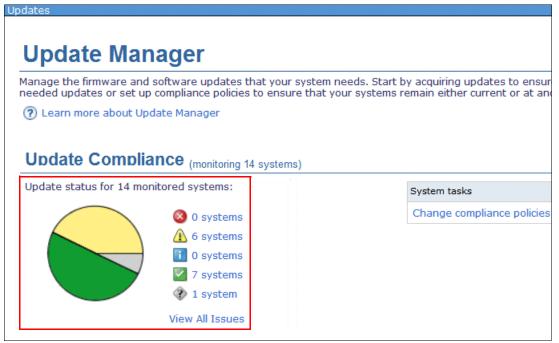


Figure 6-108 Update Compliance window

7. You can see that six systems need minor updates. Click the 6 systems hyperlink and review which systems need updates. From here, all systems or certain systems can be selected by clicking Actions → Select All. Then, click Actions → Release Management → Show and Install Updates, as shown in Figure 6-109, to deploy the updates.

Actions 🔻 Search the tabl	le Search	
Create Group	Access 🗘	Compliance - Update
Remove	📓 ок	A Minor
Add to	• 🖉 ок	A Minor
Automation	ОК	A Minor
Inventory	N ■ OK	Minor
Power On/Off		
Release Management Security	Install Agent     Acquire Updates	
•		🛕 Minor
System Configuration	Show and Install Updates	
System Status and Health	Show Installed Updates	
Service and Support	•	
Resources with Warning Problems	•	
Import Groups		
Columns		
Export		
Select All		
Deselect All		
Show Filter Row		
Clear All Filters		

Figure 6-109 Show and Install Updates

# 6.10 Manage Feature-on-Demand keys

With Features on Demand keys, you can view and install optional features for IBM Flex System Manager management software and managed IBM Flex System resources.

You can only enable Features on Demand keys on compute nodes through the management software if the compute node is configured to boot a UEFI-compatible operating system. If the compute node is configured in the Setup Utility to boot in legacy mode, you cannot activate Features on Demand keys.

Install Features on Demand keys by using the management software web interface. If you use the IMM2 interface or any other method to import and install FoD keys, you must restart the management software to activate the software.

The Manage Features on Demand Keys window has a view list from which you can select either IBM FSM keys or All keys. You can use the FSM keys view to add and remove only the keys that apply to the management software. Use the All keys view to add and remove keys from the management software and managed compute nodes.

For more information about how to obtain FoD keys, see 5.1.3, "Planning for Features on Demand" on page 90.

To manage the Features on Demand keys that are installed, or to import a new key, perform the following steps:

1. On the Home page, click the **Administration** tab and scroll to the bottom. Under Features on Demand tasks, click **Manage Features on Demand Keys** as shown in Figure 6-110.

Update tasks	
Update IBM Flex System Manager™	Manage software updates of the console
Configuration tasks	
Configure Flex System Manager User Registry	Configure or change the Flex System Manager U
Configure SMTP server defaults	Configure SMTP server settings for Flex System N
Network Management Preferences	Configure SNMP and other network settings
Configure Remote Syslog	Configure remote syslog servers for the Flex Sys
Configure Date/Time	Configure Date/Time
Configure Network	Configure Network
Common Service	Configure Common Service
Configure VPN	Configure VPN
Serviceability tasks	
Backup and Restore	Schedule backups, list backups, restore the Flex
Electronic Service Agent Getting Started Wizard	Set up Electronic Service Agent to report service
Security tasks	
Configure Password Policy	Configure or change the Flex System Manager pa
Configure Security Policy	Configure or change the Flex System Manager se
Manage Roles	Manage all roles in this Flex System
Change password	Change the password for the current user
Change System password	Change the password used by the Flex System N
View or modify user accounts	View and change user account settings
IBM FSM Management	
IBM Flex System Manager Server Status	View the server status and properties
IBM Flex System Manager Command Line	Access the IBM Flex System Manager command li

Figure 6-110 Features on Demand tasks

2. The Manage Features on Demand Keys window opens and the installed keys are displayed. Select the keys that you want to view.

To view management software keys, select **IBM FSM keys** from the **View** list as shown in Figure 6-111.

Manag	e Features on Demand Keys			
	1 FSM keys 💌			
	on Demand Keys           BM FSM Keys         Actions         Search the table	Search		
Select	Name 🗘	Usage Limit	\$	Usage C
	IBM Flex System Manager Advanced Upgrade		1	

Figure 6-111 FSM keys

To view all IBM Flex System keys, including keys for managed resources, select **All keys** from the **View** list as shown in Figure 6-112.

Ма	nage Feat	ures on Demar	nd Keys	
	Manag	e Feature	s on Demand Keys	
١	view: All	keys 🔻		
	Features	on Demand Ke	γs	
	Add IE	BM FSM Keys	Add Node Keys Actions	Search the table Search
	Select	Name	\$	System
		IBM Flex Syste	em Manager Advanced Upgrade	

Figure 6-112 All keys

3. To import a key, click Add IBM FSM Keys or Add Node Keys (depending on the view).

If you click **Add IBM FSM Keys**, an Add IBM FSM Keys window opens that enables you to import a key.

If you click **Add Node Keys**, a window opens that enables you to import keys for compute nodes. When you click **Add Node Keys**, a list of configuration templates opens as shown in Figure 6-113. Click **Create**.

All keys	eatures on Demand Keys eatures on Demand Keys  T		
Jse config	juration templates to deploy settings on one or mo ation Templates	re systems.	
Deplo	y Create Create Like Edit Delete	e Actions	- Search
Select	Name 🗢	Deployed 🗘	Plan Count
	8GbSANSwitchProtocolConfigurationTemplate	No	0
	Boot Sequence Predefined Template	No	1
	Ethernet1GbSwitchProtocolConfigurationTempl	No	0
	Ethernet1GbSwitchVLANConfigurationTemplate	No	0
	IPv4AddressPoolConfigurationTemplate	No	0
	IPv6AddressPoolConfigurationTemplate	No	0
	OperatingSystemCreatei5AccountTemplate	No	0
	OperatingSystemCreateLinuxAccountTemplate	No	1
	OperatingSystemCreateWindowsAccountTempl		

Figure 6-113 Configuration Templates

- 4. A configuration template must be created that includes FoD keys that need to be deployed. Click **Create**.
- 5. Figure 6-114 is displayed. Under Template Type, select **Server (via CIM protocol)** to deploy FoD keys to an IMM2 of a compute node. For template, select **Feature Activation Manager Configuration** and provide a name. Then click **Continue**.

	Create
Tamalaka kusas	
Template type:	
Server (via CIM protocol)	
Configuration to create a template:	
Feature Activation Manager Configuration	
Description:	
Feature Activation Manager Configuration	
*Configuration template name:	
FOD Key	
Configuration template description:	
Automatically deploy this configuration template when notified	of a matching resource
(This option is enabled only if automatic deploy is supported by	the selected configuration.)
Continue	

Figure 6-114 Configuration Template creation

6. In the wizard, there are two choices as shown in Figure 6-115.

🗸 Welcome	Key Redemption Method
Key	The key files to be used for key activation can be redeemed from Key Mar
Redemption Method Summary	Obtain activation keys from Key Management System (KMS) Upload activation keys from a local system

Figure 6-115 Key Redemption Method window

If you select the Key Management System (KMS), the options that are shown in Figure 6-116 are available. To pull in keys from the KMS, a connection to the Internet is required. Additionally, an IBM ID must be configured appropriately and the appropriate authorization codes must be available as provided when the FoD keys were purchased. If a proxy is required for connection, that can be configured when you click **Next**.

✓ Welcome	KMS Login The user ID, password, and authorization codes will be used to log in more authorization codes to the list.		
<ul> <li>Key Redemption</li> <li>Method</li> </ul>			
🖒 KMS Login			
Connection Automatic Reboot	*User ID:		
Summary	*Password:		
	*Confirm password:		
	Feature authorization code:		
	Add to List		
	*Feature authorization code list:		
	Remove		
	* Required field		

Figure 6-116 KMS Login

If you select to upload keys from the local system, Figure 6-117 is displayed. Select the FoD keys that need to be imported and add them to the list, then click **Next**.

✓ Welcome	Upload Key Files
Key Redemption Method	The key files to be used for key activation can be uploaded from a loc
➡ Upload Key Files	To import a file, click Browse to select a file.
Automatic Reboot Summary	C:\Users\IBM_ADMIN\Downloads\ibm_fod_0001_7914KQ: Browse
	Add to List
	*Key file list:
	/opt/ibm/director/tempdata/ibm_fod_0001_738206ADNZ7_ar A Rem
	* Required field

Figure 6-117 Upload Key Files window

7. The Automatic Reboot window opens as shown in Figure 6-118. You can choose to reboot the device if needed for the FoD key to take effect. Click **Next** and then **Finish**.

Feature Activation Configu	uration
✓ Welcome	Automatic Reboot
Key Redemption Method	Choose whether to reboot after the activation key is installed. If you choo activation if required.
✓ Upload Key Files	Automatically reboot the device after activation key installation, if nece
Automatic Reboot	
Summary	

Figure 6-118 Automatic Reboot window

8. The newly created template is displayed in the list as shown in Figure 6-119. Select the key, click **Deploy**, and point it to a system that you want the key deployed to.

Deplo	y Create Create Like Edit Delete	e Actions	Search th	ne
Select	Name 🗢	Deployed 🗘	Plan Count 🗘	
	8GbSANSwitchProtocolConfigurationTemplate	No	0	
	Boot Sequence Predefined Template	No	1	
	Ethernet1GbSwitchProtocolConfigurationTempl	No	0	
	Ethernet1GbSwitchVLANConfigurationTemplate	No	0	
	FOD Key	No	0	
	IPv4AddressPoolConfigurationTemplate	No	0	N COL
	IPv6AddressPoolConfigurationTemplate	No	0	
	OperatingSystemCreatei5AccountTemplate	No	0	
	OperatingSystemCreateLinuxAccountTemplate	No	1	
	OperatingSystemCreateWindowsAccountTempl	No	1	
	OperatingSystemImmediatePowerOff	No	0	
	OperatingSystemImmediateRestart	No	0	
	OperatingSystemIPv4NetworkTemplate	No	1	
	OperatingSystemIPv6NetworkTemplate	No	1	
	ServerEnableSerialOverLAN	No	0	

Figure 6-119 FoD key deployment

# 6.11 Flex System V7000 Storage Node initial configuration

This section discusses initial configuration tasks for the IBM Flex System V7000 Storage Node. The following topics are covered:

- ► 6.11.1, "Creating a new system on the V7000 Storage Node" on page 224
- ▶ 6.11.2, "Flex System V7000 Storage Node Setup wizard" on page 228

# 6.11.1 Creating a new system on the V7000 Storage Node

The following procedure guides you through the necessary steps to create a new system on the V7000 Storage Node when using the FSM web user interface:

1. Open a web browser and point it to the IP address of the FSM and log in. The menu panel shown in Figure 6-120 displays, giving you a number of selections.

Select Launch IBM FSM Explorer from the menu list.

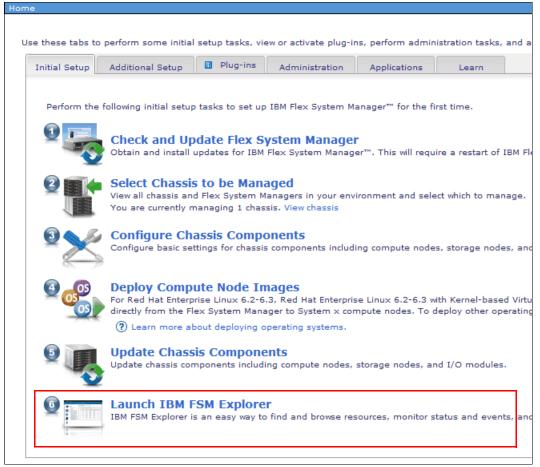


Figure 6-120 Launch IBM FSM Explorer

Notice that a new browser tab is opened, which allows you to select the applicable enclosure from the Chassis Map as shown in Figure 6-121.

IBM Flex System Manager™				
Home - Systems	• Monitor • Security • Utilities •			
	Chassis	Managed Chassis		
114	MI Compute Nodes			
	mm All Storage Nodes			
Chassis (1)	- All Chassis			
	🗈 🎹 ITSO_Chassis 🚽	Chassis Name	Access	Hardware S
		ITSO_Chassis	🔤 ок	🗾 ОК
_				
Network (3)				

Figure 6-121 Select and launch the chassis in the Chassis Manager

2. In the Chassis Manager, select the applicable chassis that will launch the chassis map for that chassis, as shown in Figure 6-122.

Hardware Map		
		Table View
13   14   11   11   12   9   9   9   10   9   9   10   9   9   10   9   9   10   9   9   10   9   10   9   10   9   10   9   10   9   10   9   10   9   10   10   9   11   11   11   12   13   14   14   14   15   16   17   18   19   10   10   11   11   11   11   12   13   14   14   15   16   17   18   19   10   10   10   10   11   12   13   14   14   15   16   17   18   19   10   10   10   10   11   12   12   13   14   14   15		
Enterprise Chassis - Summary	View Details	Common Actions
Problems: None (View Event Log) Verify Connection Interval: Every 15 minutes IP Hosts: cmm1.itso.ral.ibm.com IP Addresses: fe80:0:0:0:5ef3:fcff.feff.73d8, 9.42.170.215, fd8c:215d:17 Communication State: Communication OK System Board UUID: 2C684A86-292E-3D28-8C23-725C87D0E7C7	8e:c0de:5ef3:fcff.fe25:ed85	Configuration Patterns Configuration Details Deploy Chassis Pattern Inventory Collect Inventory

Figure 6-122 IBM Flex System Manager: Hardware Map

 Right-click the V7000 Storage Node in the chassis map, then select Remote Access and click Launch IBM Flex System V7000 as shown in Figure 6-123 to start the Initial Setup wizard.

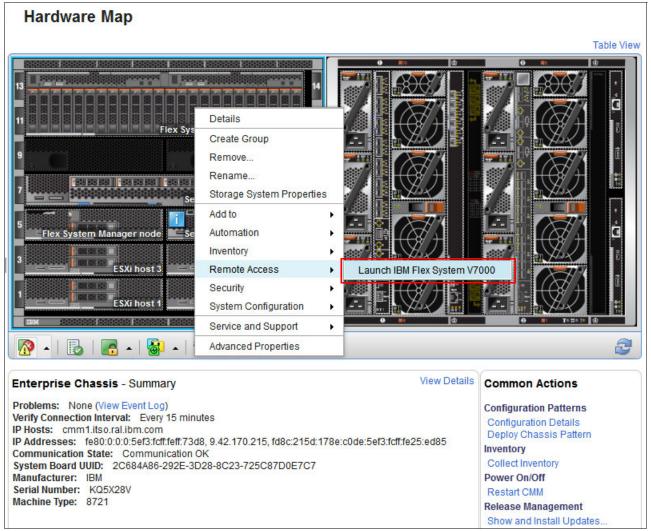


Figure 6-123 Launch Storage Manager (V7000)

4. The next window is a welcome window from the IBM Flex System V7000 Storage Node interface, asking to either create a new system (cluster) or add to an existing system, as shown in Figure 6-124 on page 227.

In this example, we are creating a new system. Select **Create a new system** and then click **Next**.



Figure 6-124 IBM Flex System V7000 Storage Node first-time setup welcome window

5. In the window shown in Figure 6-125, select whether you are using an IPv4 or IPv6 management IP address and type the IP address (you can use either DHCP or the static address that was assigned). The subnet mask and gateway will already list defaults, which you can edit.

IBM Flex S	System V7000 _{system}	
◙ IPv4	● IPv6	
IP Address:		
Subnet Mask:		
Gateway:		
<back fini<="" td=""><td>sh</td><td></td></back>	sh	

Figure 6-125 Create a new storage cluster

6. Click **Finish** to set the management IP address for the system. System initialization begins and might take several minutes to complete.

When system initialization is complete, the V7000 login window opens. Log in using the default credentials (superuser and passw0rd). Then, you are prompted to change the default password. System Setup is launched automatically. The setup wizard takes you through the steps to configure basic system settings, such as time and date, system name, and hardware detection and verification.

# 6.11.2 Flex System V7000 Storage Node Setup wizard

After the initial configuration described in 6.11, "Flex System V7000 Storage Node initial configuration" on page 223 is complete, the IBM Flex System V7000 Storage Node Welcome window opens (Figure 6-126).

System Setup	х
<ul> <li>Welcome</li> </ul>	Welcome to System Setup
Licenses	IBM Flex System V7000 Congratulations! You now have unmatched performance, availability, advanced functions and highly-scalable capacity right at your fingertips. Let's configure your system settings. You will need the following information: • Licensed function information • Email server IP
	Email addresses for local users
	Next > Cancel

Figure 6-126 IBM Flex System V7000 Storage Node Welcome window

**Tip:** During the initial setup of the Flex System V7000, the installation wizard asks for various information that you need to have available during the installation process. If you do not have this information or choose not to configure some of the items at this time, you can configure them later through the GUI.

Click Next, and perform the following steps:

1. Read and accept the license agreement, as shown in Figure 6-127. Click **Next** after accepting the license agreement.

System Setup			
S Welcome	Read the license agreement carefully.		
Licenses	Read the ticense agreement carefully.		
System License	License Addendum Java Notices Non-IBM Licenses		
Licensed Functions	International Program License Agreement		
System Name	Part 1 - General Terms BY DOWNLOADING, INSTALLING, COPYING, ACCESSING, CLICKING OF		
Date and Time	THE PROGRAM, LICENSEE AGREES TO THE TERMS OF THIS AGREEMENT BEHALF OF LICENSEE, YOU REPRESENT AND WARRANT THAT YOU HAVE THESE TERMS. IF YOU DO NOT AGREE TO THESE TERMS,		
Detected Enclosures	+ DO NOT DOWNLOAD, INSTALL, COPY, ACCESS, CLICK ON AN "ACCES		
Configure Storage	<ul> <li>PROMPTLY RETURN THE UNUSED MEDIA, DOCUMENTATION, AND PROD IT WAS OBTAINED FOR A REFUND OF THE AMOUNT PAID. IF THE PRO OF THE PROGRAM.</li> </ul>		
Summary	1. Definitions		
	"Authorized Use" - the specified level at which Licensee is Program. That level may be measured by number of users, mil Processor Value Units ("PVUs"), or other level of use speci		
	"IBM" - International Business Machines Corporation or one		
	I agree with the terms in the license agreement.		
	I do not agree with the terms in the license agreement.		

Figure 6-127 Setup wizard: License agreement

 Optional: Specify licensed functions, as shown in Figure 6-128. The System Licenses include the External Virtualization limit, Remote Copy limit, and IBM Real-time Compression™ limit. Click Apply and select Next.

System Setup			
✓ Welcome	Licensed Functions		
<ul> <li>Licenses</li> <li>System License</li> <li>Licensed Functions</li> </ul>	1000000 1000	quired to us	se certain system functions.
System Name	External Virtualization:	0	Per external enclosure
Date and Time	Remote Copy:	0	Number of enclosures
Detected Enclosures	Real-time Compression:	0	Number of enclosures
Configure Storage			
Summary			

Figure 6-128 Setup wizard: Licensed Functions

3. Specify a system name, as shown in Figure 6-128 on page 229. Click **Apply** and select **Next**.

System Setup		
𝞯 Welcome	System Name	
⊘ Licenses	Enter a name for t	he system.
System Name	System Name:	ITSO_V7000_Cluster_9.42.171.20
Date and Time		
Detected Enclosures		
Configure Storage		
Summary		

Figure 6-129 Setup wizard: Set system name

4. Set up the system date and time as shown in Figure 6-130. Click **Apply** and select **Next**.

System Setup	
𝞯 Welcome	Date and Time
☑ Licenses	Current Date and Time
☑ System Name	Nov 19, 2013 6:39:43 PM
☺ Date and Time	Time Zone
Detected Enclosures	(GMT-5:00) US Eastern Time
Configure Storage	Use Browser Settings
Summary	

Figure 6-130 Setup wizard: Set date and time

5. Verify that all hardware is detected by the system correctly as shown in Figure 6-131. Click **Apply** and select **Next**.

System Setup	
𝞯 Welcome	Detected Enclosures
⊗ Licenses	Verify that all the installed hardware has been detected by the sys
System Name	displayed, ensure it has been cabled correctly and is powered on.
-	E Actions
Date and Time	Cluster_9.42.171.20
<ul> <li>Detected Enclosures</li> </ul>	<ul> <li>Enclosure 1</li> <li>Drive Slots</li> </ul>
Configure Storage	🖃 📼 Canisters
Summary	Canister 2

Figure 6-131 Verify hardware

- 6. Do not select **Yes** to automatically configure internal storage if you are creating a customized storage layout. Click **Next**.
- 7. Verify the configuration settings in the Summary window, as shown in Figure 6-132.

System Setup	
𝞯 Welcome	Summary
✓ Licenses	System Name
System Name	ITSO_V7000_Cluster_9.42.171.20 Date and Time
☑ Date and Time	Time Zone: (GMT-5:00) US Eastern Time Enclosures
Detected Enclosures	Enclosures: 1 Usable storage: 2.97 TB SAS
😒 Summary	

Figure 6-132 V7000 Setup wizard: Summary

8. Click **Finish** to complete the Setup wizard task and log in to IBM Flex System V7000 Storage Node. You log in as a superuser with your newly defined password.

 After you successfully log in, the IBM Flex System V7000 Storage Node System Details window opens. IBM Flex System V7000 Storage Node initial configuration is complete and the cluster is up and running, as shown in Figure 6-133.

IBM Flex S	System V7000	Welco	me, superuser Legal   Log out   Help	IBM.		
ITSO_V7000_Cluster_9.42.171.20 > Monitoring > System Details ▼						
	3 Refresh	I = Actions 💌	Actions 🔻			
	☐ ITSO V7000 Cluster 9.42.1 ☐ Image: A state of the stat	ITSO_V7000_Cluster_9.42	ITS0_V7000_Cluster_9.42.171.20			
	i i i i i i i i i i i i i i i i i i i					
		System ID 0	000000020E00062			
101 I		Software Version 7	7.1.0.1 (build 79.6.1306101000)			
		General				
		Name	ITSO_V7000_Cluster_9.42.171.20			
		ID	000000020E00062			
0		Location	Local			
2		Capacity				
500		Total MDisk Capacity	0 bytes			
		Capacity in Pools	0 bytes			
		Capacity Allocated to Volumes	0 bytes			
		Total Free Capacity	0 bytes			
		Total Volume Capacity	0 bytes			
		Total Volume Copy Capacity	0 bytes	-		
	ocated: 0 bytes / 0 bytes (0%) +	Running Tasks (0)	Health Status			

Figure 6-133 IBM Flex System V7000 Storage Node home overview window

After you create a new system on the V7000 Storage Node through the FSM, the FSM attempts to automatically discover it, request access to it, and collect its inventory by running the "Storage Auto Discovery with IP *<storage system IP address>*" job. If the job ends with the error "Could not connect to any specified IP address", after the V7000 system comes online, you can rerun it from the Active and Scheduled Jobs window by selecting the job and clicking **Actions**  $\rightarrow$  **Run Now**, as shown in Figure 6-134.

	e Like Edit Delete Actions 🔻	Search the ta	ble Search	
Select	Name 🗘	Status 🗘	Progress (	Last Run 💠
	Collect Inventory - November 19, 2013 11:03:4	Complete	100%	Complete (vie
	Storage Auto Discovery with IP 9.42.171.20 - No	Complete	100%	Complete (vie
-	Blade Auto-Discovery for 9.42.171.17 - Novemb	Complete	100%	Complete (vie

Figure 6-134 Active and Scheduled Jobs: Storage Auto Discovery

The V7000 cluster system appears in the list of storage systems, as shown in Figure 6-135.

IBM Flex System	Manager™ - 1.3.0	🗹 Status (0) 🔹	🗾 Jobs (25) 🔹	USERID * 🧿
Home 🔹 System	ıs ▼ Monitor ▼ Security ▼ Ut	ilities 🝷		Find a System or Task
Chassis (1)	Storage          Image: The storage Pools         Image: The storage Systems (1)         Image: The storage System V7000-4939-ITSO	Storage Systen		Filter
Hosts and VSs (0)	☐ ☐ Fabrics (1) ☐ 100000C0DD24411B	Name Elex System V7000-493	Access 9 OK	Problems .
Storage (2)		ſ		

Figure 6-135 Discovered V7000 cluster system

# 6.12 Discover and manage external Storwize V7000

As part of the comprehensive consolidated management approach, storage management is integrated into the FSM. After your storage appliance is discovered and access is requested by the FSM, you can start managing it as shown in Figure 6-136.

me × Storage Man × Ne	twork Con ×					
orage Management						
Storage Mana	gement					
This pages shows a summary of th	e storage in your env	vironment based	on the last disc	overy and inventory	process.	
IBM Flex System Mana	iger Storage C	ontrol				
Running						
Why isn't IBM Flex System M	anager Storage Cont	rol "running"				
Capacity Summar	у					
O GB Total configured capacity (to volumes			(to volumes)	Storage Tasks		
		available capacity (for volumes)		Server to Storage Mapping View Storage to Server Mapping View View and Manage Storage Volumes View and Apply Storage Templates		
*Actual available capacity may be less due to RAID overhead						
Capacity Details						
Location	Av	vailable GB 0	Usable GB	RAW GB	Systems	1
BladeCenter Storage		0		0 0		
Network Storage		0		0 0	0 0	
Total		0		0 0	0 0	
Storage system not being discov	ered? Learn more					

Figure 6-136 Flex System Manager Storage Management

## 6.12.1 Discover an IBM Storwize V7000

Discovery of the IBM Storwize V7000 is performed through the command-line interface (CLI).

To use the command **manageV7000**, the user name superuser must be active on the IBM Storwize V7000 and have a password. If the user name superuser is not active, you must transfer the key manually and use the **mkdatasource** command, as described in this information center:

http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fco m.ibm.director.storage.helps.doc%2Fconfiguring_v7000_or_svc_storage.html **Requirement:** Automatic discovery of the Storwize V7000 and the CLI commands requires V7000 software version 6.3.0.0 or later.

Check the firmware level on the V7000 as shown in Figure 6-137.

v7000 > Settings > General	<b>▼</b>
General	Upgrade Software
Date and Time	Current software level: Version 6.3.0.0 (build 54.6.1111250000)
	Check for updates Checking for updates

Figure 6-137 Firmware level on V7000

The new IBM Storwize V7000 storage subsystem comes with the pre-configured IPv4 address 192.168.70.151. After the installation of the Storwize V7000 hardware, the user ID superuser, with the password passw0rd, is created. The management software then assigns an IPv6 address to the V7000 storage subsystem. If the IPv6 address is accessible to the management software, the default IPv4 address is disabled and the management software manages the chassis through the new IPv6 address. If the IPv6 address is inaccessible, the default IPv4 address is used to manage the V7000.

**Consideration:** All new V7000 storage subsystems come with the same default IPv4 address. Therefore, you must install them one at a time until they are all managed.

If you need to change the IP address of the V7000 storage subsystem, log in to the V7000 web interface and change the IPv4 or IPv6 address as shown in Figure 6-138.



Figure 6-138 V7000 management IP address

For more information about using the storage subsystem web interface, see this website: http://publib.boulder.ibm.com/infocenter/storwize/ic/index.jsp

#### Adding a V7000

If your V7000 is not managed by any Flex System Management Node or other IBM System Management Software, enter this command from the management software CLI:

smcli manageV7000 -i V7000_IP_address -u admin_user_ID -p admin_password

In this command, *V7000_IP_address* is the IP address of the V7000, and *admin_user_ID* and *admin_password* are the administrator's user ID and password.

#### Managing an existing V7000 from several FSMs

**Important:** If you have more than one management node (FSM) on your network, you can use the **manageV7000** command only on the management node (FSM) that manages the V7000. If you run the **manageV7000** command on an additional management node, the V7000 key generated by the initial management node is replaced by a key generated by the subsequent management node.

If you need to manage a V7000 from another Flex System Manager, complete the following steps for each additional management node:

1. Use the management software CLI on the initial management node to copy the file /home/USERID/.ssh/id_rsaV7000 from the primary management node to the /home/USERID/.ssh directory on the other FSM as shown in Figure 6-139.

```
USERID@FSM-5CF3FC5F54EF:~> scp /home/USERID/.
./ ./ .bash_history .fonts/ .mozilla/ .ssh/
USERID@FSM-5CF3FC5F54EF:~> scp /home/USERID/.ssh/
authorized_keys2 id_rsaV7000 id_rsaV7000.pub known_hosts
USERID@FSM-5CF3FC5F54EF:~> scp /home/USERID/.ssh/id_rsaV7000 IPadress_of_the_other_FSM:/home/USERID/.ssh
```

Figure 6-139 Copy USERID key to another FSM node

2. From the CLI of the additional management node (the additional FSM), run the following command to manage the V7000:

smcli mkdatasource -c svc -f /home/USERID/.ssh/id_rsaV7000 -v v7000 -i
<V7000_ip_address>

The <*V7000_ip_address*> is the IP address of the V7000.

#### Removing an existing V7000

To remove an existing V7000 from the list of managed devices, enter the command:

smcli unmanageV7000 -i V7000_IP_address

The V7000 IP address is the IP address of the V7000.

#### 6.12.2 Collect inventory on the discovered V7000

Discovery and inventory collection must be run before you can display storage systems in Storage Control. To do so, perform these steps:

1. After you run the manageV7000 command, the V7000 is discovered by your Flex System management node. A new Farm object type with OK access appears in the Resource Explorer as shown in Figure 6-140.

me ※ \(	Chassis Man X Resource Ex X				Se
iroups	> All Systems (View Members)				
Act	tions   Search the table  Search				
Select	Name 🌢	Type 💠	Access 🗘	Problems 🗘	Compliant \$
	PF-BMC2	Server	🐻 No access	💹 ок	Пок
	PF-BMC1	Server	属 No access	🖉 ок	🖉 ОК
	IBM 8737AC1 23FFP57	Server	🐻 No access	🗐 ок	🔤 ок
	FSM-5CF3FC5F54EF.rtp.stglabs.ibm.com	Farm	🔤 ок	🔤 ОК	ОК
	FSM_FSM-5CF3FC5F54EF.rtp.stglabs.ibm.com	Operating Sys	🔤 ок	💹 ОК	💹 ОК
<u> </u>					

Figure 6-140 Storage Farm object discovered

2. Collect inventory on V7000 storage by clicking **Inventory**  $\rightarrow$  **View and Collect Inventory** as shown in Figure 6-141.

ome XX	Chassis Man X Resource Ex X						Se
Groups	> All Systems (View Members)						
Ac	tions   Search the table  Search						
Select	Name	٥	Type 🗘	Acces	is 🗘	Problems	Complianc Q
	PF-BMC2		Server	🐻 No	access	🔤 ок	Ск
	PF-BMC1		Server	🐻 No	access	💹 ОК	ОК
	IBM 8737AC1 23FFP57		Server	🐻 No	access	🔤 ок	🔤 ок
2	FSM-5CF3FC5F54EF.rtp.stglabs.ibm.com	Relat	ed Resources	•		ОК	ОК
	FSM_FSM-5CF3FC5F54EF.rtp.stglabs.ibr	Торо	logy Perspectives	•		💹 ОК	Ток
		Creat	e Group				
		Remo	ve				
		Add t	0	•			
		Autor	nation	•			
		Inven	tory	•	Collect	Inventory	
		Secur	ity	•	View a	nd Collect Inve	entory
		Syste	m Configuration	• •			
		Syste	m Status and Heal	lth 🕨 🕨			
		Servio	ce and Support	•			
()		Prope	erties				

Figure 6-141 View and Collect Inventory on Storage Farm object

3. Click **Collect Inventory** to begin the inventory collection as shown in Figure 6-142.

iew and Collect Inventory	
current inventory values, clic Target systems	
FSM-5CF3FC5F54EF.rto.sta	labs.ibm.com
View by	
All Inventory	Manage Profiles
Refresh View Colled	t Inventory Last collected: None
Export All View Report	
Collected Items	System Summary
Summary	System name: FSM-5CF3FC5F54EF.rtp.stgla
Network Configuration Related Systems	bs.ibm.com Type: Farm
🖾 🦲 Related Systems	Access State: Full Access/Communication
	OK Last Collected: None
	Network Summary Hostname: FSM-5CF3FC5F54EF.rtp.stglab
	s.ibm.com
	IP Addresses: 9.27.20.38, 9.27.16.140

Figure 6-142 Collect Inventory on V7000 Farm object discovered

4. Click **OK** to run the collection task as shown in Figure 6-143.

			Launch Job		
Schedule	Notification	Options			
Lines.					
Job name an	d schedule				
*Job Name:					
	- June 18, 2012	4:37:38 PM EDT			
Choose when	n to run the j	ob.			
Run Now					
O Schedule					
♦ ocheodie					
OK Cance	l Help				

Figure 6-143 Collection task on Storage Farm object

A blue box message is displayed that indicates that the job has been started and created successfully, as shown in Figure 6-144.

View and Collect Inventory	
ATKCOR102I	
	has been created and started successfully: Collect Inventory - June 18,
2012 4:37:38 PM	
Display Properties	Close Message
Display Properces	
current inventory values, clie Target systems FSM-5CF3FC5F54EF.rto.sto View by All Inventory	
Refresh View Collec	t Inventory Last collected: None
Export All View Report	
Collected Items	System Summary
<ul> <li>Summary</li> <li>Configuration</li> <li>Related Systems</li> </ul>	System name: FSM-5CF3FC5F54EF.rtp.stgla bs.ibm.com Type: Farm

Figure 6-144 Storage farm inventory collection started successfully

Wait until it is complete as shown in Figure 6-145.

e and Sche	duled J	obs								
			(Properties) June 18, 201:	2 4:37:38 PN	1 EDT	tions 🔻	]			
General	Targ	ets	History	Logs						
Status:		Comp	lata							
Progress:			100%							
Last Run :										
Descriptio	n:	Run o PM	nce on 6/18/1	.2 at 4:37						
Next Run:										
Last Run:		6/18/	12 at 4:38 PM							
Task:		Collec	t Inventory							
Created B	y:	USERI	ID							
Edit										

Figure 6-145 Collect Inventory on a farm object completed

5. If some errors are displayed, click the **Logs** tab (Figure 6-145) to get more information, as shown in Figure 6-146.

Home	a 🛪 🤇 Cł	nassis Man 🕅 Resource Ex	View and Co X Active and X	Seled
	Job Inst		. Search	
	Select	Name	Status	
		6/18/12 at 4:38 PM	Complete	
	<.			
	H + Pag	e 1 of 1 🕨 1 🌒 🕴 Se	elected: 1 Total: 1	
	Job log	3		
	June 18, June 18, June 18, June 18, June 18, June 18, June 18, June 18, June 18,	2012 4:38:02 PM EDT-Level:200-MEI 2012 4:38:02 PM EDT-Level:200-MEI 2012 4:38:02 PM EDT-Level:100-MEI 2012 4:38:02 PM EDT-Level:100-MEI 2012 4:38:02 PM EDT-Level:1-14MEID: 2012 4:38:02 PM EDT-Level:150-MEI 2012 4:38:02 PM EDT-Level:150-MEI 2012 4:38:02 PM EDT-Level:200-MEI 2012 4:38:02 PM EDT-Level:200-MEI	0MSG: Job "Collect Inventory - June 18, 2012 4:37:38 PM EDT" activated. D:0MSG: Starting clients D:0-MSG: Starting clients D:0-MSG: Starting clients D:0-MSG: Starting clients started for task "Collect Inventory" D:0-MSG: Subtask activation status changed to "Active". D:0-MSG: Startisz Collecting inventory by using inventory profile "All Inventory". D:0-MSG: Subtask activation status changed to "Active". D:0-MSG: Subtask activation status changed to "Active". D:0-MSG: Subtask activation status changed to "Active". D:0-MSG: Subtask activation status changed to "Complete". D:0-MSG: Subtask activation status changed to "Complete".	vhich has a ty

Figure 6-146 Storage farm inventory collect log

# 6.13 Overview of Flex System V7000 and Storwize V7000 systems management (Storage Control)

Your storage devices can be viewed and managed in one central location. The Storage Management Summary window provides an introduction to your storage systems. The Storage Management Summary is started from the Plug-ins tab of the Home page as shown in Figure 6-147.

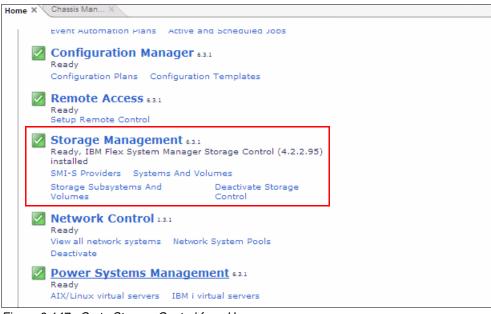


Figure 6-147 Go to Storage Control from Home page

This action opens the Storage Management window that is shown in Figure 6-148.

torage Managem	
s pages shows a summar	rry of the storage in your environment based on the last discovery and inventory proc
M Flex System Manager Stor	orage Control
Running	
Why isn't IBM Flex Syst	tem Manager Storage Control "running"
apacity Summary	
	855 GB Total configured capacity (to volumes) Storage Tasks
• 75	5828 GB Total available capacity (for volumes) Server to Storage Mapping View Storage to Server Mapping View
	View and Manage Storage Volume
	View and Apply Storage Template
Actual available apacity may be iss due to RAID verhead apacity Details	
apacity may be iss due to RAID verhead	Available GB Usable GB RAW GB Systems Disk Drives
apacity may be iss due to RAID verhead apacity Details	
apacity may be iss due to RAID verhead apacity Details Location	GB Usable GB RAW GB Systems Disk Drives
apacity may be ss due to RAID verhead apacity Details Location ocal Storage	GB Usable GB RAW GB Systems Disk Drives

Figure 6-148 Storage Control main window

The Storage Management summary window is divided into these areas:

Capacity Summary

A pie chart represents your disk capacity in each of these categories.

Total configured capacity (to volumes)

Number of GB of the volumes that are assigned.

Total available capacity (for volumes)

Number of GB of disk pool size unassigned to volumes, but available for creating future new volumes.

*Total available capacity* represents the remaining total storage array or storage pool space that can be used to create volumes. When you are creating a storage array or pool, the configured capacity is zero and the available capacity is the pool size. Creating more volumes decreases the amount of available capacity. Available capacity is a measurement of the current quantity of usable storage.

The *capacity measurement* is a snapshot that is created when inventory is collected on the storage arrays. Inventory collection can be configured to run on a schedule to periodically update the capacity information. This configuration is only possible if storage volumes and pools are created after the initial inventory collection.

For local storage, capacity information that is collected for attached storage devices is limited to the Total raw capacity. The Total configured capacity and Total available capacity are not included in the Capacity Summary for these storage devices.

The tasks that can be performed on an external V7000 storage system are summarized in the following sections.

#### Server to Storage Mapping View

The Server to Storage Mapping View displays a table that shows what storage resources are associated with your virtual servers. Select the servers to view, as shown in Figure 6-149.

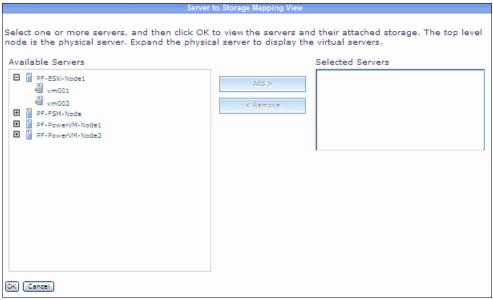


Figure 6-149 Server to Storage Mapping View

#### **Storage to Server Mapping View**

This task displays a table that shows the virtual server disks and the storage pools that contain them. Select the storage resources to view as shown in Figure 6-150.

Sto	rage to Server Mapping View									
	elect one or more storage subsystems, and then click OK to view the storage and their attached servers. The top level node is the storage subsystem. Expand the storage subsystem to display the storage pools.									
Available Storage	Selected Storage									
RSL-Shared	Add >									
OK Cancel										

Figure 6-150 Storage to Server Mapping View

#### View and Manage Storage Volumes

This task works with your currently defined storage volumes to change, add, or delete them. Details about status and capacity are also available.

This task manages the assignment of network storage to individual systems, from the context of a specific host system. You can create a volume from network storage to be assigned to a selected host system. You can also delete a volume that is assigned to a selected host system. The create volumes function simplifies the allocation process by determining the best fit storage system and by creating any necessary RAID arrays automatically.

#### View and Apply Storage Templates

This task works with *storage templates*, which are predefined images for certain storage devices. Storage templates are used to ensure uniformity among common storage elements, and save time and effort on repetitive tasks.

Storage templates, as shown in Figure 6-151, can be used for these tasks:

- To clone the storage configuration of a system, or save a storage volume template from an existing server. Then, apply the saved template to another system. This process can be used for duplication (clustering, or virtual server hosts) or for saving the storage configuration for backup or disaster recovery purposes.
- As a starting point for creating more volumes, start with a base template and change it as needed.

	nfiguration templates to deploy settings on one or mo	e systems.			
-	iration Templates			-	
Qe	slov Create Uke Edit Delete as	Cona 🔻	Search the table	Search	
Selec	Name	Deployeo	Plan Couro	Туре о	Subtype
	8GbSANSwitchProtocolConfigurationTemplate	No	0	Network	I/O Module Fibre switch
	Boot Sequence Predefined Template	No	1	Chassis	Processor
	${\tt Ethernet1GbSwitchProtocolConfigurationTemplate}$	No	0	Network	I/O Module Ethernet Switch
	Ethernet1GbSwitchVLANConfigurationTemplate	No	0	Network	I/O Module Ethernet Switch
	IPv4AddressPoolConfigurationTemplate	No	0	Server	Server (via CIM protocol)
	IPv6AddressPoolConfigurationTemplate	No	0	Server	Server (via CIM protocol)
	OperatingSystemCreatei5AccountTemplate	No	0	Operating System	Operating System (via CIM protoc
	OperatingSystemCreateLinuxAccountTemplate	No	1	Operating System	Operating System (via CIM proto
	OperatingSystemCreateWindowsAccountTemplate	No	1	Operating System	Operating System (via CIM proto
	OperatingSystemImmediatePowerOff	No	0	Operating System	Operating System (via CIM proto
	OperatingSystemImmediateRestart	No	0	Operating System	Operating System (via CIM proto
	OperatingSystemIPv4NetworkTemplate	No	1	Operating System	Operating System (via CIM proto
	OperatingSystemIPv6NetworkTemplate	No	1	Operating System	Operating System (via CIM proto
	ServerEnableSerialOverLAN	No	0	Server	Server (via CIM protocol)
	ServerEnableServiceProcesserRedirection	No	0	Server	Server (via CIM protocol)

Figure 6-151 Storage configuration templates

#### **Capacity Details table**

For each type of storage, this table indicates the available capacity, usable capacity, total capacity, number of systems, and number of disk drives. The entries in this list correspond to storage groups that have the same name as shown Figure 6-152. If you select an entry, a table of storage subsystems that are members of the selected group is displayed.

Capacity Details										
Location	Available GB	Usable GB	RAW GB	Systems	Disk Drives					
Local Storage	185	185	0	4	2					
BladeCenter Storage	0	0	0	0	0					
Network Storage	75643	80498	80509	1	22					
Total	75828	80683	80509	5	24					
Storage system not being discover	ed? Learn m	ore								

Figure 6-152 Capacity Details

Local Storage is local to only one system, and therefore dedicated to only that system. For the Local Storage row, capacity information is collected for storage devices that are attached to systems.

The total usable capacity and total available capacity are not displayed for these storage devices, as shown in Figure 6-153.

Name 🗢	Access 🗘	Problems \$		
PF-FSM-Node		Froblems V	Raw Capac 🗘	Usable Capacity
	I Offline	🖉 ОК	0	198999801856
PF-HyperV-Node1	🖉 ОК	📓 ОК	0	0
PF-KVM-Node1	💹 ОК	💹 ОК	0	6145
FILL AMENOUUS				56540
	PF-KVM-Node2			

Figure 6-153 Dedicated Local Storage

*Network storage* is storage that is accessed with switches, adapters, and protocols, such as Fibre Channel, SAS, or iSCSI, as shown in Figure 6-154. Network storage (and compute node integrated storage) is managed by IBM Flex System Manager for supported storage devices. It can also be managed by management applications that are provided with the network storage device.

etwork S	torage							
Network	Storage (View Members)							
Act	ions 🔻 Search the table	Search						
Select	Name	\$	Access	0	Problems	٥	Raw Capacit 🗘	Usable Capacity \$
	Storwize V7000-2076-v70	00-IBM	I Offline		ОК		80,509GB	80,498GB

Figure 6-154 Network storage

# 6.14 External Fibre Channel SAN switch discovery

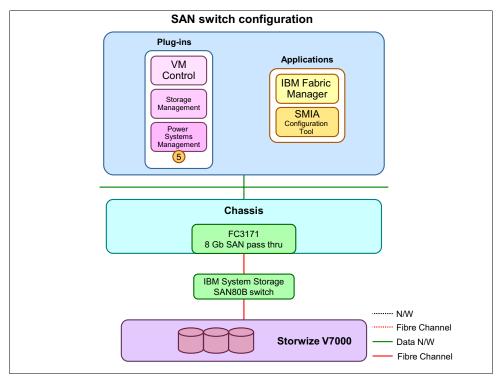


Figure 6-155 shows the test environment. One SAN switch that is installed in the chassis has a pass-through capability and is connected to the IBM SAN B80 switch.

Figure 6-155 Test SAN environment

To add the Brocade SAN switch to FSM, perform these general steps:

- 1. Obtain the IP address from Brocade switch UI.
- 2. Ensure that the FSM is in the local Domain Name System (DNS) or added to the configured workstation /etc/hosts file.
- 3. Start the SMIA application.
- 4. Start the configuration tool.
- 5. Add the switch as a new fabric to the SMIA.
- 6. Use the mkdatasource command from FSM.
- 7. Collect inventory on the "Farm".
- 8. Collect inventory on the switch objects.

To add the Brocade SAN switch, perform these detailed steps:

1. Figure 6-156 shows the Applications tab main window. Click Start to run SMIA.

e this tab to					
e this tab to	and a settle second trackt		and a later and a later	ware false floor	
	work with applicati	ons designed to	extend the capabil	ities of the Flex S	ystem Manager.
	1000 21 201	2 10:40:39 AM E	DT		
Refresh	June 21, 201.	2 10:40:39 AM E	01		
	ric Manager 1				
	ager is an addres	s virtualization t	ool.		
Start Stop	-				
	ministration cons	ole			

Figure 6-156 Applications tab in the FSM

2. Log in to your external switch (Figure 6-157 shows the SAN switch main window). Click **Switch Admin**.

<u>Manage Reports Monitor Tools</u>	
Tasks 🔅 🕯	🔘 Status 📔 🔘 Temp 💿 Power 💿 Fan 🛛 🗍 Beacon 🗍 Chassis Beacon
Manage 🎄	Switch Status Policy Logical Switch 128 -
Zone Admin	Switch View
④ Switch Admin	Switch View
👰 Port Admin 🖗 Fabric Watch	
Monitor 🌣	
M Performance Monitor	
Name Server	321         33         344         35         40         441         42         43         48         49         50         511         56         53         53         59           25         537         53         53         54         57         53         54         53         54         53         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55         55 <t< td=""></t<>

Figure 6-157 SAN switch main window

3. Note the IP address in the **Network** tab as shown in Figure 6-158.

witch Network	Firmware Download	License	User T	runking		
Ethernet and Fibre Ch	annel IP Configuration					
IPv4 Address						
Ethernet IP	9.27.16.251			IPFC Net IP	0.0.0	
Ethernet Mask	255.255.252.0			IPFC Net Mask	0.0.0.0	
Gateway IP	9.27.16.1			DHCP : Disabled		
Netstat Performar	nce					

Figure 6-158 Ethernet IP address of the IBM SAN B80 switch

4. Check that SMIA is running as shown in Figure 6-159. Click SMIA Configuration Tool.

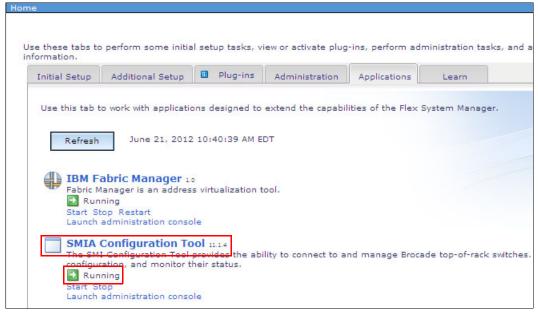


Figure 6-159 Check SMIA status

5. Enter the SAN switch credentials as shown in Figure 6-160.

SMIA Configu	ration Tool Log In	
Enter User ID and I	Password to log onto the server	
Network Address	9.27.20.38	
Server Name	FSM-5CF3FC5F54EF	
User ID	USERID	
Password		
	Save password	
		Login Exit
i Server Availat	le	

Figure 6-160 SAN switch login window

6. Click the Home tab, and then click Fabric Discovery as shown in the Figure 6-161.

SMIA Configuration Tool
Home Authentication CIMOM Certificate Management Summary
You can launch the following IBM Network Advisor dialogs by clicking on the links.
Eabric Discovery - Configuring fabric discovery will let the application discover products connected to the SAN.
Host Discovery - Configuring host discovery will let the application discover devices connected to the SAN.
Users - You can configure the user, user roles and area of responsibility.
Options - Displays all the configurable options available in the management application.
Server - Displays various properties of the server.
About - Displays the application build, java version and trademark information.

Figure 6-161 SMIA Configuration Tool window

#### 7. Click **Add** as shown in Figure 6-162.

a Fabric.					
P Address	WWN	Discovery Status	Community String	User ID	
F Address		Discovery Status	Community String	USELID	Add
					Edit
					Delete
					Seed Switch
					Unmonitor
					Monitor

Figure 6-162 Discover Fabrics Main window

8. On the IP Address tab, enter a fabric name for the Top of Rack (TOR) switch, IP address, and login credentials (the defaults are admin/password), as shown in Figure 6-163.

🐉 Add Fabric Disc	overy	×
P Address SNM	P	- i
SNMP Configuration	Automatic      Manual	
Fabric Name	IBM_2498_B80	
IP Address	9.27.16.251	
User ID	admin	
Password		
(). User ID and Pa	ssword is not required for m-EOS switches.	
	OK Cancel He	elp

Figure 6-163 Add Fabric Discovery window

9. Figure 6-164 shows the added SAN switch.

Discovered Fabr	ics					
lame	IP /	Address	WWN	Discovery Status	Cor	
± 🕹 IBM_249	8_B80					Add
						Edit
						Delete
						Seed Swite
						Seed Swit
					,	Unmonito
						Unmonito
						Unmonito
						Unmonito
	4	19999999999999999999				Unmonito
reviously Disco	Lesson				•	Unmonito
eviously Disco	vered Addresses		L	User ID		Unmonito
	Lesson	3	L		Community Strin	Unmonito
	vered Addresses	3	L			Unmonito

Figure 6-164 Discover Fabrics Main window

10.Click the **CIMOM** tab from the main interface as shown in Figure 6-165.

<b>.</b>	SMIA Configuration Tool
ſ	Home Authentication CIMOM Certificate Management Summary
	You can launch the following IBM Network Advisor dialogs by clicking on the links.
	Fabric Discovery - Configuring fabric discovery will let the application discover products connected to the SAN.
	Host Discovery - Configuring host discovery will let the application discover devices connected to the SAN.
	Users - You can configure the user, user roles and area of responsibility.
	Options - Displays all the configurable options available in the management application.
	Server - Displays various properties of the server.
	About - Displays the application build, java version and trademark information.

Figure 6-165 SMIA main window

11. Check Enable SSL to enable the SMI Agent port (25989), as shown in Figure 6-166.

ome	Authentication	CIMOM	Certificate Management	Summary	
Config	gure HTTP and HTTPS	connectio	ns between the CIMOM and	CIM Client	
[	Enable SSL	Ľ			
	SMI Agent Port#	25989	)		
	Current Value	25989	)		
	Default Value	5989			
P Cor	figuration				
	Bind Network Addres	s FSM-	5CF3FC5F54EF	-	
	M Logs will be written	into cimor	n/server/logs folder		
	Log Level	INFO	•		
	File Size	5	MB		
	Number of Files	10	<b>▲</b>		
,	Apply				

Figure 6-166 CIMOM window

12. From the FSM CLI, run the **mkdatasource** command to add the data source as shown in Figure 6-167.

```
USERID@FSM-5CF3FC5F54EF:~> smcli mkdatasource -c fabric -t https -i 9.27.20.38 -p 25989
-u USERID -w PasswOrd -n "interop"
Adding the data source ...
The data source was added successfully.
```

Figure 6-167 FSM CLI window

13.Collect inventory on a farm as shown in Figure 6-168.

A	tions 🔻 Search the table Sea	arch			
Select	Name		÷	Type 🗘	Access
	FSM-5CF3FC5F54EF.rtp.stglabs.ibm.com	Related Resources	•	Farm	🖉 ок
	FSM_FSM-5CF3FC5F54EF.rtp.stglabs.ibm	Topology Perspectives	•	Operating System	🖉 ок
	ETHERNETO-IBM*7895-42X*1014238	Create Group		Switch	📄 ок
	ETHERNETO-IBM*7895-22X*101D898	Remove		Switch	📄 ок
	ETHERNETO-IBM*7895-22X*101D888	Add to	•	Switch	📄 ок
		Automation			
		Inventory	•	Collect Inventory	
		Security	•	View and Collect Inve	ntory
		System Configuration			
		System Status and Health			
		Service and Support	•		
		Properties	-		

Figure 6-168 Run Collect Inventory

14. Check the logs as shown in Figure 6-169.

	Targets	History	Logs	
Click on jo Job Insta		e Name column	in order to view	ts logs
A	ctions 🔻	Search the tab	le Search	
Select	Name		Status	
<ul> <li>Image: A set of the set of the</li></ul>	6/21/12 at 2:5	3 PM	Complete	
<				
				1
Job log	[			•
June 2: June 2:	1, 2012 2:53:24 1, 2012 2:53:24	PM EDT-Level:20	00-MEID:0MSG	- ob "Collect Inventory - June 21, 2012 2:53:13 PM EDT" act : Subtask "Collect Inventory" activated.
June 2: June 2: June 2: June 2: June 2: June 2:	1, 2012 2:53:24 1, 2012 2:53:24 1, 2012 2:53:24 1, 2012 2:53:24 1, 2012 2:53:24	PM EDT-Level:20 PM EDT-Level:20 PM EDT-Level:10 PM EDT-Level:20	00-MEID:0MSG 00-MEID:0MSG 00-MEID:0MSG 00-MEID:0MSG	- ob "Collect Inventory - June 21, 2012 2:53:13 PM EDT" act : Subtask "Collect Inventory" activated. : Starting clients : Clients started for task "Collect Inventory" : Subtask activation status changed to "Active".
June 2: June 2: June 2: June 2: June 2: June 2: June 2: June 2: June 2:	1, 2012 2:53:24 1, 2012 2:53:24	PM EDT-Level:20 PM EDT-Level:20 PM EDT-Level:10 PM EDT-Level:20 PM EDT-Level:11 PM EDT-Level:11	00-MEID:0MSG 00-MEID:0MSG 00-MEID:0MSG 00-MEID:0MSG -MEID:0MSG; J 50-MEID:0MSG	- ob "Collect Inventory - June 21, 2012 2:53:13 PM EDT" act : Subtask "Collect Inventory" activated. : Starting clients : Clients started for task "Collect Inventory"
June 2: June 2:	1, 2012 2:53:24 1, 2012 2:53:24 m ⁿ . 1, 2012 2:53:24	PM EDT-Level:20 PM EDT-Level:20 PM EDT-Level:10 PM EDT-Level:10 PM EDT-Level:11 PM EDT-Level:11 PM EDT-Level:11 PM EDT-Level:20	00-MEID:0MSG 00-MEID:0MSG 00-MEID:0MSG 00-MEID:0MSG -MEID:0MSG 50-MEID:0MSG 50-MEID:67151 00-MEID:0MSG	- ob "Collect Inventory - June 21, 2012 2:53:13 PM EDT" act : Subtask "Collect Inventory" activated. : Starting clients : Clients started for task "Collect Inventory" : Subtask activation status changed to "Active". ob activation status changed to "Active". : ATKSRV6291 Collecting inventory by using inventory profil

Figure 6-169 Check logs

Figure 6-170 shows that the new switch object is added in the Resource Explorer.

Resource Ex	plorer		
	All Systems (View Members)		
Select	Name 🗘	Туре	Access
	BM_2498_880	Switch	📄 ок

Figure 6-170 SAN switch added

### 6.15 Configuring network parameters (Network Control)

With IBM Flex System Manager, you can manage your entire network and network devices if the network devices are discovered and have full access. The Network Control window is shown in Figure 6-171.

ex System Manager	Welcome USER
Iome × Resource Ex × Network Con ×	<u>_</u>
etwork Control	
Network Control	
This page shows the summary of the network device:	s in your environment based on the last discovery and inventory process.
Status	
Problem status for 2 network devices.	
Problem status for 2 network devices.	Common tasks
	System discovery
0 Critical	Network Topology Inventory
0 Warning	Launch DCFM Setup
0 Informationa	View partner plug-ins
	1
2 OK	
Status for switch management	
2 need additional setup	
0 ready	
Status for partner plug-ins	
Status to particle pages	
0 Activated	
o Activated	
Manage	
2 Ethernet switches	Common techn
0 Ethernet to Fibre Channel Bridges	Common tasks
0 Fibre Channel over Ethernet switches	Monitors
0 Logical Networks	Thresholds
0 Network System Pools	Event Log
3 Subnets	Automation Plans
4 VLANs	
Systems by VLAN and Subnet	
0 Logical Networks and Members	

Figure 6-171 Managing network devices

Use IBM Flex System Manager Network Control to manage network devices in your managed systems environment by performing the following tasks:

Discovering network systems

Use the Discovery task to collect an extended set of resources and relationships for network systems.

Collecting and viewing inventory for network systems

Use the View and Collect Inventory task in IBM Flex System Manager Network Control to view and manage an extended set of resources and relationships for discovered network systems.

Configuring network systems with configuration plans and templates

You can use the configuration manager to create, view, edit, delete, deploy, and schedule virtual local area network (VLAN) and protocol configuration templates to be deployed on supported network resources.

Managing network system pools and logical networks

Use network system pools and logical networks to effectively manage your virtual and physical networks.

Managing network systems health

IBM Flex System Manager provides facilities to monitor and troubleshoot network systems health.

Working with network device groups

Use the Resource Explorer task to view and manage network systems in IBM Flex System Manager.

Collecting and viewing Network Topology inventory

Use IBM Flex System Manager Network Control to work with network inventory in a topology view.

For information about the Network Pools concept and how to configure them to manage the virtualization environments, see 9.5, "Creating KVM network system pools" on page 352. For more information about Network Control, see the Network Control section in the IBM Flex System Information Center at this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp

# 7

# Managing chassis components with IBM Flex System Manager

This chapter addresses IBM Flex System Manager (FSM) capabilities for chassis hardware component management. FSM offers a wide range of hardware management options. The examples use the FSM graphical user interface to illustrate common hardware management interfaces and tasks.

This chapter includes the following sections:

- ▶ 7.1, "Using FSM Explorer" on page 260
- ▶ 7.2, "Using the Chassis Map" on page 264
- ► 7.3, "Using the Event Log" on page 269
- 7.4, "Automating tasks with event automation plans" on page 271
- 7.5, "Handling problems with Service and Support Manager" on page 279
- 7.6, "Integrating Flex System Manager with an enterprise monitoring system" on page 288
- 7.7, "Monitoring system status and health" on page 288
- ► 7.8, "Remote management" on page 298

### 7.1 Using FSM Explorer

The IBM FSM Explorer console provides a next generation user interface that provides views of your resources and helps you to manage your systems-management environment. It provides a resource-based view of your environment with intuitive navigation of those resources.

You can view basic information about your resources just by hovering over them; you do not have to click to access information about them.

You can perform the following tasks in IBM FSM Explorer:

- Configuring local storage, network adapters, boot order, Integrated Management Module (IMM) settings, and Unified Extensible Firmware Interface (UEFI) settings for one or more compute nodes before you deploy operating-system or virtual images to them. (See 6.6, "Configuring compute nodes using Configuration Patterns" on page 150.)
- Installing operating system images on X-Architecture compute nodes. (See 6.7, "Deploying compute node images" on page 168.)
- Navigating resources, viewing the properties of resources, and performing basic management tasks, such as powering on and off, collecting inventory, and working with LEDs.
- Using the Chassis Map to edit compute node details, view server properties, and manage compute node actions
- Working with resource views, such as All Systems, Chassis and Members, Hosts, Virtual Servers, Network, and Storage
- Visual monitoring of status and events
- Visual monitoring of job status

For other tasks, you are launched from the IBM FSM Explorer into IBM Flex System Manager in a separate browser window. You can return to the IBM FSM Explorer window after you complete those tasks. As more tasks become available in IBM FSM Explorer, you will need to launch the IBM Flex System Manager less often. The FSM Explorer can be started from the initial setup tab on the IBM Flex System Manager Home page. Click **Launch IBM FSM Explorer** as shown in Figure 7-1.

Initial Setup	Additional Setup	🚺 Plug-ins	Administration	Applications	Learn	
Perform the	following initial setup	tasks to set up	IBM Flex System N	1anager™ for the	first time.	
	Check and Up Obtain and install o Manager™.	ipdates for IBM	Flex System Manag	ger™. This will req		3M Flex System
	🕐 🕐 Learn more abo	ut checking and	l updating IBM Flex	System Manager	🍽 firmware.	
2	Select Chassis View all chassis and You are currently m	Flex System M	lanagers in your en	vironment and se	lect which to mana	ige.
⁹ ×	Configure Cha Configure basic set			ding compute nod	es, storage nodes	s, and I/O modules.
^a 🥵	and VMware vSpher	ise Linux 6.2-6 e 5.1 with IBM ( x compute noc	.4, Red Hat Enterpr Customization, you les. To deploy othe	can deploy the in	hage directly from	Virtual Machine (KVM the Flex System o System p compute
	(?) Learn more ab	out deploying o	perating systems.			
9	Update Chass Update chassis con			, storage nodes, a	and I/O modules.	

Figure 7-1 Initial Setup: Launch FSM Explorer

ome * System	ns • Monitor •	Security *	Utilities	÷.				
1.1	Chassis	Ma	naged	Chass	is			
th th	📟 All Compute Nod		-					
E	🚥 All Storage Node	s 📑	- 🗛	-	Actions 💌			
assis (1)	🖃 All Chassis		er					
	🖭 🌆 itsoFlex1	Chass	is Name	Access	Hardware Status	Problems	Compliance	CMM IP
VEN		its	oFlex1	📕 ОК	🚺 Information	🔳 ок	🔳 ок	9.42.17
osts and VSs (4)								
etwork (2)								
		Ι						

A separate browser window opens to present the IBM FSM Explorer as shown in Figure 7-2.

Figure 7-2 Main dashboard view of FSM Explorer

Jobs and status can be viewed by hovering your mouse over the status indicators at the upper right, as shown in Figure 7-3.

IBM Flex Syst	em Manag	jer™ - 1.3.(	)		🗹 Status (0	) -	🔽 Jobs (25) 🗵	USERID -
	Storago Au	to Discovery	with IP 0	42 171 2	Active(0) Completed(25)	Schedu	uled(0)	Find a System
Name:	-	per 19, 2013						
Status:	Complete	Progress:	100	%	ntory - November 19,	Start	ted: 11-19 11:03 PM	
Last Run Status: Created By:	Complete root	Last Run: Next Run:	11/19/13	11:03 PM	> Discovery with IP 9	Start	led: 11-19 11:03 PM	
Task:	Storage Au 0	to Discovery	with IP 9	.42.171.2	Discovery for 9.42.17	Star	rted: 11-19 5:31 PM	Filter
Description:	Run once o	on 11/19/13	at 6:17 PM	И	Discovery for 9.42.17	Star	rted: 11-19 5:31 PM	Problems
		1000	00C0D	Switch A	uto-Discovery for 9.42.1	Star	rted: 11-19 5:31 PM	ОК
losts and VSs (0)				Collect In	ventory - November 19,	Star	rted: 11-19 5:28 PM	
				Update C	ompliance - November 1	Star	rted: 11-19 5:27 PM	
				Collect In	ventory - November 19,	Star	rted: 11-19 5:26 PM	
Vetwork (3)				Update C	ompliance - November 1	Star	rted: 11-19 4:35 PM	

Figure 7-3 Pop-up view of job status

You can search for groups, resources, and tasks from a single location in the FSM Explorer. If a task is not available in IBM FSM Explorer, you are launched into IBM Flex System Manager to complete the task.

Figure 7-4 shows a search started for "chassis" and a dynamic list of items that match what you are typing.

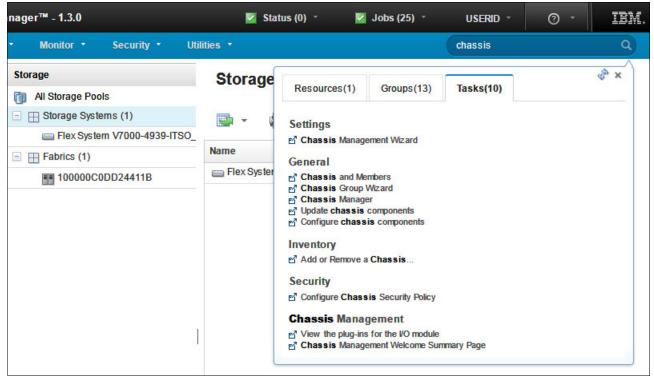


Figure 7-4 Dynamic list of items provided during a search

Clicking one of the search results performs the respective action - displays more information about the object for the Resources, displays group members for Groups, or start the task for Tasks.

# 7.2 Using the Chassis Map

You can view chassis properties and manage a chassis with the Chassis Map in the IBM FSM Explorer management software web interface. To do so, perform these steps:

1. In the FSM Explorer dashboard (the default view when you open FSM Explorer from the Home window), click **Chassis** group in the upper-left corner, and then click *<chassis name>* to open the Chassis Map for the selected chassis, as shown in Figure 7-5.

IBM Flex System	Manager™ - 1.3.0		<b>V</b> Status (0) -	🗹 Jobs (25) 🗵	USERID *	Ø -	IBM.
Home - System	ns • Monitor • Secu	rity • Utilities •			Find a System or	Task	٩
+++	Chassis all Compute Nodes all Storage Nodes		tis internativos internativos internativos	0 100			Table View
Chassis (1) Hosts and VSs (0) Network (3) Storage (2)	— AI Chassis ★ III itsoFlex1		9.42.171.11 9.42.171.11 10 10 10 10 10 10 10 10 10 10 10 10 1				
Favorites (0)		itsoFiex1 - Summary	□ •   🚔	View	Details commo	n Actions	2
All Systems (15)		Problems: None (View Event Log) Verify Connection Interval: Every 15 mini IP Hosts: 9.42.170.215 IP Addresses: 9.42.170.215, fe80:0:0:05 Communication State: Communication ( System Board UUID: 2C684A86-292E-30 Manufacturer: IBM Serial Number: KQ5X28V Machine Type: 8721	ef3:fcff:fe25:ed85 DK		Configur Configur Deploy ( Inventory Collect I Release Show ar Remote J Launch	ation Patterns ration Details Chassis Pattern / nventory Management nd Install Update	9S

Figure 7-5 IBM FSM Explorer: Chassis Hardware Map

Move the mouse over **Home** (you do not need to do a mouse click) and click **FSM Explorer** to switch to the dashboard view from other FSM Explorer views, as shown in Figure 7-6.

	rstem Manager™ - 1.3.0		🗹 S	tatus (0) 🕝	🗹 Jobs (25) 🔹
Home -	Systems • Monitor • Dashboards IBM FSM Explorer	Getting Started Initial Setup Quick Start Guides	Summary Pages VMControl Storage Control Network Control Service and Support	14	
IBM® FSM - C Hosts and VSs (	heck for Updates	9			

Figure 7-6 FSM Explorer dashboard

The graphical Chassis Map is a visual representation of the front and back of the chassis and its components (see Figure 7-7). It shows you where your hardware components are located physically, and it is a central point of management from which you can get hardware configuration and status information. You can also perform various actions.



Figure 7-7 Chassis Map (graphical view)

2. Click the compute node to get summary information, the option to view details, and relevant actions. The Common Actions area for the specific node is displayed under the Chassis Map or on the right side of it depending on the width of the web browser window, as shown in Figure 7-8.

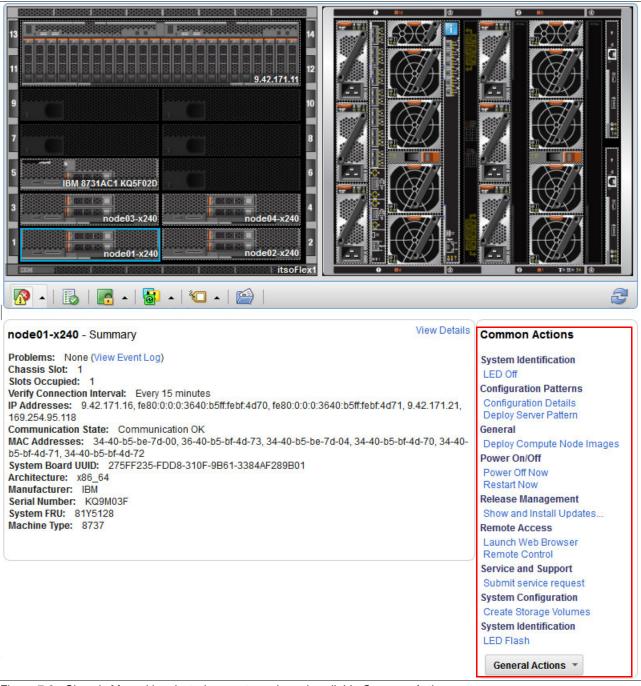


Figure 7-8 Chassis Map with selected compute node and available Common Actions area

3. The full list of actions and details that are relevant to the selected chassis component can be displayed by right-clicking it, as shown in Figure 7-9.

13 11 9 7 5 BM 8731 3 1	AC1 KQ5F020	9,4	04-3240       4         02-3240       2         itsoFlext       0	
itsoFlex1 - Sum	Create Group Deploy Compute Node Imag Rename Add to	ges •	View Details	Common Actions
Problems: None (V Verify Connection In	Automation	- <b>F</b>		Configuration Patterns Configuration Details
IP Hosts: 9.42.170 IP Addresses: 9.42	Inventory	•		Deploy Chassis Pattern
<b>Communication Sta</b>	Power On/Off	•	Hard Restart System Management Processo	r entory liect inventory
System Board UUID Manufacturer: IBM	Release Management		Power Off Now	ease Management
Serial Number: KC Machine Type: 872	Remote Access Security		Restart	ow and Install Updates
indennie ijper 072	Security System Configuration		Restart Now Shut down and power off	note Access unch Web Browser
	System Status and Health		Soft Restart System Management Processor	mote Command Line
-	Service and Support		Virtual Reseat	i <b>tart</b> start Primary CMM
-	Advanced Properties			Service and Support
				Submit service request

Figure 7-9 List of actions for the selected component (compute node)

4. Use the Chassis Map to quickly identify problematic components of your chassis. For illustration purposes, we simulated a link failure on the switch module, and the Chassis Map showed an error with one of the I/O modules. Move the mouse pointer over the I/O module to see information about the switch and its problems, as shown in Figure 7-10. Click **View All Status** to open the Active Status window.

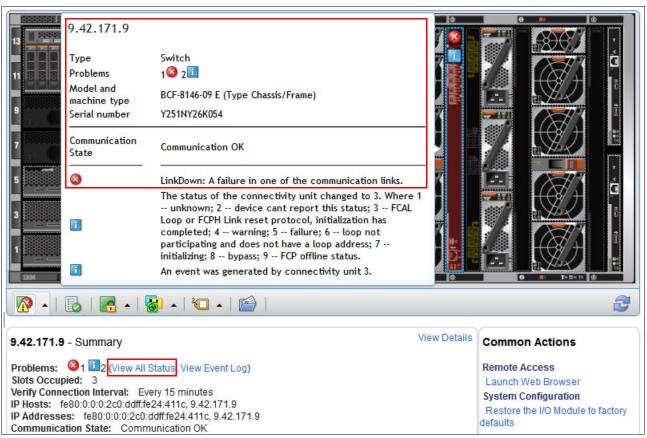


Figure 7-10 Caption with brief information about an I/O module in the Chassis Map

5. The Active Status window provides a centralized interface that you can use to get a quick snapshot of the resources that trigger a status set entry. Currently, only entries that are related to the selected I/O module are listed, as shown on Figure 7-11. You also can ignore status-set entries to prevent them from displaying with an elevated status in the future.

IBM Flex System Manager ¹	* - 1.3.0	🔰 Status (1) 🔹	🔽 Jobs (2
Home • Systems • I	lonitor ▼ Security ▼ Utilities ▼		
Actions - 9.42.171.9 © Critical	Active Status       Active Alerts     Ignored Alerts       Image: The second se		Fi
General	Name	Severity	System
Properties	LinkDown: A failure in one of the communication links.	🙆 Critical	9.42.171.9
System Status and Health	The status of the connectivity unit changed to 3. Where 1 unknow		9.42.171.9
Active Status	An event was generated by connectivity unit 3.	Information	9.42.171.
Event Log			
Related Resources			
<ul> <li>Fabric</li> <li>Installed Software</li> <li>IP Interface</li> <li>LAN Connection</li> <li>Physical Package</li> <li>Port Controller</li> <li>Service</li> <li>Switch Port</li> <li>System Chassis</li> <li>Update - Applies To Switch</li> <li>Update - Switch Needs</li> <li>VLAN Connection</li> </ul>			

Figure 7-11 FSM Explorer: Active Status window

All status-set entries, including problems and compliance issues, are displayed. Double-clicking an entry displays further details about the entry.

## 7.3 Using the Event Log

An *event* is an occurrence of significance to a task or resource. Examples of events include the completion of an operation, the failure of a hardware component, or exceeding a processor threshold. The **event log** task displays all events that the FSM receives from any resource to which you have authority to view events.

To open the Event Log for events that are reported by a specific source, perform these steps:

- 1. Select a component from the Chassis Map.
- 2. Click **View Event Log** in the Summary area below the Chassis Map, as shown in Figure 7-12.

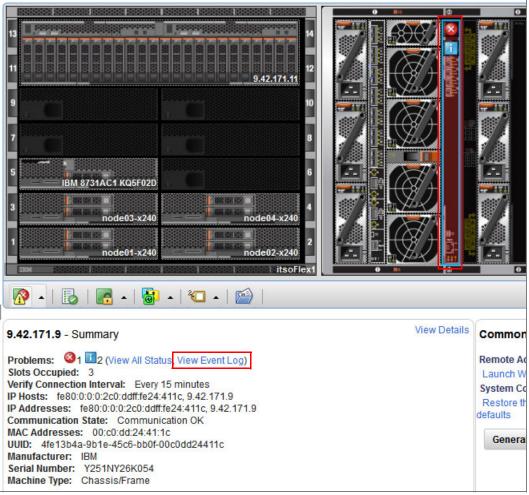


Figure 7-12 Opening the event log for the specific component

Move the mouse over **Monitor** in the FSM Explorer user interface and click **Event Log** to view all events for all chassis components, as shown in Figure 7-13.

lome • Syste	ems 🝷	Monitor *	Security • Utilities •		
	Cha		Status	Monitoring	Automation
E STATE			Active Status	Monitors	Plans
1 H H	COMPANY OF		Event Log	Thresholds	Actions
E-mail			Service Problems	Come l'anna	Event Filters
nassis (1)			-	Compliance Policies	Command Definitions
					Jobs
					Active and Scheduled Jobs

Figure 7-13 FSM Explorer: Event Log

In the Event Log window, click **Event Filter** and select the filter criteria that you want to use. The default filter is All Events. The event log displays the events that have been received by IBM Flex System Manager and match the filter criteria. See Figure 7-14 for possible choices.

IBM FI	ex System Manager™ - 1.3.0	8	Status (1) 🔹	🗹 Jobs (27) 🔹
lome *	Systems • Monitor • Security •	Utilities 🔹		
Event	t Log			
ilter by:	All Events 👻			
- 1	All Events	rom the last 24 I	Hours.	Event Log Pr
	Audit Events			<b>F</b> iller
	Common Agent offline			Filter
Event T	Critical Events		Source	Severity
An ever	Disk use		9.42.171.9	Information
An ever	Electronic Service and Support Events		9.42.171.9	Information
LinkDov	Electronic Service Requests		9.42.171.9	🚫 Critical
The sta	Environmental sensor events	/n; 2 device c;	9.42.171.9	Information
Host Pc	Fatal Events Hardware Predictive Failure Alert events		node02-x240	Information
Attempt			node02-x240	Information
An ever	Management server security events	-	9.42.171.9	Information
An even	Memory use		9.42.171.9	Information
An ever	Minor Events		9.42.171.9	Information
An even	Physical hardware security events		9.42.171.9	Information
LinkUp:	Processor use	-	9 42 171.9	Information
The sta	Service and Support Manager processing error events	/n; 2 device c;	9 42 171 9	Information
LinkDo	Service and Support Manager serviceable events		9.42.171.9	🖸 Critical
The sta	Storage events	/n; 2 device c;		Information
	Warning Events		9.42.171.9	Information
Contraction of the	t was generated by connectivity unit 3.		9.42.171.9	Information
ai eveni	and generated by connectivity drift 5.		itsoFlex1	Information

Figure 7-14 Event filter drop-down list

**Remember:** The number of events that are displayed is limited by the event log preferences settings. By default, the event log displays the last 500 events that occurred over the last 24 hours. Use the Event Log Preferences window to change the defaults.

View the properties for the event in the table or click the event to view more properties and details. You can also use the Filter field to filter the event log based on specific keywords.

#### 7.4 Automating tasks with event automation plans

Use *event automation plans* to automate tasks in your systems management environment.

Create event automation plans and apply them to specific systems to be notified by email, for example, when a specified threshold is reached or a specified event occurs. Or, you can configure an event automation plan to start a program on a system in response to the event. These plans are composed of event filters and event actions. The plans are triggered by events. Event automation plans are a powerful feature to automate a huge variety of manual tasks in your environment. These tasks can significantly reduce labor costs.

You have identified an event, created an event filter for it, and defined an event action. Now, automate triggering the action that is based on the filtered event. For this example, set up an automated email notification for an event that indicates a Predictive Failure Analysis (PFA) alert for memory dual inline memory modules (DIMMs).

To create the automation task, perform these steps:

1. Type event automation in the search field of the FSM Explorer and click **Event Automation Plans** in the Tasks pane, as shown in Figure 7-15.

IBM Flex System	n Manager™ - 1.3.0		🗹 Status (0) 🔹	🗾 Jobs (27) 🗵	USERID -	0 -	IBM.
Home 👻 Syste	ms • Monitor • Se	curity • Utilities •			event automation		٩
-	Chassis	Managed Ch	assi	(0) Groups(0)	Tasks(1)		& ×
External Task: Event Au	utomation Plans			(0)	140110(1)		
Category: Automation			Automation	n omation Plans			1
systems-management	event automation plans that ar t environment	e created to automate tasks					
Clicking here will oper	n a new browser window and	launch this task.		ОК	ОК	Ok Ok	•
Hosts and VSs (0)							

Figure 7-15 Launching Event Automation Plans task

2. In the opened Event Automation Plans window (Figure 7-16), click Create.

	mation Plans	asks based on received events. An ever		n plan includes an eve
lter, whi esponse	ch specifies the types of events o to received events, tomation Plans	n which to take action, and one or more		s that are performed i
Select	Name 💠	Targets 🗘	Status 💠	Time range
Delect				

Figure 7-16 Event Automation Plans window

3. The Welcome window of the Event Automation Plan wizard is displayed (Figure 7-17). In the Welcome window, specify whether you want to show the Welcome window the next time you use the wizard and click **Next**.

Create Event Automation Plan W	izard
S Welcome	Welcome
Name and Description	Create and edit event automation plans.
Targets	Use this wizard to create event automation plans (formerly, event action plans). Use
Events	these plans to designate events within your systems-management environment for
Event Actions	which one or more actions are executed.
Time Range	(?) Learn about event automation plans
Summary	✓ Show this Welcome page next time.

Figure 7-17 Create Event Automation Plan Wizard Welcome window

4. The Name and Description window opens (Figure 7-18). Enter a descriptive name for the event automation plan that you are creating.

/ Welcome	Name and Description	
Name and Description	Type a name and a description for this event automation plan.	
Targets	*Name:	
Events Event Actions	PFA notification Description:	
Time Range		
Summary		

Figure 7-18 Create Event Automation Plan Wizard Name and Description window

 In the Targets window, select the systems that the event automation plan will monitor for specific generated events. Select All Systems in the Available list and click Add to move them to the Selected list (Figure 7-19). Click Next.

./	Welcome	Targe	ts			
~	Name and Description	Then, clie	arget systems that will be affect the Add to move your selections o members, Make your selections	to the Selected pane. If yo		
	Targets	the group	p members, make your selection	ins and then tick Add.		
	Events					
	Event Actions	Select a va	alid target then add it to the se	elected list.		
	Time Range	Show: G	roups			
	Summary	Card Means				
		Available				Selected:
		Groups (	View Members)		Add >	All Systems
		Acti	ons 🔻 Search the table	Search	< Remove	
		Select	Name	🗢 Type 🗘		
			All Network Systems (3)	Dynamic: System		
			All Operating Systems (2)	Dynamic: Operating.		
			H All Storage Systems (1)	Dynamic: Storage S.		
			All Systems (15)	Dynamic: System		
			FSM Groups (2)	Static: Group		
			H FSM_fsm1 (0)			

Figure 7-19 Create Event Automation Plan Wizard Targets window

*Common event filters* are predefined simple filters that monitor for events of common interest in systems management. For example, the Disks event filter is triggered by any hard disk events, and the Fans event filter is triggered by any fan events. The Event Automation Plan Wizard provides several common event filters so that you can create event automation plans quickly and easily.

 To monitor specific events that are not included in the common event filters, select Advanced Event Filters (Figure 7-20). Select the Hardware Predictive Failure Alert events filter and click Next. You can also create your own custom filter, if required.

Welcome	Event	ts	
Name and Description		one or more events from a list of commonl r, select Advanced Event Filters in the Event	
Targets			
vents	Events:		
nt Actions	Advance	ed Event Filters 💌	
me Range	Use adva	anced event filters to monitor for specific ev	ents that are not included in the comm
2002/02/22/22		one event. For example, instead of monitor	
Summary		e Failure Analysis (PFA) event. Also, you car	-
		es of an event are received, when a specific	
		specific event is received but you want to ex	
	20812081208		cidde another event.
	Event Fil	Iters	
	121405	te Create Like Edit Dele	
	Crea	Create Like Edit Dei	Actions  Search the
	Select	Name	
			Description
	Select	Name \$	Description Processes any events that occur on a
	Select	Name 🔷	Description Processes any events that occur on a Processes only those events that are
	Select O O	Name 🔷	Description Processes any events that occur on a Processes only those events that are Processes only those events that are
	Select O O O	Name  All Events Audit Events Common Agent offline	Description Processes any events that occur on a Processes only those events that are Processes only those events that are Processes only those events that have
	Select O O O O	Name  All Events Audit Events Common Agent offline Critical Events	
	Select C C C C C	Name  All Events Audit Events Common Agent offline Critical Events Disk use	Description Processes any events that occur on a Processes only those events that are Processes only those events that are Processes only those events that hav Processes only those events that are
	Select C C C C C C C	Name  All Events Audit Events Common Agent offline Critical Events Disk use Electronic Service and Support Events	Description Processes any events that occur on a Processes only those events that are
	Select C C C C C C C C C	Name  All Events Audit Events Common Agent offline Critical Events Disk use Electronic Service and Support Events Electronic Service Requests	Description Processes any events that occur on a Processes only those events that are
	Select C C C C C C C C C C	Name  All Events Audit Events Common Agent offline Critical Events Disk use Electronic Service and Support Events Electronic Service Requests Environmental sensor events	Description Processes any events that occur on Processes only those events that are

Figure 7-20 Create Event Automation Plan Wizard Events window

7. The Event Actions window opens (Figure 7-21). Click Create to define a new event action.

✓ Welcome	Even	t Actions				
Name and Description	Specify Event Ac	one or more actions	that will occu	ır when this ever	nt automation pl	an is triggered.
Events	Creat	create Like	Edit.	. Delete	Actions 🔻	Search the ta
Actions	Select	Name	\$	Туре		;
Time Range		Add to the event lo	og	Add to the eve	nt log	
Summary						

Figure 7-21 Create Event Automation Plan Wizard Event Actions window

8. Select the required action as shown in Figure 7-22 and click **OK**. In our example, we selected **Send an e-mail (Internet SMTP)**.

Acti	ons  Search the table Search	
ect	Name 🗘	Туре
0	Send an e-mail to a mobile phone	Common
•	Send an e-mail (Internet SMTP)	Common
0	Start a program on the system that generated the event	Common
0	Start a program on a system	Common
0	Send an event to Tivoli Event Integration Facility (EIF) probe	Advanced
0	Post to a newsgroup (NNTP)	Advanced
0	Send an SNMP trap to an IP host	Advanced
0	Timed alarm that generates an event	Advanced
0	Static group: add or remove the event-generating system	Advanced
0	Start a task on a specified system	Advanced
0	Log to a log file	Advanced
0	Static group: add or remove group members	Advanced
0	Send an SNMP inform request to an IP host	Advanced
0	Set an event system variable	Advanced
0	Send events to Syslog server	Advanced

Figure 7-22 Create Action window: Choose an action

 Customize the selected "Send an e-mail" action. In addition to the action name and description, you need to enter the Send-to e-mail address, the Reply-to e-mail address, E-mail server, and E-mail port number. You can also specify the information to include in the email subject and body. Customize that by adding or removing predefined event variables from the Event variable list box. See Figure 7-23.

Create Action
E-mail (?)Learn more
*Action name:
Electronic Service Notification
Description:
*Send-to e-mail address:
hwsupport@mycompany.com
*Reply-to e-mail address:
fsmadmins@mycompany.com
★E-mail (SMTP) server (for example, smtp.mycompany.com):
smtp.mycompany.com
*E-mail (SMTP) port:
25
Subject of message:
&date &system
Body of message:
&text
Select an event variable and text field to insert the variable in the target text field. You can also specify the appropriate I and time zone.
(?)Learn more about using event variables Event variable:
Date the event occurred (&date)
Target text field:
Subject of message:
Insert
Language:
English 💌
Time zone:
America/New_York - Eastern Standard Time - EST
Test OK Cancel

Figure 7-23 Create Action window: The details for sending an email action

10. Click **Test** to ensure that the action is configured correctly. Click **OK**.

The newly created event action is displayed in the Event Actions list, as shown in Figure 7-24. Click **Next**.

✓ Welcome	Even	t Actions				
Name and	Specify	one or more actions th	nat will occu	ur when this eve	nt automation plan	is trigge
<ul> <li>Description</li> <li>Targets</li> </ul>						
	Event Ac	tions				
Events	Creat	e Create Like	Edit	. Delete	Actions 🔻	Sear
Event	Creat	e Create Like	Edit	. Delete	Actions 🔻	Sear
Event						Sear

Figure 7-24 Event Actions window

**Remember:** Event action history is not saved by default. Saving the history of an event action can provide useful information, such as when the event action ran and the event that triggered the action. Click **Actions**  $\rightarrow$  **Start Saving History** to enable history for a selected event action.

11.Click **Next** in the Time Range window (Figure 7-25) because time settings cannot be modified for the built-in PFA filter.

For custom filters, you can select the time period over which you want to collect the events. You can select All the time (24x7) to enable the plan to be active all the time. Or, you can select Custom to choose specific days and a specific time for the plan to be active.

aints for this event automation plan. the time (24×7)
the time (24×7)
vare Predictive Failure Alert events) cannot be mod

Figure 7-25 Create Event Automation Plan Wizard Time Range window

12. In the Summary window (Figure 7-26), verify the details of the event automation plan. If you need to make changes, click **Back**. Ensure that you specify whether you want to apply the event automation plan as soon as you finish creating it. Click **Finish**.

✓ Welcome	Summary					
<ul> <li>Name and</li> <li>Description</li> </ul>	You have specified the following settings for this event automation plan:					
✓ Targets ✓ Events	Name: PFA notification Description:					
Event     Actions	Time range: All the time (24×7) Targets: All Systems					
🗸 Time Range	Event filter: Hardware Predictive Failure Alert events					

Figure 7-26 Create Event Automation Plan Wizard Summary window

The event automation plan is saved and displayed in the Event Automation Plans window, as shown in Figure 7-27.

1000				esponse to received
Event Au	tomation Plans			
Creat	te Create Like Edit	Delete Actions V Se	arch the tab	le Searc
			Status ᅌ	Time range
Select	Name 🗢	Targets 🗘	Status V	rinne runge
Select	Name 🔶 Log All Events	All Systems	Active	All the time (24x7)

Figure 7-27 Event Automation Plans window

You can Edit, Delete, or Deactivate the automation plan from the Actions menu.

You can deactivate an event automation plan so that the specified events do not trigger the plan. When you want to enable the event automation plan again, you can activate the event automation plan. By default, event automation plans are activated.

#### 7.5 Handling problems with Service and Support Manager

In certain cases, you need to contact IBM support about a hardware issue and submit supporting data for further analysis. This activity usually includes a number of time-consuming manual tasks. Such manual tasks can now be automated with Service and Support Manager.

Service and Support Manager is a plug-in for FSM. Service and Support Manager automatically detects serviceable hardware problems and collects supporting data for serviceable hardware problems that occur on your monitored endpoint systems. The IBM Electronic Service Agent tool is integrated with Service and Support Manager, and transmits serviceable hardware problems and associated support files to IBM support. Service and Support Manager includes the following features:

- Automatically detects serviceable hardware problems to IBM support for all monitored systems.
- The integrated Electronic Service Agent tool securely transmits serviceable hardware problems, associated support files, and performance management data to IBM support.
- Collects and securely transmits scheduled system inventory and diagnostic support files to an IBM database. This inventory information is available to IBM support representatives when they are solving your problem.
- Communicates with IBM support through a secure connection that uses encryption and authentication.
- Includes the option to send email notifications when a serviceable problem is detected and a service request is opened.

Service and Support Manager begins automatically monitoring for serviceable hardware problems as soon as FSM is installed. However, activation by running the Getting Started Wizard is required to configure the Electronic Service Agent tool. This tool is integrated with Service and Support Manager, and securely transmits serviceable hardware problems and associated support files, inventory, and performance management data to IBM support.

To activate Electronic Service Agent, perform these steps:

1. Navigate to the FSM Home page. Click the **Plug-ins** tab, as shown in Figure 7-28.

×						Select Act
a these tabs to r	perform some initial s	etun tasks, view	or activate plu	a-ins.	Elex System Mana	ner - Cherk an
	tion tasks, and acces			-	Applications	Informatic
Initial Setup	Additional Setup	Piug-ins:	Administrat	ion	Applications	Learn
	100 100 10 00					
	m Manager™ contain its 'readiness', the pl			Addi	tional plug-ins to ac	tivate
or might requir	e additional setup an	d configuration.		Пт	here are no plug-i	ns to activate.
Refresh	Last refreshed: June	e 18, 2012 2:37:	18 PM EDT	Fea	er purchasing a plu tures on Demand I / key.	Keys to add the
	x System Manag	Jer 1.1.0.1		Mar	nage Features on D	emand Keys
Ready Chassis M	lanager Manageme	ent Domain				
	ower Systems Resou					
	es not have access to Jsers		3.1			
	e <b>ry Manager</b> 6.3.1 to 8 systems, 14 Sys	stems have no in	ventory			
System D	iscovery View syste	ms needing acce	55			
Resource	Explorer View and	Collect Inventory				
Status Ready	Manager 6.3.1					
Ready	mmary Monitors					

Figure 7-28 Plug-ins tab of FSM Home page

2. Locate the Service and Support Manager section, and click **Getting Started with Electronic Service Agent**, as shown in Figure 7-29.

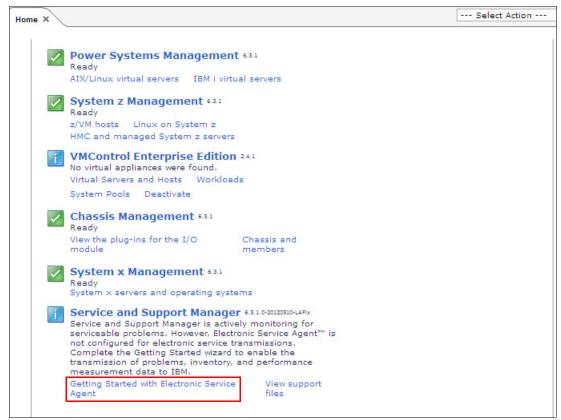


Figure 7-29 Service and Support Manager section on FSM Plug-ins window

3. Click Next in the Welcome window (Figure 7-30).

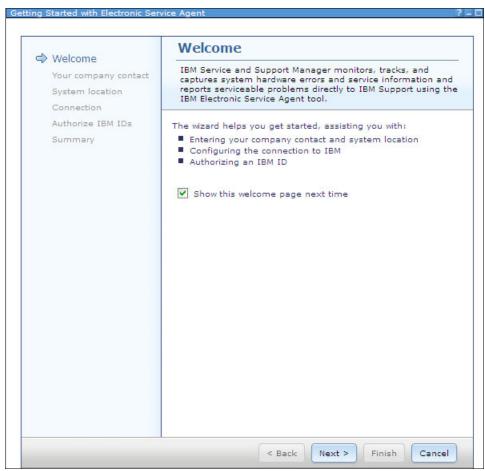


Figure 7-30 Getting Started with Electronic Service Agent Welcome window

4. Enter your company contact information and click Next (Figure 7-31).

✓ Welcome	Your company contact	
Your company     contact	Provide information about the person that IBM Su reported by Electronic Service Agent.	pport may contact about a problem
System location Connection Authorize IBM IDs Summary	<pre>*Contact name: *Company name: *Telephone number: Extension: Fax number: Alternate fax number: Alternate fax number: *E-mail: Alternate e-mail: Help desk number: Pager number: Pager number: Street address Line 1: Line 2: Line 2: Line 3: City: State or province: *Country or region: Postal code: </pre>	

Figure 7-31 Getting Started with Electronic Service Agent: Your company contact window

5. Enter the system physical location information, which might differ from your company contact information (Figure 7-32). Click **Next**.

Velcome	System location				
✓ Your company contact	Provide default information about the physical locations of your systems. Information can be overridden for specific systems by clicking Resource Explorer, selecting a system, and clicking Location under the Additional Properties heading.				
System location Connection Authorize IBM IDs Summary	*Telephone number:         Extension:         *Country or region:         *Street address:         *City:         *State or province:         *Postal code:         *Building:         Floor:         Room number:         Row:         Aisle:         Displaced height (cm):         Altitude (meters):				
	Other information:				

Figure 7-32 Getting Started with Electronic Service Agent: System location window

 The Electronic Service Agent tool needs Internet access to securely transmit serviceable hardware problems, associated support files, and performance management data to IBM support. Enter the Internet proxy details if applicable, test the Internet connection, and click Next (Figure 7-33).

Velcome	Connection					
<ul> <li>✓ Your company contact</li> </ul>	An Internet connection is required to use this function. Specify how the Internet should be accessed.					
✓ System location ⇒ Connection	Specify settings for the Internet connectivity that IBM Flex System Manager™ uses to obtain updates.					
Authorize IBM IDs	Choose the method to use to access the	he Internet.				
Summary	Connect to the Internet directly					
	O Connect to the Internet through an	n HTTP proxy server				
	Proxy server host name:	Port number:				
	Proxy server requires authent User name: Password: Test Internet Connection	ication				

Figure 7-33 Getting Started with Electronic Service Agent: Connection window

 Optional: Enter any IBM IDs you might have to see the service information that is transmitted to IBM by Electronic Service Agent under your IBM account (Figure 7-34). Click Next.



Figure 7-34 Getting Started with Electronic Service Agent: Authorize IBM IDs window

8. Review the Summary window (Figure 7-35) and click Finish.



Figure 7-35 Getting Started with Electronic Service Agent: Summary window

9. Return to the Plug-ins tab of the FSM Home page, scroll down and click **Service and Support Manager**, as shown in Figure 7-36.



Figure 7-36 Service and Support Manager section in FSM Plug-ins window

10. The Service and Support Manager window opens (Figure 7-37). You can use this window to get an overview of the serviceable problems in the environment and a number of useful links. If you need to view, collect, and submit support files to IBM manually, click Manage support files. Click Manage settings to configure Service and Support Manager settings.

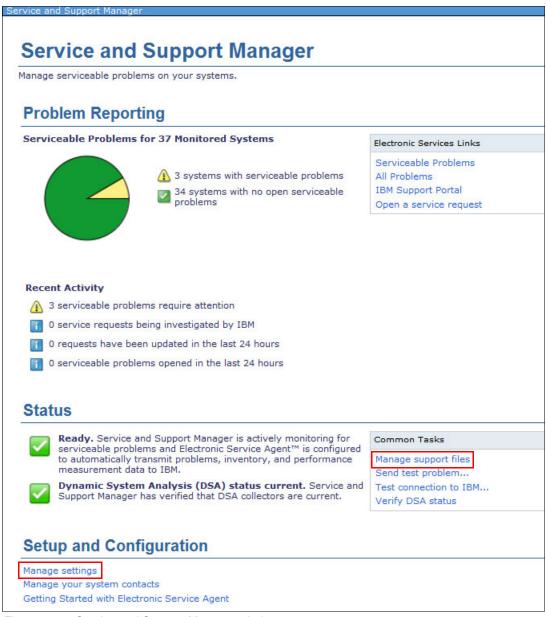


Figure 7-37 Service and Support Manager window

11.Select **Automatically report problems for all systems** to allow Electronic Service Agent to report all problems to IBM support automatically (Figure 7-38).

		Support Fil		Connect					
all systems, se	ervice Agent car lected systems of blem will need to	r disabled fo	or sele	cted syste	ms. If se	erviceab	e proble	ms are not	
Problem reporti	ng:								
<ul> <li>Automa</li> </ul>	atically report pro	blems for a	ll syste	ms					
O Do not	report problems	automatical	lly						
Ocustom	nize:								
Only	report problem	for these s	vstem:	5: O Do	not repor	t proble	ms for th	iese syster	ms:
O lassa akauk	how to use auto	Select> 💟	Brow		1:6:1:				
() Learn about	now to use auto	mation plan	s for p	roblem no	tification	5.			
	m when reportin	1	fails:						
Retry w	hen problem rep	orting fails:		_					
Retry	interval (minute	s):	15						
Numb	er of retries:	300							
Software quality	/ data:								
Allow tra	ansmission of Fl	ex System M	lanage	er manage	ment ser	ver soft	ware qua	lity event	data to IBM

Figure 7-38 Service and Support Manager settings

If you want to receive notifications about Service and Support Manager events, you can create an event automation plan as described in 7.4, "Automating tasks with event automation plans" on page 271. Use the **Electronic Service Requests** event filter in your automation plan to get notified every time that Service and Support Manager detects a serviceable hardware problem. The plan then opens an electronic service request with IBM support.

For more information about Service and Support Manager, see this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.esa.dir ector.help/esa_kickoff.html

## 7.6 Integrating Flex System Manager with an enterprise monitoring system

If you have an enterprise monitoring system that is already implemented in your environment, you can create event automation plans to forward FSM events to it. FSM offers several predefined actions to help you. For more information, see 7.4, "Automating tasks with event automation plans" on page 271. Instead of selecting "Send an e-mail (Internet SMTP)", you can choose one of the following advanced event actions:

Send an IBM Tivoli Enterprise Console® event

After it is configured, this event action will forward FSM events to your Tivoli Enterprise Console server in the appropriate format.

► Send an SNMP trap reliably to an IBM Tivoli NetView® for IBM z/OS® host

After it is configured, this event action will forward FSM events to your Tivoli NetView host. For your Tivoli NetView for z/OS host to understand the Simple Network Management Protocol (SNMP) data that it receives from FSM, you need to load it with the FSM Management Information Base (MIB) files.

Send an SNMP trap to an IP host

This event action can be used generally when you integrate FSM with a monitoring system that can receive SNMP traps. After it is configured, this action forwards FSM events to your enterprise monitoring system. For your monitoring system to understand the SNMP data, you must load it with the FSM MIB files.

Contact your IBM support representative to obtain the required FSM MIBs.

For more information about these and other event actions, see this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.directo
r.automation.helps.doc/fqm0_c_ea_actions.html

#### 7.7 Monitoring system status and health

The term *monitor* refers to a specific resource counter (for example, CPU Utilization) that you can watch (for real-time monitoring), record (for historical information), or set a threshold on (for alerting and automation).

The Monitors task provides the tools that you need to retrieve real-time status and quantitative data for specific properties and attributes of resources in your environment. You can also set thresholds for the monitors, graph the data that monitors retrieve, and drill down to quickly view the status of resources for each system. The specific monitors that are available vary based on the type of resource.

**Explanation:** For this example, a Microsoft Windows 2008 R2 server with Common Agent installed is used. For more information about agents, see 5.1.5, "Agents and tasks supported" on page 94.

To use a monitor, perform these steps:

1. Open the Monitors task from the FSM Explorer user interface by moving the mouse over the **Monitor** menu and clicking **Monitors**, as shown in Figure 7-39.

IBM Flex Sy	ystem Manag	er™ - 1.3.0		🗹 Status (0) 🔹	🗹 Jobs (27) 🔹	USERID -	0 -	IBM.
Home 🝷	Systems 🝷	Monitor 🔹	Security • Utilities •			Find a System or T	ask	٩
Chassis (1)	Ch:	M	Status Active Status Event Log Service Problems	Monitoring Monitors 년 Thresholds Compliance	Action	IBM Flex System Mana s Filters	ger™	∯ ¶
				Policies	Jobs	nand Definitions and Scheduled Jobs	Compli	
Hosts and VSs (	(0)							

Figure 7-39 FSM Explorer: Monitors

2. Click **Browse** to select a system or group to view monitors, as shown in Figure 7-40.

itors			
	n existing monitor view or create a more about monitors	a new view by selecting the m	nonitors that you want.
	ollowing steps to view and interact	with individual monitors, inc	luding activating thresholds.
	elect a system or group. elect a monitor view, then click Sl	Marthau	
	)n the Monitor View page, select a		ion that you want to perform.
PF-Wind	lows1		Browse
Ionitor \	/iews		
(			
Show	Monitors Create Ac	tions 🔻 Search the ta	ble Search
Select	Name 🗘	Read Only 🗘	Description
	AIX Monitors	True	AIX monitors available for viewing through C
	All Monitors	True	All monitors available for viewing
	Column Management Monitors	False	Monitors available as a column in the resour
	Common CIM Monitors	True	Common monitors available for viewing thro
	Common Monitors	True	Common monitors available for viewing on n
	IBM i Monitors	True	IBM i Monitors available for viewing IBM i res
	Network Monitors	True	Monitors for network systems and devices
	Server system pool Monitors	True	Server system pool monitors across all Syste
	SNMP Monitors	True	Monitors for network systems and devices
	VIOS Monitors	True	VIOS monitors available for viewing through
	Virtualization Monitors	True	Virtualization monitors across all virtual syste
	Workload Monitors	True	Workload monitors across all Workloads

Figure 7-40 Monitors window

 Select Target Systems from the Show menu to see individual systems. Select the system to monitor (in this example, PF-Windows1) and click Add to add it to the Selected list, as shown in Figure 7-41. If needed, you can choose Groups of systems, instead of individual systems. Click OK to proceed.

	ontext Chooser		
Select a va	the monitor views that are used t alid target then add it to the selec arget Systems 💌		Selected:
Target St	ons	Search	Add > PF-Windows1
Select	Name 🔷	Type :	
	PF-PowerVM2-Ethernet0	Switch	
	PF-Switch-10GbVF	Switch	
	PF-Switch-1Gb	Switch	
	PF-Switch-8GbSAN	Switch	
	PF-Windows1	Operating Sys	
	🖼 QLogic HBA Adapter QMI2	Card	
	📟 QLogic HBA Adapter QMI2	Card	

Figure 7-41 Monitors Context Chooser

4. FSM arranges available monitors in groups called *monitor views*. Each view represents a list of the most commonly available monitors in a category, for example, monitors that are supported by AIX. For this example, use the Common Monitors view.

The Common Monitors view contains some of the most common monitors for operating systems that are supported by FSM. When you create your own monitor view, more individual operating systems monitors might be available.

Click Common Monitors or select it, and click Show Monitors, as shown in Figure 7-42.

PF-Windows1 Browse								
Show	Monitors Create Act	tions 🔻 Search the table	Search					
Select	Name 🗘	Read Only 🗘	Description					
	AIX Monitors	True	AIX monitors available for viewing throug					
	All Monitors	True	All monitors available for viewing					
	Column Management Monitors	False	Monitors available as a column in the res					
	Common CIM Monitors	True	Common monitors available for viewing					
<b>V</b>	Common Monitors	True	Common monitors available for viewing o					
	IBM i Monitors	True	IBM i Monitors available for viewing IBM i					
	Network Monitors	True	Monitors for network systems and devices					
	Server system pool Monitors	True	Server system pool monitors across all Sy					
	SNMP Monitors	True	Monitors for network systems and devices					
	VIOS Monitors	True	VIOS monitors available for viewing throu					
	Virtualization Monitors	True	Virtualization monitors across all virtual s					
	Workload Monitors	True	Workload monitors across all Workloads					

Figure 7-42 Monitor Views window with Common Monitors selected

5. The Monitor View window shows all common monitors for the selected Windows target system. You can see the real-time values of the individual monitors and information about activated thresholds. There are no activated thresholds as shown in Figure 7-43.

		lows1				
Activa	ate Threshold	Create Filter	Cre	eate Event Automation Plan   Ac	tions 🔻 🛛 S	earch the ta
Select	Name		٥	Monitor Name 🗘	Monitor Ty 🗘	Threshold
	PF-Windows1			CPU % Utilization	Individual	
	PF-Windows1			Disk 0 Workload	Individual	
	PF-Windows1			Disk Space Remaining	Individual	
	PF-Windows1			Disk Space Used	Individual	
	PF-Windows1			IP Packets Received with Errors/sec	Individual	
	PF-Windows1			IP Packets Received/sec	Individual	
	PF-Windows1			IP Packets Sent/sec	Individual	
	PF-Windows1			Locked Memory	Individual	
	PF-Windows1			Memory Usage	Individual	
	PF-Windows1			Primary file system percent space u	Individual	
	PF-Windows1			Process Count	Individual	

Figure 7-43 Common Monitors Monitor View for the selected target system

6. A *threshold* for a numeric monitor is a high or low limit that you do not want the monitored system resource to exceed. For both the high threshold and the low threshold, you have the option of specifying a warning value and a critical value. For example, a monitor that measures the percentage of used space on a disk drive might have a warning value of 80% and a critical value of 90%.

Select the CPU % Utilization monitor, and click Actions  $\rightarrow$  Activate Threshold to configure a threshold (see Figure 7-44).

	View for PF-Windows1				
Activa	ate Threshold Cre	Create Event Automatic	n Plan	Actions   Search the ta	ble
Select	Name 🗘	Monitor Name	Monitor Ty	Activate Threshold	
<b>V</b>	PF-Windows1	CPU % Utilization	Individual	Create Filter	
	PF-Windows1	Disk 0 Workload	Individual	Create Event Automation Plan	
	PF-Windows1 Disk Space Remaining		Individual	Manage Processes	
	PF-Windows1	Disk Space Used	Individual	Graph	
	PF-Windows1	IP Packets Received with Errors/sec	Individual	Add To Dashboard	-20
	PF-Windows1	IP Packets Received/sec	Individual	Properties	
	PF-Windows1	IP Packets Sent/sec	Individual	Activate Threshold	
	PF-Windows1	Locked Memory	Individual	Columns	
	PF-Windows1	Memory Usage	Individual	Export	-
	PF-Windows1	Primary file system percent space u	Individual	Select All Deselect All	
	PF-Windows1	Process Count	Individual	Show Filter Row	5
	PF-Windows1	TCP Connections	Individual	Clear All Filters	=
	PF-Windows1 UDP Datagrams Received/sec		Individual	Edit Sort	20
	PF-Windows1 UDP Datagrams Sent/sec		Individual	Clear All Sorts	20

Figure 7-44 Clicking Activate Threshold in Actions menu for selected CPU % Utilization monitor

7. When you activate a threshold on a numeric monitor, you get the window shown in Figure 7-45. Activating a threshold includes setting a number of options. Choose whether to generate an event when the threshold is exceeded and determine the amount of time that the threshold waits before it resends the information. Define Critical and Warning threshold values. When the monitored resource exceeds the specified value for any threshold limit, the monitor displays the appropriate icon for a warning or critical notification.

Configure the threshold to trigger an event in the case of high CPU Utilization on the selected Windows system. Select **Critical** and **Warning** under the "Monitor values that are too high" section and configure the values as shown in Figure 7-45. Set the Minimum duration to **20 seconds**. This setting ensures triggering an event if the CPU Utilization value exceeds the threshold for over 20 seconds. Click **OK**.

Threshold	2 - 0
Selected Monitor is CPU % Utilization	
Threshold	
Enable event generation	
Generate events when the value changes	
Maximum queued events:	
0	
Minimum duration:	
20 second(s)	
Resend delay:	
0 day(s) 💙	
Monitor values that are too high:	
Critical:	
95 %	
Warning:	
85 %	
Monitor values that are too low:	
Warning:	
%	
Critical:	
9/6	
OK Cancel	

Figure 7-45 Threshold window

Activa	ate Threshold	Create Filter	Create Eve	nt Automation	Plan Actions 🔻	Search the t	able
Select	Name 🗘	Monitor Name 💠	Moni 🗘	Thres 🗘	Current 🔇	Warning 🗘	C
<b>V</b>	PF-Windows1	CPU % Utilization	Individual	Activated	1%	>= 85.0	>
	PF-Windows1	Disk 0 Workload	Individual		108119.8 bytes/sec		
	PF-Windows1	Disk Space Rem	Individual		26504.3 Megabytes Free		
	PF-Windows1	Disk Space Used	Individual		14353.7 Megabytes Used		
	PF-Windows1	IP Packets Rece	Individual		0 Packets/sec		
	PF-Windows1	IP Packets Rece	Individual		9 Packets/sec		
	PF-Windows1	IP Packets Sent	Individual		2 Packets/sec		
	PF-Windows1	Locked Memory	Individual		44.1 Megabytes		
	PF-Windows1	Memory Usage	Individual		1360.8 Megabytes		
	PF-Windows1	Primary file syst	Individual		35%		
	PF-Windows1	Process Count	Individual		66 Processes		
	PF-Windows1	TCP Connections	Individual		3 TCP Connections		
	PF-Windows1	UDP Datagrams	Individual		3 Packets/sec		
	PF-Windows1	UDP Datagrams	Individual		1 Packets/sec		

The activated Threshold is now visible on the CPU % Utilization monitor, as shown in Figure 7-46.

Figure 7-46 Monitoring View window with activated threshold for CPU % Utilization monitor

In the example, the system's CPU is used at 100%. As shown in Figure 7-47, the Threshold Status turns to Critical. This change happens 20 seconds after the high CPU utilization started. This delay is because the Critical threshold value that we specified earlier is 95 and the minimum duration is 20 seconds.

Monitor \	View for PF-Wind	ows1					
Activate Threshold		Create Filter	Create Event Automation Plan		Actions 🔻	Search the table.	
Select	Name 🗘	Monitor Name 💠	Moni 🗘	Threshold Status 🗘	Current 🗘	Warning	\$
	PF-Windows1	CPU % Utilization	Individual	🔇 Critical	100%	>= 85.0	
	PF-Windows1	Disk 0 Workload	Individual		108119.8 bytes/sec		
	PF-Windows1	Disk Space Rem	Individual		26504.2 Megabyt		
	PF-Windows1	Disk Space Used	Individual		14353.8 Megabyt		
	PF-Windows1	IP Packets Rece	Individual		0 Packets/sec		
	PF-Windows1	IP Packets Rece	Individual		8 Packets/sec		
	PF-Windows1	IP Packets Sent	Individual		2 Packets/sec		
	PF-Windows1	Locked Memory	Individual		44.1 Megabytes		
	PF-Windows1	Memory Usage	Individual		1377.7 Megabytes		
	PF-Windows1	Primary file syst	Individual		35%		
	PF-Windows1	Process Count	Individual		72 Processes		
	PF-Windows1	TCP Connections	Individual		3 TCP Connections		
	PF-Windows1	UDP Datagrams	Individual		2 Packets/sec		
	PF-Windows1	UDP Datagrams	Individual		1 Packets/sec		

Figure 7-47 Monitor View window with Critical Threshold Status for CPU % Utilization monitor

The Critical problem is also displayed in the Active Status window.

In the example, you want to be notified by email in the event of high CPU utilization on your Windows system. Return to the Monitor View for the selected target system. Select the **CPU % Utilization** monitor, and click **Actions**  $\rightarrow$  **Create Event Automation Plan**, as shown in Figure 7-48.

Activa	ate Threshold	Create Filter	reate Event Au	utomation Plan	Actions 🔻 Search the tab	
Select	Name 🗘	Monitor Name 🗘	Monito 🗘	Threshold Status	Edit Threshold	
	PF-Windows1	CPU % Utilization	Individual	🔇 Critical	Deactivate Threshold Delete Threshold	
	PF-Windows1	Disk 0 Workload	Individual		Create Filter	
	PF-Windows1	Disk Space Remai	Individual		Create Event Automation Plan	
	PF-Windows1	Disk Space Used	Individual		Manage Processes	
	PF-Windows1	IP Packets Receive	Individual		Graph	
	PF-Windows1	IP Packets Receive	Individual		Add To Dashboard	
	PF-Windows1	IP Packets Sent/sec	Individual		Properties	
	PF-Windows1	Locked Memory	Individual		Activate Threshold	
	PF-Windows1	Memory Usage	Individual		Columns	
	PF-Windows1	Primary file system	Individual		Export	
	PF-Windows1	Process Count	Individual		Select All	
	PF-Windows1	TCP Connections	Individual		Deselect All	
	PF-Windows1	UDP Datagrams Re	Individual		Show Filter Row	
	PF-Windows1	UDP Datagrams Se	Individual		Clear All Filters	
					Edit Sort	
					Clear All Sorts	

Figure 7-48 Use the Actions menu to create an Event Automation Plan for the selected monitor

- 8. Click Next in the Welcome window.
- 9. Enter a name and description for the event automation plan, as shown in Figure 7-49.

elcome	Name and Description
Name and	Type a name and a description for this event automation plan.
escription ents	*Name:
ent Actions	High Win CPU
ne Range	Description:
Summary	Event response plan on CPU % Utilization threshold events.

Figure 7-49 Create Event Automation Plan Wizard Name and Description window

10. Select threshold levels on which to filter. In this case, select High - Critical and High - Warning, as shown in Figure 7-50. If you want to receive an email when the Critical condition is resolved, select Threshold resolved, as well. Click Next.

✓ Welcome	Events Select threshold levels to filter on. This plan will detect the event type indicated by the selected threshold levels.					
<ul> <li>✓ Welcome</li> <li>✓ Name and</li> <li>✓ Description</li> </ul>						
➡ Events Event Actions Time Range Summary	Select th	: Itilization: High - Critical, High - Warning, Irreshold levels:				
	Select	Threshold level	Event type			
		High - Critical >= 95.0 %	Director Director Agent.CPU Monitor.CPU U			
		High - Warning >= 85.0 %	Director.Director Agent.CPU Monitor.CPU U			
		Low - Critical %	Director.Director Agent.CPU Monitor.CPU U			
		Low - Warning %	Director.Director Agent.CPU Monitor.CPU U			
		Threshold resolved	Director.Director Agent.CPU Monitor.CPU U			

Figure 7-50 Create Event Automation Plan Wizard Events window

11. Select the Add to the event log and Electronic Service Notification event actions as shown in Figure 7-51. You created the Electronic Service Notification action in 7.4, "Automating tasks with event automation plans" on page 271. It sends an email notification with event information.

✓ Welcome	Event Actions Specify one or more actions that will occur when this event automation plan is triggered.					
✓ Name and ✓ Description						
🗸 Events	Event Ad	tions				
⇔ Event Actions	Creat	Create Like Edit	Delete Actions  Search the table			
Time Range	Select	Name 💠	Type 🗘			
Summary		Add to the event log	Add to the event log			
		Electronic Service Notification	Send an e-mail (Internet SMTP)			

Figure 7-51 Create Event Automation Plan Wizard Event Actions window

12. In the example, the Windows server runs heavy CPU load operations during the weekend, so high CPU utilization is expected and considered normal. Therefore, you want to be notified for high CPU utilization only from Monday until Friday. In the Time Range window, select **Custom** and specify the time range constraints for the automation plan as shown in Figure 7-52. Click **Add** and then click **Next**.

✓ Welcome	Time Range						
Name and	(Optional) Specify any time-range constraints for this event automation plan.						
<ul> <li>Description</li> <li>Events</li> <li>Event Actions</li> <li>Time Range Summary</li> </ul>	<ul> <li>○ All the time (24×7)</li> <li>● Custom</li> <li>To specify certain days in a time range, select the day from the list and click Add. To specify times clear the All day check box, set the start and end of the time range, and click Add. You can add mutime range. The start and end of the time range is rounded to the nearest 15-minute interval. For you specify a time range that starts at 10:10 and ends at 1:35, the event automation plan uses 1 13:30 for the time range.</li> </ul>						
	Beginning day and time: Ending day and time:						
	Monday M 6:00 AM 🗘 Friday 🕥 5:59 PM 🔷 🗌 All day						
	Add Specified time range:						
	Monday, 6:00 AM-12:00 AM Tuesday, All day Wednesday, All day Thursday, All day Friday, 12:00 AM-6:00 PM						
	Remove						

Figure 7-52 Create Event Automation Plan Wizard Time Range Custom window

🗸 Welcome	Summar	y .				
✓ Name and ✓ Description	You have specified the following settings for this event automation plan:					
V Events	Name:	High Win CPU				
✓ Event Actions	Description:	Event response plan on CPU % Utilization threshold events. Monday, 6:00 - 24:00				
🗸 Time Range		Tuesday, 0:00 - 24:00				
✿ Summary	Time range:	Wednesday, 0:00 - 24:00 Thursday, 0:00 - 24:00 Friday, 0:00 - 18:00				
	Targets:	PF-Windows1				
	Event filter:	High Win CPU-Filter CPU % Utilization: High - Critical >= 95.0, High - Warning >= 85.0,				
	Event actions:	Electronic Service Notification Add to the event log				
	Apply this	s event automation plan when I click Finish.				

Figure 7-53 Create Event Automation Plan Wizard Summary window

14.In the FSM Explorer web interface, open the Event Automation Plans window (see 7.4, "Automating tasks with event automation plans" on page 271) to see the automation plan that you just created (Figure 7-54).

Jse event		asks based on received events. An eve ke action, and one or more event actio			
	comation Plans	Delete Actions V Se	earch the tab	le	
Select	Name 🔷	Targets 🗘	Status 🗘	Time range	
	High Win CPU	PF-Windows1	Active	Monday, 6:00-24:00, 1	
	Hot air	All Systems	Active	All the time (24x7)	

Figure 7-54 Event Automation Plans window

The automation plan is active. Any time that the CPU % Utilization threshold for your Windows system turns to the Critical or Warning state, you are notified. This notification is sent to the email address that is specified in the Electronic Service Notification event action settings.

15.Now, decrease the generated CPU load on your Windows system. Open the Event Log window. Enter PF-Windows1 in the Search field to filter only events that are related to your Windows system. Notice the Resolution events in Figure 7-55 that are displayed after you decrease the CPU load.

vent filt	er:				
All Even	ts	×			
Refre	Event Text	ions V PF-	Windows1 🗶	Search Category 🗘	Date and
	• • • • • • • • • • • • • • • • • • •	*	_		
	Monitor 'Individual threshold for CPU %	PF-Windows1	Information	Resolution	Jun 18, 2
	Monitor 'Individual threshold for CPU % Monitor 'Individual threshold for CPU %	PF-Windows1 PF-Windows1	Information	Resolution Alert	Jun 18, Jun 18,

Figure 7-55 Event Log window

16.Open the Thresholds window from the FSM Explorer (Monitor → Thresholds). Use this window (see Figure 7-56) as a quick way to view and manage thresholds that are set for the monitors on your resources.

Threshol	as							_	
Activa	ate Threshold	Cre	ate Filter	Cr	eate Event Autom	ation Plan	Actions 🔻		Search the t
Select	Name	٥	Monitor N	\$	Monitor Ty 🗘	Threshold \$	Warning	٥	Critical
Derect						Activated			>= 95.0

Figure 7-56 Thresholds window

#### 7.8 Remote management

With the Remote Control application in IBM Flex System Manager management software, you can manage X-Architecture compute nodes as though you were at a local console. This configuration is useful in many cases, especially when you do not have any other way of accessing your system remotely.

**Requirement:** Remote Control is a Java Web Start application that requires the IBM or Oracle/Sun Java runtime environment (JRE) plug-in, Version 6.0, update 18 or later. You must obtain and install the JRE plug-in before you can use the Remote Control application.

To enable remote management, perform these steps:

1. Return to the Chassis Map and select a compute node. The Common Actions navigation bar gives you quick access to some of the most common tasks performed on the system, as shown in Figure 7-57.

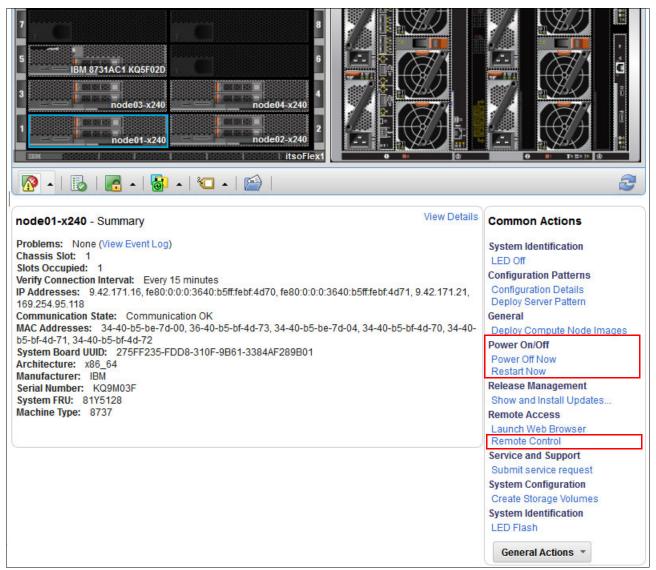


Figure 7-57 Chassis Map with selected compute node and available Common Actions menu

If you need to perform hardware maintenance, you can power off and power on or restart the compute node.

- 2. Under Common Actions, click the **Remote Control** task to start the Remote Control Java application. When you start the Remote Control application from FSM, you are prompted to save a shortcut to the application on your system. You can then use this shortcut to open the Remote Control session to the specified compute node without using the FSM user interface. However, your computer must have access to FSM because the application validates the user ID with the management software user registry.
- 3. Select one of the connection types, as shown in Figure 7-58:
  - If you need to give exclusive access to the remote control session, select Single-user access. All other Remote Control sessions to the selected compute node are blocked until you disconnect from the selected compute node.

		IBM.
Flex	System Manager Remote Control Select the connection type to use for connecting to the selected compute node. Single-user will give exclusive access to the remote cor session. Multi-user will allow multiple users to connect to the rem session. Single-user Multi-user Multi-user Multi-user	note

- Select Multi-user to allow multiple users to connect to the remote session.

Figure 7-58 FSM Remote Control connection type window

4. The console window opens as shown in Figure 7-59. You can now use the mouse and keyboard to operate with the server as though you were at the local console. Click the arrow on top of the console window to open the Remote Control toolbar.

Remote Control			
IBM 87 × +	J		
A 7		The second secon	

Figure 7-59 Remote Control console window

5. The Remote Control toolbar (Figure 7-60) offers functions, such as screen capture, compute node power controls, defining custom key sequences, sticky keys, mounting media, and Remote Control preferences. Click the **Mount Media** icon and select **Mount Remote Media**.

Remote Contro	
IBM 87 ×	•
	✓ General Alt Shift general with the second sec

Figure 7-60 Remote Control toolbar

 You can mount a local CD-ROM drive, upload an image to the integrated management module (IMM) (up to 50 MB), or select an image. Highlight Select an image and click Add as shown in Figure 7-61.

Nounting options for "IBM 8737AC1	23FFP57"
vailable Resources	Selected Resources
Upload image to the IMM 51200 K of 51200 K free. Select an image. CDROM Drive (D:) CDROM Drive (E:)	Add -> <- Remove

Figure 7-61 Mount Remote Media window

7. You are prompted to select an image from your local computer. Select the image that you want to mount and click **Open**, as shown in Figure 7-62.

📤 Open	×
Look In:	VMware
VMware-V	/IMSetup-all-5.0.0-639890.iso
File Name:	VMware-VIMSetup-all-5.0.0-639890.iso
Files of Type:	Disk Images
	<u>Open</u> <u>Cancel</u>

Figure 7-62 Open dialog box

8. The image file path is displayed in the list of devices available for mounting, as shown in Figure 7-63. Click **Mount All**.

Mounting options for "IBM 8737AC1	23FFP57"			
Available Resources		Selec	ted R	Resources
Upload image to the IMM 51200 K of 51200 K free.		0	5	Device
Select an image.				C:\Install\VMware\VMware-V
CDROM Drive (D:)	Add ->			
CDROM Drive (E:)	<- Remove			

Figure 7-63 Mount Remote Media window that shows Selected Resources

9. The image is now mounted as shown in Figure 7-64. If you need to unmount it at any time, click **Unmount All**. Leave the image mounted and click **Close**.

🕌 Mount Remote Media	
Mounting options for "IBM 8737AC1	23FFP57"
Available Resources	Selected Resources
Upload image to the IMM 51200 K of 51200 K free. Select an image. CDROM Drive (D:) CDROM Drive (E:)	Add ->         <- Remove
Refresh Resource List	Mount All Unmount All

Figure 7-64 Mount Remote Media window that shows mounted resources

10.Open **My Computer** in Windows to ensure that you can access the mounted image as a CD drive.

You can also use the power control options from the Remote Control toolbar. You can choose to restart/power off the compute node immediately (**Restart Immediately/Hard Power Off**) or gracefully shut down the OS before restarting or powering off the compute node (**Shut Down OS and Restart/Shut Down OS and Power Off**), as shown in Figure 7-65.

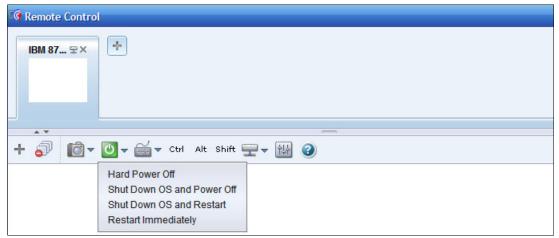


Figure 7-65 Power Controls menu on the Remote Control toolbar

11. You can quickly open a Remote Control session to another compute node by clicking the plus sign (+) icon next to your Remote Control session thumbnail. See Figure 7-66.

Remote Control			
IBM 87 空×	+		
	Flex System Manager Ren	note Control	
	Available compute nodes		
	Flex System Manager:	r2-c2-ch4-itme1.rtp.stglabs.ibm.com	
+ 🎝 🔯 -	Chassis:	r2-c2-ch4-mm.rtp.stglabs.ibm.com	•
	Connection mode:	Single-user mode	
	Compute node:	Select all	
		1: IBM 8731AC1 23AYBM3	
		3: 9203511C-E609-11E0-AED7-5C	
		4: IBM 8737AC1 DSY0123	
		5: IBM 8737AC1 23ZYT51	
		<ul> <li>8: IBM 8737AC1 23RVZ77</li> <li>9: IBM 8737AC1 23ZVC75</li> </ul>	
		5.10m 0131/1012321013	
	Connect	Cancel Help	

Figure 7-66 Window showing available compute nodes for Remote Control

12. Click Cancel and close the Remote Console.

The user ID that is used to start the Remote Control application must be a valid user ID that is defined in the FSM user registry. The user ID must also have sufficient user authority to access and manage a compute node. You can assign the role of SMAdministrator to the user ID. Or, you can define a custom role for compute node access and management, and assign that role to the user ID.

**Restriction:** Remote Control in FSM is available only for X-Architecture compute nodes. You can establish a terminal console session to any virtual server on a Power Systems compute node. For more information, see this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc. 8731.doc/using_remote_access.html

# 8

### **IBM Fabric Manager**

IBM Fabric Manager enables you to quickly replace and recover compute nodes in your IBM Flex System or to preconfigure your network and storage infrastructure in the IBM Flex System chassis.

The following topics are covered:

- ▶ 8.1, "IBM Fabric Manager overview" on page 306
- ▶ 8.2, "Starting the IBM Fabric Manager interface" on page 306
- ▶ 8.3, "Adding devices" on page 307
- ▶ 8.4, "Adding a device pool" on page 310
- ▶ 8.5, "Adding a boot target template" on page 310
- ▶ 8.6, "Adding a profile" on page 312
- ► 8.7, "Profile deployment" on page 313
- ► 8.8, "Pushing a deployment" on page 313
- ▶ 8.9, "Verifying an IBM Fabric Manager deployment" on page 314
- 8.10, "Adding and starting a monitor" on page 316

#### 8.1 IBM Fabric Manager overview

IBM Fabric Manager enables you to use virtual Ethernet Media Access Control (MAC), Fibre Channel worldwide name (WWN), and serial-attached SCSI (SAS) WWN addresses to preconfigure your network and storage environments before any compute nodes are inserted into the chassis.

IBM Fabric Manager also monitors server health and can automatically replace a failed server from a designated pool of servers without user intervention. After a failure alert occurs, IBM Fabric Manager will attempt to power off the failing node. IBM Fabric Manager will then apply the failed node's virtualized addresses and boot parameters to the next node in the standby pool and power on that standby server.

In order to take full advantage of IBM Fabric Manager, you must set up your server environment to boot from SAN.

**Note:** IBM Fabric Manager is not supported with SAS adapters on Power compute nodes. Management of Fibre Channel boot targets is also not supported. You must pre-assign Fibre Channel boot targets in the Software Management Services (SMS) menus on the Power compute node.

#### 8.2 Starting the IBM Fabric Manager interface

Perform the following steps to start the IBM Fabric Manager user interface from the IBM Flex System Manager:

1. Log in to the IBM Flex System Manager, click the **Home** tab, and select the **Applications** tab, as shown in Figure 8-1.

IBM Flex	System Manager*			Welcome USERID	Problems	0	0
Hom	ne 🗙 Chassis Man.	×					
ſ							
Hon	ne						
	Jse these tabs to j	perform some initial s	etup tasks, view	or activate plug-ins	, perform admin	istration	tasks, a
	iccess additional in		Plug-ins	Administration	Applications	Lea	
			<u> </u>		· · ·		+
	Use this tab to	work with applications	designed to ext	end the capabilities	of the IBM Flex	System	Manage
	Refresh	September 6, 2013	2:38:12 PM EDT				
	IBM Ea	bric Manager 🚕					
_		nager is an address v	irtualization tool.				
•	Start Sto	p Restart dministration console					

Figure 8-1 Flex System Manager: Applications tab

2. Select **IBM Fabric Manager**. This opens a new browser tab and presents the IBM Fabric Manager interface login window, as shown in Figure 8-2. Enter your user name and password.



Figure 8-2 IBM Fabric Manager login window

**Default credentials:** IBM Fabric Manager has a default user name of USERID and password of PASSWORD (with a zero, not an O). After you log in to IBM Fabric Manager for the first time, you are required to change the password.

3. The IBM Fabric Manager main window opens.

IBM Fabric	: Manager						USERID	Legal	I	Log Out	Hel	p IBM.
Hardware 👻	Address Pools 👻	Templates 🖣	Profiles	Deploy	ments	Monitors	Settings ·	•				
Profiles	5							Actio	ns 🔻			
Name	Hardwar	e Pool	Address Ty	/pes	Boot T	arget Types	1	Valid				
🔝 🛛 No f	🐲 No filter applied									w to view		
			No Data Ava	ilable						de	itailed in	formation

Figure 8-3 IBM Fabric Manager main window

## 8.3 Adding devices

This section describes how to add hardware devices from your Flex System chassis and define pools into which to group your compute nodes.

Before adding pools, you must add each chassis with hardware that you want to manage with IBM Fabric Manager.

Perform the following steps to add a chassis:

- 1. From the IBM Fabric Manager main window, click Hardware and select Devices.
- 2. Click the Actions menu and select Add, then select one of the following choices:
  - Add a Single Chassis

Select this choice to add a single chassis by its IP address.

- Add Multiple Chassis by Range

Select this choice to add multiple chassis in a range of IP addresses.

- Add Chassis from file or URL

Select this choice to import IP addresses from a file or URL. There is a maximum of 100 IP addresses that can be imported. Any additional IP addresses will be ignored without warning. The file must be a text file with one valid IPv4 or IPv6 address per line.

For the example in this book, add only a single chassis and click **Next**. Figure 8-4 shows the Add Individual Hardware window that you use to add a single chassis.

Add Individual Hardware		х
IP/Hostname:		]
Username:		
Password:		]
SNMPv3 receiver IP:		
SNMPv3 password:		
Backup SNMPv3 receiver IP:		
Backup SNMPv3 password:		
TCP command mode		
Order:	Secure then unsecure 🔍	
Secure port:	6091	
Unsecure port:	6090	
🧾 Generic chassis		
	Back Cancel Sta	rt

Figure 8-4 Adding a single chassis

Enter the following information:

- IP/Hostname

Enter the IP address or Domain Name System (DNS) host name of the Chassis Management Module (CMM) for the chassis you are adding.

- Username and Password

Enter the user ID and password for the CMM for the chassis you are adding.

SNMPv3 receiver IP and SNMPv3 password

These fields are required fields to monitor the chassis for failover events. The Flex System Manager IP address must be entered here. The password must be at least eight characters long. It does not have to be the same as any other SNMPv3 password for the environment. The Backup SNMPv3 fields are left blank.

- Generic chassis

Select this option to add the chassis but not log in or gather inventory.

All other listed fields can be left at their defaults. When you have completed the required fields, click **Start** and the Hardware Discovery Progress dialog box (see Figure 8-5) lists all chassis that it discovers and their progress. The time for this task to complete depends upon the number of chassis being discovered. After all the chassis are discovered, click **OK** to complete this process.

IP Address	Progress	Status
9.42.170.215		Success
	100%	

Figure 8-5 Hardware Discovery Progress window

After your chassis is added, the chassis appears on the Hardware Devices section of the IBM Fabric Manager interface as shown in Figure 8-6.

Hardware Devices			
			Actions 🔻
Name	Туре	Вау	IP Address
SN#Y011BG24H0BB	Flex System		9.42.170.215
± (1) node01-x240	8737-AC1	1	
🔳 [2] node02-x240	8737-AC1	2	
🔳 [3] node03-x240	8737-AC1	3	
🔳 [4] node04-x240	8737-AC1	4	
[5] node05-FSM	8731-AC1	5	
📧 (10) node06-p270	7954-24X	10	
[1] EN4093 10Gb Ethernet Switc		1	9.42.171.8
[3] FC3171 8Gb SAN Switch		3	9.42.171.9

Figure 8-6 IBM Fabric Manager Hardware Devices with chassis added

## 8.4 Adding a device pool

A *device pool* groups compute nodes together to define a standby pool of hardware that can be used to quickly recover from a failed compute node. All compute nodes used in a hardware pool must be of the same size (single-wide or double-wide) and configuration.

Perform the following steps to add a device pool:

- 1. From the IBM Fabric Manager Interface, click Hardware and then select Pools.
- 2. Click the Actions menu and select Add. Figure 8-7 shows the Add a New Pool dialog box.

Add a New Po	ol			х
Pool name: Show: Select:	linuxsrv01_pool	ex System		
Name		Туре	Add / Remove	
🖃 SN#Y011B	G24H0BB	Flex System		
bay 1				
bay 2				
bay 3				ш
bay 4				
bay 5				
bay 6				
bay 7				
bay 8		2		
<b>h</b> O				-
			Cancel Sav	/e

Figure 8-7 Adding a new hardware pool

Enter the following information:

Pool name

Enter the name of the hardware pool.

Select

You can select the **All Slots** check box to enable management of all the compute nodes or slots in the chassis, even if there is not a compute node in every slot. To choose individual slots or compute nodes, expand the list of slots by clicking to the left of the chassis name. Select the check box for each slot to add to the pool.

After you enter a name for your pool and select your slots, click **Save** to create the new pool. The pool that you just created now shows in the list of pools on the Hardware Pools page.

## 8.5 Adding a boot target template

This section describes how to add a boot target template to IBM Fabric Manager.

A *boot target template* enables IBM Fabric Manager to quickly recover from compute node hardware failure by reconfiguring a standby server in the hardware pool to boot from the primary server's disk.

**Boot order:** Although IBM Fabric Manager will configure the boot list on the SAS or FC adapter, it does not configure the Unified Extensible Firmware Interface (UEFI) boot list on System x compute nodes. You must manually configure your compute nodes to boot from the FC or SAS adapters.

Follow these steps to add a new boot template to IBM Fabric Manager:

- 1. From the IBM Fabric Manager interface, click Template and select Boot Target.
- 2. Click Actions and select New. Figure 8-8 shows the Create Boot Targets dialog box.

Create E	Boot Targets	х
Name:	linuxsrv01_boot_template	
Туре:	Fibre Channel 🍥 🛛 SAS 💿	
Primary	boot targets	
Order	Address	LUN
1	50:05:07:68:05:0C:03:70	0
2	50:05:07:68:05:0C:03:71	0
Seconda	ry boot targets	
Order	Address	LUN
1	<enter address=""></enter>	0
2	<enter address=""></enter>	0
		Cancel Save

Figure 8-8 Creating a boot target template

Configure the following settings:

Name

Type the name of your new boot target pool.

– Туре

You can define either a Fibre Channel or SAS boot target. For this example, we will boot from SAN and will not use SAS.

Primary boot targets

Enter the worldwide name (WWN) addresses of the target SAN storage system and logical unit number (LUN) ID of the target device to use to boot the server.

Secondary boot targets

Enter the WWN addresses of the target SAN storage system and the LUN ID of the secondary target device, if applicable, to use to boot the server.

After completing the required fields, click **Save** to finish creating the boot target template. After it is completed, the new template shows in the list of defined templates.

## 8.6 Adding a profile

*Profiles* tie hardware pools and templates together into a single entity that can be deployed to a chassis.

Perform the following steps to add a profile:

- 1. From the IBM Fabric Manager interface, click Profiles.
- 2. Click the Actions menu and select Add. Figure 8-9 shows the Create Profile window.

Create Profile			2
Profile Name:	linuxsrv01_profile		
Hardware Pool:	linuxsrv01_pool	-	
Ethernet Address Pool:	IBM MAC (Predefined)	*	×
FC WWNN-A Address Pool:	EMULEX WWNNA (Predefine	*	×
FC WWNN-B Address Pool:	EMULEX WWNNB (Predefine	*	×
FC WWPN-A Address Pool:	EMULEX WWPNA (Predefine	*	×
FC WWPN-B Address Pool:	EMULEX WWPNB (Predefine	-	×
SAS Address Pool:		*	×
Chassis Template:	Single Wide	*	
FC Boot Target Template:	linuxsrv01_boot_template	-	×
SAS Boot Target Template:		-	×
BladeCenter vNIC Template:		*	×
Flex System vNIC Template:		•	×

Figure 8-9 Creating a profile

Enter the following parameters:

Profile Name

Enter the name of the profile.

Hardware Pool

Select a previously defined hardware pool from the list.

- Address pools and templates

Profiles use Ethernet, FC, and SAS addresses and templates to configure a standby server with a failed server's virtual addresses so that a quick recovery from hardware failure can be performed automatically. There are predefined address pools and templates that can be used for simpler and faster configuration. Select the options from each list that best fit your environment and needs for this particular profile.

- Chassis Template

Select **Single Wide** or **Double Wide**. This must match the size of the compute nodes in the pool selected in the Hardware Pool field.

- FC (or SAS, if applicable) Boot Target Template

Select the previously created boot target template.

Click **Save** to finish creating the profile. The profile now appears in the list of defined profiles in the IBM Fabric Manager interface.

## 8.7 Profile deployment

Before IBM Fabric Manager can manage the hardware defined by a profile, it must be deployed.

**Deployment:** Deployment of a profile must be performed from the *Profiles* window of IBM Fabric Manager and not from the *Deployments* window.

Perform the following steps to deploy a profile:

- 1. From the IBM Fabric Manager interface, click Profiles.
- 2. Click the name of a profile to select it.
- 3. Click the Actions menu and select Deploy, as shown in Figure 8-10.

Profiles				,	Actions •
Name	Hardware Pool	Address Types	Boot Target Types		Add
🖘 🛛 No filter a	applied				Edit
linuxsrv01_profil	e linuxsrv01_pool	Eth, FC	FC	1	Сору
					Remove
					Deploy

Figure 8-10 Deploying a profile

4. Type a name for the deployment in the Deploy Profile dialog box shown in Figure 8-11.

Deploy Profil	е	х
Deploy as:	linuxsrv01_deployment	
	Cancel Deploy	

Figure 8-11 Entering a name for profile deployment

- 5. Click **Deploy** to deploy the profile.
- 6. Click **Close** on the Success dialog box to finish.

The deployed profile now is listed in the Deployments window of the IBM Fabric Manager interface. Click **Deployments** to view the list.

## 8.8 Pushing a deployment

The newly created deployment must now be edited and pushed out to the chassis and hardware.

Perform the following steps to push a deployment in IBM Fabric Manager:

- 1. Click Deployments in the IBM Fabric Manager interface.
- 2. Select the name of the deployment that you want to push.
- 3. Click the Actions menu and select Push, as shown in Figure 8-12.

Deployments		
		Actions -
Name	Source Profile	Edit
🖈 🛛 No filter applied		Remove
linuxsrv01_deployment	linuxsrv01_profile	Push
		Create Import

Figure 8-12 Pushing a deployment

4. The Pre-deployment Options window opens, as shown in Figure 8-13.

Pre-deployment Options	2
Mode for all b	ays: 🍥 Enable 💿 Disable 💿 Ignore
Name	
9.42.170.215	
bay 3	🍥 Enable 🔿 Disable 🔿 Ignore
bay 4	🍥 Enable 💿 Disable 💿 Ignore
Other options: Ignore Power Compare with current data ⑦	Cancel Continue

Figure 8-13 Options dialog box before pushing the deployment

The Pre-deployment Options dialog box allows you to select which compute nodes in the hardware pool receive the deployment being pushed. Click **Continue**.

- 5. A confirmation box asking whether you want to push this deployment appears. Click OK.
- 6. A progress window showing the status of all chassis and node deployment and overall progress opens. Click **OK** when it is complete.

## 8.9 Verifying an IBM Fabric Manager deployment

This section describes the necessary steps to verify that a deployment was successfully pushed to the hardware in the profile defined in the hardware pool used in the deployment.

Perform the following steps to verify deployment:

1. From the IBM Fabric Manager interface, click Hardware and select Devices.

- 2. Expand the hardware list by clicking the plus sign (+) to the left of the chassis name or IP address.
- 3. Verify that the IBM Fabric Manager (IFM) Mode column entries for the nodes used in this deployment are ENABLED, as shown in Figure 8-14.

Actions										
Name	Туре	Bay 🔺	IP Address	License	Inventoried	Power	Network	IFM Mode	Source	IFM Status
SN#Y011BG24H0BB	Flex System		9.42.170.215	1	~	2002			810	30
🔳 [1] node01-x240	8737-AC1	1				0		DISABLED	CMM	not available
📧 [2] node02-x240	8737-AC1	2				0	are)	DISABLED	CMM	not available
\pm (3) node03-x240	8737-AC1	3						ENABLED	CMM	not available
🗄 [4] node04-x240	8737-AC1	4						ENABLED	CMM	not available

Figure 8-14 Verify IFM mode

- 4. For nodes that are standby nodes, select each one, click the **Actions** menu, then select **Toggle IFM Mode**. The IFM Mode of each standby server must be DISABLED.
- 5. Power on the primary node or nodes in the profile that you deployed. Select each node and click the **Actions** menu and select **Toggle Power**. Click **OK** to confirm that you want to power on the node.
- An information dialog box appears stating that it can take some time for the Devices window to reflect changes in status and recommends waiting 1 - 3 minutes before refreshing the window. Click **OK** to continue.
- 7. When a primary node has booted and has been acquired by IBM Fabric Manager, the IFM Status column shows a green box with a white check mark inside it and a Details link, as shown in Figure 8-15. The details column to the right of the hardware table also shows an IFM Status of NORMAL.

										Actions 🛪	
Name	Туре	▲ Bay	IP Address	License	Inventoried	Power	Network	IFM Mode	Source	IFM Status	Name: [3] node03-x24
SN#Y011BG24H0BB	Flex System		9.42.170.215	1	1	5.00	*				Device Type:
🔳 [1] node01-x240	8737-AC1	1				0		DISABLED	CMM	not available	Server
🔳 [2] node02-x240	8737-AC1	2				0		DISABLED	CMM	not available	
🗄 (3) node03-x240	8737-AC1	3				0		ENABLED	CMM	🔽 Details	IFM Mode: ENABLED
🗏 [4] node04-x240	8737-AC1	4						DISABLED	CMM	not available	
(5) node05-FSM	8731-AC1	5				0		DISABLED	CMM	not available	IFM Status: NORMAL
🔳 (10) node06-p270	7954-24X	10				0	1117	DISABLED	CMM	not available	NORMAL
[1] EN4093 10Gb Ethernet Switc		1	9.42.171.8			•					IFM Applied: true
[3] FC3171 8Gb SAN Switch		3	9.42.171.9			0					Power State: On

Figure 8-15 Verifying IFM status for a primary node

8. Click Details. The Review IFM Status window opens, as shown in Figure 8-16.

Ethernet	Fibre	Channel	SAS Virtual				
			orio filidar				
onset 🍯	0 () 1 (	J 2 🕛 3					
Offset	Mezz	Port	WWNN	WWPN	WWPN Boot Order	WWNN Boot Order	Status
0	1	1	2F:FE:00:00:C9:00:00:00	2F:FC:00:00:C9:00:00:00	1	1	n/a
0	1	2	2F:FF:00:00:C9:00:00:00	2F:FD:00:00:C9:00:00:00	1	1	n/a
0	1 2	2 1	2F:FF:00:00:C9:00:00:00 2F:FE:00:00:C9:00:00:01	2F:FD:00:00:C9:00:00:00 2F:FC:00:00:C9:00:00:01	1	1	n/a Norm

Figure 8-16 Viewing the IFM status details

 Review the addresses applied to the node by clicking each tab and verifying that the addresses are within the range of the defined pools used in the hardware pool with which the node is associated. To close this dialog box, click the small (x) in the upper-right corner.

## 8.10 Adding and starting a monitor

Failover monitors can be configured to watch for particular events that will then trigger an automatic failover to a standby node in a pool.

#### Adding a monitor

Perform the following steps to add a monitor to IBM Fabric Manager:

- 1. From the IBM Fabric Manager interface, click Monitors.
- Click the Actions menu and select Add. Figure 8-17 shows the Create Monitor dialog box.

Create Monitor	x
Monitor name:	linuxsrv01_pool
Monitored pool:	linuxsrv01_pool
Standby pool:	linuxsrv01_pool
Failover settings:	
📃 Ignore model	📃 Ignore type
📃 Ignore width	Ignore power state
Ignore partition	Failover VLAN
Triggering events:	
🔽 Power off	🔽 Removal
💟 CPU failure	📝 Hard drive failure
🔽 Memory failure	Communication error
🔽 No power	Voltage warning
🔽 PFA	
	Cancel Save

Figure 8-17 Creating a monitor with sample events selected

Enter the following parameters:

Monitor name

Enter a name for this monitor.

Monitored pool

Select the pool to monitor for events.

- Standby pool

Select the pool of standby hardware to which to fail over when a monitored event occurs.

- Failover settings

Select the settings for this failover event. For more detailed information about each of these settings, see the Failover Settings section of the Failover Monitors help that can be accessed by using the Help link in the upper-right corner of the IBM Fabric Manager interface.

- Triggering events

Select the events that will trigger a failover event. For more detailed information about each of these events, see the Triggering Events section of the Failover Monitors help that can be accessed by using the Help link in the upper-right corner of the IBM Fabric Manager interface.

3. Click Save.

The newly created monitor now appears in the list of defined monitors as shown in Figure 8-18.

Failover Monitors			
			Actions -
Name	Active	Summary	Status
🗱 🛛 No filter applied			
linuxsrv01_pool	Inactive	linuxsrv01_pool fails into linuxsrv01_pool	

Figure 8-18 Viewing the list of defined monitors

#### Starting a failover monitor

Before IBM Fabric Manager can automatically fail over to standby hardware, you must start your defined monitors.

Perform the following steps to start a failover monitor:

- 1. To select a monitor, click the name of the monitor that you want to start.
- 2. Click the Actions menu and select Start.

When a failover monitor is started, it registers all the chassis associated with the pools used in the monitor. During chassis registration, you might see a status icon as shown in Figure 8-19 on page 318.

Name	Active	Summary	Status
辞 🛛 No filter applied			
linuxsrv01_pool	Active	linuxsrv01_pool fails into linuxsrv01_pool	٩

Figure 8-19 Chassis registration status

To refresh the monitor status, click **Monitors** in the IBM Fabric Manager interface. It can take several minutes for all of the chassis to be registered. After the chassis registration process is complete and the monitor starts, you see a green box with a white check mark in it as the status icon shown in Figure 8-20.

Name	Active	Summary	Status
😒 🛛 No filter applied			
linuxsrv01_pool	Active	linuxsrv01_pool fails into linuxsrv01_pool	

Figure 8-20 Monitor startup successful

The monitor that you just created is now started and waiting for events to trigger a failover.

## 9

# Managing the KVM environment with IBM Flex System Manager

This chapter addresses how to manage the Red Hat Enterprise Linux (RHEL) KVM-based virtualization environment with IBM Flex System Manager (FSM). It covers how to enable Kernel-based Virtual Machine (KVM) to be managed by FSM, and how to perform typical virtualization management tasks. These tasks include virtual machine lifecycle management, automation capabilities, and maintenance.

This chapter includes the following section:

- 9.1, "KVM management architecture" on page 320
- 9.2, "KVM platform agent installation" on page 320
- 9.3, "Image repository for KVM" on page 328
- ▶ 9.4, "Creating KVM storage system pools" on page 350
- 9.5, "Creating KVM network system pools" on page 352
- 9.6, "Creating KVM server system pools" on page 365
- 9.7, "Add host to an existing server system pool" on page 372
- ▶ 9.8, "Operating a KVM virtual infrastructure" on page 375

## 9.1 KVM management architecture

If you want to install an environment by using the Network File System (NFS) storage-based solution, see this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fco m.ibm.director.vim.helps.doc%2Ffsd0_vim_r_kvm.html

The SAN storage configuration looks more complex than the NFS solution, but the block storage-based model offers better performance, and more functionality and flexibility.

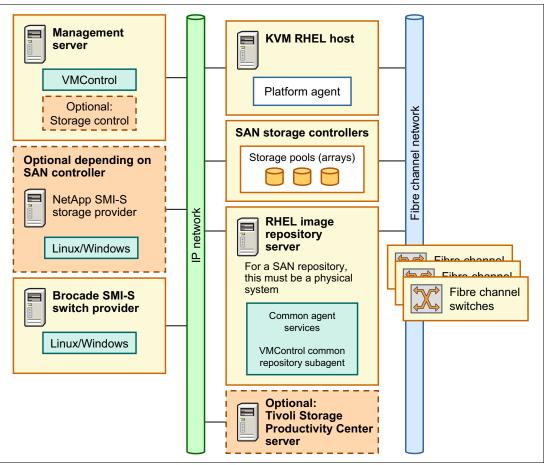


Figure 9-1 illustrates a KVM virtualization environment with SAN storage.

Figure 9-1 Select option to install KVM host

Before you start the implementation of the SAN storage-based solution, see "SAN storage-based model" on page 107.

## 9.2 KVM platform agent installation

To manage the KVM host from IBM Flex System Manager VMControl, you must manually install an agent that is called the KVM Platform Agent. You cannot use the Deploy Agent wizard on the IBM Flex System Manager to deploy this agent.

#### 9.2.1 Preparation

Install and configure RHEL 6.2 on the compute node using the Virtualization Host role. RHEL installation is not described in this book.

To allow FSM communications to the KVM platform agent, perform the following steps:

1. Disable SUSE Linux (SELinux) as shown in Figure 9-2.

```
[root@KVM01 selinux] # pwd
/etc/selinux
[root@KVM01 selinux]# ls
config config.ori restorecond.conf restorecond_user.conf semanage.conf targeted
[root@KVM01 selinux]# cat config
# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
    enforcing - SELinux security policy is enforced.
±
    permissive - SELinux prints warnings instead of enforcing.
±
     disabled - No SELinux policy is loaded.
SELINUX=disabled
# SELINUXTYPE= can take one of these two values:
    targeted - Targeted processes are protected,
    mls - Multi Level Security protection.
SELINUXTYPE=targeted
[root@KVM01 selinux]#
```

Figure 9-2 Disable SELinux

**Tip:** You can also configure SELinux in "permissive" mode if required for security reasons.

2. Configure iptables as shown in Figure 9-3.

```
[root@KVM01 selinux]# iptables -A INPUT -p tcp --dport 427 -j ACCEPT
[root@KVM01 selinux]# iptables -A INPUT -p udp --dport 427 -j ACCEPT
[root@KVM01 selinux]# iptables -A INPUT -p tcp --dport 22 -j ACCEPT
[root@KVM01 selinux]# iptables -A INPUT -p tcp --dport 15988 -j ACCEPT
[root@KVM01 selinux]# iptables -A INPUT -p tcp --dport 15989 -j ACCEPT
[root@KVM01 selinux]# iptables -A INPUT -p tcp --dport 15989 -j ACCEPT
[root@KVM01 selinux]# service iptables save
iptables: Saving firewall rules to /etc/sysconfig/iptables:[ OK ]
[root@KVM01 selinux]#
```

Figure 9-3 Configuring iptables

You might face some issues during the inventory collection because of the iptables configuration on a KVM host. If so, remove the REJECT statement at the end of the INPUT chain in the filter table and reappend it to the end of the chain. You can also temporarily disable iptables for troubleshooting purposes.

3. Configure Yum on your system. For more information, see this website:

http://docs.redhat.com/docs/en-US/Red_Hat_Enterprise_Linux/6/html/Deployment_Gu ide/sec-Configuring_Yum_and_Yum_Repositories.html

**Tip:** Configure Yum on your system because during the KVM Platform Agent (PA) installation, you might face Red Hat Package Manager (RPM) dependency requirements. You can save time if Yum is configured.

4. Check that the date on your KVM node is the same than the other hosts and the FSM as shown in Figure 9-4.

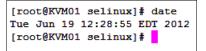


Figure 9-4 Check date on KVM host

**Remember:** If a Red Hat Package Manager (NTP) server is configured in your network, configure it on all your KVM hosts and on the FSM, as well.

#### 9.2.2 KVM Platform Agent installation

To install KVM Platform Agent, perform the following steps:

1. Remove some packages by using the following command:

yum -y erase tog-pegasus libcmpiutil libvirt-cim sblim-cmpi-nfsv3 sblim-cmpi-fsvol sblim-gather-provider sblim-gather sblim-cmpi-base openslp

2. Download KVM Platform Agent from the following URL (Figure 9-5):

https://www14.software.ibm.com/webapp/iwm/web/reg/download.do?source=dmp&S_PKG= dir_63_x86_MDagents&lang=en_US&cp=UTF-8

```
IBM Systems Director 6.3.1 Platform Agent for RHEL 6 for Linux on IBM x86-64 on 
KVM
SysDir6_3_1_Platform_Agent_Linux_RHEL6KVM_x86_64.tar.gz (56.5 MB)
```

Figure 9-5 KVM Platform Agent download

Put the downloaded agent in /tmp of your KVM host by using Secure Copy Protocol (SCP) and an SCP tool, then uncompress the archive as shown in Figure 9-6.

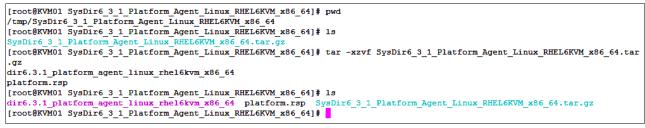


Figure 9-6 Uncompressed agent that was previously copied in /tmp

4. Start the KVM Platform Agent installation as shown in Figure 9-7.

```
[1-Agree|0-Disagree]: 1
IBM Systems Director Platform Agent 6.3.1 installation.
Extracting RPM files to /tmp/platform.jXfCp2g6Nf
114033 blocks
Preparing packages for installation...
The system you are installing on does not have the IPMI (Intelligent Platform
Management Interface) utilities installed. To install the IPMI utilities,
install the OpenIPMI package using your distribution's package management
system.
      Preparing...
3%]
5%1
3:openslp
      8%1
4:tog-pegasus
      6:ibmcim-baseos
      12:libcmpiutil
      Installing....
```

Figure 9-7 KVM Platform Agent installation panel (1 of 2)

Figure 9-8 shows the second half of the installation panel.

```
Saving /etc/libvirt/libvirtd.conf as /etc/libvirt/libvirtd.conf.old
Changes made to /etc/libvirt/libvirtd.conf
249c249
< max clients = 200
> #max clients = 20
258c258
< max workers = 200
> #max_workers = 20
274c274
< max requests = 200
> #max requests = 20
280c280
< max client requests = 100
> #max client requests = 5
 Starting libvirtd daemon:
Starting slpd: Multicast Route Enabled
                                                     [ OK ]
Starting gatherd:
                                                     [ OK ]
                                                     [ OK ]
Starting reposd:
Shutting down CIM server: cimserver stop
                                                     OK
                                                           1
toq-peqasus: Generating cimserver SSL certificates...SSL certificates generated
Starting up CIM server: cimserver start
                                                     [ OK ]
Starting tier1slp:
please wait .....
                                                     [ OK ]
Starting IBM platform agent watchdog service...
Installation of the IBM Systems Director Platform Agent 6.3.1 succeeded.
[root@KVM01 SysDir6 3 1 Platform Agent Linux RHEL6KVM x86 64]#
```

Figure 9-8 KVM Platform Agent installation panel (2 of 2)

If you receive error messages similar to the error shown in Figure 9-9, use **yum** to solve the dependencies issue and restart the KVM Platform Agent installation.

```
error: Failed dependencies:
libconfig.so.8()(64bit) is needed by libvirt-cim-0.5.14-7.el6.x86_64
The main set of RPMs will not install due to unsatisfied dependencies.
```

Figure 9-9 Dependencies error example

Your KVM Platform Agent installation is complete.

**Requirement:** Repeat the steps in 9.2.1, "Preparation" on page 321 and 9.2.2, "KVM Platform Agent installation" on page 322 for each host that you want to manage with FSM.

#### 9.2.3 KVM host discovery, granting access, and inventory collection

To enable host discovery and run inventory collection, perform these steps:

1. Go to Discovery Manager as shown in Figure 9-10 and click System Discovery.



Figure 9-10 Discovery Manager window

2. Enter the IP address of the KVM host as shown in Figure 9-11 or the range of KVM hosts IP addresses that you want to discover. Click **Discover Now**.

Chassis Man X Home Discovery M System Disc X	
System Discovery	
	chedule your discovery to run later. You can discover a resource for a sing or use a discovery profile. Discovery profiles enable you to customize dis rr the discovered resources.
② Learn more about using discovery	Advanced Tasks
Select a discovery option:	Create new profile
Single IPv4 address	Manage discovery profiles
IP address:	Discovery jobs
9 .27 .16 .79	
Select the resource type to discover:	
All	
Discover Now	
Schedule	

Figure 9-11 Entering the KVM host IP address for discovery

Wait until the job is completed as shown in Figure 9-12.

e and Sche	duled Jobs				
	eduled Jobs m Discovery		June 19, 20	012 2:02:44 PM EDT	ons 🔻
General	Targets	History	Logs	Discovered Systems	
Status: Progress: Last Run S	Active Status: Runn	78%			
Descriptio	n: Run PM	once on 6/19/1	12 at 2:02		
Next Run:					
Last Run:	6/19	/12 at 2:02 PM			
Task:	Syste	m Discovery			
Created B	y: aoui:	terats			
Edit					

Figure 9-12 KVM discovery progress

3. When the job is complete, click the discovered system. You can see that an operating system object type has been discovered as shown in Figure 9-13. Click **No access**.

	duled Jobs								
ive and Sch	neduled Jobs	(Properties)							
me: Syste	m Discovery -	- 9.27.16.79	June 19, 2012	2:02:44 PI	M EDT A	tions 🔻			
,									
General	Targets	History	Logs	Discovered	Systems				
							10 10 10		
	d Manageable		Manageable S	Systems tab	le repres	ent the res	ults of the most	t recer	nt occ
Discovere	d Manageable	e Systems:			le repres Type	ent the res	ults of the most	t recer	Pro

Figure 9-13 Discovered KVM host system

4. Grant access to your KVM host by using root credentials as shown in Figure 9-14, then click your host.

Specify the user ID and pass Manager users access to the		cate Flex System Manager to one or more target systems. Then clic ).
User ID;	-	
root		
Password:		
Request Access Close		
Selected targets:		
	Access	Trust State
Name		
Name	OK	Not applicable
	Ск	Not applicable

Figure 9-14 KVM host operating system access granted

5. Click Actions  $\rightarrow$  Inventory  $\rightarrow$  Collect Inventory as shown in Figure 9-15.

	ureflexrb5.rtp.stg	labs.ibm.com	Actions 🔻		
cess: 🗾 OI	ĸ		Related Resources	•	
atus: 📕 OI	ĸ		Topology Perspectives	•	
General	Active Status	Applied Activ	Password Expiration Notification		Service and Support
Type:		Oper	Remove Rename		_
Descriptic IP Addres		9.27 fd55	Add to Automation	+	:eb, 192.168.122.1, fe80:0:0:0:5e 90
IP Hosts:		pure	Inventory	Þ	Collect Inventory
MAC Addr	esses:	5c-f3	Power On/Off	•	View and Collect Inventory
Agent Tin	ne Zone Offset (M	linutes): GMT-	Release Management	•	Network Topology Inventory
Manufact	urer:	IBM	Remote Access	•	
Machine 7	Гуре:	8737	Security	•	
Model:		AC1	System Configuration		
Serial Nur	mber:	23R\	System Status and Health		
UUID:		56d4	Service and Support		90
Operating	3 System Type:	Linux		1	1
Operating	System Version:	6.2			

Figure 9-15 Collect Inventory on KVM host

After processing, your collection is complete as shown in Figure 9-16 and your KVM host is ready to be managed by FSM.

e and Sched	duled Jobs (	Properties)							
				-		_			
ne: Collect I	Inventory -	June 19, 2012	2:12:57 PM	1 EDT	Actions	•			
		·							
General	Targets	History	Logs						
Status:	Comp	lete							
Progress:		100%							
Last Run Sta	atus: Comp	lete							
Description:	Run o PM	nce on 6/19/1	2 at 2:12						
Next Run:									
Last Run:	6/19/	12 at 2:13 PM							
Task:	Collec	t Inventory							
Created By:	aouiz	erats							
Edit									

Figure 9-16 Collect inventory on KVM host completed

## 9.3 Image repository for KVM

To set up the image repository for IBM FSM/VMControl with SAN storage, several pieces must be in place. The sections describe the steps that you must perform.

This section addresses the implementation of the KVM SAN storage-based solution. If you want to install an environment using the NFS storage-based solution, see this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fco m.ibm.director.vim.helps.doc%2Ffsd0_vim_c_learnmore_repositories_kvm.html

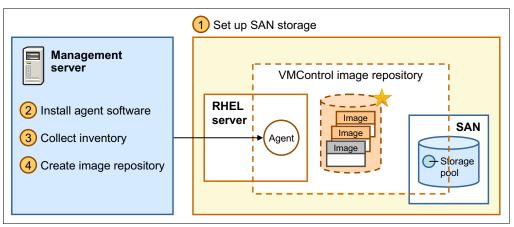


Figure 9-17 illustrates an image repository for a KVM virtual environment with SAN storage.

Figure 9-17 KVM image repository with SAN storage

#### 9.3.1 Preparation

Perform these steps to establish an image repository for KVM using the SAN-based storage:

**Remember:** The images that are shown in the image repository are not created automatically when a new repository is created. Images must be imported or captured to deploy the virtual server and workload.

1. Install your KVM host by using the steps in 9.2.1, "Preparation" on page 321.

Tip: Stop at the end of 9.2.1, "Preparation" on page 321.

2. Install the prerequisite RPMs that are required to install Linux x86 Common Agent as shown in Figure 9-18 and Figure 9-19 on page 330.

```
[root@KVM03 tmp]# yum install libcrypt.so.1 libc.so.6 libdl.so.2 libstdc++.so.5 libgcc s.so.1 libm.so.6 libnsl.so.1 libpam.so
.0 libpthread.so.0 librt.so.1 unzip bind-utils net-tools libstdc++.so.6 libuuid.so.1 libcrypt.so.1 libexpat.so.0
Loaded plugins: product-id, security, subscription-manager
Updating certificate-based repositories.
Setting up Install Process
Package unzip-6.0-1.el6.x86_64 already installed and latest version
Package 32: bind-utils-9.7.3-8.P3.e16.x86 64 already installed and latest version
Package net-tools-1.60-109.el6.x86_64 already installed and latest version
Resolving Dependencies
--> Running transaction check
---> Package compat-expat1.i686 0:1.95.8-8.el6 will be installed
---> Package compat-libstdc++-33.i686 0:3.2.3-69.el6 will be installed
---> Package glibc.i686 0:2.12-1.47.el6 will be installed
--> Processing Dependency: libfreebl3.so(NSSRAWHASH_3.12.3) for package: glibc-2.12-1.47.el6.i686
--> Processing Dependency: libfreeb13.so for package: glibc-2.12-1.47.el6.i686
---> Package libgcc.i686 0:4.4.6-3.el6 will be installed
---> Package libstdc++.i686 0:4.4.6-3.el6 will be installed
---> Package libuuid.i686 0:2.17.2-12.4.el6 will be installed
---> Package pam.i686 0:1.1.1-10.el6 will be installed
--> Processing Dependency: libcrack.so.2 for package: pam-1.1.1-10.el6.i686
--> Processing Dependency: libaudit.so.1 for package: pam-1.1.1-10.el6.i686
--> Processing Dependency: libselinux.so.1 for package: pam-1.1.1-10.el6.i686
--> Processing Dependency: libdb-4.7.so for package: pam-1.1.1-10.el6.i686
--> Running transaction check
---> Package audit-libs.i686 0:2.1.3-3.el6 will be installed
---> Package cracklib.i686 0:2.8.16-4.el6 will be installed
---> Package db4.i686 0:4.7.25-16.el6 will be installed
---> Package libselinux.i686 0:2.0.94-5.2.el6 will be installed
---> Package nss-softokn-freebl.i686 0:3.12.9-11.el6 will be installed
--> Finished Dependency Resolution
```

Figure 9-18 Linux x86 Common Agent RPM prerequisites

Total		103 MB/s   6.5 MB	00:00
warning: rpmts HdrFromFdno: Header V3 RS	SA/SHA256 Signature, key ID fd431d51: NOKEY	· ·	
Retrieving key from file:///mnt/rhel62is			
Importing GPG key 0xFD431D51:			
Userid: "Red Hat, Inc. (release key 2)	<security@redhat.com>"</security@redhat.com>		
From : /mnt/rhe162iso/RPM-GPG-KEY-redh			
Is this ok [v/N]: v			
Importing GPG key 0x2FA658E0:			
Userid: "Red Hat, Inc. (auxiliary key)	<securitv@redhat.com>"</securitv@redhat.com>		
From : /mnt/rhe162iso/RPM-GPG-KEY-redh			
Is this ok [v/N]: v			
Running rpm check debug			
Running Transaction Test			
Transaction Test Succeeded			
Running Transaction			
Installing : libgcc-4.4.6-3.el6.i686			1/12
Installing : glibc-2.12-1.47.el6.i686			2/12
Installing : nss-softokn-freebl-3.12.9	9-11 el6 i686		3/12
Installing : db4-4.7.25-16.el6.i686	, 11.010000		4/12
Installing : audit-libs-2.1.3-3.el6.i6	586		5/12
Installing : cracklib-2.8.16-4.el6.i68			6/12
Installing : libselinux-2.0.94-5.2.el			7/12
Installing : pam-1.1.1-10.el6.i686			8/12
Installing : libuuid-2.17.2-12.4.el6.i	686		9/12
Installing : libstdc++-4.4.6-3.el6.i68			10/12
Installing : compat-expat1-1.95.8-8.el			11/12
Installing : compat-libstdc++-33-3.2.3			12/12
rhel62-cdrom/productid	-03.210.1000	1.7 kB	00:00
Installed products updated.		11.7 KD	00.00
installed products updated.			
Installed:			
compat-expat1.i686 0:1.95.8-8.e16	compat-libstdc++-33.i686 0:3.2.3-69.e16	glibc.i686 0:2.12-1.47.el	6
libgcc.i686 0:4.4.6-3.el6	libstdc++.i686 0:4.4.6-3.e16	libuuid.i686 0:2.17.2-12.	
pam.i686 0:1.1.1-10.el6			
Dependency Installed:			
audit-libs.i686 0:2.1.3-3.el6	cracklib.i686 0:2.8.16-4.el6	db4.i686 0:4.7.25-16.e	-16
libselinux.i686 0:2.0.94-5.2.el6	nss-softokn-freebl.i686 0:3.12.9-11.el6		
Complete!			
-			

Figure 9-19 Linux x86 Common Agent RPM prerequisites

#### 9.3.2 Common Agent installation on a KVM host image repository

To install Common Agent, perform these steps:

1. Allow Transmission Control Protocol (TCP) ports that are required by the Common Agent on the firewall as shown in Figure 9-20.

```
[root@KVM03 ~]# iptables -A INPUT -p tcp --dport 5988 -j ACCEPT
[root@KVM03 ~]# iptables -A INPUT -p tcp --dport 5989 -j ACCEPT
[root@KVM03 ~]# service iptables save
iptables: Saving firewall rules to /etc/sysconfig/iptables:[ OK ]
[root@KVM03 ~]#
```

Figure 9-20 Open ports for CAs

2. Download KVM Common Agent from the following URL (Figure 9-21):

https://www14.software.ibm.com/webapp/iwm/web/reg/download.do?source=dmp&S_PKG= dir_63_x86_MDagents&lang=en_US&cp=UTF-8

```
IBM Systems Director 6.3 Common Agent for Linux on IBM x86
SysDir6_3_Common_Agent_Linux_x86_a.tar.gz (488.6 MB)
```

Figure 9-21 Linux Common Agent x86

3. Copy the Common Agent into the /tmp folder of your KVM host by using the SCP protocol and an SCP tool. Uncompress the archive with the following command:

tar -xvf IBM Systems Director 6.3 Common Agent for Linux on IBM x86

4. Start the Common Agent installation as shown in Figure 9-22.

```
[root@KVM03 SysDir6_3_Common_Agent_Linux_x86_a]# clear
[root@KVM03 SysDir6 3 Common Agent Linux x86 a]# 1s
dir6.3 commonagent linux x86 a diragent.rsp SysDir6 3 Common Agent Linux x86 a.tar.gz
[root@KVM03 SysDir6_3_Common_Agent_Linux_x86_a]# ./dir6.3_commonagent_linux_x86_a
[1-Agree|0-Disagree]: 1
IBM Systems Director Common Agent 6.3.0 installation.
Extracting RPM files to /tmp/agent.zNJPK7TpH7
974221 blocks
Preparing packages for installation...
The system you are installing on does not have the IPMI (Intelligent Platform
Management Interface) utilities installed. To install the IPMI utilities,
install the OpenIPMI package using your distribution's package management
system.
Preparing...
                    ibmcim-icu
ibmcim-ssl
                    Creating a SSL private key...
Generating RSA private key, 1024 bit long modulus
e is 65537 (0x10001)
Generating a SSL certificate request...
Self-signing an SSL certificate based on system information...
Signature ok
subject=/C=US/ST=NORTH CAROLINA/L=RTP/O=IBM/OU=STG/CN=KVM03
Getting Private kev
Starting slpd: Multicast Route Enabled[ OK ]
Starting IBM CIM indication listemer CIM Listemer 2.11.0
Starting CIMListener with the following options
     listenerPort 6988
     httpsConnection 0
      sslKeyFilePath
      sslCertificateFilePath
      consumerDir /opt/ibm/icc/lib
      consumerConfigDir /var/opt/ibm/icc/data/indication
      enableConsumerUnload 1
```

Figure 9-22 Common Agent installation on the KVM future image repository server

#### Wait until the Common Agent installation is complete as shown in Figure 9-23.

```
Installing Tivoli Common Agent Services.
                          Preparing...
ISDCommonAgent
                           [Wed Jun 20 01:05:41 EDT 2012]: Installing feature: com.ibm.usmi.agent.cassocketsubagent.agent.feature 6.3.0... Result: SUCCE
SSFUL
[Wed Jun 20 01:05:42 EDT 2012]: Installing feature: com.ibm.sysmgmt.uim.provider.base.agent.feature 6.3.0... Result: SUCCESSF
ШΤ.
[Wed Jun 20 01:05:42 EDT 2012]: Installing feature: com.ibm.usmi.client.ipc.agent.feature 6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:42 EDT 2012]: Installing feature: com.ibm.usmi.client.ipc.monitors.xlinux.feature 6.3.0... Result: SUCCESSF
TTT.
[Wed Jun 20 01:05:42 EDT 2012]: Installing feature: com.ibm.director.commonagent.manager.xlinux32 6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:42 EDT 2012]: Installing feature: com.ibm.director.cimlegacy.agent.feature 6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:43 EDT 2012]: Installing feature: smallpatch.agent.feature_6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:43 EDT 2012]: Installing feature: com.ibm.usmi.client.ipc.java.feature 6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:43 EDT 2012]: Installing feature: org.sblim.cim.client.agent.feature_2.0.2... Result: SUCCESSFUL
[Wed Jun 20 01:05:43 EDT 2012]: Installing feature: com.tivoli.twg.legacylibs.agent.feature_6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:43 EDT 2012]: Installing feature: org.sblim.cim.client.legacy.agent.feature_6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:44 EDT 2012]: Installing feature: com.ibm.usmi.client.ipc.monitors.feature 6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:44 EDT 2012]: Installing feature: com.ibm.usmi.agent.tpmsubagent.agent.feature_6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:44 EDT 2012]: Installing feature: com.ibm.usmi.client.ipc.procman.xlinux.feature 6.3.0... Result: SUCCESSFU
[Wed Jun 20 01:05:44 EDT 2012]: Installing feature: com.ibm.usmi.client.ipc.evtsub.feature 6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:44 EDT 2012]: Installing feature: com.ibm.sysmgmt.utils.updateinstaller.agent_6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:44 EDT 2012]: Installing feature: com.ibm.usmi.client.ipc.procman.feature_6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:45 EDT 2012]: Installing feature: com.ibm.usmi.client.ipc.rcshd.feature_6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:45 EDT 2012]: Installing feature: com.ibm.usmi.slp.agent.feature 6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:45 EDT 2012]: Installing feature: com.ibm.usmi.agent.coreagent.agent.feature_6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:45 EDT 2012]: Installing feature: com.ibm.tivoli.remoteaccess.agent.feature 6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:45 EDT 2012]: Installing feature: com.ibm.usmi.client.ipc.ft_agent.feature_6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:46 EDT 2012]: Installing feature: com.ibm.director.core.common.agent.feature 6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:46 EDT 2012]: Installing feature: com.ibm.sysmgmt.uim.provider.software.agent.feature_6.3.0... Result: SUCC
ESSFUL
[Wed Jun 20 01:05:46 EDT 2012]: Installing feature: com.ibm.director.mgr.discovery.common.agent.feature 6.3.0... Result: SUCC
ESSFUL
[Wed Jun 20 01:05:46 EDT 2012]: Installing feature: com.ibm.director.hw.bcx.agent_6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:46 EDT 2012]: Installing feature: com.ibm.director.commonagent.manager.feature_6.3.0... Result: SUCCESSFUL
[Wed Jun 20 01:05:47 EDT 2012]: Installing feature: com.ibm.director.hw.bcx.agent.manager 6.3.0... Result: SUCCESSFUL
213:ACTIVE:InstallOrderedFeatures Plug-in:6.3.0SUCCESS
Installation of the IBM Systems Director Common Agent 6.3.0 succeeded.
```

```
[root@KVM03 SysDir6_3_Common_Agent_Linux_x86_a]#
```

```
Figure 9-23 Common Agent installation on the KVM future image repository server
```

5. Go to Discovery Manager, select the **System Discovery** task, enter the IP address of the host, and then, click **Discover Now**, as shown in Figure 9-24.

	? now or schedule your discovery to run later, You can discover a
	esources of the same type for a range of IP addresses, or use a ize discoveries, including importing IP addresses, and requesting urces.
elect a discovery option: incle IPv4 address	Create new profile Manage discovery profiles Discovery jobs
elect the resource type to discover:	
All	
Discover now	

Figure 9-24 KVM hosts with Common Agent discovery

6. Click **OK** to run the job now and click **Display Properties** to check the job progress status as shown in Figure 9-25.

e and Sche	duled Jobs (Properties)			
me: System	Discovery - 9.27.16.12	4 - June 19, 2	2012 5:48:54 PM EDT	Actions 💌
and the second se				
General	Targets History	Logs	Discovered Systems	
Status:	Complete			
Progress:	100%			
Last Run St	atus: Complete			
Description:	Run once on 6/19 PM	9/12 at 5:48		
Next Run:				
Last Run:	6/19/12 at 5:48 P	PM		
Task:	System Discovery			
Created By:	aouizerats			
created by.				

Figure 9-25 KVM hosts with Common Agent discovery complete

7. Click the **Discovered Systems** tab as shown in Figure 9-26.

me: Syste	m Discovery -	9.27.16.124	- June 19, 2	:012 5:48:5	4 PM EDT Actio	ns 🔻			
General	Targets	History	Logs	Discovere	ed Systems				
The resour	rces listed in t								
of this job	d Manageable		Search						
of this job Discovered	, d Manageable	Systems:				0	Access	0	Problems

Figure 9-26 Discovered systems

8. Click **No access** and use root credentials to grant access to the system, as shown in Figure 9-27, then click the system name.

		icate Flex System Manager to one or more target systems. Then click Reque anager users access to the target system(s).
Jser ID:		
oot		
Password:		
Request Access C Selected targets : Name	Access	Trust State
Bourefleyrb6.rtp.stolab	IS I OK	Not applicable
pureflexrb6.rtp.stglab	os.i 📕 OK	Not applicable

Figure 9-27 Access granted on KVM image repository

9. Select **Collect Inventory** on the system as shown in Figure 9-28, then click **OK** to run the job now.

eflexrb6.rtp.stglabs.ibm.com (Prope me: Cpureflexrb6.rtp.stglabs.ibm cess: OK atus: OK	1	Actions  Related Resources Topology Perspectives	* *	[
General Active Status Applied	Activ	Create Group Password Expiration Notification Remove		Service and Support
Type:	Oper	Rename		Additional Propertie
Description: IP Addresses:	9.27	Add to Automation	+	:4a80, Support Files
	fd55	Inventory	•	Collect Inventory
IP Hosts: MAC Addresses:	fe80 pure 52-5	Power On/Off Release Management	+ +	View and Collect Inventory Network Topology Inventory
Agent Time Zone Offset (Minutes): Manufacturer: Machine Type: Model:	GMT- IBM 8737 AC1	Remote Access Security System Configuration System Status and Health	* * * *	
Serial Number:		Service and Support		
UUID:	fa466	5b87-6aaf-11e1-bc25-5cf3fc6e	4a	80
Operating System Type:	Linux			

Figure 9-28 Collect Inventory window

10. Click **Display Properties** as shown in Figure 9-29 to check the progress.

Resource Explorer
ATKCOR102I
The following job has been created and started successfully: Collect Inventory - June 19,
2012 5:56:02 PM EDT
Display Properties Close Message
pureflexrb6.rtp.stglabs.ibm.com (Properties)
pureflexrob.rtp.stglabs.iom.com (Properties)
Name: 🖬 pureflexrb6.rtp.stglabs.ibm.com 🛛 Actions 🔻
Access: OK
Status: OK

Figure 9-29 Information blue box

Wait until the collection is complete as shown in Figure 9-30.

Active and Scheduled	obs
Active and Schedule Name: Collect Inve	d Jobs (Properties) entory - June 19, 2012 5:56:02 PM EDT Actions
General Tar	rgets History Logs
Status: Progress: Last Run Status Description:	Complete 100% Complete Run once on 6/19/12 at 5:56 PM
Next Run:	
Last Run:	6/19/12 at 5:56 PM
Task:	Collect Inventory
Created By:	aouizerats
Edit	

Figure 9-30 Collect inventory is complete

You successfully completed Common Agent installation, discovery, and inventory collection on the KVM repository host.

#### 9.3.3 Subagent installation on a KVM image repository host

You can access and install IBM Flex System Manager VMControl subagents by using the IBM Flex System Manager Agent Installation Wizard. To install subagents, perform these steps:

1. Start the wizard from the VMControl Summary window or from the IBM Flex System Manager Release Management task. You can also start it from Resource Explorer by selecting your system as shown in Figure 9-31.

oups > All Systems > KVM03 ( ame: 🔓 KVM03 🛛 Actions 💌	Properties)				ļ
ccess: 📕 OK tatus: 📕 OK					
_	Applied Activities	Configuration	Event Log	Inventory	Service and Support
Туре:	Operating	System			Additional Properti
Description: IP Addresses:	169.254.9 fd55:faaf:	9.27.16.124, fe80:0:0:0:5ef3:fcff:fe6e:4a80, 169.254.95.120, 192.168.122.1, fd55:faaf:e1ab:1014:5ef3:fcff:fe6e:4a80, fe80:0:0:0:5cf3:fcff:fe6e:15e3			Location Support Files
IP Hosts:	pureflexrb	6.rtp.stglabs.ibm	.com		
Agent Time Zone Offset (Mi	inutes): GMT-04:0	D			
Manufacturer:	IBM				
Machine Type:	8737				
Model:	AC1				
Reported Operating System	Type: Red Hat E	nterprise Linux			
Serial Number:	23ZVC75				

Figure 9-31 KVM image repository: Operating system

2.	Click <b>Actions</b> $\rightarrow$ I	Release Mana	gement $\rightarrow$	Install A	Agent as	shown in	Figure	9-32.

oups > All System:	s > KVM03 (Properties)						
ccess: OK tatus: OK	Related Resources Topology Perspectives	+	]				1
General Activ	Create Group Password Expiration Notification		onfiguration	Event Log	Inventory	Service and Support	
Type:	Remove Rename		item			Additional Proper	ties
Description: IP Addresses: IP Hosts:	Add to Automation Inventory Power On/Off	* * * *	fe80:0:0:0:0:5 20, 192.168.1 b:1014:5ef3: cf3:fcff:fe6e:1	22.1, fcff:fe6e:4a80	Contra la contra la	Location Support Files	
	Release Management	•	Install Agent				
Agent Time Zor Manufacturer: Machine Type: Model:	Remote Access Security System Configuration	* * *	Acquire Updat Show and Inst Show Installed	all Updates			
Reported Opera Serial Number:	System Status and Health Service and Support	+	prise Linux				

Figure 9-32 Installing the VMControl image repository subagent

#### 3. A welcome window for Agent Installation opens as shown in Figure 9-33. Click Next.

ents		2 -
⇔ Welcome	Agent Installation	
Agents	Welcome to Agent Installation Wizard	
Systems Summary	Use this wizard to install agents on selected systems, Show this Welcome page next time.	

Figure 9-33 Install VMControl image repository subagent

4. Click Common Agent Subagent Packages as shown in Figure 9-34.

Agen	t Installation					
elect ti	e agent code to be installed					
Select a Show: [ Available Agent P	agent code to be installed valid target then add it to the selected list. Agent Package Groups M :: sckage Groups (View Members) dens V Sternh file table				Add > < Remove	Selected:
					< NETOPYC	
Select	Name	0	Туре	0		
Select	Name :	-	Type Dynamic: Software Module	0		
		1		0		
0	强 All Agent Packages (9)		Dynamic: Software Module	0		
0	명 All Agent Packages (9) 몇 Common Agent Packages (0)		Dynamic: Software Module Dynamic: Software Module	0		

Figure 9-34 Selecting the Common Agent Subagent Packages group

5. Select CommonAgentSubagent_VMControl_CommonRepository-2.4.1, as shown in Figure 9-35, then click Next.

Ager	it Installation				
Select the agent code to be installed					
Select a	agent code to be installed valid target then add it to the selected list. Agent Package Groups 🖌				
Availabl Agent P	s: sckage Groups ≻ Common Agent Subagent (View Members)		Add >	Selected: CommonAgentSubagent_VMControl	
Agent P	ackage Groups > Common Agent Subagent (View Members)		Add > K Remove		
Agent P	ackage Groups > Common Agent Subagent (View Members) store / Storeh Stotekie Scoreh Name Ø	Description ¢			
Agent F	ackage Groups > Common Agent Subagent (View Members)	Description 0 Software Module Software Module			

Figure 9-35 CommonAgentSubagent_VMControl_CommonRepository-2.4.1 window

6. Select your future image repository system, which is an object type Operating System Linux as shown in Figure 9-36, then click **Next**.

Welcome	Agen	t Installation								
Agents	The follow	wing systems have been selecte	a							
Systems Summary	Select a va Show: A Available All Opera	atingSystems with Full Access (	octed list.				[	Add 5	Selected: KVM03	
	A:	itore 👻 Search the tools	Search					< Samoya		
	Select	Name 0	Access 0	Problems 0	Compliance 0	IP Addresse 0	OS Type			
		FSM_FSM-SCF3FCSFS4EF.r	Ск	Ск	🖉 ок	9.27.20.38, 1055	Appliance			
		<b>₩</b> кумоз	Ск	И СК	🛃 ок	9.27.16.124, fes	Linux			
		PF-ESXI01	Ск	Ск	🖉 ОК	9.27.16.75, 192	Hypervisor			
		PF-ESXI02	Ск	Ск	🖉 ОК	9.27.16.76, 192	Hypervisor			
		PF-KVM01	Ск	Ск	🖉 ОК	9.27.16.79, feBC	Linux			
		PF-Nodel-NIM	Ск	Ск	📕 ОК	9.27.16.131	AIX			
		PF-Switch-BGbSAN	Ск	Ск	🖉 ок	9.27.21.119			1	
		PF-vCenter01	Ск	Ск	📕 ок	9.27.16.77, feBC	Windows® S		1	
		PF-Windows1	Ск	Ск	Ск	9.27.16.57, 200	Windows ® S-			
		Dureflexrb11.rtp.stglabs.lb	1	Ск	🖉 ок	9.27.16.129				
	4		1111				(A)			

Figure 9-36 Select image repository host operating system target

7. Check the summary that shows you the agent and the target for installation as shown in Figure 9-37, then click **Finish**.

/elcome	Agent Installation						
Agents Systems Summary	Summary of the Install Agent Task						
	Selected Agents:						
12.04	Name	Ф Туре	Ŷ	Description			
	CommonAgentSubagent_VMControl_CommonRepository-2.4.1	Software Module		Software Module			
	H 4 Fage 1 of 1 + H 1 +   Total: 1						
	Selected Systems:						
	Name	ð Type	0	Description			
	₩ KVM03	Operating System					
	H 4 Page 1 of 1 + H 1 + Total: 1						

Figure 9-37 Agent installation summary

8. Click **OK** to run the job now as shown in Figure 9-38.

			Launch Job		
Schedule	Notification	Options			
Job name an	d schedule				
#Job Name:					
Distal Agent - D	une 20, 2012 (0:25-13	AN SOT			
Choose whe	n to run the job.				
Run Nov	w.				
O Schedul	-				
OK Gro	al Halp				

Figure 9-38 Run agent installation job

9. Click **Display Properties** as shown in Figure 9-39 to check the job status and wait until status is complete.

Agents	
	ATKCOR1021 The following job has been created and started successfully: Install Agent - June 20, 2012 10:35:13 AM EDT
[0	

Figure 9-39 Display Properties window

#### 9.3.4 Host mappings

When you deploy to a new virtual server on Linux KVM, the disks in the virtual appliance are assigned to the disks in the virtual server based on disk order.

**Important:** The KVM host WWN must be visible from the V7000 storage system. If it is not, check your SAN zoning or your storage adapters.

To create host mappings, perform these steps:

1. Log on to the Storwize V7000 Storage Management GUI as shown in Figure 9-40.

Storage Mar	ize [®] V7000
A For best results, Firefox.	use a standards-compliant browser such as
User Name:	superuser
Password:	Low graphics mode Login →
Licensed Material - Property of IB of the IBM Corporation in the Unit	M Corp. © IBM Corporation and other(6) 2011. IBM and Storwize are registered trademarks ed States, other countries, or both.

Figure 9-40 V7000 GUI

2. Click the **Hosts** icon as shown in Figure 9-41.



Figure 9-41 V7000 host view

You see that there is no host that is defined for your KVM hosts as shown in Figure 9-42.

3M Sto	rwize V7000				Welcome, superuser		
	v7000 > Hosts	5 > Hosts ▼					
	Sew Host E Actions						
	Name	Status	Host Type	# of Ports	Host Mappings		
		🛃 Online	Generic	2	Yes 🕞		
de .		🔽 Online	Generic	2	Yes 🕞		
-		🔽 Online	Generic	1000	No		

Figure 9-42 Hosts view before you define the KVM host mapping

3. Click Create Host, then click Fibre Channel Host as shown in Figure 9-43.

Create Host Choose the Host Type	
Fibre Channel Host	ISCSI Host
Create a host object with WWPN ports.	Create a host object with iSCSI ports.

Figure 9-43 Creating the Fibre Channel host

4. Select your WWN and specify a host name as shown in Figure 9-44.

Create Host		
	Host Name (optional):	KVM01
Fibre Channel Po	rts ?	
21000024FF35EE	310 👻 🛱 Add Por	rt to List Rescan
Advanced Setting	e not added any WWPNs y	
I/O Group	Port Mask	Host Type
🔽 io_grp0	Port 1	Generic (default)
🔽 io_grp1	Port 2	O HP/UX
🧔 io_grp2	Port 3	OpenVMS
🔽 io_grp3	Port 4	O TPGS
Advanced		Create Host Cancel

Figure 9-44 Selecting the KVM host WWN

- Create Host Host Name (optional): KVM01 **Fibre Channel Ports** 🛱 Add Port to List 🛛 Rescan -Port Definitions × 21000024FF35EB10 Advanced Settings Port Mask Host Type I/O Group 🔽 io_grp0 Port 1 Generic (default) io_grp1 O HP/UX Port 2 OpenVMS 🔽 io_grp2 Port 3 O TPGS 🛃 io_grp3 Port 4 ✓ Advanced 🐮 Create Host 🛛 Cancel
- 5. Click Add Port to List as shown in Figure 9-45.

Figure 9-45 Add KVM WWN to Port Definitions list

6. Click Create Host to start the host mapping creation as shown in Figure 9-46.

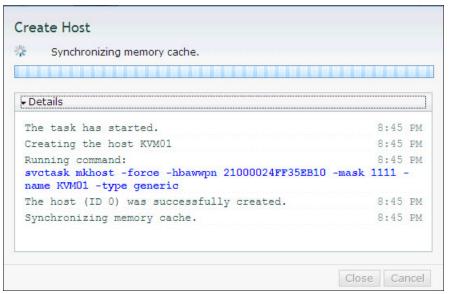


Figure 9-46 Host map creation processing

Wait until the creation task is complete as shown in Figure 9-47.

100%			
Details			
Creating the host KVM01	8:45	PM	^
Running command: svctask mkhost -force -hbawwpn 21000024FF35EB10 name KVM01 -type generic	8:45 -mask 1111		
The host (ID 0) was successfully created.	8:45	PM	=
Synchronizing memory cache.	8:45	PM	
The task is 100% complete.	8:45	PM	
The task completed.	8:45	PM	~

Figure 9-47 Host map creation completed

7. Go back to the host view to check that your host was created as shown in Figure 9-48.

v7000 > Hosts	> Hosts 🔻			
🖫 New Host 🛛 📋 A	ctions 🔻			
Name	Status	Host Type	# of Ports	Host Mappings
KVM01	🛃 Online	Generic	1	No
KVM03	🗹 Online	Generic	1	No

Figure 9-48 Host map creation checking

Remember: You must repeat this process on each KVM host.

For more information about storage, see the IBM Flex System Information Center at this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fco m.ibm.director.vim.helps.doc%2Ffsd0_vim_c_learnmore_storage_paths.html

#### 9.3.5 Discover and manage V7000 storage system

For more information about how to discover and manage V7000 storage system, see 6.12, "Discover and manage external Storwize V7000" on page 234.

#### 9.3.6 Discover and manage SAN switches

For more information about how to discover and manage SAN switches, see 6.14, "External Fibre Channel SAN switch discovery" on page 247.

#### 9.3.7 Discover and configure an image repository server for SAN storage

To configure an image repository server, perform these steps:

- 1. From the VMControl main page, click the Virtual Appliances tab.
- 2. Click Create Image Repository under Common tasks as shown in Figure 9-49.

VMControl Enter	prise Edition				
Use system pools and virtua workloads. Pool your system ⑦Learn more					. Deploy virtual appliance
Resources	Active Status 🔕 🕰	Jobs			
1 Virtual appliances	Problems	8 Active			
0 Workloads	Compliance	- Complet	ed 6	23	
0 Server system pools 0 Storage system pools		Schedul	ed -		
0 Network system pools					
Basics Workloads	Virtual Appliances	System Pool	s Vir	rtual Servers/H	osts
	nere to deploy:		Comm	ion tasks	
1 Virtual appliances 5	Existing virtual serve Hosts and 0 server s			iy virtual applia	nce
			Captu	the second s	nce
What to capture: 0 Workloads	Where 1 Ima	to store:	Impor		
1 Virtual servers and op				active and sche	-
systems				virtual applianc	and a state of the
			Creat	e image reposi	tory

Figure 9-49 Create image repository

3. You are redirected to the Welcome window as shown in Figure 9-50. Click Next.

⇔ Welcome	Welcome
Name	Welcome to the Create Image Repository wizard.
Target System Storage	Use this wizard to create a repository that is used to store images associated with image repository, ensure that the target system meets the requirements for hosting
Summary	①Learn more about image repositories
	You are guided through the following tasks:
	Specifying a name and description for the image repository Selecting a target system to host the image repository Selecting the storage for the image repository
	Show this Welcome page next time

Figure 9-50 Create Image Repository Welcome window

✓ Welcome	Name			
🗇 Name	Specify a name and description for the image repository you want to create			
Target System				
Storage	*Name: KVMimagesrepo			
Summary				
	Description:			
	Limit of 256 characters			
		< Back	Next >	Finish

4. Specify the name of your KVM image repository, as shown in Figure 9-51, then click **Next**.

Figure 9-51 Giving a name to the KVM image repository

5. Select the **Target System** that was prepared before with the Common Agent and image repository subagent to create an image repository system (Figure 9-52). Click **Next**.

✓ Welcome	Target System						
🗸 Name	Select a target system to host the	image reposito	ory you want to	create.			
➡ Target System Storage Summary	Only systems that satisfy the requir Available Target Systems		ting an image r	epository are s	hown.		
	Select Name	Access 🗘	Problems ᅌ	Compliances	IP Address 🗘	OS Type	0 0
	<ul> <li>Кумоз</li> </ul>	🖉 ОК	🖉 ОК	CK	9.27.16.124, 3	Linux	6
	✓ A set of 1 → 1 → 1 Set	elected: 1 Tota	Ш				
					< Back	Next >	Finish

Figure 9-52 Selecting the image repository system

6. Select the storage that you want to use for the image repository on which virtual appliances will be stored as shown in Figure 9-53.

✓ Welcome	Storage				
🗸 Name	Select the storage to use	for the image repository.			
✓ Target System	Storage				
Storage	Actions - Search	h the table Search			
Summary	Select Storage	<ul> <li>Storage location</li> </ul>	¢	Туре	> Available G 💠
	RSL-Shared     RSL-Shared	Storwize V7000-2076-v7000-IBM		SAN	60,858
	≮ Page 1 of 1 ▶ 1 ↓	Selected: 1 Total: 1 Filtered: 1			
				< Back	Next > Finis

Figure 9-53 Selecting virtual appliance storage

7. Review the summary and click **Finish** to complete the image repository creation as shown in Figure 9-54.

✓ Welcome	Summary
🗸 Name	You are now ready to create the image repository.
<ul> <li>✓ Target System</li> <li>✓ Storage</li> <li>✓ Summary</li> </ul>	Summary Repository Name: KVMimagesrepo Target System: KVM03 Storage RSL-Shared Storage RSL-Shared Storage location Storwize V7000-2076-v7000-IBM Tyrat Shared Available GB 60858 Total G6 62318 Description
	< Back Next > Finish

Figure 9-54 Image repository creation summary

#### 8. A blue information window opens as shown in Figure 9-55. Click **Display Properties**.

j	DNZIMC797I The following job has been created and started successfully: Create Repository Job - Thursday, June 21, 2012 7:49:07 PM EDT
	Display Properties Close Message

Figure 9-55 Display Properties window

Wait until the job is complete as shown in Figure 9-56.

General Tar	gets History Logs
Status:	Complete
Progress:	100%
Last Run Status	: Complete
Description:	Run once on 6/21/12 at 7:49 PM
Next Run:	
Last Run:	6/21/12 at 7:49 PM
Task:	Create Repository
Created By:	USERID
Edit	

Figure 9-56 Image repository creation complete

# 9.4 Creating KVM storage system pools

Storage system pools provide the ability to group similar storage subsystems and automate placement within the storage system pool to simplify workload deployment operations.

To work with storage pools, perform these steps:

1. Open the VMControl main window and click **Storage system pools** as shown in Figure 9-57.

		_									
/MControl Ente	erprise Ec	liti	0	1 I							
		(SICK)	1542.1	100040	Contraction of the Internet						
								nav avietu	al appliar	near and manage th	50.0
se system pools and virtu: ilization and automation.	al appliances to	mar	nag	e you	ir data center	mo	efficiently, Depl	oy virtu	al appliar	nces and manage t	he r
	al appliances to	mar	nag	e you	ur data center	mo	efficiently, Depl	oy virtu	al appliar	nces and manage t	he r
ilization and automation.					ur data center			oy virtu	al appliar	nces and manage t	he r
ilization and automation.	Active Status				Jobs	- mo		oy virtu	al appliar	nces and manage t	he i
ilization and automation. Learn more		0						oy virtu	al appliar	nces and manage t	he
ilization and automation. Learn more Resources	Active Status	0		8	Jobs	4	2	oy virtu	al appliar	nces and manage t	heı
ilization and automation. Learn more Resources 1 Virtual appliances	Active Status Problems	0	<u>A</u>	8	Jobs Active	4	2	oy virtu	al appliar	nces and manage t	he

Figure 9-57 VMControl main window

2. The View storage system pools window opens as shown in Figure 9-58. There are no storage system pools available at the moment. Click **Create**.

	System Pools (Vi	_	ers) Edit Rool Policy	View Dashboa	rd Actions	<ul> <li>Search the table.</li> </ul>	Search
Selec	Name	•	Problems	0	Platform	0	Description

Figure 9-58 No storage system pools available

Welcome     Name     Select Storage     Summary	Welcome to the Create Storage System Pool wizard. This wizard helps you create a storage system pool.A storage system pool aggregates storage from multiple storage subsystems together into management system You are guided through the following tasks: • Select a name • Select the storage • Confirm the Summary
1.57 N	management system You are guided through the following tasks: • Select a name • Select the storage
	Show this welcome page next time
	< Back Next >

The Welcome window opens to create the storage system pool as shown in Figure 9-59.

Figure 9-59 Welcome window to create storage system pools

3. Specify the name to assign to the storage system pool as shown in Figure 9-60, then click **Next**.

✓ Welcome	Name
I Name	Specify a name and description for the storage system pool that you want to create.
Select Storage Summary	*Name: KVMstoragepool Description: Limit of 512 characters

Figure 9-60 Storage system pool name

4. Select the storage subsystem that you want to assign to the storage system pool, click **Add**, as shown in Figure 9-61, and then click **Next**.

✓ Welcome	Select Storage Subsys	stem		
🗸 Name	Select the storage subsystem you w	ant to use to creat	e this storage system pool.	
Select Storage Summary	Storage subsystems from the same zo Available Storage Subsystems	one can be selecte	d to create a storage system pool. Selected Storage Subsystems	
	LabStor	Add >	Storwize V7000-2076-v7000-IBM	

Figure 9-61 Select Storage Subsystem window

5. Review the summary as shown in Figure 9-62 and click **Finish**.

✓ Welcome	Summary
Name	You are now ready to create the storage system pool.
✓ Select Storage	Storage system pool details:
Summary	Name: KVMstoragepool
	Storage subsystems selected: [Storwize V7000-2076-v7000-IBM]
	Click Finish to create the storage system pool.

Figure 9-62 Storage system pool creation summary

6. Wait until the storage system pool is created as shown in Figure 9-63.

Summary	Name: KVMstoragepool
	Storage subsystems selected: [Storwize V Click Finish to create the storage system p
	Click Finish to create the storage system p

Figure 9-63 Storage system pool creation

7. A blue information window opens (Figure 9-64). Click Display Properties.

View stor	age system po	pols						
i	DNZSVS77	61						
		pool KVMst		Was created su	u	ccessfully.		
				Close Message		1		
Storage	System Pools	(View Membe	ers)					
A	Add Storage	Create	Delete	Edit Pool Policy		View Dashboard		Actions 🔻
Select	Name	\$	Problems	0		Platform	٥	Description
	🖺 KVMstorag	jepool	🖉 ОК		-	TPC SAN		

Figure 9-64 Display job properties window

At the end of this process, your storage system pool is created.

## 9.5 Creating KVM network system pools

By using network system pools with logical network profiles, you can partition and provision your network into separate logical networks. The network system pool functions will automatically provision both the physical and virtual switch devices to ensure connectivity between the devices, and will also provide status when connectivity is broken.

Network system pools simplify and automate network configuration tasks for virtual servers. You can manage the network connections of the pooled network systems to ensure network connectivity across a set of network switches. **Consideration:** Network system pools manage Layer 2 network configuration. However, additional Layer 3 IP configuration might be required after VM deployment or migration.

Network system pools, combined with logical networks and server system pools, provide flexibility and control over how network resources are used. As an administrator, you can perform these tasks:

- Define larger network system pools to allow more efficient use of network resources
- Define logical networks within a network system pool for shaping and isolation purposes
- Define a server system pool with some or all of the servers managed by a network pool

To achieve full mobility, server system pools need to use both network system pools and shared storage. A server system pool can be associated with a network system pool when you create a server system pool. This provides physical network connectivity between all resources in the server system pool and ensures workload and virtual server relocation across any resource in the server system pool.

Logical networks within the network system pool define the logical connectivity between the systems; only systems on the same logical networks can connect to each other. Before creating associated server system pools, the network system pool must exist, and it defines the scope of the physical network mobility domain that you want.

A *logical network* defines how a set of workloads are connected together in the network. This logical network is isolated from other logical networks using virtual LANs (VLANs). You can use this architecture to define unique networks for various workloads across a single physical network. The *logical network profile* is the entity that defines how a logical network needs to be used within a network system pool. You can use a single logical network profile across multiple network system pools (physically independent networks).

Use a logical network profile to define a set of attributes defining how the workload or virtual machines will use the network. At a minimum, define the VLAN for the workload to use. Other attributes, such as Virtual Ethernet Bridging (VEB) attributes or Virtual Ethernet Port Aggregator (VEPA) attributes, can also be defined as part of this profile. After you create the logical network profile, you must associate the logical network profile with a network system pool to ensure that all virtual servers that are deployed using this profile will have connectivity to each other.

To create a configuration template that will be used in the network pool, perform the following steps:

1. On the Plug-ins tab of the Home page, click **Configuration Templates** under Configuration Manager, as shown in Figure 9-65.

IBM Flex System	Manager™		Welcome USERID	Problems	۵	۵Â
Home X C	Chassis Man ×					
	Configuration Ma Ready Configuration Plans	Configuration Template:	5			
	Remote Access a Ready Setup Remote Contro					

Figure 9-65 Launching Configuration Templates

2. On the Configuration Templates page, shown in Figure 9-66, click Create.

onfigur	ation Templates		ings on one		0.046-0404					
Deplo	Create	Create Like	Edit	Delete		Actions	- Se	earch the	e table	Sea
Select	Name	\$	Deployed	\$	Plan	Count 🗘	Туре	\$	Subtype	\$
	8GbSANSwitchP	rotocolConfigu	No		0		Network		I/O Modul	e Fi
	Ethernet1GbSw	itchProtocolCo	No		0		Network		I/O Modul	e Et
	Ethernet1GbSw	itchVLANConfig	No		0		Network		I/O Modul	e Et
	OperatingSyste	mCreatei5Acc	No		0		Operatin	g Sys	Operating	Sys
П	OperatingSyste	mCreateLinux	No		1		Operatin	g Sys	Operating	Sys

Figure 9-66 Configuration Templates window

3. On the Create template page, for the template type, select **System Pool**. For the configuration to create a template, select **Logical Network Configuration**. Provide a configuration template name and optionally a configuration template description, as shown in Figure 9-67. Click **Continue**.

	Create					
emplate type:						
ystem Pool	•					
onfiguration to create a template:						
ogical Network Configuration	·					
Description:						
Configures VLANs, access security,	quality of service, and VSI settings for logical network connectivity.					
Configuration template name:						
VM LNP						
122 INS AND 1211 IN 1919						
onfiguration template description:						
ontiguration template description:						
onfiguration template description:						
ontiguration template description:						
onfiguration template description:						
ontiguration template description:						
ontiguration template description:						
onfiguration template description:						
ontiguration template description:						
Automatically deploy this co						
Automatically deploy this co	nfiguration template when notified of a matching resource y if automatic deploy is supported by the selected configuration.)					
Automatically deploy this co						
Automatically deploy this co						
<ul> <li>Automatically deploy this co</li> </ul>						
(This option is enabled only						
<ul> <li>Automatically deploy this co</li> </ul>						

4. On the Logical Network Configuration Profiles page, click **Add Profile** as shown in Figure 9-68.

Logical ne	twork Con	figuration Te	mplate: KV	MLNP			
-		-			c Configuration.		
0		a la staal a sa	and a second second				
CLearn	more abou	t logical netw	ork configu	uration profiles			
Logical Ne	twork Prof	iles					
Add Pr	ofile	Add Like	Edit	Delete	Actions 🔻	Search the table	Search

Figure 9-68 Adding a network profile

This launches the Create Logical Network Profile wizard. You can use the wizard to create multiple logical network profiles for each template.

5. The Welcome page appears, as shown in Figure 9-69. Click Next.

⇔ Welcome	Welcome
Profile Name	Create a logical network profile. You can use this wizard to easily define co
VLAN Configuration Quality of Service (QoS) VSI Configuration	A logical network profile defines what network traffic is allowed between an e connected. A logical network profile can be associated with virtual servers to virtual servers as needed.
Summary	Using this wizard, you will define a profile for virtual servers that use both V Ethernet Port Aggregator (VEPA) configurations. Not all of the information yo configurations.

Figure 9-69 Logical network profile: Welcome page

6. On the Profile Name page, enter profile name and, optionally, a profile description, as shown in Figure 9-70. Click **Next**.

	Profile Name	Welcome
es must be uniqu	Specify a name for the logical network profile. Profile names m	Profile Name
ork connectivity w	The profile name and description are used for selecting network c	VLAN Configuration
	deploying virtual appliances.	Quality of Service (QoS)
	*Profile name (maximum 63 characters):	VSI Configuration
	KVM LN profile	Summary
	Profile description (maximum 63 characters):	
	*Profile name (maximum 63 characters): KVM LN profile	VSI Configuration

Figure 9-70 Logical network profile: Profile Name

7. On the VLAN Configuration page, enter a VLAN ID for this profile, as shown in Figure 9-71. Click **Next**.

Velcome	VLAN Configuration
✓ Profile Name	Specify the switch port VLAN configuration needed to support the connected
VLAN Configuration	This VLAN setting applies to both VEB and VEPA configurations.
Quality of Service (QoS)	
VSI Configuration	*VLAN ID:
Summary	42 (1 - 4094)

Figure 9-71 Logical network profile: VLAN Configuration

8. Enter Quality of Service (QoS) parameters if required, as shown in Figure 9-72. Click **Next**.

✓ Welcome	Quality of Service
Profile Name	Select Quality of Service (QoS) settings for the logical network profile.
VLAN Configuration	Quality of service parameters control network performance relative to other endpoint
Quality of Service (QoS)	(?) Learn more about quality of service settings
VSI Configuration	Port priority:
Summary	• Use default port priority
0.0000000	C Select a port priority
	(1 lowest priority – 7 highest priority)
	Bandwidth allocation:
	Ouse default bandwidth allocation
	O Enter bandwidth allocation
	(Kbps)

Figure 9-72 Logical network profile: Quality of Service

9. Enter the Virtual Switch Interface (VSI) configuration settings, as shown in Figure 9-73. Click **Next**.

Velcome	VSI Configuration
✓ Profile Name	Specify Virtual Switch Interface (VSI) settings for the network connection.
VLAN Configuration Quality of	Use a VSI interface with VEPA to communicate with multiple controllers. VSI definitions with the VSI Manager ID. If you are not using VEPA, you can skip this step.
✓ Service (QoS) → VSI Configuration	VSI Manager ID: Identifies the VSI Manager with the database that holds the detailed VSI manager ID can be used to obtain the IP address and other connectivity and acce
Summary	VSI type ID (VTID): The integer identifier of the VSI type.

Figure 9-73 Logical network profile: VSI Configuration

10.On the Summary page, check the configuration parameters, as shown in Figure 9-74. Click **Finish**.

Summary
You have specified the following settings for this logical network profile.
Profile Name: KVM LN profile
Description:
VLAN Configuration: VLAN ID: 42
Quality of Service: Port priority: Default Bandwidth allocation: Default

Figure 9-74 Logical network profile: Summary

11. The newly created profile is displayed in the Template Configuration window, as shown in Figure 9-75 on page 358. If you need to configure more logical network profiles in the configuration template, repeat steps 4 - 10. Click **Save Template**.

ogical Netwo	ork Configuration Profiles	
PI PI	NZNMC290I ease save the profiles changes to lose Message	o the template.
You can o	etwork Configuration Template: M create one or more profiles for thi more about logical network configue letwork Profiles	s Logical Network Configuration.
	Profile Add Like Edit	Delete Actions  Search the table Search
Select	Name 🗘	Description
	KVM LN profile	

Figure 9-75 Saving configuration template

12. The newly created template is shown in the Configuration Templates window, as shown in Figure 9-76.

	guration templates to deploy set ation Templates	tings on one or m	ore systems.			
Deplo		Edit Delete	Actions	<ul> <li>Search the</li> </ul>	e table Se	
Select	Name 💠	Deployed 🗘	Plan Count 💠	Type 🗘	Subtype 🔇	
	8GbSANSwitchProtocolConfigu	No	0	Network	I/O Module Fi	
	Ethernet1GbSwitchProtocolCo	No	0	Network	I/O Module Et.	
	Ethernet1GbSwitchVLANConfig	hernet1GbSwitchVLANConfig No		Network	I/O Module Et	
	KVM LNP	No		System Pool	Network Syste	
	OperatingSystemCreatei5Acc	No	0	Operating Sys	Operating Sys.	
Г	OperatingSystemCreateLinux	No	1	Operating Sys		

Figure 9-76 Configuration template created

The configuration template is created and is ready to be assigned to the network pool.

To create the network system pool, perform the following steps:

1. In the VMControl main window, click the **System pools** tab, then click **Network System Pools and Members**, as shown in Figure 9-77 on page 359.

	ls and virtua	nterpris al appliances to source utilizatio	ma	nag	e you	ur data center	more	e efficiently. Deploy virtual applian
Learn more	8							
Resources		Active Status	8			Jobs		
0 Virtual app	liances	Problems	-	-	-	Active	-	-
0 Workloads		Compliance	-	-	-	Completed	-	1
	Server system pools Storage system pools					Scheduled -	-	
0 Network sys								
Basics	Workloa	ds Virtual	Арр	lian	ces	System Po	ols	Virtual Servers/Hosts
0 Server sys pools	F	1 Storage system pools	m		0 Ne pool	twork system		Common tasks
🔕 0 Criti		🔕 0 Critical			C	0 Critical		Health summary
🕧 0 War	ning	1 0 Warning	Q.		1	0 Warning		Monitors Problems
Inform	national	🚺 0 Informa	tion	al		0 Informatio	nal	Server system pools and memb
Оок		1 OK				0 OK		Storage system pools and mem
UOK								

Figure 9-77 VMControl main window

2. In the Network System Pools and Members window, click **Create** to create the new network system pool, as shown in Figure 9-78.

2 devic	es not ready for Network System	Pools			
Network	System Pools and Members (Viev	(Members)			
Creat	e Edit Actions 🔻	Search the table	Search		

Figure 9-78 Network System Pools and Members window

3. The Create Network System Pool wizard opens, as shown in Figure 9-79 on page 360. Click **Next**.



Figure 9-79 Create Network System Pool: Welcome

4. On the Name page, enter the network pool name and description, as shown in Figure 9-80. Click **Next**.

✓ Welcome	Name
> Name	Specify a name and description for the network system pool that you want to cr
Initial Switch	
Additional Switches	*Name (maximum 63 characters):
Virtual Switches	KVM network pool
Uplink Connections	
Logical Networks	Description (maximum 63 characters):
Summary	beschpton (moximum ob characters)

Figure 9-80 Create Network System Pool: Name

5. On the Initial Switch page, select the first switch in the mobility domain, as shown in Figure 9-81 on page 361. Click **Next**.

✓ Welcome ✓ Name ⇔ Initial Switch	Initial Switch										
	Select the first switch that you want to build a network mobility domain around, find additional switches connected on the same physical network.										
Additional Switches	All Switches										
Virtual Switches Uplink Connections Logical Networks	Acti	ions 🔻	Search the	stable Search							
	Select	Name	\$	Management Status	\$	Access	Pr				
Summary	۲	9,42,171	1.8	🗥 No Direct Connectiv	ity	ОК					
	0	IB	M 8731A	🔕 No Virtual Switch		ОК					
	0	no	de03-x240	📄 ок		ОК					
	0	IBM8Gb		🙆 No Configuration Ad		ОК	E.				

Figure 9-81 Create Network System Pool: Initial Switch

6. Optional: Select additional switches, as shown in Figure 9-82. Click Next.

✓ Welcome	Additional Switches								
✓ Name	(Option	(Optional) Identify additional switches for the network system pool by adding th							
Initial Switch     Additional     Switches     Virtual Switches     Uplink Connections	Resource Selected	Switches	le are a	already added to the ne					
Logical Networks	Add	. Remove	Ac	tions 🔻 Search t	the tab	le	Search		
Logical Networks Summary	Select	Name	٥	Management Status	٥	Access			

Figure 9-82 Create Network System Pool: Additional Switches

7. The wizard automatically adds virtual switches to the pool, as shown in Figure 9-83 on page 362. Click **Next**.

Velcome	Virtual Switches									
✓ Name ✓ Initial Switch	(Optional) Verify the virtual switches and network interface cards (NICs) that yes									
<ul> <li>Additional Switches</li> <li>Virtual Switches</li> <li>Uplink Connections</li> <li>Logical Networks</li> </ul>	Resources listed in the table have been automatically added to this network system in previous steps. Virtual Switches and their attached LAN connection desired. Virtual Switches									
Summary	Add	. Remove Actions	Search the	table Searc	:h					
	Select	Name 🗘	Туре 🗘	IP Addres 🗘	N					
		9.42.171.8	Switch	fe80:0:0:0:36						
		node02-x240	Server	9.42.171.33,						
		sw_eth0-9.42	Virtual Switch	9.42.171.33						
		👎 eth0	LAN Connection		3					
		node03-x240	Server	fe80:0:0:0:36						
		=== sw_eth0-9.42	Virtual Switch	9.42.171.34						

Figure 9-83 Create Network System Pool: Virtual Switches

8. On the Pool Uplink Connections page, click **Add** to add a new uplink, as shown in Figure 9-84.

Velcome	Pool	Uplink Connection	ons				
✓ Welcome ✓ Name	(Option	al) Identify the pool upli	nk conne	ections for th	e neti	work system po	ol by a
<ul> <li>✓ Initial Switch</li> <li>✓ Additional Switches</li> <li>✓ Virtual Switches</li> <li>✓ Virtual Switches</li> <li>✓ Uplink Connections</li> <li>Logical Networks</li> <li>Summary</li> </ul>	rest of th Pool uplin (?Learn Resource	pool uplink connection, y e network. nk connections can also t more about pool uplink o s listed in the table are a nk Connections	oe modif	fied after crea	ating t	the network sys	tem po
	Add	. Remove Edit	.	Actions 🔻		Search the tab	le
	Select	LAN Connection	٥	Switch	٥	VLAN ID Set	≎ De

Figure 9-84 Create Network System Pool: Pool Uplink Connections

9. Select the uplink port as shown in Figure 9-85 on page 363. Click OK.

	te Pool Uplink Connections				
Acti	ons 🔻 Search the table	Search			
Select	LAN Connection	Switch 🗘	VLAN ID Set 🗘	Default VLAN 🗘	Descript
	EXT20	9.42.171.8	1	Default - 1	
	EXT21	9.42.171.8	1	Default - 1	
	EXT10	9.42.171.8	1	Default - 1	
	EXT22	9.42.171.8	1	Default - 1	
	EXT15	9.42.171.8	1	Default - 1	
	EXT16	9.42.171.8	1	Default - 1	
	EXT17	9.42.171.8	1	Default - 1	
	EXT18	9.42.171.8	1	Default - 1	
	EXT19	9.42.171.8	1	Default - 1	
	EXTM	9.42.171.8	4095	PVID - 4095	
V	EXT1	9.42.171.8	1	Default - 1	
	EXT2	9.42.171.8	1	Default - 1	

Figure 9-85 Add Uplink Connections - KVM network pool

10. The uplink port that was added appears in the list of uplinks, as shown in Figure 9-86. Click **Next**.

🖌 Welcome	Pool Uplink Connections	s	
Name	(Optional) Identify the pool uplink o	connections for the	network system pool by
<ul> <li>Initial Switch</li> <li>Additional Switches</li> <li>Virtual Switches</li> <li>Uplink Connections</li> <li>Logical Networks</li> </ul>	For each pool uplink connection, you rest of the network. Pool uplink connections can also be n @Learn more about pool uplink conr Resources listed in the table are alrea	nodified after creat	ing the network system p
Summary	Pool Uplink Connections	1	
	Add Remove Edit	Actions 🔻	Search the table
	Select LAN Connection	\$ Switch	♦ VLAN ID Set ♦ D
	EXT1	9,42,171.8	1 D

Figure 9-86 Create Network System Pool: Pool Uplink Connections

11. Assign the logical network profile created earlier by clicking **Add**, as shown in Figure 9-87 on page 364.

✓ Welcome	Logical Network Profiles
✓ Welcome	(Optional) Assign logical network profiles to the network system pool by adding the
<ul> <li>Initial Switch</li> <li>Additional Switches</li> <li>Virtual</li> </ul>	Logical network profiles define the set of networks available for use by virtual servers Logical network profiles can also be added or removed after creating the network sys ②Learn more about logical network profiles
Switches     Uplink     Connections	Resources listed in the table are already added to the network system pool. Assigned Logical Network Profiles
Uplink	

Figure 9-87 Create Network System Pool: Logical Network Profiles

12. Select the logical network profile, as shown in Figure 9-88. Click OK.

system p		ou want	to be available fo	or use by virtual s	ervers within the n	etwork
	ons 🔻   Search the t	able	Search			
100						
Select	Profile Name	٥	Template 🗘	VLAN ID	VSI Para 🗘	Descriptio

Figure 9-88 Create Network System Pool: Add Logical Network Profiles

13. The added profile is listed on the Logical Network Profiles page (see Figure 9-89). Click **Next**.

🖌 Welcome	Logi	al Network Pi	ofiles				
✓ Welcome ✓ Name	(Option	nal) Assign logical net	work profile:	s to the network s	stem pool	by add	ing them
<ul> <li>✓ Additional</li> <li>Switches</li> <li>✓ Virtual</li> </ul>	Logical n	etwork profiles define etwork profiles can als more about logical ne	o be added	or removed after			
✓ Virtual Switches ✓ Uplink Connections	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	s listed in the table ar Logical Network Profi		dded to the netwo	rk system	pool.	
<ul> <li>✓ Switches</li> <li>✓ Uplink Connections</li> <li>→ Logical</li> </ul>	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Logical Network Profi		1		pool. Searcl	h
<ul> <li>✓ Switches</li> <li>✓ Uplink</li> <li>✓ Connections</li> </ul>	Assigned	Logical Network Profi	les				h VSI Par

Figure 9-89 Create Network System Pool: Logical Network Profiles

14. Check the configuration settings on the Summary page, as shown in Figure 9-90 on page 365. Click **Finish**.

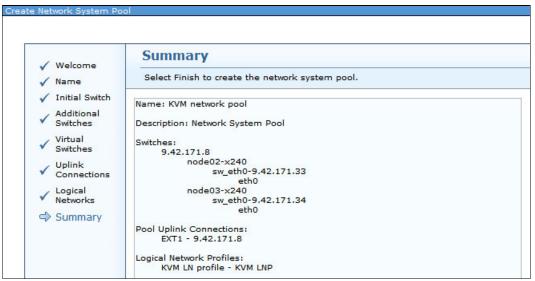


Figure 9-90 Create Network System Pool: Summary

15. The newly created network system pool is shown in the Network System Pools and Members window (see Figure 9-91).

letwork	System Pools and Members (Vi	ew Members)					
Creat	e Edit Actions 🔻	Search the	table	Search			
Select		Access	\$	Problems	٥	Virtual Servers	\$ C
Select		C Access	\$	Problems	\$	Virtual Servers	\$ D

Figure 9-91 Network System Pools and Members

For more information about implementing network system pools, see this website:

http://pic.dhe.ibm.com/infocenter/flexsys/information/topic/com.ibm.acc.8731.doc/c
om.ibm.sdnm.adv.helps.doc/fnc0_t_network_ctrl_managing_nsps_and_lnps.html

### 9.6 Creating KVM server system pools

Before you create Server system pools, review the information at this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fco m.ibm.director.vim.helps.doc%2Ffsd0_vim_c_learnmore_getting_started_system_pools.h tml

For more information about the prerequisites, see this website:

http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fco m.ibm.acc.commontasks.doc%2Fcommontasks_navigating_fsm.html To create KVM server system pools, perform these steps:

1. Go to the VMControl main window as shown in Figure 9-92, and click **Server system pools**.

/MControl Entor	maria a Edi	1	100				
/MControl Enter	rprise Edi	uo	n				
se system pools and virtu							
orkloads. Pool your syste	ems to increase	res	our	ce u	itilization and	aut	omat
)Learn more							
	Active Status	(			Jobs		
Learn more	Active Status Problems	(			Jobs Active	<u>^</u> -	-
Learn more Resources	-	3		8		-	-
Learn more Resources 1 Virtual appliances	Problems	3	<u>^</u> -	8	Active	-	-

Figure 9-92 VMControl main window

2. The View Server System Pools window opens as shown in Figure 9-93. Click Create.

View Serve	er System	Pools							
_	ystem Poo Id Hosts	Is (View Me	wiew Dashl	poard	Ad	tions 🔻	Sea	rch the table Search	
Select	Name 💠	State ᅌ	Problems ᅌ	Platform	0	CPU Avera	ige 🌣	CPU Peak Utilization \$	Alle

Figure 9-93 Server system pool member list

3. The Welcome window to create a server system pool opens as shown in Figure 9-94 on page 367. Click **Next**.

⇔ Welcome	Welcome
Name	Welcome to the Create Server System Pool wizard.
Pooling Criteria Initial Host Shared Storage Additional Hosts Optimization Summary	Use this wizard to create a server system pool. A server system pool aggregates multiple hosts together int simplified management pool. It shares common storage to allow dynamic deployment, automatic placement, relocation of workloads. <pre>@Learn more</pre> You are guided through the following tasks: <ul> <li>Select a name</li> <li>Select a pooling criteria</li> <li>Select the shared storage this pool will use</li> <li>Select additional hosts</li> <li>Select optimization settings (if applicable)</li> </ul> <li>Show this welcome page next time</li>
	< Back Next > Finish

Figure 9-94 Server system pool Welcome window

4. Specify a name to assign to the server system pool as shown in Figure 9-95, then click **Next**.

✓ Welcome	Name
Name	Specify a name and description for the server system pool that you want to creat
Pooling Criteria Initial Host Shared Storage Additional Hosts Optimization Summary	*Name: KVMpool Description (limit of 512 characters):

Figure 9-95 Server system pool name

5. Under Pooling Criteria, check **Only add hosts capable of live virtual server relocation** as shown in Figure 9-96, then click **Next**.

✓ Welcome	Pooling Criteria
✓ Name	Select the pooling criteria to use for this server system pool.
Pooling Criteria Initial Host Shared Storage Additional Hosts Optimization Summary	<ul> <li>Resilience criteria:</li> <li>Only add hosts capable of live virtual server relocation</li> <li>Network deployment criteria:</li> <li>Only add hosts connected by a network system pool and capable of automate There are no available network system pools.</li> <li>(*) Learn more about network system pools</li> <li>Note: When adding hosts that contain existing virtual servers, the existing virtual system pool management. These virtual servers will still run on the host, but not pool.</li> <li>(*) Learn about server system pool capabilities</li> </ul>

Figure 9-96 Pooling criteria

6. Select a host as the initial host to initiate the creation of the server system pool as shown in Figure 9-97, then click **Next**.

✓ Welcome	Initia	il Host				
🗸 Name	Select th	e first host that you want to use to create t	his server system pool. This in	tial host will be used to find similar ho	osts that support the re	equired capabilities for this server sy
<ul> <li>✓ Name</li> <li>✓ Pooling Criteria</li> <li>⇒ Initial Host</li> <li>Shared Storage</li> <li>Additional Hosts</li> <li>Optimization</li> <li>Summary</li> </ul>	Select a v Show:	valid target then add it to the selected list. All Targets J		Description 0 fd55: faaf: e1ab: 1015: 5ef3: fcff: fe6e	Add S Kameya	Selected:
	H 4 Pag	e 1 of 1 🕬 😰 🔶 Totel: 1				

Figure 9-97 Initial server system pool host

7. Select the shared storage system that you want to assign to the server system pool as shown in Figure 9-98, then click **Next**.

✓ Welcome	Shared Storag	e
<ul> <li>✓ Name</li> <li>✓ Pooling Criteria</li> <li>✓ Initial Host</li> </ul>	subsystem or a storage	ystem pool must use the same shared storage. For shared storage system pool that you previously created. The following shared stor system pool. Select the shared storage you want this server syster
Shared	Available shared storage	r .
Storage	Storwize V7000-2076-v7	000-IBM/RSL-Sha
Additional Hosts Optimization	Storwize V7000-2076-v70	000-IBM/RSL-Shared details:
Summary	Description:	Storage Pool
ourniner,	Available capacity:	56678GB
	Total capacity:	58038GB

Figure 9-98 Assigning a storage system to the server system pool

8. If you have several hosts, you can add more hosts to your server system pool. This configuration increases high availability and the amount of resources that are shared in your system pool as shown in Figure 9-99. Click **Next**.

✓ Welcome	Additional Hosts
🗸 Name	The following hosts are compatible and can be added to this server system pool. Select the ho
✓ Pooling Criteria	pool.
🗸 Initial Host	No compatible hosts are available. You can add hosts later by editing the server system pool.
✓ Shared Storage	@Why don't I see my system?
Additional Hosts	
Optimization	
Summary	

Figure 9-99 Additional Hosts window

9. Select the optimization mode that you want as shown in Figure 9-100, then click Next.

✓ Welcome	Optimization
🗸 Name	Configure the optimization settings for the server system pool.
✓ Pooling Criteria ✓ Initial Host	Dynamic placement optimization analyzes your server system pool and can periodically optimi Specify how optimizations are to be started:
<ul> <li>✓ Shared Storage</li> <li>✓ Additional Hosts</li> </ul>	Only allow manual optimization     Allow optimizations to occur automatically     Optimization interval: 30     Minute M
Optimization     Summary	①Learn more about server system pool optimization

Figure 9-100 Server system pool optimization choice

10. Check the summary as shown in Figure 9-101.

✓ Welcome	Summary			
🗸 Name	You are now ready to create the server system pool.			
<ul> <li>Pooling Criteria</li> <li>Initial Host</li> <li>Shared Storage</li> </ul>	Server system pool details: Name: KVMpool Shared Storage: Storwize V7000-2076-v7000-IBM/RSI	-Shared		
Additional	Hosts:			
Hosts	Hosts: Name 🔷	Туре	Ŷ	Description
		Type Server	¢	Description fd55:faaf:

Figure 9-101 Checking the summary

Click **Display Properties** to check the creation progress as shown in Figure 9-102.

ew Serv	er System P	ools					
Server S		ving job h Properties	Close Messa		ed successfully:	Create System Pool -	Friday, June 22
A	Id Hosts	Create	View Dashboard	Actions	- Search th	e table Search	
Select	Name 💠	State 0	Problems 🗘	Platform \$	CPU Average 🗘	CPU Peak Utilization 🗘	Allocated Proce
	🗓 КУМроо	Active	🖉 ок	KVM	AB.	nn,	
	PowerVN	Active	🖉 ок	POWER Hyper	III.	RD,	

Figure 9-102 Display Properties window

When the creation is complete, go back to **View Server System Pools** and check that the new server system pool is available as shown in Figure 9-103.

ew Serv	er System Pools						
Server S	ystem Pools (View Membe	ers)					
Ad	Id Hosts Create	View Dashboar	Actions	▼ Search	h the table Sea	irch	
Select	Name 🔹	State 🗘	Problems 🗘	Platform 🗘	CPU Average 🗘	CPU Peak Utilization 🗘	A
	N KVMpool	Active	ОК	KVM	1	1%	
	PowerVM-Server-Pool	Active	ОК	POWER Hyper			

Figure 9-103 Server system pools view

## 9.7 Add host to an existing server system pool

To increase your server system pool availability or to increase the amount of resources in your pool, add processors and memory. To add memory and processors, add more KVM hosts in your server system pool. To add more hosts, perform these steps:

1. Go to the server system pools view as shown in Figure 9-104.

ew Serv	er System Pools						
-	System Pools (View Member 14 Hosts Create	ers) View Dashboard	1 Actions	- Search	the table	rch	
Select	Name 🔹	State 🗘	Problems 🗘	Platform \$	CPU Average \$	CPU Peak Utilization \$	
	1 KVMpool	Active	ОК	KVM	1	1%	
	PowerVM-Server-Pool	Active	ОК				

Figure 9-104 Add hosts to a server system pool

 Select your server system pool, and click KVMpool → Availability → Add Hosts as shown in Figure 9-105.

		arch the table Search						
Sele	Create Group	. ÷	Acc	ess 🗘	Complianci 🗘	Problems 🗘	LED Status 🗘	Commu
	KVMpool 🕨	Related Resources	•	ж	ОК	ОК	ОК	Commun
	Import Groups	Topology Perspectives	•					
	Columns	Create Group						
	Export	Edit						
	Select All	Optimize						
	Deselect All	Permanently Delete						
	Show Filter Row	Remove Hosts from Pool						
	Clear All Filters	Rename						
	Edit Sort	Add to	•					
	Clear All Sorts	Automation						
		Availability	Þ	Add Hosts				
		Inventory	•		-			
		Security	•					
		System Configuration						
		System Status and Health						
•		Service and Support	•					
4 4 P	age 1 of 1 🕨 1	Properties	-	1 Filtered	d: 1			

Figure 9-105 Selecting Add Hosts

3. The Welcome window for adding hosts opens as shown in Figure 9-106. Click Next.

Select Hosts	Welcome to the Add Host wizard
Summary	This wizard helps you add hosts to this server system pool.
	Note: When adding hosts that contain existing virtual servers, the existing virtual servers will be management. These virtual servers will still run on the host, but not be managed by the server :

Figure 9-106 Welcome to the Add Host wizard window

4. Select the host that you want to add to your server system pool as shown in Figure 9-107, then click **Next**.

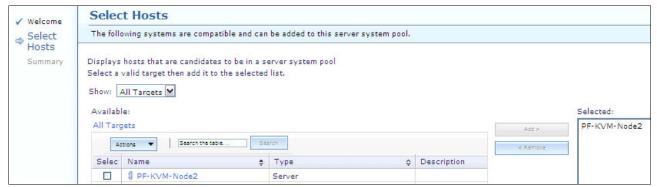


Figure 9-107 Select hosts to add to an existing server system pool

5. Review the summary and click **Finish** as shown in Figure 9-108.

✓ Welcome	Summary		
Select Hosts	You are now ready to add hosts to the server system pool.		
⇔ Summary	Server system pool details: Name: KVMpool Description: Server System Pool Hosts:		
	Name 🗢	Туре о	Description
	PF-KVM-Node2	Server	

Figure 9-108 Add hosts summary

6. Click **Display Properties** as shown in Figure 9-109.

erver	Display Properties Close Messag					Friday, June 22,	
		<u></u> .					
A	tions 👻 Search the table Se	arch					
Selec	tions   Eearch the table  Name	Access 0	Complianc ô	Problems 👌	LED Statu: ô	Communication	He
			Complianc 👌	Problems 👌	LED Statu: 👌	Communication O	

Figure 9-109 Display job properties

Wait until the job is complete as shown in Figure 9-110.

me: Add Host t	to System Pool - Friday, June 22, 2012 3:04:51 PM EDT Actions 👻
General Ta	rgets History Logs
	(#1997) 1997
Status:	Complete
Progress:	100%
Last Run Statu	s: Complete
Description:	Run once on 6/22/12 at 3:04 PM
Next Run:	
Last Run:	6/22/12 at 3:04 PM
Task:	Add Host
	USERID

Figure 9-110 Job complete

7. Go back to **Server system pools** view and click your KVM pool. You can see now that you have an additional KVM host in your server system pool as shown in Figure 9-111.

erver S	ystem Pools > KVMpool (Computer Syste	m)				
Act	ions  Search the table Search Name	Access 0	Compliance	Problems \$	LED Status \$	Commu
	PF-KVM-Node2	ОК	ОК	ОК	ок.	Commu

Figure 9-111 KVM server system pool

# 9.8 Operating a KVM virtual infrastructure

The following tasks can be performed when you are operating the KVM infrastructure:

- Importing a virtual appliance
- Deploy a virtual appliance to create a virtual server
- Capturing a virtual appliance
- Relocate virtual servers

#### 9.8.1 Importing a virtual appliance

To import virtual appliances, perform these steps:

1. Go to the VMControl plug-in tab as shown in Figure 9-112.

VMControl Enter	orise Edit	tio	n						
Use system pools and virtua workloads. Pool your system ⑦Learn more								efficiently. Deploy virtual applia ion.	
Resources	Active Status	3			Jobs			·	
1 Virtual appliances	Problems	4	- 9	9	Active	2	1		
0 Workloads	Compliance		Ξ.	-	Completed	10	36		
2 Server system pools 1 Storage system pools 1 Network system pools					Scheduled	-	1		
Basics Workloads	Virtual Appli	anc	es	S	ystem Pools	Vi	tual	Servers/Hosts	
13 Virtual servers					Co	omm	on ta	sks	
0 Warning     7 Informational					P	Virtual servers and hosts Performance Summary			
6 OK					C		e virl	tual farm	
8 Hosts with 13 virtual s 2 Virtual farms	ervers		eloca eloca		i plans				

Figure 9-112 VMControl plug-in main window

2. Click the **Virtual Appliances** tab as shown in Figure 9-113, then click **Import** in the Common tasks list.

Basics Workloads Virtual Ap	pliances System Poo	ls Virtual Servers/Hosts		
What to deploy: Where to dep 1 Virtual appliances 7 Existing vi		Common tasks		
	1 Virtual appliances       7 Existing virtual servers         2 Hosts and 2 server system pools         What to capture:       Where to store:         0 Workloads       3 Image         4 Virtual servers and operating       repositories			

Figure 9-113 Virtual Appliances tab

3. You are redirected to the import appliances Welcome window as shown in Figure 9-114. Click **Next** to start the import process.

⇔ Welcome	Welcome
Source Name Repository Version Control Summary	Welcome to the Import wizard.
	This wizard helps you import a virtual appliance package. Virtual appliance pac Format (OVF), which is a platform independent and open packaging and distrit import the virtual appliance package from the Internet or from a system in you appliance package, you can quickly deploy it into your environment.
	<ul> <li>①Learn more about importing virtual appliances</li> <li>You are guided through the following tasks:</li> <li>* Selecting the OVF package for the virtual appliance</li> <li>* Specifying an image repository to store the virtual appliance, if more than o</li> </ul>

Figure 9-114 Import appliances Welcome window

4. Enter the path to import your appliance. In this example, import the appliance from an http server as shown in Figure 9-115. Click **Next**.

Welcome	Source			
Source	Specify the virtual appliance package to import.			
Name Repository	Location and name of virtual appliance package, specified as an .ovf or .ova file:			
Version Control	http://pokgsa.ibm.com/~rrand/public/ren-va.ovf View Details			
Summary	Example: http://www.vappliances4sale.com/aix61/aix61TL4wDB2.ova			
	Acceptable specification forms:			
	On any management server:			
	[relativepath]filename.ovf or [relativepath]filename.ova http://path/filename.ovf or http://path/filename.ova			
	On IBM Flex System Manager™ Server on AIX and Linux only: /localpath/filename.ovf or /localpath/filename.ova			
	file:///localpath/filename.ovf or file:///localpath/filename.ova			
	On IBM Flex System Manager™ Server on Windows only:			
	file://c/localpath/filename.ovf or file://c/localpath/filename.ova			
	c:\localpath\filename.ovf or c:\localpath\filename.ova			
	\\computername\path\filename.ovf or \\computername\path\filename.ova			

Figure 9-115 Import appliance source path file

5. If you do not want to import the digital signature, select the **Import without digital signature** check box as shown in Figure 9-116, then click **Next**.

✓ Welcome	Digital Signature
✓ Source	Specify whether you require a digital signature for this import action.
➡ Digital Signature	No digital signature was detected for the specified package.
Name	Import without digital signature.
Repository	②Learn more about digital signatures
Version Control	
Summary	

Figure 9-116 Digital Signature window

6. By default, the original appliance name is assigned, as shown in Figure 9-117, but you can specify another one. Click **Next**.

✓ Welcome	Name
✓ Source	Specify a name and description for the virtual appliance package that you want to
✓ Digital Signature	
🗇 Name	Name: ren-va-10-12-11
Repository	Description:
Version Control	Imported from file: http://pokgsa.ibm.com/~rrand/public/ren-va.ovf
Summary	Limit of 256 characters
	Search tags:
	Enter tags separated by commas. Example: WebSphere, Test, Department 123

Figure 9-117 Assign a name to a virtual appliance

7. Select the image repository where you want to import the virtual appliance as shown in Figure 9-118, then click **Next**.

Welcome Repository											
✓ Source	Select the image repository where you want to store the virtual appliance when the										
✓ Digital Signature	ince:										
✓ Name Image Repositories											
Repository		ctions 👻 Search the table	e Search								
Version Control						-					
Summary	Select	Name 💠	Image Count	0	Managed By 🔅	Des					
Summary	0	PowerVM-Repository		0	SN101D88B_VIOS1	Ima					
	۲	🐻 KVMimagesrepo		0	PF-KVM03	Ima					
	2		1								

Figure 9-118 Appliance repository

8. You can create a version tree for the imported appliance as shown in Figure 9-119. Or, you can add it under an existing tree as a child appliance of an existing one. Click **Next** to continue.

✓ Welcome	Version Control
✓ Source	Set the version information for the new virtual appliance.
<ul> <li>Digital</li> <li>Signature</li> <li>Name</li> </ul>	You can choose to create a new version tree with the new virtual appliance as the root, appliance to be the parent version of the new virtual appliance.
Repository	Select the action you want to take to set version information for the new virtual appliar
➡ Version Control	• Create a new version tree with the new virtual appliance as the root.
Summary	O Select a virtual appliance to be the parent version of the new virtual appliance.
	<pre>AIX_Lppsource</pre>

Figure 9-119 Version Control window

9. Review the summary as shown in Figure 9-120, then click Next.

✓ Welcome	Summary	
✓ Source	You are now ready to import the selected virtual appliance package and crea	te a virt
✓ Digital Signature	Virtual appliance details:	
🗸 Name	Virtual appliance name: ren-va-10-12-11	~
<ul> <li>Repository</li> </ul>	Virtual appliance description: Imported from file: http://pokgsa.ibm.com/~rrand/public/ren-va.ovf	
✓ Version Control	Source file: ren-va.ovf	=
Summary	Repository: KVMimagesrepo	
	Version Control: Create a new version tree with the new virtual appliance as the root.	~
	Click Finish to import the virtual appliance package. Once completed, you can d environment.	eploy th

Figure 9-120 Import appliance summary

10. Select **Run Now** and click **OK** to start the virtual appliance import process as shown in Figure 9-121.

		Launch Job	
Schedule	Notification	Options	
Job name a	and schedule		
*Job Name	e:		
Import virtua	al appliance - June 2	3, 2012 9:08:41 PM EDT	
Choose wh	hen to run the jo	b.	
⊙ Run No	W		
O Schedu	ile		

Figure 9-121 Run appliance import now

11.Click **Display Properties** to open the Active and Scheduled Jobs window as shown in Figure 9-122.

e and Schedul	ed Jobs > Import virtual appliance - June 23, 2012 8:07: (Properties)
ne: Import virt	ual appliance - June 23, 2012 8:07:43 PM EDT Actions 🔻
ieneral Ta	rgets History Logs
Status:	Active
Progress:	55 ¹ / ₀
ast Run Statu	s: Running
Description:	Run once on 6/23/12 at 8:07 PM
Next Run:	
	6/23/12 at 8:07 PM
.ast Run:	
last Run: Task:	Import virtual appliance
	USERID

Figure 9-122 Import appliance job progress

**Remember:** Appliance import times can vary depending on where the appliance is in the network.

12. When the import process is complete, go back to the **Virtual Appliances** tab as shown in Figure 9-123. Check that the new appliance is available for deployment.

pliances (View Members)			
phances (view Members)			
ure Deploy Virtual Applic	ance Import Actions	Search the table     Search	
lame 👌	Operating System 🗘	Repository 🗘	Description
AIX_Lppsource	IBM AIX	pureflexrb13.rtp.stglabs.ibm.cor	Virtual Applian
AIX-6100_mksysb	IBM AIX 6	pureflexrb13.rtp.stglabs.ibm.cor	Virtual Applian
Captue_AIX_SCS	IBM AIX 6	PowerVM-Repository	Virtual Applian
CapturedVMonKVM	Linux	KVMimagesrepo	Fred's Capture
ren-va-10-12-11	Linux	KVMimagesrepo	Imported from
	AIX_Lppsource AIX-6100_mksysb Captue_AIX_SCS CapturedVMonKVM	lame c Operating System ≎ AIX_Lppsource IBM AIX AIX-6100_mksysb IBM AIX 6 Captue_AIX_SCS IBM AIX 6 CapturedVMonKVM Linux	Iame     Operating System     Repository       AIX_Lppsource     IBM AIX     pureflexrb13.rtp.stglabs.ibm.cor       AIX-6100_mksysb     IBM AIX 6     pureflexrb13.rtp.stglabs.ibm.cor       Captue_AIX_SCS     IBM AIX 6     PowerVM-Repository       CapturedVMonKVM     Linux     KVMimagesrepo

Figure 9-123 Virtual Appliances view

### 9.8.2 Deploy a virtual appliance to create a virtual server

You can deploy virtual appliances in the Linux KVM virtualization environment on IBM Flex System Manager VMControl to new or existing virtual servers, or to server system pools. For more information about deployment requirements and limitations, see the IBM Flex System Information Center at this website:

```
http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp?topic=%2Fco
m.ibm.director.vim.helps.doc%2Ffsd0_vim_r_kvm_deploy_reqs.html
```

To deploy a virtual appliance, perform these steps:

1. Go to the main page of the VMControl Plug-in as shown in Figure 9-124. Click **Deploy** virtual appliance in the Common tasks list.

our		our data c tilization ar Jobs				Deploy v
			1 .			
		Jobs				
	-					
	9	Active	-	-		
-	-	Complete	ed 10	37		
		Schedule	ed -	1		
es	Sv	stem Pool	s Vii	tual Se	rvers/Ho	osts
orvi	ore		Comm	on task	;	
		em pools	Deplo	y virtua	appliar	nce
ore	tos	tore	Captu	ire		
Ima	age					
osit	torie	S				
	ervi ver ere Ima	ervers ver syste ere to s Image ositorie	Schedule es System Pools ervers rer system pools ere to store: Image ositories	Scheduled - es System Pools Vir ervers ver system pools Deplo captu Image ositories View view view view view view view view v	Scheduled       -       1         es       System Pools       Virtual Se         ervers       Common tasks         ver system pools       Deploy virtual         ere to store:       Import         Image       View active a         ositories       View virtual a	Scheduled       -       1         ervers       Virtual Servers/Ho         ver system pools       Common tasks         ervers       Deploy virtual appliar         capture       Import         View active and sche       View virtual appliar

Figure 9-124 VMControl plug-in main window

2. The Welcome window for the Deploy Virtual Appliance opens as shown in Figure 9-125. Click **Next**.

⇔ Welcome	Welcome
Virtual appliance	Welcome to the Deploy Virtual Appliance wizard.
Target	Use this wizard to deploy a virtual appliance.
Summary	⑦Learn more about deploying virtual appliances
	You are guided through the following tasks:
	* Selecting a virtual appliance to deploy
	<ul> <li>Specifying a target for the selected virtual appliance</li> <li>(Optional) Customizing settings on the virtual appliance before deployin</li> </ul>

Figure 9-125 Deploy Virtual Appliance Welcome window

3. Select the appliance that you want to deploy as shown in Figure 9-126, then click Next.

Welcome	Virtual appliance									
Virtual	Select t	Select the virtual appliance that you want to deploy.								
appliance										
Target	Virtual a	ppliances that you can o	leploy:							
	-	Name	Revision Trun	Revision	Operating System	F				
ummary	Select	Name	rection from the							
ummary	Select	AIX_Lppsource	AIX_Lppsource	1.1	IBM AIX	p				
imary	Select				IBM AIX Linux	р К				

Figure 9-126 Virtual appliances catalog

**Remember:** You can see the appliances that are available from different image repositories, as shown in Figure 9-126.

4. Select the target location where you want to deploy the new virtual server as shown in Figure 9-127 and click **Next**.

✓ Welcome	Target						
✓ Virtual appliance	Select the	location where you want to o	leploy the virt	ual a	pplia	nce.	
Target     Workload Name     Name     Storage Mapping	the virtual a	loy the virtual appliance to c ppliance to an existing virtua o a new virtual server on the	l server.	irtual	serv	ver on an exis	ting host syst
Network Mapping	Ac	tions 👻 Search the table	. Search				
Product	Select	Name 🗢	State	0	IP /	Addresses ᅌ	Installed OS
Summary	۲	👔 KVMpool	Active				1
	0	PowerVM-Server-Pool	Active				
	O Deploy to	e 1 of 1	Starch	1			
	Select	Name 0	State	-	٥	IP Addresse	is ô De
	0	VMRHEL62x86template	Started				Virt
	Note: When	ge 1 of 1 >>> 1 1 >> Set deploying to a server system his process might take a few		rver s	syste		identify the ho

Figure 9-127 Target to deploy a virtual server

**Tip:** You can choose to deploy an appliance on an existing virtual server. A virtual server is a virtual machine with processor, RAM, and hard disk drive (HDD) resources on which you can install an OS or deploy a virtual appliance.

5. Specify a workload name as shown in Figure 9-128 and click Next.

✓ Welcome	Workload Name
🗸 Virtual appliance	A workload is created as a result of deploying the virtual appliance.
<ul> <li>✓ Target</li> <li>→ Workload</li> <li>Name</li> </ul>	*Specify a unique name for the workload. RHEL62deployed
Name	
Storage Mapping	
Network Mapping	
Product	
Summary	

Figure 9-128 Workload Name window

**Clarification:** A Workload in FSM is a group that contains one or several virtual servers.

6. Specify a name for your virtual server as shown in Figure 9-129, then click Next.

✓ Welcome	Name
🗸 Virtual appliance	Specify a name for the virtual server that you want to deploy.
<ul> <li>✓ Target</li> <li>✓ <u>Workload Name</u></li> <li>⇒ Name</li> </ul>	*Type the name of the virtual server that you want to create. RHEL62VS
Storage Mapping	
Network Mapping	
Product	
Summary	

Figure 9-129 Virtual server naming

7. Assign a disk from a storage pool or from a storage volume, as shown in Figure 9-130. Select **Assign to Storage Pool**, then click **Next**.

✓ Welcome	Storage Mapping						
🗸 Virtual appliance	Specify	y how to assign the storage for the virtu	ial disks when you c	leploy the vir	rtual ap	oplia	
<ul> <li>✓ Target</li> <li>✓ Workload Name</li> <li>✓ Name</li> <li>✓ Storage</li> <li>Mapping</li> <li>Network Mapping</li> <li>Product</li> </ul>	single di If one or the defa ?Learn serve	each disk in the table is assigned to eith sk. You can select multiple disks to assi r more available storage locations were ult assignment(s) are adequate, you ca n more about storage mapping for deplo r Mapping	gn to a storage poo found, then a sugg n just click Next to o	l. ested storage continue with	e pool I	has	
Summary		Assign to Storage Volume Assign	to Storage Pool	Actions	•	Sea	
	Select	Disk Required by Virtual Appliance 🗢	Assigned Stora 🗘	Size (MB)	٥	Im	
	۲	disk1	RSL-Shared (SAN		6,144	Tru	
	<						

Figure 9-130 Assigning a disk

Tip: By default, the storage volume (disk1) is selected, as shown in Figure 9-130.

8. Select the storage pool that you configured previously, as shown in Figure 9-131, then click **OK**.

			Assign to Storage P	ool	
and the second second second	ne storage pool that you war sk space required for selecte pools		lisks. A storage volume w	ill automatically be create	ed on the selected storage
Ac	tions	Starch			
Select	Storage Pool 💠	Storage Type 🔹 🗘	Storage Location 🔹 🗘	Available (GB) 🗘	Description
۲	RSL-Shared	SAN	Storwize V7000-2076-v7	56,672.5	RSL-Shared
<					
I€ € Pag	elof1 ▶ भ 🔟 🔹 🕴 Se	elected: 1 Total: 1 Filter	red: 1		

Figure 9-131 Selecting the storage pool

9. The Storage Mapping GUI is displayed as shown in Figure 9-132. Note that disk1 is not selected now because a disk is created automatically in your storage pool. Click **Next**.

✓ Welcome	Stor	age Mapping							
🗸 Virtual appliance	Specify how to assign the storage for the virtual disks when you deploy the virtual applia								
<ul> <li>✓ Target</li> <li>✓ <u>Workload Name</u></li> <li>✓ <u>Name</u></li> <li>✓ Storage Mapping Network Mapping Product</li> </ul>	single di If one or the defa @Learn serve	each disk in the table is assigned to eith sk. You can select multiple disks to ass r more available storage locations were ult assignment(s) are adequate, you ca more about storage mapping for deplo r Mapping	ign to a storage pool. found, then a suggested storage p in just click Next to continue with th	ool has l					
Summary		Assign to Storage Volume Assign	to Storage Pool Actions 💌	Sea					
	Select	Disk Required by Virtual Appliance 🗢	Assigned Storage	Size (N					
	0	disk1	RSL-Shared (SAN Storage Pool)						
	<								
	H 4 Pag	e 1 of 1 🕨 主 🔹 Selected: 0	Total: 1 Filtered: 1						

Figure 9-132 Storage Mapping window

10. Select the virtual network adapter to create a virtual Ethernet adapter on your virtual server, as shown in Figure 9-133, then click **Next**.

✓ Welcome	Network Mapping						
🗸 Virtual appliance	Select a virtual network for each network defined for the appliance.						
Target     Workload Name     Name	The following networks will be assigned for this virt Network Mapping	ual server.					
✓ <u>Name</u> ✓ <u>Storage Mapping</u>	Actions V Search the table						
🚽 Network	VA Network Name 🔶	Description 🗘	Assigned Virtual				
Mapping	Network adapter 0 on Discovered-brUntagged-0	Network adapter 0 on	Discovered-br0-				
Product	<	Ш					
Summary	H      Page 1 of 1      H      Total: 1 Filtere	d: 1					

Figure 9-133 Network Mapping window

11. You can preconfigure several parameters that include the name and the network configuration of your virtual server as shown in Figure 9-134. Click **Next**.

✓ Welcome	Product						
Virtual appliance	Specify the product settings you want to use when you deploy the virtual appliance.						
Target <u>Workload Name</u> <u>Name</u> <u>Storage Mapping</u> Network Mapping	General System Product Section Time zone setting for the virtual system System Level Networking	America/New_York					
Product	Short host name for the system.	RHEL62VS					
Summary	DNS domain name for the system.						
Summary	IP addresses of DNS servers for system.	9.42.242.28					
	Default IPv4 gateway.	9.27.16.1					
	Network adapter configuration for Network adapter 0 on Discovered-brUntagged-0						
	Internet Protocol Version 4						
	Static IP address for the network adapter "Network adapter 0 on Discovered-brUntagged-0".	9.27.16.59					
	Static network mask for network adapter "Network adapter 0 on Discovered-brUntagged-0".	255.255.252.0					
	Use DHCP for network adapter "Network adapter 0 on Discovered-brUntagged-0".						
	Internet Protocol Version 6						
	Static IP address for the network adapter "Network adapter 0 on Discovered-brUntagged-0".						
	Static default gateway for network adapter "Network adapter 0 on Discovered-brUntagged-0".						
	Use IPv6 stateless address autoconfiguration for network adapter "Network adapter 0 on Discovered-brUntagged-0".						
	Deployment use						
	The adapter order for network adapter "Network adapter 0 on Discovered-brUntagged-0".						
	The MAC address for network adapter "Network adapter 0 on Discovered-brUntagged-0".						
	Remove ISO Product Section						
	Remove ISO after customization (requires shutdown)						

Figure 9-134 Virtual server preconfiguration

12. Review the summary and click **Finish** as shown in Figure 9-135.

Welcome	Summary		
Virtual appliance	You are now ready to deploy the virtual	appliance.	
✓ Target ✓ <u>Workload Name</u>	Deployment details:		
Name	Virtual appliance to deploy:	ren-va-10-12-11	
Storage Mapping	Target server or system pool:	KVMpool	Ξ
Network Mapping	Workload Name	RHEL62deployed	-
Product	Name:	RHEL62VS	
	Storage Mapping:		
Summary	Disk Required by Virtual Appliance	disk1	
	Assigned Storage	RSL-Shared (SAN Storage Pool)	
	Size (MB)	6144	_
	Image	Yes	-

Figure 9-135 Virtual server creation summary

13. Click **OK** to start the creation of your virtual server workload member as shown in Figure 9-136.

	Launch Job
Schedule [	Notification Options
ob name ar	nd schedule
*Job Name	4
Deploy virtual ap	opliance to new virtual server - June 23, 2012 10:32:28 PM EDT
Choose whe	en to run the job.
Run Nov	v .
OSchedul	e
OK Can	tel Help

Figure 9-136 Run job

14. Click **Display Properties** as shown in Figure 9-137.

i	ATKCOR102I The following job has been created and started successfully: Deploy virtual appliance to new virtual server - Ju
	Display Properties Close Message

Figure 9-137 Display Properties window

Virtual server creation is complete as shown in Figure 9-138.

General	Targets	History	Logs			
Status:	Com	olete				
Progress:		100%				
Last Run	Status: Comp	plete				
Descriptio	n: Run	once on 6/23/	12 at 10:32 PM	4		
Next Run:						
Last Run:	6/23	/12 at 10:32 F	PM			
Task:	Deplo	oy virtual appl	iance to new v	irtual server		
Created B	y: USEF	DIS				
Edit						

Figure 9-138 Virtual server creation complete

15.Go back to the **Virtual Servers and Hosts** view to check that your new server is deployed as shown in Figure 9-139.

in color a	Servers and Hosts (View Me	mbers)			
	Performance Summary	Actions 👻	Search the table	Search	
Select	Name 🗘	State 🗘	OS Name ᅌ	OS Type and Version 🗯	Access
	PF-ESXi-Node1	Started	PF-ESXi01	Hypervisor 5.0.0	🖉 OK
	avm001	Started	PF-vCenter01	Windows® Server 2008	OK
	J vm002	Started	PF-Windows1	Windows® Server 2008	ОК
	PF-ESXi-Node2	Started	PF-ESXi02	Hypervisor 5.0.0	OK
	🗸 vm003	Stopped			CK 🖉
	<pre>     PF-HyperV-Node1 </pre>	Started	PF-HyperV01	Windows® Server 2008	CK 🖉
	🍓 VMWindowsHyperV	Started			CK 🖉
	<pre>PF-KVM-Node1</pre>	Started	PF-KVM01	Linux 6.2	OK
	RHEL62VS	Started			OK
	VMRHEL62x86temp	Started			ОК
	PF-KVM-Node2	Started	PF-KVM02	Linux 6.2	ОК
	RHEL62vmForVNC	Started			CK 🖉
	vmRHEL62	Stopped			OK
	<pre>     PF-PowerVM-Node1 </pre>	Started			OK
	PF-Node1-NIM	Started	PF-Node1-NIM	AIX 6.1	ОК

Figure 9-139 Virtual Servers and Hosts view

# 9.8.3 Capturing a virtual appliance

To capture a virtual appliance, perform these steps:

1. Click the **Virtual Appliances** tab in the VMControl plug-in main window, then click **Capture** in the Common tasks list as shown in Figure 9-140.



Figure 9-140 VMControl main page

2. The Welcome capture window opens as shown in Figure 9-141. Click Next.

🗢 Welcome	Welcome
Name	Welcome to the Capture wizard.
Source	Use this wizard to help you capture a virtual server or workload to creat
Source Virtual Server	virtual appliance, you can quickly deploy it into your environment.
Version Control	Before capturing a virtual server or workload, view the requirements for
Summary	⑦Capture requirements
	You are guided through the following tasks:
	* Naming the virtual appliance
	<ul> <li>Selecting the source virtual server or workload</li> <li>Securities additional information because and an annual setup.</li> </ul>
	* Specifying additional information based on your source selection
	②Learn more about capturing virtual appliances
	Show this Welcome page next time.

Figure 9-141 Capture Welcome window

3. Specify a name for the virtual appliance as shown in Figure 9-142, then click Next.

✓ Welcome	Name
I Name	Specify a name and description for the virtual appliance that you want to cre
Source	
Source Virtual Server	*Name:
Version Control	CapturedVMonKVM
Summary	Description:
	Fred's Capture on KVM.
	Limit of 256 characters
	Search tags:
	Enter tags separated by commas. Example: WebSphere, Test, Department 12

Figure 9-142 Appliance capture name

4. Select the source type to capture as shown in Figure 9-143, then click Next.

✓ Welcome	Source
🗸 Name	Select the source type to capture.
Source     Source Virtual Server     Version Control     Summary	⊙ Virtual Server ○ Workload

Figure 9-143 Source type to capture

5. Select the virtual server that you want to capture as shown in Figure 9-144.

✓ Welcome	Source Virtual Server									
🗸 Name	Select the virtual server to capture.									
✓ Source										
Source	Select	Name 🗧	State 0	Access 🗘	Problems ᅌ	(				
Virtual	0	PF-Node1-NIM	Started	OK	ОК					
Server	0	PF-Node1-Test02	Stopped	Offline	Information					
Version Control	0	RHEL62vmForVNC	Started	OK	OK					
Summary	۲	ቭ RHEL62VS	Started	ОК	ОК					
	0	vmRHEL62	Stopped	OK	OK					
	0	VMRHEL62x86template	Started	ОК	ОК					
	<									

Figure 9-144 Select server to capture

6. Select the image repository where you want to put the appliance that is generated by the capture process as shown in Figure 9-145.

✓ Welcome	Rep	ository								
🗸 Name	Select	Select the repository where you want to store the image that is associated with t								
✓ Source	Roposite	pries that are capable of sto	ring the image a		isted with the new vir	tual -				
<ul> <li>Source Virtual</li> <li>Server</li> </ul>		Repositories	ning the image a	5500	ated with the new vi	tual a				
Aepository	A	ctions 🔻 Search the table	Search							
Version Control	Select	Name 🗘	Image Count	0	Managed By 🗘	Des				
Summary	0	BowerVM-Repository	-	0	SN101D88B_VIOS1	Imag				
	۲	📴 KVMimagesrepo	1	1	PF-KVM03	Imag				
	<									
	M Pag	le 1 of 1 ▶ ₩ 1 🔹 🕴 Se	elected: 1 Total:	2 F	Filtered: 2					

Figure 9-145 Repository to capture

7. Select the disk that you want to capture from your existing virtual server as shown in Figure 9-146.

✓ Welcome	Disks Specify the disks and disk images to be captured. Selecting a disk captures infor disk image additionally captures the disk contents.								
✓ Name ✓ Source									
<ul> <li>Source Virtual</li> <li>Server</li> <li>Repository</li> </ul>	By default all compatible disks and their associated disk image contents are select choose to exclude a disk or disk image from the capture. The resulting virtual appl needs to create an operational virtual server when it is deployed. For example, th								
Disks Network Mapping Operating System Version Control	① Lear imag Disks a	nd Images to Capture							
Summary	A	ctions 🔻 Search t	he table	Search					
	Select	Disk Name	\$	Storage Server	Ŷ	Size (MB)			
	۲	RHEL62VS2895D0		Storwize V7000-2076-v7000-	IBM	6144			
	<					-			
	I¶ ₹ Pag	je 1 of 1 ► ₩ 1 ●	Se	lected: 1 Total: 1 Filtered: 1					

Figure 9-146 Select the disk for capture

8. Select the network mapping for your future appliance as shown in Figure 9-147.

✓ Welcome	Network Mapping	
🗸 Name	Specify a description to use for each virtual network	
✓ Source		
Source Virtual Server	Actions	
✓ Repository		
🗸 Disks	Network 🗢	Description
Network	Discovered-br0-0	Network adapter 0 on Discov
Mapping		
Operating System	Page 1 of 1 🍽 1 🔹 Total: 1 Filtered: 1	
Version Control		
Summary		

Figure 9-147 Network Mapping window

9. If no operating system was discovered from the original virtual server, you must specify the type of operating system as shown in Figure 9-148.

✓ Welcome	Operating System		
✓ Name ✓ Source	No operating system has been discovered for server.	or the following virtual ser	ver. Select a
✓ Source Virtual Server	Operating System		
✓ Repository	Actions 👻 Search the table Se	arch	
🗸 Disks	Host 💠	Virtual Server 🔷	Operating 9
<ul> <li>Network</li> <li>Mapping</li> </ul>	PF-KVM-Node1 (PF-KVM01)	RHEL62VS	Linux
Operating System	K ← Page 1 of 1 → H 1 → Fotal: 1 Filt	tered: 1	
Version Control Summary	Note: If you select "None" for the operating s software products when the captured virtual		e to customiz

Figure 9-148 Virtual server captured operating system

10. Select the version control type for your future virtual appliance as shown in Figure 9-149, then click **Next**.

✓ Welcome	Version Control
🗸 Name	Set the version information for the new virtual appliance.
<ul> <li>✓ Source</li> <li>Source</li> <li>✓ Virtual</li> <li>Server</li> <li>✓ Repository</li> <li>✓ Disks</li> <li>✓ Network</li> <li>Mapping</li> </ul>	If the virtual server you want to capture is associated with a virtual appliance from a previous deployment, you can s based on the associated virtual appliance. If the virtual server has no associated virtual appliance from a previous d tree with the new virtual appliance as the root, or you can select an existing virtual appliance to be the parent versio Select the action you want to take to set version information for the new virtual appliance:
<ul> <li>Operating System</li> <li>Version Control Summary</li> </ul>	Version comment:

Figure 9-149 Version Control window

11. Review the summary as shown in Figure 9-150. You cannot capture a running server.

✓ Welcome	Summary						
✓ Name	You are now ready to capture the virtual server or workload to create a virtual appliance.						
<ul> <li>✓ Source</li> <li>Source</li> <li>✓ Virtual</li> <li>Server</li> <li>✓ Repository</li> </ul>	DNZVMK411W Warning: The virtual servers in the workload to capture must be in a stopped state. If you sched fail due to the current operating state of server 'RHEL62VS'. Close Message						
✓ Disks							
Network Mapping	Virtual appliance or workload details	51					
Operating	Virtual appliance name:	CapturedVMonKVM	•				
System	Virtual appliance description:	Fred's Capture on KVM.	_				
Version	Source server:	RHEL62VS					
Control	Repository:	KVMimagesrepo					
Summary	Disks:						
	Disk Name	RHEL62VS2895D0					
	Storage Server	Storwize V7000-2076- v7000-IBM					
	Size (MB)	6144					
	Note: The virtualization manager wi	II provide access to the target :	server so that it can be captured.				
	Click Finish to capture the virtual ser	ver or workload and create a vi	rtual appliance. Once completed, you can deplo				

*Figure 9-150 Virtual server capture summary* 

12.Go back to the Virtual Servers and Hosts window. Power off the virtual server that you want to capture by right-clicking the name and clicking **Power On/Off**  $\rightarrow$  **Power Off Now**, as shown in Figure 9-151.

	Performance Summary		Actions 🔻	Search	the table.				
Selec	Name	ô	State ô	OS Nam	e ô	OS Type and Version :	Accessó	Problems ô	Compliance
	<pre>I PF-ESXi-Node1</pre>		Started PF-ES		01	Hypervisor 5.0.0	ОК	🚺 Information	OK .
	🚽 vm001	Started PF-v		PF-vCen	ter01	Windows® Server 200	в 📕 ок	Information	🖉 ОК
	🖑 vm002	Started PF-V		PF-Wind	ows1	Windows® Server 200	в 📕 ок	Information	🖉 ОК
	<pre>I PF-ESXi-Node2</pre>	Started PF-E		PF-ESXi	Xi02 Hypervisor 5.0.0		ОК	Information	OK 🖉
	al vm003		Stopped				ОК	Information	OK 🖉
	<pre>I PF-HyperV-Nod</pre>	Relate	Resources	•	V01	Windows® Server 200	в 📕 ок	Information	OK 🖉
	🖁 VMWindow	Topolo	y Perspective	es )			ОК	🚺 Information	ОК
	<pre>I PF-KVM-Node1</pre>	Create Group			1	Linux 6.2	OK	🖉 ОК	ОК
M	🚽 RHEL62VS						ОК	🖉 ОК	🖉 ОК
	VMRHEL6:		ure IMM Netwo	лк			OK	ОК	ОК
	PF-KVM-Node2	Remov			2	Linux 6.2	OK	ОК	ОК
	🖉 RHEL62vm	Renam	ie		_		ОК	ОК	🖉 ОК
	vmRHEL62	Add to		•	-		ОК	ОК	ОК
	<pre>I PF-PowerVM-N</pre>	Automa		•			ØОК	OK	🖉 ОК
	PF-Node1-	Availat			L-NIM	AIX 6.1	OK	OK	ОК
<)		Invent	1.5	•					
• • Pag	pe 1 of 2 ເ⊧າ 🔟 🖣	Power	On/Off	▶	Powe	r Off Now			
		Releas	e Managemeni	t 🕨	Resta	art			
		Remot	e Access	•	Resta	art Now			
		Securit	Sector and	•	Shut	down and power off			
		System	n Configuration	n 🕨	Susp	end			
		System	n Status and H	lealth 🕨					
		Service	e and Support	•					
		Prope	rties		1				

Figure 9-151 Power off the server for capture

13. Check that the virtual server is stopped as shown in Figure 9-152.

	Performance Summary	ctions 🔻	Search the table.	. Search			
Selec	Name 0	State ô	OS Name 🌼	OS Type and Version ô	Accesso	Problems ô	Complianc
	PF-ESXi-Node1	Started	PF-ESXi01	Hypervisor 5.0.0	ОК	Information	ОК
	🚽 vm001	Started	PF-vCenter01	Windows® Server 2008	ОК	🚺 Information	ОК
	🗸 vm002	Started	PF-Windows1	Windows® Server 2008	ОК	Information	🖉 ОК
	PF-ESXi-Node2	Started	PF-ESXi02	Hypervisor 5.0.0	ОК	🚺 Information	🖉 ОК
	🗸 vm003	Stopped			ОК	Information	ОК
	PF-HyperV-Node1	Started	PF-HyperV01	Windows® Server 2008	ОК	Information	🖉 ОК
	🖉 VMWindowsHyperV	Started			ОК	🚺 Information	OK OK
	<pre>PF-KVM-Node1</pre>	Started	PF-KVM01	Linux 6.2	ОК	ОК	🖉 ОК
M	성 RHEL62VS	Stopped			ОК	ОК	🖉 ок
	🖑 VMRHEL62x86tem	Started			ОК	🖉 ОК	🖉 ОК
	PF-KVM-Node2	Started	PF-KVM02	Linux 6.2	ОК	🖉 ОК	ОК
	🖁 RHEL62vmForVNC	Started			ОК	📕 ОК	🖉 ОК
	🗸 vmRHEL62	Stopped			ОК	ОК	🖉 ОК
	<pre>PF-PowerVM-Node1</pre>	Started			ОК	🖉 ОК	🖉 ОК
	PF-Node1-NIM	Started	PF-Node1-NIM	AIX 6.1	ОК	ОК	ОК

Figure 9-152 Virtual server stopped for capture

14.Go back to the Summary window and close the Warning information window as shown in Figure 9-153, then click **Finish**.

✓ Welcome	Summary					
🗸 Name	You are now ready to capture the virtual server or workload to create a virtual appliance.					
✓ Source						
Source Virtual Server	Virtual appliance or workload details:					
Repository	Virtual appliance name:	CapturedVMonKVM	<b>~</b>			
🗸 Disks	Virtual appliance description:	Fred's Capture on KVM.				
Network	Source server:	RHEL62VS				
Mapping	Repository:	KVMimagesrepo				
Operating	Disks:					
System	Disk Name	RHEL62VS2895D0				
Version Control	Storage Server	Storwize V7000-2076- v7000-IBM				
A Cummon	Size (MB)	6144				
Summary	Compatible	Yes				
	Include Image	Yes	¥			

Figure 9-153 Capture summary

15. Click **OK** to run the job as shown in Figure 9-154 and begin to capture your virtual server.

			Launch	Job		
Schedule	Notification	Options				
Job name :	and schedule					
#Job Nam	e:					
Capture virtue	al appliance - June 23	3, 2012 11:08:01	PM EDT			
Choose wh	en to run the j	ob.				
Run No	W					
○ Schedu	le					
ОК Са	ncel Help				 	

Figure 9-154 Run job now

16. Click **Display Properties** to check the job status as shown in Figure 9-155.

i	ATKCOR102I The following job has	been created and started successfully: Capture virtual appliance - June 23, 20
	Display Properties	Close Message

Figure 9-155 Capture job status

Wait until the job is complete as shown in Figure 9-156.

General	Targets	History	Logs	
Status:	Comp	lete		
Progress:		100%		
Last Run S	Status: Comp	lete		
Description	n: Run o	nce on 6/23/	12 at 11:08 PM	м
Next Run:				
Last Run:	6/23/	12 at 11:08 P	PM	
Task:	Captu	re virtual app	liance	
Created By	VI USERI	D		
Edit				

Figure 9-156 Capture complete

17.Go back to the VMControl main tab and check that your appliance count is incremented as shown in Figure 9-157. Click **Virtual Appliances**.

			_			-		
VMControl Ente	rprise Ec	lit	ioi	1				
				ge y	our data cent	er m	re efficiently. Deploy virtual applia	ances and
o increase resource utilizat	ion and autom	atic	on.					
DLearn more								
		1	1					
Resources	Active Status	3			Jobs		2	
Resources 3 Virtual appliances	Active Status Problems	3		9	Jobs Active	<u>^</u>	2	
		-		9	Lever case is	-	40	
3 Virtual appliances	Problems	-		9	Active	- 10	•	

Figure 9-157 VMControl main window

In the Virtual Appliances window, you can see the new virtual appliance as shown in Figure 9-158.

		center. Add to this list by clicking (	Canture or Impo	
		concerning to any not by cherding t		
pphances (view members)		19 - 1 / KG		
pture Deploy Virtual Applic	ance Import Actions	✓ Search the table Search		
Name A	Operating System 0	Repository 0	Description	
	IBM AIX			
CapturedVMonKVM	Linux	KVMimagesrepo	Fred's Capture	
ren-va-10-12-11	Linux	KVMimagesrepo		
	ppliances (View Members) sture Deploy Virtual Appli Name AIX_Lppsource CapturedVMonKVM	ppliances (View Members) sture Deploy Virtual Appliance Import Actions Name Operating System  AIX_Lppsource IBM AIX CapturedVMonKVM Linux	ppliances (View Members) sture Deploy Virtual Appliance Import Actions Search the table Search Name Operating System Repository AIX_Lppsource IBM AIX pureflexrb13.rtp.stglabs.ibm.cor CapturedVMonKVM Linux KVMimagesrepo	

Figure 9-158 Virtual Appliances window

# 9.8.4 Relocate virtual servers

You can migrate your virtual server from a physical KVM host to another physical KVM host. To do so, perform these steps:

- 1. From the VMControl plug-in main page, click the Virtual Servers/Hosts tab.
- 2. Click the **Virtual servers and hosts** link under the Common tasks, as shown in Figure 9-159.

		rprise Ec				our data cent	ter m	iore e	fficiently. Deploy virtual appliances an		
increase re Learn more		ion and autom	ation	ı.							
Resources		Active Status	3			Jobs					
3 Virtual appliances 1 Workloads 2 Server system pools		Problems		-		Active	-	-			
		Compliance -			-	Completed	ed 10	40			
1 Storage :	vstem pools system pools system pools					Scheduled	-	1			
Basics	Workloads	Virtual Appli	ance	IS	Sy	stem Pools	Vir	tual S	ervers/Hosts		
15 Virtual	servers										
3 0 Cri	tical					_	-	ion ta			
🛆 0 Wa	arning						Virtual servers and hosts				
	formational						Performance Summary Virtual farms				
🗹 8 ОК	2								al farm		
8 Hosts w	ith 15 virtual s	ervers				R	eloca	ation p	plans		
	8 Hosts with 15 virtual servers 2 Virtual farms						Relocate				

Figure 9-159 VMControl plug-in main page: Virtual Servers/Hosts tab

	Performance Summary	Actions 👻	Search the table	Search		
Select	Name Ô	State 🗘	OS Name 💠	OS Type and Version \$	Access 🗘	Problems :
	<pre>PF-ESXi-Node1</pre>	Started	PF-ESXi01	Hypervisor 5.0.0	ОК	Information
	🗸 vm001	Started	PF-vCenter01	Windows® Server 2008 6	🖉 ок	Information
	🗸 vm002	Started	PF-Windows1	Windows® Server 2008 6	ОК	Information
	<pre>     PF-ESXi-Node2 </pre>	Started	PF-ESXi02	Hypervisor 5.0.0	🖉 ок	Information
	🗸 vm003	Stopped			ОК	Information
	<pre>     PF-HyperV-Node1 </pre>	Started	PF-HyperV01	Windows® Server 2008 6	ОК	Information
	JVMWindowsHyperV	Started			ОК	Information
	<pre>PF-KVM-Node1</pre>	Started	PF-KVM01	Linux 6.2	ОК	ОК
	RHEL62VS	Stopped			ОК	ОК
	🔏 VMRHEL62x86temp	Started			ОК	ОК
	PF-KVM-Node2	Started	PF-KVM02	Linux 6.2	ОК	ОК
	RHEL62vmForVNC	Started			ОК	ОК
	🗸 vmRHEL62	Stopped			ОК	ОК
	<pre>PF-PowerVM-Node1</pre>	Started			ОК	ОК
	PF-Node1-NIM	Started	PF-Node1-NIM	AIX 6.1	ОК	ОК

Figure 9-160 Virtual Servers and Hosts window

 Right-click your virtual server and select Availability → Relocate as shown in Figure 9-161.

	Performance Summary		Actions 👻	Search tr	e tabi	e Search				
Select	Name	0	State 🗘	OS Name	¢	OS Type and Version 🗘	Access 🗘	Problems		
	PF-ESXi-Node1		Started	PF-ESXi01		Hypervisor 5.0.0	ОК	Information		
	🗸 vm001		Started	PF-vCenter	01	Windows® Server 2008 6	ОК	🚺 Information		
	🗸 vm002	Related	Resources		•	Windows® Server 2008 6	ОК	🚺 Information		
	PF-ESXi-Node2	Topoloo	v Perspective	s		Hypervisor 5.0.0	🖉 ОК	Informatio		
	🗸 vm003	Create G		5	-		ОК	🚺 Informatio		
	PF-HyperV-Noc			200	_	Windows® Server 2008 6	ОК	Informatio		
	🗸 VMWindov	Configure IMM Network Permanently Delete Virtual Serv					ОК	🚺 Informatio		
	<pre>PF-KVM-Node1</pre>		/irtual Server		Linux 6.2	ОК	ОК			
	RHEL62VS	Remove					ОК	🖉 ок		
	VMR HEL62				_		ОК	ОК		
	PF-KVM-Node2	Add to				Linux 6.2	ОК	ОК		
	🔏 RHEL62vn	Automat			•	A.51992 JP	ОК	ОК		
	🗸 vmRHEL6	Availabi	20 <b>2</b> 4		·	Relocate	ОК	ОК		
	PF-PowerVM-No	Inventor	·		2		ОК	ОК		
	J PF-Node1	Power O			1	AIX 6.1	🔤 ОК	💹 ОК		
			Release Management		1					
• Pag	e 1 of 2 ▶₩ 1	Security			( er	ed: 23				
			Configuration		1					
			Status and He	aith	'					
		Service	and Support		•					
		Properti	es							

Figure 9-161 Select server for relocation

4. A confirmation window opens to confirm that your virtual server can be relocated as shown in Figure 9-162. Click **OK** to start the server relocation.

Relocate Virtual Server
You have selected to relocate RHEL62VS in KVMpool. Click OK to perform the proposed actions.
Recommended actions:
Relocate 1 virtual servers Relocate RHEL62VS to PF-KVM-Node2 Relocate virtual server
OK Cancel

Figure 9-162 Relocate virtual server information window

5. Click **Display Properties** to check the relocation status as shown in Figure 9-163.

i	DNZIMC797I The following job has been created and started successfully: Relocate - Saturday, June 23, 2012 11:13:19 PM EDT
	Display Properties Close Message

Figure 9-163 Display Properties window

6. Go back to the Virtual Servers and Hosts window. Make sure that your virtual server is "hosted" by another KVM member of the system pool as shown in Figure 9-164.

	Performance Summary	Actions	▼ Search the	table Search		
Select	Name 🗘	State ᅌ	OS Name 🗘	OS Type and Version ᅌ	Access ᅌ	Problems (
	<pre>PF-ESXi-Node1</pre>	Started	PF-ESXi01	Hypervisor 5.0.0	OK	🚺 Information
	🗸 vm001	Started	PF-vCenter01	Windows® Server 2008 6.	🖉 ОК	🚺 Information
	June 2002	Started	PF-Windows1	Windows® Server 2008 6.	💹 ОК	Information
	PF-ESXi-Node2	Started	PF-ESXi02	Hypervisor 5.0.0	ОК	🚺 Information
	🗸 vm003	Stopped			🖉 ОК	🚺 Information
	<pre>PF-HyperV-Node1</pre>	Started	PF-HyperV01	Windows® Server 2008 6.	ОК	🚺 Information
	JVMWindowsHyperV	Started			ОК	🚺 Information
	<pre>PF-KVM-Node1</pre>	Started	PF-KVM01	Linux 6.2	ОК	🔤 ОК
	🌡 VMRHEL62x86templa	Started			📄 ОК	<b>ОК</b>
	PF-KVM-Node2	Started	PF-KVM02	Linux 6.2	🖉 ОК	💹 ОК
	RHEL62vmForVNC	Started			ОК	💹 ОК
	성 RHEL62VS	Stopped			🔲 ОК	💹 ОК
	June With the work of the work	Stopped			ОК	💹 ОК
	<pre>     PF-PowerVM-Node1 </pre>	Started			💹 ОК	💹 ОК
	PF-Node1-NIM	Started	PF-Node1-NIM	AIX 6.1	ОК	ОК

Figure 9-164 Check relocation

# 10

# Managing the PowerVM environment with IBM Flex System Manager

This chapter addresses how to manage the PowerVM infrastructure through IBM Flex System Manager (FSM). IBM Flex System p260 and p460 compute nodes have the same capabilities as the rack POWER7 system family, which includes Power 770 and Power 750. You can create logical partition profiles, and modify, delete, and activate them. You can use p260 and p460 compute nodes for full partition purposes, and you can set up the Virtual I/O Server (VIOS) environment on the p260 and p460 compute nodes. You can manage the Virtual I/O Controller (VIOC) client image through VMControl, which is a feature in the Flex System Manager. The VMControl feature can capture, deploy, and relocate virtual servers. The included example scenario describes the steps to set up the PowerVM virtualization environment.

This chapter includes the following sections:

- ▶ 10.1, "Initial deployment of virtual machine" on page 402
- ► 10.2, "Capturing virtual machines" on page 416
- 10.3, "Deploying virtual machines" on page 471
- 10.4, "Relocating virtual machines" on page 486

# 10.1 Initial deployment of virtual machine

This section describes how to deploy the PowerVM virtual machine through Flex System Manager. For more information about planning for PowerVM infrastructure management, see 5.2.3, "Planning for PowerVM virtualization" on page 111.

# 10.1.1 Solution architecture

The overall architecture of the PowerVM infrastructure with Flex System Manager is shown in Figure 10-1.

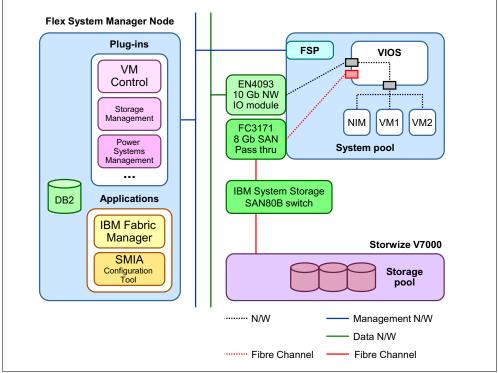


Figure 10-1 Architectural overview with Flex System Manager

The diagram in Figure 10-1 shows the relationships between PowerVM infrastructure components and Flex System Manager. The blue boxes represent physical compute nodes. The purple box stands for Storwize V7000 and the storage pools that are defined on it. The green boxes are I/O modules in the chassis (10 GbE switch, 8 Gb FC Pass-thru module, and external 8 Gb FC SAN switch). A Flex System Manager node box describes components that are needed for the PowerVM implementation. A p260 compute node box represents logical partitions (LPARs), the flexible service processor (FSP), and the Shared Ethernet Adapter (SEA).

# 10.1.2 Setting up VIOS and Network Installation Manager server

This section shows the initial deployment of PowerVM on the p260 compute node.

You can see physical compute nodes and I/O modules in the Chassis Manager view of Flex System Manager, as shown in Figure 10-2. For more information about managing the chassis, see Chapter 4, "Chassis Management Module operations" on page 41.

Managed Chassis > r2-c2-ch4-mm.rtp.stglabs.ibm.co	m 💌 Find: 🔍 Find a Tas	ik or Hardware
	14	
11 p260 compute node Server-7895-42	DX-SN101423B	
9PF-KVM=Node3PF-Pg	werVM=Node2	
	PF-KVM∋Node1	
5PF-Po	werVM=Node1	
	F-ESX=Node2	
1 PF-FSM-Node P IBM P2-c2-ch4-mm.rt	F-ESXENode1	
👰 🔹 🕞 🛛 🖶 🕶 🖾 🔹 🖌	10 Gb network switch	8 Gb SAN switch

Figure 10-2 Chassis components view

First, install VIOS on a p260 compute node.

If you want more information about how to implement the p260 and p460 compute nodes, see *IBM Flex System p260 and p460 Planning and Implementation Guide*, SG24-7989, at this website:

http://www.redbooks.ibm.com/abstracts/sg247989.html?Open

There are two options to install VIOS on the p260 compute node for the first time:

 Install VIOS by using a DVD through the supported USB optical DVD drive, which is connected to the p260 front panel as shown in Figure 10-3.

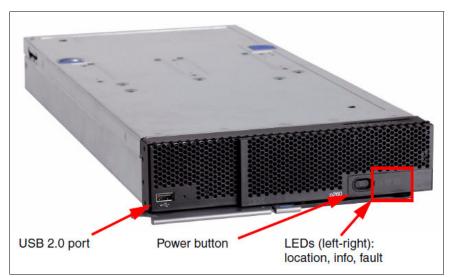


Figure 10-3 Front panel of the IBM Flex System p260 compute node

Use the Network Installation Manager (NIM) method.

Restriction: This option is only for a NIM server that exists at the site.

#### Creating and activating the VIOS profile

One of the strengths of FSM is the capability to provide a single point of management. To activate the VIOS profile, perform these steps:

- 1. Click Chassis Manager on the Initial Setup tab.
- 2. Click the chassis name as shown in Figure 10-4.

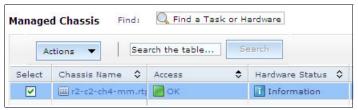


Figure 10-4 Installed chassis name

3. Click **Manage Power Systems Resources** in the menu at the far left of the chassis graphical view as shown in Figure 10-5.



Figure 10-5 Manage Power Systems Resources

4. If you discovered and collected inventory on p260 compute nodes earlier, you see the physical p260 compute nodes in the opened window (Figure 10-6).

**Tip:** If you do not see any compute node in the chassis, go to 6.1, "IBM Flex System Manager Setup Wizard" on page 123.

Right-click the discovered compute node, and select System Configuration  $\rightarrow$  Create Virtual Server (Figure 10-6).

Server-7895-42X-SN1014231       Virtual Servers       Started       None         Operating Systems       Image: PF-PowerVM-Node2       Topology Perspectives       Started       None         Server-7895-42X-Standby       Image: PF-PowerVM-Node2       Topology Perspectives       Started       None         Power Units       Image: PF-PowerVM-Node2       Create Group       Started       None         Image: Prover Units       Image: PF-PowerVM-Node2       Create Group       Started       None         Image: Prover Units       Image: PF-PowerVM-Node2       Create Group       Started       None         Image: Prover Units       Image: PF-PowerVM-Node2       Create Group       Started       None         Image: Prover Units       Image: PF-PowerVM-Node2       Create Group       Capacity on Demand (CoD)       Client Partition Storage Mapping V         Image: Prover Units       Image: Prover Pr	• Welcome ( Version)									
Server-7895-42X-SN1014231       Virtual Servers       PF-PowerVM-Nodes       Related Resources       Started       None         Operating Systems       Image       Image <t< th=""><th>E 🗁 Hosts</th><th></th><th>Performance Summar</th><th>y  </th><th>Actions</th><th>•</th><th>S</th><th>earch</th><th>the table</th><th>Search</th></t<>	E 🗁 Hosts		Performance Summar	y	Actions	•	S	earch	the table	Search
Virtual Servers       Image: ProwerVM-Node       Related Resources       Started       None         Operating Systems       Image: ProwerVM-Node       Topology Perspectives       Started       None         Image: Prower Units       Image: ProwerVM-Node       Topology Perspectives       Started       None         Image: Prower Units       Image: ProwerVM-Node       Topology Perspectives       Started       None         Image: Prower Units       Image: ProwerVM-Node       Configure IMM Network       Capacity on Demand (CoD)       Client Partition Storage Mapping V         Image: Prower Units       Image: Prower Prover Prove Prover Prover Prover Prover Prover Prover Pr		Select	Name	Access			٥	State 🗘	Detailed Stat	
Image: Depending Systems       Image: Depending Systems       Image: Depending Systems       Image: Server-7895-42X-5       Create Group       Standby       None         Image: Depending Systems       Image: Server-7895-42X-5       Create Group       Started       None         Image: Depending Systems       Image: Server-7895-42X-5       Create Group       Started       None         Image: Depending Systems       Image: Server-7895-42X-5       Create Group       Started       None         Image: Depending System       Image: Server-7895-42X-5       Create Group       Capacity on Demand (CoD)       Client Partition Storage Mapping V         Image: Depending System       Add to       Add to       Image: Server       Configuration Templates         Image: Depending System       Add to       Automation       Create Virtual Server       Current Configuration         Image: Depending System Information       Inventory       Image: System Plans       Manage System Plans         Image: Depending System Configuration       Security       Security       Vio S Storage Mapping View         Image: System Status and Health       Service and Support       Vitual Server Availability Priority		<b>~</b>	PF-PowerVM-Node1	Related Res	sources		•	1	Started	None
Image: Server-7895-42X-       Create Group       Started       None         Configure IMM Network       Capacity on Demand (CoD)       Clent Partition Storage Mapping V         Configure IMM Network       Graphical View       Configuration Plans       Configuration Templates         Add to       Add to       Configuration Templates       Current Configuration       Current Configuration         Add to       Automation       Current Configuration       Deployment History       Edit Host         Manage System Plans       Manage System Plans       Manage System Plans       Manage System Plans         Release Management       Security       View Workload Management Group       View Workload Management Group         System Status and Health       Service and Support       Vitual Server Availability Priority       View Vorkload Management Group			PF-PowerVM-Node2	Topology P	erspectives		•		Standby	None
Compute Num Network     Client Partition Storage Mapping V       Graphical View     Client Partition Storage Mapping V       Remove from Server System Pool     Configuration Plans       Add to     Automation       Availability     Current Configuration       Hardware Information     Deployment History       Edit Host     Manage System Plans       Manage System Profile     Server to Storage Mapping View       System Configuration     View Workload Management Group       System Status and Health     Viors Storage Mapping View       Virtual Server Availability Priority     Service and Support			Server-7895-42X-9	Create Group					Started	None
System Computation         VIOS Storage Mapping View           System Status and Health         VIOS Storage Mapping View           Virtual Server Availability Priority	< <u> </u>			Graphical V Remove fro Add to Automation Availability Hardware In Inventory Operations Release Ma	fiew m Server Sys oformation	stem Po	iol	Cli Co Co Cu De Ed Ma Se	ent Partition Storage onfiguration Plans onfiguration Template eate Virtual Server orrent Configuration aployment History lit Host anage System Plans anage System Profile erver to Storage Mapp	Mapping View
Virtual Server Availability Priority										
		(+)					Vi	rtual Server Availabili	ity Priority	
H  Properties Edit Location Edit Location				201 222	- spport			Ed	lit Location	

Figure 10-6 Manage Power Systems Resources main window

5. Create the VIOS profile based on your system requirements. Enter the VIOS name, as shown in Figure 10-7.

Name	Name
Memory	This wizard helps you create and assign resources to a virtual server.
Processor	
Ethernet	Host name: PF-PowerVM-Node1
Physical I/O	*Virtual server name:
Summary	SN101D88B_VIOS1
	Virtual server ID:
	Environment:
	Suspend capable 🔲 Remote Restart capable
	Assign all resources to this virtual server.
	Enable virtual trusted platform module (VTPM)
	Warning: The VTPM key is set to default key.

Figure 10-7 Creating the VIOS profile: Name

6. Define the VIOS memory size, as shown in Figure 10-8.

🗸 Name	Memory		
Ammory	Select the memory mode a	nd assigne	d memory for the virtual ser
Processor			
Ethernet	Dedicated Memory		
Virtual Storage Adapters	Total system memory:	32.0	GB
Physical I/O	Memory available:	31.0	GB

Figure 10-8 Creating the VIOS profile: Memory

7. Define the processing mode and how many processors are used for VIOS, as shown in Figure 10-9.

🗸 Name	Processor					
🗸 Memory	Specify the processing mode and number of processors.					
A Processor						
Ethernet	In dedicated processing mode, e	ach assigned processor uses 1 physical processor				
Virtual Storage Adapters	Processing Mode					
Physical I/O						
Summary						
	Shared					
	Assigned Processors					
	Maximum pool processors:	16.0				
	Available processors:	16.0				
	*Assigned processors:					
	1					

Figure 10-9 Creating the VIOS profile: Processor

8. Define the virtual Ethernet adapter for the Shared Ethernet Adapter (SEA), as shown in Figure 10-10. Click **Add** to create new adapter or **Edit** to modify an existing adapter.

🗸 Name	Ethernet
🗸 Memory	Configure the virtual network adapters for the virtual server. Physical I/O network
V Processor	default, however you can add, edit, or remove adapters to suite your needs.
🔿 Ethernet	1. 17 (1) - 10 (1)
Virtual Storage Adapters	Virtual Ethernet
Physical I/O	
Summary	Add Edit Delete
	Select Adapter 🛇 Port VLAN II

Figure 10-10 Creating the VIOS profile: Ethernet

9. Create one virtual Ethernet adapter for the Shared Ethernet Adapter and assign priority 1 to the VIOS, as shown in Figure 10-11.

	Virtual Ethernet	- Modify Adapter
Specify an adapter ID and virtual Ethernet for this adapter.		
*Adapter Id		
11		
*Port Virtual Ethernet		
1		
VSI Type Id		
VSI Type Version		
VSI Manager Id		
IEEE Settings		
Select this option to allow additional virtual LAN IDs for the adapter.		
IEEE 802.1g compatible adapter		
Maximum number of VLANs: 20		
Additional VLAN IDs:		
1,20,48,		
Shared Ethernet Settings Select Ethernet bridging to link (bridge) the virtual Ethernet to a physical network.		
select Ethemet broging to link (broge) the virtual Ethemet to a physical network.		
Use this adapter for Ethernet bridging		
Priority:		
1 (1 or 2)		

Figure 10-11 Creating the VIOS profile: Virtual Ethernet: Modify Adapter

10. Click Create Adapter as shown in Figure 10-12.

🗸 Name	Virtual Storage Adapters
V Memory	Specify the virtual storage adapters required for this virtual server.
<ul><li>✓ Processor</li><li>✓ Ethernet</li></ul>	*Maximum number of virtual adapters : 100
Virtual Storage Adapters Physical I/O Summary	No adapters configured. Select "Create Adapter" button to create a new virtual adapter. Create Adapter
	*Note: 1) You can use the Virtual Storage Management task to define the physical block storage Fibre Channel server adapters that the client virtual servers will use for storage access

Figure 10-12 Creating the VIOS profile: Virtual Storage Adapters

#### Virtual Storage Adapters 🗸 Name Specify the virtual storage adapters required for this virtual server. 🗸 Memory V Processor *Maximum number of virtual adapters : 100 🗸 Ethernet Create Virtual Adapter Virtual ⇒ Storage Adapters No adapters configured. Select "Create Adapter.." button to create a new virtua Specify the virtual storage adapter ID and client Create Adapter... information. *Adapter ID *Note: 1) You can use the Virtual Storage Management task to define the ph Fibre Channel server adapters that the client virtual servers will use s clie 31 Adapter type SCSI Y Connecting virtual server information *Connecting Virtual Server ID: *Connecting adapter ID : Ok Cancel Help

#### 11.Create an adapter for virtual SCSI, as shown in Figure 10-13.

Figure 10-13 Creating the VIOS profile: Create Virtual Adapter

12. Define the connecting VIOC ID and an adapter ID, as shown in Figure 10-14. After you enter parameters for virtual storage adapters, click **OK**.

🗸 Name	Virtual Storage Adapters	
V Memory	Specify the virtual storage adapters required for this virtual server.	
<ul> <li>✓ Memory</li> <li>✓ Processor</li> <li>✓ Ethernet</li> <li>Virtual</li> <li>⇔ Storage</li> <li>Adapters</li> <li>Physical I/O</li> <li>Summary</li> </ul>	Specify the virtual storage adapters required for this virtual server.  *Maximum number of virtual adapters : 100  No adapters configured. Select "Create Adapter" button to create a new virtua Create Adapter  *Note: 1) You can use the Virtual Storage Management task to define the ph Fibre Channel server adapters that the client virtual servers will use	Create Virtual Adapter Specify the virtual storage adapter ID and client information. *Adapter ID 31 Adapter type SCSI Connecting virtual server information *Connecting Virtual Server ID: 2 *Connecting adapter ID: 1

Figure 10-14 Creating the VIOS profile: Create Virtual Adapter continued

13. You can see the newly created virtual SCSI adapter in the Virtual Storage Adapters pane, as shown in Figure 10-15. If you need to create more virtual storage adapters, click **Add**.

🗸 Name	Virtual St	orage Adapte	rs			
Memory	Specify the virtua	al storage adapters requ	ired for thi	s virtual server.		
<ul><li>✓ Processor</li><li>✓ Ethernet</li></ul>	*Maximum numb	er of virtual adapters :	100			
Virtual ⇔ Storage Adapters						
Physical I/O	Add	Edit Delete				
Summary	Select	Adapter ID	\$	Туре	\$	Conne
		31		SCSI	2	

Figure 10-15 Creating the VIOS profile: Virtual Storage Adapters

14. Define the physical I/O adapters, as shown in Figure 10-16. Assign all physical adapters to the VIOS.

🗸 Name	Physical I/O Adapters						
✓ Memory	Select one or mo	Select one or more physical adapters from the list of available physical adapters. Note. Virtual servers that					
<ul> <li>Processor</li> <li>Ethernet</li> <li>Virtual</li> </ul>		adapters that are currently available.					
<ul> <li>Storage</li> <li>Adapters</li> </ul>	Select	Location Code	\$				
Physical		U78AE.001.WZS00T2-P1-C18-L1		Ethernet controller			
I/O		U78AE.001.WZS00T2-P1-C19-L1		Fibre Channel Serial Bus			
Summary		U78AE.001.WZS00T2-P1-T2		PCI-E SAS Controller			
		U78AE.001.WZS00T2-P1-T1		PCI-to-PCI bridge			
		U78AE.001.WZS00T2-P1-C18-L2		Ethernet controller			

Figure 10-16 Creating the VIOS profile: Physical I/O Adapters

15. Review the information in the Summary window, as shown in Figure 10-17.

🗸 Name	Summary	
Memory	The following is a summary of your virtual server settings	. You can select Back to make changes. You can also use
Processor		
🗸 Ethernet	Server Name:	PF-PowerVM-Node1
Virtual	Virtual server name:	SN101D88B_VIOS1
<ul> <li>Storage</li> <li>Adapters</li> </ul>	Virtual server ID:	1
Physical I/O	Environment:	VIOS
Summary	Memory:	10 GB [Dedicated]
∽ Summary	Processors:	1 [Shared, DefaultPool(0)]
	Virtual Ethernets:	11 [1, Bridge]
	Virtual Adapters:	31 [SCSI, 2:1]
	Physical adapters:	U78AE.001.WZS00T2-P1-C18-L1 U78AE.001.WZS00T2-P1-C18-L2

Figure 10-17 Creating the VIOS profile: Summary

16.Right-click the created VIOS, and select **Operations**  $\rightarrow$  **Activate**  $\rightarrow$  **Profile** as shown in Figure 10-18.

	SN101D888_VIOC1			ж	ОК	Ск	📃 ок
	SN101D888_VIOS1	Related Resources Topology Perspectives Create Group Configure IMM Network Add to Automation	> > >	ffline	ок	ок	СК
1		Inventory Operations		Delete		1	
<		Security System Configuration System Status and Health	+	Schedule Activate Console	e Operations	Current Config	uration
I  Page	≥1of1 ▶ ₩ 1 ♥ -	Service and Support Properties	•				

Figure 10-18 Activating the VIOS profile

17. Click Advanced, as shown in the Figure 10-19.

Activate Virtual server:SN10:	1D88B_VIOS1
Select a profile below to a	activate the virtual server with.
Virtual server name:	SN101D88B_VIOS1
Virtual server profiles	OriginalProfile
Advanced Open a terminal wind No VSI Profile. OK Cancel	low or console session.

Figure 10-19 Activating the virtual server

18.Set the Boot mode value to SMS mode, as shown in the Figure 10-20. Click OK.

Activate Virtual serve	r - Advanced	
Set advanced activ	vation settings using the fields b	elow.
Keylock position:	Do Not Override	×
-		
Boot mode:	SMS	×
OK Cancel		

Figure 10-20 Activating the virtual server: Advanced properties

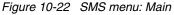
19. The terminal console is displayed as shown in the Figure 10-21. Enter Passw0rd, then you can see the Software Management Services (SMS) mode menu.

```
In order to access the terminal, you must first authenticate with the following management console: 9.27.20.38
----
Jser ID: USERID
Password:
```

Figure 10-21 Entering the SMS mode menu

#### 20. Select 5. Select Boot Options, as shown in Figure 10-22.

```
Version AF743_103
SMS 1.7 (c) Copyright IBM Corp. 2000,2008 All rights reserved.
Main Menu
1. Select Language
2. Setup Remote IPL (Initial Program Load)
3. Change SCSI Settings
4. Select Console
5. Select Boot Options
```



#### 21.Select 1. Select Install/Boot Device, as shown in Figure 10-23.

Vers	sion AF743_103
SMS	1.7 (c) Copyright IBM Corp. 2000,2008 All rights reserved.
Mult	iboot
1.	Select Install/Boot Device
2.	Configure Boot Device Order
3.	Multiboot Startup <off></off>
4.	SAN Zoning Support
5.	Management Module Boot List Synchronization

Figure 10-23 SMS menu: Multiboot

#### 22. Select 3. CD/DVD, as shown in Figure 10-24.

	sion AF743_103 1.7 (c) Copyright IBM Corp. 2000,2008 All rights reserved.
Sel	ест Device Туре
1.	Diskette
2.	Таре
3.	CD/DYD
4.	IDE
5.	Hard Drive
6.	Network
7.	List all Devices

Figure 10-24 SMS menu: Select Device Type

23. Select 6. USB, as shown in the Figure 10-25.

	sion AF743_103 1.7 (c) Copyright IBM Corp. 2000,2008 All rights reserved.
 Solo	 юст Media Туре
1.	SCSI
	SSA
3.	SAN
4.	SAS
5.	SATA
6.	USB
7.	IDE
8.	ISA
9.	List All Devices

Figure 10-25 SMS menu: Select Media Type

Follow the VIOS installation menu to complete the installation of VIOS. For more information, see the *IBM Flex System p260 and p460 Planning and Implementation Guide*, SG24-7989, at this website:

http://www.redbooks.ibm.com/abstracts/sg247989.html?Open

#### **AIX** installation

The next step is to install an AIX image. For more information about implementing a VIOC, see *IBM PowerVM Virtualization Introduction and Configuration*, SG24-7940, at this website:

http://www.redbooks.ibm.com/abstracts/sg247940.html?Open

Tip: When you are installing a VIOC, use a virtual CD-ROM host by VIOS.

You can check the media device configuration, as shown in Figure 10-26.

	Host:	PF-PowerVM-Nod	e1	Name: SN101D88B_VIO	51	Id: 1
	Environment	t: VIOS		State: Started - RMC a	vailable	Tasks
General Settings	▼ Physical media					
Processor						
Memory	Assign	Unassign R	lefresh			
Network	Select	Name 🔇	Assigned	Virtual Server	Descript	ion
Storage Adapters		cd0	PF-Node1-NIM(3)		USB DVD R/RW or RAM Dri	
Storage Devices						
Media Devices	▼ Virtual media					
Physical IO		15.7 (0.22) (23)				
	There are no virt	ual media assigne	d to this virtual serve	er		
	Click on "Refresh	" button to refresh	h the virtual media ir	nformation.		

Figure 10-26 Media Devices window in the Manage Virtual Server

To do so, perform these steps:

- 1. Right-click VIOS name and select System Configuration  $\rightarrow$  Manage Virtual Server.
- Click Media Devices to see the current VIOS configuration. You can see which server owns the media device. In the example, PF-Node1-NIM owns the virtual CD-ROM. The description indicates which media is assigned to the virtual server, for example, CD-ROM.

There are two partitions, as shown in Figure 10-27. One is VIOS and the other one is for the NIM server to deploy AIX OS. The minimum requirement is set to deploy the PowerVM virtual machine by using VMControl.

esource E	xplorer
_	rVM-Node1 (Computer System)
A	ctions   Search the table  Search
Select	Name
	SN101D888_VIOS1
-	PF-Node1-NIM

Figure 10-27 Created two partitions

# 10.2 Capturing virtual machines

This section addresses how to capture virtual machines in the PowerVM environment.

There are two methods to capture virtual machines in PowerVM virtual infrastructures:

- Capturing AIX by using Network Installation Manager (NIM)
- Capturing AIX by using storage copy services (SCS)

For more information about NIM and SCS-based capture methods, see 5.2.3, "Planning for PowerVM virtualization" on page 111.

# 10.2.1 Capturing AIX by using Network Installation Manager (NIM)

This section describes how to capture AIX by using NIM through IBM Flex System Manager. Figure 10-28 shows the minimum configuration for NIM-based virtual machine deployment.

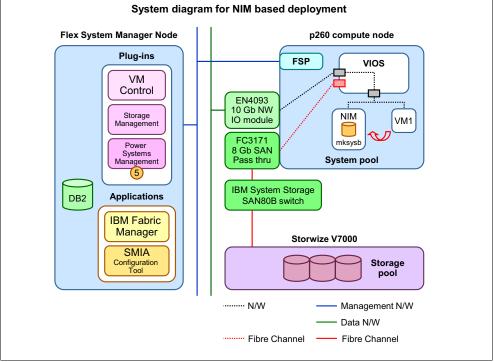


Figure 10-28 System diagram for NIM-based deployment

To capture AIX by using NIM, perform these steps:

1. Click the **Plug-ins** tab on the Flex System Manager Home page, as shown in Figure 10-29.

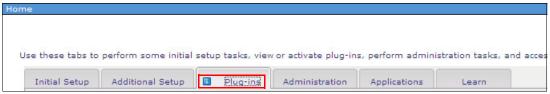


Figure 10-29 Flex System Manager main window

2. Click VMControl Enterprise Edition in the Plug-ins window, as shown in Figure 10-30.



Figure 10-30 VMControl Enterprise Edition menu

3. Click the **Virtual Appliances** tab to see the status of managed virtual appliances from the perspective of the virtual machine deployment, as shown in Figure 10-31 on page 418.

0 Virtual appliances     Problems     -     -     Active     -     -       0 Workloads     Compliance     -     -     -     Completed     -     5       0 Storage system pools     Storage system pools     -     -     -     5	
0 Storage system pools 0 Network system pools	
o Network system pools	
Basics Workloads <u>Wirtual Appliances</u> System Pools Virtual Servers/Hos	ts
What to deploy:     Where to deploy:       0 Virtual appliances     3 Existing virtual servers       2 Hosts and 0 server system pools	

Figure 10-31 Virtual Appliances tab

The following information is highlighted in Figure 10-31:

- What to deploy: This menu shows ready-to-use virtual appliances in your data center, such as Lpp_source capture or mksysb capture. When you finish this task, 0 Virtual appliances changes to 1 Virtual appliances.
- Where to deploy: When you are deploying a virtual machine, select one of these two options: virtual server itself or server system pools that are normally physical servers.
- What to capture: This menu shows the partitions that are going to be gold images.
- Where to store: This menu shows all image repositories that VMControl has.

4. From the **Virtual Servers/Hosts** tab, select the PowerVM node, then collect inventory for the physical server and for the VIO Server as shown in Figure 10-32.

2 Virtual	100.000 NO 2000 NO	Related Resources Topology Perspectives	* *			Relocatio Relocate	n plans	
Virtual Se	Performance Summar	Create Group		I	Search the	tabla	Search	1
Select	Name	Configure IMM Network Graphical View Remove		\$	Access	\$	Problems	\$
	PF-ESXi-Node1	Add to Automation Hardware Information	* *		<ul> <li>ок</li> <li>ок</li> <li>ок</li> </ul>		ок ок	
	PF-ESXi-Node2	Inventory Operations	•		llect Invento		irmware	
<	PF-PowerVM-Node1	Release Management Security System Configuration System Status and Health	* * * *	Vie Ne	ew and Colle	ct Inventory		
		Service and Support Properties	•					

Figure 10-32 Running a Collect Inventory job

5. Check the log for a job, as shown in Figure 10-33.

eneral	Targets	History	Logs	
ob Insta		Name column in Search the tab	order to view its logs	
Select	Name		Status	
	6/19/12 at 11:4	0.444	Complete	
	0/13/12 at 11:4	U AM	Complete	
I Dane	tofi kki i	Sele	cted: 1 Total: 1	
• • Page	1 of 1 🕨 🗎 🚺	🔶 🕴 Sele	cted: 1 Total: 1	
Job log				
Job log June 19	, 2012 11:40:45 /	AM EDT-Level:20	0-MEID:0MSG; Sub	task activation status changed to "Active".
Job log June 19 June 19	, 2012 11:40:45 / , 2012 11:40:45 /	AM EDT-Level:20 AM EDT-Level:1-	0-MEID:0MSG: Sub MEID:0MSG: Job ac	tivation status changed to "Active".
Job log June 19 June 19 June 19	, 2012 11:40:45 / , 2012 11:40:45 / , 2012 11:40:45 /	AM EDT-Level:20 AM EDT-Level:1- AM EDT-Level:15	0-MEID:0MSG: Sub MEID:0MSG: Job ac 0-MEID:0MSG: ATK	
Job log June 19 June 19 June 19 June 19 June 19	, 2012 11:40:45 / , 2012 11:40:45 / , 2012 11:40:45 / , 2012 11:40:45 / , 2012 11:40:45	AM EDT-Level:20 AM EDT-Level:1- AM EDT-Level:15 AM EDT-Level:15	0-MEID:0MSG: Sub MEID:0MSG: Job ac 0-MEID:0MSG: ATK 0-MEID:13663MSG	tivation status changed to "Active". SRV629I Collecting inventory by using inventory profile "All Inventory".
Job log June 19 June 19 June 19 June 19 June 19	, 2012 11:40:45 / , 2012 11:40:45 / , 2012 11:40:45 / , 2012 11:40:45 / , 2012 11:40:45 /	AM EDT-Level:20 AM EDT-Level:1- AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:20	0-MEID:0MSG; Sub MEID:0MSG; Job ac 0-MEID:0MSG; ATK 0-MEID:13663MSG 0-MEID:0MSG; Sub	tivation status changed to "Active". SRV629I Collecting inventory by using inventory profile "All Inventory". ATKSRV628I Collecting inventory for "PF-PowerVM-Node1", which has a type
Job log June 19 June 19 June 19 June 19 June 19 June 19 June 19	, 2012 11:40:45 / , 2012 11:40:45 /	AM EDT-Level:20 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:20 AM EDT-Level:20 AM EDT-Level:10 AM EDT-Level:10	0-MEID:0MSG: Sub MEID:0MSG: Job ac 0-MEID:0MSG: ATK 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG	tivation status changed to "Active". SRV6291 Collecting inventory by using inventory profile "All Inventory". ATKSRV6281 Collecting inventory for "PF-PowerVM-Node1", which has a type task activation status changed to "Active". PF-PowerVM-Node1 client job status changed to "Active". Data collection started for cec PF-PowerVM-Node1.
Job log June 19 June 19 June 19 June 19 June 19 June 19 June 19 June 19	2012 11:40:45 / 2012 11:40:45 /	AM EDT-Level:20 AM EDT-Level:1- AM EDT-Level:15 AM EDT-Level:20 AM EDT-Level:20 AM EDT-Level:10 AM EDT-Level:15 AM EDT-Level:15	0-MEID:0MSG: Sub MEID:0MSG: Job ac 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG	tivation status changed to "Active". SRV6291 Collecting inventory by using inventory profile "All Inventory". ATKSRV6281 Collecting inventory for "PF-PowerVM-Node1", which has a type task activation status changed to "Active". PF-PowerVM-Node1 client job status changed to "Active". Data collection started for cec PF-PowerVM-Node1. Comparing data collection to existing database for PF-PowerVM-Node1.
Job log June 19 June 19 June 19 June 19 June 19 June 19 June 19 June 19 June 19	<pre>, 2012 11:40:45 / , 2012 11:40:47 / , 2012 11:40:47 / , 2012 11:40:47 / , 2012 11:40:47 /</pre>	AM EDT-Level:20 AM EDT-Level:1- AM EDT-Level:15 AM EDT-Level:20 AM EDT-Level:20 AM EDT-Level:10 AM EDT-Level:15 AM EDT-Level:15	0-MEID:0MSG: Sub MEID:0MSG: Job ac 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG	tivation status changed to "Active". SRV6291 Collecting inventory by using inventory profile "All Inventory". ATKSRV6281 Collecting inventory for "PF-PowerVM-Node1", which has a type task activation status changed to "Active". PF-PowerVM-Node1 client job status changed to "Active". Data collection started for cec PF-PowerVM-Node1. Comparing data collection to existing database for PF-PowerVM-Node1.
Job log June 19 June 19 June 19 June 19 June 19 June 19 June 19 June 19 June 19 June 19	, 2012 11:40:45 / , 2012 11:40:47 / , 2012 11:40:47 / ; 2012 11:40:47 /	AM EDT-Level:20 AM EDT-Level:1- AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:00 AM EDT-Level:10 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:15	0-MEID:0MSG: Sub MEID:0MSG: Job ac 0-MEID:0MSG: ATK 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG	tivation status changed to "Active". SRV629I Collecting inventory by using inventory profile "All Inventory". ATKSRV628I Collecting inventory for "PF-PowerVM-Node1", which has a type task activation status changed to "Active". PF-PowerVM-Node1 client job status changed to "Active". Data collection started for cec PF-PowerVM-Node1. Comparing data collection to existing database for PF-PowerVM-Node1. Adding/Updating 3 ResourcePool resource(s) relating to system PF-PowerV!
Job log June 19 June 19	<pre> 2012 11:40:45 / 2012 11:40:45 / 2012 11:40:45 / 2012 11:40:45 / 2012 11:40:45 / 2012 11:40:45 / 2012 11:40:45 / 2012 11:40:47 / 2012 11:40:47 / se. 2012 11:40:47 / </pre>	AM EDT-Level:20 AM EDT-Level:1- AM EDT-Level:15 AM EDT-Level:20 AM EDT-Level:20 AM EDT-Level:10 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:15	0-MEID:0MSG: Sub MEID:0MSG: Job ac 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG	tivation status changed to "Active". SRV6291 Collecting inventory by using inventory profile "All Inventory". ATKSRV6281 Collecting inventory for "PF-PowerVM-Node1", which has a type task activation status changed to "Active". PF-PowerVM-Node1 client job status changed to "Active". Data collection started for cec PF-PowerVM-Node1. Comparing data collection to existing database for PF-PowerVM-Node1. Adding/Updating 3 ResourcePool resource(s) relating to system PF-PowerVI Adding/Updating 5 Slot resource(s) relating to system PF-PowerVM-Node1 t
Job log June 19 June 19	<pre>, 2012 11:40:45 / , 2012 11:40:47 /</pre>	AM EDT-Level:20 AM EDT-Level:1- AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:20 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:15	0-MEID:0MSG: Sub MEID:0MSG: Job ac 0-MEID:13-63MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG	tivation status changed to "Active". SRV6291 Collecting inventory by using inventory profile "All Inventory". ATKSRV6281 Collecting inventory for "PF-PowerVM-Node1", which has a type task activation status changed to "Active". PF-PowerVM-Node1 client job status changed to "Active". Data collection started for cec PF-PowerVM-Node1. Comparing data collection to existing database for PF-PowerVM-Node1. Adding/Updating 3 ResourcePool resource(s) relating to system PF-PowerVM-Node1 t Adding/Updating 5 Slot resource(s) relating to system PF-PowerVM-Node1 t All inventory tasks have completed for PF-PowerVM-Node1.
Job log June 19 June 19	<pre>, 2012 11:40:45 / , 2012 11:40:47 / , 2012 11:40:47 / ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;</pre>	AM EDT-Level:20 AM EDT-Level:1- AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:00 AM EDT-Level:00 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:15	0-MEID:0MSG: Sub MEID:0MSG: Job ac 0-MEID:0MSG: ATK 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG	tivation status changed to "Active". SRV629I Collecting inventory by using inventory profile "All Inventory". ATKSRV628I Collecting inventory for "PF-PowerVM-Node1", which has a type task activation status changed to "Active". PF-PowerVM-Node1 client job status changed to "Active". Data collection started for cec PF-PowerVM-Node1. Comparing data collection to existing database for PF-PowerVM-Node1. Adding/Updating 3 ResourcePool resource(s) relating to system PF-PowerVI Adding/Updating 5 Slot resource(s) relating to system PF-PowerVM-Node1 t All inventory tasks have completed for PF-PowerVM-Node1. PF-PowerVM-Node1 client job status changed to "Complete".
Job log June 19 June 19	<pre>, 2012 11:40:45 / , 2012 11:40:47 / , 2012 11:40:47 / ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;</pre>	AM EDT-Level:20 AM EDT-Level:1- AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:00 AM EDT-Level:00 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:15 AM EDT-Level:15	0-MEID:0MSG: Sub MEID:0MSG: Job ac 0-MEID:0MSG: ATK 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG 0-MEID:13663MSG	tivation status changed to "Active". SRV6291 Collecting inventory by using inventory profile "All Inventory". ATKSRV6281 Collecting inventory for "PF-PowerVM-Node1", which has a type task activation status changed to "Active". PF-PowerVM-Node1 client job status changed to "Active". Data collection started for cec PF-PowerVM-Node1. Comparing data collection to existing database for PF-PowerVM-Node1. Adding/Updating 3 ResourcePool resource(s) relating to system PF-PowerVM-Node1 t Adding/Updating 5 Slot resource(s) relating to system PF-PowerVM-Node1 t All inventory tasks have completed for PF-PowerVM-Node1.

Figure 10-33 Checking the log in the Logs tab

 You can check the Resource Explorer window where three more virtual resources are added to the physical server, as shown in Figure 10-34 compared to Figure 10-27 on page 416.

А	ctions 🔻 Search the table Search	
Select	Name 🔷	Access 0
	PF-Node1-NIM	🗾 ок
	PF-Node1-VIOC2	📄 ок
	PF-PowerVM1-Ethernet0	📄 ок
	SN101D88B_VIOC1	📄 ок
	SN101D88B_VIOS1	ок

Figure 10-34 Four PowerVM virtual servers in the Resource Explorer menu

7. On the Virtual Servers/Hosts tab, the total number of virtual servers has increased to six, as shown in Figure 10-35.

/MCont	rolE	nterpr	ise	e E	d	tion			
e system pools a Learn more	nd virtual	l appliances to	mar	nage	your	data center m	ore (	efficie	ntly. Deploy virtual appliances ar
Resources		Active Status	8			Jobs			
0 Virtual applian	ces	Problems	-	-	-	Active	-	-	
0 Workloads 0 Server system		Compliance	- 21	120	-	Completed	-	6	
0 Storage system						Scheduled	120	-	
Basics	Worklo	ads Virtua	I Apj	olian	ces	System Poo	Is	Virt	tual Servers/Hosta
6 Virtual server O Critical ① 0 Warnir ① 0 Inform	19								Common tasks Virtual servers and hosts Performance Summary Virtual farms Create virtual farm

Figure 10-35 Discovered virtual servers on the Virtual Server/Hosts tab

The second step is creating a VMControl repository by using NIM. The following characteristics are required:

- You can manage the AIX mksysb or lpp_source images.
- The VMControl repository must be configured as a NIM master system:
  - nim_master_setup
  - AIX 7.1 or later

"

- File sets:
  - dsm.core (not installed as part of the default file set)
  - openssh.base.client
  - openssl.base
- ► IBM Flex System Manager Common Agent must be installed.
- VMControl NIM subagent must be installed.
- ► NIM master must be discovered, accessed, and inventoried by IBM Flex System Manager.
- ► After /export/nim is created, make sure that it is large enough to hold appliances.

To create the repository, perform these steps:

1. Make sure that you have the SystemMgmtClient bundle installed on the NIM server, as shown in Figure 10-36.

# lslpp -l Director* Fileset	Level	State	Description
Path: /usr/lib/objrepos			
DirectorCommonAgent	6.2.1.3	COMMITTED	All required files of Director Common Agent, including JRE, LWI
DirectorPlatformAgent	6.2.1.2	COMMITTED	Director Platform Agent for IBM Systems Director on AIX
Path: /etc/objrepos			
DirectorCommonAgent	6.2.1.3	COMMITTED	All required files of Director Common Agent, including JRE, LWI
DirectorPlatformAgent	6.2.1.2	COMMITTED	Director Platform Agent for IBM Systems Director on AIX
# lslpp -l cas*			
Fileset			Description
Path: /usr/lib/objrepos			
cas.agent	1.4.2.32	COMMITTED	Common Agent Services Agent
Path: /etc/objrepos			
cas.agent	1.4.2.32	COMMITTED	Common Agent Services Agent

Figure 10-36 SystemMgmtClient file set

 Ensure that openssh and openssl are installed and ssh is started on the NIM server, as shown in Figure 10-37.

```
# lslpp -l | grep dsm

    dsm.core
    6.1.7.15
    COMMITTED
    Distributed
    Systems
    Management

    dsm.core
    6.1.7.15
    COMMITTED
    Distributed
    Systems
    Management

    dsm.core
    6.1.7.15
    COMMITTED
    Distributed
    Systems
    Management

# lslpp -l | grep openssh
  openssh.base.client 5.0.0.5301 COMMITTED Open Secure Shell Commands
   openssh.base.server 5.0.0.5301 COMMITTED Open Secure Shell Server
  openssh.base.server5.0.0.5301COMMITTEDOpen Secure Shell Licenseopenssh.man.en_US5.0.0.5301COMMITTEDOpen Secure Shell Licenseopenssh.msg.en_US5.0.0.5301COMMITTEDOpen Secure Shell Messages -openssh.base.client5.0.0.5301COMMITTEDOpen Secure Shell Messages -openssh.base.server5.0.0.5301COMMITTEDOpen Secure Shell Messages -
# lslpp -1 | grep openss1
  openssi.license 0.9.8.802 COMMITTED Open Secure Socket Layer
openssi.man.en_US 0.9.8.1800 COMMITTED Open Secure Socket Layer
openssi.base 0.9.8.1800 COMMITTED Open Secure Socket Layer
lssrc -s sshd
                                                0.9.8.802 COMMITTED Open Secure Socket License
# lssrc -s sshd
                                                              PID
                                                                PID Status
5898428 active
Subsystem Group
                               ssh
 sshd
#
```

Figure 10-37 Checking the ssh status

Discover the NIM server by using its IP address, as shown in Figure 10-38.

**Requirement:** This step is a prerequisite to deploying the VMControl agent on the NIM server from FSM.

now or schedule your dis
omize discoveries, includi

Figure 10-38 Discovering the NIM server

4. Check the progress, as shown in Figure 10-39.

and Scheduled Job	5			
ive and Scheduled J ame: System Disco			2012 2:11:54 F	PM EDT Actions 🔻
General	Targets	History	Logs	Discovered Systems
Status:	Active			
Progress:	92%			
Last Run Status:	Running			
Description:	Run once or PM	n 6/19/12 at 2:11		
Next Run:				
Last Run:	6/19/12 at 2	2:11 PM		
Task:	System Disc	overy		
Created By:	USERID			
Edit				

Figure 10-39 Checking the discovery job

5. Check the logs as shown in Figure 10-40.

		History	Logs	Discovered Systems
ick on jo ob Instar	b instance in the M	Name column in o	rder to view its lo	rgs
Ac	tions 🔻	Search the table	Search	
Select	Name		Status	
	6/19/12 at 2:30	PM	Complete	
4 Page	1 of 1 🕨 🕅 1	Select	ed: 1 Total: 1	
Job log				
June 19 June 19	2012 2:30:01 PM	4 EDT-Level:200-1	MEID:0MSG: Su	System Discovery - 9.27.16.131 - June 19, 2012 2:30:01 PM EDT" activated. btask "System Discovery" activated.
June 19 June 19 June 19	2012 2:30:01 PM	4 EDT-Level:200-1 4 EDT-Level:200-1	MEID:0MSG: Su MEID:0MSG: No	btask "System Discovery" activated. clients to start.
June 19 June 19 June 19 June 19 June 19	2012 2:30:01 PM 2012 2:30:01 PM 2012 2:30:01 PM	4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:200-1	MEID:0MSG: Su MEID:0MSG: No MEID:0MSG: Su	btask "System Discovery" activated. clients to start. btask activation status changed to "Active".
June 19 June 19 June 19 June 19 June 19 June 19	2012 2:30:01 PM 2012 2:30:01 PM 2012 2:30:01 PM 2012 2:30:01 PM 2012 2:30:01 PM	4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:1-ME	MEID:0MSG: Su MEID:0MSG: No MEID:0MSG: Su ID:0MSG: Job a	btask "System Discovery" activated. clients to start. btask activation status changed to "Active". activation status changed to "Active".
June 19 June 19 June 19 June 19 June 19 June 19 June 19	, 2012 2:30:01 PM , 2012 2:30:01 PM	4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:1-ME 4 EDT-Level:200-1	MEID:0MSG: Su MEID:0MSG: No MEID:0MSG: Su ID:0MSG: Job a MEID:0MSG: Su	btask "System Discovery" activated. clients to start. btask activation status changed to "Active". activation status changed to "Active". btask activation status changed to "Starting".
June 19 June 19 June 19 June 19 June 19 June 19 June 19 June 19	, 2012 2:30:01 PM , 2012 2:30:01 PM	4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:1-ME 4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:150-1	MEID:0MSG: Su MEID:0MSG: No MEID:0MSG: Su ID:0MSG: Job a MEID:0MSG: Su MEID:0MSG: AT	btask "System Discovery" activated. clients to start. btask activation status changed to "Active". activation status changed to "Active".
June 19 June 19 June 19 June 19 June 19 June 19 June 19 June 19 June 19	, 2012 2:30:01 PM , 2012 2:30:01 PM	4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:1-ME 4 EDT-Level:200-1 4 EDT-Level:150-1 4 EDT-Level:200-1	MEID:0MSG; Su MEID:0MSG; No MEID:0MSG; Su ID:0MSG; Job a MEID:0MSG; SU MEID:0MSG; AT MEID:0MSG; Su	btask "System Discovery" activated. clients to start. btask activation status changed to "Active". activation status changed to "Active". btask activation status changed to "Starting". KSRV623I Starting the discovery process for IP address or range "9.27.16.131"
June 19 June 19 June 19 June 19 June 19 June 19 June 19 June 19 June 19 June 19	, 2012 2:30:01 PM , 2012 2:30:06 PM , 2012 2:30:06 PM , 2012 2:30:06 PM	4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:1-ME 5 EDT-Level:200-1 4 EDT-Level:150-1 5 EDT-Level:200-1 4 EDT-Level:150-1	MEID:0MSG: Su MEID:0MSG: No MEID:0MSG: Su ID:0MSG: Job z MEID:0MSG: Su MEID:0MSG: AT MEID:0MSG: Su MEID:20478MSG	btask "System Discovery" activated. clients to start. btask activation status changed to "Active". scitvation status changed to "Active". btask activation status changed to "Starting". KSRV623I Starting the discovery process for IP address or range "9.27.16.131" btask activation status changed to "Active". G: ATKSRV615I Discovered new system or resource "pureflexrb13.rtp.stglabs.ibr
June 19 June 19	, 2012 2:30:01 PM , 2012 2:30:06 PM berating System". , 2012 2:30:26 PM	4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:150-1 4 EDT-Level:150-1 4 EDT-Level:150-1 4 EDT-Level:150-1	MEID:0MSG: Su MEID:0MSG: No MEID:0MSG: Su ID:0MSG: Job z MEID:0MSG: Su MEID:0MSG: AT MEID:0MSG: AT MEID:20478MSG	btask "System Discovery" activated. clients to start. btask activation status changed to "Active". activation status changed to "Starting". btask activation status changed to "Starting". "KSRV623I Starting the discovery process for IP address or range "9.27.16.131" btask activation status changed to "Active". G: ATKSRV615I Discovered new system or resource "pureflexrb13.rtp.stglabs.ibr "KSRV616I Discovered 1 new systems.
June 19 June 19	, 2012 2:30:01 PM , 2012 2:30:06 PM , 2012 2:30:26 PM , 2012 2:30:26 PM , 2012 2:30:26 PM	4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:1-ME 5 EDT-Level:10-1 4 EDT-Level:200-1 4 EDT-Level:200-1 4 EDT-Level:150-1 4 EDT-Level:150-1 4 EDT-Level:150-1	MEID:0MSG: Su MEID:0MSG: No MEID:0MSG: Su ID:0MSG: Job # MEID:0MSG: Su MEID:0MSG: Su MEID:20478MSG MEID:0MSG: AT MEID:0MSG: Su	btask "System Discovery" activated. clients to start. btask activation status changed to "Active". scitvation status changed to "Active". btask activation status changed to "Starting". KSRV623I Starting the discovery process for IP address or range "9.27.16.131" btask activation status changed to "Active". G: ATKSRV615I Discovered new system or resource "pureflexrb13.rtp.stglabs.ibr

Figure 10-40 Checking the log

6. Click **No access** to gain access to the server, as shown in Figure 10-41.

ive and schedu	ed Jobs (Properties)								
ame: System [	scovery - 9.27.16.13	1 - June 19, 20	12 2:30:01	PM EDT Ad	tions 🔻				
General	Targets	History	Logs	Discours	red Systems	1			
a charan			Lugs		nee eysterns				
					272				
Discovered M		h the table	Search	]					
Discovered M	nageable Systems:			ole represent	t the results Access	of the r	most recent or Problems	currer	Compliar

Figure 10-41 Discovered Systems tab

7. Enter the root password for your NIM server, as shown in Figure 10-42.

harm's and anon an arres h	assword to authenticate Flex Sys	tem Manager to one or more target systems. Then click Request Access to gr
Jser ID:		
root		
Password:		
Request Access	Close	
	Access	Trust State
Name		
pureflexrb13.rtp.stgl	labs.ibm.co 📕 OK	Not applicable

Figure 10-42 Request Access window

#### You can see access is granted, as shown in Figure 10-43.

Groups >	All Systems (View Members)				
	ctions  9.27.16.131  Search				
Select	Name 🗘	Туре 🗘	Access O	Problems 🗘	C
		Conceptor Approximation of the			
	PF-Node1-NIM	Virtual Server	💹 ОК	ОК	

Figure 10-43 Checking accessibility in the Resource Explorer menu

8. Discover the NIM server in VMControl, as shown in Figure 10-44.

Resources		Active Status	8	Â	0	Jobs		
0 Virtual appliances 0 Workloads 0 Server system pools		Problems	-		-	Active		•
		Compliance	( e(		-e(*	Completed	$\mathbf{H}$	6
) Server system pools ) Storage system pools						Scheduled	-	
Basics	Worklo	ads Virtua	al App	olian	ces	System Poo	Is	Virtual Servers/Hosts
						1		

Figure 10-44 Discover virtual appliances

9. Select the NIM server that you want to discover, then click **Add** as shown in Figure 10-45 on page 426.

Targets	Schedule	Notification	Options		
Select the ta	rgets on which the	job will run.			
		l it to the selected	P-1		
	Targets 🗸	It to the selected	list.		
Available:					Selected:
All Target				- Add >	PF-Node1-NIM
A	tions 🔻	Search the table	Search		
Select	Name			< Remove	
Select	10.3.0.1				
	FSM_FSM-5C	F3FC5F54EF.rtp.stg	labs.ibm.com		
	PF-ESXi01				
	PF-ESXi02				
	PF-HyperV1				
	PF-KVM01	ũ.			
	PF-Switch-8G				
	PF-vCenter0:				
	PF-Windows1				52
<	 ≥ 1 of 1 ► ► 1				

Figure 10-45 Discover virtual appliances menu

You can now deploy the VMControl agent on the NIM server.

- To install the VMControl agent on the NIM server, perform these steps:
- 1. Click Install Agents, as shown in Figure 10-46 on page 427.

# VMControl Enterprise Edition

esources	Active Status	0		i	Jobs				
Virtual appliances	Problems	-	-	2	Active	-	2		
Workloads	Compliance	-	-	-	Completed	2	11		
Server system pool Storage system po					Scheduled	-	-		
		1.000	11:22	ree	System Poo	ls	Virt	ual Servers/Hosts	
Basics Wo	rkloads Virtua	al Ap	phan	ices		312 L			
Basics Wo	rkloads Virtu	al Ap	pnan	ices	bystem roo				

Figure 10-46 Install Agents on the Basics tab

The Welcome window opens as shown in Figure 10-47.

nts	
I Welcome	Agent Installation
Agents	Welcome to Agent Installation Wizard
Systems Summary	Use this wizard to install agents on selected systems.  Show this Welcome page next time.

Figure 10-47 Agent Installation Welcome window

2. Select Common Agent Subagent Packages, as shown in Figure 10-48.

Agen	t Installation		
Select the	agent code to be installed		
elect the a	gent code to be installed		
elect a va	id target then add it to the selected list.		
how: A	ent Package Groups 💌		
Available:			
Agent Pa	kage Groups (View Members)	18	
A	tions 🔻 Search the table Sea	arch	
Select	Name 🗢	Type 🗘	Description
0	All Agent Packages (9)	Dynamic: Software	All installable agent packages
0	Common Agent Packages (0)	Dynamic: Software	Contains Common Agent installation a
۲	Common Agent Subagent Packages (3)	Dynamic: Software	Contains Common Agent subagent pa
0	Platform Agent Packages (0)	Dynamic: Software	Contains Platform Agent installation a
0	Platform Agent Subagent Packages (6)	Dynamic: Software	Contains Platform Agent subagents pa

Figure 10-48 Agent Installation window

3. Select the agent for the NIM server as shown in Figure 10-49.

🖌 Welcome	Agent	t Installation	
Agents	Select the	agent code to be installed	
Systems Summary	Select a val Show: All Available: All Target	gent code to be installed id target then add it to the selected list. Targets s tions  Search the table Search	
	Select	Name 🔷	Type 🗘
	0	CommonAgentSubagent_VMControl_CommonRepository-2	Software Module
	0	CommonAgentSubagent_VMControl_ESX4x-6.3.1	Software Module
	0	CommonAgentSubagent_VMControl_NIM-2.4.1	Software Module
	0	PlatformAgentSubagent IBM BladeCenter SAS RAID Contro	Software Module
	0	PlatformAgentSubagent IBM BladeCenter SAS RAID Contro	Software Module
	0	PlatformAgentSubagent IBM BladeCenter SAS RAID Contro	Software Module
	0	PlatformAgentSubagent IBM BladeCenter SAS RAID Contro	Software Module
	0	PlatformAgentSubagent IBM BladeCenter SAS RAID Contro	Software Module
	0	PlatformAgentSubagent IBM BladeCenter SAS RAID Contro	Software Module

Figure 10-49 Agent Installation window

4. Click **Add** as shown in Figure 10-50.

	Add >	Selected: CommonAgentSubagent_VMControl_NIM-2.4.1
Description	< Remove	
Software Module		

Figure 10-50 Agent Installation window

5. Select the NIM server for agent installation, then click **Add**, as shown in Figure 10-51.

Targets	Schedule Notification	Options		
Select the ta	rgets on which the job will run.			
Select a va	ilid target then add it to the selected lis	t.		
Show: Al	l Targets 🗸 🗸			
Available:				Selected:
All Target	ts		Add >	PF-Node1-NIM
A	ctions 🔻 Search the table	Search	< Remove	
Select	Name			
	10.3.0.1			
	FSM_FSM-5CF3FC5F54EF.rtp.stglat	bs.ibm.com		
	PF-ESXI01			
	PF-ESXI02			
	PF-HyperV1			
	PF-KVM01			
	PF-Node1-NIM			
	PF-Switch-8GbSAN			
	PF-vCenter01			
	PF-Windows1			J
<		3	>	
H 4 Pag	e 1 of 1 🕨 🕺 🤰 🕴 Total: 10			

Figure 10-51 Agent Installation window

6. Verify the information, then click **Finish** to install the agent for NIM, as shown in Figure 10-52.

Summary of the Install Agent Task					
Selected Agents:					
Vame	\$	Туре			
CommonAgentSubagent_VMControl_NIM-2.4.1		Software Module			
◀ Page 1 of 1 ▶ ₩ 1 → Total: 1					
elected Systems:					
Vame	\$	Туре			
PF-Node1-NIM		Operating System			
PENGGETNIM					

Figure 10-52 Agent Installation

7. A menu for the installation task opens as shown in Figure 10-53. Click **OK**.

			Launch Job		
Schedule	Notification	Options			
Job name and	schedule				
*Job Name:					
	- June 19, 2012 2:46:4	3 PM EDT			
Choose when	to run the job.				
Run Now					
O Schedule					
ок Са	ncel Help				

Figure 10-53 Agent Installation

8. Check the progress, as shown in Figure 10-54.

Active and Scheduled Job	S			
Active and Scheduled J Name: Install Agent			T Actions	•
General	Targets	History	Logs	1
Status:	Active			
Progress:	5%			
Last Run Status:	Running			
Description:	Run once on 6 PM	5/19/12 at 2:46		
Next Run:				
Last Run:	6/19/12 at 2:	47 PM		
Task:	Install Agent			
Created By:	USERID			
Edit				

Figure 10-54 Checking your progress

9. Check the logs, as shown in Figure 10-55.

eneral	Targets	History	Logs		
lick on jol	b instance in the I	Name column in c	order to view its log:	5	
ob Instan	ce				
Act	ions 🔻	Search the table	Search		
Select	Name		Status		
<b>V</b>	6/19/12 at 2:47	PM	Complete		
<			Landon and the second second		
Job log	1 of 1 🕨 🕅 1	♦ Select	ted: 1 Total: 1		
Job log June 19,	2012 2:47:15 PI	M EDT-Level:1-ME	ID:0MSG; Job "Ir	istall Agent - June 19, 2012 2:46:43 PM EDT" activated. .ask "Install Agent" activated.	
Job log June 19, June 19, June 19,	2012 2:47:15 Pl 2012 2:47:15 Pl 2012 2:47:15 Pl	M EDT-Level:1-ME M EDT-Level:200- M EDT-Level:200-	ID:0MSG; Job "Ir MEID:0MSG; Subt MEID:0MSG; Star	ask "Install Agent" activated. ting clients	
Job log June 19, June 19, June 19, June 19,	2012 2:47:15 Pl 2012 2:47:15 Pl 2012 2:47:15 Pl 2012 2:47:15 Pl 2012 2:47:15 Pl	M EDT-Level:1-ME M EDT-Level:200- M EDT-Level:200- M EDT-Level:100-	ID:0MSG; Job "Ir MEID:0MSG; Subt MEID:0MSG; Staf MEID:0MSG; Clier	ask "Install Agent" activated. ting clients nts started for task "Install Agent"	
Job log June 19, June 19, June 19, June 19, June 19, June 19,	2012 2:47:15 P 2012 2:47:15 P 2012 2:47:15 P 2012 2:47:15 P 2012 2:47:15 P 2012 2:47:15 P 2012 2:47:15 P	M EDT-Level:1-ME M EDT-Level:200- M EDT-Level:200- M EDT-Level:100- M EDT-Level:200- M EDT-Level:21-ME	ID:0MSG: Job "In MEID:0MSG: Subt MEID:0MSG: Star MEID:0MSG: Subt MEID:0MSG: Subt DI:0MSG: Job act	ask "Install Agent" activated. ting clients nts started for task "Install Agent" ask activation status changed to "Active". ivation status changed to "Active".	
Job log June 19, June 19, June 19, June 19, June 19, June 19, June 19,	2012 2:47:15 P 2012 2:47:15 P	M EDT-Level:1-ME M EDT-Level:200- M EDT-Level:200- M EDT-Level:100- M EDT-Level:200- M EDT-Level:1-ME M EDT-Level:200-	ID:0MSG; Job "Ir MEID:0MSG; Subt MEID:0MSG; Star MEID:0MSG; Clier MEID:0MSG; Subt MEID:0MSG; Subt	ask "Install Agent" activated. ting clients nts started for task "Install Agent" cask activation status changed to "Active". ivation status changed to "Active". cask activation status changed to "Starting".	
Job log June 19, June 19, June 19, June 19, June 19, June 19, June 19, June 19,	2012 2:47:15 P 2012 2:47:15 P	M EDT-Level:1-ME M EDT-Level:200- M EDT-Level:200- M EDT-Level:200- M EDT-Level:1-ME M EDT-Level:200- M EDT-Level:200- M EDT-Level:200-	ID:0MSG: Job "Ir MEID:0MSG: Subt MEID:0MSG: Clier MEID:0MSG: Subt ID:0MSG: Job act MEID:0MSG: Subt MEID:0MSG: Subt	ask "Install Agent" activated. ting clients its started for task "Install Agent" task activation status changed to "Active". tivation status changed to "Active". task activation status changed to "Starting". task activation status changed to "Active".	
Job log June 19, June 19, June 19, June 19, June 19, June 19, June 19, June 19,	2012 2:47:15 P 2012 2:47:15 P	M EDT-Level:1-ME M EDT-Level:200- M EDT-Level:200- M EDT-Level:100- M EDT-Level:200- M EDT-Level:200- M EDT-Level:200- M EDT-Level:200-	ID:0MSG: Job "Ir MEID:0MSG: Subt MEID:0MSG: Clier MEID:0MSG: Subt ID:0MSG: Subt MEID:0MSG: Subt MEID:0MSG: Subt	ask "Install Agent" activated. ting clients nts started for task "Install Agent" iask activation status changed to "Active". divation status changed to "Active". ask activation status changed to "Starting". cask activation status changed to "Active". PF-Node1-NIM client job status changed to "Pending".	
Job log June 19, June 19, June 19, June 19, June 19, June 19, June 19, June 19, June 19, June 19,	2012 2:47:15 P 2012 2:47:15 P	M EDT-Level:1-ME M EDT-Level:200- M EDT-Level:200- M EDT-Level:100- M EDT-Level:200- M EDT-Level:200- M EDT-Level:200- M EDT-Level:100- M EDT-Level:100-	ID:0MSG: Job "In MEID:0MSG: Subt MEID:0MSG: Star MEID:0MSG: Subt MEID:0MSG: Job act MEID:0MSG: Subt MEID:20478MSG: MEID:20478MSG:	ask "Install Agent" activated. ting clients nts started for task "Install Agent" task activation status changed to "Active". tivation status changed to "Active". task activation status changed to "Starting". task activation status changed to "Active". PF-Node1-NIM client job status changed to "Active". PF-Node1-NIM client job status changed to "Active".	
Job log June 19, June 19,	2012 2:47:15 P 2012 2:48:41 P 2012 2:48:41 P	M EDT-Level:1-ME M EDT-Level:200- M EDT-Level:200- M EDT-Level:100- M EDT-Level:200- M EDT-Level:200- M EDT-Level:200- M EDT-Level:100- M EDT-Level:100- M EDT-Level:100- M EDT-Level:200-	ID:0MSG: Job "Ir MEID:0MSG: Subt MEID:0MSG: Star MEID:0MSG: Subt ID:0MSG: Subt MEID:0MSG: Subt MEID:0MSG: Subt MEID:20478MSG: MEID:20478MSG: MEID:20478MSG: MEID:20MSG: Subt	ask "Install Agent" activated. ting clients nts started for task "Install Agent" iask activation status changed to "Active". divation status changed to "Active". ask activation status changed to "Starting". cask activation status changed to "Active". PF-Node1-NIM client job status changed to "Pending".	

Figure 10-55 Checking the logs

10. The server object is displayed for the NIM server. Run the Inventory task against both objects, as shown in Figure 10-56.

A	tions 👻 9.27.16.131 💥 Search			
Select	Name 🗘	Туре 🗘	Access Ô	Problems 🗘
		Personal and a second second	💹 ок	ОК
	PF-Node1-NIM	Virtual Server	UK OK	

Figure 10-56 Checking the NIM server status in the Resource Explorer menu

11. Click Create image repository, as shown in Figure 10-57.

ease resource utilization	and automatio	n.						
lesources	Active Status	8	Â		Jobs			
) Virtual appliances	Problems	-	-	2	Active	-	-	
) Workloads ) Server system pools	Compliance	-	-	- 44	Completed	2	12	
) Storage system pools ) Network system pools					Scheduled			
Basics Worklo	ads Virtua	I App	lian	ces	System Poo	ls	Virt	ual Servers/Hosts
Learn how to create	and discover in	nage	rep	ositor	es			Virtualization tasks
Learn how to create	and discover in	nage	rep	ositor	es			Virtualization tasks Set up VMControl Express Editio

Figure 10-57 Create the image repository on the Basics tab

# 12. Select the NIM server to use as the repository, as shown in Figure 10-58.

				La	aunch Jo	b.		
	_							
Targets	Schedule	Notification	Options					
Select the ta	rgets on which the	job will run.						
Select a va	lid target then add	it to the selected	list					
		in to the selected	iist.					
Show: Al	l Targets 💉							
Available:							 Selected:	
All Target	ts			-		Add >	PF-Node1-NIM	
A	ctions 🔻	Search the table	Search			< Remove		
Select	Name					e nemere.		
	10.3.0.1							
	FSM_FSM-5C	F3FC5F54EF.rtp.st	glabs.ibm.com					
	PF-ESXi01							
	PF-ESXI02							
	PF-HyperV1							
	PF-KVM01							
	PF-Node1-NI	M						
	PF-Switch-8G	<b>bsan</b>						
	PF-vCenter01							
	PF-Windows1							

Figure 10-58 Creating the image repository

13. The new NIM repository is created. Click the **Image repositories** link for more information about this repository, as shown in Figure 10-59.

e system pools and virtua ease resource utilization			age	your	data center m	ore	efficie	ently. Deploy virtual appliances and
Learn more								
esources	Active Status	3	A		Jobs			
0 Virtual appliances 0 Workloads	Problems	-	-	-	Active	-	-	
0 Server system pools	Compliance		2	2	Completed	2	13	
0 Storage system pools					Scheduled	-	-	
Basics Worklo	ads Virtua	I App	olian	ces	System Pool	s	Virt	ual Servers/Hosts
- Workie								

Figure 10-59 Checking the newly created image repository

14. Review the newly created image repository, as shown in Figure 10-60.

e imag	e repositories to store	e virtual appliances for deployment in	n your data c	enter.		
nage R	epositories (View Mer	and discovering image nbers) Search the table				
	Name	↓ Image Count	¢	Managed By	Ŷ	Description
elect						

Figure 10-60 Checking the image repository

The prerequisite steps to capture the virtual server are complete.

## 10.2.2 Capturing the Network Installation Manager server

There are two possible capture methods for the NIM:

- Creating the LPP_source base
- Capturing the mksysb base

# Creating the LPP_source base

This section describes to how to create the LPP_source.

Figure 10-61 shows the LPP_source base capture system diagram.

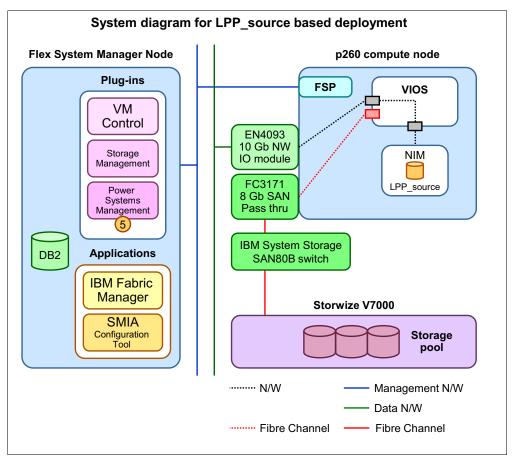


Figure 10-61 System diagram for LPP_source based deployment

The LPP_source base capture involves the following basic steps:

- 1. Create the LPP_source file from the AIX CD/DVD on the NIM server.
- 2. Check that all related servers can be seen in FSM. If they cannot, discover the specific object, then run the Collect Inventory task.
- 3. Put the LPP_source file together with the Open Virtualization Format (OVF) format by using the **captureva** command.

The following commands take an existing lpp_source from the NIM server and make it into a virtual appliance, as shown in Figure 10-62. This function cannot be completed from the GUI.

```
USERID@FSM-5CF3FC5F54EF:~> smcli lsrepos -o
pureflexrb13.rtp.stglabs.ibm.com, 20609 (0x5081)
USERID@FSM-5CF3FC5F54EF:~> smcli captureva -r 20609 -F repos:lpp_source_6100 -n"
AIX_Lppsource" -A "cpushare=1,memsize=8192"
USERID@FSM-5CF3FC5F54EF:~>
```

Figure 10-62 Create LPP_source base capture

Use the 1srepos command to list the repositories:

- Display all repositories: smcli lsrepos -v
- Display the object identifier (OID): smcli lsrepos -o

Use the captureva command to capture a virtual appliance:

- Capture a virtual appliance from a virtual server: smcli captureva -v -s 123 -r 345 -n "XYZLpar" -D "Production server"
- Capture a virtual appliance from existing lpp_source and set the processor and memory size: smcli captureva -r 20609 -F repos:lpp_source_6100 -n "AIX_Lppsource" -A "cpushare=1,memsize=8192"

Click the **Virtual Appliances** tab to see the newly created virtual appliance, as shown in Figure 10-63.

What to deploy:       1 Virtual appliances       2 Existing virtual servers         1 Virtual appliances       2 Hosts and 0 server system pools         What to capture:       0 Workloads         1 Virtual servers and operating systems       1 Image repositories         Virtual servers and operating systems       1 Image repositories         Virtual Appliances (View Members)       1 Image repositories         Virtual Appliances (View Members)       Import         Virtual Appliances (View Members)       Import         Select       Name       Operating System         Operating System       Repository       Description         IBM AIX       pureflexrb13.rtp.stglabs.ibm.c       Virtual Appliance	Basics	Workloads	Virtual Appliance	es System Pools	Virtu	ual Servers/Hosts		
2 Hosts and 0 server system pools         2 Hosts and 0 server system pools         What to capture:         0 Workloads         1 Virtual servers and operating systems         1 Image repositories         Uitwal servers and operating systems         Virtual Appliances (View Members)         Virtual Appliances (View Members)         Capture       Deploy Virtual Appliance         Select       Name         Operating System       Repository         Deploy Virtual Appliance       Description	What to de	eploy: W	/here to deploy:					
What to capture:       0 Where to store:       1 Image repositories       Deploy virtual appliance         1 Virtual servers and operating systems       1 Image repositories       Import         View virtual appliances (View Members)       View virtual appliance versions Create image repository         Virtual Appliances (View Members)       Import       Actions         Select       Name       Operating System       Repository	1 Virtual	appliances	2 Existing virtual se	ervers		Common tasks		
Capture     Deploy Virtual Appliance     Import     Actions     Search the table     Search       Select     Name     Import     Import     Repository     Description	0 Workle	pads		Where to store:	es	Capture Import View active and scl View virtual applian	heduled job nce version:	
Select Name $\diamond$ Operating System $\diamond$ Repository $\diamond$ Description	Virtual App	oliances (View Memb	ers)					
	Ca	apture D	eploy Virtual Applia	nce Impo	rt	Actions 🔻	Searc	h the table Search
Image: Mail All All All All All All All All All A	Select	Name	\$ 0	perating System	٥	Repository	٥	Description
		AIX_Lppsource	IB	M AIX		pureflexrb13.rtp.stg	glabs.ibm.c	Virtual Appliance

Figure 10-63 Checking the newly created virtual appliance

#### Capturing the mksysb base

This section describes how to create a virtual appliance by using the mksysb method.

The following steps are a general overview of the mksysb base capture:

- 1. Create two partitions without VIOS: one for NIM server (if it exists, no need to create it) and one AIX partition where mksysb will run.
- 2. Make sure that all related servers are seen in FSM. If you cannot see all of them, discover the specific object, then run the Collect Inventory task.
- 3. Check the file system size where the mksysb file will be stored in the NIM.

To capture the mksysb base, perform these steps:

1. Click Capture in the Virtual Appliances tab, as shown in Figure 10-64.

e system pools a Learn more	nd virtual a	ppliances to	ma	nag	е уот	ur data center	more	e effici	ently. Deploy v	virtual applia
Resources		Active Status	8	A		Jobs				
4 Virtual applianc		Problems	-	-	8	Active	-	1		
2 Workloads		Compliance	82	-		Completed	10	44		
2 Server system						Scheduled	100	1		
1 Storage system 1 Network system										
		۵ <u>(۳</u>		ance		System Pools		/irtual	Servers/Hosts	
Basics V	Vorkloads	Virtual A	ppila			System Pools		medan	Servers/Hosts	
Basics V What to deploy:		Where to dep				System Pools				
		Where to dep 9 Existing v	ploy	: al se	erver	5			mon tasks	
What to deploy:		Where to dep 9 Existing v	ploy	: al se	erver			Com		
What to deploy:	ances	Where to dep 9 Existing v	ploy	: al serv	erver er sy Wher	5		Com	mon tasks loy virtual app ture	

Figure 10-64 Virtual Appliances window

Figure 10-65 shows the Capture Welcome window.

⇔ Welcome	Welcome
Name	Welcome to the Capture wizard.
Source Source Virtual Server Version Control Summary	Use this wizard to help you capture a virtual server or workload to create a virtual appliance. After creating Before capturing a virtual server or workload, view the requirements for your virtualization environment. ⑦Capture requirements
	You are guided through the following tasks: * Naming the virtual appliance * Selecting the source virtual server or workload * Specifying additional information based on your source selection
	<ul> <li>Learn more about capturing virtual appliances</li> <li>Show this Welcome page next time.</li> </ul>

Figure 10-65 Capture Welcome window

2. Enter the virtual appliance name, as shown in Figure 10-66. In this example, it is AIX-6100-mksysb.

Velcome	Name
Ame Name	Specify a name and description for the virtual appliance that you want to creat
Source	
Source Virtual Server	*Name:
Version Control	AIX-6100_mksysb
Summary	Description:
	This is AIX-6100-mksysb for deployment.
	Limit of 256 characters
	Search tags:

Figure 10-66 Capture: Name

3. Select the source type to capture, as shown in Figure 10-67. In this example, it is **Virtual Server**.

✓ Welcome	Source
🗸 Name	Select the source type to capture.
🔿 Source	
Source Virtual Server	• Virtual Server
Version Control	O Workload
Summary	

Figure 10-67 Capture: Source

4. Select the source virtual server, as shown in Figure 10-68.

	ce Virtual Server					
Select t	he virtual server to capture.					
Select	Name	State 🗘	Access 🗘	Problems 🗘	Compliance 🗘	OSI
$\odot$	AIX-SCS	Started	📄 ок	ек	ок	pure
0	PF-Node1-Test02	Stopped	Offline	🚺 Information	ОК	pure
0	RHEL62vmForVNC	Started	🗾 ок	🗾 ок	🗾 ок	
0	RHEL62VS	Stopped	🗾 ок	💹 ок	🗾 ок	
0	vmRHEL62	Stopped	ОК	🖉 ок	🖉 ок	
	VMRHEL62x86template	Started	ОК	ОК	Пок	

Figure 10-68 Capture: Source Virtual Server

5. Select the repository as shown in Figure 10-69. The repository is where you want to store the image that is associated with the new virtual appliance.

Repo	ository				
Select t	he repository where y	ou want to st	tore the image that is associate	d with the	new virtual appliance.
_	epositories ctions 🔻   Sea	arch the table	e		
Select	Name	\$	Image Count	\$	Managed By
elect	Name		Image Count	\$ 1	

Figure 10-69 Capture: Repository

 Select a network as shown in Figure 10-70. In the example, only one SEA was created, so only one network is displayed. If more than one SEA exist, select the network that you want to use.

Network Mapping				
Specify a description to use for each virtual network				
Network Mapping				
Actions   Search the table  Search				
Network	\$	Description		
Discovered-1-0		Captured from virtual server PF-N		

Figure 10-70 Capture: Network Mapping

 Figure 10-71 shows the Version Control window. Normally, mksysb-based capture is based on a source that is already running an AIX image. Therefore, the wizard selects Set the version based on the virtual appliance from which the virtual server was originally deployed: Capture_AIX_SCS, by default.

/ersion Control	
et the version information for the new virtual appliance.	
	virtual appliance from a previous deployment, you can set the version of the ne a previous deployment, you can choose to create a new version tree with the new nce.
elect the action you want to take to set version informatio	on for the new virtual appliance:
• Set the version based on the virtual appliance from wh	nich the virtual server was originally deployed: Captue_AIX_SCS
O Create a new version tree with the new virtual applianc	e as the root.
O Select a virtual appliance to be the parent version of the	he new virtual appliance.
	Name: 🖶 Captue_AIX_SCS 🛛 🗲
	Status: 🗾 OK
	General
E 🗁 AIX_Lppsource	Serielar
1.1 (AIX_Lppsource)	
□ → Captue_AIX_SCS □ 1.1 (Captue AIX SCS)	
□	Edit
⊞ 🧰 1.1 (ren-va-10-12-11)	

Figure 10-71 Capture: Version Control

# Figure 10-72 shows a summary.

Summary					
You are now ready to capture the virtual server or workload to create a virtual appliance.					
Virtual appliance or workload details:					
Virtual appliance name:	AIX-6100_mksysb	~			
Virtual appliance description:					
Source server:	AIX-SCS				
Repository:	pureflexrb13.rtp.stglabs.ibm.com				
Network Mapping:					
Network	Discovered-1-0				
Description	Captured from virtual server AIX-SCS connected to Discovered-1-0 on host PF- PowerVM-Node1				
Version Control:					
Set the version based on the virtual appliance from which the virtual serve was originally deployed:	er				

Figure 10-72 Capture: Summary

8. Figure 10-73 shows the Launch Job menu.

			Launch	Job		
Schedule	Notification	Options				
Job name and	schedule				 	
*Job Name:						
Capture virtu	al appliance - J	une 24, 2012 3	:59:01 PM EDT			
Choose when	to run the job.					
Run Now						
Oschedule						
OK Ca	ncel Help					

Figure 10-73 Capture: Launch Job

#### 9. Click **OK** and check the log as shown in Figure 10-74.

General	Targets	History	Logs	
Click on jo Job Insta		e Name column	in order to view	its logs
Ac	tions 🔻	Search the tab	le Searc	
Select	Name		Status	
	6/24/12 at 6:1	1 PM	Complete	
<				
Job log	a 1 of 1 ▶ ₩ 1		ected: 1 Total	1 3: No clients to start.
June 24 June 24 June 24 June 24	4, 2012 6:11:42 4, 2012 6:11:42 4, 2012 6:11:42 4, 2012 6:11:42 4, 2012 6:11:42	PM EDT-Level:20 PM EDT-Level:20 PM EDT-Level:10 PM EDT-Level:20	00-MEID:0MS 00-MEID:0MS -MEID:0MSG: 00-MEID:0MS	<ul> <li>INO Clients to start.</li> <li>Subtask activation status changed to "Active".</li> <li>Subtask activation status changed to "Active".</li> <li>Job activation status changed to "Active".</li> <li>Subtask activation status changed to "Active".</li> <li>Subtask activation status changed to "Active".</li> <li>Subtask activation status changed to "Active".</li> </ul>
purefle:	xrb13.rtp.stglabs	s.ibm.com.		3: DNZLOP4111 Capturing virtual server AIX-SCS to virtual appliance AIX-S100_MKS 3: DNZLOP4101 Configuring the NIM capture on the virtual server and the NIM mast
June 24 June 24 June 24 June 24 June 24 June 24	4, 2012 6:12:05 4, 2012 6:14:20 4, 2012 6:14:41 4, 2012 6:14:44 4, 2012 6:14:44 4, 2012 6:14:44	PM EDT-Level:1: PM EDT-Level:1: PM EDT-Level:1: PM EDT-Level:2: PM EDT-Level:1: PM EDT-Level:2:	50-MEID:0MS 50-MEID:0MS 50-MEID:0MS 00-MEID:0MS -MEID:0MSG: 00-MEID:0MS	<ul> <li>SI DNZLOP4071 Conlighting the NIM capture on the Virtual server and the NIM mast</li> <li>SI DNZLOP4071 Initiating capture processing on the NIM master.</li> <li>SI DNZLOP4091 Creating the OVF for the virtual appliance.</li> <li>Subtask activation status changed to "Complete".</li> <li>Job activation status changed to "Complete".</li> <li>Subtask activation status changed to "Complete".</li> </ul>

Figure 10-74 Capture: Logs

10. Review the newly captured virtual appliance, as shown in Figure 10-75.

	deploy: Where to deplo al appliances 8 Existing virt		Common tasks		
1 Work	capture:	2 server system pools Where to store: 3 Image repositories	Deploy virtual app Capture Import View active and s View virtual applia Create image rep	heduled jobs ince versions	
	ppliances (View Members)	l Appliance Impor		<ul> <li>Search the table</li> </ul>	Search
		Appliance Impor			Search
0	Capture Deploy Virtual		t Actions	Search the table	\$
0	Capture Deploy Virtual	Operating System	t Actions	<ul> <li>Search the table</li> <li>Repository</li> </ul>	¢
0	Deploy Virtual       Name       AIX_Lppsource	Operating System IBM AIX	t Actions	Repository pureflexrb13.rtp.stglabs.ibi	¢
Select	Deploy Virtual       Name       ➡ AIX_Lppsource       ➡ AIX-6100_mksysb	Operating System IBM AIX IBM AIX 6	t Actions	Repository pureflexrb13.rtp.stglabs.ibr	¢

Figure 10-75 Capture finished

# 10.2.3 Capturing AIX by using storage copy services (SCS)

This section addresses how to work with the storage copy services (SCS) method. Figure 10-76 shows an SCS-based capture system diagram.

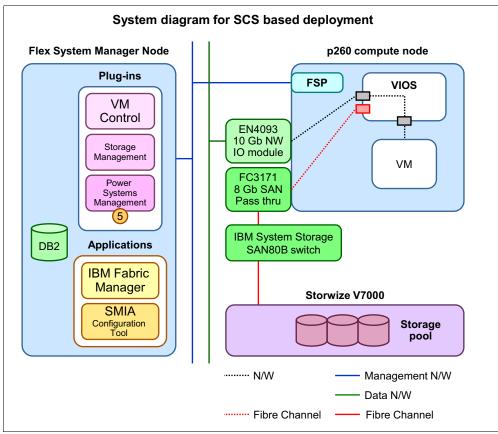


Figure 10-76 System diagram of SCS-based deployment

The following steps are a general overview of the SCS base capture:

- 1. Hardware preparation:
  - a. Storage configuration
  - b. Fabric zoning
  - c. Installation/configuration of VIOS on Power servers
- 2. Storage Management Initiative Specification (SMI-S) provider check step:
  - a. Configuration of SMI-S provider for the storage area network (SAN) switch (if needed)
- 3. Management check step:
  - a. VMControl
  - b. IBM Flex System Manager Storage Control
- 4. Infrastructure discovery:
  - a. Discovery of server infrastructure: Managed Power Servers
  - b. Discovery of storage infrastructure: V7000 and SAN fabric
  - c. Discovery of VIOS

- 5. Configure image repository and system pool:
  - a. Deploy Common Agent VMControl Subagent
  - b. Image repository and system pool creation
- 6. Preparation for capture:
  - a. Installation of activation engine
  - b. Enable activation engine
- 7. Functional test from FSM console

## **Check Storage Copy Services configuration**

This section describes the checklist to configure the SCS. To do so, perform these steps:

1. Check whether IBM Flex System Manager Storage Control is running, as shown in Figure 10-77.

Storage Mana	gement	
	ry of the storage in your environment based on the last	discovery and inventory process.
IBM Flex System Man	ager Storage Control	
Running	-	
(?) Why isn't IBM Flex Syst	em Manager Storage Control "running"	
Capacity Summa	ſŷ	
		Charles Tables
	4855 GB Total configured capacity (to volumes)	Storage Tasks

Figure 10-77 Storage Control main window

2. Check that related resources exist in the farm by right-clicking the farm name and selecting **Related Resources** → **Storage System**, as shown in Figure 10-78.

CF3FC5F54EF.rtp.stglabs.ibm.	\$ Туре	ŧ	Access
CF3FC5F54EF.rtp.stglabs.ibm.			Access
	Topology Perspectives	DNS In	
	Create Group	Storage	e System
	Remove	Switch	
	Add to Automation Inventory Security System Configuration System Status and Health Service and Support	>	
	Syste Syste Servi	m Configuration m Status and Health	em Configuration

Figure 10-78 Checking the farm resources

 Check that related resources exist in the All Systems window, as shown in Figure 10-79. In the example environment, there are three storage-related components: Storwize V7000, a Feature Code (FC) 3171 SAN pass-through, and an IBM System Storage® SANB80 switch.

10112 C 1012	All Systems (View Members)			
	ttions  Search the table Sea	rch		
Select	Name	\$	Туре	
	E Storwize V7000-2076-v7000-IBM		Storage Array	
	- BIBM_2498_880		Switch	

Figure 10-79 All Systems window in the Resource Explorer

4. Check ssh in the Remote Service Access Point (RSAP) configuration as shown in Figure 10-80.

A	ctions 🔻 Search the table	Search		
elect	Name	\$	Туре 🗢	Access
	PF-BMC3		Server	ок
	PF-ESXi-Node1		Server	📰 ок
			Server System Pool	ок
	PowerVM-Server-Pool		Server System Pool	💹 ок
	Storwize V7000-2076-v7000-IBM	Related Resources	×	🖉 ок
	KVMstoragepool	Topology Perspectives		💹 ок
	ETHERNETO-IBM*7895-22X*101	Create Group		ок
	Switch0-PF-ESXi02	Remove Storage from	Storage System Pool	🔚 ок
	- ₿IBM8Gb	Remove		ОК
	vSwitchUSB0-PF-ESXi02	Add to	•	🔙 ок
	ETHERNETO-IBM*7895-22X*101	Automation	•	ок
	Sw_bond0-PF-KVM01	Inventory	•	Пок
	Switch0-PF-ESXi01	Security		Configure Access
	ETHERNETO-IBM*7895-42X*1014	System Configuration System Status and Hei	alth	Verify Connection
	vSwitchUSB0-PF-ESXi01	System Status and He		ОК

Figure 10-80 Checking the RSAP configuration

5. Check that SSH access is displayed in the Access column, as shown in Figure 10-81.

	Certificate Trust St	ore	Actio
Select	Access Type 🔷	Access	\$
	E, TPC	ОК	
	🖺 SSH	ОК	

Figure 10-81 Checking the RSAP configuration

For more information about how to add Storwize V7000 and third-party SAN switches, see 6.12, "Discover and manage external Storwize V7000" on page 234.

#### SCS configuration

To configure the SCS, perform these steps:

1. Check the auto start setting of the Common Agent file set by using the **1ssvc DIRECTOR_agent** command, as shown in Figure 10-82.

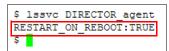


Figure 10-82 Agent startup setting check step

Tip: The VIOS OS image has the Common Agent file, by default.

- 2. Discover VIOS and update the VIOS information in the FSM by clicking **Inventory**  $\rightarrow$  **System Discovery**.
- 3. Right-click the discovered system in the Resource Explorer, then click **Configure Access**. Check that the Common Agent Services (CAS), Common Information Model (CIM), and Secure Shell (SSH) protocols are displayed as shown in Figure 10-83. Click **Request Access**, then enter the correct credentials.

							ecified below in the Access fie
the acces	is state of the	individ	ual access p	oints tha	at are used to evalu	ate the overa	all status.
Select Re	quest Access	to enter	r a user ID a	and pass	word to gain access	to the identi	fied system. Select Revoke A
System:	pureflexrb10	.rtp.stg	labs.ibm.co	m			
	No ad	cess		1	-		Revoke Access
Access:	-••				Request Acces	15	Kevoke Access
Access Ty	pe link to view	w the lis	st of manage	eable cre	edentials configured	for authentic	grant all authorized Flex Syste ation on the selected access
Access Ty viewable	vpe link to viev or configurable	w the lis e. Some	st of manage e examples	eable cre include (		for authentic	
Access Ty viewable	vpe link to viev or configurable	w the lis e. Some	st of manage e examples com (Remot	eable cre include (	edentials configured CAS and IPC creder a Access Point)	for authentic	ation on the selected access
Access Ty viewable	vpe link to viev or configurable rb10.rtp.stglab	w the lis e. Som os.ibm.o Trust Sto	st of manage e examples com (Remot	eable cre include ( e Service	edentials configured CAS and IPC creder a Access Point)	for authentic ntials. The table	ation on the selected access
Access Ty viewable pureflex	vpe link to view or configurable rb10.rtp.stglab Certificate 7	w the lis e. Som os.ibm.o Trust Sto	st of manage e examples com (Remot	eable cre include ( e Service Actio	edentials configured CAS and IPC creder e Access Point) ns	tor authentic ntials.	Search
Access Ty viewable pureflex	rpe link to view or configurable rb10.rtp.stglab Certificate T Access Type	w the lis e. Som os.ibm.o Trust Sto	e examples	e Service Actio	edentials configured CAS and IPC creder a Access Point) ns  Trust State	<ul> <li>ch the table</li> <li>Access I</li> <li>https://9</li> </ul>	Search

Figure 10-83 Configure Access window

4. Check the access status, as shown in Figure 10-84.

	the identified system for te the overall status.	or all authorized Flex	System Manager users is	specified below in the Access fie
Select Re	quest Access to enter a	user ID and passwore	d to gain access to the ide	entified system. Select Revoke A
System:	SN101D88B_VIOS1			
Access:	📄 ок	Request Acc	Royala	e Áccess
Accessi	1			
				to grant all authorized Flex Syst
configure		the selected access p		to grant all authorized Flex Syst ess point credentials might not b
configure	d for authentication on	the selected access p	oint. Certain types of acc	ess point credentials might not b
configure	d for authentication on 8B_VIOS1 (Remote Ser	the selected access p	oint. Certain types of acc	table
SN101D8	d for authentication on 8B_VIOS1 (Remote Ser Certificate Trust Stor	the selected access privice Access Point)	oint. Certain types of acc	table
SN101D8	d for authentication on 8B_VIOS1 (Remote Ser Certificate Trust Stor Access Type	the selected access prvice Access Point)   Access	oint. Certain types of according to the Search the Trust State	table Search Access Information

Figure 10-84 Checking the access status

# Agent installation

To install agents, perform these steps:

1. Click Install agents as shown in Figure 10-85.

VMControl E					NAME OF		
Jse system pools and virtua Rearn more	al appliances to	mar	nage	e yo	ur data center	more	e efficiently. Deploy virtual appliances and m
ULEarn more							
Resources	Active Status	$\otimes$		1	Jobs		
1 Virtual appliances	Problems	-	-	8	Active	-	-
0 Workloads	Compliance	14	-		Completed	8	24
0 Server system pools 0 Storage system pools					Scheduled	2	
0 Network system pools							
Basics Workload	ds Virtual Aj	pplia	nce	S	System Pools		Virtual Servers/Hosts
VMControl is ready	y.						Virtualization tasks
							Set up VMControl Express Edition
Deploy a virtual appliar	ice						Discover virtual appliances
View workloads in your	data center						Create image repository
							Import
							Capture
							Discover TPM for Images server
License							
VMControl Express Editi License installed	on 2.4						Common tasks
							Install agents
VMControl Standard Edi License installed	tion 2.4						Check for updates
VMControl Enterprise Ed	litica D. 4						Launch information center
VMControl Enterprise Ed	1000 2.4						

Figure 10-85 Clicking Install agents

Figure 10-86 shows the Agent Installation Welcome window.

➡ Welcome	Agent Installation
Agents	Welcome to Agent Installation Wizard

Figure 10-86 Agent Installation Welcome window

# 2. Select CommonAgentSubagent_VMControl_CommonRepository-2.4.1 as shown in Figure 10-87.

Agent Installation				
Select the agent code to be installed				
Select the agent code to be installed				
Select a valid target then add it to the selected list.				
Show: Agent Package Groups 💙				
Available:				
Agent Package Groups > Common Agent Subagent (View Members)				
Actions				
Select Name	\$ Description 🗘	Vendor	٥	Version
CommonAgentSubagent_VMControl_CommonRepository-2.4.1	Software Module	IBM		2.4.1
CommonAgentSubagent_VMControl_ESX4x-6.3.1	Software Module	IBM		6.3.1
CommonAgentSubagent_VMControl_NIM-2.4.1	Software Module	IBM		2.4.1

Figure 10-87 Selecting the agent

3. Click Add as shown in Figure 10-88.

=)				Selected: Add >CommonAgentSubagent_VMControl_Comm
\$	Description 🗘	Vendor 🗘	Version	< Remove
y-2,4,1	Software Module	IBM	2.4.1	
	Software Module	IBM	6.3.1	
	Software Module	IBM	2.4.1	

Figure 10-88 Adding the agent

4. Select a VIOS to deploy an agent, as shown in Figure 10-89.

Agent Installation				
The following systems have been selecte	÷			
The following systems have been selected Select a valid target then add it to the sele Show: All OperatingSystems with Full Acc Available:				Selected:
All OperatingSystems with Full Access (Vi	ew Members)		Add >	SN101D88B_VIOS1
Actions 🔻 Search the tab	Search		< Remove	
Select Name	Access 🗘	Problems 🗘		
PF-Windows1	ОК	ОК		
pureflexrb11.rtp.stglabs.ibr	п 💹 ОК	ОК		
SN101D88B_VIOS1	ОК	i Information		

Figure 10-89 Selecting a target VIOS

Figure 10-90 shows the summary.

/ Welcome	Agent Installation						
Agents	Summary of the Install Agent Task						
✓ Systems ⇒ Summary	Selected Agents:		11				
	Name 🗢	Туре 🗘	Description				
	CommonAgentSubagent_VMControl_CommonReposit	Software Module	Software Module				
	M 4 Page 1 of 1 D H Total: 1						
	Selected Systems:		9				
	Name 🗢	Туре 🗘	Description				
	SN101D88B_VIOS1	Operating System					

Figure 10-90 Summary window

5. Figure 10-91 shows the Launch Job menu. Click **OK**.

			Launch Job	)		
Schedule	Notification	Options				
Job name ar	d schedule				 	
*Job Name						
Install Agen	t - June 22, 2012	9:15:46 AM EDT				
Choose whe	n to run the job.					
🖲 Run Nov	c.					
Oschedul						
O Deficedur						
		1				
ок с	ancel Help					

Figure 10-91 Launch Job menu

6. Check the log as shown in Figure 10-92.

and Schedu	uled Jobs		
ive and Sche	eduled Jobs (Propertie	<b>≥</b> ≤)	
ame: Install	Agent - June 22, 201	L2 9:15:46 A	AM EDT Actions
General	Targets	History	Logi
Job Insta	ance	me column in	n order to view its logs
Select	Name		Status
V	6/22/12 at 9:16 AM		Complete
<	0/22/12/800/10/AM		Complete
H 4 Page	= 1 of 1 → H 1	Selection	cted: 1 Total: 1
June 2	2, 2012 9:16:08 AM E	DT-Level:20	MEID:0MSG: Job "Install Agent - June 22, 2012 9:15:46 AM EDT 10-MEID:0MSG: Subtask "Install Agent" activated.
June 2: June 2: June 2: June 2: June 2: June 2: June 2: June 2: June 2: June 2:	2, 2012 9:16:08 AM E 2, 2012 9:17:46 AM E 2, 2012 9:17:46 AM E	DT-Level:10 DT-Level:20 DT-Level:1- DT-Level:20 DT-Level:20 DT-Level:10 DT-Level:10 DT-Level:10 DT-Level:20	<ul> <li>MEID:0MSG: Starting clients</li> <li>MEID:0MSG: Clients started for task "Install Agent"</li> <li>MEID:0MSG: Subtask activation status changed to "Active".</li> <li>MEID:0MSG: Job activation status changed to "Active".</li> <li>MEID:0MSG: Subtask activation status Changed to "Starting".</li> <li>MEID:0MSG: Subtask activation status changed to "Active".</li> <li>MEID:0-28572MSG: SN101D888_VIOS1 client job status change</li> <li>MEID:0MSG: Subtask activation status changed to "Complete MEID:0MSG: Job activation status changed to "Complete".</li> </ul>

Figure 10-92 Checking the log

# Image repository creation

To create an image repository, perform these steps:

1. Click Create image repository as shown in Figure 10-93.

	al appliances to	ma			ion ur data center (	more	e effic	ciently. Deploy virtual appliances :
.earn more								
lesources	Active Status	$\odot$	$\triangle$		Jobs	≙		
L Virtual appliances	Problems	9 <del>4</del>	14	8	Active	-	-	
) Workloads	Compliance	14	-	4	Completed	8	25	
) Server system pools ) Storage system pools ) Network system pools					Scheduled	17		
Basics Workload	ds Virtual A	pplia	ance	es (	System Pools		Virtua	al Servers/Hosts
VMControl is ready	y.						Virt	tualization tasks
							Set	t up VMControl Express Edition
Deploy a virtual applian	ice						Dis	scover virtual appliances
View workloads in your	data center						Cre	eate image repository
								port
							-	pture

Figure 10-93 Image repository creation step

Figure 10-94 shows the Welcome window.

Selcome → Welcome	Welcome
Name	Welcome to the Create Image Repository wizard.
Target System Storage	Use this wizard to create a repository that is used to store images associated with virtual a image repository.
Summary	②Learn more about image repositories
	You are guided through the following tasks:
	Specifying a name and description for the image repository Selecting a target system to host the image repository Selecting the storage for the image repository

Figure 10-94 Image repository creation Welcome window

2. Enter the repository name as shown in Figure 10-95. In this example, the repository name is PowerVM-Repository.

reate Image Repository	
🗸 Welcome	Name
Name     Target System	Specify a name and description for the image repository you want to create
Storage	*Name:
Summary	PowerVM-Repository Description:
	(A) (V)
	Limit of 256 characters

Figure 10-95 Entering the repository name

3. Select the VIOS as shown in Figure 10-96. If the AIX deployment uses Storage Copy Services (SCS), the newly created logical unit number (LUN) is allocated to the VIOS. The VIOS assigns this LUN to the new virtual server by using vscsi mapping.

Targ	et System						
Select a	a target system to host the image	repository you wa	ant to create.				
Available	ems that satisfy the requirements Target Systems ttions		nage repository ar	e shown.	1		1
Select	Name 🗢	Access 🗘	Problems 🗘	Compliance 🗘	IP Addresses 🗘	OS Type 🗘	OS Vers
0	PF-KVM03	ОК	Ск	ок	9.27.16.124, 192	Linux	6.2
۲	SN101D88B_VIOS1	🖉 ок	Information	🖉 ок	9.27.16.128	VIOS	2.2.1.4
<	elofi≯⊨ <mark>1 →</mark> Sele	tted: 1 Total: 2	Filtered: 2				

Figure 10-96 Selecting the target system

4. Select a target storage pool as shown in Figure 10-97. Whenever you create a virtual server, FSM creates a LUN in the storage pool and allocates it to VIOS.

Stor	age							
Select	the storage to use f	for the image i	repository.					
Storage								
A	ctions 🔻 🛛 S	earch the tabl	e Search					
Select	Storage	\$	Storage locati 🗘	Туре	\$	Available GB 🗘	Total GB	\$
$\odot$	RSL-Shared	i i i i i i i i i i i i i i i i i i i	Storwize V7000-2	SAN	1	60,858		62,318

Figure 10-97 Selecting a target storage

Figure 10-98 shows the Summary window.

🗸 Welcome	Summary	
🗸 Name	You are now ready to create the image repository.	
✓ Target System	Summary	
🗸 Storage	Repository Name:	
Summary	PowerVM-Repository	
	Target System:	
	SN101D88B_VIOS1	
	Storage: Storage RSL-Shared	
	Storage location Storwize V7000-2076-v7000-IBM	
	Type SAN	
	Available GB 60858	
	Total GB 62318 Description	

Figure 10-98 Summary window

- 5. When the Launch Job window opens, click OK.
- 6. Check the log as shown in Figure 10-99.

Schedul	ed Jobs	
and Sched	luled Jobs (Properties)	
: Create	Repository Job - Friday, J	une 22, 2012 9:46:47 AM EDT Actions 🔻
eneral	Targets Histo	pry. Logs
Click on io	b instance in the Name co	olumn in order to view its logs
Job Instar	ice	
Act	ions 🔻 🛛 Search th	he table Search
Select	Name	Status
<b>V</b>	6/22/12 at 9:46 AM	Complete
<		
	1 of 1 ▶ ▶ 1 🔹 🖡	Selected: 1 Total: 1
in a Page		Selected: 1 (otal: 1
Job log		
Job log		
1		
		evel:1-MEID:0MSG: Job "Create Repository Job - Friday, June 22, 2012 9:46:47 AM El evel:200-MEID:0MSG: Subtask "Create Repository" activated.
		evel:200-MEID:0MSG: No clients to start.
		evel:200-MEID:0MSG: Subtask activation status changed to "Active".
June 22,	2012 9:46:48 AM EDT-Le	evel:200-MEID:0MSG: Subtask activation status changed to "Active".
		evel:1-MEID:0MSG: Job activation status changed to "Active".
		evel:200-MEID:0MSG: Subtask activation status changed to "Complete".
June 22,		evel:1-MEID:0MSG: Job activation status changed to "Complete".
		evel:100-MEID:0MSG: Create Image Repository Completed.

Figure 10-99 Check the log

# Creating the server system pool

To create the server system pool, perform these steps:

1. Click Server system pools and members as shown in Figure 10-100.

VMControl E						more	e effi	ciently. Deploy virtual appliances and man
Resources	Active Status	0		i	Jobs			
1 Virtual appliances	Problems	25	2	8	Active	13		
0 Workloads 0 Server system pools	Compliance	3	1	-	Completed	8	27	
0 Storage system pools 0 Network system pools					Scheduled	-		
Basics Workloa	ds Virtual A	pplia	ance	s	System Pools		Virtua	al Servers/Hosts
	0 Storage syste	m		0 Ne	twork system		Co	mmon tasks
🔕 0 Critical	🔕 0 Critical			C	0 Critical		He	ealth summary
0 Warning	0 Warning			1	0 Warning			onitors
0 Informational	0 Informa	tion	al		0 Informatio	nal	-	oblems erver system pools and members
0 OK	🛛 0 ОК				0 ок		Ste	rver system pools and members orage system pools and members twork system pools and members

Figure 10-100 Server system pools creation

#### 2. Click Create as shown in Figure 10-101.

erver S	ystem Pools a	and Members (View I	Members)						
	Add Hosts	Create	View Dashbo	oard	Actic	ons	▼ Searc	h the table	
Select	Name		State	\$	Problems	\$	Compliance \$	Platform	٥

Figure 10-101 Clicking Create

Figure 10-102 shows the Create Server System Pool Welcome window.



Figure 10-102 Create Server System Pool Welcome window

Figure 10-103 shows the Pooling Criteria window.

Pooling Criteria
Select the pooling criteria to use for this server system pool.
Resilience criteria:
Only add hosts capable of live virtual server relocation
Network deployment criteria:
Only add hosts connected by a network system pool and capable of automated network deployment
There are no available network system pools.
②Learn more about network system pools
Note: When adding hosts that contain existing virtual servers, the existing virtual servers will be excluded from server system pool.
Dearn about server system pool capabilities

Figure 10-103 Pooling Criteria window

3. Select a physical system to use as a pool as shown in Figure 10-104.

Initial Host		
Select the first host that you want to use to create this server system poo	l. This initial host w	ill be used to find similar h
Select a valid target then add it to the selected list. Show: All Targets Available: All Targets Actions		
Actions V Search the table Search	Type 🗘	Description
O PF-PowerVM-Node1	Server	and a second

Figure 10-104 Selecting a physical server (part 1 of 2)

4. Click **Add** as shown in Figure 10-105.

			-
be used to find similar hosts that suppor	t the secured specialities f	or this server surters a	
	t the required capabilities r	or this server system p	
	Add >	Selected: PF-PowerVM-Node1	
Description 🗘	< Remove		
Description V			

Figure 10-105 Selecting a physical server (part 2 of 2)

5. Select a storage pool that you want to use as shown in Figure 10-106. If you define more storage pools, you will see more storage pools in this window.

🗸 Welcome	Shared Storag	ge
✓ Name ✓ Pooling Criteria		ystem pool must use the same shared storage. For shared stora a is connected to PF-PowerVM-Node1 and available for this server
Initial Host	Available shared storage	
⇒ Shared Storage	Storwize V7000-2076-v7	000-IBM/RSL-Shared
Additional Hosts Optimization Summary	Storwize V7000-2076-v70 Description: Available capacity: Total capacity:	000-IBM/RSL-Shared details: Storage Pool 56678GB 58038GB

Figure 10-106 Selecting a storage pool

Figure 10-107 shows the Additional Hosts window.

🗸 Welcome	Additional Hosts
🗸 Name	The following hosts are compatible and can be added to this server system pool. Select the
✓ Pooling Criteria	No compatible hosts are available. You can add hosts later by editing the server system poo
🗸 Initial Host	(?) Why don't I see my system?
✓ Shared Storage	
Additional Hosts	
Optimization	
Summary	

Figure 10-107 Additional Hosts window

6. When you deploy a new virtual server in the server system pool, FSM deploys that server on the correct physical server automatically if you select **Allow optimizations to occur automatically**, as shown in Figure 10-108.

✓ Welcome	Optimization
🗸 Name	Configure the optimization settings for the server system pool.
<ul> <li>Pooling Criteria</li> <li>Initial Host</li> </ul>	Dynamic placement optimization analyzes your server system pool and can periodically optir
•	Specify how optimizations are to be started:
✓ Shared Storage	Only allow manual optimization
✓ Additional Hosts	O Allow optimizations to occur automatically
Optimization	Optimization interval: 30 Minutes 🕑
Summary	Dearn more about server system pool optimization

Figure 10-108 Optimization window

Figure 10-109 shows the Summary window.

🗸 Welcome	Summary	
🗸 Name	You are now ready to create the server system pool.	
<ul> <li>Criteria</li> <li>Initial Host</li> <li>Shared Storage</li> </ul>	Server system pool details: Name: PowerVM-Server-Pool Shared Storage: Storwize V7000-2076-v7000-IBM/RSL-Shared	
✓ Additional Hosts	Hosts:	
	Hosts: Name	Туре
<ul> <li>Hosts</li> </ul>		Type Serve

Figure 10-109 Summary window

7. Click Finish to run the job.

8. Check the log as shown in Figure 10-110.

	Targets	History	Logi
click on jo	b instance in the Na	ame column in ord	der to view its logs
Job Insta	nce		
Ac	tions 🔻 Se	earch the table	Search
Select	Name	Sta	atus
	6/22/12 at 10:22 /	M Cor	mplete
<			
I Pana	1 of 1 ▶ ▶ 1	Selected:	: 1 Total: 1
		, , , , , , , , , , , , , , , , , , , ,	
Job log			
Job log			
June 22			ID:0MSG: Job "Create System Pool - Friday, June 22, 2012 10:
June 22 June 22	, 2012 10:22:58 AM	4 EDT-Level:200-M	MEID:0MSG: Subtask "Create a server system pool" activated.
June 22 June 22 June 22	, 2012 10:22:58 AM , 2012 10:22:58 AM	4 EDT-Level:200-M 4 EDT-Level:200-M	MEID:0MSG: Subtask "Create a server system pool" activated. MEID:0MSG: Starting clients
June 22 June 22 June 22 June 22	, 2012 10:22:58 AM , 2012 10:22:58 AM , 2012 10:22:58 AM	4 EDT-Level:200-M 4 EDT-Level:200-M 4 EDT-Level:100-M	MEID:0MSG: Subtask "Create a server system pool" activated. MEID:0MSG: Starting clients MEID:0MSG: Clients started for task "Create a server system po
June 22 June 22 June 22 June 22 June 22 June 22	, 2012 10:22:58 AM , 2012 10:22:58 AM , 2012 10:22:58 AM , 2012 10:22:58 AM , 2012 10:22:58 AM	4 EDT-Level:200-M 4 EDT-Level:200-M 4 EDT-Level:100-M 4 EDT-Level:200-M	MEID:0MSG: Subtask "Create a server system pool" activated. MEID:0MSG: Starting clients
June 22 June 22 June 22 June 22 June 22 June 22 June 22	, 2012 10:22:58 AM , 2012 10:22:58 AM	A EDT-Level:200-N A EDT-Level:200-N A EDT-Level:100-N A EDT-Level:200-N A EDT-Level:200-N A EDT-Level:1-MEI	MEID:0MSG: Subtask "Create a server system pool" activated. MEID:0MSG: Starting clients MEID:0MSG: Clients started for task "Create a server system po MEID:0MSG: Subtask activation status changed to "Active".
June 22 June 22 June 22 June 22 June 22 June 22 June 22 June 22 June 22	, 2012 10:22:58 AM , 2012 10:22:03 AM	M EDT-Level:200-N M EDT-Level:200-N M EDT-Level:100-N M EDT-Level:200-N M EDT-Level:200-N M EDT-Level:200-N M EDT-Level:200-N	MEID:0MSG: Subtask "Create a server system pool" activated. MEID:0MSG: Starting clients MEID:0MSG: Clients started for task "Create a server system po MEID:0MSG: Subtask activation status changed to "Active". ID:0MSG: Job activation status changed to "Active". MEID:0MSG: Subtask activation status changed to "Active". MEID:0MSG: Subtask activation status changed to "Complete".
June 22 June 22 June 22 June 22 June 22 June 22 June 22 June 22 June 22 June 22	, 2012 10:22:58 AM , 2012 10:22:53 AM , 2012 10:23:03 AM , 2012 10:23:03 AM	4 EDT-Level:200-N 4 EDT-Level:200-N 4 EDT-Level:200-N 4 EDT-Level:200-N 4 EDT-Level:200-N 4 EDT-Level:200-N 4 EDT-Level:200-N 4 EDT-Level:1-MEI	MEID:0MSG: Subtask "Create a server system pool" activated. MEID:0MSG: Starting clients MEID:0MSG: Clients started for task "Create a server system po MEID:0MSG: Subtask activation status changed to "Active". ID:0-MSG: Job activation status changed to "Active". MEID:0MSG: Subtask activation status changed to "Active".

Figure 10-110 Checking the log

### **Preparation for capture**

To capture the virtual server in an SCS environment, perform these steps:

1. Copy the vmc.vsae.tar file from Flex System Manager by using the scp command as shown in Figure 10-111.

```
USERID@FSM-5CF3FC5F54EF:~> scp /opt/ibm/director/proddata/activation-engine/vmc.vsae.tar root@9.27.16.129:/o
pen/
The authenticity of host '9.27.16.129 (9.27.16.129)' can't be established.
RSA key fingerprint is 44:c4:61:8d:56:b2:ba:e5:cd:7b:29:bc:43:bc:16:67.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '9.27.16.129' (RSA) to the list of known hosts.
root@9.27.16.129's password:
vmc.vsae.tar
USERID@FSM-5CF3FC5F54EF:~>
```

Figure 10-111 Copying the vmc.vsae.tar file from FSM

2. Extract the contents of the .tar file by using the tar -xvf vmc.vsae.tar command, as shown in Figure 10-112.

# ls -al total 15808 drwxr-xr-x 2 root system 256 Jun 22 14:51 . drwxr-xr-x 5 root system 4096 Jun 22 14:48 .. -rw-r--r- 1 root system 8089600 Jun 22 14:35 vmc.vsae.tar # tar -xvf vmc.vsae.tar x activation-engine-2.1-1.13.aix5.3.noarch.rpm, 86482 bytes, 169 tape blocks x activation-engine-jython-2.1-1.13.aix5.3.noarch.rpm, 7871473 bytes, 15374 tape blocks x activation-engine-libxml2-python-2.1-1.13.noarch.rpm, 1569 bytes, 4 tape blocks x activation-engine-libxml2-python-2.1-1.13.aix5.3.noarch.rpm, 1171 bytes, 3 tape blocks x activation-engine-2.1-1.13.noarch.rpm, 74360 bytes, 146 tape blocks x activation-engine-python-xml-2.1-1.13.noarch.rpm, 1553 bytes, 4 tape blocks x activation-engine-python-xml-2.1-1.13.noarch.rpm, 1553 bytes, 5 tape blocks x activation-engine-python-xml-2.1-1.13.noarch.rpm, 1553 bytes, 4 tape blocks x activation-engine-python-xml-2.1-1.13.noarch.rpm, 1553 bytes, 5 tape blocks x linux-install.sh, 3408 bytes, 7 tape blocks x aix-install.sh, 2233 bytes, 5 tape blocks

Figure 10-112 Unpacking the tar file

3. For AIX, ensure that the **JAVA_HOME** environment variable is set and points at a Java runtime environment (JRE), as shown in Figure 10-113.

```
# set JAVA_HOME=/usr/java5/jre
# echo $JAVA_HOME
```

Figure 10-113 Setting up the environment

Run aix-install.sh as shown in Figure 10-114.

```
# ./aix-install.sh
Install VSAE and VMC extensions
JAVA HOME=/usr/java5/jre
*sys-package-mgr*: processing new jar, '/opt/ibm/ae/lib/jython/jython.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/vm.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/core.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/charsets.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/graphics.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/security.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/ibmpkcs.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/ibmorb.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/ibmcfw.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/ibmorbapi.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/ibmjcefw.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/ibmjgssprovider.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/ibmjsseprovider2.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/ibmjaaslm.jar'
*sys-package-mgr*: processing new jar, '/usr/java5/jre/lib/ibmcertpathprovider.jar'
```

Figure 10-114 Installing the VSAE file

5. Prepare the virtual server to be captured by running the **AE.sh** --reset command as shown in Figure 10-115.

```
# /opt/ibm/ae/AE.sh --reset
JAVA_HOME=/usr/java5/jre
[2012-06-22 16:16:23,391] INFO: Looking for platform initialization commands
[2012-06-22 16:16:23,398] INFO: Version: AIX pureflexrb11 1 6 0001D88BD400
[2012-06-22 16:16:23,573] INFO: No initialization commands found....continuing
[2012-06-22 16:16:23,576] INFO: CLI parameters are ' --reset'
[2012-06-22 16:16:23,578] INFO: AE base directory is /opt/ibm/ae/
[2012-06-22 16:16:23,588] INFO: Resetting system. AP file: None. Interactive: False
[2012-06-22 16:16:23,752] INFO: In reset
[2012-06-22 16:16:23,753] INFO: Resetting products
[2012-06-22 16:16:23,755] INFO: Start to reset com.ibm.ovf.vmcontrol.system
ifconfig: error loading
/usr/lib/drivers/if_eth: No such file or directory
[2012-06-22 16:16:23,984] INFO: Reset: about to execute path /opt/ibm/ae/AS/vmc-system/resetAIX.sh
[2012-06-22 16:16:24,107] INFO: [com.ibm.ovf.vmcontrol.system] reset Not Activated
```

Figure 10-115 Preparing the virtual server to be captured

**Tip:** If you previously captured the virtual server and want to capture it again, run the following commands:

rm /opt/ibm/ae/AP/*
cp /opt/ibm/ae/AS/vmc-network-restore/resetenv /opt/ibm/ae/AP/ovf-env.xml

6. The virtual server shuts down automatically as shown in Figure 10-116.

```
Broadcast message from root@pureflexrb11.rtp.stglabs.ibm.com
Broadcast message from root@ (tty) at 16:16:32 ...
! ! ! SYSTEM BEING BROUGHT DOWN NOW ! ! !
JAVA_HOME=/usr/java5/jre
[2012-06-22 16:16:39,532] INFO: Looking for platform initialization commands
[2012-06-22 16:16:39,542] INFO: Version: AIX pureflexrb11 1 6 0001D88BD400
[2012-06-22 16:16:39,799] INFO: No initialization commands found....continuing
[2012-06-22 16:16:39,803] INFO: CLI parameters are ' -d stop'
[2012-06-22 16:16:39,805] INFO: AE base directory is /opt/ibm/ae/
[2012-06-22 16:16:39,822] INFO: Stopping AE daemon.
[2012-06-22 16:16:39,841] INFO: AE daemon was not running.
Stopping The LWI Nonstop Profile ...
Waiting for The LWI Nonstop Profile to exit...
```

Figure 10-116 Checking the AE.sh progress

# Capture AIX by using Storage Copy Services

To capture AIX by using SCS, perform these steps:

1. Click **Capture** as shown in Figure 10-117.

se system po Learn more.		I appliances to	ma	nage	e you	r data center i	more	efficiently. Deploy virtual appl	iances
Resources		Active Status	$\otimes$		i	Jobs			
1 Virtual app		Problems	-	-	9	Active	-		
0 Workloads 2 Server system pools		Compliance -			-	Completed	10	30	
2 Server sys 1 Storage sy	10 A.					Scheduled	56		
0 Network sy	1 A A A A A A A A A A A A A A A A A A A								
	)	ls Virtual A	pplia	ince	W.:	System Pools	Ń	/irtual Servers/Hosts	
Basics	Workload	is wincoarte							
What to de	ploy:	Where to de						Common tasks	
What to de		Where to de	virtua	al se		s stem pools			
What to de	ploy: appliances	Where to de	virtua	al se serve	er sy:			Common tasks Deploy virtual appliance Capture	
What to de 1 Virtual a What to cap 0 Workloa	ploy: appliances oture: ads	Where to de 5 Existing v 2 Hosts an	virtua d 2 s	al se serve	er sy: Vhere	stem pools	ies	Deploy virtual appliance	
What to de 1 Virtual a What to cap 0 Workloa	ploy: appliances oture: ads	Where to de	virtua d 2 s	al se serve	er sy: Vhere	stem pools e to store:	ies	Deploy virtual appliance Capture	bs
What to de 1 Virtual a What to cap 0 Workloa	ploy: appliances oture: ads	Where to de 5 Existing v 2 Hosts an	virtua d 2 s	al se serve	er sy: Vhere	stem pools e to store:	ies	Deploy virtual appliance Capture Import	

Figure 10-117 Capturing AIX using SCS

2. Enter the name as shown in Figure 10-118.

t you want to create

Figure 10-118 Entering a name

3. Select a source virtual server as shown in Figure 10-119. Storwize V7000 runs a **flashcopy** command for the LUN on a virtual server that you select.

ce Virtual Serve	er									
he virtual server to capture.										
Name	\$	State	\$	Access	\$	Problems	٥	Compliance 🗘	OS Name 🗘	OS Type
PF-Node1-NIM		Started		ОК		ОК		ок	PF-Node1-NIM	AIX 6.1
PF-Node1-Test02		Stopped		Offline	5	i Informat	ion	🖉 ок	pureflexrb11.rtp	AIX 6.1
alofi ) I 🔹	Sele	rted: 1 Tot	tali 2			IIII				
	Name	Name PF-Node1-NIM PF-Node1-Test02	Name State PF-Node1-NIM Started PF-Node1-Test02 Stopped	Name State State PF-Node1-NIM Started PF-Node1-Test02 Stopped	Name State Access PF-Node1-NIM Started OK PF-Node1-Test02 Stopped Offline	Name State Access PF-Node1-NIM Started OK PF-Node1-Test02 Stopped Offline	Name PF-Node1-NIM Started OK Informat PF-Node1-Test02 Stopped Offline Informat	Name State Access Problems PF-Node1-NIM Started OK OK PF-Node1-Test02 Stopped Offline Information	Name PF-Node1-NIM Started OK OK OK PF-Node1-Test02 Stopped Offline Information OK	Name PF-Node1-NIM Started OK OK PF-Node1-NIM PF-Node1-Test02 Stopped Offline Information OK pureflexrb11.rtp.

Figure 10-119 Selecting a source virtual server

- 4. Select Virtual Server, then click Next.
- 5. Select a repository as shown in Figure 10-120.

Rep	ository				
Select	the repository where you want to s	tore the image that is as	ssociated with the	new virtual appliance.	
Image R	ries that are capable of storing th Repositories		the new virtual ap	pliance:	
Select	Name 🗘	Image Count	\$	Managed By	\$ Description
۲	PowerVM-Repository		0	SN101D88B_VIOS1	Image Reposi
0	👌 pureflexrb13.rtp.stglabs.ibm		1	PF-Node1-NIM	Image Reposi
<					
H 4 Pag	e 1 of 1 🕨 🕺 1 🔹 🕴 Sele	cted: 1 Total: 2 Filter	ed: 2		

Figure 10-120 Selecting a repository

### Figure 10-121 shows information about the LUN that is being captured.

Disks								
Specify the disks and disk images to be captured. Se	elec	ting a disk capture	s info	rmation about th	e disk. S	electing a disk im	age add	itionally
By default all compatible disks and their associated dis contain everything it needs to create an operational virt (?) Learn more about capturing disks and disk images Disks and Images to Capture Actions  Search the table	rtual	server when it is a						
Select Disk Name	\$	Storage Server	\$	Size (MB)	\$	Compatible	٥	Include
SN101D88B_VIOS1_vol5		SN101D88B_VIOS1	L	20480		Yes		
K ← Page 1 of 1 → M 1 → Selected: 1 Tot		1 Filtorodu 1						
I Page I di Page I d	, and	I Pilleredi I						

Figure 10-121 Disk information to be captured

Figure 10-122 shows network mapping.

Specify a description to use for each virtual network	
Network Mapping	
Actions 🔻 Search the table Search	
Network	\$ Description
Discovered-1-0	Captured from virtual server PF-I

Figure 10-122 Network mapping window

6. Select the version as shown in Figure 10-123.

Version Control	
Set the version information for the new virtual appliance.	
	ual appliance from a previous deployment, you can set the version o evious deployment, you can choose to create a new version tree with
Select the action you want to take to set version information fo	r the new virtual appliance:
<ul> <li>Set the version based on the virtual appliance from which to</li> <li>Create a new version tree with the new virtual appliance as</li> <li>Select a virtual appliance to be the parent version of the new version version of the new version version</li></ul>	the root.
<ul> <li>□ → AIX_Lppsource</li> <li>□ → 1.1 (AIX_Lppsource)</li> <li>□ → ren-va-10-12-11</li> <li>□ → 1.1 (ren-va-10-12-11)</li> </ul>	

Figure 10-123 Version Control window

7. Figure 10-124 shows summary window. Click Finish.

🗸 Welcome	Summary		
🗸 Name	You are now ready to capture	e the virtual server or workload to create a virtual a	pplian
V Source			
✓ Source ✓ Virtual Server	Virtual appliance or workload	details:	
Repository	Virtual appliance name:	Captue_AIX_SCS	
🗸 Disks	Virtual appliance description	1	
Network	Source server:	PF-Node1-Test02	
<ul> <li>Mapping</li> </ul>	Repository:	PowerVM-Repository	
/ Version	Disks:		
<ul> <li>Control</li> </ul>	Disk Name	SN101D88B_VIOS1_vol5	
Summary	Storage Server	SN101D88B_VIOS1	
	Size (MB)	20480	
	Compatible	Yes	
	Include Image	Yes	
	Disk Description		
	Network Mapping:		

Figure 10-124 Summary window

8. Figure 10-125 shows the menu for starting jobs. Click **OK**.

			Launch Job
Schedule	Notification	Options	
Job name an	id schedule		
*Job Name:			
Capture virt	ual appliance - J	une 24, 2012 1	2:10:25 PM EDT
Choose whe	n to run the job.		
Run Nov	v		
Oschedul	e		
ОК Са	ancel Help		

Figure 10-125 Launch Job menu

### 9. Check the log for the task completion, as shown in Figure 10-126.

	1			
General	Targets	History	Logs	
Click on jo Job Insta		e Name column i	in order to view i	ts logs
Ac	tions 🔻	Search the tabl	e Search	
Select	Name		Status	
	6/24/12 at 12:	10 PM	Complete	
<				
	1 of 1 🕨 1	🔹 🛛 Sele	cted: 1 Total:	
Job log				
				3: DNZLOP912I Disk group to be captured: DG_06.24.2012-11:27:52:281 3: DNZLOP900I Requesting SAN volume(s)
				3: DNZLOP948I New disk group: DG_06.24.2012-12:10:53:072 3: DNZLOP413I The virtual appliance is using disk group DG_06.24.2012-12:10:53
following	g SAN volumes:	[Captue_AIX_SC	S1].	
		3 PM EDT-Level:1 888_VIOS1_vol5]		3: DNZLOP414I The virtual server is using disk group DG_06.24.2012-11:27:52:28
June 24	, 2012 12:10:53	3 PM EDT-Level:		3: DNZLOP909I Copying disk images
				3: DNZLOP409I Creating the OVF for the virtual appliance.
				3: Discovering software image where the Derby ID is '1'
				3: Creating new container for the software image. The derby container ID is '1'
				3: Subtask activation status changed to "Complete".
				Job activation status changed to "Complete". 3: Subtask activation status changed to "Complete".
				3: Capture virtual appliance complete.

Figure 10-126 Check log

10. Check the captured image as shown in Figure 10-127.

What to		here to deploy: 8 Existing virtua		Common tasks	
4 virtua			erver system pools	Deploy virtual ap	pliance
What to 1 Work 6 Virtua		ting systems	Where to store: 3 Image repositories	Capture Import View active and s View virtual appli Create image rep	cheduled jobs ance versions
	ppliances (View Mem Capture	Deploy Virtual A	ppliance Import	Actions	<ul> <li>Search the table</li> </ul>
Select	Name		Operating System		Repository
Select	Name		Operating System	\$	Repository
Select	Name AIX_Lppsource			*	Repository pureflexrb13.rtp.stglabs.it PowerVM-Repository
Select	AIX_Lppsource	:S	IBM AIX	\$	pureflexrb13.rtp.stglabs.il

Figure 10-127 Checking a captured image

# **10.3 Deploying virtual machines**

This section addresses different types of deployment methods of previously captured virtual machines (VMs). It describes the following methods:

- Deploying virtual machines by using the LPP_source
- Deploying a virtual machine by using mksysb
- Deploying a virtual machine by using Storage Copy Services (SCS)

# 10.3.1 Deploying virtual machines by using the LPP_source

To deploy VMs by using the LPP_source, perform these steps:

- 1. Click the Virtual Appliances tab.
- Select an LPP_source, then click the Deploy Virtual Appliance task, as shown in Figure 10-128.

Basics	Workloads	Virtual Appliance	s System Pools	Virtu	ual Servers/Hosts		
What to deplo 1 Virtual ap	pliances	here to deploy: 2 Existing virtual se 2 Hosts and 0 serve			Common tasks Deploy virtual applia		
What to captu 0 Workload 1 Virtual se		ig systems	Where to store: 1 Image repositori	es	Capture Import View active and sche View virtual appliant Create image repos	eduled job	
Virtual Applia	nces (View Membe	ers)	Impo	rt	Actions 🔻	Search	the tabl
	ame		perating System	\$	Repository	¢	Descripti
	AIX_Lppsource	IB	XIA N		pureflexrb13.rtp.stgl	abs.ibm.c	Virtual Ap

Figure 10-128 VM deployment by using the LPP_source

3. Figure 10-129 shows the Deploy Virtual Appliance Welcome window. Click Next.

Welcome         Target         Summary         Use this wizard to deploy virtual appliance wizard.         (?) Learn more about deploying virtual appliances         You are guided through the following tasks:	
Use this wizard to deploy virtual appliance "AIX_Lppsource" to a server. Output: Deploying virtual appliances You are guided through the following tasks:	Welcome to the Deploy Virtual Appliance vizard.
You are guided through the following tasks:	Use this wizard to deploy virtual appliance "AIX_Lppsource" to a server.
	②Learn more about deploying virtual appliances
	You are guided through the following tasks:
Specifying a target for the selected virtual appliance	You are guided through the following tasks: * Specifying a target for the selected virtual appliance

Figure 10-129 Welcome window

4. Select a target onto which to deploy the LPP_source as shown in Figure 10-130. It can be a physical server or a partition. Click **Next**.

Та	arget							
Se	lect the loc	ation where you want to deploy the	e virtual appliance.	5				
appl	iance to ar	v the virtual appliance to create a r n existing virtual server. a new virtual server on the following		n an	existing host s	ystem or	system p	ool. Or, you ca
	Ac	tions 🔻 Search the table	Search					
	Select	Name 🗘	State 🗘	IP	Addresses 🗘	Installe	d os MO	Description
	۲	PF-PowerVM-Node1	Started	9.2	7.21.44, fd55:			
	0	PF-PowerVM-Node2	Standby	9,2	7.21.46, fe80:			
	<							
	M 4 Page	a 1 of 1 🕨 🚺 🔹 🕴 Select	ted: 1 Total: 2	Filter	ed: 2			
0		an existing virtual server:	e Search					
				٥	IP Addresses	Ô		
	Select	Name 🗘	State	Y	IP Addresses 9.27.16.131	Ŷ	Descript	lion
	0	SN101D88B_VIOC1	Started		9.27.10.131			
	<	M PHIDIDS9P_VIOCI	started					
	I  Pag	e 1 of 1 ເ⊨ 🕴 🚺 🔹 🕴 Selec	ted: 0 Total: 2	Filter	ed: 2			

Figure 10-130 Choosing an available target

5. Enter the workload name as shown in Figure 10-131, then click Next.



Figure 10-131 Entering the workload name

 Figure 10-132 shows storage mapping. You can choose to assign each disk in the table to either a storage volume or storage pool. For this example, deploy a disk size of 9,537 MB. Click Assign to Storage Pool.

Stora	age Mapping			
Specify	how to assign the storage for the virtual disks when y	ou deploy the virtual applian	ce.	
Total requ				me, select a single dis
Select	Disk Name	Size (MB)	Image 🗘	Assigned Storage
۲	disk1	9,537	True	Not assigned
<				
I Pag	e 1 of 1 🕨 1 🔹 Selected: 1 Total: 1	Filtered: 1		

Figure 10-132 Storage Mapping window

 Assign the disk to a new virtual server from the VIOS rootvg storage pool as shown in Figure 10-133. Click OK.

					Assign to Stor	rage Pool
1 ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (		l that you want to use ed for selected disks:	for the selected disks. A storage vol '9537' (MB)	ume will automa	atically be created on the	selected storage poo
Storage	Pools					
A	ctions 🔻	Search the table	Search			
Select	Name	÷	Location	VIOS Count	0	Maximum Allocatio
$\bigcirc$	rootvg		VIOS: SN101D88B_VIOS1	1		
<						
I Pag	e 1 of 1 🕨 🕅	1 🔶 Select	ed: 0 Total: 1 Filtered: 1			
() Why o	do I not see n	ny storage				
•pool?						
ок	Cancel					

Figure 10-133 Assigning a disk to a new virtual server

**Tip:** There are three ways to allocate disk to a virtual server through VMControl:

- Iv from vg (one of the storage pool types).
- ► A LUN is already assigned to VIOS by the storage subsystem.
- A LUN is allocated to VIOS upon request by using SMI-S (another storage pool type).

8. Figure 10-134 shows the Storage Mapping view. Click Next.

Stor	age Mapping				
Specify	how to assign the storage for the virtual disks when	you deploy the virtual ap	liance.		
Total req			o assign a disk		me, select a single disk
Select	Disk Name	Size (MB)	Image	0	Assigned Storage
0	disk1	9,537	True		Storage pool: rootvg
<					
H 4 Pag	e 1 of 1 🍽 1 🌩 🛛 Selected: 0 Total: 1	Filtered: 1			

Figure 10-134 Storage Mapping view

9. Enter the IP address information as shown in Figure 10-135, then click Next.

Product	
Specify the product settings you want to use when you deploy the virtual appliance.	
System Level Networking	
Short host name for the system.	PF-Node1-
DNS domain name for the system.	rtp.stglabs
IP addresses of DNS servers for system.	9.42.242.2
Default IPv4 gateway.	9.27.16.1
Network adapter configuration for Network adapter 1 on Network 1	
Internet Protocol Version 4	
Static IP address for the network adapter "Network adapter 1 on Network 1".	9.27.16.12
Static network mask for network adapter "Network adapter 1 on Network 1".	255.255.2
Deployment use	
The adapter order for network adapter "Network adapter 1 on Network 1".	
Default network	
NIM-specific settings	
NIM-specific settings	
NIM Resource or Resource Group	

Figure 10-135 IP address configuration

10. Review the information in the Summary window that is shown in Figure 10-136, then click **Finish** to run the job.

Welcome	Summary				
Target	You are now ready to deploy the virtual appliance.				
<u>Workload Name</u> <u>Storage Mapping</u>	Deployment details:				
Network Mapping	Virtual appliance to deploy:	AIX_Lppsource			
Product	Target server or system pool:	PF-PowerVM-Node1			
Summary	Workload Name	PF-Node1-Test1			
	Storage Mapping:				
	Disk Name	disk1			
	Size (MB)	9537			
	Image	Yes			
	Assigned Storage	Storage pool: rootvg			
	Description				
	Networks:				
	Network Name	Network 1			
	Description	Default network			
	Click Finish to deploy the virtual appliance.	10 - 10			

Figure 10-136 Summary window

11. Figure 10-137 shows the Launch Job menu. Click **OK**.

			Launch Job	
Schedule	Notification	Options		
Job name and	d schedule			
*Job Name:				
Deploy virtua	al appliance to new	v virtual server -	June 19, 2012 3:50:33 PM EDT	
Choose when	to run the job.			
Run Now				
O Schedule				
ОК Са	ncel Help			

Figure 10-137 Launch Job menu

Figure 10-138 shows the newly deployed virtual server.

	Performance Summary	Actions	▼ Sean	ch the table Search	
Select	Name 🗘	State 🗘	OS Name 🗘	OS Type and Version 💲	Access 🗘
	PF-ESXi-Node1	Started	PF-ESXi01	Hypervisor 5.0.0	🖉 ок
	🖉 vm001	Started	PF-vCenter01	Windows® Server 2008 6.	🖉 ок
	🗸 vm002	Started	PF-Windows1	Windows® Server 2008 6.	🖉 ок
	PF-ESXi-Node2	Started	PF-ESXi02	Hypervisor 5.0.0	📄 ок
	🗸 vm003	Started			🖉 ок
	PF-PowerVM-Node1	Started			🖉 ок
	PF-Node1-NIM	Started	PF-Node1-NIM	AIX 6.1	📄 ок
	PF-Node1-Test01	Started			📄 ок
	SN101D88B_VIOC1	Started			🖉 ок
	SN101D88B_VIOS1	Started			🖉 ок
	PF-PowerVM-Node2	Standby			ОК

Figure 10-138 Checking the newly deployed virtual server

12. Check the virtual server in the Resource Explorer window, as shown in Figure 10-139.

		1			
A	tions   Search the table Search				
Select	Name 🗢	Access 🗘	Compliance 🗘	Problems \$	
	ETHERNETO-IBM*7895-22X*101D888	ОК	📕 ок	ОК	
	PF-Node1-NIM	🗾 ок	📕 ок	🔳 ок	
	PF-Node1-Test01	💹 ок	💹 ок	ОК	
	SN101D88B_VIOC1	🗾 ок	🖉 ок	🔳 ок	
	SN101D88B VIOS1	ОК	ОК	ОК	

Figure 10-139 Virtual server in the Resource Explorer

13. Discover the newly deployed virtual server as shown in Figure 10-140. Discover the virtual server and collect inventory in the Resource Explorer window. Perform this step even if you can see the virtual server in the Virtual Servers and Hosts tab in VMControl. Click the **No Access** link to get access to the newly discovered server.

	led Jobs								
ve and Sched	duled Jobs (Prop	verties)							
me: System	Discovery - 9.27	7.16.129 - June	20, 2012 9:53:53	3 AM EDT Actions	•				
General	Targets	History	Logs	Discovered Systems	]				
	The state								
The resource	es listed in the D	)iscovered Mana	geable Systems ta	able represent the re	sults of the	most	recent occur	rence	of this job.
			geable Systems ta	able represent the re	sults of the	most	recent occur	rence	e of this job.
	Manageable Sys	tems:		able represent the re	sults of the	most	recent occur	rence	e of this job.
	Manageable Sys			able represent the re	esults of the	most	recent occur	rence	e of this job.
Discovered I	Manageable Sys	tems:	Search	able represent the re	Access	most	Problems	rence	of this job.

Figure 10-140 Checking the virtual server status

14. Enter the credentials for the virtual server and click **Request Access** as shown in Figure 10-141.

Specify the user ID and password users access to the target system		ystem Manager to one or more target systems. Then click
*User ID:	(2)	
root		
*Password:		
••••		
Request Access C	lose	
Selected targets:	Access	Trust State
Name	Access	
		Not applicable

Figure 10-141 Entering the credentials for the virtual server

Figure 10-142 shows that the request access task is completed successfully.

Specify the user ID and pas users access to the target s		System Manager to one or more target systems. Then click
User ID:		
root		
Password:		
Request Access	Close	
Selected targets:		
	Access	Trust State
Selected targets:		Trust State
Selected targets:		

Figure 10-142 Request Access window

# 10.3.2 Deploying a virtual machine by using mksysb

To deploy VMs by using mksysb, perform these steps:

- 1. From the Virtual Appliances tab, click the **Deploy virtual appliance** task.
- 2. Click Next in the Welcome window.
- 3. Select the virtual appliance of the mksysb type as shown in Figure 10-143.

elcome	Virtual appliance						
tual	Select the virtual appliance that you want to deploy.						
ance	v.						
arget ummary	1 Sec. 220 23	pliances that you can deploy					
	Select	Name	Revision Trunk	Revision	Operating Sy		
	0	ren-va-10-12-11	ren-va-10-12-11	1.1	Linux		
				1.2	Linux		
	0	CapturedVMonKVM	ren-va-10-12-11	1.2			
	0	CapturedVMonKVM	Captue_AIX_SCS	1.1	IBM AIX 6		
	-						

Figure 10-143 Selecting a virtual appliance of the mksysb type

4. Select a target where you want to deploy this mksysb image as shown in Figure 10-144, then click **Next**.

🗸 Welcome	Та	rget			
Virtual	Sele	ect the lo	cation where you want to deploy t	he virtual appli	iance.
Summary	O De	eploy to	a new virtual server on the followi	ng:	
		A	ctions		
		Ad	Name \$	State	h
		A			
		Ad	Name \$	State Active	
		Ad Select	Name 🗘	State Active	

Figure 10-144 Selecting a target

5. Enter the workload name as shown in Figure 10-145 and click **Next**.

Welcome	Workload Name
🗸 Virtual appliance	A workload is created as a result of deploying the virtual appliance
/ Target	
Workload	*Specify a unique name for the workload.
V Name	PF-Node1-Test02
Network Mapping	
Product	
Summary	

Figure 10-145 Entering the workload name

6. Figure 10-146 shows the networking mapping. Click Next.

✓ Welcome	Network Mapping
🗸 Virtual appliance	Select a virtual network for each network defined for the appliance
<ul> <li>✓ Target</li> <li>✓ Workload Name</li> <li>Network</li> <li>Mapping</li> <li>Product</li> <li>Summary</li> </ul>	The following networks will be assigned for this virtual server. Deploying to host: PF-PowerVM-Node1 Network Mapping Actions Search the table Search Network Name
	Discovered-1-0
	M 4 Page 1 of 1 ▶ M 1 ➡ Total: 1 Filtered: 1

Figure 10-146 Network Mapping window

7. Enter the IP address and the Domain Name System (DNS) information as shown in Figure 10-147.

Product	
Specify the product settings you want to use when you deploy the virtual appliance.	
System Level Networking	
Short host name for the system.	PF-Node1-Test02
DNS domain name for the system.	rtp.stglabs.ibm.com
IP addresses of DNS servers for system.	9.42.242.28
Default IPv4 gateway.	9.27.16.1
Network adapter configuration for Network adapter 1 on Discovered-1-0	
Internet Protocol Version 4	
Static IP address for the network adapter "Network adapter 1 on Discovered-1-0".	9.27.16.129
Static network mask for network adapter "Network adapter 1 on Discovered-1-0".	255.255.252.0
Deployment use	
The adapter order for network adapter "Network adapter 1 on Discovered-1-0".	
Captured from virtual server AIX-SCS connected to Discovered-1-0 on host PF-PowerVM-Node1	
NIM-specific settings	
NIM-specific settings	
NIM Resource or Resource Group	

Figure 10-147 IP address configuration window

8. Click **Finish**, then click **OK** in the Launch Job window.

Figure 10-148 shows the newly deployed virtual machine that was deployed through the mksysb virtual appliance.

	VM-Node1 (Computer System)	
A	tions 🔻 Search the table Search	
Select	Name 🗘	Access
	SN101D88B_VIOS1	ОК
	PF-Node1-NIM	🖉 ок

Figure 10-148 Newly deployed virtual server

# 10.3.3 Deploying a virtual machine by using Storage Copy Services (SCS)

To deploy a virtual machine by using the Storage Copy Services (SCS) method, perform these steps:

1. Click Deploy virtual appliance as shown in Figure 10-149.

VMCon									
Ise system poo Learn more		al appliances to	ma	nag	e you	ur data center	more	e effic	ciently. Deploy virtual appliances and ma
Resources		Active Status	8			Jobs			
4 Virtual app	4 Virtual appliances 1 Workloads 2 Server system pools 1 Storage system pools		-	-	9	Active	-	-	
			-	-	-	Completed	10	44	
1						Scheduled	-	1	
1 Network sys	2								
Basics	Workload	ds Virtual A	peli	ance		System Pools	1	/irtua	I Servers/Hosts
What to dep 4 Virtual a		Where to de 8 Existing			erver	5		Cor	mmon tasks
						stem pools		De	ploy virtual appliance
What to cap				1		e to store:			pture
1 Workloa		perating system			3 Ir	mage repositor	ies	Im	port
6 virtual s	ervers and o	perating system	ms					Vie	ew active and scheduled jobs
								Vie	ew virtual appliance versions
								Cre	eate image repository

Figure 10-149 Deploying the virtual appliance task

2. Figure 10-150 shows the Welcome window. Click Next.

⇔ Welcome	Welcome
Virtual appliance	Welcome to the Deploy Virtual Appliance wizard.
Target Summary	Use this wizard to deploy a virtual appliance. ②Learn more about deploying virtual appliances You are guided through the following tasks:
	<ul> <li>* Selecting a virtual appliance to deploy</li> <li>* Specifying a target for the selected virtual appliance</li> <li>* (Optional) Customizing settings on the virtual appliance before deploying</li> </ul>

Figure 10-150 Welcome window

3. Select a virtual appliance as shown in Figure 10-151. Captue_AIX_SCS is an image that is created by the V7000 FlashCopy feature. Click **Next**.

Virtu	ial appliance				
Select th	he virtual appliance that you	want to deploy.			
irtual ap Select	ppliances that you can deploy Name	: Revision Trunk	Revision	Operating System	Repository
	Hame		1.1	IBM AIX	pureflexrb13.rtp.stglabs.ibm.cor
0	AIX_Lppsource	AIX_Lppsource	1.1		
0	AIX_Lppsource	ren-va-10-12-11	1.1	Linux	KVMimagesrepo
~					

Figure 10-151 Selecting a virtual appliance

4. Select a target as shown in Figure 10-152, then click Next.

Target						
Select the l	ocation where you want to deploy	the virtual appliance.				
Deploy to	oy the virtual appliance to create a new virtual server on the follo	-	g host sy	rstem or system pool. Or,	you can deploy	the virtual a
Select	Name \$	State \$	IP Add	resses 🗘	Installed OS Na	ame
0	KVMpool	Active				
0	Server-7895-42X-SN101423	E Started	169.25	i4.3.196, fd55:faaf:e1ab:		
0	PF-PowerVM-Node2	Standby	9.27.2	1.46, fe80:0:0:0:5ef3:fcf		
$\odot$	PowerVM-Server-Pool	Active				
Deploy to	an existing virtual server:	ected: 1 Total: 4 Filtered: 4				
Select	Name 🗘	State	\$	IP Addresses	\$	Description
0	PF-Node1-NIM	Started		0.0.0.0, 9.27.16.131		
0	atest 🕹	Stopped				
0	SN101D88B_VIOC1	Stopped				
0	PF-Node1-Test02	Stopped		9.27.16.129		

Figure 10-152 Select a target

5. Enter the workload name as shown in Figure 10-153, then click Next.

Virtual appliance A workload is created as a result of deploying the virtual ap	
	ppliance.
✓ Target	
Workload *Specify a unique name for the workload.	

Figure 10-153 Enter the workload name

6. Figure 10-154 shows the networking mapping. Click Next.

Network Mapping		
Select a virtual network for each network defined for the appliance.		
The following networks will be assigned for this virtual server. Deploying to host: PF-PowerVM-Node1 Network Mapping Actions Search the table Search		
Network Name	Description	;
Discovered-1-0	Captured from virtual se	rver PF-Node1-
<u>&lt;</u>		
H + Page 1 of 1 + H 1 + Total: 1 Filtered: 1		

Figure 10-154 Network Mapping window

7. Enter the IP address information as shown in Figure 10-155 and click Next.

Product						
Specify the product settings you want to use when you deploy the virtual appliance.						
General System Product Section						
Time zone setting for the virtual system						
System Level Networking						
Short host name for the system.	AIX-SCS					
DNS domain name for the system.	rtp.stglabs.ibm.com					
IP addresses of DNS servers for system.	9.42.242.28					
Default IPv4 gateway.	9.27.16.1					
Network adapter configuration for Network adapter 1 on Discovered-1-0						
Internet Protocol Version 4						
Static IP address for the network adapter "Network adapter 1 on Discovered-1-0".	9.27.16.130					
Static network mask for network adapter "Network adapter 1 on Discovered-1-0".	255.255.252.0					
Internet Protocol Version 6						
Static IP address for the network adapter "Network adapter 1 on Discovered-1-0".						
Static default gateway for network adapter "Network adapter 1 on Discovered-1-0".						
Use IPv6 stateless address autoconfiguration for network adapter "Network adapter 1 on Discovered-1-0".						

Figure 10-155 IP address configuration window

8. Figure 10-156 shows the summary. Click Finish.

Very see services du te deslaw the vistual		
You are now ready to deploy the virtual appliance.		
Deployment details:		
Virtual appliance to deploy:	Captue_AIX_SCS	
Target server or system pool:	PowerVM-Server-Pool	
Workload Name	PF-Node1-AIX-SCS	
Networks:		
Network Name	Discovered-1-0	
Description	Captured from virtual server PF-Node1 Test02 connected to Discovered-1-0 o host PF-PowerVM-Node1	
Virtual Networks on Host	Discovered-1-0 (VLAN 1, Bridged)	
Specify the product settings you want to use when you deploy the virtual appliance.		
General System Product Section		
	Virtual appliance to deploy: Target server or system pool: Workload Name Networks: Network Name Description Virtual Networks on Host Specify the product settings you want to use when you deploy the virtual appliance.	

Figure 10-156 Summary window

9. Figure 10-157 shows the Launch Job window. Click **OK**.

Launch Job							
Schedule	Notification	Options					
Job name and	d schedule						
*Job Name:							
Deploy virtua	al appliance to n	ew virtual serve	er - June 24, 20	12 12:27:55 PI	M EDT		
Choose when	to run the job.						
Run Now							
Oschedule							
ОК Са	ncel Help						

Figure 10-157 Launch Job window

#### Figure 10-158 shows the job log with the completed task.

General	Targets	History	Logs	
Click on ; Job Inst	job instance in th ance	e Name column	in order to viev	v its logs
A	ctions 🔻	Search the tab	Searc	h
Select	Name		Status	
	6/24/12 at 4:5	3 PM	Complete	
<				
H d Dee	elofi≯N [	A   0-1	ected: 1 Total	
Job log				
	4, 2012 4:54:11		50-MEID:0MS	G: DNZLOP413I The virtual appliance is using disk group DG_06.24.2012-12:10:5
			50-MEID:0MS	G: DNZLOP414I The virtual server is using disk group DG_06.24.2012-16:53:23:9
	lumes: [vdisk10]		50-MEID-0MS	G: DNZLOP909I Copying disk images
June 2	4, 2012 4:54:12			G: DNZLOP406I Configuring a virtual optical device on virtual server AIX-SCS for th
option				
				G: Subtask activation status changed to "Complete".
				Job activation status changed to "Complete", G: DNZLOP404I Starting virtual server AIX-SCS,
				G: Virtual server AIX-SCS added to workload PF-Node1-AIX-SCS.
				G: Workload PF-Node1-AIX-SCS is stopped.
				G: Workload PF-Node1-AIX-SCS is stopped.
				G: Subtask activation status changed to "Complete".
June 2	4, 2012 4:54:29	PM EDT-Level:1	00-MEID:0MS	G: Deploy virtual server complete.

Figure 10-158 Job log: Task completed

# **10.4 Relocating virtual machines**

IBM Flex System Manager VMControl can relocate virtual servers in response to predicted hardware failures related to processors, memory subsystems, power source, and storage. You can also choose to relocate virtual servers for planned maintenance or downtime, or to adjust resources to improve performance.

The following relocation methods are supported in a PowerVM environment:

- Static relocation in virtual farms
- Live relocation in virtual farms
- Live relocation in server system pools

### 10.4.1 Manual relocation

You can choose to relocate one or more virtual servers from an existing host at any time. When you relocate virtual servers within server system pools, the relocation target is automatically identified.

# **10.4.2 Automatic relocation**

VMControl server system pools can predict hardware failure problems and relocate virtual servers to maintain resilience. However, you might also want to monitor and adjust resources within your server system pool.

For example, you might want to monitor the hosts in your server system pool for high processor utilization. To do so, activate a threshold to monitor high and low values for processor utilization in your workloads. Then, if the threshold is reached, a message is displayed in the Server system pools dashboard, and in the Problems view.

#### 10.4.3 Relocating virtual servers manually

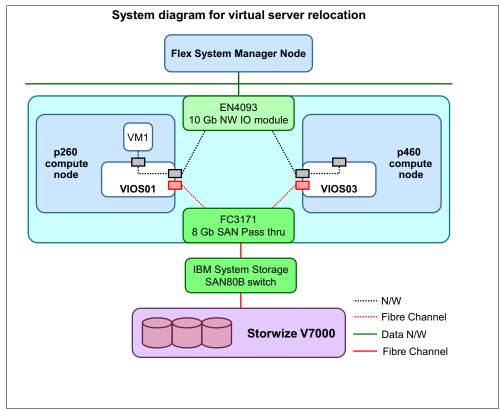


Figure 10-159 shows the overall architecture for virtual server relocation.

Figure 10-159 System diagram for virtual server relocation

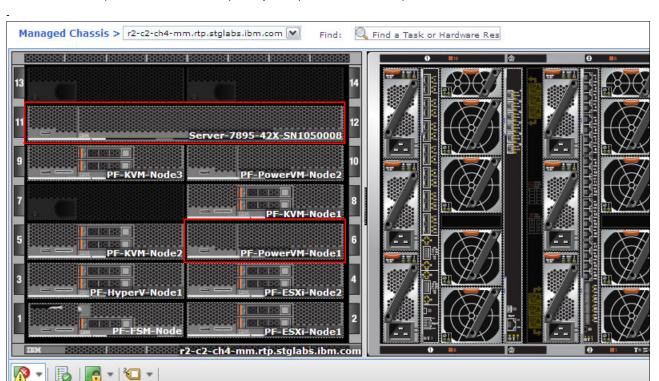


Figure 10-160 shows the physical compute nodes. The example environment uses p260 (PF-PowerVM-Node1) and p460 (Server-7895-42X) for virtual server relocation.

Figure 10-160 Chassis front view

This section describes several important steps that you must follow to set up virtual server relocation (Live Partition Mobility). For more information about Live Partition Mobility, see *IBM PowerVM Live Partition Mobility*, SG24-7460, at this website:

http://www.redbooks.ibm.com/abstracts/sg247460.html?Open

To relocate virtual servers manually, perform these steps:

1. Click **Manage Virtual Server** to check the VIOS profile settings as shown in Figure 10-161.

Acti	ons 🔻 Search the	e table Search					
Select	Name	\$	Access	\$	Compliance 🗘	Problems	<
	AIX-SCS		📄 ок		ОК	ОК	
	PF-Node1-NIM		🖉 ок		ОК	🖉 ок	
	SN101D888_VIOC1		ОК		ОК	ОК	
	ETHERNETO-IBM*78	95-22X*101D88B	🖉 ок		Ок	🖉 ок	
<b>V</b>	SN101D888_VIOS1	Related Resources	▶ K		Ок	ОК	
	PF-Node1-Test02	Topology Perspectives	▶ fflin	e	ок	ОК	
	PF-Node1-Test01	Create Group	ĸ		ок	🖉 ок	
		Configure IMM Network					
		Add to	•				
		Automation					
		Inventory	•				
		Operations	•				
		Release Management					
		Remote Access					
		Security			4		
		System Configuration		Manage F	Profiles		
		System Status and Health		Manage \	/irtual Server		
• Pag	e 1 of 1 🕨 1 🔹	Service and Support		Save Curr	ent Configuration		
		Properties		Server to	Storage Mapping Vie	w	
	L	rioperues		Edit Locat	ion		_

Figure 10-161 Launch Virtual Server settings

	Host: PF-	PowerVM-Node1	Name: SN101D88B_VIOS1		
	Environment: VIO	S	State: Started - RMC avail		
General Settings	▼ Overview				
Processor					
Memory	Virtual server name:	SN101D88B_VIOS1			
Network	OS installed :	AIX 6.1 6100-07-04-1216			
Storage Adapters	IP address:	9.27.16.128			
Storage Devices	Processors:	1.0			
Media Devices	Memory	10.0 GB			
Physical IO					
	General Configuration				
	Maximum virtual ada	apters: 100			
	Mover service:*	<b>v</b>			
	Boot				
	Boot Mode:		Normal		
	Keylock position:		Normal 💌		
	Automatically sta	art with managed system:			

2. Select **Mover service** to perform Live Partition Mobility as shown in Figure 10-162.

Figure 10-162 Check VIOS server setting

3. When you create a VIOS pair to perform Live Partition Mobility, priorities for Shared Ethernet Adapters need to be changed as shown in Figure 10-163.

Adapter Id*       11       Port Virtual Ethernet	Adapter Id*       11       Port Virtual Ethernet
1 VSI Type Id	1 VSI Type Id
VSI Manager Id	VSI Manager Id
VSI Type Version	VSI Type Version
IEEE Settings Select this option to allow additional virtual LAN IDs for the adapter.	IEEE Settings Select this option to allow additional virtual LAN IDs for the adapter.
IEEE 802.1q compatible adapter	IEEE 802.1q compatible adapter
Maximum number of VLANs: 20	Maximum number of VLANs: 20
Additional VLAN IDs: 1,20,48,	Additional VLAN IDs:
Shared Ethernet Settings	Shared Ethernet Settings
Select Ethernet bridging to link (bridge) the virtual Ethernet to a physical	Select Ethernet bridging to link (bridge) the virtual Ethernet to a physical network.
✓ Use this adapter for Ethernet bridging*	✓ Use this adapter for Ethernet bridging*
Priority:*	Priority:*
1 (1 or 2)	2 (1 or 2)

Figure 10-163 Virtual Ethernet Adapter setting

4. Figure 10-164 shows a virtual SCSI configuration. The Live Partition Mobility virtual server is AIX SCS. The AIX SCS partition has vhost4 as the vscsi in the VIOS environment.

	Host:	PF-PowerVM-Node1		Name: SI	101D888_VIOS1	
	Environmen	t: VIOS		State: S	tarted - RMC avai	lable
General Settings	▼ Virtual Storage	Adapters				
Processor						
Memory	Available Virtual	Slots: 92				
Network						
Storage Adapters	Add	Remove Properties				
Storage Devices	Select	Adapter(Id)	\$	Туре	\$	Connecting virtual server
Media Devices		vhost2(2)		SCSI	PF-Node1-Tes	t01(4)
Physical IO		vhost4(3)		SCSI	AIX-SCS(6)	
		vhost0(21)		SCSI	SN101D88B_V	IOC1(2)
		vhost1(22)		SCSI	PF-Node1-NIN	1(3)
		vhost3(24)		SCSI	Any	

Figure 10-164 Virtual SCSI configuration window

	Host:	PF-PowerVM	-Node1	Name: SN101D88	B_VIOS1	1
	Environme	nt: VIOS		State: Started -	RMC available	
General Settings	▼ Virtual Disks					
Processor						
Memory	Assign	Unassign	Refresh			
Network	Select	Na	ime 🗘	Assigne	ed Virtual Server	
Storage Adapters		lp4vd1		PF-Node1-Test01(4)		
Storage Devices		3				
Media Devices						
Media Devices Physical IO	Physical Volum	nes				
55 TA			Refresh			
	Assign	Unassign	Refresh			
		Unassign Name 🔷	Size (GB) 🔇		Storage Pool	
10 M	Assign	Unassign Name 🔷 hdisk5	Size (GB) 🔇 20.0	Any (Virtual Slot 24)	Storage Pool	U78AE.001.
10 M	Assign	Unassign Name 🔷 hdisk5 hdisk6	Size (GB) 🔇 20.0 20.0			U78AE.001.
	Assign	Unassign Name 🔷 hdisk5	Size (GB) 🔇 20.0	Any (Virtual Slot 24)	Storage Pool	U78AE.001.
55 TA	Assign	Unassign Name 🔷 hdisk5 hdisk6	Size (GB) 🔇 20.0 20.0	Any (Virtual Slot 24)		U78AE.001.
	Assign	Unassign Name 🔷 hdisk5 hdisk6 hdisk0	Size (GB) 20.0 20.0 279.4	Any (Virtual Slot 24) AIX-SCS(6)		U78AE.001. U78AE.001. U78AE.001.
55 TA	Assign	Unassign Name ♦ hdisk5 hdisk6 hdisk0 hdisk1	Size (GB) 20.0 20.0 279.4 20.0	Any (Virtual Slot 24) AIX-SCS(6) SN101D88B_VIOC1(2)		U78AE.001. U78AE.001. U78AE.001. U78AE.001.

#### Figure 10-165 shows disk allocation information in the VIOS environment.

Figure 10-165 Disk allocation information

5. Shared disk drives on VIO Servers must have the Reserve policy set to no_reserve by using the **chdev** command, as shown in Figure 10-166.

NAME	PVID	VG	STATUS
hdisk0	0001d88be70e39c1	rootvq	active
hdisk1	0001d88bf1c70f7c	None	
hdisk2	0001d88b00668e98	None	
hdisk3	0001d88b01220754	None	
hdisk4	none	None	
hdisk5	0001d88b0f6e913a	None	
hdisk6	0001d88b0f6e913a	None	
\$ chdev -de	v hdisk6 -attr reserve policy=no	reserve	
hdisk6 chan	ged	-	

Figure 10-166 Set to no_reserve

6. From the Resource Explorer, click Migrate as shown in Figure 10-167.

	ons 🔻	Search the table Sea	arch						
Select	Name		\$	Access	\$	Com	pliance 🗘	Problems	<
	AIX-SCS	Related Resources		🖉 ок		0	к	ОК	
	PF-Node	Topology Perspectives		🖉 ок		0	к	🖉 ок	
	J SN101D	Create Group		ОК		0	к	ОК	
	ETHERN	Configure IMM Network		ОК		0	к	🖉 ок	
	SN101D	Add to	•	ОК		0	к	🔜 ок	
	PF-Node	Automation		ОК		0	к	🖉 ок	
	PF-Node	Availability Inventory		ок			к	ОК	
		Operations		Restart					
		Security System Configuration		Schedule Oper Shutdown	ations				
		System Status and Health		Console Windo	N			Contraction of the second seco	
		Service and Support	•	Mobility		•	Migrate		
		Properties		Suspend Opera	tions		Recover		

Figure 10-167 Launch the relocation of a virtual server

7. Figure 10-168 shows the migration wizard. Go through the wizard, then click **Finish** after checking the summary. You can then observe the relocation of the virtual server.

Migration Information     Profile Name	Migration Information
Remote Management Console Destination Validation Errors/Warnings Mover Service Partitions VLAN Configuration Virtual Storage Adapters Shared Processor Pools Wait Time Summary	The virtual server migration wizard will guide you through the migration System name : PF-PowerVM-Node1 Migrating virtual server: AIX-SCS Migration type: Active Override virtual network errors when possible: Override virtual storage errors when possible:

Figure 10-168 Virtual server relocation wizard

Figure 10-169 shows AIX-SCS running on the p460 (Server-7895-42X).

Server-7	895-42X-SN1050008 (Computer System)		
Acti	ons   Search the table Search		
Select	Name 🗘	Access	٥
	PF-Node3-VIOS3	ОК	
	AIX-SCS	Ок	

Figure 10-169 Checking the status of AIX running on p460

# 11

### Managing the VMware environment with IBM Flex System Manager

This chapter addresses Flex System Manager (FSM) integration with the VMware environment. It describes common tasks that can be run on your VMware infrastructure by using FSM. These tasks include creating, editing, and relocating virtual servers, as well as reconfiguring clusters and working with maintenance mode.

This chapter also addresses how to use FSM to configure simple but powerful automation plans that can be used to proactively protect your virtual servers from hardware problems. A common use case scenario of a hardware problem is provided to illustrate the results from the automaton plan.

This chapter includes the following sections:

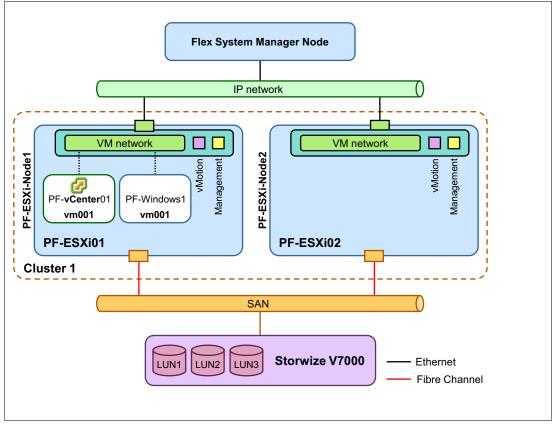
- ▶ 11.1, "Environment overview" on page 496
- ► 11.2, "Deploying a VM" on page 498
- ▶ 11.3, "Relocating a VM" on page 514
- 11.4, "Relocating all VMs from a host and saving a relocation plan" on page 519
- ▶ 11.5, "Modifying the Virtual Server resource allocation" on page 523
- ▶ 11.6, "Enabling VMware Distributed Resource Scheduler (DRS)" on page 529
- ▶ 11.7, "Putting a host in maintenance mode" on page 534
- 11.8, "Topology view" on page 539
- 11.9, "Automating preventive actions in response to hardware alerts" on page 544

#### 11.1 Environment overview

VMware vCenter Server is the central management component for VMware ESX/ESXi hosts. vCenter is used in almost all VMware environments, and it is required for you to use VMware cluster features.

FSM uses its VMControl plug-in to interact with vCenter. FSM does not replace vCenter. In fact, VMControl uses the robust and virtualization specialized vCenter to run tasks that are targeted at the VMware vSphere infrastructure components. FSM provides an essential collection of the most commonly used tasks by a privileged administrator. Using these tasks, an enterprise administrator with full privileges can manage all platforms in your chassis from the single FSM interface. In addition, junior administrators with lower privileges can perform activities directly on vCenter, if needed.

Additionally, integrating FSM with VMware allows you to correlate events and automate tasks over the physical hardware through your hypervisor, clusters, and virtual servers. It gives you a full picture of your infrastructure end to end. By using VMware, you can operate your system from a single pane of glass from both a hardware and software perspective.



The example initial vSphere 5.0 environment used in this chapter is shown in Figure 11-1.

Figure 11-1 VMware environment diagram

Two physical X-Architecture compute nodes are used in a PureFlex Chassis to set up a small vSphere 5 cluster. The cluster has vCenter running in a virtual machine on the first node. Shared SAN storage is provided by Storwize V7000. A simple VM network and a vMotion network are configured for the hosts. FSM eth1 has network connectivity to vCenter.

See Table 11-1 for more information about each component.

Component	Description
Hosts	Two ESXi 5.0 hosts. Compute node PF-ESXi-Node1 runs ESXi with host name PF-ESXi01. Compute node PF-ESXi-Node2 runs ESXi with host name PF-ESXi02.
Virtual machines	Two VMware virtual machines Version 8: vm001 and vm002. Both run Microsoft Windows Server 2008 R2 as guest OS. Both are hosted by PF-ESXi-Node1. vm001 has host name PF-vCenter01 and runs the vCenter Server application. vm002 has host name PF-Windows1.
vCenter Server	One VMware vCenter Server 5.0 is running in a virtual machine vm001, which is hosted by PF-ESX01. It manages both PF-ESXi01 and PF-ESXi02.
Data centers and clusters	One data center, Datacenter1, includes one cluster: Cluster1. Cluster1 has two member hosts: PF-ESXi01 and PF-ESXi02. Cluster1 does not have <i>VMware High Availability</i> (HA) or <i>Distributed Resource Scheduler</i> (DRS) enabled.
Network	<ul> <li>Each host has one vSwitch, which has these components:</li> <li>One virtual machine port group VM Network</li> <li>One vMotion VMkernel port</li> <li>One management port</li> <li>The vMotion network is configured by using a non-routable network.</li> <li>The two virtual machines, two management ports, and FSM eth1 are in the same network. Each vSwitch has one 10 Gbit uplink.</li> </ul>
Storage	Each host is connected through an 8-Gbit interface through the SAN fabric to Storwize V7000. Three 100 GB logical unit numbers (LUNs) are zoned and mapped to both hosts. All three LUNs are formatted with Virtual Machine File System 5 (VMFS5) and are used to store vm001, vm002, and future virtual machine files.

Table 11-1 VMware environment components

**Tip:** Generally, run vCenter Server in a virtual machine. This configuration has the following benefits:

- Easy live migration between physical hosts
- Easy backup and protection by VMware HA
- Easy to resize its allocated resources
- Reduced costs by eliminating the need for a dedicated physical host

For more information about planning for VMware, see 5.2.4, "Planning for VMware virtualization" on page 115.

After you set up the environment, discover the vCenter operating system endpoint by using FSM and request access using the Administrator local user. The Administrator user has full vCenter privileges. All ESXi hosts are discovered automatically after the vCenter compute node is accessed by FSM.

For more information about the discovery of OS, see 6.9.3, "Updating compute node firmware" on page 201.

#### 11.2 Deploying a VM

To deploy a virtual machine (VM), perform these steps:

1. From the VMControl plug-in main window, select the **Virtual Servers/Hosts** tab and click **Virtual Servers and hosts** under Common tasks, as shown in Figure 11-2.

	esource utilizat	al appliances to ion and autom			ge y	vour data cen	ter m	ore	fficiently. Deploy virtual	appliances and
Resources	1	Active Status	0	A		Jobs				
3 Virtual a	ppliances	Problems			9	Active	-	-		
1 Workload		Compliance	$(\mathbf{z})$	-	-	Completed	10	40		
1 Storage	ystem pools system pools system pools					Scheduled	-	1		
Basics	Workloads	Virtual Appli	ance	es	S	ystem Pools	Vir	tual	ervers/Hosts	
15 Virtual	servers						omm		elve	
3 0 Cri									ers and hosts	
∆ o Wa	5								e Summary	
	formational						irtua			
S OK	C .					c	reate	e virt	al farm	
8 Hosts w	ith 15 virtual s	ervers							plans	
2 Virtual t	farms					F	eloca	ate		

Figure 11-2 VMControl main window

2. The Virtual Servers and Hosts window opens as shown in Figure
------------------------------------------------------------------

Perfo	rmance Summary Actions	▼ Se	earch the table	Search	
Select	Name 🗘	State 🗘	OS Name 🗘	OS Type and Version 💲	Access
	PF-ESXi-Node1	Started	PF-ESXi01	Hypervisor 5.0.0	ОК
	Vm001	Started	PF-vCenter01	Windows® Server 2008	💹 ок
	Vm002	Started	PF-Windows1	Windows® Server 2008	📰 ок
	PF-ESXi-Node2	Started	PF-ESXi02	Hypervisor 5.0.0	🗾 ок
	PF-PowerVM-Node1	Started			🖉 ОК
	PF-Node1-NIM	Started			💹 ок
	PF-Node1-VIOC2	Started			ОК
	SN101D888_VIOC1	Stopped			🖉 ок
	SN101D88B_VIOS1	Started			🖉 ОК
	PF-PowerVM-Node2	Standby			📄 ок

Figure 11-3 Virtual Servers and Hosts window

3. Select the first ESXi node and click Actions → System Configuration → Create Virtual Server, as shown in Figure 11-4.

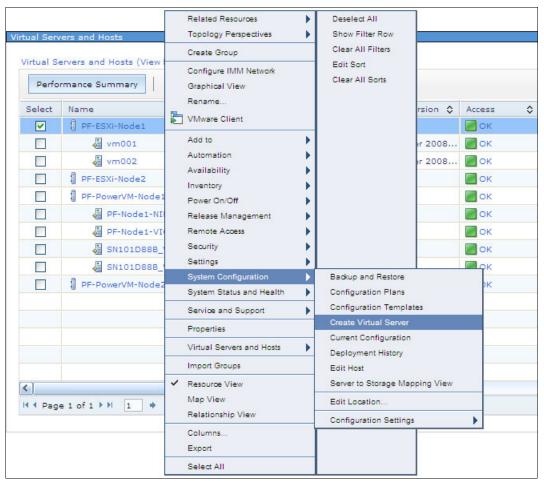


Figure 11-4 Create Virtual Server Actions menu for selected ESXi host

4. Click Next on the Welcome window as shown in Figure 11-5.

ate Virtual Server	
⇔ Welcome	Welcome
Name	Welcome to the Create Virtual Server wizard.
Summary	Use this wizard to create a virtual server on 'PF-ESXi-Node1'. You are guided through the following tasks: * Naming the virtual server
	* Specifying the platform-specific settings           Image: Show this Welcome page next time.
	< Back Next > Finish Ca

Figure 11-5 Create Virtual Server Welcome window

5. Enter a name for the virtual server that you want to create, as shown in Figure 11-6. In this example, it is vm003. Click **Next**.

🗸 Welcome	Name
⇔ Name	Specify a name for the virtual server that you want to create.
Ame Summary	Specify a name for the virtual server that you want to create.  *Type the name of the virtual server that you want to create. vm003
	< Back Next > Finish Cancel

Figure 11-6 Create Virtual Server Name window

 Select the operating system that you are planning to install on this virtual server. In this example, Windows Server 2008 R2 (64 bit) is selected, as shown in Figure 11-7. Click Next.

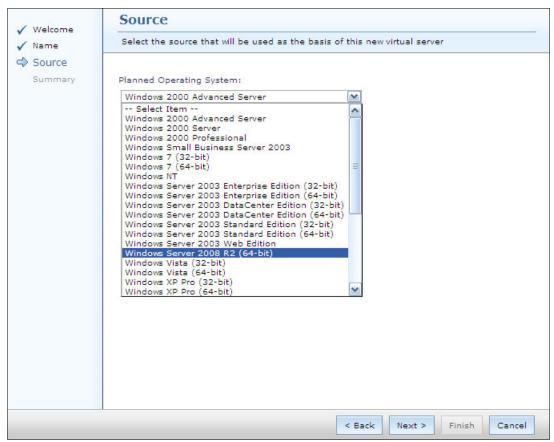


Figure 11-7 Create Virtual Server Source window

7. Specify a number of virtual processors to assign to the virtual server. In this case, enter 2 and click **Next**, as shown in Figure 11-8.

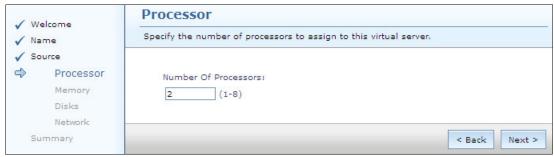


Figure 11-8 Create Virtual Server Processor window

8. Enter the amount of memory to assign to this virtual server in MB (see Figure 11-9). In this case, enter 2048 and click **Next**.

Velcome	Memory		
✓ Name	Specify the amou	ant of memory to assign to this virtual server.	
<ul> <li>✓ Source</li> <li>✓ Processor</li> <li>⇒ Memory</li> <li>Disks</li> </ul>	Memory Size: 2048	Units: Memory Size (MB) 💌 (256-261,120)	
Network Summary			< Back Next >

Figure 11-9 Create Virtual Server Memory window

- Select a datastore from the Volume label list box where you want to store the virtual machine files. All datastores that are visible by the ESXi host that you selected initially are listed. Make sure that you select a shared datastore to take advantage of cluster features.
- 10.Specify a virtual disk size in GB. The wizard creates one thick lazy zeroed dependent virtual disk with the size that you specify. In this example, enter 40 and click Next (Figure 11-10).

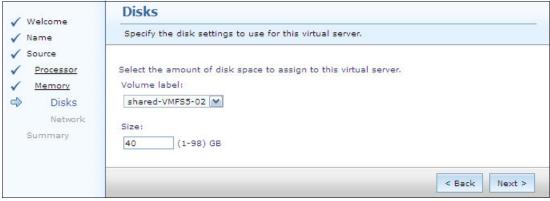


Figure 11-10 Create Virtual Server Disks window

11.Select a virtual machine port group from the Network Label list box. For this example, select VM Network and click Next (Figure 11-11). The wizard configures the virtual machine with one virtual network card connected to the port group that you selected.

🗸 Welcome	Network	24
✓ Name	Select the network label for this virtual server.	
Source     Processor     Memory	Network Label: VM Network	
✓ <u>Disks</u>		< Back Next >
Summary		

Figure 11-11 Create Virtual Server Network window

12. Review the Sum	mary window and	click Finish (Figure	e 11-12).
--------------------	-----------------	----------------------	-----------

Summary	
The You are now ready to create your	virtual server.
urce	
Processor Virtual Server details:	PF-ESXi-Node1
Memory Targets:	
Disks Name:	vm003
letwork Selected planned operating syste	m: Windows Server 2008 R2 (64-bit)
Volume label:	shared-VMFS5-02
Disk size:	40 GB
Number Of Processors:	2
Memory:	2,048 Memory Size (MB)
Network Label:	VM Network
Click Finish to create the virtual so	erver.

Figure 11-12 Create Virtual Server Summary window

13.Click **OK** in the Launch Job window to start the virtual server creation immediately as shown in Figure 11-13.

			Laun	ch Job		
Schedule	Notification	Options				
Job name and	schedule					
*Job Name:						
Create Virtual	Server - June 1	9, 2012 11:59	32 AM EDT			
Choose when t	o run the job.					
Run Now						
Oschedule						
6						
OK Can	el Help					

Figure 11-13 Create Virtual Server Launch Job window

14.Click **Display Properties** in the Create Virtual Server window to see the job status (see Figure 11-14).

The following job 11:59:32 AM EDT Display Propert	has been created and starte	d successfully: Cr		
11:59:32 AM EDT	has been created and starte			
Display Propert	г	a successfully; Cr	eate Virtual S	erver - June 19, 2012
	ties Close Message			

Figure 11-14 Create Virtual Server job message box

15. Ensure that the Create Virtual Server job completed successfully (Figure 11-15), and close the **Active and Scheduled Jobs** tab.

and Scheduled J				
e and Schedule	Jobs (Properties)			
ne: Create Virtu	al Server - June 19, 2012 1	1:59:32 AM EDT	Actions 🔻	
			, ictions	
General	Targets History	Logs		 
Status:	Complete			
Progress:	100%			
Last Run Status	Complete			
Description:	Run once on 6/19/12 at 1	1:59 AM		
Next Run:				
Last Run:	6/19/12 at 12:00 PM			
Task:	Create Virtual Server			
Created By:	USERID			

Figure 11-15 Create Virtual Server job details window

16. Return to the Virtual Servers and Hosts window to see the newly created virtual server vm003. It is in the Stopped state, as shown in Figure 11-16. The virtual machine was created on the ESXi host PF-ESXi-Node1, which is managed by the vCenter server PF-vCenter01. Click the **Information** link on the PF-ESXi-Node1 row to open the list of events for that ESXi server.

Perfo	rmance Summary Actions	▼ Se	arch the table	Search		
Select	Name 🗘	State 🗘	OS Name 🛟	OS Type and Version 💲	Access 🗘	Problems 🔇
	PF-ESXi-Node1	Started	PF-ESXi01	Hypervisor 5.0.0	🗾 ок	i Information
	🗸 vm001	Started	PF-vCenter01	Windows® Server 2008	🗾 ок	i Information
	🖉 vm002	Started	PF-Windows1	Windows® Server 2008	🗾 ок	🗾 ок
	🖉 vm003	Stopped			🗾 ок	🖉 ок
	PF-ESXi-Node2	Started	PF-ESXi02	Hypervisor 5.0.0	🗾 ок	🗾 ок
	PF-PowerVM-Node1	Started			🗾 ок	📄 ок
	PF-Node1-NIM	Started			ОК	ОК
	PF-Node1-VIOC2	Started			🗾 ок	ок
	SN101D88B_VIOC1	Stopped			🗾 ок	ок
	SN101D88B_VIOS1	Started			🗾 ок	ОК
	PF-PowerVM-Node2	Standby			📄 ок	ОК

Figure 11-16 Virtual Servers and Hosts window

17. An informational event about the virtual server creation is displayed as shown in Figure 11-17. Similar informational events are also displayed under PF-vCenter01 because the virtual server was created on a host that is managed by PF-vCenter01.

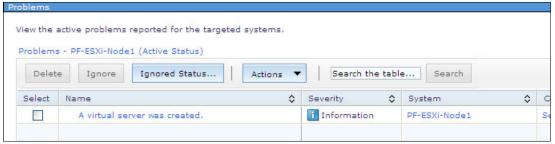


Figure 11-17 Virtual server creation informational event in the Problems window

18. If you need to delete the informational event, select it and click **Actions**  $\rightarrow$  **Delete**, as shown in Figure 11-18.

Delet	a Ignore Ignored Status	Actions 🔻	Search the ta	ble Search	
elect	Name	Delete	ty 🗘	System	
A virte	A virtual server was created.	Properties	prmation	PF-ESXi-Node1	
		Columns Export			
		Select All Deselect All Show Filter Row Clear All Filters			
		Edit Sort Clear All Sorts			

Figure 11-18 Delete menu item for selected event in the Problems window

19. For this example, connect to your vCenter server and observe its state (see Figure 11-19). The vm003 virtual machine was created. The virtual machine creation was started by Administrator, which is the user that FSM used to discover and authenticate to vCenter.

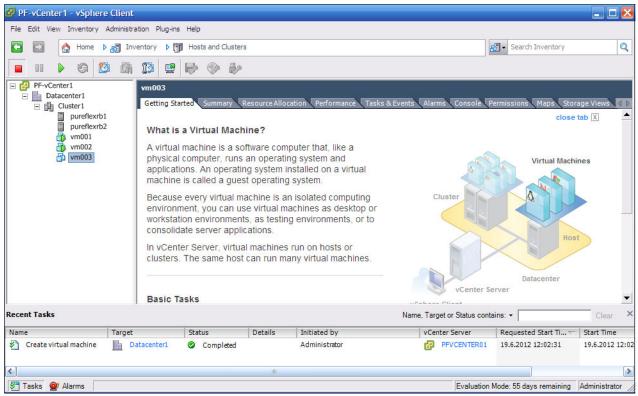


Figure 11-19 vSphere Client window that shows the newly created virtual machine

20. Return to the Virtual Servers and Hosts view to power on the newly created virtual server. Select vm003, and click Actions → Power On/Off → Power On, as shown in Figure 11-20.

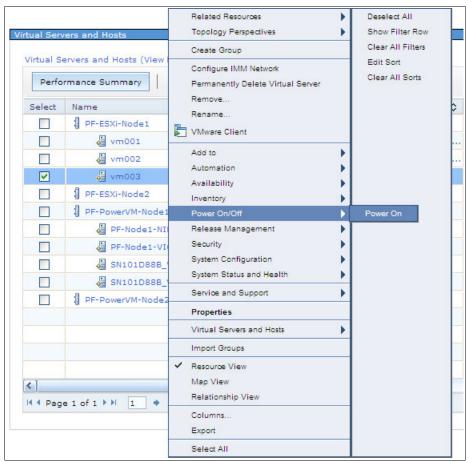


Figure 11-20 Power On menu item for selected virtual server

21.Click **OK** to start the Power On job immediately as shown in Figure 11-21.

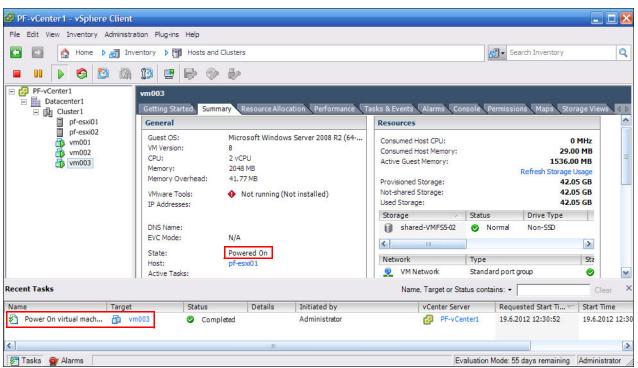
			Launch Jo	ob	
Schedule	Notification	Options			
Job name an	d schedule				
*Job Name:					 
	June 19, 2012 12:	27:56 DM EDT			
	n to run the job.	27.50 PM ED1			
Run Nov					
Oschedul					
⊖ scriedur	=				
ОК Са	ancel Help				

Figure 11-21 Power On Launch Job window

22. The virtual server State changes to Started in the Virtual Servers and Hosts view, as shown in Figure 11-22.

Setuel Ca	Display Properties Close M					
-	mance Summary Actions		arch the table	Search		
Select	Name 🗘	State 🗘	OS Name 🗘	OS Type and Version 💲	Access 🗘	Pr
	PF-ESXi-Node1	Started	PF-ESXi01	Hypervisor 5.0.0	🔜 ок	
	🗸 vm001	Started	PF-vCenter01	Windows® Server 2008	🔤 ок	i
	🖉 vm002	Started	PF-Windows1	Windows® Server 2008	ОК	
	🗸 vm003	Started			🗾 ок	ī
	PF-ESXi-Node2	Started	PF-ESXi02	Hypervisor 5.0.0	📰 ок	
	PF-PowerVM-Node1	Started			🔤 ок	
	PF-Node1-NIM	Started			С ОК	
	PF-Node1-VIOC2	Started			📰 ок	
	SN101D888_VIOC1	Stopped			🔤 ок	
	SN101D888_VIOS1	Started			🔤 ок	
	PF-PowerVM-Node2	Standby			ОК	

Figure 11-22 Virtual Servers and Hosts window that shows the started virtual server



In Figure 11-23, you can see the powered on virtual machine in vCenter.

Figure 11-23 vSphere Client window that shows a powered on virtual machine

FSM creates a virtual server without any guest OS installed. Normally, this task is performed by an enterprise administrator who manages the entire chassis by using FSM and has full privileges to create a virtual server. At this point, a junior administrator with virtual machine user privileges in vCenter can connect to the Virtual Machine console through a vSphere client. The junior administrator can then proceed with the guest OS installation.

#### 11.3 Relocating a VM

To relocate the newly created virtual server to the second host while the virtual server is running, perform these steps:

1. Select the virtual server that you want to relocate to another host (in this example, **vm003**), and click Actions  $\rightarrow$  Availability  $\rightarrow$  Relocate, as shown in Figure 11-24.

irtual Serv	vers and Hosts		Related Resources Topology Perspectives	;	Clear All Filters Edit Sort	
			Create Group		Clear All Sorts	
	ervers and Hosts (View		Configure IMM Network Remove			
Select	Name	-	Rename			ersion
	PF-ESXi-Node1		VMware Client			þ
	🖉 vm001		Add to			er 2008
	🖉 vm002		Automation			er 2008
	🖉 vm003		Availability		Relocate	
	PF-ESXi-Node2		Inventory			6
	PF-PowerVM-Node1	1	Power On/Off Release Management			
	PF-Node1-NI		Security	- 11		
	PF-Node1-VI		System Configuration			
	SN101D88B		System Status and Health			
	SN101D88B		Service and Support			
	PF-PowerVM-Node2		Properties			
			Virtual Servers and Hosts	•		
			Import Groups			
		~	Resource View			
			Map View			
<			Relationship View			
H 4 Pag	eiofi⊧⊨ 1 +		Columns			
			Export			
			Select All			
			Deselect All			
			Show Filter Row			

Figure 11-24 Relocate menu item for selected virtual server

2. Verify the virtual machine name and click **Next**, as shown in Figure 11-25.

Welcome Source	Source
Target Relocation Type Save Plan Summary	Select the virtual server you want to relocate.  Relocate a virtual server Source virtual server:
	vm003

Figure 11-25 Relocate Welcome window

3. Select the target host for the virtual machine. You can also select "Relocate by CPU utilization" if you want the virtual server to be moved to the host with the lowest processor utilization. Select **PF-ESXi-Node2**, as shown in Figure 11-26.

Welcome Source	Target
→ Target	Select the target host to which the virtual server will be relocated.
Relocation Type Save Plan Summary	The following hosts can receive the selected virtual server.
	Target host:
	PF-ESXi-Node1
	PF-ESXi-Node1
	PF-ESXi-Node2

Figure 11-26 Relocate Target window

4. You can save the plan for relocation to run it again or use it later, if needed. Select **Relocate only** and click **Next** as shown in Figure 11-27.

Welcome Source	Save Plan
✓ Target Relocation Type	You can save this plan so that it could be run again or used at a later time. You can also choose whether you want to relocate now.
→ Save Plan Summary	Select whether you want to save this as a relocation plan and if you want to relocate now You will have the option to schedule the relocation when you click Finish.
	O Relocate and save plan
	Relocate only
	< Back Next > Finish Cancel

Figure 11-27 Relocate Save Plan window

5. Verify the relocation Summary and click **Finish** (see Figure 11-28).

Relocate					
Kelocate					
Welcome Source	Summary				
✓ Target	You are now ready to finish the Create Relocation Plan wizard.				
Relocation Type	Click Finish to create a relocation plan with the following settings:				
✓ Save Plan → Summary	Source:vm003 Target:PF-ESXi-Node2 Save plan: No Run now: Yes				
	< Back Next > Finish Cancel				

Figure 11-28 Relocate Summary window

6. The virtual server Status in the Virtual Servers and Hosts window changes to Relocating during the relocation from PF-ESXi01 to PF-ESXi02, as shown in Figure 11-29.

Perfo	rmance Summary Actions	▼ Se	arch the table	Search	
Select	Name 🗘	State 🗘	OS Name 🗘	OS Type and Version 💲	Access 🗘
	PF-ESXi-Node1	Started	PF-ESXi01	Hypervisor 5.0.0	🗾 ок
	🖉 vm001	Started	PF-vCenter01	Windows® Server 2008	🖉 ок
	🖉 vm002	Started	PF-Windows1	Windows® Server 2008	📄 ок
	🚽 vm003	Relocating			🖉 ок
	PF-ESXi-Node2	Started	PF-ESXi02	Hypervisor 5.0.0	🖉 ок
	PF-PowerVM-Node1	Started			🖉 ок
	PF-Node1-NIM	Started			🖉 ок
	PF-Node1-VIOC2	Started			🖉 ок
	SN101D888_VIOC1	Stopped			🖉 ок
	SN101D88B_VIOS1	Started			🖉 ок
	PF-PowerVM-Node2	Standby			ок

Figure 11-29 Virtual Servers and Hosts window that shows a virtual server in the Relocating state

FSM triggers a command for vCenter to run a vMotion migration of vm003 from FP-ESXi01 to FP-ESXi02. The migration completes successfully and vm003 is now running on FP-ESXi02, as shown in Figure 11-30.

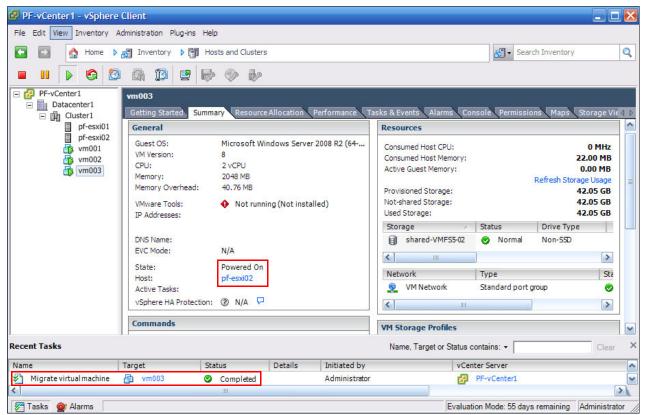


Figure 11-30 vSphere Client window that shows the migrated virtual machine

7. Return to the Virtual Servers and Hosts window in FSM. The virtual machine vm003 is now listed under FP-ESXi02 and it is in the Started state, as shown in Figure 11-31.

Perfo	rmance Summary Actions	▼ Se	arch the table	Search		
Select	Name 🗘	State 🗘	OS Name 🗘	OS Type and Version 💠	Access 🗘	Problems 🔇
	PF-ESXi-Node1	Started	PF-ESXi01	Hypervisor 5.0.0	📃 ок	i Information
	🖉 vm001	Started	PF-vCenter01	Windows® Server 2008	📄 ок	i Information
	🖉 vm002	Started	PF-Windows1	Windows® Server 2008	🖉 ок	📰 ок
	PF-ESXi-Node2	Started	PF-ESXi02	Hypervisor 5.0.0	📄 ок	i Information
	🗸 vm003	Started			📄 ок	i Information
	PF-PowerVM-Node1	Started			🖉 ок	🗾 ок
	PF-Node1-NIM	Stopped			🖉 ок	i Information
	PF-Node1-VIOC2	Started			🖉 ок	🗾 ок
	SN101D888_VIOC1	Stopped			📄 ок	💹 ок
	SN101D888_VIOS1	Started			📕 ок	🗾 ок
	PF-PowerVM-Node2	Standby			ОК	ок
1						

Figure 11-31 Virtual Servers and Hosts window that shows the migrated virtual server

## 11.4 Relocating all VMs from a host and saving a relocation plan

In certain cases, you might need to relocate all virtual servers away from a specific host to perform service tasks. For this example, move vm003 back to PF-ESXi-Node1. To relocate all VMs from a host and save a relocation plan, which can be run later or used in an automation plan, perform these steps:

 Right-click the host (PF-ESXi-Node1) and select Availability → Relocate Virtual Servers, as shown in Figure 11-32.

	rmance Summary	Actions 🔻 Search	the table	Search
Select	Name	🗘 State 🗘 OS	S Name 💠	OS Type and Version 🔇
	PF-ESXi-Node1	Related Resources	• Ki01	Hypervisor 5.0.0
	🖉 vm001	Topology Perspectives	▶ enter01	Windows® Server 2008
	🖉 vm002	Create Group	ndows1	Windows® Server 2008
	🗸 vm003	Configure IMM Network		
	PF-ESXi-Node2	Graphical View	Ki02	Hypervisor 5.0.0
	PF-PowerVM-N	Rename		
	PF-Node	VMware Client	de1-NIM	AIX 6.1
	J SN101D8	Add to	•	
	SN101D8	Automation	•	
	PF-PowerVM-N	Availability	Enter M	laintenance Mode
		Inventory	Relocat	e Virtual Servers
		Power On/Off	Remove	e from Virtual Farm
		Release Management		
		Remote Access		
		Security Settings		
		System Configuration		
		System Status and Health	Filtered: :	
r Page	e 1 of 1 ▶ ₩ 1	Service and Support	Filtered: :	10
		Properties		
	2	( topentes		

Figure 11-32 Relocate Virtual Servers menu item for the selected host

2. Verify the source host and click **Next**, as shown in Figure 11-33. If necessary, you can select "Put host in maintenance mode after all virtual servers are relocated".

Welcome	Source
Target Relocation Type Save Plan Summary	Select the host containing all the virtual servers you want to relocate.  Relocate all virtual servers Source host:
	PF-ESXi-Node1
	Put host in maintenance mode after all virtual servers are relocated

Figure 11-33 Relocate Source window

3. You can select a specific target host or choose "Relocate by CPU utilization". Select **PF-ESXi-Node2** and click **Next**, as shown in Figure 11-34.

Welcome	Target					
→ Target	Select the target host to which the virtual server will be relocated.					
Relocation Type Save Plan Summary	The following hosts can receive the selected virtual server. Target host:					
Summary	PF-ESXi-Node2					
	< Back Next > Finish Cancel					

Figure 11-34 Relocate Target window

4. Select **Relocate and save plan** and provide a descriptive relocation plan name, as shown in Figure 11-35.

Relocate	
Welcome Source	Save Plan
✓ Target Relocation Type	You can save this plan so that it could be run again or used at a later time. You can also choose whether you want to relocate now.
→ Save Plan Summary	Select whether you want to save this as a relocation plan and if you want to relocate now. will have the option to schedule the relocation when you click Finish.
	Relocate and save plan
	O Relocate only
	** Relocation plan name:
	Relocate all VMs from PF-ESXi01 to PF-ESXi02
	Description:
	< Back Next > Finish Cancel

Figure 11-35 Relocate Save Plan window

5. Review the Summary window and click **Finish**, see Figure 11-36.

Welcome	Summary
<ul> <li>Source</li> <li>Target</li> <li>Relocation Type</li> </ul>	You are now ready to finish the Create Relocation Plan wizard. Click Finish to create a relocation plan with the following settings:
✓ Save Plan → Summary	Relocation plan name:Relocate all VMs from PF-ESXi01 to PF-ESXi02 Source:PF-ESXi-Node1 Target:PF-ESXi-Node2 Save plan: Yes Run now: Yes Put host in maintenance mode after all virtual servers are relocated: No

Figure 11-36 Relocate Summary window

 Click OK to start the relocation job immediately and observe the Virtual Servers and Hosts window to ensure that all virtual machines from PF-ESXi01 relocate to PF-ESXi02, as shown in Figure 11-37.

Perfo	rmance Summary Actions	▼ Se	arch the table	Search		
Select	Name 🗘	State 🗘	OS Name 🛟	OS Type and Version 💲	Access 🛟	Problems
	PF-ESXi-Node1	Started	PF-ESXi01	Hypervisor 5.0.0	📄 ок	i Informatio
	PF-ESXI-Node2	Started	PF-ESXi02	Hypervisor 5.0.0	🖉 ок	i Information
	🖉 vm001	Started	PF-vCenter01	Windows® Server 2008	📄 ок	🚺 Information
	🗸 vm002	Started	PF-Windows1	Windows® Server 2008	🖉 ок	🚺 Information
	🖉 vm003	Started			📄 ок	i Information
	PF-PowerVM-Node1	Started			🖉 ок	💹 ок
	PF-Node1-NIM	Started	PF-Node1-NIM	AIX 6.1	ок	🗾 ок
	SN101D888_VIOC1	Started			🖉 ок	🖉 ок
	SN101D88B_VIOS1	Started			🖉 ок	🖉 ок
	PF-PowerVM-Node2	Standby			📄 ок	Ск
1						

Figure 11-37 Virtual Servers and Hosts window

7. In the IBM Flex System Manager web interface navigation area, expand **Availability** and click **Relocation Plans for Farms**, as shown in Figure 11-38. In this window, you can view, run, and manage all relocation plans for farms.

elocation	. ×			•	
elocation	Plans for Farms				
Relocatio	on Plans (View Members)				
Creat	e Delete Edit Actions V Sea	arch the table Sear	ch		
Select	Name 🗢	Plan type 🗘	Source 🗘	Destination	\$
	Relocate all VMs from PF-ESXi01 to PF-ESXi02	All	PF-ESXi-Node1	PF-ESXi-Node2	

Figure 11-38 Relocation Plans for Farms window

### 11.5 Modifying the Virtual Server resource allocation

Changing the resource allocation for a virtual server is another task that is often the responsibility of a full administrator. To modify the memory allocation of a virtual server, perform these steps:

 Right-click the virtual server vm002 and select Power On/Off → Shut down and power off, as shown in Figure 11-39. This process starts a graceful OS shutdown before powering off the virtual server.

**Important:** Ensure that you always have an up-to-date version of VMware tools installed in the guest OS of your VMware virtual machines. Graceful OS shutdown is just one of the many features that make VMware tools extremely useful.

Perfo	rmance Summary	Actions	▼ Se	earch	the table	Search
Select	Name	\$	State 🗘	OS	Name 🗘	OS Type and Version 🔇
	PF-ESXi-Nod	e1	Started	PF-	ESXi01	Hypervisor 5.0.0
	🖉 vm001		Started	PF-	vCenter01	Windows® Server 2008.
<b>V</b>	🦨 vm002	Related Reso	ources	•	Vindows1	Windows® Server 2008.
	PF-ESXi-Nod	Topology Per	rspectives		SXi02	Hypervisor 5.0.0
	al vm003	Create Group	)			
	PF-PowerVM					
	F-Noc				lode1-NIM	AIX 6.1
	J SN101	VMware Clier	nt			
	J SN101	Add to		•		
	PF-PowerVM-	Automation		•		
		Availability		•		
		Inventory		•		
		Power On/Of			Power Off	
		Release Man Remote Acce		1	Restart No	n and power off
		Security		1	Suspend	n and power on
1		System Confi	guration	1		
A Page	elof1 ⊧⊧ 1	System Statu			Filtered:	10
		Service and S	Support	•		
		Properties				

Figure 11-39 Shut down and power off menu item in the Virtual Servers and Hosts window

2. Click **OK** in the Launch Job window to run the job immediately as shown in Figure 11-40.

			Launch .	Job		
1	1					
Schedule	Notification	Options				
Job name and	schedule					
	Senessie					
*Job Name:	r d				1	
Shut down an						
	to run the job.					
Run Now						
O Schedule						
OK Car	icel Help					

Figure 11-40 Shut down and power off Launch Job window

3. Check the state in vCenter, as shown in Figure 11-41. The "Initiate guest OS shutdown" task that was triggered by Administrator completed successfully, and the virtual machine vm002 is in the Powered Off state.

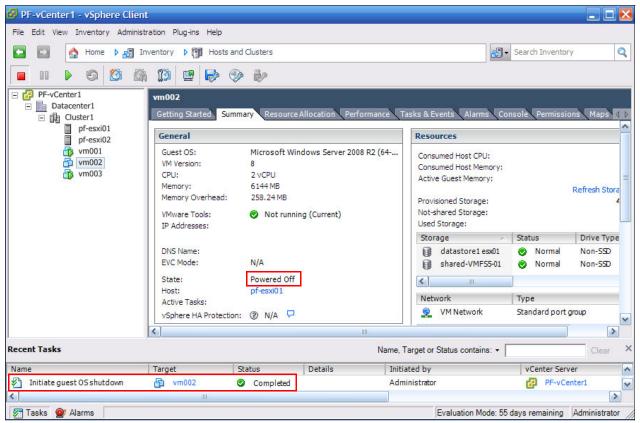


Figure 11-41 vSphere Client window that shows the Powered Off virtual machine

4. Return to the Virtual Servers and Hosts window, right-click the powered-off **vm002**, and select **System Configuration** → **Edit Virtual Server**, as shown in Figure 11-42.

Perfo	rmance Summary	Actions	▼   Se	earch the tal	ole	Search		
Select	Name	\$	State 🗘	OS Name	٥	OS Type and Version 💲	Access	\$
	PF-ESXi-Node	≥1	Started	PF-ESXi01		Hypervisor 5.0.0	📄 ок	
	🖉 vm001		Started	PF-vCente	r01	Windows® Server 2008	Ск	
	🕹 vm002	Related Reso	ources	•	51	Windows® Server 2008	ОК	
	PF-ESXi-Nod	Topology Per	rspectives	•		Hypervisor 5.0.0	🖉 ок	
	June 1003	Create Group	Create Group				📄 ок	
	PF-PowerVM	Configure IM	M Network				📄 ок	
	PF-Noc	Permanently Delete Virtual Server Rename			NIM	AIX 6.1	ОК	
	J SN101						📄 ок	
	J SN101	VMware Clie	nt				📄 ок	
	PF-PowerVM	Add to		•			Ск	
		Automation		•				
		Availability		•				
		Inventory		•				
		Power On/Of	f	•				
		Release Man	agement	•				
		Remote Acce	155	•				
<		Security		•				
I I Pag	e 1 of 1 ▶ 🕨 🚺	System Confi	guration	Þ		Edit Virtual Server		
		System Statu	s and Health	•	s	Server to Storage Mapping View		
		Service and	Support	•	E	Edit Location		
		Properties					100	

Figure 11-42 Edit Virtual Server menu item in the Virtual Servers and Hosts window

5. The Edit Virtual Server window opens. Click the **Memory** tab, as shown in Figure 11-43.

al server: vr	m002			
General	Processor	Memory	Disks	
Restrict	this virtual serve	er from moving fr	rom its current	host

Figure 11-43 Edit Virtual Server window

6. Observe the current memory that is assigned to the virtual server, as shown in Figure 11-44.

	Processor	Memory	Disks	_
Specify the n	nemory sizes in •	4 MB increments		
Assigned:	Units:			
6144	Mem	ory Size (MB) 💌	(256-261,120)	)
				1

Figure 11-44 Memory tab of the Edit Virtual Server window

7. Change the assigned memory value from 6144 to 8192 to increase the virtual server memory to 8 GB (see Figure 11-45). Click **OK** to apply the new configuration.

General	Processor	Memory	Disks	
Specify the r	memory sizes in	4 MB increment	5,	
Assigned:	Units:			
8192	Mem	ory Size (MB) 💽	(256-261,12	.0)
ок Са	incel			

Figure 11-45 Updated memory value in the Edit Virtual Server window

 Right-click vm002 and power it on by selecting Power On/Off → Power On. See Figure 11-46.

Perfo	rmance Summary	Actions	▼ Se	arch the ta	ble	Search	
Select	Name	\$	State 🗘	OS Name	•	OS Type and Version 💠	
	PF-ESXi-Node	e1 Started PF-ES			1	Hypervisor 5.0.0	
	🖉 vm001		Started	PF-vCent	er01	Windows® Server 2008	
	J vm002	Related Reso	urces	51	Windows® Server 2008.		
	PF-ESXi-Nod	Topology Per	spectives		Hypervisor 5.0.0		
	🖉 vm003	Create Group					
	PF-PowerVM	Configure IM	M Network				
	PF-Nod	Permanently	Delete Virtual	NIM	AIX 6.1		
	🍯 SN101	Rename					
	SN101	VMware Clier	VMware Client				
	PF-PowerVM	Add to		)			
		Automation		)			
			Availability				
		Inventory Power On/Ofi				Power On	
		Security				ower on	
		System Confi	guration	, i			
()		System Statu	s and Health	)			
🖣 🖣 Pag	e 1 of 1 ▶ ▶ 1	Service and S	Support	)	ed:	10	
		Properties					

Figure 11-46 Power On menu item in the Virtual Servers and Hosts window

9. The virtual server is now running with 8 GB of allocated memory. Observe the tasks that FSM sent to vCenter on Figure 11-47.

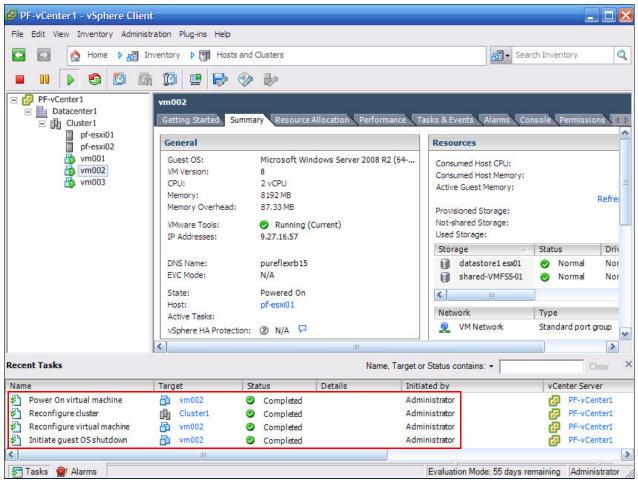


Figure 11-47 vSphere Client window that shows tasks for edited virtual machine

### 11.6 Enabling VMware Distributed Resource Scheduler (DRS)

*VMware Distributed Resource Scheduler* (DRS) is a cluster feature that can perform dynamic load balancing of compute resources (processor and memory) across physical hosts that are members of the cluster. When configured in *Fully Automated mode*, DRS uses VMware vMotion to run live migration of virtual machines (VMs) whenever needed. DRS continuously monitors the processor and memory resource usage for all cluster physical hosts and their VMs. DRS evaluates these metrics and ensures an optimal VM placement to achieve a relatively even load on all cluster physical hosts.

**Explanation:** For most vSphere environments, configure DRS in Fully Automated mode. To use DRS for load balancing, you must have a vMotion network that is configured in your cluster, and your virtual machines must meet vMotion requirements. Ensure that you have the correct vSphere license to use DRS. For more information about DRS, see the *vSphere Resource Management Guide* at this website:

http://pubs.vmware.com/vsphere-50/topic/com.vmware.ICbase/PDF/vsphere-esxi-vcen
ter-server-501-resource-management-guide.pdf

To enable DRS in Fully Automated mode for Cluster1 in the example environment, perform these steps:

1. In the IBM Flex System Manager web interface navigation area, expand **Inventory** and **Views** and click **Platform Managers and Members**, as shown in Figure 11-48. Observe the vCenter server and all discovered data center and cluster objects listed under it.

tform M	anagers and Members						?
latform	Managers and Membe	rs (View Members)					
Acti	ons 🔻 Search t	Search	1				
Select	Name	OS Name 🗘	Access \$	Problems \$	Compliance 🗘	Type 🗘	;
	🗸 vm001	PF-vCenter01	ОК	Information	💹 ок	Virtual Server	Virtu.
	Cluster1		Not applica	Information	🗾 ок	Farm	Farm
	Datacenter1		Not applica	i Information	ОК	Farm	Farm

Figure 11-48 Platform Managers and Members window

**Clarification:** A *Platform Manager* manages one or more host systems and their associated virtual servers and operating systems. VMware vCenter Server is a Platform Manager.

2. Right-click **Cluster1** and select **Availability**  $\rightarrow$  **Edit Virtual Farm**, as shown in Figure 11-49.

Select	Name	\$	OS Name 🗘	Acc	ess 🗘	Problems 🔇
	🖉 vm001		PF-vCenter01		ок	i Information
	Cluster1	Related	d Resources	•	Not applica	Information
	Datacen	Торою	gy Perspectives	•	Not applica	i Information
		Create Group Permanently Delete Remove				
			Add to			
		Availat	pility	►	Add Host	
		System	Configuration	•	Edit Virtual	Farm
		System	Status and Health	•		
		Propert	ties			

Figure 11-49 Edit Virtual Farm menu item in the Platform Managers and Members window

3. Click Next in the Welcome window, as shown in Figure 11-50.

	Welcome
Capabilities	Welcome to the Edit Virtual Farm wizard.
Capabilities Details Initial Host Additional Hosts Add VMware Host Storage Policies Summary	This wizard helps you edit a virtual farm. A virtual farm lets you group hosts and enable specialized capabilities to the virtual servers running on the hosts. For example, you can edit the high availability, workload management, live and static relocation capabilities.
	The virtual farm will use those capabilities to enhance availability and reduce downtime on the virtual servers that run your work and applications.
	You are guided through the following tasks: • Confirming the name of the virtual farm • Changing the capabilities applicable to the virtual farm • Changing the hosts that belong to the virtual farm • Customizing any policy settings for the selected capabilities

Figure 11-50 Edit Virtual Farm Welcome window

4. Verify the cluster name and click **Next**, as shown in Figure 11-51.

✓ Welcome → Name	
Capabilities	Name
Capabilities Details Initial Host Additional Hosts Add VMware Host	The name of the virtual farm you want to edit. *Name: Cluster1
Storage Policies Summary	<pre>&lt; Back Next &gt; Finish Cancel</pre>

Figure 11-51 Edit Virtual Farm Name window

 Select VMware Distributed Resource Scheduler (DRS) and leave VMotion rate as Normal, as shown in Figure 11-52. Click Next.

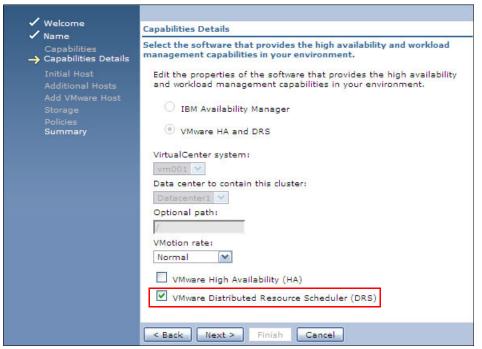


Figure 11-52 Edit Virtual Farm Capabilities Details window

6. Review the Summary window and click **Finish**, as shown in Figure 11-53.

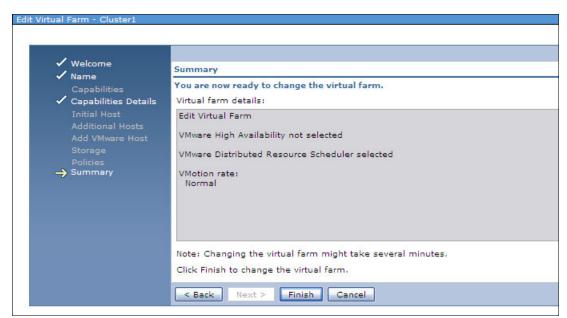


Figure 11-53 Edit Virtual Farm Summary window

FSM sends a command to vCenter to enable DRS on Cluster1 with a normal migration threshold and in Fully Automated mode. The status of vCenter is shown in Figure 11-54.

	Plug-ins Help			
Home 🕨 🚮 Inventory	Hosts and Clu	usters		Search Inventory
i & & #				
PF-vCenter1  Datacenter1  Cluster1  Custer1  Cu	ted Summary Virt	ual Machines Hosts	DRS Resource Allocation F	Performance Tasks & Events Alarms Permissions
pf-esxi01 pf-esxi02 General			vSphere DR	S
vm001 vm002 vm003 vm003 vm003 vm003 vm003 vm003 vm001 vSphere E vSphere E vS	A: /C Mode: pory: age: Hosts:	On Off Disabled 46 GHz 39.96 GB 848.25 GB 2 22	Power Mana DRS Recomm DRS Faults: Migration Th Target host Current host View Resour	ō
	Datastore Clusters:	0	Storage	
Total Data	stores:	5	Storage res	
			III	
ent Tasks			Name, Tar	get or Status contains: • Clear
me Target	Status	Details	Initiated by	vCenter Server
Reconfigure cluster 🙀 Cluster1	Complet	ed	Administrator	PF-vCenter1

Figure 11-54 vSphere Client window that shows a DRS-enabled cluster

### 11.7 Putting a host in maintenance mode

You can place a host in maintenance mode to perform service tasks on it. A vSphere host in maintenance mode cannot have any virtual machines in the powered-on state. If a host entering maintenance mode has powered on virtual machines and is a member of a fully automated DRS cluster, DRS automatically migrates all running virtual machines to other hosts in the cluster. DRS then places the host in maintenance mode.

In the previous section, you enabled DRS in Fully Automated mode for Cluster1. Now, place PF-ESXi-Node2 in maintenance mode. PF-ESXi-Node2 is running one virtual server: vm003. To place a VMware host in maintenance mode, perform these steps:

 Open the Virtual Servers and Hosts window and select PF-ESXi-Node2. Select Actions → Availability → Enter Maintenance Mode, as shown in Figure 11-55.

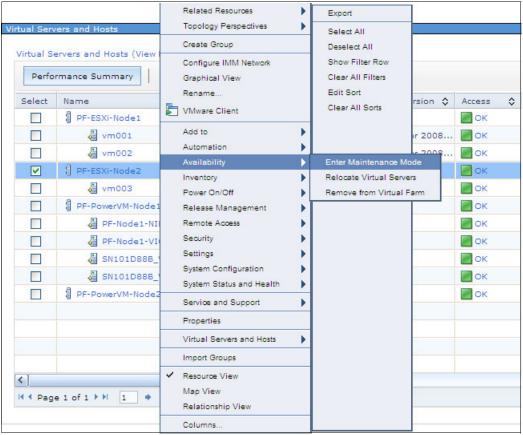


Figure 11-55 Enter Maintenance Mode menu item in Virtual Servers and Hosts window

FSM places the ESXi host in maintenance mode by sending a command to vCenter. This mode is also evident in vCenter (Figure 11-56). The virtual machine vm003 originally was on PF-ESXi02, but DRS migrated it to PF-ESXi01 before placing PF-ESXi02 in maintenance mode.

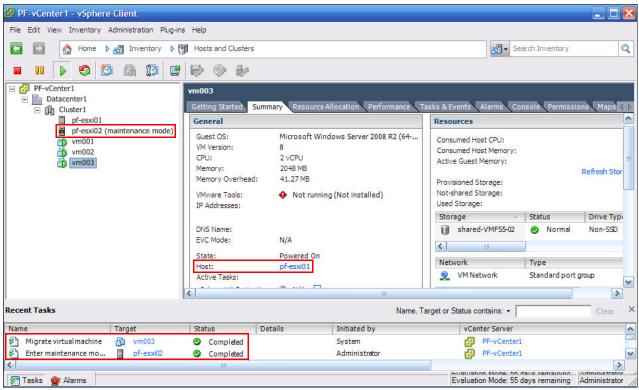


Figure 11-56 vSphere Client window that shows the host in maintenance mode

2. Return to the Virtual Servers and Hosts window and observe that all virtual servers are now running on PF-ESXi01 (Figure 11-57).

Perfo	mance Summary Actions	▼ Se	arch the table	Search		
Select	Name 🗘	State 🗘	OS Name 🛟	OS Type and Version 💲	Access 🛟	Problems
	PF-ESXi-Node1	Started	PF-ESXi01	Hypervisor 5.0.0	🖉 ок	i Informa
	🖉 vm001	Started	PF-vCenter01	Windows® Server 2008	🖉 ок	i Informa
	🖉 vm002	Started	PF-Windows1	Windows® Server 2008	ОК	ОК
	🖉 vm003	Started			🖉 ок	🖉 ок
	PF-ESXi-Node2	Started	PF-ESXi02	Hypervisor 5.0.0	🖉 ок	📄 ок
	PF-PowerVM-Node1	Started			🛃 Partial a	🖉 ок
	PF-Node1-NIM	Started			ОК	ОК
	SN101D88B_VIOC1	Started			🖉 ок	🖉 ок
	SN101D88B_VIOS1	Started			🖉 ок	📄 ок
	PF-PowerVM-Node2	Standby			Partial a	🗾 ок

Figure 11-57 Virtual Servers and Hosts window

3. Select **PF-ESXi-Node2** and click **Actions** → **Availability** → **Exit Maintenance Mode**, as shown in Figure 11-58.

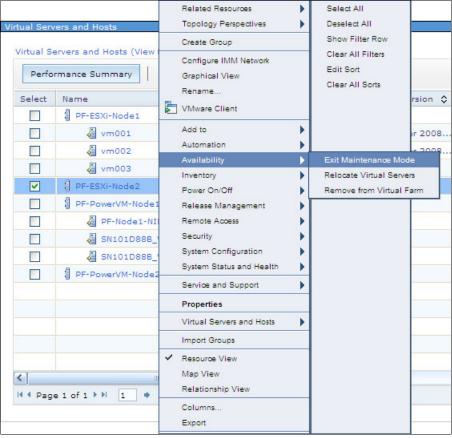


Figure 11-58 Exit Maintenance Mode menu item in Virtual Servers and Hosts window

4. Click **OK** to start the job immediately, as shown in Figure 11-59.

Launch Job
Schedule Notification Options
Job name and schedule
*Job Name:
Exit Maintenance Mode - June 19, 2012 2:28:43 PM EDT
Choose when to run the job.
Oschedule
OK Cancel Help

Figure 11-59 Exit Maintenance Mode Launch Job window

As shown in Figure 11-60, the Exit maintenance mode task that was triggered by FSM completed successfully.

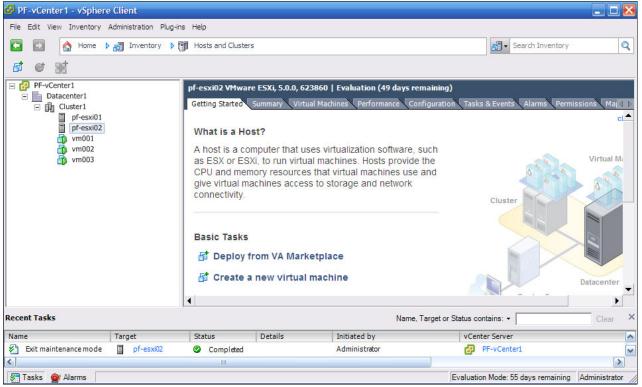


Figure 11-60 vSphere Client window that shows the Exit maintenance mode task

### 11.8 Topology view

Using the topology view in FSM, you can to view and manage your virtual infrastructure. You can use the Virtualization Basic Topology perspective to view and manage your vCenter, data centers, clusters, hosts, virtual servers, operating systems, and physical compute nodes. The Virtualization Basic Topology interactive map shows you the logical relationships between the components of your virtual infrastructure. This view can also be useful to troubleshoot a problem by determining problematic components and their logical connections to the rest of the infrastructure.

To enable the topology view, perform these steps:

 In the IBM Flex System Manager web interface navigation area, expand Inventory and Views and click Platform Managers and Members, as shown in Figure 11-61. For this example, select the vCenter server PF-vCenter01 that is installed in virtual machine vm001.

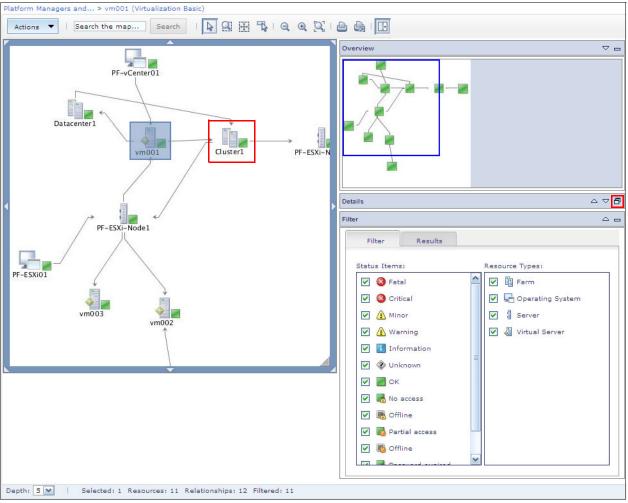
tform Ma	×					Select Action	
Platform	anagers and Members Managers and Members (V ions						? -
Select		OS Name 🗘	Access 🗘	Problems 🗘	Compliance 🗘	Type 🗘	
							Descrip
<b>V</b>	🚽 vm001	PF-vCenter01	🖉 ок	🖉 ок	Ок	Virtual Server	Descrip Virtual
<b>~</b>	vm001	PF-vCenter01	ок		📄 ок		Statute and state

Figure 11-61 Platform Managers and Members window

2. Click Actions  $\rightarrow$  Topology Perspectives  $\rightarrow$  Virtualization Basic, as shown in Figure 11-62.

	Related Resources	Þ	Edit Sort			
Platfo	Topology Perspectives		Basic			
Pla	Create Group Configure IMM Network Rename VMware Client		Network Storage Storage Area Network Updates Virtualization Basic	•	Problems	Compliance 🗘
	Add to Automation	\$	Virtualization Common Virtualization Detail	n	📄 ок 📄 ок	<mark>е</mark> ок
	Availability Inventory Release Management Remote Access Security System Configuration System Status and Health Service and Support Properties			applica	ОК	ОК
	Platform Managers and Members Import Groups	•	_			
	<ul> <li>Resource View</li> <li>Relationship View</li> <li>Columns</li> </ul>					
<	Export					
14	Select All Deselect All Show Filter Row Clear All Filters		r	ed: 3		

Figure 11-62 Virtualization Basic menu item in Platform Managers and Members window



3. Click the **Cluster1** icon and click the **Maximize** icon in the Details window, as shown in Figure 11-63.

Figure 11-63 Virtualization Basic Topology view

Cluster1 PF-ESXi-N				
	Details			
	Proper	ties		
				~
	Name		Value	
	Name	0	Cluster1	=
	Status	5	Ск	
	Туре		Farm	
	Descr	iption	Farm	
		ble (High Ava	True	
		1.5.1	1 40 0040 4 44 07 014	~
	<			
	Edit			
	4	1		
	Filter			
	Filte	r Result	ts	

The details for the selected object are displayed, as shown in Figure 11-64.

Figure 11-64 Details window in the Virtualization Basic Topology view

4. Click the **Hide Palette View** icon and **Zoom To Fit** icon to get a full diagram of the base components of your virtual infrastructure. Right-click any component to get the Actions menu that is relevant to the selected component, as shown in Figure 11-65.

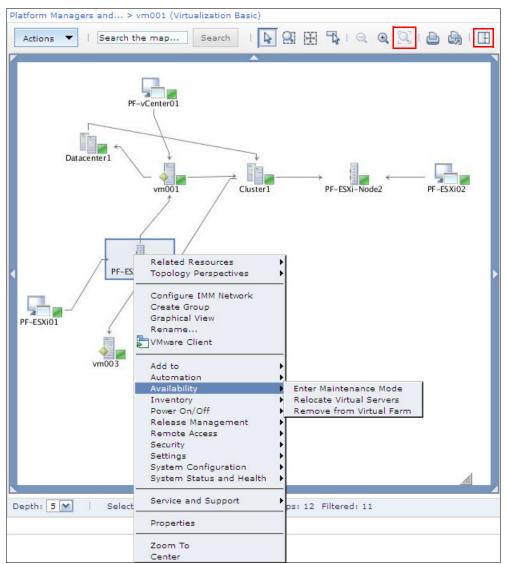


Figure 11-65 Menu items in the Virtualization Basic Topology view

**Tip:** Click **Actions**  $\rightarrow$  **Layout**  $\rightarrow$  **Tree** to change the default Radial layout if it does not suit your purposes.

## **11.9** Automating preventive actions in response to hardware alerts

This section addresses how to automate tasks that can prevent service outages. This example involves configuring automation that is based on hardware alerts. To automate preventive actions, perform these steps:

1. In the IBM Flex System Manager web interface navigation area, expand **Automation** and click **Event Automation Plans**, as shown in Figure 11-66. Click **Create** for a new automation plan.

Event Auton	n X			Sel	ect Action
Event Auto	mation Plans				
types of a	events on which to take action, an	asks based on received events. An eve ad one or more event actions that are p			nich specifie:
Creat	tomation Plans Create Like Edit	Delete Actions	earch the tab	le Search	
Select	Name 💠	Targets 🗘	Status 🗘	Time range	Description
	High Win CPU	PF-Windows1	Active	Monday, 6:00-24:00, Tuesda	Event resp
	Hot air	All Systems	Active	All the time (24×7)	
	Log All Events	All Systems	Active	All the time (24×7)	

Figure 11-66 Event Automation Plans window

2. Click Next in the Welcome window, as shown in Figure 11-67.

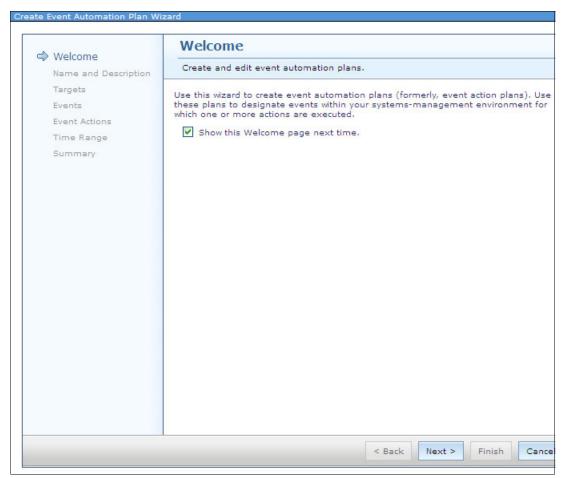


Figure 11-67 Create Event Automation Plan Wizard Welcome window

3. Enter a name and description for the automation plan, as shown in Figure 11-68.

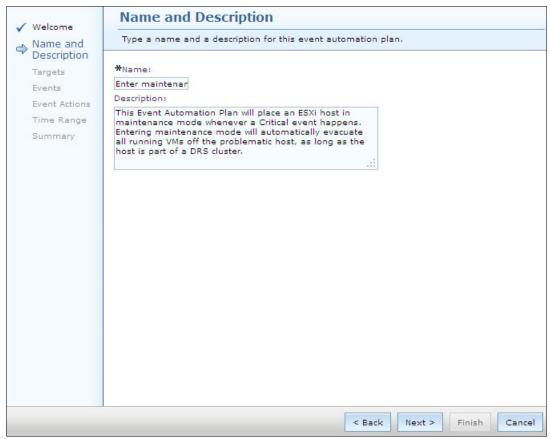


Figure 11-68 Create Event Automation Plan Wizard Name and Description window

 In the Targets window, select the systems to be affected by the event automation plan. For this example, select the two ESXi servers, PF-ESXi-Node1 and PF-ESXi-Node2, as shown in Figure 11-69, and click Add. Click Next to proceed.

🗸 Welcome	Targets	
✓ Name and Description	Specify target systems that will be affected by this event auto systems. Then, click Add to move your selections to the Sele- the group to view the group members. Make your selections	cted pane. If you want to select specific systems from
Targets     Events     Event Actions     Time Range     Summary	Select a valid target then add it to the selected list. Show: Groups Available: Groups > Virtualization Groups > Hosts (View Members) Actions Search the table Search Select Name Access Select Name Access PF-ESXi-Node1 OK PF-ESXi-Node1 OK PF-PowerVM-Node1 OK PF-PowerVM-Node1 OK	Selected: Add > < Remove

Figure 11-69 Create Event Automation Plan Wizard Targets window

5. Select **Advanced Event Filters** from the Events menu. Select **Critical Events** from the Event Filters list to process all events that have a Critical severity (Figure 11-70).

**Tip:** If needed, you can also select the Hardware Predictive Failure Alerts event filter. For this exercise, filter all Critical events.



Figure 11-70 Create Event Automation Plan Wizard Events window

6. Click Create for a new event action, as shown in Figure 11-71.

Welcome Name and Description	Specify	one or more actions that will occu	ur when this event automation plan is triggered.	
Tanada				
Targets Events Event	Event Act		. Delete Actions  Search the table	. Search
Actions	Select	Name 💠	Type 🗘	History
Time Range		Add to the event log	Add to the event log	Not saved
Summary		Electronic Service Notification	Send an e-mail (Internet SMTP)	Saved

Figure 11-71 Create Event Automation Plan Wizard Event Actions window

7. Move to page 2 of the Actions list and select **Start a task on a system that generated the event**, as shown in Figure 11-72. Click **OK**.

	Create Action	
Select th	e type of action that you want to create.	
Acti	ons  Search the table Search	
Select	Name 🗘	Туре
0	Modify an event and send it	Advanced
0	Send a Tivoli Enterprise Console event	Advanced
۲	Start a task on a system that generated the event	Advanced
0	Send an SNMP trap reliably to a NetView host	Advanced
		_
<		
If I Pag	e 2 of 2 M 2 M Selected: 1 Total: 19 Filtered: 19	
ок	Cancel Help	

Figure 11-72 Create Action window Actions list

8. Enter an action name and description for the event action and select **Enter Maintenance Mode** from the Select a task to run menu, as shown in Figure 11-73. Get familiar with the broad choice of tasks that you can run as an action. Click **OK**.

	Create Action
Start a task on a system that generated the event *Action name: Enter maintenance mode Description: Place the host in maintenance mode.	OLearn more
Select a task to run: Select a task Select a task	OK Cancel

Figure 11-73 Create Action window action properties

9. Select the newly created **Enter maintenance mode** event action, as shown in Figure 11-74. Click **Next**.

/ Welcome	Even	t Actions		
Name and	Specify	one or more actions that will occ	ur when this event automation plan is triggered.	
Description Targets Events Event Actions	Event Act	e Create Like Edit.		
	Select	Name 💠	Туре	History
Time Range		Add to the event log	Add to the event log	Not saved
Summary		Electronic Service Notification	Send an e-mail (Internet SMTP)	Saved
		Enter maintenance mode	Start a task on a system that generated the event	Not saved

Figure 11-74 Create Event Automation Plan Wizard Event Actions window

10. Click **Next** in the Time Range window, as shown in Figure 11-75.

/ Welcome	Time Range
Name and Description	(Optional) Specify any time-range constraints for this event automation plan.
/ Targets	Time range: All the time (24x7)
/ Events	The time range of the current filter ( Critical Events) cannot be modified.
Event Actions	Continue to the next page.
⇒ Time Range	
Summary	

Figure 11-75 Create Event Automation Plan Wizard Time Range window

11.Review the Summary window and click **Finish** to create and apply the event automation plan, as shown in Figure 11-76.

✓ Welcome	Summa	ry
<ul> <li>Name and Description</li> </ul>	You have s	pecified the following settings for this event automation plan:
🗸 Targets	Name:	Enter maintenance mode after critical event
✓ Events ✓ Event	Description:	This Event Automation Plan will place an ESXi host in maintenance mode whene maintenance mode will automatically evacuate all running VMs off the problem of a DRS cluster.
<ul> <li>Actions</li> </ul>	Time range:	All the time (24x7)
✓ Time Range	Targets:	PF-ESXi-Node1 PF-ESXi-Node2
	Event filter:	Critical Events
	Event actions:	Enter maintenance mode

Figure 11-76 Create Event Automation Plan Wizard Summary window

The newly created event automation plan is displayed in the Event Automation Plans window, as shown in Figure 11-77.

vent Au	tomation Plans	ke action, and one of	r more event actions that are per	formed	in response	to received
Creat	e Create Like	Edit Delete	Actions 🔻 Search	the tab	le Sear	rch
Select	Name	\$	Targets	\$	Status 🗘	Time rang
	Enter maintenance mod	le after critical event	PF-ESXi-Node2, PF-ESXi-Node1		Active	All the time
	High Win CPU		PF-Windows1		Active	Monday, 6
	Hot air		All Systems		Active	All the time
	Log All Events		All Systems		Active	All the time

Figure 11-77 Event Automation Plans window

12. For testing, generate a Critical System error with source PF-ESXi-Node2. The status of the PF-ESXi-Node2 compute node shows Critical on the Chassis Map, as shown in Figure 11-78.

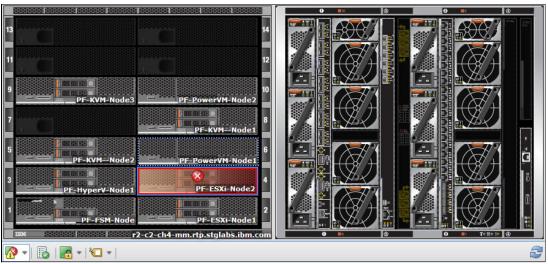


Figure 11-78 Chassis Map showing PF-ESXi-Node2 with a critical error

The generated error is also listed in PF-ESXi-Node2 Event Log, as shown in Figure 11-79.

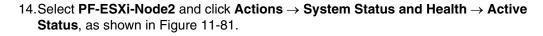
		ecific set of events	s. Select Event	Log Preference	s to customize how many events
Event filt All Even			V		
Last Upd	ated: Jun 19, 2012 6:10:2	26 PM EDT			
PF-ESXi-I	Node2 (Events)				
Refre	sh Delete Create	Filter Acti	ons 🔻	Search the tab	Search
Select	Event Text 🗘	Source 🗘	Severity 🗘	Category 🗘	Date and Time
	System error	PF-ESXi-Node2	🔇 Critical	Alert	Jun 19, 2012 6:08:08 PM
	Para and a second s				

Figure 11-79 Event Log window for selected node

13. Return to the Virtual Servers and Hosts window and make sure that all virtual servers were automatically migrated away from the host with the Critical error. See Figure 11-80.

Perfo	rmance Summary Actions	▼   Se	arch the table	Search			
Select	Name 🗘	State 🗘	OS Name 💠	OS Type and Version 💲	Access 🗘	Problems 🗘	Compl
	PF-ESXi-Node1	Started	PF-ESXi01	Hypervisor 5.0.0	🗾 ок	🗾 ок	ОК
	Vm001	Started	PF-vCenter01	Windows® Server 2008	🖉 ок	i Information	ОК
	🖉 vm002	Started	PF-Windows1	Windows® Server 2008	📄 ок	i Information	ОК
	🖉 vm003	Started			📄 ок	🚺 Information	ОК
	PF-ESXi-Node2	Started	PF-ESXi02	Hypervisor 5.0.0	🔤 ок	🔕 Critical	ОК
	PF-PowerVM-Node1	Started			📄 ок	🖉 ок	📄 ок
	PF-Node1-NIM	Started	PF-Node1-NIM	AIX 6.1	ок	🔤 ок	ОК
	SN101D88B_VIOC1	Started			📄 ок	📕 ок	ОК
	SN101D888_VIOS1	Started			ок	ок	ОК
	PF-PowerVM-Node2	Standby			🖉 ок	🖉 ок	ок

Figure 11-80 Virtual Servers and Hosts window



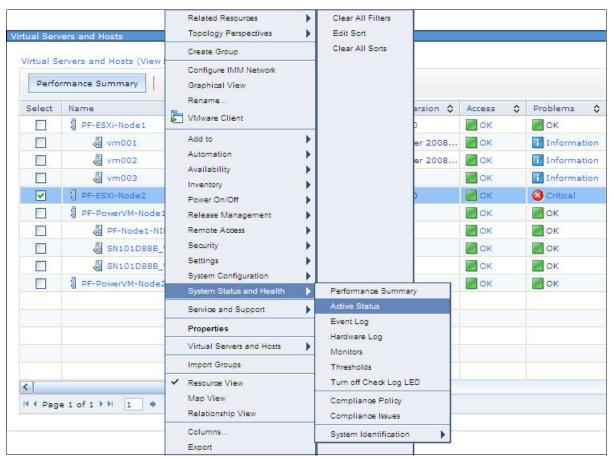


Figure 11-81 Selecting Active Status

15. Observe the Information events that describe the actions that were performed by the event automation plan configured earlier. See Figure 11-82. PF-ESXi-Node2 is now in maintenance mode.

E-ESXI-I	Node2 (Active Status)			
Delet		Search th	e table Search	
Select	Name	\$	Severity 🗘	System
	Host is in maintenance mode.		🚺 Information	PF-ESXi-Node
	Operation completed successfully.		Information	PF-ESXi-Node
	System error		🔕 Critical	PF-ESXi-Node

Figure 11-82 Active Status window for selected node

FSM triggered the "Enter maintenance mode" command on vCenter and DRS migrated all virtual machines away from pf-esxi02 before placing it in maintenance mode, as shown in Figure 11-83.

PF-vCenter1 - vSphere File Edit View Inventory		; Help						. 🗆 🔀
🖸 🔂 🏠 Home 🕽	🕨 🚮 Inventory 🕨 📑	Hosts and Cluster	s			🚮 🗸 Search	Inventory	Q
		Cluster1 Getting Started	Summary Virtual Ma	chines Hosts D	RS Resource Alloca	tion Performance	Tasks & Events	s AI (
pf-esxi01				· · · · · ·	State, Host or Guest (	,		Clear
pf-esxi02 (	maintenance mode)	Name	1	itate	Status	Host	Provisioned Sp	ace Usec
📅 vm002		m001		owered On	Normal	pf-esxi01	46.05 GB	17.18
👘 vm003		m002	1	owered On	Normal	pf-esxi01	46.05 GB	14.55
		m003		owered On	Normal	pf-esxi01	42.05 GB	42.05
		<	m					>
								*
ecent Tasks				Na	ime, Target or Status o	contains: •	(	Clear ×
Name	Target	Status	Details	Initiated by		vCenter Server		
Vallie	🔁 vm003	Completed		System		PF-vCenter1		
Migrate virtual machine	🗗 vm003			Cushere		PF-vCenter1		
	muus vm002	Completed		System		PF-VCenter1		
Migrate virtual machine		<ul><li>Completed</li><li>Completed</li></ul>		Administrator		PF-vCenter1		
Migrate virtual machine Migrate virtual machine	🗗 vm002							3

Figure 11-83 vSphere Client window that shows a host in maintenance mode

16.Return to the Virtual Servers and Hosts window, right-click **PF-ESXi-Node2** and select **Availability** → **Exit Maintenance Mode**, as shown in Figure 11-84.

	ers and Hosts ervers and Hosts (V	/iew Members)	1			
Perfo	rmance Summary	Actions	▼ Se	earch th	ne table	Search
Select	Name	\$	State 🗘	OS N	ame 🗘	OS Type and Version 💲
	PF-ESXi-Node1		Started	PF-ES	Xi01	Hypervisor 5.0.0
	Vm001		Started	PF-v0	Center01	Windows® Server 2008
	June 10 10 10 10 10 10 10 10 10 10 10 10 10		Started	PF-W	indows1	Windows® Server 2008
	🖉 vm003		Started			
<b>V</b>	PF-ESXi-Node2	Related Re	esources	•	Ki02	Hypervisor 5.0.0
	PF-PowerVM-N	Topology F	Perspectives	•		
	PF-Node	Create Gro	up		de1-NIM	AIX 6.1
	J SN101D8	Configure	IMM Network			
	J SN101D8	Graphical	View			
	PF-PowerVM-N	Rename				
		VMware CI	lient			
		Add to		•		
		Automatio	n	•		
		Availability	Ý	Þ		iintenance Mode
		Inventory				te Virtual Servers
<		Power On/	om anagement	1	Remov	e from Virtual Farm
I I Page	e 1 of 1 ▶ ▶ 1	Remote Ac	and the second of	1	Filtered:	10
		Security				
		Settings				
		System Co	nfiguration	•		
		System Sta	atus and Health	•		
		Service an	d Support	•		
		Properties				

Figure 11-84 Exiting Maintenance Mode

# 12

### Managing the Hyper-V environment with IBM Flex System Manager

This chapter is focused on managing the Hyper-V-based virtualization environment with IBM Flex System Manager (FSM). It addresses how to enable Hyper-V to be managed by FSM, and how to perform typical virtualization management tasks. These tasks include virtual machine lifecycle management, automation capabilities, and maintenance.

The following topics are covered:

- ▶ 12.1, "Initial setup tasks for a Hyper-V node" on page 556
- ► 12.2, "Managing Hyper-V with IBM Flex System Manager" on page 562

### 12.1 Initial setup tasks for a Hyper-V node

IBM Flex System Manager can run basic tasks for the Microsoft Hyper-V hypervisor. You can start, stop, restart, suspend, create, and delete your virtual servers that run on Microsoft hypervisors with the same tool that manages other hypervisors in the market.

Before you can manage a Hyper-V virtual environment, you must perform these tasks:

- Prepare your Hyper-V system as addressed in 5.2.5, "Planning for Hyper-V virtualization" on page 118.
- Download the Windows Common Agent for Remote Installation from the URL:

https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?source=dmp&lang=en_US &S_PKG=dir_63_x86_RDagents

- Import the Common Agent for Windows x64 operating systems as described in "Importing the Common Agent for Windows" on page 557.
- Discover your system without any agent, grant access to it, and run the Collect Inventory task before you install the agent with FSM.
- Install a Platform or a Common Agent on your hypervisor to allow your FSM management appliance to manage your Microsoft hypervisor.

This section describes the following tasks:

- ▶ 12.1.1, "Discovering your Hyper-V server" on page 556
- 12.1.2, "Importing the Common Agent for Windows" on page 557
- ▶ 12.1.3, "Granting access and collecting inventory on a Hyper-V node" on page 558
- 12.1.4, "Installing the Common Agent on a Hyper-V host" on page 559

### 12.1.1 Discovering your Hyper-V server

To discover a Hyper-V server, use System Discovery as described in 6.8, "System discovery, access, and inventory collection" on page 176.

Specify the IP address of your operating system and click **Discover Now**, as shown in Figure 12-1. Then, wait until the job is complete.

System Discovery	
Use system discovery to discover manageable resources now or schedule discover resources of the same type for a range of IP addresses, or use a IP addresses, and requesting access to and collecting inventory for the dis	discovery profile. Discovery profiles enable you to customize disco
② Learn more about using discovery	Advanced Tasks
Select a discovery option: Single IPv4 address	Create new profile Manage discovery profiles Discovery jobs
IP address: 9 .27 .16 .125	
Select the resource type to discover:	
Discover Now	
Schedule	

Figure 12-1 Discovering a Hyper-V node

### 12.1.2 Importing the Common Agent for Windows

To import the Common Agent for Windows, perform these steps:

1. Select Release Management. Then, click Agents as shown in Figure 12-2.



Figure 12-2 Release Management

2. Select an agent and click Import Agent (Figure 12-3).

Select	Name	Description	Vendor 🗘	Version
	CommonAgent 6.3 Windows	Software Module	IBM	6.3

Figure 12-3 Importing an agent

3. Specify the path that contains the agent that you want to import and click **OK**, as shown in Figure 12-4.

Agents Agent P	Package Groups (View Members)		
	Import Agent Actions 👻 Search th	e table Search	
Select	Name 🔷	Type 🗘	Description
	🕾 All Agent Packages (15)	Dynamic: Software Module	All installable agent pack
	II	mport Agent	
	he directory path that contains the agent p ted on the management server. All agent p : /home/USERID/RemoteAgentInstall Cancel		

Figure 12-4 Path to import agent

After a few minutes, you get a blue information window as shown in Figure 12-5.

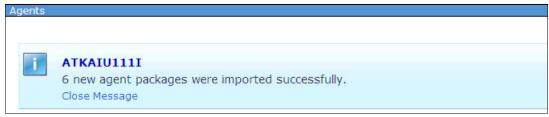


Figure 12-5 Agent imported

**Tip:** In this example, six agents are imported because six agents were present in the local FSM directory /home/USERID/RemoteAgentInstall.

#### 12.1.3 Granting access and collecting inventory on a Hyper-V node

To grant access and collect inventory on a Hyper-V node, perform these steps:

1. Find your server in the Resource Explorer, and click No Access (Figure 12-6).

		e Flex System Manager to one or more target systems. Then click i iger users access to the target system(s).
*User ID:	nonzed ( lex bystem mana	ger abers access to the target system(s).
administrator		
*Password:		
Request Access	Close	
Selected targets:		
Selected targets: Name	Access	Trust State
	Access	Trust State

Figure 12-6 Request access to Hyper-V node

2. When the job is complete, your access is OK as shown in Figure 12-7. You can install your Common Agent that you imported previously.

		cate Flex System Manager to one or more target systems. Then click
-	horized Flex System Ma	anager users access to the target system(s).
User ID:		
administrator Password :		
rassword:		
Request Access	Close	
Request Access	Close	
Request Access	Close	
	Close	Trust State
Selected targets:		Trust State
Selected targets:	Access	

Figure 12-7 Hyper-V access is granted

#### 12.1.4 Installing the Common Agent on a Hyper-V host

To install the Common Agent on a Hyper-V host, perform these steps:

1. Go to Release Management as shown in Figure 12-8.

Igents				
Agent P	ackage Groups > Common Agent Pac	kages (View Members	5)	
I	nstall Agent 🛛 🖌 Actions 🔻 🖉 Se	arch the table Se	arch	
Select	Name 🔶	Description 🗘	Vendor 🗘	Version
<b>V</b>	CommonAgent 6.3 Windows	Software Module	IBM	6.3
	CommonAgent 6.3 a xLinux CommonAgent 6.3 Windows	Software Module	IBM	6.3_a

Figure 12-8 Select CommonAgent 6.3 Windows for an installation on Hyper-V

An Agent Installation Welcome window opens as shown in Figure 12-9.

⇔ Welcome	Agent Installation
Agents	Welcome to Agent Installation Wizard
Agents Systems Summary	Use this wizard to install agents on selected systems.  Show this Welcome page next time.
	< Back Next > Finish Cancel

Figure 12-9 Agent Installation: Welcome page

 You can see a list of agents. Click Next because the Common Agent for Windows is already in the selected list (Figure 12-10). Otherwise, add the Common Agent for Windows from the Common Agent Packages by clicking Common Agent Packages.

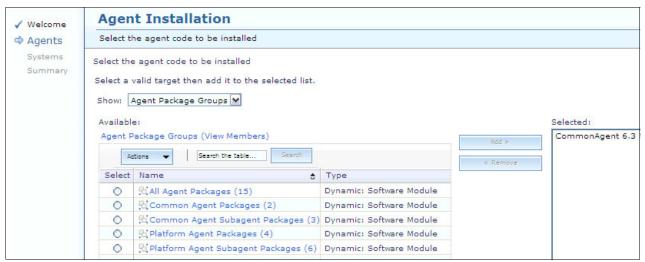


Figure 12-10 Agent Installation: Package selection

3. Select your Hyper-V host as shown in Figure 12-11. Click Add, and then click Next.

Welcome	Ager	nt Installation													
Agents	The following systems have been selected														
Summary	The following systems have been selected Select a valid target then add it to the selected list.														
	Availabl All Ope	All OperatingSystems with Fu e: ratingSystems with Full Access kotons	s (View Member	s)						.Add >	Selected: PF-HyperV				
	Select	Name 0	Access 0	Problems 0	Compliance o	IP Addresse 0	OS Type 🔅	OS Version @	Descripti	C. Deliverte	-				
		FSM_FSM-SCF3FC5F548	Сок	🛃 ОК	ОК	9.27.20.38, fd	Appliance	1.1.0.1							
		PF-ESXi01	ОК	🖉 ОК	ОК	9.27.16.75, 19	Hypervisor	5.0.0							
		PF-ESXI02	ОК	🖉 ОК	ОК	9.27.16.76, 19	Hypervisor	5.0.0							
		PF-HyperV1	ОК	🖉 ок	ОК	9.27.16.125, 1	Windows® Ser	6.1							
		PF-KVM01	<b>В</b> ОК	🖉 ОК	ОК	9.27.16.79, fe	Linux	6.2							
		PF-KVM02	<b>ОК</b>	🖉 ОК	СК	9.27.16.78, 16	Linux	6.2							
		PF-KVM03	СК	📰 ОК	СК	9.27.16.124, 1	Linux	6.2							
		PF-Node1-NIM	🔤 ОК	🖉 ОК	ОК	9.27.16.131, 0	AIX	6.1							
		PF-Switch-8GbSAN	<b>е</b> ок	🖉 ок	Вок	9.27.21.119									
		PF-vCenter01	CK OK	🛃 ОК	OK	9.27.16.77, fe	Windows® Ser	6.1							
	4								2						

Figure 12-11 Agent Installation: Target selection

4. Check the summary of the Common Agent installation as shown in Figure 12-12.

✓ Welcome	Agent Installation								
✓ Agents	Summary of the Install Agent Task								
✓ Systems ⇒ Summary	Selected Agents:								
6	Name 🔶	Туре 👌	Description						
	CommonAgent 6.3 Windows	Software Module	Software Mod						
	🛤 Page 1 of 1 🕨 1 🔹 🕴 Total: 1								
	Selected Systems:	2							
	Name 👌	Туре 🖒	Description						
	PF-HyperV1	Operating System							
	(4)								

Figure 12-12 Agent Installation: Summary

5. In the Launch Job window, click **OK** to run the installation as shown in Figure 12-13.

Launch Job
Schedule Notification Options
Job name and schedule
#Job Name:
Install Agent - June 21, 2012 11:04:45 PM EDT
Choose when to run the job.
⊙Run Now
OSchedule
OK Cencel Help

Figure 12-13 Agent Installation: Launch Job

6. Click Display Properties as shown in Figure 12-14.

Agents	
i	ATKCOR102I The following job has been created and started successfully: Install Agent - June 21, 2012 11:04:46 PM EDT
	Display Properties Close Message

Figure 12-14 Display Properties

7. Go to your Windows 2008 R2 Hyper-V server and make sure that the Common Agent is present in the list of installed programs.

#### 12.2 Managing Hyper-V with IBM Flex System Manager

The following tasks can be performed in a Hyper-V environment from the FSM appliance:

- Deploying virtual servers
- Editing a virtual server
- Deleting a virtual server
- Viewing the virtual server network topology

#### 12.2.1 Deploying virtual servers

To deploy virtual servers, perform these steps:

1. Go to VMControl and click the Virtual Servers/Hosts tab as shown in Figure 12-15.

			111 C	-				SUE								
VMCor	trol Ente	rprise l	Edit	io	n											
	esource utilizat				age y	vour data (	cente	r m	ore	efficiently. Deploy virtu	lal	appliance	s an	id manage	e th	e resulting wo
Resources		Active Stat	us 🙆	A		Jobs				1						
1 Virtual a	ppliances	Problems	10000	-		Active		-	-							
	0 Workloads		ce -	-	-	Complet	ted	10	36							
	system pools				-	Schedul	ed	-	-	1						
	system pools															
Basics	Workloads	Virtual Ap	plian	es	S	/stem Poo	ols	Vir	tual	Servers/Hosts						
11 Virtua 0 C	al servers						Cor	mm	on	tasks						
	arning						Virtual servers and hosts									
	formational						Performance Summary									
5 0	к						Virtual farms									
1000	an Mariata Mariata						Create virtual farm Relocation plans									
8 Hosts 2 Virtual	with 11 virtual s farms	servers						loca		i piana						
Matural C		- (10-11-11-														
virtual S	ervers and Hos	ts (View Mer	nbers	)	-				-							
	Performance Summ	ary	Actions		-	Search th	e table			Search						
Select	Name	ô	Stat	e		¢ OS	Nam	e	0	OS Type and Version ;	0	Access (	) F	Problems	٥	Compliance
	<pre>Image: PF-HyperV-N</pre>	lode1	Start	ed		PF-	Нуре	erVO	1	Windows® Server 2008	6	🔳 ок		ок		ок
	<pre>Image: PF-KVM-Nod</pre>	e1	Start	ed		PF-	KVM	01	- 1	Linux 6.2		ОК		ок		ОК

Figure 12-15 VMControl Enterprise Edition

2. Right-click your Hyper-V host and select **System Configuration**  $\rightarrow$  **Create Virtual Server**, as shown in Figure 12-16.

Basics	Workloads	Virtual Appliances S	System Pools	Virtual S	ervers/Hosts				
	al servers Critical			Common ta	sks				
-	Varning			Virtual serv	ers and hosts				
5 0	with 11 virtual se	Related Resources Topology Perspective Create Group	) 15 )	Performance Summary Virtual farms Create virtual farm Relocation plans Belocate					
Virtual S	Servers and Hosts	Configure IMM Netwo (Vi Rename	nk						
	Performance Summary	Add to Automation	the t	able S	earch)				
Select	Name	Inventory	DS N	ame 👌 O	S Type and Ver	sion 👌	Access	٥	Problems
	1 PF-HyperV-Noo	le1 Power On/Off	) Ba	adkup and Res	tore	08 é	ОК		ОК
	PF-KVM-Node1	Release Managemen	t 🕨 Ca	onfiguration P	lans		ОК		🖉 ок
	🕹 VMRHEL6	2×8 Remote Access	Co	onfiguration T	emplates		ОК		ОК
	PF-KVM-Node2	Security	) Cr	eate Virtual S	erver		🖉 ОК		ОК
	PF-PowerVM-N	ode System Configuration	) Cu	urrent Configu	ration		ОК		ОК
4		System Status and He	aalth 🕨 De	ployment His	tory				
H 4 Pag	e 2 of 4 ▶ № 2	* Service and Support	) Se	Server to Storage Mapping View					
		Properties	Ed	lit Location					
			0	onfiguration S	ettinos				

Figure 12-16 VMControl: Create Virtual Server

3. A Welcome window opens as shown in Figure 12-17. Click Next.

⇔ Welcome	Welcome
Name	Welcome to the Create Virtual Server wizard.
Summary	Use this wizard to create a virtual server on 'PF-HyperV-Node1'. You are guided through the following tasks: * Naming the virtual server * Specifying the platform-specific settings IN Show this Welcome page next time.

Figure 12-17 Create Virtual Server: Welcome page

4. Enter a name for your virtual server and click **Next**, as shown in Figure 12-18.

✓ Welcome	Name							
Name	Specify a name for the virtual server that you want to create.							
Summary	*Type the name of the virtual server that you want to create.							
	VMWindowsHyperV							

Figure 12-18 Naming a virtual server

5. Enter the number of processors and click **Next**, as shown in Figure 12-19.

✓ Welcome	Processor						
🗸 Name	Specify the number of processors to assign to this virtual server.						
Processor     Memory     Disks     Network     Summary	Number Of Processors:						

Figure 12-19 Number of virtual server processors

6. Enter your virtual server memory size and click **Next**, as shown in Figure 12-20.

✓ Welcome	Memory								
🗸 Name	Specify the amount of memory to assign to this virtual server.								
<ul> <li>✓ Processor</li> <li>⇒ Memory</li> </ul>	Memory Size: Units:								
Disks Network Summary	8 MB (8-65,536)								

Figure 12-20 Virtual server memory size

7. Enter your disk size and click **Next**, as shown in Figure 12-21.

✓ Welcome	Disks
🗸 Name	Specify the disk settings to use for this virtual server.
<ul> <li>✓ Processor</li> <li>✓ Memory</li> <li>➡ Disks</li> <li>Network</li> <li>Summary</li> </ul>	Select the amount of disk space to assign to this virtual server. Size: 20 (3-2,040) GB

Figure 12-21 Virtual server disk size

8. Select the virtual switch to which to connect your virtual server and click **Next**, as shown in Figure 12-22.

✓ Welcome	Network
🗸 Name	Select the network label for this virtual server.
<ul> <li>✓ <u>Processor</u></li> <li>✓ <u>Memory</u></li> </ul>	Network Label:
<ul> <li>✓ <u>Disks</u></li> <li>⇒ Network</li> </ul>	Local Area Connection 2 - Virtual Network
Summary	

Figure 12-22 Configuring a virtual server network

9. Review your virtual server summary configuration and click **Finish**, as shown in Figure 12-23.

✓ Welcome	Summary							
🗸 Name	You are now ready to create your virtual server.							
✓ Processor ✓ Memory	Virtual Server details:							
✓ <u>Disks</u>	Targets:	PF-HyperV-Node1						
✓ <u>Network</u>	Name:	VMWindowsHyperV						
Summary	Disk size:	20 GB						
	Number Of Processors:	1						
	Memory:	8 MB						
	Network Label:	Local Area Connection 2 - Virtual Network						
			9					
	Click Finish to create the	virtual server.						

Figure 12-23 Virtual server configuration summary

10. Click **OK** to run your virtual server creation task as shown in Figure 12-24.

		Launch Jo	
Schedule	Notification	Options	
Job name a	and schedule		
*Job Name			
Create Virtual	Server - June 23, 20	12 5:45:30 PM EDT	
Choose wh	ien to run the jo	ь.	
Run No	w		
OSchedu	e		

Figure 12-24 Run now

11.A blue box information message is displayed as shown in Figure 12-25. Click **Display Properties**.

i	ATKCOR102I The following job has	s been created a	nd started successfully: Create Virtual Server - J	une 23, 2012 5
	Display Properties	Close Message		

Figure 12-25 Information blue box

Wait until the job is complete as shown in Figure 12-26.

General	Targets	History	Logs	
Status:	Comp	olete		
Progress:		100%		
Last Run S	Status: Comp	olete		
Description	n: Run d PM	once on 6/23/	12 at 5:45	
Next Run:				
Last Run:	6/23/	12 at 5:45 PM	1	
Task:	Creat	e Virtual Serv	ers	
Created By	y: USER	ID		
Edit				

Figure 12-26 Job is complete

12.Go back to VMControl and select **Virtual Servers/Hosts** to make sure that your virtual server was created as shown in Figure 12-27.

Performance Summary		Actions 👻 Sea	rch the table	Search	
Select	Name 0	State 0	OS Name 👌	OS Type and Version 👌	Access
	PF-HyperV-Node1	Started	PF-HyperV01	Windows® Server 2008 6	ОК
	JVMWindowsHyperV	Stopped			ОК

Figure 12-27 Virtual server was created on Hyper-V

#### 12.2.2 Editing a virtual server

To edit a virtual server, right-click your virtual server and select System Configuration  $\rightarrow$  Edit Virtual Server, as shown in Figure 12-28.

Basics Workloads Virtual A	oppliances System Poo	ls Virtu	al Servers/Hosts					
12 Virtual servers ③ 0 Critical ① 0 Warning 1 Informational	Related Resources	Common Virtual s	ervers and hosts nce Summary					
5 OK 8 Hosts with 12 virtual servers 2 Virtual farms Virtual Servers and Hosts (View Me Performance Summary		• Server	rms rtual farm n plans					
Select Name 0	Remove Rename Add to Automation	•	Search OS Type and Version 👌	Access 👌	Problems			
Image: PF-HyperV-Node1           Image: VMWindowsHyperV           Image: PF-KVM-Node1           Image: VMRHEL62x86term	Inventory Power On/Off Release Management	*	Windows® Server 2008 6		Inform Inform OK OK			
	Security System Configuration System Status and Health	) ) )	Linux 6.2 Edit Virtual Server Server to Storage Mapping \	View	ОК			
	Service and Support Properties	•	Edit Location					

Figure 12-28 Editing a virtual server

You get information about processor and memory size, as shown in Figure 12-29.

Processor	Memory
Assign	ed:
1	(1-4)

Figure 12-29 Virtual server details

#### 12.2.3 Deleting a virtual server

To delete a virtual server, right-click your virtual server and select **Permanently Delete Virtual Server**, as shown in Figure 12-30.

Basics Workloads Virtual A	ppliances System Pool	s Virtu	al Servers/Hosts					
12 Virtual servers		Common tasks Virtual servers and hosts						
		pology Perspectives		rms rtual farm n plans				
Virtual Servers and Hosts (View Me	Permanently Delete Virtual	Server	Search					
Select Name C	Add to Automation Inventory	> > >	OS Type and Version ♂ Windows® Server 2008 6	Access 👌	Problems 🔅			
PF-KVM-Node1     WRRHEL62x86tem     PF-KVM-Node2	Power On/Off Release Management Security	> > >	Linux 6.2 Linux 6.2	<ul> <li>ок</li> <li>ок</li> <li>ок</li> </ul>	<ul> <li>ок</li> <li>ок</li> <li>ок</li> </ul>			
(≰)  K € Page 2 of 4 → H 2 →   5	System Configuration System Status and Health Service and Support	System Status and Health						
	Properties							

Figure 12-30 Deleting a virtual server

#### 12.2.4 Viewing the virtual server network topology

To view the virtual network topology, perform these steps:

1. Select your virtual server as shown in Figure 12-31.

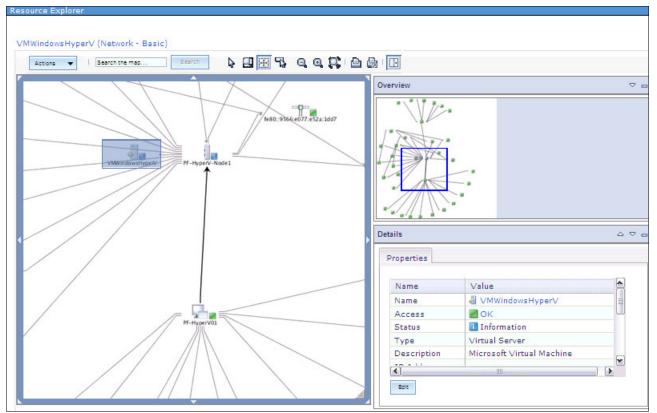
Virtual S	Servers and Hosts (View Me	mbers)								
	Performance Summary	Actions 👻	Sear	ch the table	Search					
Select	Name O	State	٥	OS Name ᅌ	OS Type and Version 🐧	Access	٥	Problems 👌	Compliance	0
	PF-HyperV-Node1	Started		PF-HyperV01	Windows® Server 2008 6	ОК		🚺 Informatio	r 📕 OK	
	al VMWindowsHyperV 🕹	Started				ОК		Informatio	r 📕 OK	

Figure 12-31 Selecting a virtual server

2. Right-click the server and select **Topology Perspective**  $\rightarrow$  **Network**  $\rightarrow$  **Basic**, as shown in Figure 12-32.

Basics	Workloads Virtual A	ppliances	System Pools	i Vi	rtual Servers/Hosts					
	al servers			Comn	non tasks					
<ul> <li>O Critical</li> <li>▲ 0 Warning</li> <li>7 Informational</li> </ul>				Virtual servers and hosts Performance Summary						
<b>∑</b> 5 C	States and a second states of	Related Res	ources		l farms e virtual farm	_				
8 Hosts with 12 virtual servers 2 Virtual farms Virtual Servers and Hosts (View Me Performance Summary		Topology Pe	erspectives	Ba	esic					
		Create Grou	P	Ne	etwork )	Basi				
		Configure IMM Network Remove Rename		Storage Storage Area Network Updates			Port-level Subnet			
						Syste	m-level			
Select	Name 3	Add to		2	rtualization Basic	on ò	Access	¢	Problems 👌	Compliance
	PF-HyperV-Node1	Automation			rtualization Common	2008 6	в 🔳 ок		Information	ОК
	🌡 VMWindowsHyperV	Inventory			rtualization Detail		ОК		Information	ОК
	<pre>PF-KVM-Node1</pre>	Power On/O	ff	101	Linux 6.2		ОК		ОК	ОК
	🗸 VMRHEL62x86tem	Release Ma	nagement	*			📄 ОК		ОК	ОК
	PF-KVM-Node2	Security		102	Linux 6.2		ОК		ОК	ОК
<		System Cont System Stat	figuration us and Health	ed: 20						
		Service and	Support	•						
		Properties								

Figure 12-32 Selecting a basic network topology



A network topology view of your virtual server within the infrastructure is displayed as shown in Figure 12-33.

Figure 12-33 Topology view

# 13

### **Mobile management**

This chapter describes the features and advantages of the IBM Flex System Manager (FSM) application, which is now available for mobile devices.

In this chapter, we provide information about the mobile application, which enables you to manage your IBM Flex System and PureFlex System hardware remotely through the Flex System Manager.

The following topics are covered:

- ▶ 13.1, "Obtaining the mobile application" on page 572
- ► 13.2, "Configuring secure communications to the FSM" on page 572
- ▶ 13.3, "Using the Flex System Manager mobile application" on page 576

#### 13.1 Obtaining the mobile application

The Flex System Manager mobile application can be downloaded from the following application stores (app stores):

For the Android operating system, see the IBM Flex System Manager for mobile devices Google Play page:

http://play.google.com/store/apps/details?id=com.ibm.msm.android

**Note:** IBM Flex System Manager for mobile devices is not supported for Android Version 3.0.

- For Apple iOS, see the IBM Flex System Manager for mobile devices iTunes page: http://bit.ly/ljaDIFF
- For BlackBerry OS, see the IBM Flex System Manager for mobile devices BlackBerry App World page:

http://appworld.blackberry.com/webstore/content/20199697/?lang=en

**Note:** The IBM Flex System Manager for mobile devices application does not support BlackBerry OS Version 7.0 or earlier.

#### **13.2 Configuring secure communications to the FSM**

IBM Flex System Manager for mobile devices can use Secure Sockets Layer (SSL) certificates to create a secure connection to the IBM Flex System Manager management software.

**Important:** If you have not configured SSL certificates on the IBM Flex System Manager, the app will prompt you with the option to connect in an insecure manner.

To ensure that the connection is secure, the certificate that is installed on the IBM Flex System Manager must be a valid certificate for the URI that will be used to access the IBM Flex System Manager and be signed by a separate certificate authority (CA). Self-signed certificates are not accepted by IBM Flex System Manager for Android, BlackBerry, and iOS.

In addition, there is a current issue with importing certificates that were signed by an intermediate CA instead of a root CA into the default keystore on the IBM Flex System Manager. This issue requires you to create a new keystore on a separate system (with Java installed) from the Flex System Manager and replace the existing keystore with the new keystore. To replace the existing keystore, the IBM Flex System Manager must be at level 1.2.0 or higher.

#### 13.2.1 Generating a Java keystore and Certificate Signing Request

Java ships with a utility named *Keytool* in its bin directory that can be used to create and edit keystore files. The first step is to create a keystore by using the following command:

keytool -genkey -alias <keystore_alias> -keyalg <encryption_algorithm> -keystore
<path_to_the_keystore_being_created> -keysize <size_of_encryption_key>

Replace the specific options with the ones for your keystore, as shown in Example 13-1.

Example 13-1 Creating a keystore

keytool -genkey -alias Flex_Manager -keyalg RSA -keystore flexStore.jks -keysize
2048

This command will prompt you to create a password for the keystore being generated. Remember this password because it will be required later when you replace the keystore on the IBM Flex System Manager. This password will be requested for each subsequent **keytool** command run against the created keystore. In addition, it will prompt for organization and location information to create the keystore. Also, it will prompt for a password for the alias specified, which can be the same or different from the previous password. In this example, the alias was Flex_Manager and the keystore file was flexStore.jks. Using a strong keysize is advised because some mobile operating systems have restrictions on the keysize that they will accept.

After a keystore is generated, a Certificate Signing Request (CSR) can be created from the keystore by using the following command:

keytool -certreq -alias <keystore_alias> -keystore <path_to_the_keystore> -file
<path_to_the_csr_file_being_created>

Replace the specific options with the options for your environment, as shown in Example 13-2.

Example 13-2 Creating the Certificate Signing Request

keytool -certreq -alias Flex_Manager -keystore flexStore.jks -file mydomain.csr

The Certificate Signing Request that is generated can be submitted to a CA to create a certificate signed by the CA. Send the certificate-signing request file to the CA. See the CA website for specific instructions about requesting a new certificate.

You can request either a test certificate or a production certificate from the CA. However, in a production environment, you must request a production certificate.

The next steps involve installing the CA root and any intermediate certificates into the keystore, and then installing the generated server certificate into the keystore. These certificates can be acquired from the CA that is used to generate the server certificate.

To install the root and intermediate certificates (start with the root certificate first), run the following command:

```
keytool -import -trustcacerts -alias <root_certificate_alias> -file
certificate> -keystore certificate> -keystore
```

Replace the specific options with the options for your environment, as shown in Example 13-3.

Example 13-3 Installing root certificates

keytool -import -trustcacerts -alias root -file root.crt -keystore flexStore.jks

In Example 13-3, root.crt is the CA root or intermediate certificate and flexStore.jks is the name of the previously generated keystore. When prompted, select to trust the certificate that is being installed. Run this command for each certificate in the certificate chain.

Import the server certificate that is returned from the CA by running the following command:

keytool -import -trustcacerts -alias <server_certificate_alias> -file
<path to server certificate> -keystore <path to the keystore>

Replace the specific options with the options for your environment, as shown in Example 13-4.

```
Example 13-4 Importing server certificates
```

keytool -import -trustcacerts -alias Flex_Manager_Server -file mydomain.crt
-keystore flexStore.jks

In Example 13-4, the alias that is used is the alias for the server certificate, and the file that is provided is the server certificate file.

#### 13.2.2 Installing the keystore into the IBM Flex System Manager

To install the keystore into the IBM Flex System Manager, follow these steps:

- Copy the keystore to the IBM Flex System Manager by using Secure Copy Protocol (SCP).
- Log in to the Flex System Manager by using Secure Shell (SSH).
- Run the smstop command on the IBM Flex System Manager to stop the web server, as shown in Example 13-5.

Example 13-5 Stopping the web server

```
USERID@fsm1:~> smstop
Shutting down IBM Director... done
```

4. Run the following command:

```
updcert -I -n <password of the keystore> -f <path to the keystore file>
```

The **-f** parameter is the location of the keystore file that is copied over SCP, as shown in Example 13-6.

Example 13-6 updcert command to install keystore onto Flex System Manager node

USERID@fsm1:~>updcert -I -n password -f /home/USERID/flexStore.jks

5. 5. The web server restarts automatically, but its progress can be checked by using the **smstatus** command, as shown in Example 13-7.

```
Example 13-7 Check status of the web server
```

```
USERID@fsm1:~> smstatus
Starting IBM Director...The starting process may take a while. Please use
smstatus to check if the server is active
USERID@fsm1:~> smstatus
Active
```

#### 13.2.3 Installation on Android

The installation of custom CA certificates on Android 2.3 is only supported on Motorola devices.

Motorola allows you to install custom CA certificates through its custom certificate manager. For more information, see this website:

https://motorola-enterprise.custhelp.com/app/answers/detail/a_id/57093/~/android---root-certificate-management

To use IBM Flex System Manager for Android with Android 2.3 devices by manufacturers other than Motorola, the certificate installed on IBM Flex System Manager must be recognized by one of the preinstalled certificate authorities on the Android device. Installing a certificate that is trusted by one of these preinstalled certificates allows a successful connection to an IBM Flex System Manager with the Android device.

Starting with Android 4.0, installing CA certificates is supported by Android natively. See this website:

http://support.google.com/android/bin/answer.py?hl=en&answer=1649774

On Android 4.0, the installed certificates can be seen inside "Trusted Credentials" in the "Security" section of "Settings".

It is now possible to connect to IBM Flex System Manager systems that have a server certificate signed by the CA certificate that is installed by using the IBM Flex System Manager for Android application.

If the Android device does not connect successfully after the installation of a CA certificate, try restarting the Android device.

#### 13.2.4 Installation on BlackBerry

There are two ways to get a CA certificate onto a BlackBerry device. A CA certificate can be installed by using BlackBerry Desktop Software or by importing it directly to the device.

To import the certificate by using the BlackBerry Desktop Software, follow these steps:

- 1. Download the certificate onto a device management system.
- 2. Import the certificate onto the management system through the web browser.
- 3. Connect to the device by using BlackBerry Desktop Software.
- 4. Select **Tools**  $\rightarrow$  **Desktop Options**.
- 5. In the dialog that displays, select the **General** tab.
- 6. Select Use certificate synchronization and select OK.
- 7. In the left pane, select Certificates.
- 8. Select the store into which the CA certificate was imported.
- 9. Select the certificate and select Sync Certificates.

Or, to install the certificate directly, follow these steps:

- 1. Download the CA certificate to the device.
- 2. Opening the file prompts you to import the certificate.
- 3. Click **Import**, and then create a password for the keystore. This password can be any password that you want. It is used if you want to uninstall the certificate later.
- 4. Click **OK** after setting the password. The BlackBerry shows the certificate details and a green check mark indicating that the certificate is successfully installed.

To verify that the certificate was installed, go to Home  $\rightarrow$  Options  $\rightarrow$  Security  $\rightarrow$  Advanced Security  $\rightarrow$  Certificates  $\rightarrow$  <*CA Certificate*>. It is now possible to connect to IBM Flex System Manager systems with a server certificate that is signed by the CA certificate that was installed using the IBM Flex System Manager for BlackBerry application. No warning message appears.

#### 13.2.5 Installation on iOS

Acquire the CA root certificate on the iOS device through email, a website link, or another method.

After clicking the link or file, iOS automatically brings you to another window that is labeled Install Profile. In this window, press **Install**, then press **Install Now**. To verify the certificate was installed, open iOS Settings and go to **General**  $\rightarrow$  **Profiles**. The imported CA certificate is listed. It is now possible to connect to IBM Flex System Manager systems with a server certificate that is signed by the CA certificate that was installed by using the IBM Flex System Manager for iOS application.

#### 13.3 Using the Flex System Manager mobile application

The Flex System Manager mobile application enables you to view the following types of IBM Flex System information:

- Managed resource health problems and status
- Event history for chassis, compute nodes, and network devices
- Front and rear graphical views of a chassis
- Hardware components installed in a chassis
- Manage resource Vital Product Data (VPD) and firmware levels
- Recent scheduled jobs

The Flex System Manager for mobile devices enables you to manage your IBM Flex System and PureFlex System hardware remotely with the following hardware-management actions:

- Manage multiple chassis and multiple management nodes from a single application
- Perform actions on compute nodes, such as Power On, Power Off, Restart, and Shut Down and Power Off
- Perform actions on the Chassis Management Module (CMM), such as Virtual Reseat and Restart Primary CMM

Figure 13-1 shows the initial setup window where you can enter a passcode, which is used when executing important commands, such as node power on and off.

IBM Flex System Manager
IBM Flex System Manager provides an easy way to browse Flex Chassis status and events. Learn More Create an application passcode  Go

Figure 13-1 Entering your application passcode

5	Chassis	\$
Add con	nection	
No conne	ctions found	

Choose Add Connection as shown on Figure 13-2.

Figure 13-2 Setting up a new chassis connection

Enter Flex System Manager login information as shown in Figure 13-3 on page 578.

Hostname : 9.42.170.223 Username : USERID Password : •••••• Port : 8422 Description : Lab Test System	an easy way status and ev	tem Manager provides to browse Flex Chassis ents. Add your FSM ata below. <u>Learn More</u>
Password : •••••• Port : 8422	Hostname :	9.42.170.223
Port : 8422	Username :	USERID
	Password :	•••••
Description : Lab Test System	Port :	8422
	Description :	Lab Test System
Add connection	Ade	d connection

Figure 13-3 Enter your FSM login credentials

The successful connection and addition are shown in Figure 13-4.



Figure 13-4 Successful addition of a new chassis

Choosing the connection displays the chassis view with status indicators, as shown in Figure 13-5.

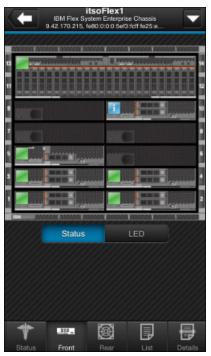


Figure 13-5 Front view of the chassis

Choose the LED button to see the front panel indicators for each node as shown in Figure 13-6.

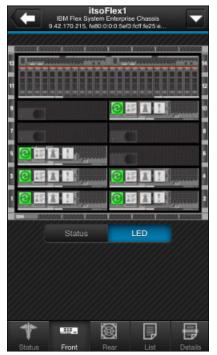


Figure 13-6 Showing front panel indicators

From the chassis pull-down menu, multiple options are available to manipulate the CMM as shown in Figure 13-7.

(	IBM Flex Sy	tsoFlex1 stem Enterprise le80-0:0-0 5et3:	e Chassis fotf fe25 e	
Resta	rt Prima	ry CMM		>
Virtua	I Reseat	t Primary	CMM	>
LED F	lash			>
LED (	Dn			>
1 Shahar	Front			

Figure 13-7 CMM functions in the chassis pull-down menu

You can view and perform actions on a specific node by choosing it as shown in Figure 13-8.

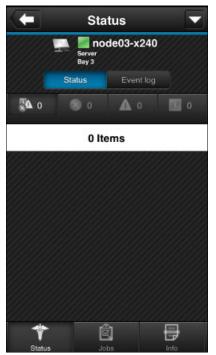


Figure 13-8 Node status

The event log for a specific node can be chosen by pressing the Event log button as shown in Figure 13-9.

(	Sta	tus	E	•
	Server Bay 3	de03-x24	0	
	Status	Event lo	9	
<b>a</b> 25	⊗ o	<b>A</b> 0	2	5
cn=USERI	e Login Succe D,ou=users,do uis at IP addre	=ibmbase,c	ic=com	>
The cor completed.	nfiguration set	ting deployr	ment Wednesday	>
Host Por	ower has beer	n turned on.	Wednesday	>
	ting to Power by user USEF		SN# Wednesday	>
*	ĺ	1	₽	

Figure 13-9 Viewing the event log for a specific node

You can press the Status button to perform actions on the node as shown in Figure 13-10.

(	Status	
Power Off	low	>
Restart Nov	v	>
Shut down	and power off	>
Virtual Res	eat	>
LED Flash		>
LED On		>
*	Ê	-

Figure 13-10 Status menu for a specific node

If you choose to perform an action, it prompts you for your app passcode as shown in Figure 13-11.



Figure 13-11 Prompt for your passcode to perform an action, such as LED flash

The LED flash job shows in the Recent Jobs list by pressing the **Jobs** button on the bottom of the display, as shown in Figure 13-12.

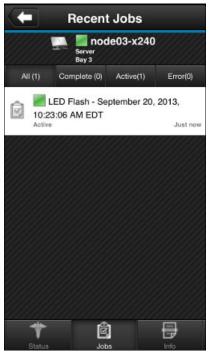


Figure 13-12 Recent jobs showing LED flash job

You can see information for a certain node by pressing the **Info** button as shown in Figure 13-13.

<ul> <li>System information</li> </ul>
Every Bay 3 General
deneral
Slots Occupied
Machine Type
State Started
Name node03-x240
Type _{Server}
Chassis Slot
Status
🅈 🖻 🖶
Status Jobs Info

Figure 13-13 Node information

You can see the LED status for the node by scrolling to the bottom of the System Information window as shown in Figure 13-14.

🗲 System in	formation
UEFI Level: 1.31	Date: August 13, 2013
UEFI Level: 1.21	Date: March 28, 2013
Diagnostics	Date: November 22, 2012
LED Details	
Power	
Event Log	
Location	
Fault	
*	
Status Jo	bs Info

Figure 13-14 LED information as shown on the System Information window

You can view status indicators from the rear of the chassis as shown in Figure 13-15.



Figure 13-15 Viewing status indicators for the rear of the chassis

You can view a list of chassis components by using the List button as shown in Figure 13-16.

+	Components	-
	IBM Flox System Enterprise Chassis 9.42.170.215, fe80:0:0:0:5ef3:fcff:fe25:ed85	
	Server-7954-24X-SN1077 Server Bay 10	>
*	<b>1.</b> 9.42.171.9 Fibre Channel fe80:0000:0000:0000:02c0:ddff:fe24:411c, fe80:0:0	>
	IBM 8731AC1 KQ5F02D Server Bay 5	>
	IBM 8737AC1 KQ9M03F Server Bay 1	>
	node02-x240 Server Bay 2	>
	erver Bay 3	>
1	• ••• 🕺 🗗 🗄	7
Stat	us Front Rear <b>List</b> Det	alis

Figure 13-16 The list option to view chassis components

The Chassis button allows you to choose the chassis to work with as shown in Figure 13-17.



Figure 13-17 Choosing the chassis to work with

Press the gear icon (upper-right corner in Figure 13-17) to update settings.

Network information, login credentials, and the passcode can be updated, as shown in Figure 13-18.

Settings	Done
Connections	
Lab Test System Hostname : 9.42.170.223 Username : USERID	>
Security	
Application passcode Manage application passcode	>
Reset application data Reset and remove all data within this app.	. >
Information	
Send feedback	>
Troubleshooting	>
About	>

Figure 13-18 Updating login or passcode information

### Abbreviations and acronyms

АММ	advanced management module	НТТР	Hypertext Transfer Protocol
ASU	Advanced Settings Utility	HTTPS	HTTP over SSL
ATS	Advanced Technical Skills	I/O	input/output
BE3	BladeEngine 3	IBM	International Business Machines
СА	certificate authority	ID	identifier
CAS	Common Agent Services	IFM	IBM Fabric Manager
CD	compact disc	IMM	integrated management module
CD-ROM	compact-disc read-only memory	IMM2	Integrated management module II
CIM	Common Information Model	IP	Internet Protocol
СІМОМ	CIM object manager	IPC	interprocess communication
CLI	command-line interface	ISV	independent software vendor
СММ	Chassis Management Module	ІТ	information technology
СОМ	Component Object Model	ITIL	Information Technology
CPU	central processing unit		Infrastructure Library
CRTM	Core Root of Trust Measurement	ITSO	International Technical Support Organization
CSR	certificate signing request	JRE	Java Runtime Environment
DCOM	distributed component object model	KMS	Key Management System
DHCP	Dynamic Host Configuration Protocol	KVM	kernel-based virtual machine
DNS	Domain Name System	LAN	local area network
DRS	Distributed Resource Scheduler	LDAP	Lightweight Directory Access Protocol
DRTM	Dynamic Root of Trust Measurement	LED	light emitting diode
DVD	digital versatile disc	LLDP	Link Layer Discovery Protocol
ECC	error checking and correcting	LOM	LAN on motherboard
ESP	Early Shipment Program	LP	low profile
FC	Fibre Channel	LUN	logical unit number
FCoE	Fibre Channel over Ethernet	MAC	Media Access Control
FDR	fourteen data rate	MB	megabyte
FFDC	first-failure data capture	MIB	Management Information Base
FSM	Flex System Manager	MLC	multi-level cell
FSP	flexible service processor	MPIO	multi-path I/O
FTP	File Transfer Protocol	NFS	Network File System
FTSS	Field Technical Sales Support	NIM	Network Installation Manager
FoD	Features on Demand	NL	nearline
GB	gigabyte	NTP	Network Time Protocol
GUI	graphical user interface	OID	object identifier
НА	high availability	OS	operating system
HBA	host bus adapter	OVF	Open Virtualization Format
HDD	hard disk drive	PEP	policy enforcement point
HS	hot swap	QoS	quality of service

RAID	redundant array of independent disks
RAM	random access memory
RBAC	role-based access control
RSAP	Remote Service Access Point
RDIMM	registered DIMM
RHEL	Red Hat Enterprise Linux
RPM	Red Hat Package Manager
RSS	Receive-Side Scaling
SAN	storage area network
SAS	Serial Attached SCSI
SATA	Serial Advanced Technology Attachment
SCP	Secure Copy Protocol
SCS	Storage Copy Services
SCSI	Small Computer System Interface
SFF	small form factor
SLP	Service Location Protocol
SMI-S	Storage Management Initiative Specification
SMS	Software Management Services
SNIA	Storage Networking Industry Association
SNMP	Simple Network Management Protocol
SNMP SNMPv3	
	Protocol Simple Network Management
SNMPv3	Protocol Simple Network Management Protocol v3
SNMPv3	Protocol Simple Network Management Protocol v3 Serial over LAN
SNMPv3 SOL SSD	Protocol Simple Network Management Protocol v3 Serial over LAN solid-state drive
SNMPv3 SOL SSD SSH	Protocol Simple Network Management Protocol v3 Serial over LAN solid-state drive Secure Shell
SNMPv3 SOL SSD SSH SSL	Protocol Simple Network Management Protocol v3 Serial over LAN solid-state drive Secure Shell Secure Sockets Layer
SNMPv3 SOL SSD SSH SSL SW	Protocol Simple Network Management Protocol v3 Serial over LAN solid-state drive Secure Shell Secure Sockets Layer special weight
SNMPv3 SOL SSD SSH SSL SW TB	Protocol Simple Network Management Protocol v3 Serial over LAN solid-state drive Secure Shell Secure Sockets Layer special weight terabyte
SNMPv3 SOL SSD SSH SSL SW TB TCG	Protocol Simple Network Management Protocol v3 Serial over LAN solid-state drive Secure Shell Secure Sockets Layer special weight terabyte Trusted Computing Group
SNMPv3 SOL SSD SSH SSL SW TB TCG TCP	Protocol Simple Network Management Protocol v3 Serial over LAN solid-state drive Secure Shell Secure Sockets Layer special weight terabyte Trusted Computing Group Transmission Control Protocol Transmission Control
SNMPv3 SOL SSD SSH SSL SW TB TCG TCP TCP/IP	Protocol Simple Network Management Protocol v3 Serial over LAN solid-state drive Secure Shell Secure Sockets Layer special weight terabyte Trusted Computing Group Transmission Control Protocol Transmission Control Protocol/Internet Protocol
SNMPv3 SOL SSD SSH SSL SW TB TCG TCP TCP/IP TFTP	Protocol Simple Network Management Protocol v3 Serial over LAN solid-state drive Secure Shell Secure Sockets Layer special weight terabyte Trusted Computing Group Transmission Control Protocol Transmission Control Protocol/Internet Protocol Trivial File Transfer Protocol
SNMPv3 SOL SSD SSH SSL SW TB TCG TCP TCP/IP TFTP TPM	Protocol Simple Network Management Protocol v3 Serial over LAN solid-state drive Secure Shell Secure Sockets Layer special weight terabyte Trusted Computing Group Transmission Control Protocol Transmission Control Protocol/Internet Protocol Trivial File Transfer Protocol Trusted Platform Module
SNMPv3 SOL SSD SSH SSL SW TB TCG TCP TCP/IP TFTP TPM TXT	Protocol Simple Network Management Protocol v3 Serial over LAN solid-state drive Secure Shell Secure Sockets Layer special weight terabyte Trusted Computing Group Transmission Control Protocol Transmission Control Protocol Transmission Control Protocol/Internet Protocol Trivial File Transfer Protocol Trusted Platform Module text Unified Extensible Firmware
SNMPv3 SOL SSD SSH SSL SW TB TCG TCP/IP TFTP TFTP TPM TXT UEFI	Protocol Simple Network Management Protocol v3 Serial over LAN solid-state drive Secure Shell Secure Sockets Layer special weight terabyte Trusted Computing Group Transmission Control Protocol Transmission Control Protocol Transmission Control Protocol/Internet Protocol Trivial File Transfer Protocol Trusted Platform Module text Unified Extensible Firmware Interface
SNMPv3 SOL SSD SSH SSL SW TB TCG TCP TCP/IP TFTP TPM TXT UEFI UI	Protocol Simple Network Management Protocol v3 Serial over LAN solid-state drive Secure Shell Secure Sockets Layer special weight terabyte Trusted Computing Group Transmission Control Protocol Transmission Control Protocol Transmission Control Protocol/Internet Protocol Trivial File Transfer Protocol Trusted Platform Module text Unified Extensible Firmware Interface user interface

USB	Universal Serial Bus
VEB	Virtual Ethernet Bridging
VEPA	Virtual Ethernet Port Aggregator
VIOS	Virtual I/O Server
VLAN	virtual local area network
VM	virtual machine
VMs	virtual machine
VPD	Vital Product Data
WWN	worldwide name
WWPN	worldwide port name
XML	Extensible Markup Language

### **Related publications**

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this book.

#### **IBM Redbooks**

The following IBM Redbooks publications provide additional information about the topic in this document. Note that some publications referenced in this list might be available in softcopy only.

- ► IBM PureFlex System and IBM Flex System Products and Technology, SG24-7984
- ► IBM Flex System p260 and p460 Planning and Implementation Guide, SG24-7989
- IBM Flex System p270 Compute Node Planning and Implementation Guide, SG24-8166
- IBM PowerVM Live Partition Mobility, SG24-7460
- Implementing the IBM Storwize V7000 V6.3, SG24-7938
- Introduction to Storage Area Networks, SG24-5470
- ► Moving to IBM PureFlex System x86-to-x86 Migration, REDP-4887
- IBM Flex System Networking in an Enterprise Data Center, REDP-4834

You can search for, view, download or order these documents and other Redbooks, Redpapers, Web Docs, draft and additional materials, at the following website:

ibm.com/redbooks

#### **Online resources**

These websites are also relevant as further information sources:

IBM Flex System Information Center

http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp

 IBM PureSystems offerings http://www.ibm.com/ibm/puresystems

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(1.0" spine) 0.875"<->1.498" 460 <-> 788 pages



## Implementing Systems Management of IBM PureFlex System



Explores IBM PureFlex System and its systems management capabilities

Provides planning and deployment considerations

Gives step-by-step implementation instructions To meet today's complex and ever-changing business demands, you need a solid foundation of compute, storage, networking, and software resources. This system must be simple to deploy and be able to quickly and automatically adapt to changing conditions. You also need to be able to take advantage of broad expertise and proven guidelines in systems management, applications, industry solutions, and more.

IBM PureFlex System combines no-compromise system designs along with built-in expertise and integrates them into complete, optimized scalable solutions. With IBM Flex System Manager, multiple solution components that include compute nodes, network and storage infrastructures, storage systems, and heterogeneous virtualization environments can be managed from a single panel.

This IBM Redbooks publication introduces IBM PureFlex System and IBM Flex System and their management devices and appliances. It provides implementation guidelines for managing Linux kernel-based virtual machine (KVM), IBM PowerVM, VMware vSphere, and Microsoft Hyper-V virtualization environments.

This book is intended for the IT community of clients, IBM Business Partners, and IBM employees who are interested in planning and implementing systems management of the IBM PureFlex System. INTERNATIONAL TECHNICAL SUPPORT ORGANIZATION

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