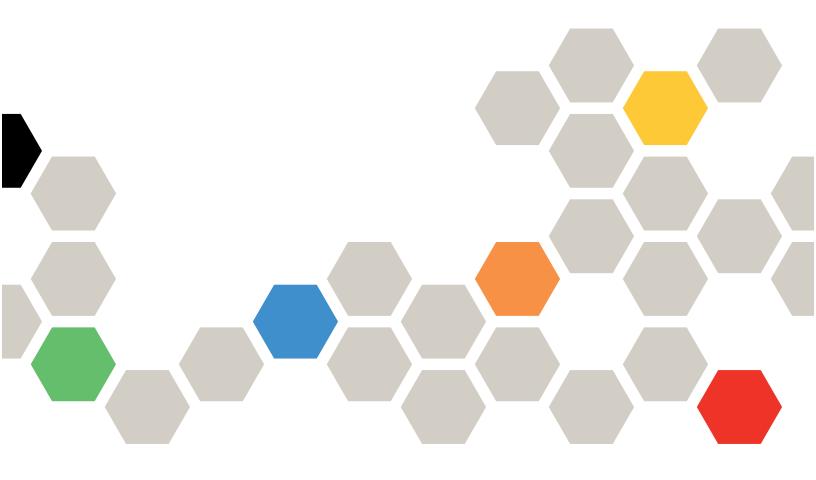# ThinkAgile HX Series User Guide

**Note**

Before using this information and the product it supports, be sure to read and understand the safety information and the safety instructions, which are available at:
https://thinksystem.lenovofiles.com/help/topic/safety_documentation/pdf_files.html

In addition, be sure that you are familiar with the terms and conditions of the Lenovo warranty for your server, which can be found at:
https://datacentersupport.lenovo.com/us/en/warrantylookup

**Seventh Edition (September 2023)**

# Contents

# Chapter 1.  Lenovo ThinkAgile HX series

Lenovo® ThinkAgile™ HX series are Nutanix software defined hyper-converged cluster solutions. The solutions consolidates software-defined compute, storage, and networking into one cluster to provide high-performance, cost-effective, and easily scalable virtualization.

**Important:**  ThinkAgile HX series does not support wireless WLAN/WWAN devices.

| Solution series | | Workloads and Scenarios |
|---|---|---|
| HX 1000 series-Intel® Xeon® Gen1/Gen2/Gen3 | <br>• 1U 1-node<br>• 2U 1-node | Light-to-medium workloads, for edge and remote office/branch office (ROBO) |
| HX 2000 series-Intel Xeon Gen1/Gen2/Gen3 | <br>1U 1-node | Light-to-medium workloads, small and medium businesses (SMBs) |
| HX 3000 series-AMD® EPYC™ Gen2/Gen3 | <br>1U 1-node | Compute-heavy workloads, for general virtualization and virtual desktop infrastructure (VDI) |
| HX 3000 series-Intel Xeon Gen1/Gen2/Gen3 | <br>• 1U 1-node<br>• 2U 1-node<br>• 2U 4-node | Compute-heavy workloads, for general virtualization and virtual desktop infrastructure (VDI) |

| | | |
|---|---|---|
| HX 5000 series-Intel Xeon Gen1/ Gen2/Gen3 | 2U 1-node | Storage-heavy workloads, for big data and enterprise applications |
| HX 7000 series-Intel Xeon Gen1/ Gen2/Gen3 | • 2U 1-node<br>• 4U 1-node | High-performance and mission critical workloads, for enterprise applications and in-memory databases (such as SAP HANA) |
| SR645 V3 series-AMD® EPYC™ Gen4 | 2U 1-node | Light-to-medium workloads, small and medium businesses (SMBs) |
| SR665 V3 series-AMD® EPYC™ Gen4 | 2U 1-node | Light-to-medium workloads, small and medium businesses (SMBs) |
| SR630 V3 series-Intel Xeon Gen4 | 1U 1-node | Light-to-medium workloads, for edge and remote office/branch office (ROBO) |
| SR650 V3 series-Intel Xeon Gen4 | 2U 1-node | Light-to-medium workloads, small and medium businesses (SMBs) |

# Resources and downloads

Use this section to find handy documents, driver and firmware downloads, and support resources.

**Downloads**

You can find the latest firmware, drivers, and software packages from the Best Recipe pages. See Chapter 4 "Firmware/drivers/software updates" on page 23.

**Note:** The firmware, drivers, and software have been tested together as a stack to run on certain models. Lenovo highly recommends you use the Best Recipe in full to avoid unforeseen errors.

**Web resources**

- ThinkAgile HX series user guide (this document)

  ThinkAgile HX series user guide (this document)

- Recommended UEFI settings - Intel Xeon SP Gen3

  https://datacentersupport.lenovo.com/solutions/ht512850

- Recommended UEFI settings - Intel Xeon SP Gen1/Gen2

  https://datacentersupport.lenovo.com/solutions/ht507780

- Nutanix software documentation

  https://portal.nutanix.com/

- Lenovo software documentation

  https://sysmgt.lenovofiles.com/help/index.jsp

- Lenovo press (Product guides/Technical briefs/Datasheets)

  https://lenovopress.com/servers/thinkagile/hx-series

- Lenovo hardware documentation

  http://thinksystem.lenovofiles.com/help/index.jsp

**Lenovo Support**

- Lenovo support portal

  http://datacentersupport.lenovo.com

- Lenovo product warranty plans

  http://datacentersupport.lenovo.com/warrantylookup

- Lenovo authorized service providers

  https://datacentersupport.lenovo.com/serviceprovider

- Lenovo service request submission

  https://support.lenovo.com/servicerequest

- Lenovo license information documents

  https://datacentersupport.lenovo.com/documents/lnvo-eula

- Lenovo product security advisories

  https://datacentersupport.lenovo.com/product_security/home

- Lenovo privacy statement

  https:///www.lenovo.com/privacy

# What is new

Review this information to learn about new enhancements in ThinkAgile HX series solutions.

# What is new (September, 2023)

Lenovo delivers additional hardware support.

**Additional hardware support**

Enabled ThinkSystem SR630 V3 based models. (1U 2-Socket with 4th Gen Intel Xeon scalable processors)

| Product | CTO model | Machine type |
|---|---|---|
| HX630 V3 LOD Integrated System (PRC only) | 7D6MCTO7WW | 7D6M |
| HX630 V3 ROBO LOD Integrated System (PRC only) | 7D6MCTO8WW | 7D6M |

Enabled ThinkAgile SR650 V3 based models. (2U 2-Socket with 4th Gen Intel Xeon scalable processors)

| Product | CTO model | Machine type |
|---|---|---|
| HX650 V3 LOD Integrated System (PRC only) | 7D6NCTO7WW | 7D6N |
| HX650 V3 Storage LOD Integrated System (PRC only) | 7D6NCTO8WW | 7D6N |

Enabled ThinkAgile SR645 V3 based models. (1U 2-Socket with 4th Gen AMD EPYC processors)

| Product | CTO model | Machine type |
|---|---|---|
| HX645 V3 LOD Integrated System (PRC only) | 7D9MCTO3WW | 7D9M |

Enabled ThinkSystem SR665 V3 based models. (2U 2-Socket with 4th Gen AMD EPYC processors)

| Product | CTO model | Machine type |
|---|---|---|
| HX665 V3 Storage LOD Integrated System (PRC only) | 7D9NCTO6WW | 7D9N |
| HX665 V3 LOD Integrated System (PRC only) | 7D9NCTO5WW | 7D9N |

## What is new (July, 2023)

Lenovo delivers additional hardware support.

**Additional hardware support**

Enabled ThinkAgile SR630 V3 based models. (1U 2-Socket with 4th Gen Intel Xeon scalable processors)

| Product | CTO model | Machine type |
|---|---|---|
| HX630 V3 ROBO Integrated System | 7D6MCTO2WW | 7D6M |
| HX630 V3 ROBO Certified Node | 7D6MCTO4WW | 7D6M |

Enabled ThinkAgile SR665 V3 based models. (2U 2-Socket with 4th Gen AMD EPYC processors)

| Product | CTO model | Machine type |
|---|---|---|
| HX665 V3 Integrated System | 7D9NCTO1WW | 7D9N |
| HX665 V3 Certified Node | 7D9NCTO3WW | 7D9N |

# What is new (June, 2023)

Lenovo delivers additional hardware support.

### Additional hardware support

Enabled ThinkAgile SR630 V3 based models. (1U 2-Socket with 4th Gen Intel Xeon scalable processors)

| Product | CTO model | Machine type |
|---|---|---|
| HX630 V3 Integrated System | 7D6MCTO1WW | 7D6M |
| HX630 V3 Certified Node | 7D6MCTO3WW | 7D6M |

Enabled ThinkAgile SR650 V3 based models. (2U 2-Socket with 4th Gen Intel Xeon scalable processors)

| Product | CTO model | Machine type |
|---|---|---|
| HX650 V3 Integrated System | 7D6NCTO1WW | 7D6N |
| HX650 V3 Storage Integrated System | 7D6NCTO2WW | 7D6N |
| HX650 V3 Certified Node | 7D6NCTO3WW | 7D6N |
| HX650 V3 Storage Certified Node | 7D6NCTO4WW | 7D6N |

Enabled ThinkAgile SR645 V3 based models. (1U 2-Socket with 4th Gen AMD EPYC processors)

| Product | CTO model | Machine type |
|---|---|---|
| HX645 V3 Integrated System | 7D9MCTO1WW | 7D9M |
| HX645 V3 Certified Node | 7D9MCTO2WW | 7D9M |

Enabled ThinkAgile SR665 V3 based models. (2U 2-Socket with 4th Gen AMD EPYC processors)

| Product | CTO model | Machine type |
|---|---|---|
| HX665 V3 Storage Integrated System | 7D9NCTO2WW | 7D9N |
| HX665 V3 Storage Certified Node | 7D9NCTO4WW | 7D9N |

# What is new (August, 2021)

Lenovo delivers additional hardware support.

### Additional hardware support

Enabled ThinkAgile SR630 V2-based models. (1U 2-Socket with Intel Xeon Gen3 processors)

| Product | CTO model | Machine type |
|---|---|---|
| HX1330 Appliance | 7Z85CTO1WW | 7Z85 |
| HX2330 Appliance | 7Z85CTO2WW | 7Z85 |
| HX3330 Appliance | 7Z85CTO3WW | 7Z85 |
| HX1331 Certified Node | 7D52CTO1WW | 7D52 |

| Product | CTO model | Machine type |
|---|---|---|
| HX2331 Certified Node | 7D52CTO2WW | 7D52 |
| HX3331 Certified Node | 7D52CTO3WW | 7D52 |

Enabled ThinkAgile SR650 V2-based models. (2U 2-Socket with Intel Xeon Gen3 processors)

| Product | CTO model | Machine type |
|---|---|---|
| HX5530 Appliance | 7Z82CTO1WW | 7Z82 |
| HX7530 Appliance | 7Z82CTO2WW | 7Z82 |
| HX5531 Certified Node | 7Z84CTO1WW | 7Z84 |
| HX7531 Certified Node | 7Z84CTO2WW | 7Z84 |

# What is new (May, 2021)

Lenovo delivers additional hardware support.

### Additional hardware support

Enabled AMD EYPC 7003 families of processors on below models.

| Product | CTO model | Machine type |
|---|---|---|
| HX3375 Appliance | 7D5UCTO1WW | 7D5U |
| HX3376 Certified Node | 7D5UCTO2WW | 7D5U |

### Software enhancements

None

### Known limitations

| Item | Impacted products | Description |
|---|---|---|
| Hypervisor version | • HX3375 Appliance<br>• HX3376 Certified Node | The AMD EPYC 7003 series processors do not support the AHV hypervisor at this time.<br><br>Relevant downloads are available at: https://support.lenovo.com/solutions/HT511487. |

# System architecture

The solution products are designed for Nutanix architecture cluster deployment. A typical ThinkAgile HX architecture includes three or more servers that are implemented as single-node, two-node, or four-node clusters.

Each server contributes storage to the Nutanix cluster from the local disks on the server:

- Hybrid Cluster – The server provides a combination of solid state disks (SSDs) for caching and hard disk drives (HDDs) for storage capacity.

- All-Flash Cluster – The server provides SSDs for caching and SSDs for storage capacity.

The following figure provides a conceptual view of the Nutanix architecture:

For detailed information on Nutanix architecture and workloads, visit

https://lenovopress.com/lp0084-converged-hx-series-nutanix-appliances-workloads-ra

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# HX series models

Use the methods in this section to view all available ThinkAgile HX series solution models.

### Appliances/Integrated Systems

The ThinkAgile HX series appliances/integrated systems are shipped with pre-bundled Nutanix software licenses. For a seamless customer experience, the ThinkAgile HX series appliances/integrated systems also includes white glove Lenovo deployment services and ThinkAgile HX series Advantage Single Point of Support.

- Fully validated and integrated Lenovo hardware and firmware.
- Pre-loaded Nutanix software for ready deployment, Nutanix software licenses are pre-bundled.
- ThinkAgile HX series Advantage Single Point of Support for quick 24/7 problem reporting and resolution.
- Lenovo deployment services.

### Certified nodes

For customers who do not require prebundled Nutanix software licenses or deployment services, Lenovo offers another fully validated and certified choice, Lenovo ThinkAgile HX certified nodes.

- Fully validated and integrated Lenovo hardware and firmware, certified with Nutanix software.
- Pre-loaded Nutanix software for ready deployment, Nutanix software licenses need to be obtained separately.
- Lenovo ThinkAgile Advantage Single Point of Support for quick 24/7 problem reporting and resolution.
- Optional Lenovo deployment services.

| Base ThinkSystem system | Model name | Machine types | Form factor | Type |
|---|---|---|---|---|
| **ThinkSystem SD530**<br><br>For more information, refer to https://pubs.lenovo.com/sd530/ | HX2720-E | 7X82 | 2U Enclosure (4 nodes) | Appliance/Integrated System |
| | HX3720 | 7X81, 7X82 | 2U Enclosure (4 nodes) | Appliance/Integrated System |

| Base ThinkSystem system | Model name | Machine types | Form factor | Type |
|---|---|---|---|---|
| | HX Enclosure | 7X81, 7Y87, 7Z02 | 2U Enclosure | Certified node |
| | HX3721 | 7Y88, 7Z03, 7Y87, 7Z02 | 2U Enclosure | Certified node |
| **ThinkSystem SE350**<br><br>For more information, refer to https://pubs.lenovo.com/se350/ | HX1021 | 7D1X | 1U rack | Certified node |
| | HX E1 Enclosure | 7D22 | 1U Enclosure | Certified node |
| | HX E2 Enclosure | 7D22 | 2U Enclosure | Certified node |
| **ThinkSystem SR630**<br><br>For more information, refer to https://pubs.lenovo.com/sr630/ | X1320 | 7X83 | 1U rack | Appliance/Integrated System |
| | HX2320 | 7X83 | 1U rack | Appliance/Integrated System |
| | HX2320-E | 7X83 | 1U rack | Appliance/Integrated System |
| | HX3320 | 7X83 | 1U rack | Appliance/Integrated System |
| | HX3320 for SAP HANA | 7X83 | 1U rack | Appliance/Integrated System |
| | HX1321 | 7Y89, 7Z04 | 1U rack | Certified node |
| | HX2321 | 7Y89, 7Z04 | 1U rack | Certified node |
| | HX3321 | 7Y89, 7Z04 | 1U rack | Certified node |
| | HX3321 for SAP HANA | 7Y89 | 1U rack | Certified node |
| **ThinkSystem SR630 V2**<br><br>For more information, refer to https://pubs.lenovo.com/sr630-v2/ | HX1330 | 7Z85 | 1U rack | Appliance/Integrated System |
| | HX2330 | 7Z85 | 1U rack | Appliance/Integrated System |
| | HX3330 | 7Z85 | 1U rack | Appliance/Integrated System |
| | HX1331 | 7D52 | 1U rack | Certified node |
| | HX2331 | 7D52 | 1U rack | Certified node |
| | HX3331 | 7D52 | 1U rack | Certified node |
| **ThinkSystem SR630 V3**<br><br>For more information, refer to https://pubs.lenovo.com/sr630-v3/ | HX630 V3 | 7D6M | 1U rack | Appliance/Integrated System |
| | HX630 V3 LOD (PRC only) | 7D6M | 1U rack | Appliance/Integrated System |
| | HX630 V3 for ROBO | 7D6M | 1U rack | Appliance/Integrated System |
| | HX630 V3 for ROBO LOD (PRC only) | 7D6M | 1U rack | Appliance/Integrated System |
| | HX630 V3 | 7D6M | 1U rack | Certified node |

| Base ThinkSystem system | Model name | Machine types | Form factor | Type |
|---|---|---|---|---|
| | HX630 V3 for ROBO | 7D6M | 1U rack | Certified node |
| **ThinkSystem SR645**<br><br>For more information, refer to<br>https://pubs.lenovo.com/sr645/ | HX3375 | 7D5U | 1U rack | Appliance/Integrated System |
| | HX3376 | 7D5U | 1U rack | Certified node |
| **ThinkSystem SR645 V3**<br><br>For more information, refer to<br>https://pubs.lenovo.com/sr645-v3/ | HX645 V3 | 7D9M | 1U rack | Appliance/Integrated System |
| | HX645 V3 LOD (PRC only) | 7D9M | 1U rack | Appliance/Integrated System |
| | HX645 V3 | 7D9M | 1U rack | Certified node |
| **ThinkSystem SR650**<br><br>For more information, refer to<br>https://pubs.lenovo.com/sr650/ | HX1520-R | 7X84 | 2U rack | Appliance/Integrated System |
| | HX3520-G | 7X84 | 2U rack | Appliance/Integrated System |
| | HX5520 | 7X84 | 2U rack | Appliance/Integrated System |
| | HX5520-C | 7X84 | 2U rack | Appliance/Integrated System |
| | HX7520 | 7X84 | 2U rack | Appliance/Integrated System |
| | HX7520 for SAP HANA | 7X84 | 2U rack | Appliance/Integrated System |
| | HX1521-R | 7Y90, 7Z05 | 2U rack | Certified node |
| | HX3521-G | 7Y90, 7Z05 | 2U rack | Certified node |
| | HX5521 | 7Y90, 7Z05 | 2U rack | Certified node |
| | HX5521-C | 7Y90, 7Z05 | 2U rack | Certified node |
| | HX7521 | 7Y90, 7Z05, 7Z45 | 2U rack | Certified node |
| | HX7521 for SAP HANA | 7Y90 | 2U rack | Certified node |
| **ThinkSystem SR650 V2**<br><br>For more information, refer to<br>https://pubs.lenovo.com/sr650-v2/ | HX5530 | 7Z82 | 2U rack | Appliance/Integrated System |
| | HX7530 | 7Z82 | 2U rack | Appliance/Integrated System |
| | HX5531 | 7Z84 | 2U rack | Certified node |
| | HX7531 | 7Z84 | 2U rack | Certified node |
| **ThinkSystem SR650 V3**<br><br>For more information, refer to<br>https://pubs.lenovo.com/sr650-v3/ | HX650 V3 | 7D6N | 2U rack | Appliance/Integrated System |
| | HX650 V3 LOD (PRC only) | 7D6N | 2U rack | Appliance/Integrated System |
| | HX650 V3 for Storage | 7D6N | 2U rack | Appliance/Integrated System |

| Base ThinkSystem system | Model name | Machine types | Form factor | Type |
|---|---|---|---|---|
| | HX650 V3 for Storage LOD (PRC only) | 7D6N | 2U rack | Appliance/Integrated System |
| | HX650 V3 | 7D6N | 2U rack | Certified node |
| | HX650 V3 for Storage | 7D6N | 2U rack | Certified node |
| **ThinkSystem SR665 V3**<br><br>For more information, refer to https://pubs.lenovo.com/sr665-v3/ | HX665 V3 | 7D9N | 2U rack | Appliance/Integrated System |
| | HX665 V3 LOD (PRC only) | 7D9N | 2U rack | Appliance/Integrated System |
| | HX665 V3 for Storage | 7D9N | 2U rack | Appliance/Integrated System |
| | HX665 V3 for Storage LOD (PRC only) | 7D9N | 2U rack | Appliance/Integrated System |
| | HX665 V3 | 7D9N | 2U rack | Certified node |
| | HX665 V3 for Storage | 7D9N | 2U rack | Certified node |
| **ThinkSystem SR950**<br><br>For more information, refer to https://pubs.lenovo.com/sr950/ | HX7820 | 7Y95 | 4U rack | Appliance/Integrated System |
| | HX7820 for SAP HANA | 7Z08 | 4U rack | Appliance/Integrated System |
| | HX7821 | 7Y96 | 4U rack | Certified node |
| | HX7821 for SAP HANA | 7Z09 | 4U rack | Certified node |

# Solution components

Use this section for available hardware and software components and the license options in a solution product.

*Table 1. Hardware components*

| Component | Description | Function |
|---|---|---|
| ThinkSystem SE350 | 1U edge server | Provides physical compute, storage, and network resources. |
| ThinkSystem SE350 E1 | 1U Enclosure | |
| ThinkSystem SE350 E2 | 2U Enclosure | |
| ThinkSystem SD530 | Half-wide, 1U compute node | |
| ThinkSystem SR630 | 1U rack server | |
| ThinkSystem SR630 V2 | 1U rack server | |
| ThinkSystem SR630 V3 | 1U rack server | |
| ThinkSystem SR645 | 1U rack server | |

*Table 1. Hardware components (continued)*

| | |
|---|---|
| ThinkSystem SR645 V3 | 1U rack server |
| ThinkSystem SR650 | 2U rack server |
| ThinkSystem SR650 V2 | 2U rack server |
| ThinkSystem SR650 V3 | 2U rack server |
| ThinkSystem SR665 V3 | 2U rack server |
| ThinkSystem SR950 | 4U rack server |
| Network switch | Rack switch (10 Gbe or higher) |

*Table 2. Software components*

| Component(optional) | Description | Function |
|---|---|---|
| Foundation | Nutanix software deployment tool | Deploys required Nutanix software for the cluster. |
| Nutanix AHV(bundled with AOS) | Nutanix hypervisor bundled with the base operating system | Separates the operating system and applications from the underlying physical hardware. |
| VMware vSphere | VMware hypervisor | Separates the operating system and applications from the underlying physical hardware. |
| Microsoft Hyper-V | Microsoft hypervisor | Separates the operating system and applications from the underlying physical hardware. |
| Nutanix Prism | Unified cluster resource management tool | Provides single-point control, data protection, expansion cluster monitoring, diagnostics and troubleshooting functions. |
| Lenovo XClarity Administrator | Unified bare metal cluster resource management tool | Simplifies infrastructure management, speeds responses, and enhances the availability of Lenovo solution server systems. |
| Lenovo XClarity Controller | Baseboard management controller | Manages devices of a single appliance and connects the appliance to the management layer. |
| Lenovo Capacity Planner | Capacity planning tool | Plans the power supply capacity based on server configurations. |
| Lenovo Energy Manager | Power management tool | Monitors and manages cluster power consumption. |

# Product specifications

Use the methods in this section to view the features and specifications of your models.

- **Product specific specifications**

  One product guide is available for each model on Lenovo Press website. Perform the following steps to view the specification details of your product.

  1. Go to https://lenovopress.com/ and choose **SERVERS ➔ ThinkAgile ➔ HX Series for Nutanix**. All ThinkAgile HX series relevant resources appear in the page.
  2. Locate and double-click the product name. The product guide page opens.
  3. View the specification details in the **Specifications** section.

- **Specifications comparison of all HX solution products**

  One product-by-product specification comparison page is also available for you to quickly view the specification differences among models. There is one reference link available to the product guide of a specific model in the page.

  For details, see https://lenovopress.com/lp1336-thinkagile-hx-series-comparison#availability=Available.

# Parts list

Use this section to understand and identify hardware parts of your product.

**Parts definition**

There are four types of hardware parts in each product:

- Tier 1 customer replaceable unit (CRU): Replacement of Tier 1 CRUs is your responsibility. If Lenovo installs a Tier 1 CRU at your request with no service agreement, you will be charged for the installation.
- Tier 2 customer replaceable unit (CRU): You may install a Tier 2 CRU yourself or request Lenovo to install it, at no additional charge, under the type of warranty service that is designated for your server.
- Field replaceable unit (FRU): FRUs must be installed only by trained service technicians.
- Consumable and Structural parts: Purchase and replacement of consumable and structural parts (components, such as a cover or bezel) is your responsibility. If Lenovo acquires or installs a structural component at your request, you will be charged for the service.

**Identifying your parts**

Go to the following pages to identify each of the components that are available for your server. Depending on the model, your server might look slightly different from the illustration.

- SD530-based servers:
  https://pubs.lenovo.com/sd530/parts_list.html
- SE350-based servers:
  https://pubs.lenovo.com/se350/parts_list.html
- SR630-based servers:
  https://pubs.lenovo.com/sr630/parts_list.html
- SR630 V2-based servers:
  https://pubs.lenovo.com/sr630-v2/parts_list.html
- SR630 V3-based servers:
  https://pubs.lenovo.com/sr630-v3/parts_list.html
- SR645-based servers:
  https://pubs.lenovo.com/sr645/parts_list.html
- SR645 V3-based servers:
  https://pubs.lenovo.com/sr645-v3/parts_list.html
- SR650-based servers:
  https://pubs.lenovo.com/sr650/parts_list.html
- SR650 V2-based servers:
  https://pubs.lenovo.com/sr650-v2/parts_list.html
- SR650 V3-based servers:
  https://pubs.lenovo.com/sr650-v3/parts_list.html
- SR665 V3-based servers:
  https://pubs.lenovo.com/sr665-v3/parts_list.html
- SR950-based servers:

https://pubs.lenovo.com/sr950/parts_list.html

# Chapter 2. Cluster deployment

Use this section to deploy a cluster.

## Deployment engagement

Use this section to understand the Lenovo professional service team engagement in the pre-deployment and post-deployment phases.

Lenovo professional service team performs a specific set of activities to help ensure proper deployment of ThinkAgile HX series products. Additional predeployment services are also available.

The onsite deployment and configuration activities that Lenovo professional will perform include the following:

- Review the deployment worksheet that was completed during the predeployment engagement.
- Verify that the customer network is ready.
- Verify the as-shipped product configuration.
- Connect the switches to the customer network.
- Perform basic network configuration to integrate the rack into the customer environment.
- Set up Lenovo XClarity Administrator management of the product.
- Verify and update the product to the Best Recipe firmware profile.
- Create credentials for BMC access.
- Deploy Nutanix cluster.
- Register the ThinkAgile HX series product with Nutanix.
- Verify the product environment, to ensure a successful handover.
- Provide a skill transfer to the customer. This includes basic operational tasks and Support processes.

Lenovo professional team will provide information about the configured system, for your records.

The following items are not in the scope of the initial deployment engagement. Many of these can be handled via other available professional service offerings.

- Installation or configuration of server applications.
- Complete administrative or operations training.
- Data migration from existing storage systems and VMware environments.
- Installation assistance for nonstandard hardware components or components not purchased from Lenovo. Note that this activity can affect the support for the product.

## License considerations

The ThinkAgile HX products provide different license options catering to your needs. You can use the default feature set of both Lenovo and Nutanix software, upgrade your software to an enhanced set, extend your license term, or reassign existing licenses to nodes or clusters as required.

*Table 3. License options*

| Component | License options |
|---|---|
| Lenovo XClarity Administrator | • Lenovo XClarity Pro (for XClarity Administrator)<br>• Lenovo XClarity Pro (for XClarity Administrator) and Prism Pro |
| Nutanix | Nutanix Software Solution Product Guide: https://lenovopress.lenovo.com/lp1765-nutanix-software-solution-product-guide |
| Microsoft | Microsoft Software Solution Product Guide: https://lenovopress.lenovo.com/lp1079-microsoft-software-solution-product-guide |
| SUSE | SUSE Software Solution Product Guide: https://lenovopress.lenovo.com/lp1264-suse-software-solution-product-guide |
| Veeam | Veeam Software Solution Product Guide: https://lenovopress.lenovo.com/lp1440-veeam-software-solution-product-guide |
| VMware | VMware Software Solution Product Guide: https://lenovopress.lenovo.com/lp1265-vmware-software-solution-product-guide |
| Red Hat | Red Hat Software Solution Product Guide: https://lenovopress.lenovo.com/lp1236-red-hat-software-solution-product-guide |

**Notes:** Refer to below web pages for the most current information about license types, expiration dates, and any free license inventory:

- Nutanix Licensing Guide: https://portal.nutanix.com/page/documents/details?targetId=Licensing-Guide:Licensing-Guide
- Lenovo XClarity Pro license and free trials: https://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/plan_freetrial.html

# Preparing server hardware

Use the server setup checklist to ensure that the server hardware is operational prior to cluster deployment.

| Phase | Task |
|---|---|
| 1 | Unpack the server and install any separately shipped components/peripherals to the server.<br><br>• SE350-based servers:<br>https://pubs.lenovo.com/se350/install_server_hardware_options.html<br><br>• SR630-based servers:<br>https://pubs.lenovo.com/sr630/install_server_hardware_options.html<br><br>• SR630 V2-based servers:<br>https://pubs.lenovo.com/sr630-v2/install_server_hardware_options.html<br><br>• SR630 V3-based servers:<br>https://pubs.lenovo.com/sr630-v3/hardware_replacement_procedures.html<br><br>• SR645-based servers:<br>https://pubs.lenovo.com/sr645/install_server_hardware_options.html<br><br>• SR645 V3-based servers:<br>https://pubs.lenovo.com/sr645-v3/hardware_replacement_procedures.html<br><br>• SR650-based servers:<br>https://pubs.lenovo.com/sr650/install_server_hardware_options.html<br><br>• SR650 V2-based servers:<br>https://pubs.lenovo.com/sr650-v2/install_server_hardware_options.html<br><br>• SR650 V3-based servers:<br>https://pubs.lenovo.com/sr650-v3/hardware_replacement_procedures.html<br><br>• SR665 V3-based servers:<br>https://pubs.lenovo.com/sr665-v3/hardware_replacement_procedures.html<br><br>• SD530-based servers:<br>https://pubs.lenovo.com/sd530/install_server_hardware_options.html<br><br>• SR950-based servers:<br>https://pubs.lenovo.com/sr950/install_server_hardware_options.html |
| 2 | Connect required internal cables if applicable.<br><br>• SR630-based servers:<br>https://pubs.lenovo.com/sr630/internal_cable_routing.html<br><br>• SR630 V2-based servers:<br>https://pubs.lenovo.com/sr630-v2/internal_cable_routing.html<br><br>• SR630 V3-based servers:<br>https://pubs.lenovo.com/sr630-v3/internal_cable_routing.html<br><br>• SR645-based servers:<br>https://pubs.lenovo.com/sr645/internal_cable_routing.html<br><br>• SR645 V3-based servers:<br>https://pubs.lenovo.com/sr645-v3/internal_cable_routing.html<br><br>• SR650-based servers:<br>https://pubs.lenovo.com/sr650/internal_cable_routing.html<br><br>• SR650 V2-based servers:<br>https://pubs.lenovo.com/sr650-v2/internal_cable_routing.html<br><br>• SR650 V3-based servers:<br>https://pubs.lenovo.com/sr650-v3/internal_cable_routing.html<br><br>• SR665 V3-based servers:<br>https://pubs.lenovo.com/sr665-v3/internal_cable_routing.html<br><br>• SD530-based servers:<br>https://pubs.lenovo.com/sd530/internal_cable_routing.html<br><br>• SR950-based servers:<br>https://pubs.lenovo.com/sr950/internal_cable_routing.html |

| | |
|---|---|
| 3 | Install the server in the rack.<br><br>• SE350-based servers:<br>https://pubs.lenovo.com/se350/se350_rack_install_guide.zip<br><br>• SR630-based servers:<br>https://pubs.lenovo.com/sr630/sr630_rack_install_guide.zip<br><br>• SR630 V2-based servers:<br>https://pubs.lenovo.com/sr630-v2/sr630_v2_rack_install_guide.zip<br><br>• SR630 V3-based servers:<br>https://serveroption.lenovo.com/rail_options/rail_options_rack_servers/<br><br>• SR645-based servers:<br>https://pubs.lenovo.com/sr645/sr645_rack_install_guide.zip<br><br>• SR645 V3-based servers:<br>https://serveroption.lenovo.com/rail_options/rail_options_rack_servers/<br><br>• SR650-based servers:<br>https://pubs.lenovo.com/sr650/sr650_rack_install_guide.zip<br><br>• SR650 V2-based servers:<br>https://pubs.lenovo.com/sr650-v2/sr650_v2_rack_install_guide.zip<br><br>• SR650 V3-based servers:<br>https://serveroption.lenovo.com/rail_options/rail_options_rack_servers/<br><br>• SR665 V3-based servers:<br>https://serveroption.lenovo.com/rail_options/rail_options_rack_servers/<br><br>• SD530-based servers:<br>https://pubs.lenovo.com/sd530/rack_installation_guide.pdf<br><br>• SR950-based servers:<br>https://pubs.lenovo.com/sr950/sr950_rack_instructions.pdf |
| 4 | Connect external cables and power cords. |
| 5 | Verify BMC and UEFI firmware versions and update them to the required levels.<br><br>For details, see Chapter 4 "Firmware/drivers/software updates" on page 23. |
| 6 | Perform the green light check and resolve any installation issues.<br><br>For details, see Chapter 6 "Troubleshooting" on page 29. |
| 7 | (Optional) Image the server with a hypervisor and AOS combination if necessary.<br><br>• Verify the OS and hypervisor versions. For details, see "Resources and downloads" on page 2.<br>• Image the server by referring to https://portal.nutanix.com/page/documents/details?targetId=Field-Installation-Guide-v4_5:Field-Installation-Guide-v4_5. |

# Planning data

Use this section to plan login parameters and network parameters for physical host and each controller virtual machine for later Nutanix implementation.

**Locate service labels**

The information on service labels are helpful for support technicians to identify your products and provide faster services. After receiving the product, peel the labels away and store them in a safe place.

- The machine type and serial number are on the ID label of each product.
- The BMC network access label is attached on the top side of the pull-out information tab.

**Create and activate a Nutanix account**

If you are new to Nutanix Support Portal, refer to the following steps to create and set up your Nutanix account.

1. Go to http://portal.nutanix.com and follow the on-screen instructions to create an account.
2. One verification email will be sent to your email address, click the verification link upon receiving the email. The Nutanix Welcome page is displayed.
3. Type the required information and click **Log in**.
4. Locate the "Support Portal" card in the "Support and Community" area. Then, click **Activate**. The Activation required dialogue box is displayed.
5. Specify the serial number of your product and click your account is well set up. See "Locate service labels" on page 19.

**Acquire default credentials**

Use the following table to plan for all required software.

| Software | Default user name | Default password |
|---|---|---|
| Lenovo XClarity Controller(BMC) | USERID | PASSW0RD |
| Prism Central | admin | admin |
| Prism | admin | nutanix/4u |
| Hypervisor (ESXi & AHV) | root | nutanix/4u |
| Hypervisor (Hyper-V) | administrator | nutanix/4u |

**Plan the network**

Use the following table to plan the network for your Nutanix implementation.

| ThinkAgile HX Servers | | | | |
|---|---|---|---|---|
| | **XCC IP address** | **XCC host name** | **Hypervisor IP address** | **Hypervisor host name** |
| Node 1 | | | | |
| Node 2 | | | | |
| Node 3 | | | | |
| User ID/ Password | User ID: USERID (Default) Password: <br><br> PASSW0RD (Default) | | User ID: root (Default) Password: | |
| **Virtual Machines (VMs)** | | | | |
| | **IPV4** | **Host name** | **User ID** | **Password** |

| vCenter Server (for ESXi only) | | | | |
|---|---|---|---|---|
| XClarity Administrator | | | | |
| | | | | |

| Infrastructure | |
|---|---|
| Domain | |
| DNS/NTP | |
| Default Gateway | |

| Virtual Network | | |
|---|---|---|
| | **Physical Adapters** | **VMkernel Adapter** |
| vSwitch 0 | | |
| vSwitch 1 | | |

| | **VLAN Name** | | **VLAN ID** | | **VLAN Portgroup** | | **Assigned vSwitch** | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

| VMKernel Adapter Services | | **vMotion** | **Provi-sioning** | **FT Logging** | **Manage-ment** | **vSphere Replica-tion** | **vSphere Replica-tion NFC** | |
|---|---|---|---|---|---|---|---|---|
| | Adapter 1 | | | | | | | |
| | Adapter 2 | | | | | | | |

# Creating and configuring a cluster

To create and configure a ThinkAgile HX series cluster, you can use the Nutanix Foundation tool.

**About the Nutanix foundation tool**

The Nutanix Foundation tool is a virtual machine that you can install in your network. It helps with:

- Automatic provision hypervisor on Nutanix block
- Automatic Nutanix OS (NOS) cluster installation and configuration
- Automatic IPMI configuration
- Automatic CVM configuration
- Automatic bare metal discovery and Nutanix OS extension

**Download and deploy the foundation tool**

The foundation tool is available in OVF format and can be downloaded from Nutanix portal as **tar.gz** package.

For detailed information and deployment steps, see https://portal.nutanix.com/page/documents/details?targetId=Field-Installation-Guide-v4_5:Field-Installation-Guide-v4_5.

# Chapter 3. Cluster management

You can monitor an appliance by using any of the following software tools.

**Nutanix Prism**

Nutanix Prism is a management and monitoring console tightly integrated with Nutanix cluster. From Nutanix Prism you can manage single Nutanix cluster, from Nutanix Prism Central you can manage multiple Nutanix clusters.

Documentation for Nutanix Prism is available at:

- Prism Central Guide: https://portal.nutanix.com/page/documents/details?targetId=Prism-Central-Guide-Prism-v5_19:Prism-Central-Guide-Prism-v5_19
- Prism Web Console Guide: https://portal.nutanix.com/page/documents/details?targetId=Web-Console-Guide-Prism-v5_19:Web-Console-Guide-Prism-v5_19

**Lenovo XClarity Administrator**

Lenovo XClarity Administrator is a centralized, resource-management tool that simplifies infrastructure management, speeds responses, and enhances the availability of Lenovo server systems and solutions. It runs as a virtual appliance that automates discovery, inventory, tracking, monitoring, and provisioning for server, network, and storage hardware in a secure environment.

Documentation for Lenovo XClarity Administrator is available at:

https://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/aug_product_page.html

# Chapter 4. Firmware/drivers/software updates

The HX Best Recipe details the supported firmware levels for the servers.

**Best Recipe**

- You can find the latest firmware, drivers, and software packages from below Best Recipe pages.

  **Note:** The firmware, drivers, and software have been tested together as a stack to run on certain models. Lenovo highly recommends you use the Best Recipe in full to avoid unforeseen errors.

  – Server models – Intel Xeon SP Gen3:

    https://support.lenovo.com/us/en/solutions/HT512728

  – Server models – Intel Xeon SP Gen1/Gen2:

    https://support.lenovo.com/solutions/ht505413

  – Server models – Intel Xeon SP Gen4:

    https://datacentersupport.lenovo.com/us/en/solutions/ht515453-thinkagile-hx-egs-systems-best-recipe

  – Server models – AMD EPYC Gen2/Gen3:

    https://support.lenovo.com/solutions/HT511487

  – Server models – AMD EPYC Gen4:

    https://datacentersupport.lenovo.com/solutions/ht515451-thinkagile-hx-genoa-systems-best-recipe

  – Server models – Intel Xeon D:

    https://support.lenovo.com/solutions/HT511485

**UEFI settings (CMOS settings)**

- Lenovo also recommends specific UEFI settings (CMOS settings) for your reference. See **Recommended CMOS Settings** from the links in "Best Recipe" on page 23.

  **Note: Recommended CMOS Settings** may still be displayed as **Recommended UEFI settings** in the Best Recipe web page.

**Tools**

You can use the tools listed here to install the latest updates from the ThinkAgile HX Best Recipe pages.

**Tools available before OS installation**

- **Lenovo XClarity Essentials Bootable Media Creator**

  – Update the server using an ISO image or CD.

  – Update the server using a USB key.

  – Update the server using the Preboot Execution Environment (PXE) interface.

  – Update the server in unattendance mode.

  – Update the server in Serial Over LAN (SOL) mode.

  Details about using Lenovo XClarity Essentials Bootable Media Creator to update firmware is available at:

  https://sysmgt.lenovofiles.com/help/topic/bomc_lenovo/bomc_main.html

- **Lenovo XClarity Controller**

If you need to update system and device firmware for a single server, connect the local keyboard, video, and mouse (KVM) to the server or log in to the web interface on the management PC.

Details about using Lenovo XClarity Controller to update firmware is available at:

https://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/NN1ia_c_manageserverfirmware.html

**Tools available within OS**

- **Nutanix Prism**

    Nutanix provides a Life Cycle Manager (LCM) dashboard that can track software and firmware versions of the various components in a single cluster. It allows you to view information about the current inventory and update the versions as needed. To view the LCM dashboard, select LCM from the pull-down list on the left of the main menu on Prism Web Console.

    Details about using Nutanix Prism to update firmware is available at:

    https://portal.nutanix.com/#/page/docs/list?type=software=software=LCM=falsehttp://sysmgt.lenovofiles.com/help/index.jsp?topic=%2Fcom.lenovo.lxca.doc%2Fupdate_fw.html

- **Lenovo XClarity Administrator**

    If you are managing multiple servers using the Lenovo XClarity Administrator, you can batch update firmware for all managed instances through the management interface.

    Details about using Lenovo XClarity Administrator to update firmware is available at:

    https://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/update_fw.html

- **Lenovo XClarity Controller**

    If you need to update system and device firmware for a single server, connect the local keyboard, video, and mouse (KVM) to the server or log in to the web interface on the management PC.

    Details about using Lenovo XClarity Controller to update firmware is available at:

    https://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/NN1ia_c_manageserverfirmware.html

# Chapter 5. Configuration procedures

Lenovo recommends the following UEFI settings for Lenovo ThinkAgile HX series appliances.

The following procedure will configure the systems to the recommended levels:

1. Set UEFI to default settings:
   ```
   OneCli config loaddefault UEFI
   ```

2. Set the following values:
   ```
   OneCli config set BootModes.SystemBootMode "Legacy Mode"
   OneCli config set SystemRecovery.F1StartControl "Text Setup"
   OneCli config set OperatingModes.ChooseOperatingMode "Maximum Performance"
   ```

**Notes:**

1. The use of OneCLI above is for illustration purposes only. Configuring through F1 Setup at boot time works as well. Refer to the system documentation or OneCLI documentation for more information. Power on/reboot is necessary for the UEFI changes to take effect.

2. Refer to the following web page for the full list of ThinkAgile HX UEFI settings:

   https://support.lenovo.com/us/en/solutions/HT507780

3. For VMWare clusters, it is possible that EVC (Enhanced vMotion Compatibility) could be affected bysome UEFI settings. It might be necessary to change some settings, like MONITORMWAIT, from the recommended values below, to allow EVC to function asdesired.

   For more information on VMWare's EVC, refer to this article:

   https://kb.vmware.com/s/article/1003212

## Configuration boot order

Use corresponding OneCLI to configure the boot order as follows:

1. CD/DVD Rom

2. Hard Disk 0

3. PXE Network

- **Intel Gen3 models:**

  ```
  OneCLI config set BootModes.SystemBootMode "UEFI Mode"
  OneCLI config set BootOrder.BootOrder "CD/DVD Rom=Hard Disk=Network"
  ```

  For other UEFI settings, see this page:

  https://support.lenovo.com/us/en/solutions/ht512850-recommended-uefi-settings-for-lenovo-thinkagile-hx-systems-3rd-gen-lenovo-thinkagile

- **AMD models:**

  ```
  OneCLI config loaddefault UEFI
  OneCLI config set SystemRecovery.F1StartControl "Text Setup"
  OneCLI config set BootModes.SystemBootMode UEFI Mode"
  OneCLI config set IMM.PowerRestorePolicy "Restore"
  OneCLI config set BootOrder.BootOrder "CD/DVD Rom=Hard Disk=Network"
  ```

- **Legacy models:**

```
OneCli config set BootOrder.BootOrder="Legacy Only=CD/DVD Rom=Hard Disk 0=PXE Network"
```

For other UEFI settings, see this page:

https://datacentersupport.lenovo.com/us/en/solutions/ht507780

# Configure M.2 Mirroring

The M.2 adapter must be configured with a RAID 1 mirrored virtual drive to allow the Hypervisor to be installed for booting.

Use OneCLI to configure the M.2 adapter:
```
[m.2]
#RAID level. RAID level can only be 0 or 1.
raid_level=1
#vol_name.the name of vol. vol_name=volume0
#Strip Size. Unit:KB.
stripe size can only be 32k or 64k.
```

# Update the appliance/integrated system name

When the VPD string is updated, the corresponding appliance/integrated system name will also be updated. The appliance/integrated system name should be updated after the system board is replaced.

Use OneCLI to update the appliance/integrated system name as follows:

```
OneCli config set SYSTEM_PROD_DATA.SysInfoProdIdentifier "ThinkAgile HX3720 Appliance"
onecli config set SYSTEM_PROD_DATA.SysInfoProdIdentifierEx "ThinkAgile HX3720 Appliance:"-
- override
```

Table 4.  Appliance/Integrated system names and the corresponding VPD strings

| Appliance name | VPD String |
|---|---|
| ThinkAgile HX1320 Appliance | ThinkAgile HX1320 Appliance |
| ThinkAgile HX1330 Appliance | ThinkAgile HX1330 Appliance |
| ThinkAgile HX2320 Appliance | ThinkAgile HX2320 Appliance |
| ThinkAgile HX2330 Appliance | ThinkAgile HX2330 Appliance |
| ThinkAgile HX2320-E Appliance | ThinkAgile HX2320-E Appliance |
| ThinkAgile HX3320 Appliance | ThinkAgile HX3320 Appliance |
| ThinkAgile HX3320 Appliance for SAP HANA | ThinkAgile HX3320 Appliance for SAP HANA |
| ThinkAgile HX3330 Appliance | ThinkAgile HX3330 Appliance |
| ThinkAgile HX3375 Appliance | ThinkAgile HX3375 Appliance |
| ThinkAgile HX2720-E Appliance | ThinkAgile HX2720-E Appliance |
| ThinkAgile HX3720 Appliance | ThinkAgile HX3720 Appliance |
| ThinkAgile HX1520-R Appliance | ThinkAgile HX1520-R Appliance |
| ThinkAgile HX3520-G Appliance | ThinkAgile HX3520-G Appliance |
| ThinkAgile HX5520 Appliance | ThinkAgile HX5520 Appliance |
| ThinkAgile HX5520-C Appliance | ThinkAgile HX5520-C Appliance |

| | |
|---|---|
| ThinkAgile HX7520 Appliance | ThinkAgile HX7520 Appliance |
| ThinkAgile HX7520 Appliance for SAP HANA | ThinkAgile HX7520 Appliance for SAP HANA |
| ThinkAgile HX5530 Appliance | ThinkAgile HX5530 Appliance |
| ThinkAgile HX7530 Appliance | ThinkAgile HX7530 Appliance |
| ThinkAgile HX7820 Appliance | ThinkAgile HX7820 Appliance |
| ThinkAgile HX7820 HANA Appliance | ThinkAgile HX7820 HANA Appliance |
| ThinkAgile HX630 V3 Certified Node | ThinkAgile HX630 V3 CN |
| ThinkAgile HX630 V3 Integrated System | ThinkAgile HX630 V3 IS |
| ThinkAgile HX630 V3 LOD Integrated System | ThinkAgile HX630 V3 LOD IS |
| ThinkAgile HX630 V3 ROBO Certified Node | ThinkAgile HX630 V3 ROBO CN |
| ThinkAgile HX630 V3 ROBO Integrated System | ThinkAgile HX630 V3 ROBO IS |
| ThinkAgile HX630 V3 ROBO LOD Integrated System | ThinkAgile HX630 V3 ROBO LOD IS |
| ThinkAgile HX645 V3 Certified Node | ThinkAgile HX645 V3 CN |
| ThinkAgile HX645 V3 Integrated System | ThinkAgile HX645 V3 IS |
| ThinkAgile HX645 V3 LOD Integrated System | ThinkAgile HX645 V3 LOD IS |
| ThinkAgile HX650 V3 Certified Node | ThinkAgile HX650 V3 CN |
| ThinkAgile HX650 V3 Integrated System | ThinkAgile HX650 V3 IS |
| ThinkAgile HX650 V3 LOD Integrated System | ThinkAgile HX650 V3 LOD IS |
| ThinkAgile HX650 V3 Storage Certified Node | ThinkAgile HX650 V3 Storage CN |
| ThinkAgile HX650 V3 Storage Integrated System | ThinkAgile HX650 V3 Storage IS |
| ThinkAgile HX650 V3 Storage LOD Integrated System | ThinkAgile HX650 V3 Storage LOD IS |
| ThinkAgile HX665 V3 Certified Node | ThinkAgile HX665 V3 CN |
| ThinkAgile HX665 V3 Integrated System | ThinkAgile HX665 V3 IS |
| ThinkAgile HX665 V3 LOD Integrated System | ThinkAgile HX665 V3 LOD IS |
| ThinkAgile HX665 V3 Storage Certified Node | ThinkAgile HX665 V3 Storage CN |
| ThinkAgile HX665 V3 Storage Integrated System | ThinkAgile HX665 V3 Storage IS |
| ThinkAgile HX665 V3 Storage LOD Integrated System | ThinkAgile HX665 V3 Storage LOD IS |

# Chapter 6. Troubleshooting

This section provides reference links for troubleshooting the systems.

- Lenovo XClarity Controller:
  http://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/event_log.html
- Lenovo XClarity Administrator:
  http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/events_vieweventlog.html
- Nutanix Prism Web Console:
  https://portal.nutanix.com/page/documents/details?targetId=Web-Console-Guide-Prism-v5_19:wc-alerts-management-wc-c.html
- Nutanix Prism Central:
  https://portal.nutanix.com/page/documents/details?targetId=Prism-Central-Guide-Prism-v5_19:mul-alerts-management-pc-c.html

# Chapter 7. Hardware replacement

This chapter provides installation and removal procedures for all serviceable system components and methods for ordering a serviceable part. Each component replacement procedure references any tasks that need to be performed to gain access to the component being replaced.

## Ordering a serviceable part

Use this section to order a serviceable part for your product as required.

1. Go to http://datacentersupport.lenovo.com and select your product.

2. On the specific product page, choose the **Parts** from the left pane. The **Parts** tab page is displayed.

3. Search the part name and record the FRU part number of the part.

4. Directly call Lenovo Support or go to https://support.lenovo.com/servicerequest and submit a service ticket.

## Replacing parts

This section provides installation and removal procedures for all serviceable system components. Each component replacement procedure references any tasks that need to be performed to gain access to the component being replaced.

**Note:** Ensure that you have updated the firmware and have applied the required settings after the component replacement. See Chapter 4 "Firmware/drivers/software updates" on page 23.

- SD530-based servers:
  https://pubs.lenovo.com/sd530/maintenance_manual_hardware_replacement_procedures.html

- SE350-based servers:
  https://pubs.lenovo.com/se350/maintenance_manual_hardware_replacement_procedures.html

  **Notes:** To identifying a drive slot number in HX1021, follow the steps below:

  1. From the Prism GUI, select **Hardware ➙ Diagram** from the drop down list to locate the *Serial Number*.

  2. Login to the Lenovo XClarity Controller page using the BMC IP. Under **Inventory ➙ Storage Device**, the drive slot number will be located on the left of the *Serial Number* under the **Bay** column.

- SR630-based servers:
  https://pubs.lenovo.com/sr630/maintenance_manual_hardware_replacement_procedures.html

- SR630 V2-based servers:
  https://pubs.lenovo.com/sr630-v2/maintenance_manual_hardware_replacement_procedures.html

- SR630 V3-based servers:
  https://pubs.lenovo.com/sr630-v3/hardware_replacement_procedures.html

- SR645-based servers:
  https://pubs.lenovo.com/sr645/maintenance_manual_hardware_replacement_procedures.html

- SR645 V3-based servers:
  https://pubs.lenovo.com/sr645-v3/hardware_replacement_procedures.html

- SR650-based servers:
  https://pubs.lenovo.com/sr650/maintenance_manual_hardware_replacement_procedures.html

- SR650 V2-based servers:
  https://pubs.lenovo.com/sr650-v2/maintenance_manual_hardware_replacement_procedures.html

- SR650 V3-based servers:
  https://pubs.lenovo.com/sr650-v3/hardware_replacement_procedures.html
- SR665 V3-based servers:
  https://pubs.lenovo.com/sr665-v3/hardware_replacement_procedures.html
- SR950-based servers:
  https://pubs.lenovo.com/sr950/maintenance_manual_hardware_replacement_procedures.html

# Appendix A.   Getting help

If you need help, service, or technical assistance or just want more information about Lenovo products use the Lenovo Support Plan for ThinkAgile HX.

Details for the ThinkAgile HX Support Plan are available at the following site:

- ThinkAgile HX series appliances: https://support.lenovo.com/solutions/ht505404
- ThinkAgile HX series certified nodes: https://support.lenovo.com/solutions/HT510301

## Before you call

Before you call, there are several steps that you can take to try and solve the problem yourself. If you decide that you do need to call for assistance, gather the information that will be needed by the service technician to more quickly resolve your problem.

**Attempt to resolve the problem yourself**

You can solve many problems without outside assistance by following the troubleshooting procedures that Lenovo provides in the online help or in the Lenovo product documentation. The Lenovo product documentation also describes the diagnostic tests that you can perform. The documentation for most systems, operating systems, and programs contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

You can find the product documentation for ThinkSystem products at the following location:

http://thinksystem.lenovofiles.com/help/index.jsp

You can take these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Check for updated software, firmware, and operating-system device drivers for your Lenovo product. The Lenovo Warranty terms and conditions state that you, the owner of the Lenovo product, are responsible for maintaining and updating all software and firmware for the product (unless it is covered by an additional maintenance contract). Your service technician will request that you upgrade your software and firmware if the problem has a documented solution within a software upgrade.
- If you have installed new hardware or software in your environment, check http://www.lenovo.com/serverproven/ to make sure that the hardware and software is supported by your product.
- Go to http://datacentersupport.lenovo.com and check for information to help you solve the problem.
  - Check the Lenovo forums at https://forums.lenovo.com/t5/Datacenter-Systems/ct-p/sv_eg to see if someone else has encountered a similar problem.

You can solve many problems without outside assistance by following the troubleshooting procedures that Lenovo provides in the online help or in the Lenovo product documentation. The Lenovo product documentation also describes the diagnostic tests that you can perform. The documentation for most systems, operating systems, and programs contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

**Gathering information needed to call Support**

If you believe that you require warranty service for your Lenovo product, the service technicians will be able to assist you more efficiently if you prepare before you call. You can also see http://datacentersupport.lenovo.com/warrantylookup for more information about your product warranty.

Gather the following information to provide to the service technician. This data will help the service technician quickly provide a solution to your problem and ensure that you receive the level of service for which you might have contracted.

- Hardware and Software Maintenance agreement contract numbers, if applicable
- Machine type number (Lenovo 4-digit machine identifier)
- Model number
- Serial number
- Current system UEFI and firmware levels
- Other pertinent information such as error messages and logs

As an alternative to calling Lenovo Support, you can go to https://support.lenovo.com/servicerequest to submit an Electronic Service Request. Submitting an Electronic Service Request will start the process of determining a solution to your problem by making the pertinent information available to the service technicians. The Lenovo service technicians can start working on your solution as soon as you have completed and submitted an Electronic Service Request.

**Collecting service data**

To clearly identify the root cause of a server issue or at the request of Lenovo Support, you might need to collect service data that can be used for further analysis. Service data includes information such as event logs and hardware inventory. Service data can be collected through the following tools:

- **Lenovo XClarity Administrator**

  Lenovo XClarity Administrator can be set up to collect and send diagnostic files automatically to Lenovo Support when certain serviceable events occur in Lenovo XClarity Administrator and the managed endpoints. You can choose to send diagnostic files to Lenovo Support using Call Home or to another service provider using SFTP. You can also manually collect diagnostic files, open a problem record, and send diagnostic files to the Lenovo Support Center.

  You can find more information about setting up automatic problem notification within the Lenovo XClarity Administrator at http://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/admin_setupcallhome.html.

- **Lenovo XClarity Controller**

  You can use the Lenovo XClarity Controller web interface or the CLI to collect service data for the server. The file can be saved and sent to Lenovo Support.

  – For more information about using the web interface to collect service data, see http://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/NN1ia_c_servicesandsupport.html.

  – For more information about using the CLI to collect service data, see http://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/nn1ia_r_ffdccommand.html.

# Contacting Support

You can contact Support to obtain help for your issue.

You can receive hardware service through a Lenovo Authorized Service Provider. To locate a service provider authorized by Lenovo to provide warranty service, go to https://datacentersupport.lenovo.com/

serviceprovider and use filter searching for different countries. For Lenovo support telephone numbers, see https://datacentersupport.lenovo.com/supportphonelist for your region support details.

# Appendix B.   Trademarks

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