Lenovo

Migrating your x86 Servers from BladeCenter to Flex System

Advice on upgrading from an x86 environment to Lenovo Flex System Hardware migration guides with BladeCenter source examples

Guidance on migrating Microsoft, VMware, and KVM system images Recommended for all BladeCenter customers

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

Last update on December 2013

This edition applies to these products:

- ► Flex System Manager 1.3
- ► VMware vSphere 4.1
- VMware vCenter Server/Client 4.1
- Microsoft Windows 2008 x64 R2
- Microsoft Hyper-V Manager 6.1
- Red Hat Enterprise Linux 6.2
- ► Kernel Virtual Machine KVM-22

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Preface

Lenovo Flex System is a next-generation platform ideally suited to data center environments that require flexible, cost-effective, secure, and energy-efficient server infrastructure.

This Lenovo Press paper highlights the major advances of Flex System[™]. Lenovo BladeCenter® is used as a comparative example on aspects such as chassis, compute node, management module, power supply, cooling, network, and I/O. Key factors users need to consider when planning workload migration also are reviewed. Some instrumentation and reference tools are offered here, with detailed steps that take the user through the entire planning process.

This paper is intended for those IT professionals who want to migrate a workload from existing hardware to the Flex System.

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1

Introduction

Flex System is a next-generation platform that is ideally suited to data center environments that require flexible, cost-effective, secure, and energy-efficient server infrastructure.

The innovative design features of the Flex System products make it possible to configure integrated, customized, highly secure solutions. These solutions meet data center needs and provide for flexible expansion capabilities. The scalable hardware features and the unprecedented power and cooling capabilities of the Flex System products help optimize hardware and power utilization, minimize operational costs, and simplify the overall management of the data center.

Figure 1-1 shows Flex System.



Figure 1-1 Flex System

Flex System is also an infrastructure that is custom-built to your requirements with more performance and bandwidth, true integrated enterprise SAN storage, and far more capability to consolidate and virtualize than previous systems.

The Flex System chassis is designed for new levels of simplicity, reliability, and upgradeability. With high performance compute nodes, enhanced networking capabilities, and sophisticated system management capabilities, you can upgrade an existing blade server system to this converged infrastructure to make your IT simpler, more flexible, more open, and more efficient.

This paper provides an overview of the process to migrate workloads from an x86 source server to the Flex System platform. All the necessary key factors that must be considered during the migration process are documented with detailed descriptions and explanations. You can take these general guidelines and apply them to your environment and make changes where appropriate.

Workload migration is not only about moving the operating system (OS) images that contain the application and data. Preparing the hardware infrastructure and ensuring it is optimally fitted to the workload that runs on that hardware also is important. Such preparation also prevents problems, such as different hardware platforms that have different software or OS support. Problem-solving techniques are presented in this paper.

This paper contains the following chapters:

- In the Introduction, the hardware components of the Flex System are introduced by comparing the components to their well-known BladeCenter counterparts.
- In the remaining chapters, the migration solutions are described in terms of the hardware settings migration process and OS images migration process, and the considerations behind those processes.

For users familiar with the OS, hypervisor, virtual machine, and application migration, you can find more information in Chapter 2, "Migrating hardware settings" on page 15 about setting up the hardware as similar to the source environment as possible.

For users who are planning for Physical-to-Virtual or Virtual-to-Virtual migration, you can find more information in Chapter 3, "Migrating operating system images" on page 55 about the different scenarios to consider.

For users unfamiliar with the workload migration process, review this entire paper and then focus on the sections that are most relevant.

This paper does not address all potential issues that can occur during a migration process, although many detailed operations are shown. Users must consider the actual environment, constraints, topology, and policies of their system, and then design a comprehensive customized transition plan to implement. Data migration is not described in this paper. Therefore, product interfaces that are shown in this paper can change because of software updates.

Important: Some migrations might share commonalities with the cases and scenarios that are introduced in this paper. However, a successful migration is not guaranteed. Lenovo is not liable for any damage, loss of data, or any other unpredictable consequences to your equipment that might result from the migration process.

1.1 Comparing Flex System with BladeCenter

Before starting any migration, it is useful to first understand the hardware infrastructure, the value proposition of the Flex System, and the key hardware components. A simple approach is to start with a familiar concept and extend the thinking to the new offerings. In this paper, the BladeCenter system is used to introduce the Flex System.

Capacity planning is not a simple mapping of one component to another. Instead, also considered in the new workload planning are the scalability, reliability, availability, serviceability, and manageability of the offerings of the new Flex System as compared to BladeCenter. This hardware component comparison is only an example that is used to begin the planning process.

1.1.1 Chassis

The Flex System chassis, compute node, storage, networking, and management components are engineered to integrate and deliver optimized, highly reliable systems.

The Flex System features blade server technology. This type of server is a hot-swap, independent server with its own processors, memory, storage, network device controllers, operation system, and applications.

The chassis is an enclosure for blade servers that supplies shared power modules, cooling components (fans), and management modules for system management. The chassis also includes I/O modules, such as Ethernet, Fibre Channel, InfiniBand, and Serial Attached Small Computer System Interface (SAS) switch modules. In some configurations, network pass-through modules also are used for different network topologies.

Shared modules are included with Flex System Enterprise chassis.

The hardware form factor differs between a BladeCenter chassis and Flex System Enterprise chassis in the following aspects:

- The BladeCenter H Chassis has 14 slots (also known as *bays*) and is 9U high. The orientation of the blade servers is vertical in most BladeCenter chassis.
- Flex System Enterprise chassis also has 14 bays, but the bays are horizontally arranged in seven rows, each with two standard-width bays. The Flex System Enterprise chassis is 10U high.



The different chassis designs are shown in Figure 1-2.

Figure 1-2 Front view of the BladeCenter H chassis and the Flex System Enterprise Chassis

The rear view of the chassis shows that, although the components are arranged differently, the components are similar. These components include I/O modules, fan modules, power modules, and so on, which are shared by all the servers within the chassis.



Figure 1-3 shows the rear view of the chassis.

Figure 1-3 Rear view of the BladeCenter H and Flex System chassis

1.1.2 Compute nodes

A BladeCenter chassis includes bays for blade servers or other BladeCenter devices, as shown in Figure 1-4. The blade server shares power, fans, switches, and ports with other blade servers.



Figure 1-4 Blade servers that are installed in a BladeCenter chassis

In the Flex System, a *compute node*, such as a blade server, contains components such as microprocessors, memory, Ethernet controllers, and hard disk drives. Power and network connections are provided by the mid-plane of the Flex System Enterprise chassis.

Flex System Enterprise Chassis supports up:

- 28 servers in 14 Flex System x222 Compute Nodes
- ▶ 14 servers in 14 Flex System x220 or x240 Compute Nodes
- ► 7 servers in 7 Flex System x440 Compute Nodes

Figure 1-5 shows a one-bay compute node (or *standard* compute node) and a two-bay compute node (or *double-wide* compute node).



Figure 1-5 Flex System compute nodes that are installed in the Enterprise Chassis

1.1.3 Management module

The management module is a hot-swap module that is used to configure and manage BladeCenter or Flex System components. The BladeCenter and Flex System chassis have similar modules, but the names differ:

- ► BladeCenter uses the Advanced Management Module (AMM)
- ► Flex System Enterprise Chassis uses the *Chassis Management Module* (CMM)

Figure 1-6 shows the form factor and installation position for each of these modules in the BladeCenter chassis and Flex System Enterprise chassis.



Figure 1-6 Comparing the management modules

The login windows are similar to the windows that are shown in Figure 1-7 on page 7.

			IBM.	Login window for the Flex System CMM	
	IBM Chassis Management Module	1			
	User name: USERID Password: ••••••• Inactive session timeout				
	no timeout 👻	BM BladeCent	ter₀ E Advanced M	anagement Module	IBM.
	Log In				
	Licensed Materials - Property of IBM Corp. © IBM Coporation an trademark of the IBM Corporation in the United States, other co	Welcome	to the Advan	ced Management Module	
N		User ID:	USERID		
		Password:	Log In		
	Login window for the BladeCenter AMM		Copyright © IBM	Corporation 2005-2011. All rights reserved.	

Figure 1-7 Login windows

During the setting migration process from AMM to CMM, document the settings of the power policies, user accounts, and the network so that the source and target systems are consistent after migration.

The CMM provides more security and powerful systems management functions. Some new settings can be applied to the CMM after you migrate the old settings. For more information, see the *Chassis Management Module User's Guide* at this website:

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

1.1.4 Systems management

Flex System Manager[™] is a management node that configures and manages multiple chassis platforms remotely. Flex System Manager provides systems management functions for all compute nodes in a multiple-chassis configuration (up to four chassis and 56 nodes).

Flex System Manager is an essential component for PureFlex System, but still can be an optional component for Flex System. From a hardware perspective, it is a standard compute node that is preinstalled with an OS and management software stack.

Figure 1-8 shows the Flex System Manager node.



Figure 1-8 Flex System Manager

Because a similar component is not available for BladeCenter, there are no configuration or data settings to be migrated to the Flex System.

If your configuration does not include Flex System Manager, Lenovo ToolsCenter is another option that can provide you with basic hardware management capability, including server diagnostic tests, an UEFI configuration, a firmware update, and operating system deployment. ToolsCenter supports some basic hardware management for Flex System and for BladeCenter. For more information and to download it, go to the following website:

http://ibm.com/support/entry/portal/docdisplay?lndocid=tool-center

1.1.5 Power supplies and fan modules

The BladeCenter H chassis includes two or four hot-swap power modules and two hot-swap blowers for cooling, as shown in Figure 1-9.



Figure 1-9 BladeCenter H power and blower modules

The design of the Flex System Enterprise Chassis is much more integrated. It supports up to six auto-ranging AC power supplies and up to 10 fan modules (two 40 mm fan modules and eight 80 mm fan modules). It includes a minimum of six hot-swap fan modules (four 80 mm fan modules and two 40 mm fan modules).

The two smaller 40 mm fan modules at the top of the chassis provide cooling to the I/O modules and the CMMs. The larger 80 mm fan modules provide cooling to the compute nodes and the Flex System Manager.



Figure 1-10 shows the Flex System Enterprise Chassis power and fan modules.

Figure 1-10 Flex System power and blower modules

Although the power and fan modules do not directly affect the workload migration, you must ensure that the modules are sufficient for your availability, redundancy, and energy consumption needs. For more information, see the *Flex System Enterprise Chassis & PureFlex Power Requirements Guide*, found at:

http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP102111

1.1.6 I/O modules

The BladeCenter H chassis contains 10 hot-swap I/O module bays that can be used in the following configurations:

- The modules in bays 1 and 2, such as Ethernet switches or pass-through modules, provide a communication link for the first and second network interface controllers (NICs) on each blade server.
- The modules in bay 3 and 4 can be switch modules or bridge modules. If a switch module is installed, the module provides a communication link for the third and fourth NIC in each blade server, similar to bays 1 and 2. If bridge modules are installed, they provide links to bays 7 10 that can be used as additional outputs for I/O modules in those bays.

- ► The modules in bays 5 and 6, such as bridge modules, provide links to bays 7 10 that can be used as additional outputs for I/O modules in those bays. (This configuration is the same as a configuration that uses bays 3 and 4 in bridge mode.)
- Modules in bays 7 10, such as InfiniBand switches, provide high-speed communication links to NICs 5 - 8 in each blade server.

The Flex System I/O design is simpler and more flexible than the BladeCenter design. Four high-speed I/O modules are supported in the Flex System Enterprise Chassis, including Ethernet, Fibre Channel, and InfiniBand switches, and pass-through modules (optical and copper). These I/O module bays can be used in the following configurations:

- I/O module bays 1 and 2 support any standard Ethernet switches or pass-through modules that connect to the two integrated Ethernet controllers or an Ethernet I/O adapter in each of the compute nodes. When you install an adapter in the first slot on the compute node, the I/O module bays support any switch module with the same type of network interface that is used in the corresponding compute node adapter slot.
- ► I/O module bays 3 and 4 support Ethernet, Fibre Channel, InfiniBand switch modules, and pass-through modules. If you install an additional I/O module in bay 3 or bay 4, a corresponding adapter must be installed in each compute node to access the I/O bay.

With a range of available adapters and switches to support key network protocols, you can configure Flex System to fit in your infrastructure and still anticipate future needs. The networking resources in Flex System are standards-based, flexible, and fully integrated into the system, which results in a no-compromise networking 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.

Flex System features the following capabilities:

- ► Supports your networking infrastructure, including Ethernet, Fibre Channel, and InfiniBand
- Offers industry-leading performance with 1 Gb, 10 Gb, and 40 Gb Ethernet; 8 Gb and 16 Gb Fibre Channel and FDR InfiniBand
- Provides pay-as-you-grow scalability so you can add ports and bandwidth as needed

The BladeCenter and Flex System I/O modules are shown in Figure 1-11.



Figure 1-11 Comparison of I/O modules

During the migration process, the I/O module is important because it contains the network topology and other essential settings from your source system.

If you plan to migrate the old physical network topology to an Flex System, you must adhere to the following guidelines:

 Before starting the migration, you must consider the necessary I/O settings to migrate from the source system to the Flex System. It might not be necessary to migrate these configurations.

For example, if a Physical-to-Virtual (P2V) migration of the source server OS to the Flex Compute Node is needed, the original physical I/O settings must not be migrated. These settings must not be migrated because the original physical settings become virtual during the migration process. If you want to keep the old network topology, configure the similar settings in the virtual switch by using the hypervisor tool.

There are two types of modules: switch modules and pass-through modules. Use caution when the source system contains modules that differ from the Flex System because the network topology might need to be changed.

The following solutions are available for several common configuration scenarios:

 Scenario 1: A switch module is installed in the source system and in the Flex System Enterprise Chassis.

Solution: Document all the network information from the source system and apply that information to the Flex System.

 Scenario 2: A switch module is installed in the source system and a pass-through module is installed in the Flex System Enterprise Chassis.

Solution: Although no additional work is required, you must ensure that the compute node and switch I/O module connectivity is consistent with what was expected.

 Scenario 3: A pass-through module is installed in the source system and a pass-through module is installed in the Flex System Enterprise Chassis.

Solution: No additional work is required, and no changes are made in the Flex System Enterprise Chassis.

 Scenario 4: A pass-through module is installed in the source system and a switch module is installed in the Flex System Enterprise Chassis.

Solution: You do not need to retrieve information from the source switch. However, you must create a large VLAN group in the Flex System configuration of which all the compute nodes must be a member.

Ensure that the bandwidth of your Ethernet adapter, switch module, and Top of the Rack (TOR) switches match. If these switches do not match, the network operates at the lowest bandwidth that matches one of these components. Upgrade to a 10 Gb Ethernet network to make full use of the Flex System capacity.

1.1.7 Expansion nodes

Flex System offers directly attached expansion nodes, which are similar to BladeCenter expansion blades. These units provide a cost-effective way to add various industry-standard PCI Express (PCIe) adapters or storage to the attached server. They allow you to customize and balance your specific workload requirements by increasing the capabilities and usage of your existing compute node resources.

Two expansion nodes are available:

PCIe Expansion Node

The Flex System PCIe Expansion Node supports additional PCIe adapters and I/O expansion adapters for compute nodes in the Flex System Enterprise Chassis.

The PCIe Expansion Node is physically connected to a supported compute node. The connection is made through the interposer cable and connectors on the PCIe Expansion Node and compute node system boards. The expansion adapters that are installed in the PCIe Expansion Node are available only to the attached compute node.

The PCIe Expansion Node that is connected to the x240 Compute Node is shown in Figure 1-12 on page 12 along side the PCIe Expansion Blade for BladeCenter.



Figure 1-12 Comparison of PCIe expansion units

Storage expansion node

The Flex System Storage Expansion Node is a direct-attach storage enclosure that is dedicated to a single compute node in the Flex System Enterprise Chassis. It is similar to the BladeCenter Storage and I/O Expansion Blade, although the Storage Expansion Node provides more local storage than the BladeCenter unit.

The Storage Expansion Node is different from V7000 Storage Node in that the V7000 Storage Node is shared by all the compute node in chassis, and the Storage Expansion Node is accessible only by the compute node to which it is attached.

The storage expansion node is PCIe 3.0 and SAS 2.1 compliant. It supports up to 12 SAS or SATA 2.5-inch hot-swap hard disk drives and solid-state drives, and it supports JBOD configurations and RAID 0, 1, 5, 6, 10, 50, and 60. Some RAID configurations require a Features on Demand key, an optional 512 MB or 1 GB flash/RAID adapter, or both.

Figure 1-13 shows a comparison of the storage expansion units.



1.2 Introduction to the migration process

The migration process consists of two phases: hardware settings migration and OS and workload image migration. For the purposes of this paper, the following assumptions are made before initiating the migration:

- The Flex System chassis, servers, and I/O modules are installed, the power is on, and all cables are connected.
- Initial setup is complete for the Flex Chassis Management Module and Flex System Manager (if present).

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

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

This paper covers the two migration phases:

- Migrating hardware settings
- Migrating operating system images

Migrating hardware settings

In this chapter, you learn how to migrate hardware settings so that the source hardware and target hardware can be set as similar to each other as possible. These settings include the compute node, networking, and storage components.

The following topics are described in these sections:

- "Migrating chassis and compute node settings" on page 16
- "Migrating network settings" on page 32
- "Migrating storage settings" on page 41

2.1 Migrating chassis and compute node settings

Several groups of settings must be considered during the migration process: Advanced Management Module (AMM), Chassis Management Module (CMM), and Compute Node/Unified Extensible Firmware Interface (UEFI) settings.

This section covers the following topics:

- Migrating AMM and CMM settings
- Migrating compute node settings
- Migrating UEFI settings

2.1.1 Migrating AMM and CMM settings

As shown in 1.1.3, "Management module" on page 6, the management module is used to configure and manage BladeCenter and Flex System components. You configure and manage the components by logging in to the AMM web page. After you are logged in, you can capture the source chassis configuration settings and deploy the settings to the target CMM.

The AMM and CMM are assigned static IP addresses. Depending upon the configuration that is used, you can choose to acquire an IP address from a Dynamic Host Configuration Protocol (DHCP) address instead of using the assigned address. In either case, enter the IP address into a web browser and log in to the AMM with your AMM credentials, as shown in Figure 2-1.

<u>.</u>			
User ID:		ed Management Modul	e
assword:	•••••		
	Log In		
	Copyright © IBM Cor	poration 2005-2011. All rights reserved.	

Figure 2-1 AMM login window

Many management functions are available on the AMM web page. The following sections describe the settings that must be considered for migration from the AMM to CMM.

Determining power management settings

The power management policy settings determine how the BladeCenter chassis reacts in each power domain to a failure of a power source or power module. The combination of the BladeCenter configuration, power-management policy settings, and available power might cause blade servers to reduce their power level (throttle) or fail to turn on.

Follow these steps to determine the current power management settings:

 In the AMM navigation bar, click Monitor → Power Management. The BladeCenter Power Domain Summary page opens, as shown in Figure 2-2. This page features the power supply status and related information, including the Power Management Policy of the power domains.

	Power Domain 1	Power Domain 2
Status	Power domain status is good.	Power domain status is good.
Power Modules	Bay 1: 2000W Bay 2: 2000W	Bay 3: 2000W Bay 4: 2000W
Power Management Policy	Basic Power Management Total allowed power is higher than other policies only by the total power capacity of all the Power the maximum of chassis power rating. This is the conservative approach, since it does not provide for AC power source or Power Module failure. If supply fails, blade and/or chassis operation may 1	Basic Power Management Total allowed power is higher than other policies and is limited Modules up to eleast any protection any single power any single power be affected. supply fails, blade and/or chassis operation may be affected.
Maximum Power Limit T	2650W	2650W
Maximum Power Limit * Power in Use ** deCenter Power Domai	2650W 833W n Planning @	2650W 656W
Maximum Power Limit *	2650W 833W n Planning ⁽²⁾ 2650W 2650W 2650W	2650W 656W
Maximum Power Limit [*] Power in Use ^{**} deCenter Power Domai Maximum Power Limit [*] Allocated Power (Max) ^{***}	2650W 833W n Planning ¹ Power Domain 1 Power Domain 2 2650W 2650W 1631W 1309W	2650W 656W
Maximum Power Limit [*] Power in Use ^{**} deCenter Power Domai Maximum Power Limit [*] Allocated Power (Max) ^{****} = Remaining Power	2650W 833W n Planning ? 2650W 2650W 2650W 1631W 1309W 1019W 1341W	2650W 656W

Figure 2-2 Power Domain Summary page

2. Click **Basic Power Management** under each power domain in turn to change the power policy for each power domain. (Depending on the power policy you chose, the link name might differ from the link that is shown in Figure 2-2.) A table opens that lists the power management polices, as shown in Figure 2-3.

This table	his table lists the power management policies ordered from most conservative to least conservative.						
Select	Option Name	Power Supply Failure Limit [†]	Maximum Power Limit (Watts)				
0	Power Module Redundancy Intended for a single AC power source into the chassis where each Power Module is on its own dedicated circuit. Total allowed power draw 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 blade operation. Multiple Power Module failures can cause the chassis to power off. Note that some blades may not be allowed to power on if doing so would exceed the policy power limit. <u>More</u>	1	2000				
0	Power Module Redundancy with Blade Throttling Allowed Very similar to Power Module Redundancy. This policy allows you to draw more total power; however, capable blades may be allowed to throttle down if one Power Module fails. <u>More</u>	1	2650				
۲	Basic Power Management Total allowed power is higher than other policies and is limited only by the total power capacity of all the Power Modules up to the maximum of chassis power rating. This is the least conservative approach, since it does not provide any protection for AC power source or Power Module failure. If any single power supply fails, blade and/or chassis operation may be affected. <u>More</u>	9 O	2650				

Figure 2-3 Power management policy in effect

3. Review and record the AMM power policy settings as shown. In our example, the policy in effect is "Basic Power Management".

Current power policy setting: It is important to understand the current power policy setting and the effects of that setting. If the policy provides the protection and performance that is needed, migrate this policy to the CMM.

Determining user account settings

Follow these steps to determine the current user account settings:

1. In the navigation bar, click **MM Control** \rightarrow **Login Profiles**, as shown in Figure 2-4.

IBM BladeCenter _® E Advan	ced Manag	jement Modul	9				Welcome USERID		
Bay 1: SN#YK14807741JR D Monitors D Blade Tasks	Manage	ement Modu	le Logi	n Configuration	1 Ø				
 I/O Module Tasks MM Control General Settings Login Profiles 	Use th	e following links t Login Profiles	o jump d	own to different sectio	ns on this page.				
Alerts Serial Port Port Assignments		Group Profiles Account Security	Manager	nent					
Network Interfaces Network Protocols Chassis Int Network	Login F	Profiles 🕜	file, click	a link in the "Login ID'	' column.				
Securicy File Management Firmware Update		Login ID	Role	Active Sessions	Last Login	Password Compliant	Days Until Password Expires	Dormant	State
Configuration Mgmt	1	USERID	S	1	02/21/12 05:04:29	Yes	n/a		Active
Restart MM	2	xhj	S	0	09/24/09 15:21:24	Yes	n/a		Active
License Manager	3	<u>tester</u>	S	0	09/01/11 08:35:30	Yes	n/a		Active
Service Tools	4	<u>~ not used ~</u>							
	5	<u>~ not used ~</u>							
	6	<u>~ not used ~</u>							
	7	\simeq not used \sim							
	8	\simeq not used \simeq							
	9	<u>~ not used ~</u>							
	10	<u>~ not used ~</u>							
	11	\simeq not used \simeq							
	12	\simeq not used \simeq							
	Group Use th	Profiles for is section to confi	Acti∨e gure grou	Directory User	s 🕜				

Figure 2-4 AMM Login Profiles page

2. Click each user account. Document the information of each login profile that is defined with the login ID and the role or access level that is assigned to each profile.

3. Click **Account Security Management**. As shown in Figure 2-5, the advanced settings for Account Security Management are displayed. You document items such as authentication method, section timeout, and security level here.

Account Security Management (
User authentication method		Local only
Web inactivity session timeout		User picks timeout 💌
CLI inactivity session timeout (seconds)		0
Number of simultaneous active sessions for	r LDAP users	0 💌
Do not log new authentication events for th	e same user for	5 minutes 💌
Ignore client IP address when tracking use	r authentication events	
Account security level: Security Level		Details
Legacy security settings	No password requ No password expi No password re-u No password char Account is locked Simple password No account inactiv	ired ration se restrictions nge frequency restrictions for 2 minutes after 5 login failures rules ity monitoring
O High security settings	Password require Factory default 'U Force user to chai Passwords expire Password re-use Minimum 24 hour Account is locked Complex passwor Alert on account ii Accounts disabled	d SERID' account password must be changed on next login nge password on first login in 90 days checking enabled (last 5 passwords kept in history) interval between password changes for 60 minutes after 5 login failures d rules with 2 degrees of difference from previous password nactivity after 120 days after 180 days of inactivity
○ Custom security settings	Edit Security Se	ttings

Figure 2-5 Account Security Management settings page

Determining network settings

The Network Interfaces view displays the network and IP setting for AMM. Follow these steps to determine the current network settings:

 In the navigation bar, click MM Control → Network Interfaces. The External Network Interface page opens, as shown in Figure 2-6.

IBM BladeCenter. E Advanc	ed Management Module			Welcome USERID
Bay 1: SN#YK14807741JR Monitors System Status Event Log LEDs Power Management Hardware VPD Firmware VPD	External Network In Interface: Enabled IPv6 Enabled Hide all IPv6 configura	ation fields whe	t h0) 🕜 n IPv6 is disabled. <u>ms</u>	re
Remote Chassis Blade Tasks I/O Module Tasks MC Control General Settings	Primary Managemer	nt Module (e is in Bay 1 of M00145EE1A0FE	the chassis	
General Settings Login Profiles Alerts Serial Port Port Assignments	Domain name Register this interface wit Advanced Ethernet Setup	h DNS 🔲		
Network Protocols Chassis Int Network Security File Management Firmware Update	IPv4 DHCP DHCP **** Currently)isabled - Use si / the static IP	atic IP configuration	tive for this interface. *** This static configuration i
Configuration Mgmt Restart MM	IPv4 Static IP	Configuration	1	
Service Tools AMM Service Data	IP address Subnet ma	sk	9.125.90.213 255.255.255.0	
Blade Service Data AMM Status Service Advisor	Gateway ad	ldress	9.125.90.1	
	Link local addro	ess:		fe80::214:5eff:fedf:8068
	IPv6 static IP configuration			Enabled 2002:325b:1000::97d:5ad5
	Address pro Default rou	efix length (1-1: te	28)	64 0::0
	DHCPv6			Enabled 💌

Figure 2-6 AMM Module page

2. From this page, you can find the IPv4 and IPv6 settings for the AMM, including the DHCP setting, IP address, mask, and gateway configuration information.

For more information about these and other settings in the AMM, see the *Advanced Management Module User's Guide* at this website:

http://download.boulder.ibm.com/ibmdl/pub/systems/support/system_x_pdf/00d3237.pdf

You now have most (if not all) of the relevant customizations that are made in the AMM. You can access the CMM in the Flex System Enterprise Chassis to apply the new settings. Log in with your CMM credentials, as shown in Figure 2-7 on page 21.

IBM Chassis	Management Module	
	User name:	
and the second second	USERID	
	Desword	
888888	••••••	
	Inactive session timeout	
	no timeout 👻	
	Log In	

Figure 2-7 CMM login window

Applying power management settings

Follow these steps to apply the current settings to the CMM:

 From the menu bar at the top of the main CMM window, click Chassis Management → Power Modules and Management, as shown in Figure 2-8. The Power Modules and Management window opens, as shown in Figure 2-9 on page 22.

IBM Chassis Management Module			Welcome, USERID! Settings H
😵 System Status Multi-Chassis Monitor Events 🗸 Service and Support 🗸	Chassis Management 👻	Mgt Module Management 🗸 Search	
	Chassis	Properties and settings for the overall chassis	
	Compute Nodes	Properties and settings for compute node in the d	hassis
Service and Support: no open problems.	I/O Modules	Properties and settings for I/O Modules in the cha	issis
	Fans and Cooling	Cooling devices installed in your system	
Chassis Active Events	Power Modules and Mar	agement Power devices, consumption, and allocation	
Table View	Component IP Configura	tion Single location for you to view and configure the v	various IP address setting of chassis components
	Chassis Internal Networ	k Provides internal connectivity between compute n	ode ports and the internal CMM management port
	Hardware Topology	Hierarchical view of components in your chassis	
	Reports	Generate Reports of hardware information	

Figure 2-8 Chassis Management Module menu

2. Click **Change** under the No Power Policy section (as shown in Figure 2-9) to set or change the power policy.

Power Manage power	Module r related policies	s and Managem	ent				
Policies	Hardware	Input Power and Allocation	Power History	Power Scheduling			
No Set j Curr	Power Poli policies for how rent policy: B é	Cy or if you wish to protect your chas asic Power Management	isis in the case of p	otential power module f	ailure.		
Power Limiting/Capping Policy							
Set	policies for how	or if you wish to limit the total amo	ount of power that I	the chassis overall is allo	owed to consume.		
Curr	rent policy: No	Power Capping Change					

Figure 2-9 Power Modules and Management window

3. The Change Power Policy window opens, as shown in Figure 2-10 on page 23. In this window, there are five options available (three are identical to the policies on the AMM). The Flex System Enterprise Chassis includes more power options than BladeCenter. You must understand the meaning of the additional options if you want to use them.

Change Power Policy			x
	Power Supply Failure Limit	Maximum Input Power (Watts)	Estimated Actual Input Power for your chassis (percent)
AC Power Source Redundancy Intended for dual AC power sources into the chassis. Maximum input power is limited to the capacity of two power modules. This is the most conservative approach and is recommended when all four power modules are installed. When the chassis is correctly wired with dual AC power sources, one AC 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.	1	2745	24
AC Power Source Redundancy with Compute Node Throttling Allowed Very similar to the AC Power Source Redundancy. This policy allows higher input power, however capable compute nodes may be allowed to throttle down if one AC power source fails.	1	3538	19
Power Module Redundancy Intended for a single AC power source into the chassis where each Power Module is on its own dedicated circuit. Maximum input 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 so would exceed the policy power limit.	1	2745	24
Power Module Redundancy with Compute Nodes Throttling Allowed Very similar to Power Module Redundancy. This policy allows higher input power; however, capable compute nodes may be allowed to throttle down if one Power Module fails.	1	5490	12
Basic Power Management Maximum input power 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 AC power source or Power Module failure. If any single power supply fails, compute node and/or chassis operation may be affected.	0	5490	12
OK Cancel			

Figure 2-10 CMM Change Power Policy window

4. Click **Change** in the Power Limiting/Capping Policy section of the Power Modules and Management window, as shown in Figure 2-9 on page 22. The Change Power Policy window opens, as shown in Figure 2-11. From this window, you can set or change the power capping policy. By setting a specific power static capping limit value, you can control the chassis power consumption that is suitable for your environment.

Change F	Power Capp	ing Policy						Х
 No Power Capping Maximum input power will be determined by the active Power Redundancy policy. Static Capping Sets an overall chassis limit on the maximum input power. In a situation where powering on a component would cause the limit to be exceeded, the component would not be permitted to power on. 								
0%	20%	40%	60%	80%	100%	4057 74	Watts (Range 1979 - 5490) % of max allocation	
OK	Cancel							

Figure 2-11 Change Power Capping Policy window

Applying user account settings

Follow these steps to apply the current settings to the CMM. You need to decide which user accounts and groups to migrate:

5. From the CMM, click **Mgt Module Management** → **User Accounts**. The User Accounts window opens, as shown in Figure 2-12.



Figure 2-12 User Accounts window

- 6. Click **Create User** (see Figure 2-12) and re-create the same user IDs and passwords that are used with the source AMM.
- 7. In the Group profiles tab, click **Add a Group** (as shown in Figure 2-13) to create the same group profile as the source AMM.

User Accounts Shows the user accounts defined for this web console.					
Accounts Permission Groups Group profiles					
Use this section to configure group authorization profiles. <i>These profiles will not be used while the LDAP client is configure page.</i> Add a Group					
Gr	oup ID	Role	Role		
No Data Available					

Figure 2-13 Group profiles tab

8. In the Accounts tab, click **Global Login Settings**. The Global Login Settings window opens, as shown in Figure 2-14 on page 25.

IBM Chassis Management Module					
😢 System Status Multi-Chassis Monitor Events 🕶 Service and Support 👻 Chassis Management 👻 Mgt Module Management 👻					
User Shows th Accour Creat	Accounts ne user accounts define nts Permission Gr te User Globa	ed for this web console. oups Group profiles	Currently Logge	Global Login Settings Global Login Settings	
	User Name	Permission Group	# Active Sessions	General Account Security Level	
0	USERID	supervisor	2	User authentication method	
0	HMC		0		
				User selects timeout period	
				CLI inactivity session timeout (seconds)	
				Number of simultaneous active sessions for LDAP users	
				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 2-14 Global Login Settings window

- 9. Use the same settings here that you used in the source AMM.
- 10.Click the **Account Security Level** tab and choose the needed security settings, as shown in Figure 2-15.

Global Login Settings					
Global Login Settings					
General Account Security Level					
Legacy Security Settings 🤜					
Custom Security Settings riod (days) None					
High Security Settings se cycle None					
Legacy Security Settings nge interval (hours) None					
Account is locked for 2 minutes after 5 login failures Yes					
Simple password rules Ye					
Account inactivity monitoring None					
OK Cancel					

Figure 2-15 Global Login Settings window

Applying network settings

Apply the network settings to the CMM, IPv4, and IPv6 by selecting **Mgt Module Management** \rightarrow **Network**, as shown in Figure 2-16.

IBM Chassis Management Module		Welcome, USERID! Settings Help		
😣 System Status Multi-Chassis Monitor Events 🕶 Service and Support 👻 Chassis Management 👻	Mgt Module Management 👻	Search:		
	User Accounts	Create and modify user accounts that will have access to this web console		
Network Protocol Properties	Firmware	View CMM firmware information and Update firmware		
	Security	Configure security protocols such as SSL and SSH		
Apply	Network	Network settings such as SNMP and LDAP used by the CMM		
Ethernet SNMP DNS SMTP LD&P (lient TCP Command Mode SLP ETP	Configuration	Backup current configuration and restore a configuration		
	Properties	Properties and settings such as Date and Time and Failover		
Ethernet Configuration	License Key Management	Licenses for additional functionality		
	Restart	Restart the CMM. Typically only needed when experiencing problems.		
Host name MM5CF3FC25DDED	Reset to Defaults	Sets all current configuration settings back to default values		
Register this interface with DNS	File Management	View or delete files in the CMM local storage file system.		
IPv4 IPv6 Advanced Ethernet Currently assigned IPv4 address information IP address: 9.125.90.108 Subnet mask: 255.255.255.255.25 Default gateways 9.125.90.1 DNS primary: 9.125.90.211 DNS secondary: 9.125.90.212 DNS tertiary: 9.181.2.101 IP address assignment method: Enabled - Obtain IP address from DHCP server				

Figure 2-16 Network Protocol Properties window

After completing these migration steps, you might consider migrating more customized settings to their specific environment. For more information, see the *Chassis Management Module User's Guide* at this website:

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

2.1.2 Migrating compute node settings

In this section, we describe how the configuration information of a compute node (server node) is obtained. The configuration information includes the OS type, host network settings, virtual machine utilization, and host resource allocation.

You must ascertain the blade setting through the AMM interface. Knowing the blade setting saves time later in the migration process.

Follow these steps to determine the current blade settings:

- 1. Log in to the AMM with your AMM credentials.
- 2. In the navigation bar, click **System Status**. In the Blades section (as shown in Figure 2-17 on page 27), the status of all chassis bays is shown, including information about the installed blade servers.
| 08BD1PY Click | s 🕜
the icon in | the Status column to viev | v detaileo | l inform | ation a | bout each | blade. | | | |
|----------------------|---------------------------|---------------------------|------------|----------|--------------|--------------|-------------------|--------------|--------------|--------------|
| us | | | | Own | ier** | **** | 1/0 C | * | Lo | cal Co |
| Ва | y status | Name | PWr | кум | MT* | CKVM | 1/O Compatibility | WOL | Pwr | KVI |
| 1 | | Mako_TCD_B034 | On | ~ | | | OK | On | ~ | ~ |
| ent 2 | | HX5TCTB023 | On | | | | <u>OK</u> | On | \checkmark | \checkmark |
| 3 | 8 | Comm Error | | | | | Unknown | | \checkmark | \checkmark |
| 4 | | Crichton5 | On | | | | <u>OK</u> | On | \checkmark | \checkmark |
| 5 | 8 | HS22V_Mako_SIT | On | | | | OK | On | \checkmark | \checkmark |
| 6 | | Crichto_TCTB007 | On | | | | OK | On | \checkmark | ~ |
| : 7 | | SN#Y010UF13F050 | Off | | | | OK | On | \checkmark | ~ |
| 8 | | None | On | | | | <u>OK</u> | On | \checkmark | ~ |
| 9 | | Mongoos_TCTB014 | On | | | | OK | On | \checkmark | ~ |
| 10 | | TCDB010_TBU | On | | | | <u>OK</u> | On | \checkmark | \checkmark |
| 11 | 8 | Comm Error | | | \checkmark | | Unknown | | \checkmark | \checkmark |
| 12 🖬
13 🖬
14 🗐 | | Crichto_TCDB023 | On | | | \checkmark | OK | On | \checkmark | \checkmark |
| | | TCDB021_TBU | On | | | | OK | On | \checkmark | \checkmark |
| | Mongoos_TCTB013 | On | | | | <u>OK</u> | On | \checkmark | ~ | |

Figure 2-17 System Status window

- 3. Create a mapping list that includes the host name and its host IP addresses. Use the remote presence feature in the AMM to obtain the IP address. The OS must be running before completing this step.
- 4. In the navigation bar, click **Blade Tasks** → **Remote Control**. The Remote Control Status window opens, as shown in Figure 2-18.

Blade3 - SN#Y030UN19R00R): Blade8 - HS22VTCTB031	•	1
): Blade8 - HS22VTCTB031	•	
]
No session in progress.		
		Ref
remotely. A new window will ap On this window, you will have f Ilso be able to change KVM and wnload the Java Runtime Enviror	pea ull k med mee	or that provides access to the keyboard and mouse control dia tray ownership. ent (18E) if the Java Plug-in is
	remotely. A new window will ap . On this window, you will have f . lso be able to change KVM and n	remotely. A new window will appea On this window, you will have full H lso be able to change KVM and me

Figure 2-18 Remote Control Status window

Tip: For more information about the Remote Control features of the AMM, see the *Advanced Management Module User's Guide* at this website:

http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5073887

5. In the Remote Control Status window, select each server in turn, and log in and use the OS windows to determine the host IP addresses of each server. For example, for Windows, you can use Network Connections by way of the Windows Control Panel to determine the host IP address, as shown in Figure 2-19.

	x	Network Connection Deta	ils
Seneral		Network Connection Details:	
		Property	Value
Connection		Connection-specific DN	
IPv4 Connectivity:	Internet	Description	Broadcom BCM5708S NetXtreme II Gi
IPv6 Connectivity: No In	iternet access	Physical Address	00-1A-64-59-1D-B6
Media State:	Enabled	DHCP Enabled	Yes
Duration: 12 c	days 21:21:14	IPv4 Address	9.125.90.112
Speed:	1.0 Gbps	IPv4 Subnet Mask	255.255.255.0
specar	110 0000	Lease Obtained	Wednesday, December 21, 2011 1:50
Details		Lease Expires	Thursday, December 22, 2011 9:20:4
		IPv4 Default Gateway	9.125.90.1
		IPv4 DHCP Server	9.125.90.211
Activity		IPv4 DNS Servers	9.125.90.211
			9.125.90.212
Sent 🔊	Received		9.181.2.101
	Received		9.181.2.102
		IPv4 WINS Server	
Bytes: 5,226,843,324 4	,/34,010,106	NetBIOS over Tcpip En	Yes
		IPv6 Address	2002:97d:5aed:5:c546:a21a:696d:55
🔗 Properties 🛛 🤗 Disable 🛛 Diagnose		•	
			Close
	Close		

Figure 2-19 Windows networking window that shows the host IP address

For Linux, the IP address is displayed by using **ifconfig**, as shown in Figure 2-20.

vn😃 🖓 - P	Piranha_TCTBODI 🚽 the 🕕 - the 🛄 - the 🛄 - 2.1 Chil Alt Shift 🛋 📮 🔭 ?	>>
Videc	Power Control KVM Media Tray Softkey Remote Drive Preferences Help	
	RX packets:617854 errors:0 dropped:0 overruns:0 frame:0	
	TX packets:16523 errors:0 dropped:0 overruns:0 carrier:0	
	collisions:0 txqueuelen:1000	
	RX bytes:74240365 (70.8 MiB) TX bytes:4483906 (4.2 MiB)	
	Interrupt:255 Memory:fa000000-fa012800	
vmnic1	Link encap:Ethernet HWaddr 00:21:5E:97:B5:D6	
	UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1	
	RX packets:0 errors:0 dropped:0 overruns:0 frame:0	
	TX packets:0 errors:0 dropped:0 overruns:0 carrier:0	
	collisions:0 txqueuelen:1000	
	RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)	
	Interrupt:255 Memory:92000000-92012800	
vswif0	Link encap:Ethernet HWaddr 00:50:56:44:AE:CB	
	inet addr 9.125.90.205 Bcast:9.125.90.255 Mask:255.255.255.0	
	UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1	
	RX packets:355790 errors:0 dropped:0 overruns:0 frame:0	
	TX packets:18017 errors:0 dropped:0 overruns:0 carrier:0	
	collisions:0 txgueuelen:1000	
	RX bytes:47010456 (44.8 MiB) TX bytes:48024596 (45.7 MiB)	
More		

Figure 2-20 Determining the IP address of a Linux server

For servers that are installed with bare metal hypervisors, such as VMware vSphere (formerly ESX or ESXi), the method to obtain the IP address is different. In most cases, you can obtain the IP address directly from the panel that is shown in Figure 2-21.

```
      UMware ESX 4.1.0 (UMKernel Release Build 502767)

      IBM System x -[7870]-

      Click inside center of viewab

      Intel(R) Xeon(R) CPU X5667 @ 3.07GHz

      8 GB Memory

      Download tools to manage this host from:

      http://9.125.90.189/

      To open the ESX console, press Alt-F1.

      To return to this screen, press Alt-F11.
```

Figure 2-21 Determining the IP address of a VMware ESX server

You can build a comprehensive spreadsheet that includes the chassis identifier, blade server bay number, host name, operating system (OS) type, and host IP address. This information is critical to the migration process and is regarded as the starting point to create the workload migration plan.

You must also consider the mapping relationship of the target compute nodes, including the virtualized and physical computing nodes. For more information, see Chapter 3, "Migrating operating system images" on page 55. Example 2-1 shows an example of Physical-to-Virtual (P2V) system information.

Example 2-1 Sample collection of system information

```
Flex System Enterprise Chassis (IP of CMM, related setting from AMM)
Compute Node1
OS (VMware vSphere/ESXi 5.0)
Virtual Machine: P2V from source blade 1 (Windows 2008: 192.168.1.1)
Virtual Machine: P2V from source blade 2 (Windows 2003: 192.168.1.2)
Virtual Machine: P2V from source blade 3 (Windows 2003: 192.168.1.3)
Compute Node2
OS (Red Hat 5.4)
Virtual Machine: P2V from source blade 4 (SLES 11: 192.168.1.4)
Virtual Machine: P2V from source blade 5 (SLES 10.3: 192.168.1.5)
```

2.1.3 Migrating UEFI settings

An optional migration step is to copy BIOS or UEFI settings that might be preserved from the source server to the target server. (The source server can be BIOS-based or UEFI-based.) For this task, the first step is to determine the settings that need to be migrated.

Follow these steps to determine the current UEFI settings:

1. When prompted, press **F1** during the system boot process. A System Configuration and Boot Management menu opens that is similar to the menu shown in Figure 2-22.

System Information System Settings Date and Time Start Options Boot Manager System Event Logs User Security Save Settings Restore Settings Load Default Setting Exit Setup	ystem Configuration and Boot	t Management Select this entry to display general information about the processors, memory, and firmware components of the system.
î↓=Move Highlight	<enter>=Select Entry</enter>	<esc>=Exit Setup</esc>
[]] Informational E	vent(s) Detected, Check POS	I Event Viewer

Figure 2-22 System Configuration and Boot Management window

This menu includes the settings for the compute node. A similar configuration menu is available for the compute nodes in a Flex System configuration.

2. Choose the settings that you deem important and use the same or similar settings between the source and target server. Using these same settings helps to ensure that both servers have the same performance, power, capability, and reliability features.

	Change Boot Order	
Change the order	<cd dvd="" rom=""> <floppy disk=""> <hard 0="" disk=""> <pxe network=""></pxe></hard></floppy></cd>	Change the order
Commit Changes		
		I
†↓=Move Highlight	<enter>=Select Entry</enter>	Esc=Exit
[]] Informational Ev	ent(s) Detected, Check POST	Event Viewer

Pay attention to the customized server boot order and security settings, as shown in Figure 2-23.

Figure 2-23 Change Boot Order menu

3. Review the Intel Virtualization Technology (Intel VT) setting in the Processors setting page, as shown in Figure 2-24. Most Flex System clients run a virtualization environment, so you must ensure that the Intel VT settings are enabled.

	Processors	
All CPU Packages Performance States Turbo Mode Power C-States C1 Enhanced Mode ACPI C-State limit Report C2 to OS Virtualization UT-x UT-d Cache Data Prefetch Data Reuse QPI Link Speed Select Execute Disable more ↓	<enable> <disable> <disable> <enable> <acpi c3=""> <enable> <enable> <enable> <enable> <enable> <max performance=""> <enable></enable></max></enable></enable></enable></enable></enable></acpi></enable></disable></disable></enable>	Intel Virtualization Technology (VT-x) provides hardware support for processor virtualization on Intel x86 platforms.
î↓=Move Highlight <	Enter>=Select Entry	Esc=Exit
[]] Informational Event(s) Detected, Check POST	Event Viewer

Figure 2-24 Virtualization settings in UEFI

2.2 Migrating network settings

When planning for a server network setting migration, compare the network settings of the server nodes and network switch modules.

Assuming that you have the networking settings from the source servers, a mapping relationship might be needed in the case of static allocation or some required setting changes (for example, DHCP). These new settings are applied to target compute nodes within the utilities by OS, hypervisor, or other methods. You might want to migrate the NIC Adapter Teaming setting to the target system.

The following examples show how to configure Adapter Teaming on different platforms:

 Linux: Adapter Teaming is displayed in the command shell output of ifconfig, as shown in Figure 2-25 on page 33. You also can see that two physical adapters, eth0 and eth1, are bonded as bond0.



Figure 2-25 ifconfig output

 Microsoft Windows Server: The NICs from different vendors have their specified network teaming tools. Use these vendor-specific tools to manage these settings. Using a Broadcom adapter as an example, the Broadcom Advanced Control Suite can be used to create and manage the network teaming setting. Figure 2-26 shows that "Team1" is bonded by the Ethernet Adapter [0001] and Ethernet Adapter [0010]. Ethernet Adapter [0014] is still a Standby Member (stand-alone NIC adapter).

		×
Il Sign <u>D</u> iagnostics <u>C</u> able Analysis Load <u>B</u> alan	nce/Virtual Lan	
	😭 Save As 📜 Bi	estore 🣍 Help
∃ ∰ Team1 [0001] Broadcom NetXtreme Gigabit Eth [0010] Broadcom NetXtreme Gigabit Eth [0014] Broadcom NetXtreme Gigabit Eth [0014] Broadcom NetXtreme Gigabit Eth	hernet #2 hernet hernet #4	
Member Assignment for Team : Team1 Available Adapters	Load Balance Members [0001] Broadcom NetXtreme Gigabit Ether [0010] Broadcom NetXtreme Gigabit Ether	Create <u>T</u> eam <u>R</u> emove Team
	Standby Member	Add VLAN

Figure 2-26 Broadcom Advanced Control Suite window

After you complete the settings migration for the network adapter, you must manage the settings for the network switch module.

For the switch modules, the virtual local area network (VLAN) settings must be carefully documented. These windows display a group of hosts with a common set of requirements that communicates as though they were attached to the same broadcast domain, regardless of their physical locations. VLANs are the basic logic network topology of the source environment.

Follow these steps to retrieve the VLAN information from the source server (for this example, BladeCenter):

1. At the source side, log in to the AMM.

On the left side of the AMM window, click I/O Module Tasks → Configuration. The I/O modules that are installed in the source system are displayed, as shown in Figure 2-27.

IBM BladeCenter _® E Advar	nced Management	t Module	
Bay 1: SN#YK14807741JR Monitors System Status Event Log LEDs Power Management Hardware VPD Firmware VPD Remote Chassis Blade Tasks I J/O Module Tasks Admin/Power/Restart	I/O Module C	Configuration	
	IPv6 Suppor Click the ch I/O module below the action.	rt and Status neckboxes in the first c es; then, click one of th table and click Perform	olumn to select one or more le actions in the action list I Action to perform the desired
Configuration	🗖 Ba	y Name	IPv6 state
MM Control	1	Ethernet SM	not supported
Service Tools	2	Not installed	
	3	Not installed	
	4	Not installed	
	Enable IPv6	✓ Perform acti	on
	* SM = Switch N Fri, 06 Jan 2012 07:18:	1odule, CM = Concentra 45	ator Module, PM = Pass-thru Module

Figure 2-27 I/O Module Configuration window

3. Click the tab that is associated with the I/O module bay. In our example, this tab is **Slot 1**, as shown in Figure 2-28.

IBM BladeCenter _® H Advar	nced Management Module	
Bay 1: SN#0J1U9E5841EH	I/O Module Configuratio	'n
 Monitors System Status Event Log LEDs Power Management Hardware VPD Firmware VPD Remote Chassis Blade Tasks I/O Module Tasks Admin/Power/Restart Configuration Firmware Update MM Control Service Tools 	IPv6 Support Slot 1 Slot 1 Current IP Configuration Configuration method: IP address: Subnet mask: Gateway address: Subnet mask: Gateway address: To change the IP configuration Configuration tetls IP address New Static IP Configuration Configuration status IP address Subnet mask Gateway address Subnet mask Gateway address Advanced Options * SM = Switch Module, CM = Constatus Sat, 14 Jun 2012 12:15:28 Solor 12:15:28	Static 9.123.198.81 255.255.255.0 9.123.198.1 ation for this I/O module, fill in the following is will save and enable the new IP configuration. Enabled • 9.123.198.81 255.255.255.0 9.123.198.81 255.255.255.0 9.123.198.1

Figure 2-28 Information for the I/O module in Slot 1

- 4. Find the switch module type. (The type of device in Figure 2-28 is an Ethernet switch module as indicated in Figure 2-27 on page 35.) For each module type, you must determine whether you want the same configuration on the target side.
- 5. To find information such as the settings for the switch module VLAN, click **Advanced Options**. Scroll down to the Start Web Session section, as shown in Figure 2-29.

Start Web Session 🔞		
Choose your se	ssion parameters belo	ow, and then click Start Session. All available options for this module will be shown.
IP Address:	9.125.90.242	✓
Security:	Unsecure 💙	Start Session

Figure 2-29 Start Web Session section

6. Click **Start Session**. You see the web interface of the switch you selected. In our example, the switch is a Lenovo RackSwitch switch on which BladeOS is running, as shown in Figure 2-30. If you have different switches that are installed, the interface might be different.

BLADE Virtual Switch /	Extension for
BNT Layer 2/3 GbESM <u>Help Logout</u>	EXT1EXT2EXT3EXT4EXT5EXT6EXT7EXT8EXT9EXT10EXT11EXT12EXT33EXT14
Bay 1 Port Group Mapping	Port Group Mapping
Internal Port Settings External Port Settings Non-Default Virtual LANs	External Port Server Port EXT1 Group 1 INT1 Group 1 INT2 Group 1
oystem Settings	EXT2 Group 1 INT3 Group 1 INT4 Group 1 EXT3 Group 1 INT5 Group 1 INT6 Group 1
	EXT4 Group 1 INT7 Group 1 INT8 Group 1 INT9 Group 1 Group 1 INT10 Group 1
	EXT6 Group 1 INT11 Group 1 INT13 Group 1 INT14 Group 1
	Apply Saye Revert Apply
<u>د</u>	Арру Бакс Косстарру

Figure 2-30 Switch web interface

Figure 2-30 shows that all the blade servers connected to the specific switch are in one group (Group 1) and use static VLAN (port-based) information. For other switch devices, you might see the dynamic VLAN setting with the Media Access Control (MAC) address of the server that is connected to the port. However, you can ascertain the logic diagram by examining the types of VLAN settings.

Using the information that is gathered from the figures in the previous steps, follow these steps to configure the same network topology on the Flex System chassis:

1. Log in to the CMM.

2. From the menu bar, click **Chassis Management** → **Component IP configuration**. The Component IP Configuration window opens, as shown in Figure 2-31.

IBM Ch	assis Management Module						Welcome,	
🔕 Sys	tem Status Multi-Chassis Monitor	Events 👻 Servic	e and Support 👻	Chassis Management 👻	Mgt Module Management 👻	Search.		
Component IP Configuration Configure IPv4 and IPv6 address information for the components below. I/O Modules				Chassis Properties and settings for the overall chassis Compute Nodes Properties and settings for compute node in the chassis I/O Modules Properties and settings for I/O Modules in the chassis Fans and Cooling Cooling devices installed in your system Power Modules and Management Power devices, consumption, and allocation				
Вау	Description	IPv4 Enabled	IP Address	Component ID Configure	tion Single location for you to	Single location for you to view and configure the various TP add		
1	EN4093 10Gb Ethernet Switch	Yes	View	Component in Computa	CION Single location for you to	Single location for you to view and conligure the validas th address		
2	EN2092 1Gb Ethernet Switch	Yes	View	Chassis Internal Network	 Provides internal connecti 	Provides internal connectivity between compute node ports and the		
3	IBM FC3171 8Gb SAN Switch	Yes	View	Hardware Topology	Hierarchical view of comp	Hierarchical view of components in your chassis		
4	IBM FC3171 8Gb SAN Switch	Yes	View	Reports	Generate Reports of hard	Generate Reports of hardware information		
Compu Bay 1 2 3	te Nodes Description SN#Y030BG1AW00T SN#Y033BG17T02K SN#Y033BG17E027	IPv4 Enabled Yes Yes	IP Address View View View					

Figure 2-31 Component IP Configuration window

3. Click an Ethernet switch. An Ethernet Switch Configuration wizard opens, as shown in Figure 2-32.

IP Address Configuration	n EN2092 1Gb Ethernet Switch	х
General Setting	IPv6	
Current IP Conf	iguration	
Configuration Method IP Address Subnet Mask Gateway Address	Use Static IP Address 192.168.70.121 255.255.255.0 0.0.0.0	
Enable IPv4 Configuration Method	Use Static IP Address	
New Static IP Co	onfiguration	
IP Address	192.168.70.121	
Subnet Mask	255.255.255.0	
Gateway Address	0.0.0.0	
Apply		
Cancel		

Figure 2-32 Ethernet Switch Configuration wizard

4. Copy into a web browser the IP address that is listed in the Current IP Configuration section of the wizard. A login window opens, as shown in Figure 2-33.



Figure 2-33 EN2092 Ethernet Switch login window

- 5. Log in with the credentials you customized or use the following default login information:
 - User name: USERID
 - Password: PASSW0RD (where "0" is zero)
- Click Configure at the top of the window. In the navigation bar, click Flex System EN2092 1Gb ScSE → Switch Ports, as shown in Figure 2-34.

Configure Statistics Da	ashboard	Netwo	orking C)S						
Apply Save Revert Diff	Dump	Show Log	Help Lo	gout						
67. Feb 13 17:44:21 9.125.90.113 WARNING ntp: cannot c	ontact primary NTP serve	r fe80::200:	ff:fe00:0	-						
IBM Flex System EN2092 1Gb ScSE System System System Port-Based Port Mirroring	Switch P	ort State	VLAN Tagging disabled	Sw Default PVID	ritch Por PVID tagging disabled	rts Conf Tulticast Threshold disabled	iguratio t Broadcast d Threshold disabled	n Destination Lookup Fail Threshold disabled	802.1p Priority	FDB Learning
Layer 2	INT2/	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
RMON Menu	INT3/	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
Layer 3	INT4/	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
QoS	INT5/	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
Access Control	INT6/	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
Virtualization	INT7/	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	<u>INT8/</u>	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	<u>INT9/</u>	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	<u>INT10</u>	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	<u>INT11</u>	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	<u>INT12</u>	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	<u>INT13</u>	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	<u>INT14</u>	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	MGT1	enabled	enabled	4095	disabled	disabled	disabled	disabled	0	enabled
	EXT1	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	EXT2	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	EXT3	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	EXT4	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	EXT5	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	EXT6	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	EXT7	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	EXT8	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	EXT9	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled
	EXT10	enabled	disabled	1	disabled	disabled	disabled	disabled	0	enabled

Figure 2-34 EN2092 Ethernet Switch switch ports configuration

Except for the management port, all of the switch ports belong to PVID 1. This setting is the default setting. All of the compute nodes that are connected to this switch are in one VLAN. This configuration is similar to the configuration that was captured from the source switch.

 If you require additional customization, click Layer 2 → Virtual LANs → Add vLAN, as shown in Figure 2-35. Select the ports from the Ports Available list and click Add to add them to the VLAN.

IBM	Configu	ure	Statistics	Da	shboard	Netwo	orkin	gOS	
	Apply	Save	Revert	Diff	Dump	Show Log	Help	Logout	
103. Feb 13 19:23:	51 9.125.90	.113 I	NFO mgmt:	configu	iration				
IBM Flex System IBM Flex System	EN2092 1Gb	ScSE				VLAN	"New"	Confi	iguration
						VLAN ID (1 - 4094)) 2		
🔄 Port-Based Port	t Mirroring					VLAN Name	VL.	AN 2	
🔄 Layer 2						VLAN State	en	abled 🗸	•
"🚞 802.1x						Management Vlan St	tate di	sabled 🗸	
EDB									
<u> </u>	AN					Ports Availa	ble		Ports in Vlan
🗀 Spanning Tre	e Groups								
MSTP/RSTP/	/PVRST					Port			
						INT4A			Port
Failover						INT5A INT6A		<pre></pre>	INT1A
						INT7A		< <remove< td=""><th>e INIZA</th></remove<>	e INIZA
Trunk Hash						INT9A			
						INT10A			
PVST+ comp	atiblity								
VLAN Auto S	TG Assignme	ent					Pris	vate VI	AN
MAC Address	Notification							rate vi	
💼 RMON Menu							Туре І	lap Sta	itus
🗎 Layer 3							None () disa	abled
<u></u> QoS									
Access Control							Prote	ocol VL	.ANs
Virtualization							_		
🛄 Virtual Machi	ine						Proto	col Sta	atus
							Nev	/ Protoco	1
						Configure	e VIIAP	for E	xternal Ports

Figure 2-35 Add VLAN window

8. After submitting the change, you can see that an additional VLAN group is available, as shown in Figure 2-36.

VL.	ANs Configura	ation								
1. Search Rang	1. Search Range									
VLAN ID (1 - 4095) From 1 To 4095										
2. Search Options										
VLAN Name										
VLAN State	any 🗸	any 🗸								
Search Operation	or 🗸	or 🗸 Search								
VLAN 1	D VLAN Name	State								
<u>1</u>	Default VLAN	enabled								
2	VLAN 2	enabled								
4095	Mgmt VLAN	enabled								

Figure 2-36 VLANs Configuration window

9. Click **Switch Ports** in the navigation window again. As shown in Figure 2-37, ports 1 and 2 belong to the VLAN group 2 that you created.

IBN.	Configure	e Stat	istics	Dasl	hboard	Ν	letwo	rking C)S			
	Apply Sa	ave Re	vert D	Diff	Dump	St	now Log	Help Log	gout			
226. Feb 14 17:48:	41 9.125.90.11	13 NOTICE	system: li	nk up	on managem	ent port MGT1						
	5N0000 401 5	0.5							C-	ital Da	at a Carof	
IBM Flex System	EN2092 1Gb Sc	: <u>SE</u>							24	itch Poi	rts lonf	iguratic
System							_	VI.AN	Default	PTD	Inlticast	Broadcast
Switch Ports						Switch Port	State	Tagging	PVID	tagging	Threshold	Threshold
Port-Based Port	t <u>Mirroring</u>					<u>INT1A</u>	enabled	disabled	2	disabled	disabled	disabled
Layer 2						<u>INT2A</u>	enabled	disabled	2	disabled	disabled	disabled
802.1x						<u>INT3A</u>	enabled	disabled	1	disabled	disabled	disabled
						<u>INT4A</u>	enabled	disabled	1	disabled	disabled	disabled
Virtual LANs						INT5A	enabled	disabled	1	disabled	disabled	disabled
Add VL	AN					<u>INT6A</u>	enabled	disabled	1	disabled	disabled	disabled
Spanning Tre	e Groups					<u>INT7A</u>	enabled	disabled	1	disabled	disabled	disabled
	PVRSI					<u>INT8A</u>	enabled	disabled	1	disabled	disabled	disabled
						<u>INT9A</u>	enabled	disabled	1	disabled	disabled	disabled
E Failover						<u>INT10A</u>	enabled	disabled	1	disabled	disabled	disabled
Hot Links						INT11A	enabled	disabled	1	disabled	disabled	disabled
Trunk Groups						INT12A	enabled	disabled	1	disabled	disabled	disabled
Trunk Hash						<u>INT13A</u>	enabled	disabled	1	disabled	disabled	disabled
						<u>INT14A</u>	enabled	disabled	1	disabled	disabled	disabled
PVSI+ comp	atiblity					MGT1	enabled	enabled	4095	disabled	disabled	disabled
VLAN Auto S	IG Assignment					EXT1	enabled	disabled	1	disabled	disabled	disabled
MAC Address	Notification					EXT2	enabled	disabled	1	disabled	disabled	disabled
RMON Menu						EXT3	enabled	disabled	1	disabled	disabled	disabled
Layer 3						EXT4	enabled	disabled	1	disabled	disabled	disabled
QoS						EXT5	enabled	disabled	1	disabled	disabled	disabled
Access Control						EXT6	enabled	disabled	1	disabled	disabled	disabled
Virtualization						EXT7	enabled	disabled	1	disabled	disabled	disabled
···· Virtual Machi	ine					EXT8	enabled	disabled	1	disabled	disabled	disabled
						EXT9	enabled	disabled	1	disabled	disabled	disabled
						<u>EXT10</u>	enabled	disabled	1	disabled	disabled	disabled

Figure 2-37 The result of creating a second VLAN

2.3 Migrating storage settings

In addition to a compute node and network switch configuration, external storage is an item that you must plan for during the workload migration.

In many cases, critical data and images are on this external storage, but the data source is the same. If data is stored in external storage devices, maintain the data that is in those devices. The best approach is to map the new compute node to the same target logical unit number (LUN), where the data is stored.

In this section, the process to ensure that the images that contain the OS and applications are migrated smoothly is reviewed.

The storage settings migration processes (P2P, P2V, and V2V) for the images also are reviewed. (For more information, see Chapter 3, "Migrating operating system images" on page 55.)

Virtual-to-Physical migration: Although Virtual-to-Physical (V2P) migration is an option, it is rarely used and therefore is not covered in this document.

In the V2V and P2V migration scenarios, the underlying infrastructure must be as similar as possible, unless there is a valid reason against it. The configuration must be copied. If the image on the source server is on a local RAID array (for example, RAID-5), the image on the target server also is based on local RAID-5. The V2V scenario assumes that the same RAID level and additional configuration options are available on the new RAID controller. If no counterpart is found in the new hardware, you must decide which RAID level to use. However, using a local RAID array is still the primary consideration. But, if the image on the source server is on external storage, the target server must be configured in the same manner. Reuse the data segment by mapping the Fibre Channel host bus adapter (HBA) to the same LUN target.

The P2V process is different. When you want to move a workload from a physical system to a virtual system, most of the hardware configuration on the source server becomes meaningless. For instance, an RAID-5 configuration on the source server secures the storage with high availability. However, this configuration is no longer achievable on a virtualized disk for the target server because the hypervisor controls the virtual disk. The hypervisor might have a different policy from a local RAID-5 array and use storage area network (SAN) storage for implementing live migration.

There are a few ways to configure local RAID. If you want to configure the LSI Corporation RAID adapter, use the LSI Corporation Configuration Utility and WebBIOS.

Follow these steps to obtain the information about the RAID volumes in the source servers:

1. During system POST, press Ctrl+C when prompted to start the configuration utility, as shown in Figure 2-38. This utility features a menu style in which the RAID configuration can be defined.

LSI Corp Config Utility v6.30.00.00 (2009.11.12) Adapter List Global Properties									
Adapter	PCI PC Bus De	CI PCI	PCI Slot	FW Revision	Status	Boot Order			
SAS1064	0B 00) 00	00	1.30.10.00-IR	Enabled	0			
Esc = Exit Menu	F1/Shif	t+1 = He	lp						
Alt+N = Global Pro	perties	-/+ = Alt	ter Boo	t Order Ins/De	el = Alter Bo	ot List			

Figure 2-38 LSI Configuration Utility

2. Highlight the selected RAID controller (if it is not selected) and press Enter. In our example, our blade server has an onboard SAS1064 controller. The Adapter Properties window opens, as shown in Figure 2-39 on page 43.

LSI Corp Config Utility v6.30.00.00 Adapter Properties - SAS1064E	(2009.11.12)					
Adapter PCI Slot PCI Address (Bus/Dev) MPT Firmware Revision SAS Address NVDATA Version Status Boot Order Boot Support RAID Properties	SAS1064 00 0B:00 1.30.10.00-IR 5005076B:08A1EDAC 2D.22 Enabled 0 [Enabled BIOS & OS]					
SAS Topology Advanced Adapter Properties						
Esc = Exit Menu F1/Shift+1 = Help Enter = Select Item -/+/Enter = Change Item						

Figure 2-39 Adapter properties

3. Highlight **RAID Properties** and press Enter. The View Array window opens, as shown in Figure 2-40.

LSI Corp Config Utility v6.30.00. View Array - SAS1064E	00 (2009.11.12)						
Array Identifier Type Scan Order Size(MB) Status	1 of 1 LSILOGICLogical Volume 3000 IM 5 68664 Optimal						
Manage Array Slot Device Identifier Num 0 IBM-ESXSCBRBA073C3ETSO NC49C 1 IBM-ESXSCBRBA073C3ETSO NC49C	RAID Hot Drive Pred Size Disk Spr Status Fail (MB) Yes No Primary No 68664 Yes No Secondary No 68664						
Esc = Exit Menu F1/Shift+1 = Help Enter=Select Item Alt+N=Next Array C=Create an array R=Refresh Display							

Figure 2-40 View Array - RAID properties

In our example, the RAID level is RAID-1, as indicated by Type: IM (Integrated Mirroring). The logical size of the array is 68664 MB. Two physical drives also are available for the specific machine, as shown in Figure 2-40.

As an alternative interface, you can start the LSI MegaRAID WebBIOS utility by pressing Ctrl+H during POST, as shown in Figure 2-41.



Figure 2-41 Starting WebBIOS

The WebBIOS utility shows the physical and virtual devices and provides you a graphical display to view and configure RAID. The WebBIOS interface is shown in Figure 2-42.



Figure 2-42 MegaRAID BIOS Configuration Utility Virtual Configuration interface

Two virtual drives are available with RAID-1 and RAID-0 enabled separately, as shown in Figure 2-42. By clicking the icons on the left side of the window, you can obtain more information about these drives.

You also can obtain the RAID and disk information of the source server. You can use the same utility to apply the same RAID settings on the compute nodes in the Flex System chassis.

Follow these steps to create new RAID arrays on the Flex System compute nodes by using WebBIOS:

1. Click **Configuration Wizard** in the left navigation window of the MegaRAID BIOS Configuration Utility Virtual Configuration interface, as shown in Figure 2-42 on page 44. The Configuration wizard opens, as shown in Figure 2-43.

MegaRAID BIOS ConfigurationUtility Config Wizard - Disk Group Definition: To add drives to a Disk G Unconf Good drives and a undone by selecting the R	DG Definition roup, hold Control key while selecting lick on Accept DG. Drive addition can be eclaim button.
Physical Drives	Disk Groups
Enclosure I (ID 30) • He PD0: ONLINE: 68664 MB: • PD1: ONLINE: 33378 MB: • PD2: UNCONF GOOD: 33378 MB: • PD3: UNCONF GOOD: 139236 MB: • PD4: UNCONF GOOD: 139236 MB: • PD5: ONLINE: 68664 MB: • PD5: ONLINE: 68664 MB: • PD6: UNCONF GOOD: 33378 MB: •	DG0 FPD0: ONLINE: 68664 MB FPD1: ONLINE: 33378 MB FPD5: ONLINE: 68664 MB
🖆 AddtoArray	🖡 Accept DG 🏾 🎓 Reclaim
	X Cancel 4 Back Next

Figure 2-43 MegaRAID WebBIOS Configuration wizard

2. Choose the physical drives that you want to include in a virtual group and click **Next**. The VD Definition wizard opens, as shown in Figure 2-44.

KAID Level	RAID 0	
Strip Size	64 KB	
Access Policy	RW	
Read Policy	Normal	
Write Policy	WBack y	
🗖 Wrthru for	BAD BBU	
IO Policy	Direct	Press Back Button To Add Another VD.
IO Policy DISK Cache Policy	Direct V NoChange	Press Back Button To Add Another VD.
IO Policy DISK Cache Policy Disable BGI	Direct T NoChange T	Press Back Button To Add Another VD.
IO Policy DISK Cache Policy Disable BGI Select Size	Direct Image: The second sec	Press Back Button To Add Another VD.
IO Policy DISK Cache Policy Disable BGI Select Size	Direct V NoChange V No V 0 MB	Press Back Button To Add Another VD.

Figure 2-44 Configuring the RAID volume

3. Configure the same RAID and other disk settings from the source server.

The following tools also are available to configure RAID:

ServerGuide:

http://ibm.com/support/entry/portal/docdisplay?lndocid=SERV-GUIDE

MegaRAID Storage Manager:

http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5077712

If you need a lightweight, mouse-compatible utility, ServerGuide is the best option. This option also can help you with a Microsoft Windows OS deployment. MegaRAID Storage Manager is an advanced solution for users who require more configuration flexibility.

For the external storage configuration, you must plan Fibre Channel (FC) switch and storage settings. For switches, zone settings are the most important settings. *Zoning* is the partitioning of a Fibre Channel fabric into smaller subsets to avoid conflicts, add security, and simplify management.

Several virtual disks, or LUNs, are available through the SAN. Each system that is connected to the SAN is allowed access only to a controlled subset of the LUNs. For storage, the configuration is similar to local storage. You need to configure the RAID level, virtual disks, and so on.

Follow these steps to capture and apply the configuration settings of the Fibre Channel switch, including zone settings:

- 1. Log in to the AMM.
- In the navigation bar, choose I/O Module Tasks → Configuration. As shown in Figure 2-45, there is an FC Switch in Slot (Bay) 3.

IBM BladeCenter _® H Adva	nced Managen	nent N	Nodule	
Bay 1: SN#YK17808BD1PY	I/O Modu	le Co	nfiguration	
E Monitors	IPv6 Supp	ort	Slot 1 Slot 3 Slot 9	
 System Status Event Log LEDs Power Management Hardware VPD Firmware VPD Remote Chassis Blade Tasks Power/Restart 	IPv6 Sup Click ti modul the tat action.	port ne chec es; ther ble and	and Status kboxes in the first column to n, click one of the actions in click "Perform Action" to pe	o select one or more I/O the action list below rform the desired
Remote Control		Bay	Name	IPv6 state
Firmware Update Configuration		1	Server Conn Mod	not supported
Serial Over LAN		2	Not installed	
Open Fabric Manager		3	Fibre Channel SM	not supported
I/O Module Tasks		4	Not installed	
Admin/Power/Restart		5	Not installed	
Firmware Update		6	Not installed	
MM Control		7	Not installed	

Figure 2-45 AMM I/O Module Configuration

3. Click the **Slot 3** tab. The I/O Module Configuration window opens, as shown in Figure 2-46.

I/O Module Configurat	ion
IPv6 Support Slot 1 Sl	ot 3 Slot 9
Current IP Configuration	
Configuration method:	Static
IP address:	9.125.90.164
Subnet mask:	255.255.255.0
Gateway address:	9.125.90.1
To change the IP configu fields and click "Save". 7 New Static IP Configuration	iration for this 1/O module, fill in This will save and enable the new
Configuration status	Enabled 💌
IP address	9.125.90.164
Subnet mask	255.255.255.0
Gateway address	9.125.90.1
Advanced Options	

Figure 2-46 I/O Module Configuration

4. Click **Advanced Options**. Scroll down to Start CLI/Web Session, as shown in Figure 2-47.

Start CLI/Web Session 🕜		
Choose your se	ession parameters below, and then click Start Session. All available options for this module will be shown.	
Protocol:	Web 💌	
IP Address:	9.125.90.164	
Security:	Unsecure 💌	
	Start Session	

Figure 2-47 Starting the web interface to the FC switch

5. Click **Start Session** to start a management web page, as shown in Figure 2-48.



Figure 2-48 Fibre Channel switch web interface

 From the menu bar, click Zoning → Edit Zoning. The Edit Zoning windows opens, as shown in Figure 2-49 on page 49.



Figure 2-49 Edit Zoning

From these windows, you can see that there is one zone available, all. All the blade servers belong to this zone. You can also find details of the switch from this window.

Follow these steps to move to the Flex System chassis and migrate these settings to the FC switch:

1. Log in to the CMM.

2. From the menu bar, click **Chassis Management** → I/O modules to see the IO module list, as shown in Figure 2-50.

I/O Modules							
Power	r and Restart 🔻	Actions 🥆	-				
	Device Name	Restore Factory Defaults			Вау	Power	Serial Number
	IO Module 1	Send Ping Requests			1	On	Y250VT161594
	IO Module 2	Launch IOM Console			2	On	Y050VT16E07F
	IO Module 3		<u> Attention</u>		3	On	YK5022186014
	IO Module 4		Attention		4	On	YK5022187059

Figure 2-50 Launching the I/O Module console

 Select the SAN switch module (in this example, it is an FC5022 16Gb SAN Scalable Switch). Click Actions → Launch IOM Console. The web interface for the switch opens, as shown in Figure 2-51.



Figure 2-51 Web interface for the FC5022 16Gb SAN Scalable Switch

4. In the Task window on the left side of the interface, click **Zone Admin**. Add one new zone and place all of the ports into the zone, as shown in Figure 2-52.



Figure 2-52 FC5022 Zone Administration

The FC/SAN switch migration can be completed, but only if the source and target are SAN switches. If the source network protocol is Fibre Channel over Ethernet (FCoE) and the target is SAN or Internet Small Computer System Interface (iSCSI), the configuration becomes more complex.

For the external storage setting, you must use the management software of the vendor to manage the third-party product. For example, to manage IBM System Storage Data Studio storage, use the IBM Data Studio Storage Manager that is available at this web page:

http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5077693

There are two other complex configurations in which users must migrate network settings: moving from FCoE to SAN, or from iSCSI to SAN.

From a hardware device perspective, FCoE uses Converged Network Adapters (CNAs) and Converged switches. SAN has Fibre Channel Host Bus Adapters (FC HBAs) and SAN switches. iSCSI uses a normal NIC Adapter or iSCSI HBA and Ethernet switches. You must determine the properties of these kinds of network devices for migration.

However, FCoE and SAN share some configuration settings. These shared settings provide an opportunity for migration. For iSCSI to SAN or FCoE, there is no direct relationship between the two groups of settings, so there might be more work to complete the migration. Another possible scenario is to migrate the configuration settings from an existing local RAID or external storage (the source) to the Flex System V7000 Storage Node (the target). Given that the V7000 Storage Node is similar to the Storwize V7000, you can access the IBM Storwize management software and duplicate the configuration settings that you defined in the source storage.

To gain access to the storage node management software, complete the following steps:

- 1. Log in to the CMM.
- 2. From the menu bar, click Chassis Management \rightarrow Component IP Configuration, as shown in Figure 2-53.

ІВМ С	IBM Chassis Management Module							
🔕 s	ystem Status Multi-Chass	sis Monitor 🛛 Events 👻 Service	e and Support 👻	Chassis Management 👻	Mgt Module Management 👻	Search		
				Chassis	Properties and settings for	r the overall chassis		
Com	Component IP Configuration			Compute Nodes	Compute Nodes Properties and settings for compute nodes in the chassis			
Configure	e IPv4 and IPv6 address inform	lation for the components below.		Storage Nodes	Properties and settings for	r storage nodes in the ch	assis	
				I/O Modules	Properties and settings for	Properties and settings for I/O Modules in the chassis		
I/O M	odules			Fans and Cooling	Cooling devices installed in	Cooling devices installed in your system		
Bay	Device Name	IPv4 Enabled	IP Address	Power Modules and Management Power devices consumption and allocation				
1	IO Module 1	Yes	View	Power modules and man	agement Power devices, consump	uon, and allocation		
2	IO Module 2	Yes	View	Component IP Configura	tion Single location for you to v	view and configure the va	arious IP address se	
3	IO Module 3	Yes	View	Chassis Internal Networ	k Provides internal connectiv	vity between compute no	de ports and the inf	
				Hardware Topology	Hierarchical view of compo	onents in your chassis		
Comp	Compute Nodes			Reports	Generate Reports of hard	ware information		

Figure 2-53 Component IP Configuration menu in the CMM

3. Go to the Storage Nodes section and click the storage nodes device that you want to configure, as shown in Figure 2-54.

Storage Nodes				
Ва	ay	Device Name	IPv4 Enabled	IP Address
1-	-4:1	<u>Node 01 - 01</u>	Yes	View

Figure 2-54 Storage Node list

4. From the Tab menu, you can get or set the IP address of your storage node, as shown in Figure 2-55.

IP Address Configuration	Node 01 - 01	х
General Setting IPv4	IPv6	
Current IP Config	guration	
Network Interface:	eth0 👻	
Configuration Method: IP Address:	Obtain IP Address from DHCP server 9.110.76.17	
Subnet Mask: Gateway Address:	255.255.255.0 9.110.76.1	
Change IP Config	guration	
Configuration Method	Obtain IP Address from DHCP server	
Apply		
Close		

Figure 2-55 Storage node IP address

5. Open a new window in the web browser and enter the IP address of the storage node. You then see the welcome page of the IBM Storwize storage management software interface.

3

Migrating operating system images

When the hardware configurations are completed on the Flex System side, the next step is to migrate the operating system (OS) and applications from the source server to the Flex System. Before starting this migration process, it is helpful to understand the available migration options:

- Physical-to-Physical (P2P): Migrating the OS, applications, and data from one physical server to another physical server
- Physical-to-Virtual (P2V): Decoupling and migrating the OS, applications, and data from a physical server to a virtual machine that is guest-hosted on a virtualized platform. This is a typical scenario of server consolidation.
- Virtual-to-Virtual (V2V): Migrating an OS, application programs, and data from a virtual machine or disk partition to another virtual machine or disk partition. Typically, it is a move of virtual machine images from one physical host server to another.

Virtual-to-Physical migration: Although Virtual-to-Physical (V2P) migration is an option, it is rarely used and therefore is not covered in this document.

Review your current hardware configuration (the source and the target) to determine whether the source servers and Flex System (target servers) are connected on the same network. If the source and target servers are connected on the same network, the settings of the hardware and virtual image files can be transferred directly through the network. If the source and target servers are disconnected, the settings must be exported, transferred through removable storage, and then imported.

The migration solutions for the following scenarios are described in these sections:

- 3.1, "Source server and Flex System are disconnected" on page 56
- ► 3.2, "Source servers and Flex System are connected" on page 88
- ► 3.3, "Conclusion" on page 137

3.1 Source server and Flex System are disconnected

In this section, the following scenarios are described in which the source server and Flex System server are not connected by a local area network (LAN) or other network:

- Disconnected Physical-to-Physical
- Disconnected Physical-to-Virtual
- Disconnected Virtual-to-Virtual

3.1.1 Disconnected Physical-to-Physical

Before installing an OS to Flex System, you must check the ServerProven® list at the following website to confirm that the OS is supported:

http://ibm.com/systems/info/x86servers/serverproven/compat/us

In this paper, details are not provided about how to move a physical OS to the Flex System. However, the Norton Ghost backup product is one of the simplest tools to implement P2P, from which you can capture the image from the source disk and deploy the image to another disk.

For more information about Norton Ghost, see the following websites:

- http://www.symantec.com/themes/theme.jsp?themeid=ghost
- http://us.norton.com/ghost

Is it important to ensure the consistency of the drivers between the source server and the target server. The hardware for the source and target servers is different, which results in the issue of inconsistent drivers during the image migration. You must install updated drivers for the OS image of the target machine before or after transferring the drivers to the target server.

3.1.2 Disconnected Physical-to-Virtual

Before you attempt a P2V migration, the key performance of the old infrastructure must be monitored for at least one business cycle. Monitoring this cycle helps you understand more about the system usage over the entire business cycle period.

Numerous performance monitoring tools are available. For example, the Guided Consolidation module in VMware vCenter can monitor a server and report its average processing and memory quantities over a specified time. With this information, you can determine the amount of processing power and memory that you must assign to virtual machines before creating those machines.

You must also consider the type of hypervisor to deploy on the destination server. The following vendors provide hypervisors:

- VMware vSphere (ESX/ESXi)
- Microsoft Hyper-V
- ► KVM
- Citrix XenServer
- Qemu

These vendors have incompatible virtual disk formats such as VHD for Microsoft, VMDK for VMware, or qcow and qcow2 for QEMU, KVM, and Xen. Under these incompatibility conditions, you must use the corresponding vendor-specific tools or solutions for each vendor-specific platform. Regardless of the vendor solution you choose, the following solution implementation process is similar:

- 1. Capture the OS image from the source server as an OS image.
- 2. Copy the image to the destination hypervisor as a virtual machine.

We use Microsoft Hyper-V as the example in the following process to migrate a physical machine image to another machine as a virtual machine.

Before you begin, complete the following steps:

1. Prepare the target server that is deployed by Hyper-V and the System Center Virtual Machine Manager (SCVMM) server.

Hyper-V is included in Microsoft Windows Server 2008 R2 as one component. This hypervisor is part of the Windows Server 2008 R2 installation. The installation process can be completed from the retail Windows CD installation media or with the help of ServerGuide. You must ensure that the user enabled the Hyper-V role after installation.

An ServerGuide for your server configuration is available for download at this website:

http://ibm.com/support/entry/portal/docdisplay?lndocid=SERV-GUIDE

At the download website, click the corresponding server version number and browse to the guide download window. A link also is available for the ServerGuide Scripting Toolkit.

2. Identify a server to provide virtual machine management capabilities by installing and configuring System Center Virtual Machine Manager on the server.

For more information about Microsoft System Center, see this website:

http://www.microsoft.com/en-us/server-cloud/system-center/default.aspx

During the migration process, you must take the following measures:

- Connect the management server to the target host server in the Ethernet network.
- Ensure that the management server and target host server are in the same domain.
- ► Log in to the management server by using a domain user ID.

After you prepare all of the hardware and software, follow these steps to start the P2V process:

 Open the System Center Virtual Machine Manager (SCVMM) Console on the management server. Click Add host to add the destination server to the VMM pool, as shown in Figure 3-1.

🖥 Virtual Machine Manager - WINDOWS-NEQOGJH.ngptt.com								
File View Go Actions Help								
💱 💆 Actions 🔳 Columns 📕 Jobs 🔚 PRO	Tips (0)	👞 Networking 🔼	PowerShell 🕐	Help				
Virtual Machines	All H	OSTS Virtual Mad	:hines (2)					Actions
Host Groups	Search					🤉 🔽 None	e 💌	Virtual Machine Manager 🔷 🔺
💽 Overview	N	ame 🔺	Status	Job Status	Host	Owner	CPU Average	New virtual machine
E 📑 All Hosts	🔘 VI	n-suse	Stopped		9.125.90.62	Unknown	0%	Convert physical server
₽2 9.125.90.62	I V	n-windows2008	Stopped		9.125.90.62	Unknown	0%	Convert virtual machine
								🚆 Add library server
								📑 Add host
								Add VMware VirtualCenter
								Help
								All Hosts
Filters <u>Clear</u>								Mew host group
Status 👻								Properties
Owner 👻								Virtual Machine
Operating system								🜔 Start
Added date	b vm	windows2008					•	Stop
Tag	Shahi	c Stopped						III Pause
	Memo	irv: 1.00 GB						🗟 Save state
	Proce	ssor: (1) 1.00 Gł	Hz Pentium III Xeo	n				🕤 Discard saved state
	Stora	ge: 20.00 GB						O Shut down
	Lates	tjob: 🥑 100 %	6 complete					🛬 Connect to virtual machine
📋 Hosts		Refresh-VN	1					🚏 Migrate storage
The Virtual Machines								🚏 Migrate
et								🚽 New checkpoint
🐳 Library								🔣 Manage checkpoints
Jobs								🌀 Disable undo disks
								👔 Repair
Administration								虂 Install virtual guest services
	Summar	y Networking and	d Storage Lates	t Job				🔯 New template

Figure 3-1 SCVMM main window

The Add Hosts window opens, as shown in Figure 3-2.

Add Hosts	X
📑 Select Host	Location
Select Host Location Select Host Servers Configuration Settings Host Properties Summary	Select the host location and then enter the required credentials. • Windows Server-based host on a perimeter network • VfWware ESX Server host (any location) • VfWware ESX Server host (any location) • Vindows Server-based host on an Active Directory domain Enter the credentials for connecting to the host. User name: Administrator Password: Domain: NGPTT NGPTT Lear this option if the host does not have a two-way trust relationship with the domain of the VMM server.
	Next Cancel

Figure 3-2 Add Hosts wizard: Select Host Location

- Choose Windows Server-based host on an Active Directory domain if the management server and target host are in one domain. Enter the domain information and click Next.
- 3. Select the destination machine as shown in Figure 3-3 and click Next.

No hosts listed: If no domain is available, no selected hosts are listed here. The user must install the VMM Agent on the destination server. Also, the user must enter the IP and credential information of the destination server into the Host details fields in Figure 3-3. Entering this information ensures that the management server can access the destination server.

Padd Hosts	st Servers	2
Select Host Location Select Host Servers Configuration Settings Host Properties	Host details Computer name or IP address: Encryption key: Confirm encryption key:	
	Security nie patri:	Add
-	How to add a host on a perimeter network.	Remove
		Previous Next Cancel

Figure 3-3 Add Hosts wizard: Select Host Servers

4. Select the host group that contains the host in the Configuration Settings window (shown in Figure 3-4).

If any of the selected hosts are managed by another Virtual Machine Management server, click **Reassociate host with this Virtual Machine Manager server** to change the associations so that you do not have to manage the association manually.

Add Hosts	×
Configuratior	en Settings
Select Host Location Select Host Servers Configuration Settings Host Properties Summary	Host groupAd the selected new hosts to the following host group: All Hosts I day of the selected hosts are currently managed by another Virtual Machine Manager server, select this option to reassociate the hosts with this Virtual Machine Manager server. Reassociate host with this Virtual Machine Manager server
	Previous Next Cancel

Figure 3-4 Add Hosts wizard: Configuration Settings

5. Enter the default path of the virtual machine in the Host Properties window (shown in Figure 3-5). This path can be left blank.

Click Next.

Add Hosts	×
📑 Host Prope	erties 🕜
Select Host Location Select Host Servers Configuration Settings Host Properties Summary	Add a virtual machine path or use default paths. Virtual Machine Manager uses virtual machine paths as default locations to store virtual machines placed on a host. About virtual machine default paths Add the following path:
	Default virtual machine paths:
	Remote connection The default port settings for remote connections will be used for the selected hosts. You can change the port settings for individual hosts after they have been added.
	Previous Next Cancel

Figure 3-5 Add Hosts wizard: Host Properties
6. Review the summary and click **Add Hosts**, as shown in Figure 3-6.

Add Hosts			×
🗊 Summary			•
Select Host Location	Review the host sett	inas.	
Select Host Servers	Settings:		
Configuration Settings	Property	Value 🔺	
Host Properties	Host	Adding host server 9.125.90.107	
	Remote control	Enabled	
			🗾 View Script
			Previous Add Hosts Cancel

Figure 3-6 Add Hosts wizard: Summary

7. After a short period, the destination server is added into the list of managed hosts, as shown in Figure 3-7.

🖪 Virtual Machine Manager - WINDOWS-	-NEQOGJH.ngptt.com						_ 8
File View Go Actions Help							
💱 💆 Actions 🔳 Columns 🗏 Jobs 🗔 PRO	Tips (0) 📴 Networking	🔼 PowerShell 🔞 He	elp				
Virtual Machines	9.125.90.107	Virtual Machines (1)					Actions
Host Groups	Search				Der None		Virtual Machine Manager 🔷 🔺
Overview	Name 🔺	Status	Job Status	Host	Owner	CPU Average	New virtual machine
E All Hosts	🔳 vm	Stopped		9.125.90.107	Unknown	0%	Convert physical cerver
H _ 9.125.90.107							Convert physical server
■ 9.125.90.62							👕 Convert virtual machine
							📑 🛗 Add library server
							📑 Add host
							Add VMware VirtualCenter server
							😢 Help
							Host 🔺
Filters <u>Clear</u>	1						中 Update Agent

Figure 3-7 SCVMM main window after the host is added

The destination server preparation is now complete. The next step is to capture the OS image on the source server. Follow these steps to capture the OS image:

1. Download the Disk2vhd tool to capture the OS from the source server.

The Disk2vhd tool creates Virtual Hard Disk (VHD) versions of physical disks for use in Microsoft Virtual PC or Microsoft Hyper-V virtual machines. (VHD is the Microsoft Virtual Machine disk format.) For more information about the Disk2vhd tool, see this website:

http://technet.microsoft.com/en-us/sysinternals/ee656415

 Start the Disk2vhd tool on the source physical machine. Select the volumes (C:\ in Figure 3-8) that you want to migrate. Document the target path to which you want to migrate the image file. Click Create.

4	Disk2v	hd - Sysint	ernals: ww	w.sysinte	rnals.com	_ 🗆 X		
	Disk2vhd v1.63 Copyright © 2009-2010 Mark Russinovich and Bryce Cogswell Sysinternals - www.sysinternals.com							
	VHD File	name:						
	D:\shar	e\disk2vhd\W	/INDOWS-B	251EMX.vho	1			
	Volumes	to include:						
	Drive	Label	Size	Free	Space	e Required		
	☑ ⊂\	[No Label]	20.00 GB	4.35 GB		14.05 GB		
	🗖 D:\	Data	48.36 GB	45.28 GB		3.11 GB		
	He	lp		Create	Cancel	Close		

Figure 3-8 Disk2vhd: Select a volume

3. The chosen volumes are converted to the virtual machine disk file, as shown in Figure 3-9.

🐇 Disk2vhd - Sysinternals: www.sysinternals.com 📃 🗖 🗙							
Disk2vhd v1.63 Copyright © 2009-2010 Mark Russinovich and Bryce Cogswell Sysinternals - www.sysinternals.com							
VHD File name:							
D:\share\disk2v	hd\WINDOWS-B	2S1EMX.vho	1				
Volumes to includ	le:						
Drive Label	Size	Free	S	pace Required			
C:\ [No Lal	bel] 20.00 GB	4.35 GB		14.05 GB			
D:\ Data	48.36 GB	45.28 GB		3.11 GB			
Copying volume	Copying volume C: on disk 0 1/20/2012 10:34:52 AM						
Help		Create	Cancel	Close			

Figure 3-9 Disk2vhd: Creating the VHD file

4. After the conversion is complete, navigate to the location where the .vhd file was saved (see Figure 3-10). Copy the VHD file to a location that the target server can access.

Name *	Date modified	Туре	Size
🐗 disk2vhd.exe	10/11/2010 9:56 PM	Application	1,725 KB
🐗 disk2vhd-tmp.exe	1/20/2012 10:27 AM	Application	373 KB
WINDOWS-B2S1EMX.VHD	1/20/2012 10:33 AM	VHD File	14,739,097

Figure 3-10 Location of the VHD file

- 5. Share to the network the folder where the VHD file is located to ensure that the management server can access the VHD file.
- 6. Return to the management server and in the SCVMM Console, click the **Library** tab (at the bottom of the left side of the window). Add the folder path to the Library tab by right-clicking the server name and then clicking **Select Path**.
- 7. The VHD file is listed in the Library tab, as shown in Figure 3-11.

🖪 Virtual Machine Manager - WINDOWS-	NEQOGJH.ngptt.com						
File View Go Actions Help							
💱 💆 Actions 🔳 Columns 📕 Jobs 🕞 PRO	Tips (0) 斗 Networking	PowerShe	ell 🕜 Help				
Library	test Library Objects	(1)					
Resources	Search				• 🤇	None	•
🧭 Overview	Name		Library	Туре	Operati	Owner	Status
E Library Servers	🔄 WINDOWS-B2S1E	MX.VHD	WINDO	Virtual H	Unknown	Unknown	ОК
E 📷 WINDUWS-NEQUGJH.ngptt.com							
in test							
늘 VMs and Templates							
🧱 Profiles							
Filters <u>Clear</u>							
Туре 💌							
Owner 👻							
Added date 💌							
	- WINDOWS-B2S)				•
	Description:						
	Owner:	Unknow	n Level Diele				
	Type:	Virtual F	iard Disk owie Neoco				
Hosts	Operating system:	Linknow		aoningpititi	ouricesciwith	JUWJ-0201E	עחזי האריו.
	Added:	1/20/20	 12 11:24:26	5 AM			
🕕 Virtual Machines	Modified:	1/20/20	12 11:24:26	5 AM			

Figure 3-11 VHD added to the Library tab

8. Choose the **Virtual Machines** tab in the left navigation window. Click **New virtual machine** in the Actions window on the right, as shown in Figure 3-12.

🛿 Virtual Machine Manager - WINDOWS-NEQOGJH.ngptt.com								
File View Go Actions Help								
💱 🗳 Actions 💷 Columns 🧮 Jobs ொ PRO	Tips (0) 🛛 🚛 Networking 💹 I	PowerShell 🕜 Help						
Virtual Machines	9.125.90.107 Virtu	al Machines (1)				Actions	×	
Host Groups	Search		• 2	None	•	Virtual Machine Manager	• •	
🧭 Overview	Name 🔺	Status Job St	atus Host	Owner	CPU Ave	New virtual machine		
□ 📑 All Hosts	🔳 vm-win2003	Stopped	9.125.90	Unknown	0%	The server and the se		
windows-eoi32eb						🚰 Convert virtual machine		
■ ₽						🚆 Add library server		
						📑 Add host		
						Add VMware VirtualCenter server		
						🔞 Help		
Filters <u>Clear</u>						Host	•	
Status 👻						🛟 Update Agent		
Owner 💌						훰 Move to host group		
Operating system 🔻								
Added date 👻	🀌 vm-win2003				-	🗙 Remove host		
Tag 🗸 🗸						ዀ Start maintenance mode		
	Status: Co	mpleted	Property	Pr	evious V.	🐌 Stop maintenance mode		
	Command: (R Sy	stem Job)	🗏 📄 Host - 9.1	25.90.107		👞 View networking		
	Started: 1/	19/2012 10:45:19 PM	Status	No	ot Respoi	🖅 Properties		
👔 Hosts	Duration: 00	:00:17	Virtual Ser	rver st Ur	hknown	Virtual Machine	•	
Wirtual Machines	Owner: NT	AUTHORITY\SYSTEM	🗏 🎑 Managed	Computer -	9.125.9	Charles		
	Progress:	100 % complete	Status	No	ot Respoi	Start		
🐳 Library	Current step: Re	fresh virtual machine	🗏 💼 Virtual Ma	achine - vm	-win200	Stop		
Jobs	P.,		Status	He	ost Not R	Save state		
					•	Discard saved state		
aministration	•				•	Shut down		
	Summary Networking and	Storage Latest Job				Connect to virtual machine	-	

Figure 3-12 Creating a new virtual machine

9. The New Virtual Machine wizard starts. Choose the OS image file that you captured from the source server, as shown in Figure 3-13.

🕕 Select Sou	ırce					
lect Source tual Machine Identity nfigure Hardware	Select th	e source for th existing virtual machi	e new virtual m ne, template, or virtu	achine. al hard disk.		Browse
t Virtual Machine Sour	'ce					×
elect a template, virtual har	d disk, or virtual macl	hine as the source fo	r the new virtual mac	hine.		
iearch		₽ in		▼ Ty	pe 💌	
Name	Owner	Operating System	Virtualization Pl	Description	Path	
🗉 Type: Virtual Hard Di	isk					
Blank Disk - Large	NGPTT\Adminis	None	Microsoft Virtua	To be used as	\\WINDOWS-N	
Blank Disk - Small	NGPTT\Adminis	None	Microsoft Virtua	To be used as	\\WINDOWS-N	
					In the second	
WINDOWS-B251E	Unknown	Unknown	Unknown		\\WINDOWS-N	
WINDOWS-B251E		Unknown	Unknown		\\WINDOWS-N	
WINDOWS-B251E Type: Virtual Mach	Unknown INDOWS-B251EMX.V Unknown	Unknown /HD Unknown	Unknown Microsoft Hyper-V		\\WINDOWS-N	
WINDOWS-8251E Type: Virtual Mach	Unknown INDOWS-B251EMX.\ Unknown Unknown	Unknown HD Unknown Unknown	Unknown Microsoft Hyper-V Microsoft Hyper-V		\\WINDOWS-N	
WINDOWS-8251E Type: Virtual Mach	Unknown INDOWS-B251EMX.\ Unknown Unknown Unknown	Unknown HD Unknown Unknown Unknown	Unknown Microsoft Hyper-V Microsoft Hyper-V Microsoft Hyper-V		(WINDOWS-N	
WINDOWS-8251E Type: Virtual Maching vm-suse vm-suse vm-win2003 vm-win2003-1	Unknown INDOWS-B251EMX.V Unknown Unknown Unknown Unknown	Unknown IHD Unknown Unknown Unknown Windows Serve	Unknown Microsoft Hyper-V Microsoft Hyper-V Microsoft Hyper-V Microsoft Hyper-V		WWINDOWS-N	
WINDOWS-8251E Type: Virtual Maching vm-suse vm-suse vm-win2003 vm-win2003-1 vm-windows2008	Unknown INDOWS-B251EMX.V Unknown Unknown Unknown Unknown Unknown	Unknown IHD Unknown Unknown Unknown Windows Serve Unknown	Unknown Microsoft Hyper-V Microsoft Hyper-V Microsoft Hyper-V Microsoft Hyper-V Microsoft Hyper-V		UWINDOWS-N	

Figure 3-13 New Virtual Machine wizard: Select source

10. In the Virtual Machine Identity window, enter the virtual machine identity information, as shown in Figure 3-14. Click **Next**.

🗄 New Virtual Machine	X
🗊 Virtual Machi	ne Identity
Select Source	Virtual machine name:
Virtual Machine Identity	vm-import-vhd
Configure Hardware	Owner:
Select Destination	NGPTT\Administrator Browse
Select Host	Format: domain\username
Select Path	Description:
Select Networks	
Additional Properties	
Summary	
	(i) The virtual machine name identifies the virtual machine to VMM. The name does not have to match the computer name of the virtual machine. However, using the same name ensures consistent displays in System Center Operations Manager.
	Previous Next Cancel

Figure 3-14 New Virtual Machine wizard: Virtual Machine Identity

11. In the Configure Hardware window, configure the virtual hardware information about the destination server according to the source physical machine, as shown in Figure 3-15.

You can configure the settings of the hardware based on the performance monitoring analysis of the source server to provide the best performance for the new virtual machine. Click **Next**.



Figure 3-15 New Virtual Machine wizard: Configure Hardware

12. In the Select Destination window, select **Place the virtual machine on a host**, as shown in Figure 3-16. Click **Next**.



Figure 3-16 New Virtual Machine wizard: Select Destination

13.In the Select Host window, select the destination server that functions as the host, as shown in Figure 3-17. Click **Next**.

🖪 New Virtual Machine				×
🗊 Select Host			All	0
Select Source Virtual Machine Identity Configure Hardware	Select a host for the virtual Hosts are rated based on the virtual n this virtual machine, click Customize R	machine. nachine's requirements and c Ratings.	lefault placement options. To char	nge placement options for
	Bating T Host		Transfer T	
	**** 9.	125.90.107	_i_ Networ	k
Select Path	क्रेक्रेक्रेक्रे 🖡 wi	indows-eoi32eb.ngptt.com	🔔 Networ	k
Select Networks				
Additional Properties				
Summary				
	S Details	SAN Explanation	What do these ratings mean?	Customize Ratings
	Description			
	Status	ок		
	Operating system	Microsoft Windows Sei	rver 2008 R2 Standard ,	
	Virtualization software status	Up-to-date		
	Virtual machines	vm-win2003		
			Previous	Next Cancel

Figure 3-17 New Virtual Machine wizard: Select Host

14. In the Select Path window, enter the storage location for the virtual machine files, as shown in Figure 3-18. Click **Next**.

🗄 New Virtual Machine			×
🗊 Select Path			0
Select Source Virtual Machine Identity Configure Hardware Select Destination Select Host Select Path Select Networks Additional Properties Summary	Select storage locations on the host for the virtual machine files Image: Selected host: 9.125.90.107 ChrogremDataMicrosoftWindowsMHyperA Image: Add this path to the list of default virtual machine paths on the host		Browse
	Previous	Next	Cancel

Figure 3-18 New Virtual Machine wizard: Select Path

15. In the Select Networks window, configure the network for the virtual machine as shown in Figure 3-19. Click **Next**.

🖪 New Virtual Machine				×
🗊 Select Networ	ks			0
Select Source Virtual Machine Identity Configure Hardware	Specify which virtual network Selected host: 9.125.90.107	s to use for the virtual	machine.	
Select Destination	Physical Network A Location	Network Tag	Virtual Network	
Select Host	Network Adapter 1		New Network Location (9.	125.90.1) - Local /
Select Path				
Select Networks				
Additional Properties				
Summary				
				Restore Defaults
	 The Virtual Network field contains v 	irtual networks that are configu	ared for each physical network a	adapter on the host.
			Previous Ne	xt Cancel

Figure 3-19 New Virtual Machine wizard: Select Networks

16.In the Additional Properties window, confirm any additional properties, as shown in Figure 3-20. Click **Next**.

🖪 New Virtual Machine	×
🕕 Additional P	roperties
Select Source Virtual Machine Identity Configure Hardware Select Destination Select Host Select Path Select Networks Additional Properties Summary	Automatic start action Action when physical server starts: Never automatically turn on the virtual machine Delay start (Sec): Save State Operating system Specify the operating system you will install in the virtual machine: S4-bit edition of Windows Server 2008 R2 Standard
	Previous Next Cancel

Figure 3-20 New Virtual Machine wizard: Additional Properties

17. In the Summary window, review the summary information, as shown in Figure 3-21. Click **Create**.

New Virtual Machine		X
🗊 Summary		•
Select Source	Review the virtual m	nachine settings.
Virtual Machine Identity	Supposer	
Configure Hardware	Propertu	Value
	Virtual machine	vm-import-vhd
Select Destination	Owner	NGPTT\Administrator
Select Host	Destination host	9.125.90.107
Select Path	Path	D:\share\disk2vhd\vm-import-vhd
Select Networks	Operating System	64-bit edition of Windows Server 2008 R2 Standard
Additional Proportion		
Additional Properties		
Summary		
	Start the virtual machin	ne after deploying it on the host
	i To create the virtual	machine, click Create. You can track progress of this job by viewing the Jobs page.
		Previous Create Cancel

Figure 3-21 New Virtual Machine wizard: Summary

After a short period, a virtual machine is created on the target host. The virtual machine has the same configuration and disk layout as the physical source machine.

3.1.3 Disconnected Virtual-to-Virtual

Any V2V migration must start with an evaluation of the computing resource requirements of each original virtual machine (VM). This evaluation ensures that those resources are available on the destination server. This type of resource contains the processor capability, and the memory and storage capacity. If the required resources are not available, the VM must not be deployed on the destination server unless other workloads can be redistributed to free the necessary resources.

Furthermore, the hypervisor must be installed on the destination server. There are several options for hypervisors that are offered by different vendors:

- VMware vSphere (formerly ESXi)
- Microsoft Hyper-V
- ► KVM
- ► Xen
- Qemu

You must use the same hypervisor for the source and destination servers to reduce the risk of complications. By using the same hypervisor, you also save costs (particularly VM management costs) when making the transition from one hypervisor to another. This extra cost can be incurred because of the effort to convert VM images between incompatible virtual disk formats of different vendors. Those vendors that support the Open Virtual Machine Format do so only for virtual appliances. Hypervisors handle proprietary formats, such as VHD for Microsoft, VMDK for VMware, or gcow and gcow2 for QEMU, KVM, and Xen.

The following example process uses VMware vSphere to migrate a VM image to another machine:

1. Install VMware vSphere/ESX/ESXi on the destination server. For ESXi or vSphere, use the Lenovo customized image that contains the necessary drivers. To download an image and order a supported USB memory key, see this website:

http://ibm.com/systems/x/os/vmware/esxi/index.html

The no charge ServerGuide Scripting Toolkit can be a valuable tool to help you prepare for the installation of VMware. Alternatively, aUSB Memory Key with embedded VMware can be purchased and requires no installation.

For more information and to download the ServerGuide Scripting Toolkit, see this website:

http://ibm.com/support/entry/portal/docdisplay?Indocid=SERV-TOOLKIT

2. Install vCenter Server (as shown in Figure 3-22 on page 77), which centralizes virtual machine management (although in this example scenario, it is not required). Additionally, you can install the vSphere client.

For more information about and to download the VMware vCenter and the VMware vSphere Client, see this website:

http://www.vmware.com/products



Figure 3-22 VMware vCenter Installer

3. After the vSphere client software is installed, start the vSphere client. Enter the IP address and credentials of vCenter for the source machine in the login window, as shown in Figure 3-23. Click **Login**.

🕼 VMware vSphere Clie	nt	
VMware VMware vSphere		
Chem		
To directly manage a singl To manage multiple hosts, vCenter Server.	e host, enter the IP address or host n enter the IP address or name of a	ame.
IP address / <u>N</u> ame:	9.115.232.164	1
<u>U</u> ser name:	root	
Password:	****	
	Use <u>Windows</u> session credential	s
	Login <u>C</u> lose	Help

Figure 3-23 VMware vSphere login window

The main vCenter console opens, as shown in Figure 3-24.

🕑 WINDOWS-B2S1EMX - vSphere Clie	ent						
File Edit View Inventory Adminis	tration Plug-ins	Help					
🖸 🔝 🔥 Home 🕨 🚮 Invento	ry 🕨 🛐 Hosts a	nd Clusters			₽ Sea	arch Inventory	
5 e 35							
Image: System of the syste	9.125.90.17 Getting Star What is a A host is as ESX o CPU and give virtu connectiv Basic Ta ∰ Dep ∰ Crea	Vitware ESX, 4.1.0, 399509 ed Summary Virtual Mach I Host? a computer that uses virt r ESXI, to run virtual mac memory resources that v al machines access to stu- ity. Sks loy from VA Marketplac ite a new virtual machines	Evaluation (60 days remaining ines Resource Allocation Performance and the performance and performance an	ng) rmance Configuration Cluster Cluster vCluster vCluster vcente	Tasks & Events Alar Virtual Datacente er Server	ns Permissions Maps close tab 🔀 Machines Host	Stora
Recent Tasks				Name, Targe	t or Status contains	i: •	Cle
Name	larget	Status	Details	Initiated by	vCenter Server	Requested Start Ti 🗸	Start
 Import physical machine Create virtual machine 	9.125.90.17 Datacenter1	In ProgressCompleted		Administrator Administrator	WINDOWS-B2	2011/12/17 7:16:14 2011/12/17 7:16:08	2011 2011
*		m					
🐖 Tasks 🞯 Alarms					Evaluation Mode: 54	days remaining Adm	inistra

Figure 3-24 vCenter console

- 4. If you are using vCenter for the first time, right-click **Hosts & Clusters** and click **Add Datacenter**. Name the data center (in this example, datacenter 1).
- 5. Right-click datacenter 1 and click Add Host. The Add Host Wizard opens.

6. As shown in Figure 3-25, in Connection Settings, enter the fully qualified Host name of the VMware source Server and the Username and Password for the host. Click **Next**.

Add Host Wizard Specify Connection Settings Type in the information used to co	onnect to this host.
Connection Settings Host Summary Virtual Machine Location Ready to Complete	Connection Enter the name or IP address of the host to add to vCenter. Host: Authorization Enter the administrative account information for the host. vSphere Client will use this information to connect to the host and establish a permanent account for its operations. Username: Password:
Help	< Back Next > Cancel

Figure 3-25 Add Host Wizard: Connection Settings

7. vCenter discovers VMs that are running on the host and displays the details of each host server, as shown in Figure 3-26. Click **Next** to enter the license key. Click **Next** again.

Add Host Wizard			
Review the product information	for the specified host.		
Connection Settings	You have chose	n to add the following host to vCenter:	
Host Summary Assign License Virtual Machine Location Ready to Complete	Name: Vendor: Model: Version:	9.119.47.74 IBM IBM System x -[7870]- VMware ESX 4.1.0 build-502767	
	Virtual Machin RedHat 5.5 Predhat74 Pubuntu74 Win2003r2- Win2008R2 Win2008R2 Win2008R2 Win2008R2	es: He Lei std-i386-ip104-vCenter2.5 x64- x64-ip101-vCenterServer5.0 x64-ip102-vCenterServer4.1 x64-ip103-vCenterServer4.0	4
Help		< Back N	ext > Cancel

Figure 3-26 Add Host Wizard: Host summary

8. Select the data center to which to add the host, as shown in Figure 3-27. Click **Next** to review the summary. Then, click **Finish**.

🕝 Add Host Wizard	and the second sec	
Virtual Machine Location Select a location in the vCenter Server	inventory for the host's virtual machines.	
Connection Settings Host Summary Assign License Virtual Machine Location Ready to Complete	Select a location for this host's virtual machines.	
Help	< Back	Next > Cancel

Figure 3-27 Add Host Wizard: Virtual machine location

9. The server and VMs are shown on the left side of the window. Click **Next** to complete the Add Host wizard.

10. In the vCenter Console, select the virtual machine for which you want to capture the image and click File \rightarrow Export \rightarrow Export OVF Template, as shown in Figure 3-28.

WINDOWS-B2S1EMX - vSphere Clie	nt 💶 🗖 📈
File Edit View Inventory Adminis	tration Plug-ins Help
New •	v ▶ 🕅 Hosts and Clusters Q
Deploy OVF Template	
Export +	Export OVF Template
Report +	Export Events
Browse VA Marketplace	Export List source Allocation Performance Tasks & Events Alarms Cr 4 R
Print Maps	Export Maps
E.it	Export System Logs ne?
 □ 9.125.90.97 □ redhat6x64 □ suse11sp1x64 □ win2003 	physical computer, runs an operating system and applications. An operating system installed on a virtual machine is called a guest operating system. Because every virtual machine is an isolated computing environment, you can use virtual machines as desktop or workstation environments, as testing environments, or to consolidate server applications. In vCenter Server, virtual machines run on hosts or clusters. The same host can run many virtual machines. Basic Tasks
ecent Tasks	Name, Target or Status contains: - Clear
Name	arget Status Details Initiated by
Clone virtual machine Clone virtual machine	w2003-base-o Ompleted Administrator windows2003 Completed Administrator
Tasks 🞯 Alarms	Evaluation Mode: 42 days remaining Administrator

Figure 3-28 Export OVF Template

11. The Export OVF Template dialog opens. Enter the Name, Directory, and Format for the OVF template package and click **OK**, as shown in Figure 3-29.

C Export OVF Template	
Name: wir2003	
Directory: C:\Vsers\IBM_ADMIN\Desktop\test	
Format: Folder of files (OVF)	
Description	
Include image files attached to floppy and CD/DVD devices in the	> UVF package
Help	Cancel

Figure 3-29 Export OVF Template

12. The time that it takes to complete the export process depends on the image size. After the process completes, the OVF package is shown in the directory that is selected for the export location, as shown in Figure 3-30.

👔 vm-export			
	MIN\Desktop\test\windows2003	69	
File Edit View Tools Help			
🕒 Organize 👻 📗 Views 💌	📄 Open 🕙 Burn		0
Name	→ Date modified → Type	▼ Size ▼	▼ Tags
win2003-disk1.vmdk	3/22/2012 11:23 VMDK File	1,085,6	81 KB
win2003.ovf	3/22/2012 11:23 OVF File		6 KB
in2003.mf 📄	3/22/2012 11:23 MF File		1 KB
•			•
1 item selected	1.0)3 GB 💦 🙀 Comput	ter //

Figure 3-30 Export process complete

- 13. Ensure that the OVF packages can be accessed by the vSphere Client that is referenced in the next step.
- 14. Restart the vSphere Client so that vCenter connects to and manages the destination compute node in the Flex System chassis. Add the compute node into the data center as shown in the process in step 1 on page 76 step 9 on page 81.

Disconnected: The source server and destination server are not connected in this migration scenario. There are two installations of vCenter on different management servers. One installation is connected to the source server and the other is connected to the destination server.

The next step to perform on the target (Flex System) that was added to data center is to deploy a virtual OS image to the Flex System chassis.

15.Use the vCenter Console and click File \rightarrow Deploy OVF Template, as shown in Figure 3-31.

🛃 W	INDOWS-B2S1EMX - vSphere	lient			
File	ile Edit View Inventory Administration Plug-ins Help				
	New	y ▶ 🗊 Hosts and Clusters 🗗 - Se	earch Inventory 🔍		
	Deploy OVF Template				
Ī	Export Report	9.125.90.97 VMware ESX, 4.1.0, 399509 Evaluation (47 days remaini	ing)		
	Browse VA Marketplace	Getting Started Summary Virtual Machines Resource Allocation Performed	ormance Configural 🛛 👂		
	Print Maps	A host is a computer that uses virtualization software, such			
	Exit U suse11sp1xp64_clon Windows2003 9.125.90.97 R redhat6x64 Suse11sp1x64	as ESX or ESXi, to run virtual machines. Hosts provide the CPU and memory resources that virtual machines use and give virtual machines access to storage and network connectivity.	Cluster		

Figure 3-31 Deploy OVF Template

16.A wizard starts, as shown in Figure 3-32. Enter the path of OS images, define the virtual machine names and locations, and choose the disk format. Click **Next**.

Deploy OVF Template	
Source Select the source location.	
Source OVF Template Details Name and Location Disk Format Ready to Complete	Deploy from a file or URL s\IBM_ADMIN\Desktop\test\windows2003\windows2003.ovf Browse Enter a URL to download and install the OVF package from the Internet, or specify a location accessible from your computer, such as a local hard drive, a network share, or a CD/DVD drive.
Help	< Back Next > Cancel

Figure 3-32 Deploy OVF Template

17. You see the summary of the information that you entered, as shown in Figure 3-33. Click **Finish** to start the deployment process.

Ready to Complete Are these the options y	ou want to use?	
<u>Source</u> <u>OVF Template Details</u> Name and Location	When you dick Finish, Deployment settings:	the deployment task will be started.
Disk Format Ready to Complete	OVF file: Download size: Size on disk: Name: Folder: Host/Cluster: Datastore: Disk Format: Estimated disk usage: Network Mapping:	C:\Users\IBM_ADMIN\Desktop\test\windows2003\windows2003.ovf 1.0 GB 2.2 GB windows2003-import Datacenter1 9.125.90.97 datastore1 Thin Provisioning : 2.2 GB "VM Network" to "VM Network"
Help		< Back Finish Cancel

Figure 3-33 Deploy OVF Template: Summary

The deployment process takes minutes or hours, depending on the image size. After the deployment process is finished, an additional virtual machine is created and is displayed beneath the destination server, as shown in Figure 3-34.



Figure 3-34 Deployed

The V2V process is now complete.

Use the System Center Virtual Machine Manager management tool when migrating a virtual machine on the Hyper-V hypervisor.

If you need to implement a V2V migration across hypervisors from different vendors, the format of the virtual disks is the key issue to consider. Ensure that the disk format of the virtual machine is supported by the source and target hypervisors. For example, the raw disk format is supported by hypervisors from nearly all the vendors. If the format is not supported, some transfer tools of the vendors are available, such as VMware vCenter Converter. For more information, see the website of the hypervisor vendor.

3.2 Source servers and Flex System are connected

In this section, the following scenarios are reviewed in which the source and target systems are connected:

- Connected Physical-to-Physical
- Connected Physical-to-Virtual
- Connected Virtual-to-Virtual

3.2.1 Connected Physical-to-Physical

Similar to Disconnected P2P as described in 3.1.1, "Disconnected Physical-to-Physical" on page 56, in addition to Norton Ghost, you can use the following end-to-end solutions:

► IBM Tivoli® Provisioning Manager:

https://ibm.com/software/tivoli/products/prov-mgr/

Novell PlateSpin Migrate:

http://www.novell.com/products/migrate/

Vision Solutions Double-Take Move

http://www.visionsolutions.com/Products/DT-Move.aspx

It is possible to plan a migration with Double-Take Move which involves near zero downtime.

3.2.2 Connected Physical-to-Virtual

As in the Disconnected P2V scenario described in 3.1.2, "Disconnected Physical-to-Virtual" on page 56, you need to understand the source system usage over the entire activity period. Understanding this usage helps you determine the amount of processing power and memory to assign to a virtual machine.

The task here is to choose the tools to implement the P2V function. The P2V migration functions in VMware vCenter or Microsoft System Center Virtual Machine Manager work fine for converting physical machines to virtual machines. In addition, some third-party companies have their own P2V conversion tools that are faster and have more features.

One important consideration for P2V conversion tools is determining the hypervisor that you want to use as the target. Some factors, such as resources, budget, time, and risks are key to the decision-making process.

With both the source and target interconnected (for example, in a LAN environment), some end-to-end solutions are available to capture the physical machine image into a virtual machine image and place it on the new target host, such as Vision Solutions Double-Take Move. For information about this tool, go to the following website:

http://www.visionsolutions.com/Products/DT-Move.aspx

The following scenarios illustrate the more general process of implementing a P2V migration from the source server to the Flex System solution:

- VMware vSphere scenario
- Microsoft Hyper-V scenario

VMware vSphere scenario

Some of the main components of a VMware vSphere environment, which includes vCenter server, vSphere Client, and any VMware hypervisors, must be deployed to complete the entire migration process. The Disconnected V2V scenario that is shown in 3.1.2, "Disconnected Physical-to-Virtual" on page 56 describes how to acquire, install, and configure the environment.

When all source servers are properly managed by vCenter Server, follow these steps:

1. Install the VMware OS on the needed compute nodes in the Flex System chassis.

The Flex System is managed by at least one vCenter server and the vCenter server installs the vCenter Converter plug-in.

- 2. After the new vCenter server is in place, use the vSphere Client to connect to the vCenter server.
- 3. Add the VMware hosts in the chassis to the new data center. (For more information, see 3.1.3, "Disconnected Virtual-to-Virtual" on page 75.)

4. Right-click the target server to which you want to migrate and click **Import Machine**, as shown in Figure 3-35. The Import Machine wizard starts.



Figure 3-35 Import Machine

5. In the Source System window (see Figure 3-36), choose the Source type as **Powered-on machine**. Enter the IP address or name, User name, Password, and the OS Family of the source physical OS.

Source System Destination Location Options	Source: none	Destinatio	on: 🚳 9.125.90.17	
ummary	Select source type: [] C	'owered-on machine onvert any powered-on physical or	virtual machine.	
	Specify the powered IP address or name: User name: Password	on machine 9. 125. 90. 72 root	•	
	OS Family: View source details	Linux		

Figure 3-36 Import Machine wizard

Tip: This wizard also can implement the V2V connected migration, as shown in Figure 3-37.

Source System	m you want to convert		
Sciece are source syste	in you want to convert		
Source System	Source: none	Destination: 嵶 9.125.90.137	
Destination Location			
Options			
Summary	Select source type:	Powered-on machine	
		Powered-on machine	
		VMware Infrastructure virtual machine	
	Constitution provide	VMware Workstation or other VMware virtual machine Backup image or third-party virtual machine	
	-specify the power	Hyper-V Server	
	TD a d d		

6. Confirm the destination location, as shown in Figure 3-38.

Select the location for the new virtual machine	
Source System Destination Location Dytions Summary Summary Summary Summary Source: 1 9.125.90.72 Inventory for: 9.125.90.228 Source: 1 9.125.90.17 Inventory for: 9.125.90.17 Inventory	Destination: ♀ 9.125.90.17 Virtual machine name p2vredhat Total source disks size: 33.53 GB Datastore datastore1(1) ▼ Capacity: 231.5 GB Free: 207.52 GB Type: VMFS Virtual machine version Version 7 ▼

Figure 3-38 Import Machine wizard: Destination Location

7. Edit the options for the virtual machine, such as CPU, memory, or the disk settings in the Import Machine window, as shown in Figure 3-39. Use the same settings on the physical OS of the source server if the target server has the capacity.

Set up the paramet	ers for the conversion task	
ource System estination Location ptions	Source: 🗐 9.125.90.72 Click on an option below to edit it.	Destination: ॷ p2 v- redhat on 9.125.90.17
nnwar.à.	Current settings:	
	Destination attributes	Edir
	Name: p2v-redhat	
	Folder: Datacenter1	
	Tota to copy	Edit
	Copy type: Volume-based	
	: 19.53 GB	
	<swap>: 1.95 GB</swap>	
	- Devices	Edi
	Processors: 2	
	Disk controller: Preserve source	
	Memory: 1024 MB	
	Networks	Edi
	NIC1: VM Network	
	NIC2: VM Network	
	Advanced options	Edi
	Synchronization: N/A	
	Power on destination: No	
	Power off source: No	
	Install VMware Tools: N/A	
	Customize Guest OS: N/A	
	Reconfigure: Yes	

Figure 3-39 Import Machine wizard: Options

Figure 3-40 shows the dialog that opens when you click **Edit** next to Data to copy, for example.

				×		
Data copy type: 🛛	ata copy type: Select volumes to copy 🗸 Advanced					
Configuration (VMX) Select the source v Select a system and) file location: datastorel (1) (110. rolumes to copy to the destination ma l an active volume, or a system/activ	45 GB) achine. Resize destinatio re volume to run the dest	n disk inatio	s to add or save space. 1 machine.		
Source volumes	Destination size	Destination disk	Total	Destination datastore		
V 🚙 C:	Maintain size (19.53 GB) 🛛 👻]				
V 🚙 E:	Maintain size (19.53 GB) 🔹 🔻	VirtualDisk1	74	datastore1 (1) (110.45 GB)		
V 🚙 F:	Maintain size (35.47 GB) 🔹 🔻]				

Figure 3-40 Changing the options for Data to copy

8. Click **Next** to confirm the setting (see Figure 3-41). Click **Finish**.

Review the conversion	n parameters	
ource System estination Location	Source: 🗐 9. 125. 90. 72	Destination: 🚳 p2v-redhat on 9.125.90.17
ptions		
ummary	Source system information	
	Source type:	Yowered-on machine
	Name/IF address:	9, 125, 90, 72
	Connected as:	root
	US family: No throttling information	Linux
	Destination system informati	on
	Virtual machine name:	p2v-redhat
	Host/Server:	9, 125, 90, 228
	Connected as:	Administrator
	VM folder:	None
	Host system	9,125,90,17
	Resource pool	Default
	Power on after conversion	No
	Number of CPUs	2
	Physical memory:	1024 MB
	Network:	Preserve NIC count
	NTC1	Connected
		VM Network
	NTC2	Connected
	11202	VM Network
	Storage'	Volume-based cloning
	Number of disks	1
	Create disk 0 as	Monolithic flat disk
	Configuration files detectore	detectorel (1)
	Helper VM network:	Automatic
	Destination customization	
	Reconfigure virtual machine:	Yes

Figure 3-41 Import Machine wizard: Summary

Another task is added to the list in the Recent Tasks window at the bottom of the vSphere client interface, as shown in Figure 3-42. The task processing can take minutes or hours, depending on the disk size. After the task is finished, another virtual machine opens and is associated with the chosen host.

🕑 WINDOWS-B2S1EMX - vSphere Client	-			and the second se			- D X
File Edit View Inventory Administra	tion Plug-ins He	lp					
🖸 🔝 🏠 Home 🕨 🚮 Inventory	Hosts and Cl	usters			🛃 🕶 Sear	ch Inventory	Q
a e #							
□ □ UNINDOWS-B2SIEMX □ Datacenter1 □ 9.125.90.17 □ 9.125.90.17 □ 9.125.90.92 □ 9.125.90.92 □ 9.125.90.92 □ rednat5x64 □ 9.125.90.92 □ rednat5x64 □ suse11sp1x64	9.125.90.17 VHW Getting Started What is a Ho A host is a cc as ESX or ES CPU and mer give virtual m connectivity. Basic Tasks ∰ Deploy f ∰ Create a	Summary Virtual Mad ost? mputer that uses vii XI, to run virtual mac nory resources that achines access to s from VA Marketpla a new virtual mach	P Evaluation (60 days remaining nines Resource Allocation Perform tualization software, such chines. Hosts provide the virtual machines use and torage and network) sance Configuration Tr	asks & Events Alarm	s Permissions Maps close tab 🔀 Aachines Host	Storage (
				vSohere Client	Server		+
Recent Tasks				Name, Target	or Status contains	•	Clear ×
Name Tar	get S	atus	Details	Initiated by	vCenter Server	Requested Start Ti	Start Time
ne Power On virtual machine	p2v-redhat 🧧	Completed		com.vmware	WINDOWS-B2	2011/12/17 7:16:23	2011/12/17 7
Reconfigure virtual machine	p2v-redhat 🦉	Completed		com.vmware	WINDOWS-B2	2011/12/17 7:16:22	2011/12/17 7
Import physical machine	9.125.90.17	1%		Administrator	WINDOWS-B2	2011/12/17 7:16:14	2011/12/17
4			n				
Tarke M Alarme					Valuation Mode: 54	days remaining Ad	ministrator

Figure 3-42 Import Machine task in progress

Microsoft Hyper-V scenario

Before you start this migration process, the following requirements and restrictions must be reviewed.

The source computer must meet the following requirements:

- No volumes larger than 2040 GB
- Must be accessible by VMM and the host computer
- Cannot be in a DMZ

A DMZ (screened subnet) is a collection of devices and subnets that are placed between an intranet and the Internet to help protect the intranet from unauthorized Internet users. The source computer for a P2V conversion can be in any other network topology in which the SCVMM management server can connect to the source machine to temporarily install an agent. The management server also must be able to make Windows Management Instrumentation (WMI) calls to the source computer.

For a list of supported physical machine operating systems for P2V conversions in VMM 2008 and VMM 2008 R2, see this website:

http://technet.microsoft.com/en-us/library/cc764232.aspx

P2V has the following restrictions for VMM:

- VMM does not support P2V on source computers that are running Windows NT Server 4.0. However, you can use the Microsoft Virtual Server 2005 Migration Toolkit (VSMT) or third-party solutions for converting computers that are running Windows NT Server 4.0.
- VMM 2008 R2 does not support converting a physical computer that is running Windows Server 2003 SP1 to a virtual machine that is managed by Hyper-V.

Hyper-V does not support Integration Components on computers that are running Windows Server 2003 SP1. As a result, there is no mouse control when you use Remote Desktop Protocol (RDP) to connect to the virtual machine. To avoid this issue, update the OS to Windows Server 2003 SP2 before converting the physical computer. You also can convert the computer by using VMM 2008 and then deploy the virtual machine in VMM 2008 R2.

The following requirements for the destination host server must be met:

- The destination host must be in the domain of the management server and must not be in a DMZ.
- As in any virtual machine creation or migration, the destination host for a P2V conversion must have sufficient memory for the virtual machine. The host also must have memory that is reserved for the host OS. By default, the amount of memory that is reserved for the host OS is 256 MB in VMM 2008 or 512 MB in VMM 2008 R2. If the host does not have enough memory for the virtual machine in addition to the memory reserved for the host, the user receives a placement error in the Convert Physical Server Wizard.

During a P2V conversion, the destination host can be running Windows Server 2008 with Hyper-V, Windows Server 2008 R2 with Hyper-V, or Virtual Server R2 SP1 (or later).

It is assumed that you prepared all of the hardware and software for the source and destination server. It is also assumed that the servers were added to the pool of System Center Virtual Machine Manager. (See 3.1.2, "Disconnected Physical-to-Virtual" on page 56.)

Follow these steps to implement a P2V conversion with Hyper-V:

1. From the SCVMM console, click **Convert physical server** to start the P2V process, as shown in Figure 3-43.

🖪 Virtual Machine Manager - WINDOWS	-NEQOGJH.ngptt.com						_ 8
File View Go Actions Help							
💱 🔀 Actions 💷 Columns 🗏 Jobs 🔚 PRO	Tips (0) 🛄 Networking	💹 PowerShell 🧯) Help				
Virtual Machines	9.125.90.62 ¥	irtual Machines (2)					Actions
Host Groups	Search				M T	lone 💌	Virtual Machine Manager 🔷 🔺
Overview	Name 🔺	Status	Job Status	Host	Owner	CPU Average	New virtual machine
🖃 🥂 All Hosts	🔘 vm-suse	Stopped		9.125.90.62	Unknown	0%	
₽2 9.125.90.62	🜔 vm-windows2	Running		9.125.90.62	Unknown	0%	Convert physical server
							Add library server
							📑 Add host
							Add VMware VirtualCenter server
							🕢 Help
							Host
Filters <u>Clear</u>							🖕 Update Agent

Figure 3-43 Starting the P2V process in SCVMM

Tip: The source physical server is connected to the destination server. The management server must be able to capture the source OS image and deploy this image to a virtual machine in one step.

2. The P2V wizard starts. Enter the IP address or host name and the Administrative account information for the physical computer, as shown in Figure 3-44. Click **Next**.

🖪 Convert Physical Server (P	2V) Wizard
🗊 Select Source	9
Select Source Vitual Machine Identity System Information Volume Configuration VM Configuration Select Host Select Path Select Networks Additional Properties Conversion Information Summary	Select the physical computer that you want to convert to a virtual machine. Support name or IP address: 3125.30.63 Administrative account Specify the administrative account to use to connect to the physical computer. User name: Administrator Password: Image: J25.50.62 Omain or computer name: J325.50.62 If the source machine is not in a domain, specify the source machine name or IP address.
	Next Cancel

Figure 3-44 SCVMM P2V wizard: Select Source

- 3. Enter suitable values in the Virtual Machine identity page. Click Next.
- 4. Click **Scan System** (as shown in Figure 3-45 on page 98) to scan the source physical computer and install the VMM agent on the source physical computer. (The VMM agent is installed automatically on the source server if the source server is in the same domain as the management server.)

5. The characteristics of the source system are displayed in the System Information window of the wizard, as shown in Figure 3-45. Click **Next**.

🖪 Convert Physical Server (P	2Y) Wizard
5 System Inforr	mation
Select Source Virtual Machine Identity System Information Volume Configuration VM Configuration Select Host Select Path Select Networks Additional Properties Conversion Information Summary	To gather system information VMM temporarily installs a VMM agent on the source machine. Click Scan System to install the agent and begin gathering system information. More about physical-to-virtual conversions Scan System If the source machine has encrypted volumes, an offline P2V conversion might render the system unbootable. We highly recommend that you not convert a source machine that has encrypted volumes. Scan System System Information If the source machine has encrypted volumes, an offline P2V conversion might render the system unbootable. We highly recommend that you not convert a source machine that has encrypted volumes. System Information Image: Click Scan System Operating System DS Version: Microsoft Windows Server 2008 R2 Standard , Service Pack 1 Processor Count: 2 Hard Drives Volume C 68.36 GB Network Adapters Coal Area Connection (Broadcom BCM5708S NetXtreme II GigE (NDIS VBD Client)) Local Area Connection 2 (Broadcom BCM5708S NetXtreme II GigE (NDIS VBD Client))
	Previous Next Cancel

Figure 3-45 SCVMM P2V wizard: System Information
6. In the Volume Configuration window, select the volumes that are captured on the source machine, as shown in Figure 3-46. Click **Next**.

E Convert Physical Server (P2)	V) Wizard						×
🕕 Volume Config	guratior	ı					0
Select Source Virtual Machine Identity	Select 1	he volumes	on the source r	machine to dupli	cate on the virt	ual machine.	
System Information	VMM will attach the	create a virtual ha vhd.	ard disk (.vhd file) for	each volume. Specify	the size, the disk typ	be, and the channel to wh	nich to
Volume Configuration		Volume 🔺	Data Size	VHD Size (MB)	VHD Type	Channel	
VM Configuration	1	C:	27,632.18 MB	70004	🛨 Dynamic 🔄	Primary channel (0)	-
Select Host							
Select Path							
Select Networks							
Additional Properties							
Conversion Information							
Summaru							
Summary							
	(8) Convi	ersion Options	More about convers	sion options			
					Previous	Next	Cancel

Figure 3-46 SCVMM P2V wizard: Volume Configuration

7. Define the processors, memory, disk, network, and any additional custom properties for the destination virtual machine, as shown in Figure 3-47, Figure 3-48, Figure 3-49, and Figure 3-50 on page 101.

🖪 Convert Physical Server (P	2¥) Wizard	×
🗊 Virtual Machi	ne Configuration	
Select Source Virtual Machine Identity System Information	Specify the processors and memory for the new machine. Number of processors: 2	
Volume Configuration	Memory: 1024 🖶 MB 💌	
VM Configuration		
Select Host		

Figure 3-47 SCVMM P2V wizard: VM Configuration

E Convert Physical Server (P:	2¥) Wizard
🗊 Select Path	•
Select Source Virtual Machine Identity System Information Volume Configuration VM Configuration Select Host Select Path	Select storage locations on the host for the virtual machine files Image: Selected host: 9.125.90.62 Virtual machine path: Image: Selected host Selected

Figure 3-48 SCVMM P2V wizard: Select storage location

E Convert Physical Server (P2)	¥) Wizard				×
🗊 Select Networ	ks				0
Select Source Virtual Machine Identity System Information	Specify which virt	ual network: 9.125.90.62	s to use for the virtual	machine.	
Volume Configuration	Physical Network A	Location	Network Tag	Virtual Network	
VM Configuration	Network Adapter 1			Not connected	-
Select Host	Network Adapter 2			Not connected	_
Select Path					
Select Networks					

Figure 3-49 SCVMM P2V wizard: Select virtual networks

E Convert Physical Server (P2V) Wizard

🕕 Additional Pr	operties
Select Source	Automatic start action
Virtual Machine Identity	Action when physical server starts:
System Information	Never automatically turn on the viitual machine
Volume Configuration	Delay start (Sec):
VM Configuration	Action when physical server stops:
Select Host	Save State
Select Path	
Select Networks	
Additional Properties	

Figure 3-50 SCVMM P2V wizard: Additional Properties

X

8. After the configuration is complete, review the Summary page, as shown in Figure 3-51. Click **Create**.

🖪 Convert Physical Server (P2)	V) Wizard		×
🗊 Summary			0
Select Source Virtual Machine Identity	Before you convert chose.	the physical server to a virtual machine, review the settings that you	
System Information	Summary:		_
Volume Configuration	Property	Value	-
VM Configuration	Source	WINDOWS-E0132EB.ngptt.com	
		WINDOWS-E0132EB	
Select Host	Destination bost		
Select Path	Path	C:\ProgramData\Microsoft\Windows\Hyper-V\WINDOWS-EQI32EB	
Select Networks		C. (Hogi anibata (Hici osofi (Windows (Hyper-4 (Windows-2015228	
Additional Properties			
Conversion Information			
Summaru			
Summary			
	🔲 Start the virtual machin	ne after deploying it on the host	t I
	 To convert the physical structure Jobs page. 	ical server into a virtual machine, click Create. You can track progress of this job by viewing the	
		Previous Create Cancel	

Figure 3-51 SCVMM P2V wizard: Summary

The job runs for a short time. The progress of the job is displayed, as shown in Figure 3-52.

🗎 Jo	bs						
							0
	Name			Status	St 🔻	Result Name	: Owner 🔺
0	Physical-to-	virtual conversion		40	0 % 1/19/2	WINDO	NGP
Ø	Perform prerec	quisites check for physical-to-virtua	l con	. Completed	1/19/20	WINDOW	NGPTT
Ø	Collect machine	e configuration		Completed	1/19/20	WINDOW	NGPTT
Ø	Add virtual ma	chine host		Completed	1/19/20	windows-e	NGPTT
Δ	Remove virtua	I machine host		Completed	1/19/20	9.125.90.62	NGPTT
Ø	Start virtual m	achine		Completed	1/19/20	vm-win20	NGPTT
8	Collect machine	e configuration		Failed	1/19/20	Job Failed	NGPTT
0	Remove source	e machine agent		Completed	1/19/20	9.125.90	NGPTT
8	Perform prerec	quisites check for physical-to-virtua	l con	. Failed	1/19/20	Job Failed	NGPTT
	Neuroine Literuit	turl remains			<u> </u>		
	nysical-to-vir	rual conversion					•
S	tatus:	Running		Step	Name	Status	Start Time
C	ommand:	New-P2V		1	Physical-t	40 %	1/19/2012
R	esult name:	WINDOWS-E0132EB		1.1	Collect ma	100 %	1/19/2012
S	tarted:	1/19/2012 10:54:48 PM	Ø	1.1.1	Add sourc	100 %	1/19/2012
D	uration:	00:00:02	Ø	1.2	Create vir	100 %	1/19/2012
0	wner:	NGPTT\Administrator		1.3	Copy hard	0%	-1
•	1001000	Δ <u>Ω</u> ΔΩ %					
	Dotaila	Change Tracking					
Sum	nary Details	change Hacking					
~	Show this windo	ow when new objects are created			В	estart Job	Cancel Job

Figure 3-52 Progress of the P2V job

When the P2V conversion is complete, you see that one more virtual machine is displayed on the destination server, as shown in Figure 3-53.



Figure 3-53 P2V conversion complete

3.2.3 Connected Virtual-to-Virtual

The Connected V2V migration scenario has the same rules and requirements as the Disconnected V2V migration scenario as described in 3.1.3, "Disconnected Virtual-to-Virtual" on page 75.

As of this writing, there are two types of V2V migrations in the industry:

- Live V2V migration
- Offline V2V migration

The Live V2V migration does not require you to take the source virtual machine offline. Normal operations are completed during the migration process. One example of a live migration solution is Vision Solutions Double-Take Move:

http://www.visionsolutions.com/Products/DT-Move.aspx

Offline V2V migration requires you to shut down the source virtual machine before starting the migration process.

You implement the offline migration process from the source server to the Flex System Compute Node. Implementing this type of migration in this manner is necessary because this live migration requires the source and destination servers to have the same type of processor. This requirement is not met in current Flex System transition scenarios. Also, live migration is a fee-based function of the virtualization management software.

In this section, the following migration scenarios are described:

- VMware scenario
- Hyper-V scenario
- KVM scenario

VMware scenario

The following requirements must be met before starting the VMware migration process:

- VMware must be installed on the destination Flex System compute nodes.
- A VMware vCenter server must be connected to the source server and the destination server.
- The source server and the destination server must be added to the necessary data server in vCenter.

If any of these requirements are not met, see 3.1.3, "Disconnected Virtual-to-Virtual" on page 75 for more information about completing the requirements.

Follow these steps to implement a V2V migration:

1. Use the vSphere Client to connect to the vCenter server. Right-click the source virtual machine that you are migrating and click **Clone**, as shown in Figure 3-54.



Figure 3-54 Starting the clone process

Migrate versus Clone: There are two options for this scenario that are available on the context-sensitive menu: *Migrate* and *Clone*. Migrate deletes the source VM image after copying the image from the source server to the destination server. Clone does not delete the image after the image is copied. To reduce the risk of data loss, the user must choose the Clone option.

2. The Clone Virtual Machine wizard starts. Enter the name and the location of the destination virtual machine, as shown in Figure 3-55. Click **Next**.

Clone Virtual Machine Name and Location	
Specify a name and lo	scation for this virtual machine
Name and Location	Name:
Host / Cluster	new_VM
Resource Pool Datastore Disk Format	, Virtual machine (VM) names may contain up to 80 characters and they must be unique within each vCenter Server VM folder.
Guest Customization	Inventory Location:
	UINDOWS-B2S1EMX
Help	< Back Next > Cancel

Figure 3-55 Clone Virtual Machine wizard: Name and Location

3. In the Host/Cluster window, as shown in Figure 3-56, select the destination server. Click **Next**.

💋 Clone Virtual Machine			
Host / Cluster On which host or clus	ter do you want to run this virtual machine?		
Name and Location Host / Cluster Specific Host Resource Pool Datastore Disk Format Guest Customization Ready to Complete	Datacenter1 9.125.90.163 9.125.90.205		
	Compatibility:		
Help		< Back	lext > Cancel

Figure 3-56 Clone Virtual Machine wizard: Host/Cluster

4. Select the data store for the new virtual machine, as shown in Figure 3-57.

Clone Virtual Machine	e					_		x I
Datastore Select a datastore in	which to store the virtual	l machine files						
Name and Location	Select a datastore in v	which to store the	virtual machine	e files:				
Host / Cluster	Name	Capacity	Provisioned	Free	Туре	Thin Provisi	oning /	Access
Disk Format	[datastore1(1)]	231.50 GB	69.04 GB	163.46 GB	VMFS	Supported		Singlehos
 Guest Customization Ready to Complete 								
	•		m					,
	Compatibility: Validation succeeded						Advand	ed >>
						1	1	
Неір					< Back	Next >		Cancel

Figure 3-57 Clone Virtual Machine wizard: Datastore

5. Select the disk format for the new virtual machine, as shown in Figure 3-58. To avoid any additional risk that a disk format change presents, the user must choose the **Same format as source** option. The potential disk format change risk might include (but is not limited to) lost disk access or data corruption. Click **Next**.

🕗 Clone Virtual Machine	
Disk Format In which format do you	u want to store the virtual disks?
Name and Location Host / Cluster Datastore Disk Format Guest Customization Ready to Complete	Select a format in which to store the virtual machine's virtual disks Same format as source Use the same format as the original disks. C Thin provisioned format Allocate full size now and commit on demand. This is only supported on VMFS-3 and newer datastores. Other types of datastores may create thick disks. C Thick format Allocate and commit the full size now. Compatibility: Validation succeeded
Help	< Back Next > Cancel

Figure 3-58 Clone Virtual Machine wizard: Disk Format

6. Customize any other settings of the virtual machine. In our example, the Guest Customization wizard was run, as shown in Figure 3-59 and Figure 3-60.

🕜 Clone Virtual Machine	
Guest Customization Select the customizatio	n option for the guest operating system
Name and Location Host / Cluster Datastore Disk Format Guest Customization User Settings Ready to Complete	Select the option to use in customizing the guest operating system of the new virtual machine. C Do not customize C Customize using the Customization Wizard C Customize using an existing customization specification
Help	< Back Next > Cancel

Figure 3-59 Clone Virtual Machine wizard: Guest Customization

Specify a computer name t	nat will identify this virtual machine on a network.
Computer Name Time Zone Network DNS and Domain Settings Save Specification Ready to Complete	Computer Name Computer Name Enter a name The name cannot exceed 63 characters. Append a numeric value to ensure uniqueness The name will be truncated if combined with the numeric value it exceeds 63 characters. Use the virtual machine name If the name exceeds 63 characters, it will be truncated. Enter a name in the Deploy wizard Generate a name using the custom application configured with the vCenter Server Argument: Domain Name
Help	< Back Next > Cancel

Figure 3-60 Clone Virtual Machine wizard - Computer Name

7. After all of the customization is complete, click Finish.

Recently completed tasks are displayed in the Recent Tasks pane, as shown in Figure 3-61. You see the newly migrated virtual machine on the target Flex System Compute Node.



Figure 3-61 V2V migration in progress

Hyper-V scenario

The following requirements must be met before starting the Hyper-V migration process:

- Hyper-V must be installed on the Flex System compute node (destination server).
- A System Center Virtual Machine Management (SCVMM) server must be connected to the source server and the destination server.
- The source server and destination server must be added to the server list database of the SCVMM server.

If any of these requirements are not met, see 3.1.2, "Disconnected Physical-to-Virtual" on page 56 for more information about completing the requirements.

Follow these steps to implement a V2V migration with SCVMM:

1. Log in to the SCVMM console. Right-click the source virtual machine and click **Clone**, as shown in Figure 3-62.

🖪 Virtual Machine Manager - WINDOWS-	NEQOGJH.ngpt	t.com						
File View Go Actions Help								
💱 💆 Actions 🔳 Columns 📕 Jobs ொ PRO	Tips (0) 🔔 Net	working 🛛 🔼 P	owerShell 🕐	Help				
Virtual Machines	9.125.90	107 Virtua	al Machines (1)					
Host Groups	Search					- 2	None	•
💽 Overview	Name 4		Status	Job Status	Host	Owner	CPU Ave	erage
E 📑 All Hosts	🦲 vm-win2	003	Stopped	Chaut	0.405.00.403	Unknown	0%	
9.125.90.107			~	Start				
9.125.90.62			2					
			W					
			0					
			0					
			T	Connect to virtual	machine			
			E*	Migrate storage				
Filters <u>Clear</u>			E*	Migrate				
Status 💌				New checkpoint				
Owner 👻			E.	Manage checkpoint	ts			
Operating system 💌			0					
Added date 👻	🗐	102	11					_
Tag 🔻		100	8.	Install virtual quest	t cervicec			
	Status	Stopped		Install virtual gaost	. 301 11003			
	Memory:	512.00 MB	E	New template				
	Processor:	(1) 1.00 GHz	: Pentium 📑	Clone				
	Storage:	5.00 GB	1	Store in library				
	Latest job:	🚺 100 %	complete 🔀	Delete				
Hosts		Refresh-VM	-8-	View networking				
Virtual Machines			V	Properties				
UI)								
Library								
jobs								
Moninistration								

Figure 3-62 Starting the clone operation

2. The New Virtual Machine wizard starts. In the Virtual Machine Identity window, enter the name and domain information for the new virtual machine, as shown in Figure 3-63. Click **Next**.

🖪 New Virtual Machine	×
🕕 Virtual Machin	e Identity
Virtual Machine Identity	Virtual machine name:
Configure Hardware	vm-win2003-1
Select Destination	Owner:
Select Host	NGPTT\Administrator Browse
Select Path	Format: domain\username
Select Networks	Description:
Additional Properties	
Summary	
	(i) The virtual machine name identifies the virtual machine to VMM. The name does not have to match the computer name of the virtual machine. However, using the same name ensures consistent displays in System Center Operations Manager.
	Next Cancel

Figure 3-63 SCVMM New Virtual Machine: Virtual Machine Identity

3. In the Configure Hardware window, customize the virtual hardware configuration and virtual machine type (virtual machine or virtual appliance), as shown in Figure 3-64. Click **Next**.



Figure 3-64 SCVMM New Virtual Machine: Configure Hardware

4. In the Select Destination window, choose the destination server and its storage locations for the virtual machine image files, as shown in Figure 3-65. Click **Next**.



Figure 3-65 SCVMM New Virtual Machine: Select Destination

5. In the Select Host window, select the host, as shown in Figure 3-66. Click **Next**.

🖪 New Virtual Machine			X
🗊 Select Host			•
Virtual Machine Identity Configure Hardware Select Destination	Select a host for the virtual r Hosts are rated based on the virtual ma this virtual machine, click Customize R	nachine. achine's requirements and default placement op atings.	tions. To change placement options for
Select Host	Search	🔎 💌 in	All Hosts
Select Path	Rating - Host		Transfer Type Network
Select Networks		25.90.107	🚣 Network
Additional Properties	XXXXX 8 9.1	23,90.62	
Summary			
	Details Details Details Rating Explanation i S/	What do these rat	tings mean? Customize Ratings
	Status	ОК	
	Operating system	Microsoft Windows Server 2008 R2 Standa	ard ,
	Virtualization software	Microsoft Hyper-V	
	Virtualization software status	Up-to-date	
	Virtual machines	vm-win2003	
		Previo	ous Next Cancel

Figure 3-66 SCVMM New Virtual Machine: Select Host

6. In the Select Path window, enter the file path for virtual machine files, as shown in Figure 3-67. Click **Next**.

🖪 New Virtual Machine		×
🗊 Select Path		0
Virtual Machine Identity Configure Hardware Select Destination	Select storage locations on the host for the virtual machine files Selected host: 9.125.90.107	
Select Host	Virtual machine path:	
Select Path	C:\ProgramData\Microsoft\Windows\Hyper-V Browse	
Select Networks	Add this path to the list of default virtual machine paths on the host	
Additional Properties		
Summary		

Figure 3-67 SCVMM New Virtual Machine: Select Path

7. In the Select Networks window, define the settings of the network for the new virtual machine, as shown in Figure 3-68. Click **Next**.

🖪 New Virtual Machine					×
🗊 Select Netw	orks				0
Virtual Machine Identity Configure Hardware Select Destination	Specify which virt	tual networks 9.125.90.107	to use for the virtual	machine.	
Select Host	Physical Network A	Location	Network Tag	Virtual Network	
Select Path	Network Adapter 1			Not connected	•
Select Networks					
Additional Properties					
Summary					

Figure 3-68 SCVMM New Virtual Machine: Select Networks

8. In the Additional Properties window, select any additional properties for the new virtual machine, as shown in Figure 3-69. Click **Next**.

🖪 New Virtual Machine	×
🕕 Additional Pro	operties
Virtual Machine Identity	Automatic start action
Configure Hardware	Action when physical server starts:
Select Destination	Never automatically turn on the virtual machine
Select Host	Delay start (Sec):
Select Path	Action when physical server stops:
Select Networks	Save State
Additional Properties	Operating system
Summary	Specify the operating system you will install in the virtual machine: Windows Server 2003 Standard Edition (32-bit x86)
	Previous Next Cancel

Figure 3-69 SCVMM New Virtual Machine: Additional Properties

9. Review the Summary page, as shown in Figure 3-70. Click **Create** to start the migration.

🖪 New Virtual Machine			×
🗊 Summary			0
Virtual Machine Identity	Review the virtual n	nachine settings.	
Configure Hardware	Summary:		
Select Destination	Property	Value	
Select Host	Virtual machine	vm-win2003-1	
50000000	Owner	NGPTT\Administrator	
Select Path	Destination host	9.125.90.107	
Select Networks	Path	C:\ProgramData\Microsoft\Windows\Hyper-V\vm-win2003-1	
Additional Properties	Operating System	Windows Server 2003 Standard Edition (32-bit x86)	
Summary			

Figure 3-70 SCVMM New Virtual Machine: Summary

The migration job takes time to complete. Upon completion, you see the newly migrated virtual machine on the Flex System Compute Node, as shown in Figure 3-71.

I Virtual Machine Manager - WINDOWS-	NEOOGJH.napt	t.com					
File View Go Artions Help	e de assessedere						
🔁 Actions 📰 Columns 🗏 Jobs 🗖 PRO	Tips (0) 🔔 Net	working 🔼 I	PowerShell 🔞 He	elp			
Virtual Machines	9.125.90	.107 Virtu	al Machines (2)				
Host Groups	Search					🤎 🔻 None	-
🧭 Overview	Name 4	k.	Status	Job Status	Host	Owner	CPU Average
🖃 📑 All Hosts	🔘 vm-win2	003	Stopped		9.125.90.107	Unknown	0%
9.125.90.107	💿 vm-win2	003-1	Stopped		9.125.90.107	NGPTT\Admin	0%
Filters Clear							
Status							
Owner 🗸							
Operating system 💌							
Added date 🗸							
Tag 🗸	n vm-win2t	JU3-1					•
	Status	Stopped					
	Memory:	512.00 MB					
	Processor:	(1) 1.00 GH:	z Pentium III Xeon				
	Storage:	5.00 GB					
	Latest job:	🔮 100 %	complete				
👔 Hosts		<u>New-VM</u>					
Virtual Machines							

Figure 3-71 V2V migration complete

KVM scenario

Normally, a management server is needed for this migration process. This server captures the virtual machine image from the source server and deploys the image to the destination server. In this scenario, Flex System Manager is the management server for the source server and the destination server. PureFlex System includes Flex System Manager, but Flex System Manager is optional with Flex System. In the absence of an FSM, you can use any KVM management software to implement VM migration.

If you do not have Flex System Manager in your configuration, there are several open source tools that are available, such as QEMU, libvirt, virsh, and virsh-manager. For more information, go to the following website:

http://www.linux-kvm.org/page/Migration

The remainder of this section assumes that you are using Flex System Manager.

The following requirements must be met before you start the KVM migration process:

- Confirm that Flex System Manager VMControl Express is working because the manager is used to import captured virtual appliances.
- An RHEL x86_64 server with network file system (NFS) must be enabled or a shared SAN storage pool must be set up and configured. This configuration is used to store the virtual machine image. The KVM Platform agent also must be installed on the NFS server.
- ► The following image repository conditions must be met:
 - Flex System Manager Common Agent is installed.
 - VMControl Common Repository subagent is installed.
 - The shared NFS exported storage is mounted on the Image Repository server or is connected to the SAN Fibre Channel network, which is used as a repository.
 - The image repository server is discovered and inventory is collected.
 - The image repository is configured within VMControl.
- One or more RHEL KVM hosts must be set up and available. In this scenario, the user must install RHEL KVM on the Flex System Compute Node.

For more information, see the Flex System Manager product publications at this website:

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

Follow these steps to implement a V2V migration process by using KVM:

1. Deploy KVM to the target machines. KVM is a component module of Red Hat Enterprise Linux 6.*x*. Therefore, the KVM components can be installed during the RHEL installation process.

In addition, the ServerGuide Toolkit can be a useful tool to help you install Red Hat. To download the ServerGuide Scripting Toolkit, see this website:

http://ibm.com/support/entry/portal/docdisplay?lndocid=SERV-TOOLKIT

2. After the KVM host is deployed, download and install the KVM Platform agent on the host. The agent can be downloaded from this website (registration is required):

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

3. Set up an NFS and image repository server to meet the prerequisites that were listed previously in this section. After these servers are in place, you discover, authenticate, and inventory all servers, including the NFS Server, image repository server, source server, and target server.

4. Start a web browser and enter the following Flex System Manager URL:

http://System_Name:Port_Number/ibm/console

System_Name is the name of the system on which the management node is installed, and Port_Number is the port that is specified for the web server to use. The default ports for the web server are 8421 and 8422. If port 8422 is used, specify https to indicate a secure port, which is required by default. The Flex System Manager login window opens, as shown in Figure 3-72.

IBM Flex Sys	stem Manager™	
anna anna anna anna anna anna anna ann	User ID: Password:	
ensed Materials - Proj	perty of IBM Corp. IBM Corporat	Log in

Figure 3-72 Flex System Manager login window

5. Enter the User ID and Password and click **Log in**. The main Flex System Manager window opens, as shown in Figure 3-73.

IBM Flex System Manager™				We	come USERID		Problems	1 5 🕰	Complian
View: All tasks 🗸	ſ	Chassis N	Man × System Disc	× Systems by ×					
 Home Chassis Manager Find a Task 		Manageo	d Chassis Find:	🤍 Find a Task or H	ardware Res				
Find a Resource Resource Explorer		Actio	ons 🔻 Search	the table	Search				
Welcome		Select	Chassis Name 🛟	Status 🗘	Access 🔶	Hardware 💠	CMM IP	Compliance 💠	Firmware .
Automation			INGP TT Chassis	A Warning	📄 ок	🔇 Critical	fe80:0:0:0:5e	🖉 ок	0.7.25
Inventory									
Energy									
Release Management									
Gecurity									
E System Status and Health									
🕂 Task Management		•							
E Remote Access		I Page	≥1 of 1 ► ► 1	Selected: 0 1	otal: 1 Filtered:	1			
Gettings Settings	•	Please s	elect a chassis fro	m the list to view o	letails				

Figure 3-73 Flex System Manager main window

From the left navigation pane, click Inventory → System Discovery. Enter the IP address of the server that you want to add to the management list, as shown in Figure 3-74. Add the target servers as needed.

IBM Flex System Manager™	Welcome USERID	Problems	1	5	Complian
View: All tasks 🔻	Chassis Man × System Disc × Systems by ×				
Home					
Chassis Manager					
Find a Task	System Discovery				
Find a Resource	System Discovery				
Resource Explorer	Lise system discovery to discover manageable resources now or schedule your discover	v to run later. You c	an disc	over a r	esource for
Welcome	for a range of IP addresses, or use a discovery profile. Discovery profiles enable you to	customize discover	ries, ind	luding i	mporting IP
My Startup Pages	discovered resources.			-	
Automation	(2) Learn more about using discovery				
	() Cean more about using discovery				Advanced
	Select a discovery option:				Create ne
- Inventory	Single IPv4 address				Manage (
System Discovery					Discovery
View and Collect Inventory	IP address:				
= View Network Topology					
± Views	Salast the resource type to discovery				
Energy	select the resource type to discover:				
Release Management	All				
H Security	Discover Now				
System Configuration					
	Schedule				
Task Management					
Remote Access					

Figure 3-74 Flex System Manager: System Discovery

7. When prompted, enter the User ID and Password to gain full access to the source and target server, as shown in Figure 3-75.

Home X Resource Ex X System D	isc × Request Acc ×	
Request Access		
Specify the user ID and password Systems Director users access to *User ID: #Password: Request Access Close Selected targets:	I to authenticate Systems Direct the target system(s).	tor to one or more target systems. Then click Reques
Name	Access	Trust State
9.125.90.72	No access	Not applicable
<		
I ◀ Page 1 of 1 → H 1 →	Total: 1	

Figure 3-75 Request access to remote server

Important: If the source servers are managed by Flex System Manager (FSM), use the FSM page to capture the virtual images from the source servers. Although virtual images can be captured by means other than FSM, the images must be imported to the target servers by using VMControl on FSM.

The remaining steps apply only to FSM users.

 In the left navigation pane, click System Configuration → IBM System Director VMControl, as shown in Figure 3-76. In the main part of the window, click IBM Systems Director VMControl to start the VMControl plug-in.

IBM" Systems Director	Welcome administrator	Help Logout
View: All tasks		Select Acti
Welcome My Startup Pages Find a Task Find a Resource Navigate Resources Automation Availability Inventory Release Management System Configuration Configuration Templ Configuration Templ Configuration Templ Configuration Templ Configuration Templ Configuration Templ Systems Director VMControl Storage Management	 Ready Setup Remote Control Storage Management 6.1.1.2 Ready SMI-S Providers Systems And Volu Storage Subsystems And Volumes Network Management 6.1.1.2 Ready View all network systems BladeCenter and System x Ready View I/O module plug-ins Blade set Servers and service processors Power Systems Management Ready AIX/Linux virtual servers IBM i virt IBM Systems Director VMCC Ready 	Imes Management 6.1.1.1 ervers and chassis It 6.1.1.2 ual servers ontrol 2.1.0
External Storage Appli Remote Access	Virtual Appliances Deploy	
🗄 System Status and Health	Ready System z Management 6.1.12	
⊞ Task Management ⊞ Settings	z/VM hosts Linux on System z HMC and managed System z servers	l.

Figure 3-76 Starting the VMControl plug-in

9. In the VMControl tab, select the **Virtual Appliances** tab to view virtual machine-related information, which is shown in Figure 3-77.

-											
Resources	Active	Status	\otimes	≙		Jobs					
2 Virtual appliances	Proble	ems	-	2	2	Active	-	-			
1 Workloads	Comp	pliance	-	-	-	Completed	8	31			
0 Server system pools						Scheduled	-	-			
What to deploy:	Where	e to der	olov:		Li	-			teo, oervers/ nos	515	
What to deploy: 2 Virtual appliances	Where 6 Ex	e to dep xistina v	ploy: rirtua	: al se	rvers			Co	mmon tasks	313	
What to deploy: 2 Virtual appliances	Where 6 Ex 2 Ho	e to dep xisting v osts and	oloy: /irtua d 0 s	: al se serve	er sys	item pools		Co	mmon tasks	iance	
What to deploy: 2 Virtual appliances What to capture:	Where 6 Ex 2 Ho	e to dep xisting v osts and	ploy: /irtua d 0 s	: al se serve V	ervers er sys	item pools		Co De Ca	mmon tasks ploy virtual appli pture	iance	
What to deploy: 2 Virtual appliances What to capture: 1 Workloads 6 Virtual servers and	Where 6 Ex 2 Ho	e to dep xisting v osts and	ploy: /irtua d 0 s	: al se serve V	ervers er sys Nhere 1 Im	; tem pools to store: age reposito	ries	Co De Ca In	mmon tasks eploy virtual appli epture eport	iance	
What to deploy: 2 Virtual appliances What to capture: 1 Workloads 6 Virtual servers and	Where 6 Ex 2 Ho operating	e to dep xisting v osts and g syster	ploy: /irtua d 0 s ms	: al se serve V	ervers er sys Nhere 1 Im	stem pools to store: hage reposito	ries	Co De Ca In	mmon tasks ploy virtual appli pture port ewactive and sch	iance reduled jobs	
What to deploy: 2 Virtual appliances What to capture: 1 Workloads 6 Virtual servers and	Where 6 Ex 2 Ho operating	e to der xisting v osts and g syster	ploy: /irtua d 0 s ms	: al se serve V	ervers er sys Nhere 1 Im	stem pools to store: hage reposito	ries	Co De Ca In Vie Vie	mmon tasks ploy virtual appli apture port ew virtual applian eate image repo	iance neduled jobs nce versions	
What to deploy: 2 Virtual appliances What to capture: 1 Workloads 6 Virtual servers and	Where 6 Ex 2 Ho operating	e to der xisting v osts and g syster	ploy: /irtua d 0 s ms	: al se serve V	ervers er sys Nhere 1 Im	stem pools to store: tage reposito	ries	Co De Ca In Vie Vie Cr	mmon tasks aploy virtual appli apture aport ew active and sch ew virtual applian eate image repo	iance neduled jobs nee versions sitory	
What to deploy: 2 Virtual appliances What to capture: 1 Workloads 6 Virtual servers and Virtual Appliances (View	Where 6 Ex 2 Ho operating	e to de; xisting v osts and g syster rs)	ploy: /irtua d 0 s	: al se serve V	ervers er sys Nhere 1 Im	stem pools to store: age reposito	ries	Co De Ca In Viu Viu Cr	mmon tasks sploy virtual appli apture apport ew active and sch ew virtual applian eate image repo	iance neduled jobs nee versions sitory	

Figure 3-77 VMControl: Virtual Appliances tab

10.Click the **Virtual Servers and Hosts** tab. The source and target servers that you discovered are listed, as shown in Figure 3-78.

Virtual Serv	ers and Hosts						? - 🗆
Virtual So Perfo	Virtual Servers and Hosts (View Members) Performance Summary Actions Search the table						
Select	Name 🗘	State 🗘	Access 🗘	Problems 🗘	Compliance 💠	OS Name 🔷	OS Type
	IBM 797131A 99B4191	Unknown	🔤 ок	🚹 Warning	🖉 ок	9.125.90.180	Linux 6.0
	apture1_to194	Started	🔤 ок	\Lambda Warning	📄 ок		
	🗸 suse2	Stopped	📰 ок	\Lambda Warning	🗾 ок		
	ouse3 🗸	Stopped	🗾 ок	\Lambda Warning	🖉 ок		
	🗸 suse4	Stopped	🔤 ок	\Lambda Warning	🗾 ок		
	IBM 8853L3A 99H8712	Unknown	🗾 ок	🚺 Information	🗾 ок	9.125.90.234	Linux 6.0
	🗸 win2k	Stopped	🔤 ок	🔤 ок	🗾 ок		
	🖉 windows2008	Stopped	📄 ок	🖉 ок	🖉 ок		

Figure 3-78 Virtual Servers and Hosts window

- 11. On the **Virtual Appliance** tab (see Figure 3-77 on page 124), click **Capture** in the Common tasks box.
- 12. The VMControl Capture wizard starts and opens the Welcome page, as shown in Figure 3-79. Click **Next**.

Capture ×	Select Action
⇔ Welcome	Welcome
Name	Welcome to the Capture vizard.
Source	
Source Virtual Server	Use this wizard to help you capture a virtual server or workload to create a virtual appliance. After creating the virtual appliance, you can quickly deploy it into your environment.
Version Control	Before capturing a virtual server or workload, view the requirements for your virtualization environment.
Summary	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
	()Learn more about capturing virtual appliances
	Show this Welcome page next time.
	< Back Next > Finish Cancel

Figure 3-79 VMControl Capture wizard: Welcome

13. Enter the Name and Description for the virtual appliance (target virtual machine image package), as shown in Figure 3-80. Click **Next**.

ture ×	Select Action
(Welsons	Name
Vercome	Specify a name and description for the virtual appliance that you want to create.
<pre>value</pre>	
Source	Max
Source virtual Server	*Name: capture-suse
Version Control	
Summary	Description: capture the <u>suse linux</u> virtual server
	Limit of 256 characters
	Enter tags separated by commas. Example: WebSphere, Test, Department 123
	< Back Next > Finish Cancel

Figure 3-80 VMControl Capture wizard: Name

14. In the Source window, select Virtual Server as the source type, as shown in Figure 3-81.

pture ×	Select Action
🗸 Welcome	Source
🗸 Name	Select the source type to capture.
Source	
Source Virtual Server	Virtual Server
Version Control	🔘 Workload
Summary	

Figure 3-81 VMControl Capture wizard: Source

15. In the Source Virtual Server window, choose the migration source server, as shown in Figure 3-82.



Figure 3-82 VMControl Capture wizard: Source Virtual Server

16.In the Disks window, specify the virtual appliance disk settings, as shown in Figure 3-83. Click **Next**.

Welcome	Disks				
✓ Name	Specify the disks and disk images to be captured. Selecting a disk captures information about the disk Selecting a disk image additionally captures the disk contents.				
Source Virtual Server	By default all compatible disks and their associated disk image contents are selected for capture. Use caution if you choose to exclude a disk or disk image from the capture. The resulting virtual appliance m				
🗇 Disks	operating system (boot) disk and image is required.				
Network Mapping					
Operating System	(r) Learn more about capturing disks and disk images				
Version Control	Disks and Images to Capture				
Summary	Actions Search the table Search				
	Select Disk Name 💠 Storage S 🗘 Size (MB) 💠 Compatible 🗘 Include				
	● suse3 ima IBM 7971314 6000 Ves ♥				
	Busedhing Ibin 77131A in 6000 Tes				

Figure 3-83 VMControl Capture wizard: Disks

17. In the Network Mapping window, specify the virtual appliance network mapping settings, as shown in Figure 3-84. Click **Next**.

Сар	pture ×		4	Select Action	
Сар	pture			- L	
	6 m 1	Network Mapping			
	✓ Welcome ✓ Name	Specify a description to use for each virtual netwo	rk		
	V Source	Network Mapping			
	Source Virtual Server	Actions V Search the table Search			
	🗸 Disks				
	Network	Network \$	Description	\$	
	* Mapping	Discovered-br0-0	Network adapter 0 on Discovered	-	
	Operating System	<		4	
	Version Control	I	ered: 1		
	Summary				

Figure 3-84 VMControl Capture wizard: Network Mapping

Capture ×				Select Acti	ion	
Capture						
	Velcome	Operating System				
v N v S	ame	No operating system has been discovered for the following virtual server. Select an operating system for the virtual server.				
✓ s	ource Virtual erver	Operating System				
	nsks letwork lapping	Host \$	Virtual Server \$	Operating System	\$	
⇔ s) perating System	IBM 797131A 99B4191 (9)	suse3	Linux(36)		
S	ersion Control Summary	I ← Page 1 of 1 → I 1 → I Total: 1 Filtered: 1				
		or other software products when the captu	ng system, you will not ired virtual appliance is	deployed.	tem	

Figure 3-85 VMControl Capture wizard: Operating System

19. In the Version Control window, confirm the version control information for the new virtual appliance, as shown in Figure 3-86. You also can choose **Create a new version tree with the new virtual appliance as the root** if you want to establish a new group with the new virtual appliance. If you want to use the existing virtual appliance and assign that appliance as a parent version, select **Select a virtual appliance to be the parent version of the new virtual appliance**. Click **Next**.

apture ×	 Select Action -
✓ Welcome ✓ Name	Version Control Set the version information for the new virtual appliance.
 ✓ Source Source ✓ Virtual Server ✓ Disks ✓ Network Mapping 	If the virtual server you want to capture is associated with a virtual appliance from a previous deployment, you can set the version of the new virtual appliance to be based on the associated virtual appliance. If the virtual server has no associated virtual appliance from a previous deployment, you can choose to create a new version tree with the new virtual appliance as the root, or you can select an existing virtual appliance to be the parent version of the new virtual appliance. Select the action you want to take to set version information for the new virtual appliance:
 ✓ Operating System ✓ Version Control Summary 	 Set the version based on the virtual appliance from which the virtual server was originally deployed: Create a new version tree with the new virtual appliance as the root. Select a virtual appliance to be the parent version of the new virtual appliance.
	Version comment:
	< Back Next > Finish Cancel

Figure 3-86 VMControl Capture wizard: Version Control

Capture X			Select Action
Capture			-
	Summary		
Veicome	You are now ready to capture the virtual	I server or workload to create a virtual app	pliance.
Source			
Source Virtual Server	Virtual appliance or workload details:		
🗸 Disks	Virtual appliance name:	capture-suse	•
Network	Virtual appliance description:		
Mapping	Source server:	suse3	
Operating	Repository:	image repository	=
* System	Dieke		
Version Control			
C Summany	Disk Name	suse3.img	
Summary	Storage Server	IBM 797131A 99B4191	
	Compatible	Ves	
	Include Image	Yes	
	Disk Description		-
	Note: The virtualization manager will pro	ovide access to the target server so that in	can be captured.
	Click Finish to capture the virtual server o deploy the virtual appliance into your env	r workload and create a virtual appliance. ironment.	Once completed, you can
	1		
		< Back Ne	xt > Finish Cancel

20.In the Summary page, review the summary information of the virtual appliance, as shown in Figure 3-87. Click **Finish**.

Figure 3-87 VMControl Capture wizard: Summary

21. You are prompted to run the job immediately or schedule the run for a later time, as shown in Figure 3-88. Click **Run Now**.

Launch Job						
Schedule	Notification	Options				
Job name and	schedule					
*Job Name:						
Capture virtua	al appliance - Ja	nuary 12, 2012	12:57:08 AM (GMT+08:00		
Choose when	to run the job.					
Run Now						
Schedule						
OK Car	icel Help					

Figure 3-88 VMControl Capture wizard: Schedule

After the job completes, you can see that another appliance is available in the Virtual Appliances tab, as shown in Figure 3-89. The virtual appliances that are listed in Figure 3-89 can be captured by FSM or imported by the user. By using either method, the user can deploy the virtual appliances into target KVM servers, as described in the next steps.

Basics	Workloads	Virtual Appliances	System Poo	ols	Virtual Servers	/Hosts		
What to day		and the dealers.						
1 Virtual ap	ppliances 6	Existing virtual serve	205		Common tasks			
	2	Hosts and 0 server s	system pools		Deploy virtual	appliance		
What to capt	at to capture: Wh				Capture			
1 Workload 6 Virtual se	ds ervers and operat	ting systems	1 Image repositories		Import			
0 111001 50		ang systems			View active and scheduled jobs			
					View virtual ap	pliance ver	rsions	
					Create Image	repository		
Virtual Applia	ances (View Mem	bers)						
Capture	Deploy Virtua	al Appliance Imp	ort Actio	ons 🔻	Search t	he table	Search	
Select Na	ame	Operat	ing Syst 🗘	Repo	sitory 🗘	Descripti	on	\$
	capture2	Linux		image	_repository	Virtual Ap	opliance	
	capture'	Linux		image	_repository	Virtual Ap	opliance	
4								
								, r
M 4 Page 1	of 1 🕨 1	Selected: 1	Total: 1 Filte	ered: 1				

Figure 3-89 VMControl Capture wizard: Capture complete

22. The captured virtual appliance now must be deployed by using VMControl on Flex System Manager. Click **Deploy Virtual Appliance**. A new wizard starts with a Welcome page, as shown in Figure 3-90. Click **Next**.

Deploy Virt ×	Select Action
Deploy Virtual Appliance	
- Walasaa	Welcome
Target	Welcome to the Deploy Virtual Appliance wizard.
Summary	Use this wizard to deploy virtual appliance "capture2" to a server.
	②Learn more about deploying virtual appliances
	You are guided through the following tasks:
	* Specifying a target for the selected virtual appliance
	* (Optional) Customizing settings on the virtual appliance before deploying
	Show this Welcome page next time.
	< Back Next > Finish Cancel

Figure 3-90 Deploy Virtual Appliance wizard: Welcome

23.In the Target window, choose **Deploy to a new virtual server on the following**, as shown in Figure 3-91. Select the target system in the pool list. Click **Next**.

jet .						
	Select the lo	ocation where you want to depl	oy the virtual applia	nce.		
Y 0	ou can deplo r, you can d O Deploy to	by the virtual appliance to created on the virtual appliance to a set on the virtual server on the form	te a new virtual serv an existing virtual se llowing:	er on an existing h erver.	ost system or syst	em pool.
	Acti	ons 🔻 Search the table	e Search			
	Select	Name	🗘 State 🗘	IP Addres 🗘	Installed 💠	Descripti
		IBM 8853L3A 99H8712	Unknown	9.125.90.234,	9.125.90.234	
	O	BM 797131A 99B4191	Unknown	9.125.90.194,	9.125.90.194	
	Pag Deploy to	IBM 797131A 99B4191 e 1 of 1 ▷ ▷ 1 ⇒ an existing virtual server:	Unknown III elected: 1 Total: 3	9.125.90.194, Filtered: 2	9.125.90.194	Þ
	C Deploy to	IBM 797131A 99B4191 e 1 of 1 ▶ ▶ 1 ◆ S an existing virtual server: ions ▼ Search the table	Unknown III elected: 1 Total: : e Search	9.125.90.194, 2 Filtered: 2	9.125.90.194	F
	C Deploy to Select	IBM 797131A 9984191 e 1 of 1 ▶ ▶ 1 ➡ an existing virtual server: ions ▼ Search the table Name	Unknown III eelected: 1 Total: 3 e Search	9.125.90.194, 2 Filtered: 2	9.125.90.194	▶ Descript
	C Deploy to C Select	IBM 797131A 99B4191 e 1 of 1 ▶ ▶ an existing virtual server: ions Search the table Name Lange suse3	Unknown III elected: 1 Total: : e Search \$ State : Stopped	9.125.90.194, 2 Filtered: 2	9.125.90.194	Descript Virtual S
	Deploy to Select	IBM 797131A 99B4191 e 1 of 1 ▶ ▶ 1 ▶ an existing virtual server: ions ▼ Search the table Name Image: Suse3 Image: Suse4	Unknown III elected: 1 Total: 2 e Search State 2 Stopped Stopped	9.125.90.194, 2 Filtered: 2 > IP Addres ≎	9.125.90.194	Descript Virtual S Virtual S
	C Deploy to C Deploy to C Select C C C C C C C C C C C C C C C C C C C	IBM 797131A 99B4191 e 1 of 1 ▶ № an existing virtual server: ions Search the table Name Image: Suse3 Image: Suse4 Image: Capture1_to194	Unknown III elected: 1 Total: 2 e Search State c Stopped Stopped Started	9.125.90.194, Filtered: 2	9.125.90.194	► Descript Virtual S Virtual S Virtual S
	C Deploy to C Deploy to C Select C C C C C C C C C C C C C C C C C C C	IBM 797131A 99B4191 e 1 of 1 ▶ ▶ 1 ▶ an existing virtual server: ions ▼ Search the table Name Image: Suse3 Image: Suse4 Image: Capture1_to194	Unknown III elected: 1 Total: 2 e Search Stopped Stopped Itation III III III IIII IIII IIII IIII IIII	9.125.90.194, Filtered: 2 IP Addres \$	9.125.90.194	Descript Virtual S Virtual S Virtual S

Figure 3-91 Deploy Virtual Appliance wizard: Target

24. In the Name window, enter the name for the workload (virtual machine), as shown in Figure 3-92. Click **Next**.

eploy Virtual Appliance	
✓ Welcome ✓ Target	Name Specify a name for the virtual server that you want to deploy.
 ✓ Workload Name ✓ Name Storage Mapping 	*Type the name of the virtual server that you want to create. capture2_vs86048
Network Mapping Product Summary	< Back Next >

Figure 3-92 Deploy Virtual Appliance wizard: Name
25. In the Storage Mapping window, assign the storage pool for the virtual disks when the virtual appliance is deployed, as shown in Figure 3-93. A storage pool must be defined for the target host before running the deployment operation.

Deploy Virt ×			▲ Se	elect Action	•
Deploy Virtual Appliance					
✓ Welcome	Storage Mapping				
✓ Target	Specify how to assign the storage for the virtual disks when you deploy the virtual appliance.				
 ✓ Workload Name ✓ Name Storage Mapping Network Mapping Product Summary 	Ensure each disk in the table is assigned to either a storage volume or storage pool. To assign a disk to a storage volume, select a single disk. You can select multiple disks to assign to a storage pool. If one or more available storage locations were found, then a suggested storage pool has been assigned by default for each disk. If the default assignment(s) are adequate, you can just click Next to continue with the wizard. (?) Learn more about storage mapping for deploying to a new virtual server Storage Mapping				
	Assign to Storage Volume Assign to Storage Pool Actions V Search the table Search			rch	
	Select Disk Required by Virtual 💠	Assigned Storage	Size (MB) 🗘	Image :	> >
) disk1	images (Local-Shared Storage Pool)	6,000	True	
	< Id 4 Page 1 of 1 ▷ ▷ 1	acted: 1 Total: 1 Filtered: 1			4
				< Back Ne	xt >

Figure 3-93 Deploy Virtual Appliance wizard: Storage Mapping

26.In the Network Mapping window, select the network configuration for the new virtual server, as shown in Figure 3-94.

Deploy Virt ×		 Select Action
Deploy Virtual Appliance		-
√ Welcome	Network Mapping Select a virtual network for each network defined for the appliance.	
 ✓ Workload Name ✓ Name ✓ Storage Mapping ✓ Network Mapping Product Summary 	The following networks will be assigned for this virtual server. Network Mapping Actions Search the table Search	
	VA Network Name Network adapter 0 on Discovered Network adapter Discovered-br0-0 Value Adapter 0 on Discovered	MAC Address ≎ Auto set
	I I I I Total: 1 Filtered: 1	< Back Next >

Figure 3-94 Deploy Virtual Appliance wizard: Network Mapping

27. In the Product window, enter the OS configuration for the new virtual server, as shown in Figure 3-95. Click **Next**.

Deploy Virt ×			
Deploy Virtual Appliance			
Welcome	Product		
✓ Target	Specify the product settings you want to use when you deploy the virtual appliance.		
✓ <u>Workload Name</u>			
🗸 <u>Name</u>	General System Product Section		
✓ Storage Mapping	Time zone setting for the virtual system	America/New_York	
✓ <u>Network Mapping</u>	System Level Networking		
Summan	Short host name for the system.	capture2-vs86048	
Summary	DNS domain name for the system.		
	IP addresses of DNS servers for system.		
	Default IPv4 gateway.		
	Network adapter configuration for Network adapter 0 on Discovered-br0-0		
	Internet Protocol Version 4		
	Static IP address for the network adapter "Network adapter 0 on Discovered-br0-0".		
	Static network mask for network adapter "Network adapter 0 on Discovered-br0-0".	255.255.255.0	
	Use DHCP for network adapter "Network adapter 0 on Discovered-br0-0".	False 💌	
	Internet Protocol Version 6		
	Static IP address for the network adapter "Network adapter 0 on Discovered-br0-0".		
	Static default gateway for network adapter "Network adapter 0 on Discovered-br0-0".		
	Use IPv6 stateless address autoconfiguration for network adapter "Network adapter 0 on Discovered-br0-0".	False 💌	
	Deployment use		
	The adapter order for network adapter "Network adapter 0 on Discovered-br0-0".	0	
	The MAC address for network adapter "Network adapter 0 on Discovered-br0-0".		
	Remove ISO Product Section	_	
	Remove ISO after customization (requires shutdown)	True	

Figure 3-95 Deploy Virtual Appliance wizard: Product

28. In the Summary window, review the summary information of the deployment, as shown in Figure 3-96. Click **Finish**. You see the newly created job.

Deploy Virt ×			Select Action
Deploy Virt X Velcome Target Vorkload Name Name Storage Mapping Network Mapping Product Summary	Summary You are now ready to deploy the virtual appliance Deployment details: Virtual appliance to deploy: Target server or system pool: Workload Name Name: Storage Mapping:	capture2 IBM 797131A 99B4191 deploy-workload capture2_vs86048	
	Disk Required by Virtual Appliance Assigned Storage Size (MB) Image Description Click Finish to deploy the virtual appliance.	disk1 images (Local-Shared Storage Pool) 6000 Yes	Ŧ
		< Back Ne	ext > Finish Cancel

Figure 3-96 Deploy Virtual Appliance wizard: Summary

- 29. Click **Run Now** to start the job. Click **OK**.
- 30. After the job is complete, you see that the virtual server was migrated to the KVM-based target machine.

3.3 Conclusion

Migration is a complex topic, the details of which cannot be covered in a single paper.

Users must understand the real migration environment and determine the specific solution. The examples in this paper are a good start to understanding more about the overall migration process. By following the guidelines in this document with a thorough understanding of the IT environment, you can conduct a successful migration.

Abbreviations and acronyms

ACPI	Advanced control and power interface	RAID	Redundant array of independent disks
AMM	Advanced Management Module	RAM	Random access memory
ATS	Advanced Technical Support	RDP	Remote Desktop Protocol
BIOS	Basic input output system	RHEL	Red Hat Enterprise Linux
CD	Compact disk	RSS	Receive-side scaling
CIM	Common Information Model	SAN	Storage area network
CMM	Chassis Management Module	SAS	Serial Attached SCSI
CPU	Central processing unit	SCVMM	System Center Virtual Machine
CSTL	China Systems & Technology Labs		Manager
DHCP	Dynamic Host Configuration	SLES	SUSE Linux Enterprise Server
		IOR	lop of rack
	Digital Video Disc	UEFI	Unified Extensible Firmware
	Fourtoon data rato	URL	Uniform Resource Locator
FSM	Flox System Manager	USB	Universal serial bus
GR	Gigabyte	VHD	Virtual hard disk
GUI	Graphical user interface	VLAN	Virtual LAN
HRA	Host bus adapter	VM	Virtual machine
НОО	Hard disk drive	VMDK	Virtual machine disk
1/0		VMM	Virtual Machine Manager
IBM	International Business Machines	VSMT	Virtual Server Migration Toolkit
ID	Identifier	VT	Virtualization Technology
М	Instant messaging	WMI	Windows Management
IOM	I/O Module		Instrumentation
IP	Internet Protocol		
п	Information technology		
ITSO	International Technical Support Organization		
KVM	Keyboard video mouse		
LUN	Logical unit number		
MAC	Media access control		
МВ	Megabyte		
ММ	Management Module		
NFS	Network file system		
NIC	Network interface card		
OS	Operating system		
OVF	Open Virtualization Format		
PC	Personal computer		
PNG	Portable Network Graphics		

Power-on self test

POST

Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this paper.

Lenovo Press publications

The following Lenovo Press publications provide additional information about the topic in this document.

- ► Flex System Products and Technology, SG24-8255
- ► Flex System Enterprise Chassis, TIPS0863
- ► IBM Flex System Manager, TIPS0862
- ► Flex System x240 Compute Node (E5-2600), TIPS0860
- Flex System x220 Compute Node, TIPS0885

Other publications and online resources

These publications and websites are also relevant as further information sources:

The following websites also are relevant as additional information sources:

- Advanced Management Module User's Guide http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5073887
- Lenovo Customized images for VMware ESXi and vSphere http://ibm.com/systems/x/os/vmware/esxi/index.html
- IBM DS Storage Manager http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5077693
- Flex System Information Center http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp
- ServerGuide http://ibm.com/support/entry/portal/docdisplay?lndocid=SERV-GUIDE
- ServerProven http://ibm.com/systems/info/x86servers/serverproven/compat/us
- MegaRAID Storage Manager http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5077712
- ServerGuide Scripting Toolkit http://ibm.com/support/entry/portal/docdisplay?lndocid=SERV-TOOLKIT