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Technical Research Report

Measuring the Ease of Deployment and Operation of Lenovo[®] ThinkAgile[™] VX HCI Solutions

What does it take to deploy and manage a hyperconverged infrastructure (HCI) VMware vSAN[™] cluster using Lenovo ThinkAgile VX?

Executive Summary

Lenovo[®] ThinkAgile[™] VX Integrated Systems and appliances are hyperconverged infrastructure (HCI) based on VMware vSAN[™]. Lenovo partnered with VMware to create the Lenovo ThinkAgile VX Deployer tool to ease the difficulties of creating, extending, and managing such clusters.

Prowess Labs tested the ThinkAgile VX Deployer tool to evaluate how well it works, how easy it is to use, and how long it takes to perform the key operations of creating a new cluster and extending that cluster with an additional node. We tested these operations both for a first-time deployment and expansion, and for repeating the operations using a configuration file to fill many of the fields automatically. We also tested to validate that VMware vSphere[®] Lifecycle Manager[™] (vLCM) was able to perform a successful remediation of the cluster that the ThinkAgile VX Deployer tool had created.

The results of Prowess testing validated that the ThinkAgile VX Deployer tool performed as expected. In this paper, companies considering using the ThinkAgile VX Deployer tool can learn what to expect in terms of time needed to accomplish tasks, and they can see what to expect through screenshots of the interface in action.

Key Findings

- 1. The Lenovo® ThinkAgile™ VX Deployer tool was easy to use, with an intuitive process flow.
- 2. Time to deployment was fast, and for most of that time, no user action was needed.
- 3. The configuration file feature reduced repetitive input and made for a repeatable deployment.
- 4. Integration into VMware vCenter® was seamless for viewing topology and remediating the cluster in a single interface.

Introduction

Companies are attracted to HCI offerings such as VMware HCI, but the difficulty of setting up and maintaining such systems can be off-putting. Creating clusters and adding nodes to them can be complex and time consuming. Keeping infrastructure up to date while maintaining compliance has historically been a highly manual task, often requiring separate specialized tools to update each tier of the infrastructure.

Lenovo partners with VMware to address these challenges and make it easier to deploy and maintain VMware HCI clusters on Lenovo ThinkAgile VX Integrated Systems. The ThinkAgile VX Deployer tool aims to let users deploy, integrate, and expand clusters quickly and easily using a single tool. It also aims to enhance hardware lifecycle management within the VMware vCenter[®] management console via Lenovo[®] XClarity[®] Integrator.

Prowess Labs has put the young (version 1.2) ThinkAgile VX Deployer tool to the test to evaluate its effectiveness and ease of use. This paper presents the results of our testing of key features of the ThinkAgile VX Deployer tool, including setup of a new cluster from scratch using the wizard-based user interface (UI), automated setup using a configuration file, adding a node to an existing cluster, and exercising lifecycle-management features.

Overview of the ThinkAgile VX Deployer Tool

The ThinkAgile VX Deployer tool is a web-based UI used to simplify and automate the deployment of Lenovo ThinkAgile VX systems within VMware vSAN clusters. The ThinkAgile VX Deployer tool can install and configure the following software:

VMware ESXi[™]

VMware ESXi[™] is a bare-metal hypervisor that the ThinkAgile VX Deployer tool installs on the hardware of each host in the cluster. ESXi translates requests between the physical and virtual resources, making virtualization possible.

VMware vCenter Server®

VMware vCenter Server[®] is a management console that provides a centralized platform for controlling VMware vSphere environments. One service that runs in VMware vCenter Server is VMware vLCM, which provides centralized and simplified management to install software, maintain that software through updates and upgrades, and decommission it.

Lenovo® XClarity® Integrator

Lenovo XClarity Integrator is the hardware support manager (HSM) used by vCenter for firmware upgrades. Lenovo XClarity Integrator fully integrates with VMware vLCM to give the VMware vCenter Server software visibility into Lenovo hardware.

The interface for the ThinkAgile VX Deployer tool is a straightforward web-based installation wizard with three top-level options:

- Install a new cluster (using the wizard).
- Add nodes to an existing cluster (using the wizard).
- Use a configuration file to install a new cluster or add nodes to an existing cluster.

Prowess testing included all three of these options, plus some key lifecycle-management features in VMware vCenter Server. The following sections describe the results of our testing. For each test area, we walk through the steps to accomplish these operations, using screenshots to illustrate what to expect from the tool and providing details about how long the steps took to complete.

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Test Area 1: Install a New Cluster

In this test area, we created a new cluster from three available ThinkAgile VX hosts using the ThinkAgile VX Deployer wizard interface. These steps begin after logging in to the ThinkAgile VX Deployer tool.

Steps

1. From the **Getting Started** menu, select **Install New Cluster**.

STEPS	ThinkAgile VX Deployer	Version: Build Date:	1.2.1.2976	0
Getting Started		build bate.	May 11 2022	
License Agreements	1. Getting Started			
Add Hosts to Cluster	Welcome to the ThinkAgile VX Deployer. This wizard will guide you through the initial setup and deployment of your vSAN cluster, or to add additional nodes to an existing cluster.			
Network Services	Before you begin, ensure that the cluster's devices have been installed, cabled, and powered on, based on VX deployment guide.			
New or Existing vCenter	Install new cluster ?			
Cluster Location	Add nodes to an existing cluster 🦻			
LXCI Settings	Use Configuration File ?			
Global ESXI Settings				
General Networking				
Network Settings per Physical Host				
XCC Credentials				
Review				
Deploy Cluster				

- 2. Accept the license agreements.
- 3. Add the three initial hosts to the cluster.

EPS	 ThinkAgile VX Dep 	ThinkAgile VX Deployer - New Cluster					
Getting Started	3. Add Hosts to Cluster						
License Agreements	The following physical hosts have	e been discovered. Choose at least three hosts to be u	sed for the vSAN cluster. The hosts must h	ave the same exact configuration.			
Add Hosts to Cluster	Discovered Physical Hosts						
Network Services	J1000EBW	ThinkAgile VX3720 Appliance	7Y92CTO1WW	172.11.11.41	·		
New or Existing vCenter	J1000E8R	ThinkAgile VX3720 Appliance	7Y92CTO1WW	172.11.11.42			
	J3025G7E	ThinkAgile VX5575 IS	7D43CTO1WW	172.11.11.56			
	J301ZRXV	ThinkAgile VX5575 IS	7D43CTO1WW	172.11.11.62			
	J1000E9T	ThinkAgile VX2320 Appliance	7Y93CTO2WW	172.11.11.76			
Network Settings per Physical Host	J1000E9V	ThinkAgile VX2320 Appliance	7Y93CTO2WW	172.11.11.77			
XCC Credentials	J1000E9W	ThinkAgile VX2320 Appliance	7Y93CTO2WW	172.11.11.78			
Review	□ J1000E9X	ThinkAgile VX2320 Appliance	7Y93CTO2WW	172.11.11.79			
Deploy Cluster	Rediscover						

4. Provide DNS and NTP server information.

STEPS	ThinkAgile VX Deployer - New Cluster
Getting Started	4. Network Services
License Agreements	Set the network services for your VX vSAN cluster.
Add Hosts to Cluster	DNS Servers
Network Services New or Existing vCenter Cluster Location	Primary 172.31.31.201
Global ESXI Settings	Secondary (optional) Secondary DNS IP address
Central Networking Network Settings per Physical Host NOD Oredentials Review Deploy Cluster	NTP Servers Primary 172.31.31.201
	Secondary (optional) Secondary NTP hostname or IP address

5. Provide domain information for the new vCenter server and passwords for user accounts.

STEPS	ThinkAgile VX Deployer - New Cluster
Getting Started	5. New or Existing vCenter
License Agreements	You can install a new vCenter server or you can use an existing one. Choose one of the following options, and then complete the settings required for that option.
Add Hosts to Cluster	(i) install a new vCenter server
Network Services	Fully Qualified Domain Name
New or Existing vCenter	uslemvcsa01vc.local
Cluster Location	
LXCI Settings	SSO (Single Sign-On) Domain
Giobal ESXI Settings	vschere local 7
General Networking	
Network Settings per Physical Hos	
XCC Credentials	liker ID
Review	administrator@vsphere.local vCenter Appliance Root
Deploy Cluster	Password Password
	P@ssword! & ? I @ ?
	Confirm Dassword Confirm Dassword
	Use an existing vCenter server

6. Provide cluster and physical location information.

STEPS	 ThinkAgile VX Depl 	oyer - New Cluster	0
Getting Started	6. Cluster Location		
License Agreements	Specify the details for the vSAN c	uster.	
Add Hosts to Cluster	Cluster Location in vCenter		
Vetwork Services	vCenter Datacenter		
New or Existing vCenter	TestDataCenter	2	
Cluster Location			
LXCI Settings	vSAN Cluster		
Global ESXI Settings	TestCluster	8	
General Networking			
Network Settings per Physical Hos	Physical Location of Cluster		
XCC Credentials	Organization Name		
Review	ACME	2	
Deploy Cluster			
	Region Name		
	Space	2	
	Cito Name		
	MeenPaed	2	
	MOOTDase		

7. Set the ThinkAgile VX Deployer tool to install Lenovo XClarity Integrator, and then provide host/network configuration information and an admin password.

STEPS	ThinkAgile VX	Deployer - New Cluster			0
Getting Started	7. LXCI Settings	new instance of Lenovo XClarity Integra	itor (LXCI) for vCenter, which enables you to man	age the ThinkAgile VX cluster hardware through vCen	ter. If you choose to install LXCL you must specify the network
Add Hosts to Cluster	and user account settings	or LXCI. ?	,,	-9	
Vetwork Services	Install LXCI				
New or Existing vCenter	Networking				
Cluster Location	LXCI Host Name	LXCI Domain	Management IP Address ?	XCC Network IP Address ?	XCC Network VLAN ID ?
LXCI Settings	uslemIxci01	vx.local	Management IP Address	172.11.11.219	11
Giobal ESXI Settings					
General Networking	Credentials				
Network Settings per Physical Host	User ID				
XCC Credentials		admin			
Review	Password	I ©	?		
Deploy Cluster	Confirm Password	•••••			

8. Set the new password for ESXi management for all hosts.

TEPS	 ThinkAgile VX Deployer - New Cluster 	
Getting Started	8. Global ESXi Settings	
V License Agreements	Specify the ESXi version and credentials to be used on all ESXi Ho	osts.
Add Hosts to Cluster	Version and Level	
Vetwork Services	7.0U3 - 19482537 ~	?
New or Existing vCenter		
Cluster Location		
LXCI Settings	Root Password I	
Global ESXI Settings	••••••	
General Networking		
Network Settings per Physical Host	Confirm Password	
XCC Credentials	••••••	
Review		
Deploy Cluster		

9. Provide netmask information for the vSAN, VMware vSphere® vMotion®, and Lenovo XClarity Controller management networks, in addition to netmask, default gateway, and hostname prefix information for the ESXi network.

STEPS	ThinkAgile VX Deployer - New Cluster				0	
Getting Started	9. General Networking	9. General Networking				
License Agreements	Specify the network settings for the phys	ical hosts. The hostname prefix is generated automatically, b	out you can modify it on the next page.			
Add Hosts to Cluster	Network	Subnet Mask ?	Gateway ?	Hostname Prefix ?		
Network Services						
New or Existing vCenter	ESXi Management	/16 subnet (65534 hosts) $^{\vee}$	172.31.39.20	n		
Cluster Location						
LXCI Settings	VSAN	/16 subnet (65534 hosts)~	Gateway	(not applicable)		
Global ESXi Settings						
General Networking	vMotion	/16 subnet (65534 hosts)~	Gateway	(not applicable)		
Network Settings per Physical Host						
XCC Credentials	XCC (BMC) Management	/16 subnet (65534 hosts)~	0000	(not applicable)		
Review						
Deploy Cluster						
L						

10. Edit the hostnames and provide vSAN and vSphere vMotion IP information for each host. Lenovo XClarity Controller IPs should be auto-filled, but they can be edited here.

STEPS	ThinkAgile \	/X Deployer - New	Cluster					0
Getting Started	10. Network Settin	ngs per Physical Host						
License Agreements	SESXi host name	s were validated successful	y.					×
Add Hosts to Cluster Network Services	Serial Number	ESXi Hostname	ESXi Domain	ESXI Management IP Address	? vSAN IP Address ?	vMotion IP Address ?	XCC (BMC) IP Address	Î
New or Existing vCenter	J1000E9T	n76	vx.local	172.31.31.76	172.31.31.126	172.31.31.176	172.11.11.76	
Cluster Location								
LXCI Settings	J1000E9V	n77	vx.local	172.31.31.77	172.31.31.127	172.31.31.177	172.11.11.77	
Global ESXI Settings General Networking	J1000E9W	n78	vx.local	172.31.31.78	172.31.31.128	172.31.31.178	172.11.11.78	
Network Settings per Physical Host	Revalidate							
Review Deploy Cluster			La:					

11. Provide the new Lenovo XClarity Controller password for all hosts (which can be configured as a common password or as a unique password for each host).



12. Review the configuration information and export a configuration file for future use.



13. Click **Deploy Cluster**, and then monitor the deployment's progress.

STEPS	ThinkAgile VX Deployer - New Cluster			0
Getting Started	Deploy Cluster			
Conse Agreements	Deployment initiated			×
Add Hosts to Cluster	Deployment Progress			
Network Services	Save configuration parameters		0%	
New or Existing vCenter				
Cluster Location	Deployment Log			
UXCI Settings	Description of Step	Status		Elapsed Time (mm:ss)
Global ESXI Settings	Save configuration parameters	In Progress		00:02
General Networking				
Network Settings per Physical Host				
XCC Credentials				
Review	Download Log Bundle Launch vCenter			
Deploy Cluster				

14. The ThinkAgile VX Deployer tool will notify you when deployment is complete.

STEPS	ThinkAgile VX Deployer - New Cluster			0
Getting Started	Deploy Cluster			
Conse Agreements	O Deployment is successful.			×
Add Hosts to Cluster	Deployment Progress			
Network Services			100%	
New or Existing vCenter	Deployment Log			
Cluster Location	Description of Step	Status		Elapsed Time (mm:ss)
	Save configuration parameters	⊘ Successful		00:25
LXCI Settings	Save configuration parameters in Netbox	Successful		00:23
Global ESXI Settings	Create AWX inventory	Successful		00:05
	Update search domains and nameservers in /etc/resolv.conf	⊘ Successful	N	00:04
General Networking	Change XCC IP addresses	Successful	45	01:02 _
Network Settings per Physical Host				
XCC Credentials	Download Log Bundle			
Review				
Deploy Cluster		Shutdown VX Deployer		

Timings

Step	Time
Getting Started	0:08
License Agreements	0:04
Add Hosts to a Cluster	0:31
Network Services	0:14
VMware vCenter® Configuration	0:47
Cluster Location	0:44
Lenovo® XClarity® Integrator Settings	1:16
Global VMware ESXi [™] Settings	0:37
General Networking	0:17
Network Settings/Host	1:31
Lenovo XClarity Controller Credentials	0:13
Review	1:34
Deployment	57:15
Total	1:05:11

Test Area 2: Install a New Cluster Using a Configuration File

When we installed a new cluster in test area 1, we exported a configuration file during the final review and before deployment. In this test area, we used that configuration file to further automate the process of creating another new cluster. The process here is essentially the same as in test area 1, stepping through the same wizard, except that most of the information on the screens, with the exception of password credentials, is now automatically filled in. Screenshots are not included in this test area because the screens look the same as in the previous test area. These steps begin after logging in to the ThinkAgile VX Deployer tool.

Steps

- 1. Select Use Configuration File.
- 2. Click Import the VX Configuration File.
- 3. Accept the license agreements.
- 4. Confirm the included hosts in the cluster.
- 5. Confirm the DNS and NTP server information.
- 6. Provide vCenter credentials.
- 7. Confirm location details.
- 8. Provide Lenovo XClarity Integrator details.
- 9. Provide a new ESXi password.
- 10. Confirm general networking settings.
- 11. Confirm per-host networking settings.
- 12. Provide the new common Lenovo XClarity Controller password.
- 13. Review the configuration and deploy the cluster.

Timings

Step	Time
Getting Started	0:26
License Agreements	0:04
Add Hosts to a Cluster	0:24
Network Services	0:08
VMware vCenter® Configuration	0:50
Cluster Location	0:40
Lenovo® XClarity® Integrator Settings	0:38
Global VMware ESXi [™] Settings	0:30
General Networking	0:05
Network Settings/Host	0:23
Lenovo XClarity Controller Credentials	0:11
Review	1:05
Deployment	57:17
Total	1:02:41

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Test Area 3: Add Nodes to an Existing Cluster

In this test area, we extended the cluster to add a fourth ThinkAgile VX host using the ThinkAgile VX Deployer wizard interface. These steps begin after logging in to the ThinkAgile VX Deployer tool.

Steps

1. Select Add Nodes to an Existing Cluster, and then provide the vCenter hostname and login information.

STEPS	ThinkAgile VX Deployer		Version:	1.2.1.2976	0
Getting Started			build bate.	Way 11 2022	
License Agreements	1. Getting Started				
Cluster Selection	Welcome to the ThinkAgile VX Deployer. This wizard	will guide you through the initial setup and deployment of your ThinkAgile VX vSAN cluster, or to add additional nodes to an existing cluster.			
Select Nodes	Before you begin, ensure that the cluster's devices ha	we been installed, cabled, and powered on, based on VX deployment guide.			
Physical Location	O Install new cluster				
Giobal ESX) Settings	Add nodes to an existing cluster ?				
General Networking	Use Configuration File				
Host Settings	vCenter server				
XCC Credentials	Evilia Qualifieral Damaia Nama (10 Addama				
Review	Pully Qualified Domain Name / IP Address	usiemvcsau1.vx.local			
Deploy Nodes	Administrator User ID	administrator@vsphere.local			
	Administrator Password	········ •			

- 2. Accept the license agreements.
- 3. Select the data center/vSAN cluster to which to add the host.

EPS	 ThinkAgile VX 	Comployer - Add Nodes to a	n Existing Cluster		
Getting Started	3. Cluster Selection				
License Agreements	Select the existing VX vS	AN cluster to which nodes will be added. O	nly clusters with supported VX system	s will be selectable.	
Cluster Selection					
Select Nodes	vCenter Datacenter	TestDataCenter	~ ?		
Physical Location					
Global ESXI Settings					
General Networking	vSAN Cluster	TestCluster	× ?		
XCC Credentials	Existing Physical Hosts in	n TestCluster			
Review	Serial #	VX Model	Machine T	pe ESXi Host Name	ESXi Management IP Address
	J1000E9T	ThinkAgile VX2320 Appliance	7Y93CT02	WW n76.vx.local	172.31.31.76
	J1000E9V	ThinkAgile VX2320 Appliance	7Y93CTO2	WW n77.vx.local	172.31.31.77
	J1000E9W	ThinkAgile VX2320 Appliance	7Y93CT02	NW n78.vx.local	172.31.31.78

4. Select the desired node to add to the cluster.

STEPS	ThinkAgile VX Deploy	yer - Add Nodes to an Existing Clu	uster		0
Getting Started	4. Select Nodes We have discovered the following no	odes. Select one or more to add to your existing vSAI	l cluster. All physical hosts in the cluster m	ust have the same exact hardware configuration.	
Cluster Selection Select Nodes Physical Location Global ESXI Settings	Discovered Nodes Serial # J1000E9X	VX Model ThinkAgile VX2320 Appliance	Machine Type 7Y93CTO2WW	IPv4 of XCC 172.11.179	
General Networking Host Settings XOC Credentials Review Dendoy Nodes	Rediscover				

5. Select the physical location for the new host.

STEPS	 ThinkAgile VX D 	eployer - Add Noo	des to an Existing Cluster	G
Getting Started	5. Physical Location			
License Agreements	Specify the physical location	for your VX vSAN cluster.		
Cluster Selection				
Select Nodes	Organization Name			
Physical Location	ACME	~ ?		
Global ESXi Settings				
General Networking	Region Name			
	Space	~ 2		
XCC Credentials				
	Site Name			
	MoonBase	~ ?		

6. Set the new ESXi management password.

EPS	 ThinkAgile VX Deployer - Add Nodes to an Existing Cluster 	
Getting Started	6. Global ESXI Settings	
 License Agreements 	Specify the ESXi version and credentials to be used on all ESXi Hosts.	
Cluster Selection	Version and Level	
Select Nodes	7.003 - 19482537 🗸 💎 7	
Physical Location		
Global ESXi Settings		
General Networking	Root Password	
	I @ 3	
XCC Gredentials		
Review	Confirm Password	
	······ •	

7. Set the netmask information for the Lenovo XClarity Controller (XCC) network and the netmask, gateway, and hostname prefix for the ESXi management network.

	Suc the short of				
 Getting Started 	7. General Networking				
License Agreements	Specify the network settings for each host	t. At a minimum, you must specify the ESXi Management ga	teway and the XCC (BMC) Management gateway.		
Cluster Selection	Network	Subnet Mask ?	Gateway ?	Hostname Prefix ?	
Select Nodes					
Physical Location	ESXI Management	/16 subnet (65534 hosts)~	172.31.39.20	n	
Global ESXi Settings					
General Networking	VSAN	/16 subnet (65534 hosts)~	Gateway	(not applicable)	
XCC Credentials	vMotion	/16 subnet (65534 hosts)~	Gateway	(not applicable)	
Review					
	XCC (BMC) Management	/16 subnet (65534 hosts)~	0.0.0	(not applicable)	

8. Edit the hostname, vSAN, and vSphere vMotion IP addresses for the new host.

STEPS	 ThinkAgile 	VX Deployer - Add N	lodes to an Existing	Cluster			1
Getting Started	8. Host Settings						
License Agreements	SESXi host name	es were validated successfully					
Cluster Selection	New hosts						
Select Nodes			ECVI Management ID				
Physical Location	Serial Number	ESXi Host Name	Address	? vSAN IP Address ?	vMotion IP Address ?	XCC (BMC) IP Address	
Global ESXI Settings	J1000E9X	n79	172.31.31.79	172.31.31.129	172.31.31.179	172.11.11.79	
General Networking							
Host Settings							
XCC Credentials	Develidate						
Review	Revandate						
Deploy Nodes							

9. Provide the new Lenovo XClarity Controller password for the new host.

DEPLOY THINKAGILE VX ×	Sphere - uslemvcsa01.vx.local - × +						~ -	0	3
→ C ▲ Not secure https	r//172.31.31.198/deployer/						ዸ ☆		
STEPS	ThinkAgile VX	Deployer - Add Nodes to a	n Existing Cluster						9
Getting Started	9. XCC Credentials								
License Agreements	Each physical host has an	XCC (BMC), which is used for hardware m	anagement. To simplify man	agement, specify a common XCC p	password to be assigned to all hosts.	In addition, you must specify the current XC	c passwords	s. The	
Cluster Selection	factory default password is	s listed for the current XCC password, but	note that logging into an XC	C for the first time forces a passwo	ord change.				
Select Nodes	Specify New Common XCC	C Password - This password will be used f	or all the new XCCs, for Use	r ID: USERID. You should match it w	with the existing XCC passwords.				
Physical Location	Password								
Global ESXi Settings		12 0							
General Networking	Re-enter Password								
Host Settings									
XCC Credentials	Specify Current XCC Passy	word for the 1 Physical Hosts Selected for	Cluster						
	Use the same XCC pass	word for all physical hosts ?							
	Serial #	VX Model	Machine Type	IPv4 of XCC	XCC User ID	Current XCC Password			
	J1000E9X	ThinkAgile VX2320 Appliance	7Y93CTO2WW	172 11 11 79	USERID				

10. Review the configuration and export a configuration file for future use.



- 11. Click **Deploy Cluster**, and then monitor the deployment's progress.
- 12. The ThinkAgile VX Deployer tool will notify you when deployment is complete.

TEPS	 ThinkAgile VX Deployer - Add Nodes to an I 	Existing Cluster	
Getting Started	Deploy Nodes		
Ucense Agreements	O Deployment is successful.		
Cluster Selection	Deployment Progress		
Select Nodes			100%
	Deployment Log		
	Description of Step	Status	Elapsed Time (mm:ss
	Save configuration parameters	⊘ Successful	00:1
General Networking	Save configuration parameters in Netbox	⊘ Successful	00:
	Create AWX inventory	⊘ Successful	00:
	Extract data from existing cluster	⊘ Successful	00:
XCC Credentials	Create AWX inventory	⊘ Successful	00:
Review			
Deploy Nodes	Download Log Bundle Launch vCenter		
		Shutdown VX Deployer	

Timings

Step	Time
Getting Started	0:20
License Agreements	0:27
Cluster Selection	0:09
Select Nodes	0:33
Physical Location	0:19
VMware ESXi [™] Settings	0:37
General Networking	0:22
Host Networking	0:43
Lenovo® XClarity® Controller Credentials	0:26
Review	0:43
Deployment	23:30
Total	28:09

Test Area 4: Add Nodes to a Cluster Using a Configuration File

When we added a new node in test area 3, we exported a configuration file during the final review and before deployment. In this test area, we used that configuration file to further automate the process of adding the new host again. The process here is essentially the same as in test area 3, stepping through the same wizard, except that most of the information on the screens, with the exception of password credentials, is now automatically filled in. Screenshots are not included in this test area because they look nearly the same as in the previous test area. These steps begin after logging in to the ThinkAgile VX Deployer tool.

Steps

1. Select Add Notes to an Existing Cluster.

- 2. Provide vCenter Server details.
- 3. Accept the license agreements.
- 4. Select the vCenter cluster to extend.
- 5. Select the node to add to the cluster.
- 6. Provide cluster location information.
- 7. Provide an ESXi password.
- 8. Confirm the general networking configuration.
- 9. Confirm the host networking configuration.
- 10. Provide a new Lenovo XClarity Controller password.
- 11. Review the configuration before adding a node.
- 12. Add a node to the cluster.

Timings

Step	Time
Getting Started	0:36
License Agreements	0:25
Cluster Selection	0:08
Select Nodes	0:24
Physical Location	0:10
VMware ESXi [™] Settings	0:35
General Networking	0:20
Host Networking	0:30
Lenovo® XClarity® Controller Credentials	0:24
Review	0:40
Deployment	23:43
Total	27:55

Test Area 5: Remediating a Cluster in the Lifecycle Manager

One of the last tasks the ThinkAgile VX Deployer tool completes when deploying a cluster is deploying Lenovo XClarity Integrator and using it to manage the servers. This serves as the HSM for VMware vLCM and allows cluster-aware rolling updates. It also enables hardware-topology and server-event management.

In this test area, we tested the process within vCenter to remediate the cluster.

Steps

- 1. Launch VMware vCenter. (Note that there is a convenient launch button on the last screen of the ThinkAgile VX Deployer wizard.)
- 2. Before starting remediation, it's a good idea to look at the **Hardware Topology** screen to confirm no warnings need to be resolved first. Conveniently, there is no need to leave vCenter to map the virtual and physical attributes for the topology feature.

\equiv vSphere Client Q							C Administrator@VSP	HERE.LOCAL V	? v
	[]] TestCluster : ACTION Summary Monitor Configure	s : Permissions Hosts VMs Datastores	Networks Up	dates					
✓	Summary	Hardware Topology							
TestDataCenter TestCluster	Heartbeat Configuration Issues Datastores under APD or P	Click any number below to display the hosts, or search by h	iost name or IP address Total	in the search box. Normal	Warning	Critical	(Host name or IP address	٩	
n76.vx.local	Resource Allocation V	All hosts 🗸	4	2	<u>A</u> 2	80			
n77.vx.local	CPU	- vSAN Hosts 🗸	4	2	<u>A</u> 2	80			
n79.vx.local	Memory Persistent Memory	- vSAN Disks	12	12	A 0	80			
uslemIxci02.vx.lo	Storage	- vSAN Disk Groups	4	4	A 0	80			
aslemvcsa02.vx.I	Utilization Storage Overview								-1
	Security	Machine Name		Machine Type	Front P	anel LED	Hardware Health	HOST DETAILS	
	Health	ThinkAgile VX2320 Appliance -[7Y93CTO2WW]-		7¥93	UD	1	Normal	VIEW ACTIONS ¥	
	vSAN v Skyline Health Virtual Objects Resyncing Objects Proactive Tests	0 🗟 [1 📑 [2	<u> </u>						l
	Capacity Performance Performance Diagnostics Support Data Migration Pre-check Cloud Native Storage V	Machine Name ThinkAgile VX2320 Appliance -{7Y93CTO2WW}-		Machine Type 7Y93	Front P	anel LED	Hardware Health Warning	HOST DETAILS VIEW ACTIONS ~ HOST ACTIONS ~	
	Container Volumes Lenovo XClarity Hardware Topology	0 <u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	B						•
Recent Tasks Alarms		T and	T		Vueued	T	. T	T	T
Task Name	Target Status	Details	Initiato	ər	For	Start Time	↓ ' Completion Time	' Server	_
m ∆ll y More Tasks			\bigtriangledown						0.000
indic faile									2 items

3. To update firmware on the hosts in the cluster, first make sure that the requisite firmware package was uploaded in the XClarity Integrator repository.

\equiv vSphere Client $$ Q				
Lenovo XClarity integrator Home Manage Firmware Packages	Manage Firmware Packages Import firmware packages that are stored in CIFS remote reposit ☐ IMPORT	ories or download them from Leno	vo repositories on the Internet.	
	Firmware Package Name v	Version (Date)	Status T	Description T
	C Lenovo ThinkAgile VX Repository Pack	20.4(2020/10/21)	Not Downloaded	Lenovo validated firmware best recipe and packages for ThinkAgile VX
	C Lenovo ThinkAgile VX Repository Pack	21.1(2021/02/26)	Not Downloaded	Lenovo validated firmware best recipe and packages for ThinkAgile VX
	C Lenovo ThinkAgile VX Repository Pack	21.2(2021/05/07)	Not Downloaded	Lenovo validated firmware best recipe and packages for ThinkAgile VX
	C Lenovo ThinkAgile VX Repository Pack	21.3(2021/07/31)	Not Downloaded	Lenovo validated firmware best recipe and packages for ThinkAgile VX
	C Lenovo ThinkAgile VX Repository Pack	21.4(2021/12/15)	Not Downloaded	Lenovo validated firmware best recipe and packages for ThinkAgile VX
	C Lenovo ThinkAgile VX Repository Pack	22.1(2022/04/08)	Not Downloaded	Lenovo validated firmware best recipe and packages for ThinkAgile VX
	Lenovo ThinkAgile VX Repository Pack	22.1a(2022/05/25)	Not Downloaded	Lenovo validated firmware best recipe and packages for ThinkAgile VX
	C Lenovo ThinkAgile VX Repository Pack	22.2(2022/07/26)	🖉 Ready	Lenovo validated firmware best recipe and packages for ThinkAgile VX
	C Lenovo ThinkSystem Server Repository Pack	3.1.0(2020/12/18)	Not Downloaded	Lenovo validated firmware best recipe and packages for ThinkSystem Server
		0.0.0/000//00/0.v		17 hardware support package(
V Recent Tasks Alarms				
Task Name Target	T Status T Details	T Initiator	Y Queued For	T Start Time ↓ T Completion Time T Server T
Mora Tarks				
Taxascubtivoid(n) More rack?				Oitem

4. Verify **ESXi**, **Vendor Add-on**, and **Component** images were uploaded to vLCM. The ESXi version, repository package (firmware bundle), and add-on (driver bundle) are required to ensure certification compatibility with the vSphere hardware compatibility list (HCL).

	vSphere Client Q																~ ©	
Lif	ecycle Manager	ACTIONS -																
Ima	ge Depot Updates	Imported ISOs Baselines	Settings															
ESX	I VERSIONS VENDOR	ADDONS COMPONENTS														Last Sync: 15	hours ago. Next !	Sync in 8 hours
ESX	Versions																	
	Name		٣	Version		٣	Release Date					т	Category					Ŧ
C	ESXI			7.0 U3f - 20036589			07/11/2022						Enhancem	ent				
C	ESXI			7.0 U3sf - 20036586			07/11/2022						Enhancem	ent				
C	ESXI			7.0 U3e - 19898904			06/13/2022						Enhancem	ent				
С	ESXI			7.0 U3d - 19482537			03/28/2022						Enhancem	ent				
С	ESXI			7.0 U3sd - 19482531			03/28/2022						Enhancem	ent				
C	ESXI			7.0 U3c - 19193900			01/17/2022						Enhancem	ent				_
С	ESXI			7.0 U2e - 19290878			02/14/2022						Enhancem	ent				_
С	ESXI			7.0 U2d - 18538813			09/13/2021						Enhancem	ent				_
C	ESXI			7.0 U2c - 18426014			08/23/2021						Enhancem	ent				
С	ESXI			7.0 U2sc - 18295176			08/23/2021						Enhancem	ent				
																K	< 1/3	> >
Ven	dor Addons																	
	Name		Ŧ	Version		т	Release Date					٣	Category					Ŧ
C	htc-custom-addon			7.0.3.14-03			03/16/2022						Enhancem	ent				
C	htc-custom-addon			7.0.2a.13-01			05/11/2021						Enhancem	ent				
С	htc-custom-addon			7.0.1.32-02			12/08/2020						Enhancem	ent				
C	htc-custom-addon			7.0.1.12-02			11/26/2020						Enhancem	ent				
C	htc-custom-addon			7.0.0.11-03		_	07/21/2020						Enhancem	ent				
~	Recent Tasks Alarms	5																
Task N	ame T	Target T	Status	Ŧ	Details	٣	Initiator	Ŧ	F	or Y	Start	Time	Ļ	Y Completion	Time	Ŧ	Server	· · ·
						5	2											
m	All V More Tasks																	Oitems

- 5. With those Lenovo-specific uploads confirmed, continue with the normal vCenter remediation process by marking the cluster as needing an update:
 - a. Sync the updates and sync the HCL.
 - b. Set up a new update for the cluster in the cluster's **Updates** tab, and pick which ESXi version, vendor add-on, and firmware package you need for the update.
 - c. Check cluster-image compliance, and the software will verify nodes as compliant.
 - d. Run a pre-check before remediation to make sure there aren't issues on the cluster that would prevent successful updates.
- 6. Remediate the cluster by clicking **Remediate All**.

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v Recent Tasks Adarms Y Regent Tasks Adarms Task Name Y Target Y Datals Y Nation* Y Start Time Y Completion Time Y Server Y	VSphere Client Q VSphere Client Q	Administrator@VSPHERE LOCAL Indigure Permissions Mage Hosts Mage Hosts Mage Hosts Mage Hosts Mage Hosts Mage Hosts Mage Hosts Mage Hosts Mage Hosts Mage Hosts Mage Hosts Mage Hosts Mage Hosts Mage Image Hosts Mage Image Image <td< th=""></td<>
Perform host decommiss_ 👖 n77.vx.local 🖉 Completed VSPHERE LOCAL\vpxd-extensi3 ns 08/12/2022, 12.02.16 08/12/2022, 12.02.21 uslemvcsa02.vx.local	✓ Recent Tasks Alarms Task Name Y Target Y Status Y Perform host decommiss_ □ n77.vx.local O Completed	4 hosts pre-checked: n76 vx.local, n77.vx.local, n79.vx.local Rest Mosts Mosts <td< td=""></td<>

vLCM will show you the remediation in progress and will notify you when remediation is complete.

Findings and Analysis

Prowess test engineers found the Lenovo ThinkAgile VX Deployer tool to be straightforward to use. The wizard-style interface proceeds intuitively from one screen to the next, with the tasks showing completed down the task list on the left. Each step is validated before the user can move on to the next step, which the test engineers appreciated because they knew that finished tasks were complete and correct and would not need to be revisited later. Contextual help is available to clarify instructions for select fields, and a <u>deployment guide</u> provides more details if they are needed.

It took about an hour to create a three-node cluster using the ThinkAgile VX Deployer wizard. Importantly, that included less than 10 minutes spent completing the wizard's dozen task screens and clicking **Deploy Cluster**, after which the deployment proceeded without interaction. Adding a fourth node to the cluster took just under half an hour—less than 5 minutes to complete the wizard and approximately 23 minutes to deploy without interaction. In a large environment, where there might be a large number of clusters to create or extend, the ability to start on the next cluster while monitoring the progress of the last one can significantly reduce the amount of time to complete multiple cluster deployments.

Using a configuration file to auto-fill fields in the wizard made the process easier to create and expand a cluster. When compared to deploying by manually stepping through the wizard, the process took about the same amount of time. In both cases, the two test runs were completed within seconds of each other. Two factors account for this. First, because the bulk of the time is taken after the wizard is completed, there is not much opportunity to save time completing the wizard. And second, multiple sets of credentials still need to be entered for security purposes, auto-filled data needs to be confirmed, and every **Next** button needs to be clicked. While the time savings was not significant, reducing the need to enter the same information repeatedly was a feature the test engineers appreciated, and one that can make deployment more easily repeatable, even by a less experienced engineer.

As part of deploying a new cluster, the ThinkAgile VX Deployer tool installs Lenovo XClarity Integrator as the HSM used by vCenter for firmware upgrades. We tested vCenter to verify the integration was complete, and vCenter was able to perform a remediation of the cluster—that is, upgrading the firmware in each of the nodes in the cluster. We found that all the pieces were in place for the remediation to be completed as expected, and the seamless integration was evident in the ability to map the virtual and physical attributes of the network topology.

Learn More

- Learn more about Lenovo ThinkAgile Integrated Systems and VMware HCI at www.lenovo.com/us/en/servers-storage/vmware-hci.
- View the ThinkAgile VX Deployment Guide (with ThinkAgile VX Deployer) at https://thinkagile.lenovofiles.com/help/topic/com.lenovo.thinkagile.vx/vx_deployment_guide_with_vx_deployer.pdf.
- Find this report and more at <u>https://www.prowesscorp.com/project/lenovo-thinkagile-vx-hci-easy-deployment-operation-vmware/</u>.

The analysis in this document was done by Prowess Consulting and commissioned by Lenovo.

Results have been simulated and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance.

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