

## VMware Software Solution Product Guide

### Product Guide

Lenovo and VMware have been collaborating for more than twenty years, helping customers solve their most complex problems in virtualization and digital transformation.

As an Value-Added OEM (VAO) partner of VMware solutions, Lenovo offers a broad range of VMware based solutions in varying levels of integration to meet different customer requirements and business needs. Solutions range from the turnkey Lenovo ThinkAgile VX Series with VMware Cloud Foundation Co-Engineered Solution to build-your-own systems based on Lenovo's ThinkSystem Servers, proven reference architectures and VMware software only licenses.

VMware VAO licenses are sold as a Subscription with included 1 year (for Co-term), 3 year, or 5 years support with Lenovo hardware. All Lenovo offerings come with VMware VAO software licenses that include L3 support provided by VMware and L1 and L2 support provided by Lenovo.



### Did you know?

Lenovo XClarity Integrator integrates XClarity Administrator into VMware software, providing the functionality you need to manage Lenovo infrastructure right in the console of VMware software.

Lenovo offers XClarity Integrators for VMware vCenter and VMware VCF Operations. For more information, please refer to the [Lenovo XClarity Administrator Product Guide](#).

## Why buy VMware products from Lenovo?

Lenovo has proven experience in developing and delivering VMware-based solutions that help customers modernize and simplify their IT infrastructure to dramatically drive down operating costs and open the door to cutting-edge innovations. Built around the latest Lenovo ThinkSystem servers' hardware, the Lenovo solution with VMware provides businesses with an affordable, interoperable, and reliable industry-leading solution to manage their virtualized workloads.

Why purchase VMware solutions from Lenovo?

- A Co-engineered solution with ThinkAgile VX Series built by Lenovo and VMware.
  - Careful selection of latest hardware components, BIOS settings, and network configurations that help maximize the performance of the infrastructure.
  - Ensure a reliable, compliant and consistent environment with a rigorously tested “Best Recipe” bundle of drivers and firmware for rolling system updates with 1-click updates through integrations with vLCM for and near zero interruptions to desired state
  - With the VX Deployer, you can Deploy new or expand existing clusters with in-step validation and automation for repetitive deployments
  - Through the ThinkAgile VX integrations with VMware vCenter through Lenovo XClarity, features like Virtualization management, workflow provisioning, and detailed hardware monitoring enables more precise insight and control over entire environment.
  - Robust security features, including data-at-rest encryption, secure boot and firmware integrity checks protect against unauthorized access and ensure data integrity
- Single point of support tracking for VMware software sold with Lenovo Hardware.
  - World-class service delivering single point support for Lenovo servers and Lenovo OEM software Easy ordering and delivery with Single SKU for license and Subscription and Support.

## VMware new Subscription model

In November 2023, Broadcom completed VMware’s acquisition, and continuing with the strong relationship between Partners, Lenovo now offers the new VMware by Broadcom portfolio; based entirely on subscription model with per core metric as a new standard.

The new subscription offering is composed of two main products, VMware Cloud Foundation (VCF) and VMware Sphere Foundation (VVF), and a set of add-ons.

A Subscription license represents 1 Core. Customers need to purchase as many licenses as the count of Cores that they need for their servers. A minimum of 16 Core licenses is required per CPU. A minimum of 72 Core licenses is required per order, per Broadcom ordering guidelines.

## VMware Cloud Foundation (VCF)

VMware Cloud Foundation (VCF) is the software stack that serves as the foundation of private and hybrid clouds enabling a cloud operating model that provides the benefit of public cloud with the security and performance of on-premises private clouds. It is a full stack hyperconverged infrastructure (HCI) software with fully integrated compute, storage, networking, and management with automation for reduced complexity and lower TCO.

VCF offers integrated, software-defined solution with built-in automated lifecycle management that combines **virtualized services for compute, storage, networking, security, and cloud management** . It delivers consistent infrastructure for private, hybrid, and multi-cloud demands.

Kubernetes is integrated within VCF, delivering full-stack, developer-ready infrastructure with **VMware Tanzu Kubernetes Grid**. Any environment based on VMware Cloud Foundation now natively supports both VM and container workloads.

VCF is sold as a 3-year minimum Upfront payment Subscription for every new solution. VCF is sold only with Hardware, but with 1-year Stand Alone option for Co-Term if needed.

**Every VMware Cloud Foundation license part number contains:**

- vSphere Enterprise Plus: 1 Core
- vCenter Standard: 1 Instance
- Tanzu Kubernetes Grid: 1 Core
- vSAN Enterprise Features: 1 TiB per each 1 Core
- Aria Suite Enterprise: 1 Core
- NSX Networking for VCF: 1 Core
- HCX Enterprise: 1 Core
- AON Enterprise: 1 Core
- SDDC Manager: 1 Core

Topics in this section:

- [How to license VMware Cloud Foundation](#)
- [VMware Cloud Foundation Lenovo PN](#)

## How to license VMware Cloud Foundation

- VCF is licensed by Core with a minimum of 16 Core licenses per CPU & 72 licenses per order.
- VCF provides 1 TiB of vSAN entitlement for each VCF core purchased.
- Customers can distribute surplus vSAN TiB licenses in a single VCF instance between multiple vSAN clusters that may have higher storage capacity requirements in the VCF environment.
- The vSAN subscription capacity is based on the total raw physical storage (TiBs) claimed by vSAN on all the ESXi hosts in each vSAN Cluster.
- Raw capacity refers to the aggregate that is claimed by all the hosts that comprise the vSAN cluster. Cache capacity is excluded from raw storage capacity. Note, in OSA the caching devices never contribute to capacity. In ESA, there are no dedicated caching devices.
- Keep in mind that Storage discs might be set on Terabyte (TB), so a conversion into Tebibyte (TiB) is needed.

1 Terabyte is equal to  $(10^{12} / 2^{40})$  tebibytes.

There are 0.90949470177293 tebibytes in a Terabyte. 1 TB = 0.90949470177293 TiB

The following table lists the how to license information.

Table 1. How to license VMware Cloud Foundation

ESXi Hosts (in vSAN cluster)	CPUs per ESXi Host	Cores per CPU	TiBs per ESXi Host	TiBs per Cluster	Entitled TiBs from VCF	Subscription Capacity Required for VCF (Core)	Subscription Capacity Required For vSAN (TiB)	Conclusion
3	4	16	1.84	5.52	192	192	-186.48	There's still 186.48 TiB left over from VCF entitled. No additional vSAN needs to be purchased
				1.84 TiB per ESXi Host * 3 Host = 5.52	16 Core * 4CPU * 3Host = 192	1 Core VCF comes with 1 vSAN TiB	TiB per cluster, 5.52 is smaller than VCF entitled vSAN TiB	
4	4	20	61.4	245.76	320	320	-74.24	There's still 74.24 TiB left over from VCF entitled. No additional vSAN needs to be purchased
				61.44 TiB per ESXi Host * 4 Host = 245.76	20 Core * 4CPU * 4Host = 320	1 Core VCF comes with 1 vSAN TiB	TiB per cluster, 245.76 is smaller than VCF entitled vSAN TiB	
4	4	8	61.4	245.76	128	128	117.76	TiB per Cluster is greater than entitled by VCF. Additional 118 vSAN TiB needs to be purchased
				61.44 TiB per ESXi Host * 4 Host = 245.76	8 Core * 4CPU * 4Host = 128	1 Core VCF comes with 1 vSAN TiB	TiB per cluster, 245.76 is smaller than VCF entitled vSAN TiB	

For licensing information, see VMware site here: <https://kb.vmware.com/s/article/95927>

For more information please visit [Broadcom](#) Counting Core for VMware Cloud Foundation and vSphere Foundation and TiBs for vSAN article here.

## VMware Cloud Foundation Lenovo PN

The following table lists the Lenovo ordering information.

Table 2. VMware Cloud Foundation ordering information (part number / feature code)

Region availability	Description	Feature code	Lenovo part number	VMware part number License
WW	VMware Cloud Foundation 5 - 1yr w/lenovo support - All segments for co-term	SCX5	7S1P0001WW	VCF-CLD-FND-5
WW	VMware Cloud Foundation 5 - 3yr w/lenovo support - All segments	SCX6	7S1P0002WW	VCF-CLD-FND-5
WW	VMware Cloud Foundation 5 - 5yr w/lenovo support - All segments	SCX7	7S1P0003WW	VCF-CLD-FND-5

## VMware vSphere Foundation (VVF)

A simplified, enterprise-grade workload platform for mid-size to smaller customers. Integrates vSphere with operations management to provide performance, availability, and efficiency with greater visibility and insight. In addition, VVF includes VMware vSAN™ to deliver an enterprise-class Hyperconverged Infrastructure (HCI) solution.

VVF is sold as a 3-year minimum Upfront payment Subscription for every new solution. VVF is sold only with Hardware, but with 1-year Stand Alone option for Co-Term if needed.

### Every VMware vSphere Foundation PN contains:

- vSphere Enterprise Plus: 1 Core
- vCenter Standard: 1 Instance
- Tanzu Kubernetes Grid: 1 Core
- vSAN Enterprise Features: 0.25 TiB per each 1 Core
- Aria Suite Standard: 1 Core

Only vSphere versions running 8.0U2b patch release and later will receive vSAN capacity in vSphere Foundation.

Topics in this section:

- [How to license VMware vSphere Foundation](#)
- [VMware vSphere Foundation Lenovo PN](#)
- [VMware Add-Ons](#)
- [Fulfillment](#)

## How to license VMware vSphere Foundation

- VVF is licensed by Core with a minimum of 16 Core licenses per CPU & 72 licenses per order.
- VVF provides 0.25 TiB of vSAN entitled capacity for each VVF core deployed in a vSAN cluster. The vSAN subscription capacity is based on the total raw physical storage (TiBs) claimed by vSAN on all the ESXi hosts in each vSAN Cluster.
- vSAN TiBs included in VVF can be aggregated and utilized across VVF core licenses only.
- Raw capacity refers to the aggregate that is claimed by all the hosts that comprise the vSAN cluster. Cache capacity is excluded from raw storage capacity. Note, in OSA the caching devices never contribute to capacity. in ESA, there are no dedicated caching devices.
- Keep in mind that Storage discs might be set on Terabyte (TB), so a conversion into Tebibyte (TiB) is needed.
- Customers can purchase an additional quantity of vSAN capacity for the incremental storage they may require for their VVF environment.
- For more information please visit [Broadcom Counting Core for VMware Cloud Foundation and vSphere Foundation and TiBs for vSAN article here.](#)

The following table lists the how to license information.

Table 3. How to license VMware vSphere Foundation

CPUs per ESXi Host	Cores per CPU	TiBs per ESXi Host	TiBs per Cluster	Entitled TiBs from Foundation. 0.25 TiB	Subscription Capacity Required for vSphere Foundation (Core)	Subscription Capacity Required For vSAN (TiB)	Conclusion
4	16	1.8	5.52	48.00	192.00	-42.48	There's still 42.5 TiB left over from VVF entitled. No additional vSAN needs to be purchased
			1.84 TiB per ESXi Host * 3 Host = 5.52	16 Core * 4CPU * 3Host= 192 *0.25	16 Core * 4CPU * 3Host= 192	TiB per cluster, 5.52 is smaller than VVF entitled vSAN TiB	
4	8	61.4	245.8	32.0	128.00	213.76	Customer will receive 32 TiBs of vSAN from VVF and needs to purchase additional 214 TiBs of vSAN capacity (rounding up)
			61.44 TiB per ESXi Host * 4 Host = 245.76	8 Core * 4CPU * 4Host= 128 *0.25 =32	8 Core * 4CPU * 4Host= 128	TiB per cluster, 245.76 is greater than VCF entitled vSAN TiB	
4	16	61.4	245.8	64.0	256.00	181.76	Customer will receive 64 TiBs of vSAN from VVF and needs to purchase additional 181 TiBs of vSAN capacity (rounding up)
			61.44 TiB per ESXi Host * 4 Host = 245.76	16 Core * 4CPU * 4Host= 256 *0.25 =64	16 Core * 4CPU * 4Host= 256	TiB per cluster, 245.76 is greater than VCF entitled vSAN TiB	

## VMware vSphere Foundation Lenovo PN

The following table lists the how to order Lenovo information.

Table 4. VMware vSphere Foundation ordering information (part number / feature code)

Region availability	Description	Feature code	Lenovo part number	VMware part number License
WW	VMware vSphere Foundation 8 - 1yr w/lenovo support - Corp/Comm segment only. For Co-term	SCX8	7S1P0004WW	VCF-VSP-FND-8
WW	VMware vSphere Foundation 8 - 3yr w/lenovo support - Corp/Comm segment only	SCX9	7S1P0005WW	VCF-VSP-FND-8
WW	VMware vSphere Foundation 8 - 5yr w/lenovo support - Corp/Comm segment only	SCXA	7S1P0006WW	VCF-VSP-FND-8

## VMware Add-Ons

The following table lists the how to order information.

Table 5. VMware Add-Ons ordering information (part number / feature code)

Region availability	Description	Feature code	Lenovo part number	VMware part number License
WW	VMware vSAN 8 - 1yr w/lenovo support - All segments. For Co-term	SCXE	7S1P000AWW	VCF-VSAN-8
WW	VMware vSAN 8 - 3yr w/lenovo support - All segments	SCXF	7S1P000BWW	VCF-VSAN-8
WW	VMware vSAN 8 - 5yr w/lenovo support - All segments	SCXG	7S1P000CWW	VCF-VSAN-8
WW	VMware Avi Load Balancer 1yr w/lenovo support - All segments. For Co-term	SCXP	7S1P000KWW	ANS-VMW-ALB
WW	VMware Avi Load Balancer 3yr w/lenovo support - All segments	SCXQ	7S1P000LWW	ANS-VMW-ALB
WW	VMware Avi Load Balancer 5yr w/lenovo support - All segments	SCXR	7S1P000MWW	ANS-VMW-ALB
WW	VMware Live recovery 1yr w/lenovo support - All segments. For Co-term	SCXS	7S1P000NWW	VCF-VLR-PVM
WW	VMware Live recovery 3yr w/lenovo support - All segments	SCXT	7S1P000PWW	VCF-VLR-PVM
WW	VMware Live recovery 5yr w/lenovo support - All segments	SCXU	7S1P000QWW	VCF-VLR-PVM
WW	VMware Firewall with Advanced Threat Prevention 1yr w/lenovo support - All segments. For Co-term	SCXL	7S1P000GWW	ANS-FW-ATP-B
WW	VMware Firewall 1yr w/lenovo support - All segments. For Co-term	SCXH	7S1P000DWW	ANS-VMW-FW-B
WW	VMware Firewall 3yr w/lenovo support - All segments	SCXJ	7S1P000EWW	ANS-VMW-FW-B
WW	VMware Firewall 5yr w/lenovo support - All segments	SCXK	7S1P000FWW	ANS-VMW-FW-B
WW	VMware Firewall with Advanced Threat Prevention 3yr w/lenovo support - All segments	SCXM	7S1P000HWW	ANS-FW-ATP-B
WW	VMware Firewall with Advanced Threat Prevention 5yr w/lenovo support - All segments	SCXN	7S1P000JWW	ANS-FW-ATP-B
WW	VMware Advanced Threat Prevention Add-on to VMware Firewall 1yr w/lenovo support - All segments. For Co-term	SCXV	7S1P000RWW	ANS-FW-ATPAD-B
WW	VMware Advanced Threat Prevention Add-on to VMware Firewall 3yr w/lenovo support - All segments	SCXW	7S1P000SWW	ANS-FW-ATPAD-B
WW	VMware Advanced Threat Prevention Add-on to VMware Firewall 5yr w/lenovo support - All segments	SCXX	7S1P000TWW	ANS-FW-ATPAD-B

## Fulfillment

License subscription activation of the VMware by Broadcom products purchased from Lenovo is being done by Broadcom directly to the End Customer's Broadcom Site ID.

Once the order is invoiced by Lenovo it takes 48 – 72 hours to Broadcom to send the notification mail to the contact stated as end customer contact in the PO and in the Broadcom CPQ-ID.

Notification mail does not include Keys. Broadcom does not send keys by mail anymore, the subscription licenses are activated directly in the Account Site ID.

Subscription licenses are attached to the Account Site ID, not to any user personal account.

Every user who holds the administrator profile for their Account ID will be able to see and manage the subscriptions licenses for their account, regardless of who received the Broadcom notification mail.

Notification mail will be sent to the contact stated as end user contact in the Lenovo PO and Broadcom Site ID and will come from the mail: [ERP-dontreply@broadcom.com](mailto:ERP-dontreply@broadcom.com)

The Subject will contain the following wording: "Broadcom Software delivery for contract #"

Make sure to review your Junk folder since the notification mail could have end there.

#### **To administrate your Account licenses:**

1. Register on the Broadcom support portal, if you haven't already.

[Broadcom Support Portal New User Guide here.](#)

2. Attach the Account Site ID to your user profile

[Using Site ID\(s\) for full portal access here](#)

3. Request for user & product admin access.

[Request user admin role here](#)

For support please contact Broadcom support team [here](#).

#### **Common Fulfilment questions:**

**Q: I'm trying to add an email as general user of the Broadcom Account Site ID, but I keep getting an error:**

- **A:** Only real end users can create their account in the Broadcom Account site ID. Generic mails like [itteam@client.com](mailto:itteam@client.com), [purchases@client.com](mailto:purchases@client.com), [procurement@client.com](mailto:procurement@client.com), are not accepted by Broadcom.
- Only domains that corresponds to the end customer are allowed to be attached to an Account Site ID. If you are administrating the licenses on behalf of the customer and your domain is not a match for the end customer domain, Broadcom will reject it.

Example: end customer domain is @client.com and licenses administrator is @administrator.com. If @administrator.com tries to add his account to the client Site ID, Broadcom site will reject the request.

**Q: I haven't received the Keys; how can I ask them to resend it to me.**

**A:** Broadcom does not send Keys. Subscription licenses are automatically activated in the customer Account ID. Broadcom will send a Notification mail to the contact stated as end customer contact in the CPQ-ID. Notification mail notifies that the licenses are being activated in the Account Site ID and contain important transaction information, but it doesn't contain any Key. Every person who holds administrator profile will be able to access and administrate the licenses regardless of who received the notification mail.

**Q: How can I know what my Site ID is?**

- **A:** You can contact the Broadcom Support team ([here.](#)) and ask for the Site ID.



- If you worked with a Lenovo seller on a new order, you can ask the Lenovo Seller for the Site ID stated in the Broadcom CPQ ID. Subscription licenses will be activated in the Site ID stated in the CPQ ID.

**Q: I used to have a VMware account, now I can't find it and I don't know where my licenses are:**

**A:** Once Broadcom acquired VMware, they moved all their customer information under Broadcom systems and assigned a new Site ID to every account. To know where the licenses are you need to know your new Site ID.

To do so, you can contact the Broadcom Support team ([here](#).)

If you have the VMware Contract ID for those licenses, that will make easier for the Broadcom support team to find the licenses. Once you know your Site ID, you would need to attach your user Account to the Company Account Site ID, and then request the administrator profile for that Account.

The contract ID should have been sent to the user that activated the licenses, through this VMware mail:

VMware Customer Service [vmwprod@vmware.com](mailto:vmwprod@vmware.com)

With a Subject like this: "VMware Order / License Confirmation XXXXXX" (X represents the contract ID)

Mail should look like this:

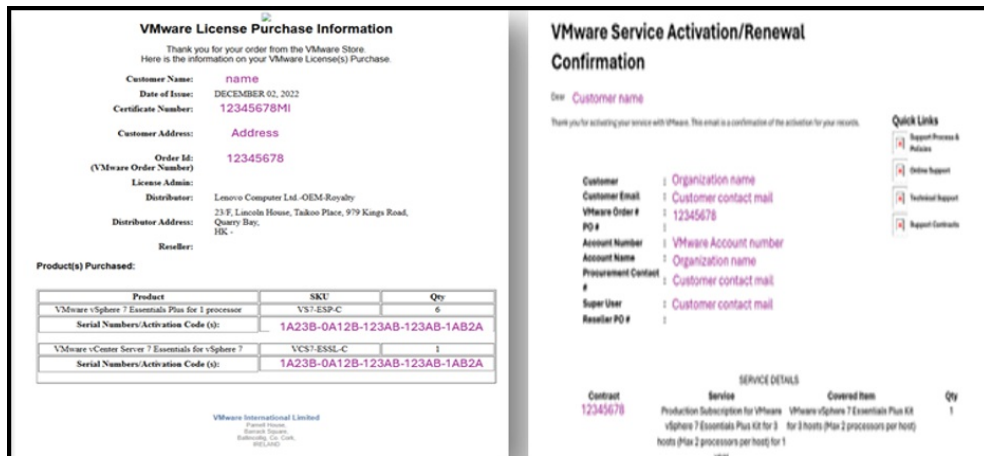


Figure 1. VMware License purchase and Service Activation/Renewal

**By downloading or using a VMware by Broadcom offering, Customer agrees to be bound by the terms of the End User License Agreement (EULA). See EULA here <https://www.vmware.com/vmware-general-terms.html>**

## Services

Lenovo provides an array of services focused on fulfillment, hardware compatibility and support.

## Server Compatibility

The Lenovo Server Operating System Interoperability Guide (OSIG) is a comprehensive source of information about operating system compatibility with Lenovo servers. It includes servers in the ThinkSystem, ThinkAgile, System x, ThinkServer, NeXtScale, Flex System and BladeCenter product families and covers servers that are currently supported by Lenovo under warranty.

To use the OSIG application, go to <http://lenovopress.com/osig>

Use the dropdown menus to filter and fine tune your search. In each of the search results, the support statement column contains clickable links that opens a popup window with details about the support.

## Option Compatibility

The ServerProven program validates selected products for compatibility with ThinkSystem, System x, BladeCenter and Flex System servers. Through the ServerProven Program, Lenovo works with industry leaders to test their equipment with Lenovo products.

To search the ServerProven list, go to <http://www.lenovo.com/us/en/serverproven>

For more details, click on the Lenovo product. For compatibility with OS, click on the green + button to expand the section.

## Lenovo L1-L2 Support

VMware software from Lenovo includes the option of 1 (For Co-term), 3, or 5 years of 24x7 unlimited global support and subscription services. The Lenovo support team provides L1 and L2 support for all VMware solutions purchased from Lenovo - there is no need to call a third party. This ensures a better level of service and faster resolution. Lenovo does extensive testing on the interoperability of the software and the compatibility with the rest of the system. Lenovo also provides offerings with a VMware-based support – look for “VMware provided” description in the part.

Lenovo Data Center support: <https://datacentersupport.lenovo.com/>

[See here the Lenovo ISG Support Plan for VMware here](#)

Technical Support for software means the provision of telephone or Web-based technical assistance by Lenovo to the customer’s technical contact(s) with respect to post installation support, errors, and technical product problems. Technical support does not cover help with initial installation of the product, software how-to, training and/or configuring the production environment. If you need assistance in these areas, contact your Lenovo Sales Representative or Lenovo Business Partner for best service offering.

Find your local support phone number at: <https://datacentersupport.lenovo.com/us/en/supportphonenumber>

For **activation issues**, please contact the Lenovo ESD team for your geography.

AP: [esdap@lenovo.com](mailto:esdap@lenovo.com)

EMEA: [esdemea@lenovo.com](mailto:esdemea@lenovo.com)

LA: [esdla@lenovo.com](mailto:esdla@lenovo.com)

NA: [esdna@lenovo.com](mailto:esdna@lenovo.com)

PRC: [esdchina@lenovo.com](mailto:esdchina@lenovo.com)

## Systems Management

Lenovo XClarity Integrator offerings for VMware provides IT administrators with the ability to integrate the management features of Lenovo XClarity Administrator with VMware vCenter and VMware Cloud Foundation (VCF) Operations. Lenovo XClarity Administrator is a centralized resource management solution that reduces complexity, speeds up response, and enhances the availability of Lenovo ThinkSystem infrastructure and ThinkAgile solutions. For more information on the XClarity family of software tools, visit <https://www.lenovo.com/us/en/data-center/software/management/>

Lenovo XClarity Integrator extends the virtualization management capabilities of VMware with Lenovo hardware management functionality, providing affordable foundational, basic management of physical and virtual environments to reduce the time and effort required for routine system administration.

Lenovo XClarity Integrator integrates XClarity Administrator into VMware software, providing the functionality you need to manage Lenovo infrastructure right in the console of VMware software. Lenovo offers XClarity Integrators for VMware vCenter, and VCF Operations.

XClarity integrated with VCF Operations and VMware vCenter management provides the following benefits:

- A single pane of glass management for virtualization management, workflow provisioning, and Lenovo server infrastructure
- Automates deployment and streamlines management reducing deployment time by 48%
- Deep VMware integration enables more precise insight and control into all layers than with other systems

For more information, please refer to the Lenovo XClarity Administrator Product Guide:  
<https://lenovopress.com/tips1200-lenovo-xclarity-administrator>

For more information about Lenovo XClarity Integrator for VMware and for links to online documentation, see the following web page:  
<https://support.lenovo.com/us/en/documents/lnvo-vmware>

## Lenovo XClarity Integrator for VMware vCenter

The Lenovo XClarity Integrator for VMware vCenter provides the following features and benefits:

- Extends Lenovo XClarity Administrator features to the virtualization management console
- Enables management of legacy infrastructure from the virtualization management console
- Reduces workload downtime by dynamically triggering workload migration in clustered environments during rolling server reboots or firmware updates, and predicted hardware failures

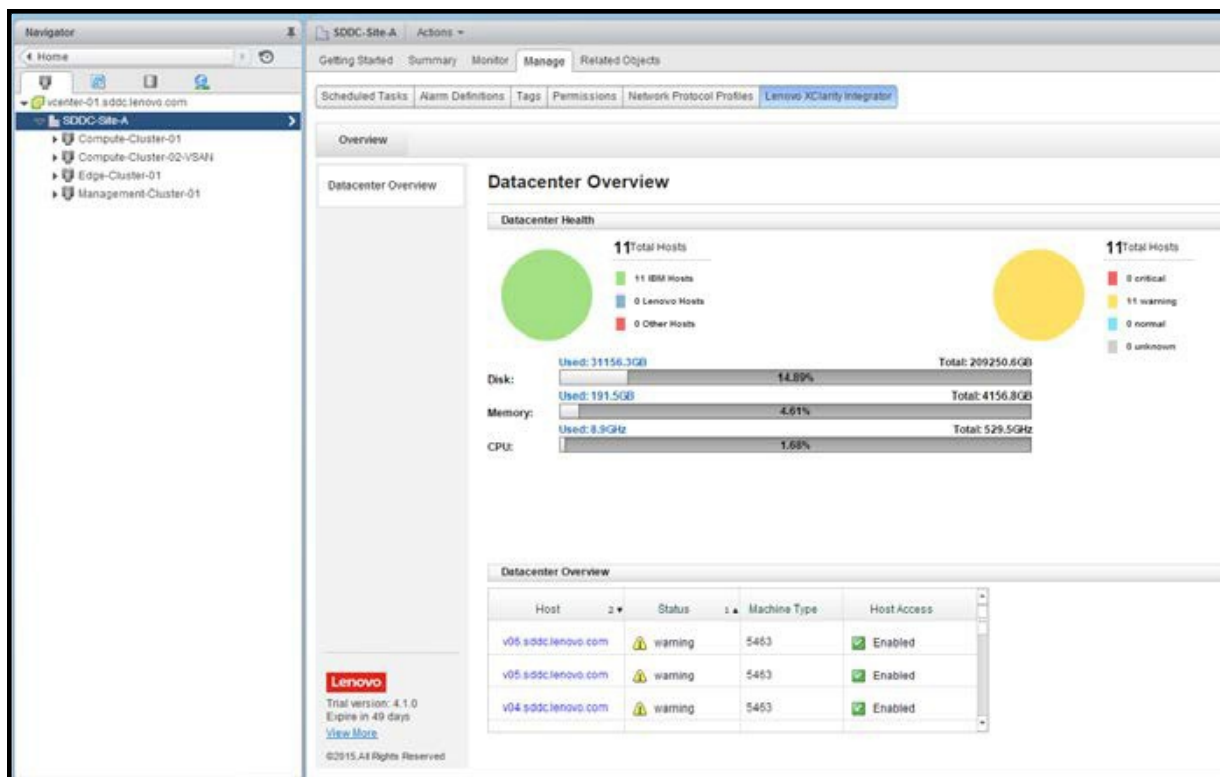


Figure 2. Lenovo XClarity Integrator for VMware vCenter

## Firmware and Drivers

The [Lenovo OS Support Center for VMware](#) web page provides quick and easy access to supported firmware and drivers for VMware. Lenovo maintains this repository of all qualified drivers with links to firmware and utilities qualified in conjunction with these drivers.

## Custom Image

The Lenovo VMware ESXi custom image is tested across Lenovo's server and adapter portfolio with the same ServerProven® support guarantee as VMware's base release. The image enables support of Lenovo's tools, including ToolCenter that give the customer the ability to flash server firmware such as: UEFI, XCC, and vendor firmware for supported IO adapters. The image includes the latest drivers that align with VMware's release schedule. These updated drivers support Lenovo's portfolio.

For additional information on VMware customized images and download links, visit: [https://download.lenovo.com/servers\\_pdf/customized\\_image\\_reference\\_guide.pdf](https://download.lenovo.com/servers_pdf/customized_image_reference_guide.pdf)

## VUM Repository

Lenovo VMware Update Manager (VUM) Repository is a one-stop repository that provides access to Lenovo developed bundles along with device drivers that are part of the Lenovo Customized VMware images.

The Lenovo VUM Repository is at <https://vmware.lenovo.com/content/>

These bundles and associated VIBs (vSphere Installation Bundles) can be used with VMware applications and tools like VMware Update Manager (VUM), ESXCLI & PowerCLI. To learn more about these tools, refer to the VMware documentation.

## VMware Solutions from Lenovo

Lenovo offers a broad range of VMware-based solutions in varying levels of integration to meet different customer requirements and business needs. Solutions range from the Co-engineered Solution of Lenovo ThinkAgile VX Series with VMware Cloud Foundation which is a turnkey factory-integrated, pre-configured ready-to-go appliance, to build-your-own systems based on Lenovo's ThinkSystem Servers, proven reference architectures and everything in between.

### ThinkAgile VX Series with VMware Cloud Foundation Co-Engineered Solution

Lenovo ThinkAgile VX Series with VMware Cloud Foundation arrives from the factory as a complete workload ready, integrated solution – preconfigured, tested, validated, and optimized to provide the simplest way to bring a new private cloud environment online. It is easy to manage, while maintaining resilience and security, with full-stack monitoring, lifecycle management and unified support.

The co-engineered solution comes with both onsite and remote deployment options delivered by Lenovo Professional Services and Premier Support to accelerate deployment and provide a single point of support, including a dedicated, direct-line phone number with 24x7 access to end-to-end case management and problem resolution.

Key attributes include:

- Careful selection of latest hardware components, BIOS settings, and network configurations to maximize performance.
- Designed with alignment on specifications of VMware Cloud Foundation's best practices for deployment and full lifecycle management.
- Streamlined lifecycle management with vSphere Lifecycle Manager (vLCM) and SDDC Manager to update the critical components of the complete solution through integrations with Lenovo's XClarity Integrator (LXCi).

- Ensure a reliable, compliant, and consistent environment with a rigorously tested “Best Recipe” bundle of drivers and firmware through a coordinated update with vLCM.
- Deployment of new or expansion of existing clusters with in-step validation and automation for repetitive deployments with the VX Deployer.
- Full-stack monitoring and automation management through integrations with VMware Cloud Foundation Operations (formerly VMware Aria Suite) and Lenovo XClarity Integrator (LXCI) to reduce time wasted in repetitive operations and human error.
- Robust security features, including data-at-rest encryption, secure boot and firmware integrity checks protect against unauthorized access and ensure data integrity.
- ThinkAgile gives you a direct phone line of to a team of Premier Support experts who specialize in ThinkAgile solutions. The team of experts will rapidly diagnose any hardware or software issues and remain with you as the single-point-of-contact throughout the entire support process.

ThinkAgile VX Series comes in a wide range of platforms and provides the flexibility to configure the system you need to meet any use-case. ThinkAgile VX Series systems support both vSAN Original Storage Architecture (OSA) as well as the all-NVMe devices based vSAN Express Storage Architecture (ESA).

For more information on the latest ThinkAgile VX Series models, refer to the ThinkAgile VX Series data sheet: <https://lenovopress.com/datasheet/ds0023-lenovo-thinkagile-vx-series>

## Technical Briefs & Reference Architectures:

### 1. Private Cloud Infrastructure

#### Deployment Guide: Lenovo ThinkAgile VX with VMware Cloud Foundation

**Abstract:** This deployment guide walks you through deploying a Private Cloud using VMware Cloud Foundation on Lenovo ThinkAgile VX servers. It offers a turnkey private cloud solution, combining Lenovo hardware, and VMware software with Lenovo XClarity integration to provide customers with an automated hyperconverged infrastructure with easy management. It is intended for IT professionals with varying levels of VMware expertise who are responsible for deploying or managing VMware-based Software-Defined Data Centers (SDDCs) in both on-premises deployments and hybrid cloud architecture.

The audience will benefit from having a base understanding of the VMware SDDC stack, including vCenter, ESXi, vSAN, and NSX. While some exposure to Lenovo's tools such as XClarity Controller, XClarity Administrator, or XClarity Integrator can be helpful, it is not a prerequisite for understanding and utilizing this reference architecture document.

Link: <https://lenovopress.lenovo.com/lp2011>

### 2. Private AI

#### Solution Brief: VMware Private AI Foundation with NVIDIA on Lenovo Architecture

**Abstract:** This solution brief introduces VMware Private AI Foundation with NVIDIA, a joint GenAI platform by Broadcom and NVIDIA on Lenovo servers, which helps enterprises deploy AI workloads faster and unleash productivity. With this platform, enterprises can fine-tune and customize Large Language Models (LLM), deploy retrieval augmented generation (RAG) workflows, and run inference workloads in their data centers, addressing privacy, choice, cost, performance, and compliance concerns.

The intended audience of this solution brief includes business strategists, AI solution architects, data architects and engineers, enterprise IT infrastructure architects, and solution providers.

Link: <https://lenovopress.lenovo.com/lp2004>

### 3. SAP HANA Workloads

#### Reference Architecture: SAP Applications using Lenovo ThinkAgile VX Series

**Abstract:** This document describes the reference architecture for SAP application workloads using Lenovo ThinkAgile VX Certified Nodes. The intended audience for this document is technical IT architects, system administrators, and managers who are interested in executing workloads on these systems.

The reference architecture provides a technical overview of the servers and networking, and explains why the combination of Lenovo products and VMware vSAN software provides best of breed system performance and reliability. The reference architecture describes the workload components, performance recommendations, and best practices of using SAP applications, especially SAP HANA.

Link: <https://lenovopress.lenovo.com/lp1074>

#### 4. SQL Server

##### **Reference Architecture: Microsoft SQL Server on VMware vSAN Express Storage Architecture (ESA) with ThinkAgile VX Series**

**Abstract:** This document describes the reference architecture for Microsoft SQL Server on vSAN Express Storage Architecture from VMware. The Lenovo and VMware teams worked together on the architectural vision, testing and joint engineering effort to create this Reference Architecture. This paper is intended to provide the planning, design considerations, and best practices for implementing Microsoft SQL Server on VMware vSAN Express Storage Architecture with Lenovo products.

Link: <https://lenovopress.lenovo.com/lp1856>

#### 5. Backup and Recovery Architecture

##### **Reference Architecture: Lenovo Backup Solution with ThinkSystem DE/DM/DG Storage and Veeam for ThinkAgile and ThinkSystem Platforms**

**Abstract:** This document is the reference architecture (RA) for the Lenovo Backup and Recovery solution using ThinkSystem DE, DM and DG Series storage systems and Veeam Data Platform. The RA describes various backup methods and technologies, ransomware protection and relevant features provided by the solution. The RA explains different operational models using Lenovo ThinkSystem servers, ThinkAgile servers, ThinkSystem DE/DM/DG storage, Tape systems and SAN switches with guidelines to design robust data protection solution and size appropriately to achieve Recovery Point Objective (RPO) and Recovery Time Objective (RTO). The RA focuses on data protection design aspects for Lenovo hyperconverged systems ThinkAgile VX powered by VMware vSAN. Many deployment models for onsite and offsite backup are covered and a bill of materials is included for backup storage and backup servers.

Link: <https://lenovopress.lenovo.com/lp1769>

#### 6. Client Virtualization

##### **Technical Brief: Lenovo Client Virtualization with VMware Horizon on ThinkSystem and ThinkAgile VX Servers**

**Abstract:** This document is the reference architecture (RA) for the Lenovo Client Virtualization (LCV) solution using VMware Horizon on ThinkSystem servers. This RA describes the software components of the solution including VMware Horizon and the VMware ESXi hypervisor. The RA shows different operational models using Lenovo ThinkSystem servers, networking and storage products with guidance on how to size each part of the solution. Some examples of different deployment models are provided together with an appendix containing the bill of materials.

Link: <http://lenovopress.lenovo.com/lp0663>

##### **Lenovo ThinkSystem ReadyNodes**

Lenovo ThinkSystem ReadyNodes offer pre-tested configurations for implementations of VMware vSAN storage.

Key attributes include:

- Pre-Defined Configurations on Broadcom Configuration Guide (BCG)
- No firmware control for vSAN support
- Build your own system based on reference configurations
- No support for best recipes for streamlined lifecycle management
- Ideal for customers with specialized IT skills and requiring unique configurations
- Multiple support organizations for hardware and software

Lenovo ThinkSystem ReadyNodes are Lenovo systems that have been tested and certified for VMware vSAN Software. With Lenovo ThinkSystem ReadyNodes you can build your own systems and rapidly deploy tested and scalable infrastructure to meet growing performance and capacity needs. Lenovo ThinkSystem ReadyNodes are delivered in a range of all-flash and hybrid nodes to meet a broad array of workload, performance, and budget needs.

List of Lenovo ThinkSystem vSAN ReadyNodes:

<https://datacentersupport.lenovo.com/us/en/solutions/ht505293>

vSan Hardware Quick Reference Guide from VMware:

[https://www.vmware.com/resources/compatibility/pdf/vi\\_vsan\\_profile.pdf](https://www.vmware.com/resources/compatibility/pdf/vi_vsan_profile.pdf)

## Related publications and links

- Broadcom Compatibility Guide:  
<https://www.vmware.com/resources/compatibility/search.php>
- VMware Cloud Foundation FAQ  
<https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/datasheet/products/vmware-cloud-foundation-faq.pdf>
- Firmware/Drivers for Lenovo ThinkSystem and System x:  
<https://support.lenovo.com/us/en/solutions/ht506028>
- [Lenovo OS Interoperability Guide](#)
- [Lenovo Server Proven Compatibility](#)
- [Lenovo vSAN Certified Devices](#)

## Related product families

Product families related to this document are the following:

- [VMware Alliance](#)
- [VMware vSphere](#)

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