Lenovo XClarity Administrator
Product Guide

Lenovo XClarity™ Administrator is a centralized resource management solution that is aimed at reducing complexity, speeding response, and enhancing the availability of Lenovo® server systems and solutions.

Lenovo XClarity Administrator runs as a virtual appliance and provides agent-free hardware management that automates discovery, inventory, tracking, updates, monitoring, and provisioning for Lenovo® server systems, storage, network switches, hyperconverged and ThinkAgile solutions. A single XClarity Administrator instance supports managing a maximum of 1,000 devices.

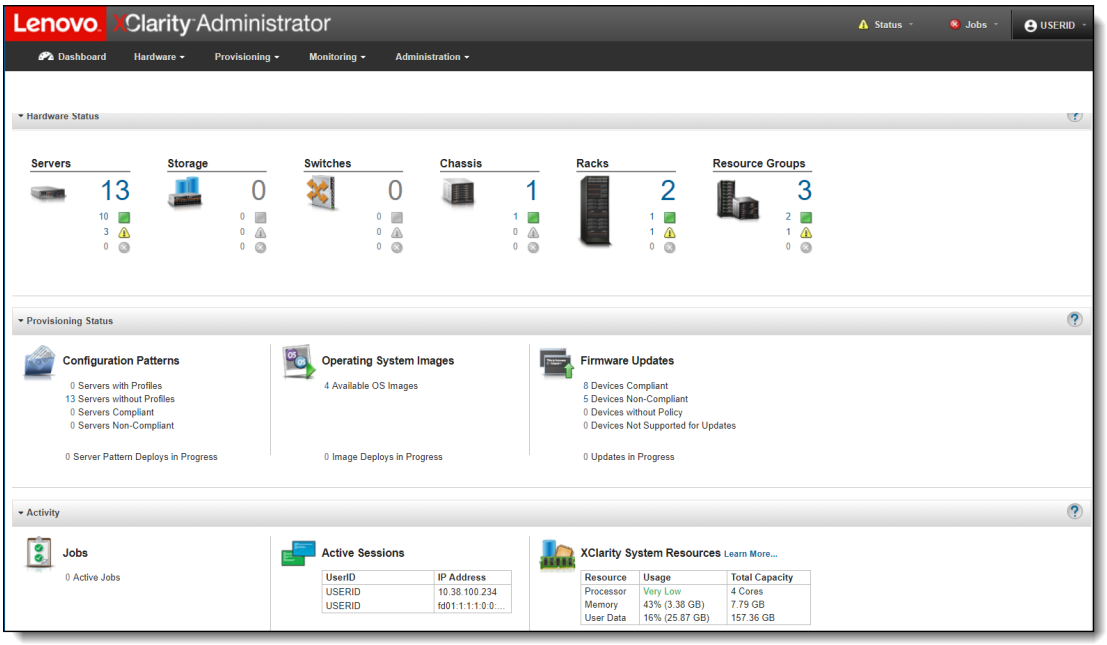

Figure 1. Lenovo XClarity Administrator dashboard

Did you know?

Lenovo XClarity offers a mobile app for Android and iOS devices. The app enables you to securely monitor physical systems, get real-time status alerts and notifications, and take action on common system level tasks. The app can also connect directly via an enabled USB port to a ThinkSystem server and provide virtual LCD capability.

Features

The XClarity Administrator dashboard is an HTML 5-based web interface that allows fast location of resources so tasks can be run quickly. Because Lenovo XClarity Administrator does not include any agent software that is installed on the managed endpoints, there are no CPU cycles spent on agent execution and no memory is used, which means that up to 1GB of RAM and 1 - 2% CPU usage is saved, compared to a typical managed system where an agent is required.

Lenovo XClarity Administrator delivers Lenovo resources faster. With a simplified administration dashboard, the following functions can be easily achieved:

- Discovery
- Inventory
- System Health & Monitoring
- Firmware compliance
- Firmware updates
- Windows device driver updates
- Configuration management and compliance
- Deployment of operating systems and hypervisors to bare metal servers
- Securely erase drive data
- Warranty status monitoring
- Call home, Service Data Upload and Ticket Status monitoring

Fast time to value is realized through automatic discovery of existing or new Lenovo rack servers and Flex System infrastructure. Inventory of the discovered endpoints is gathered, so the managed hardware inventory and its status can be viewed-at-a-glance.

A centralized view of events and alerts that are generated from managed endpoints is available. When an issue is detected by a managed endpoint, an event is passed to Lenovo XClarity Administrator. Alerts and events are visible via the XClarity Administrator Dashboard, the Status bar, and the Alerts and Events detail for the specific system.

Supported endpoints include:

- ThinkSystem servers and compute nodes
- Flex System Compute Nodes
- System x Servers
- ThinkEdge Servers
- ThinkServer Servers
- ThinkAgile solutions
- Hyperconverged solutions
- NeXtScale servers
- RackSwitch switches
- ThinkSystem storage
- Lenovo storage

For a detailed list of devices supported to be managed by XClarity Administrator see Supported Managed Endpoints

Firmware management

Firmware management is simplified by assigning Firmware-compliance policies to supported managed endpoints to ensure that firmware on those endpoints remains compliant. You can also create and edit firmware-compliance policies when validated firmware levels do not match the suggested predefined policies. Additionally, you can also apply and activate firmware that is later than the currently installed firmware on a single managed endpoint or group of endpoints without using compliance policies.

Windows Device Driver updates

Starting with v2.1.0, XClarity Administrator utilizes Windows UpdateXpress System Packs (UXSPs) to enable the update of the OS device drivers on deployed Windows operating systems. Windows UXSPs contain Windows device drivers for supported Windows versions and for Lenovo servers that supports Windows. You can download or import Windows UXSPs in the repository. UXSPs must be available in the repository before you can update Windows device drivers on managed severs.

Configuration management and compliance

Configuration management uses pattern-based configurations to quickly provision and re-provision a single server or multiple servers and compute nodes, all with a single set of configuration settings. Settings to configure include local storage, I/O adapters, boot order, and other baseboard management controller and UEFI settings on managed servers. Server patterns also integrate support for virtualizing I/O addresses, so you can virtualize server fabric connections or repurpose servers without disruption to the fabric.

Additionally, if the settings on a server change, you can determine the compliance status of each server from within the Configuration Patterns Server Profiles page and main dashboard.

Configuration support for CNOS-based RackSwitch networking switches has been added starting with XClarity Administrator 2.4.0. This feature provides template creation, editing and deployment for global settings, port channel, spine-leaf, VLAG and VLAN.

OS Provisioning

OS Provisioning enables bare metal deployment. Images of the following operating systems and hypervisors can be imported and held in a repository for images:

- VMware vSphere hypervisor (ESXi)
- Windows Server
- Windows Server with Hyper-V
- SUSE Linux Enterprise Server (SLES)
- Red Hat Enterprise Linux (RHEL)
- Ubuntu Server
- CentOS

Starting with XClarity Administrator v3.5.0 there is no longer a limit of 50GB or 10 images for to the number of OS images which can be stored within the repository, you can now continue to import images as long as there is sufficient free space within the OS images repository.

It is possible to deploy operating-system images to up to 28 bare-metal servers concurrently.

Security

Lenovo XClarity Administrator includes several features that can help you secure your environment. These include:

- When you manage Lenovo chassis and servers in XClarity Administrator, you can configure XClarity Administrator to change the firewall rules for the devices so that incoming requests are accepted only from XClarity Administrator. This is referred to as encapsulation.
- If you must be compliant with NIST SP 800-131A or FIPS 140-2, XClarity Administrator can help you meet that compliance. XClarity Administrator supports self-signed SSL certificates (issued by an internal certificate authority) or external SSL certificates (private or commercial CA).
- When changing cryptographic settings within XClarity Administrator you can choose to apply the settings to the management server only, to the managed devices only, or both.
- XClarity Administrator includes an audit log that provides a historical record of user actions, such as logging on, creating users, or changing user passwords.

Integration

XClarity Administrator can be integrated into external, higher level management, automation, and orchestration platforms using the XClarity Integrators, through SNMP and through open REST application programming interfaces (APIs). This means Lenovo XClarity can easily integrate with your existing management infrastructure.

Lenovo XClarity Integrators

Lenovo XClarity integrates with leading management applications in the areas of infrastructure management, orchestration and automation, and IT service management.

Available integrators include the following:

- Lenovo XClarity Integrator for VMware vCenter (free download, support requires XClarity Pro license)
  Lenovo XClarity Integrator for VMware vCenter is an extension to LXCI for VMware vCenter and provides system administrators with enhanced management capabilities for Lenovo Servers by integrating Lenovo hardware management functionality.

https://datacentersupport.lenovo.com/documents/LNVO-VMWARE

- Lenovo XClarity Integrator for VMware vRealize Automation (free download, support requires XClarity Pro license)
  Lenovo XClarity Integrator for VMware vRealize Automation (vRA) is installed on top of vRealize Automation and allows cloud administrators to easily, and repeatedly, provision hardware infrastructure components (such as Lenovo servers) into vRealize-managed hybrid cloud environment
  https://datacentersupport.lenovo.com/us/en/documents/lnvo-vmro#vRA
- Lenovo XClarity Integrator for VMware vRealize Orchestrator (free download, support requires XClarity Pro license)
  The Lenovo XClarity Integrator for VMware vRealize Orchestrator.vmoapp plug-in is a plug-in to the VMware vRealize Orchestrator. It provides workflows that interact with Lenovo XClarity Administrator to automate management.
  https://datacentersupport.lenovo.com/us/en/documents/lnvo-vmro#vRO
- Lenovo XClarity Integrator Management Pack for VMware vRealize Operations Manager (free download, support requires XClarity Pro license)
  The Lenovo XClarity Management Pack (MP) developed for VMware vRealize Operations Manager (vROps) monitor the health, capacity, and performance of Lenovo XClarity Administrator (LXCA) resources.
  https://datacentersupport.lenovo.com/us/en/documents/lnvo-vmro#vROps
- Lenovo XClarity Integrator for VMware vRealize Log Insight (free download, support requires XClarity Pro license)
  This content pack provides analysis of events from the LXCA, LXCO, and the resources managed by LXCA. These insights can help systems administrators find potential problems in their environment.
  https://datacentersupport.lenovo.com/us/en/documents/lnvo-vmro#vRLI
- Lenovo XClarity Integrator for Microsoft Windows Admin Center (free download, support requires XClarity Pro license)
  Lenovo XClarity Integrator for Microsoft Windows Admin Center (LXCI for WAC) is a plug-in that integrates functions for managing, monitoring, and updating the Lenovo servers and their components with Windows OS or software application management system. It supports to view Lenovo server hardware and firmware inventories, events, alerts, and health status, update firmware/driver, cluster-aware rolling update of firmware/driver for Windows cluster nodes, display Lenovo ThinkAgile MX server topology view, and facilitate storage pool operations through wizards. Lenovo XClarity Administrator (LXCA) (optional) streamlines the Lenovo server management job, especially for large-scale deployment.
  https://datacentersupport.lenovo.com/us/en/solutions/HT507549
- Lenovo XClarity Integrator for Microsoft System Center (free download, support requires XClarity Pro license)
  Lenovo XClarity Integrator offerings for Microsoft System Center offerings integrate the Lenovo server management functions into Microsoft System Center. They support server automatic discovery, monitoring, configuration, OS deployment, and firmware update functions, reducing the time and effort required for routine system administration through server consolidation and simplified management
  https://datacentersupport.lenovo.com/documents/LNVO-MANAGE
- Lenovo XClarity Administrator App for Splunk (as-is solution)
  Lenovo XClarity App for Splunk enables collection, visual representation, and analysis of Lenovo hardware events from the Splunk platform.
  https://splunkbase.splunk.com/app/3105/
- Lenovo XClarity and Moogsoft AIOps Integration (as-is solution)
  Moogsoft ingests monitoring & observability data from Lenovo XClarity at scale, while adding a layer of intelligence, by applying AI & machine learning, that enables IT & DevOps teams to proactively identify and resolve incidents before they impact business services.
  https://docs.moogsoft.com/Enterprise.8.0.0/en/lenovo-xclarity-lam.html
- Lenovo XClarity Administrator Toolkits
  - The Ruby toolkit provides a Ruby-based library of commands and APIs to automate resource management from an OpenStack environment, Chef or Puppet:
    https://github.com/lenovo/chef.lenovo-lxca
    https://github.com/lenovo/puppet.lenovo-lxca
  - Lenovo XClarity Python (PyLXCA) Toolkit
    https://github.com/lenovo/pylxca
    The PyLXCA toolkit provides a Python-based library of commands and APIs to automate provisioning and resource management from an OpenStack environment, such as Ansible
    https://github.com/lenovo/Ansible.lenovo-lxca
  - Lenovo XClarity Administrator PowerShell (LXCAPSTool) toolkit
    https://www.powershellgallery.com/packages/LXCAPSTool
    The Lenovo XClarity Administrator PowerShell toolkit provides a library of cmdlets to automate provisioning

and resource management from a Microsoft PowerShell session.

- Lenovo XClarity and PagerDuty Integration (as-is solution)
  Note: XClarity Administrator integrates with PagerDuty without additional software.
- Centerity Service Pack for Lenovo XClarity
  Centerity Service Pack for Lenovo XClarity provides fast, flexible and scalable delivery of Lenovo infrastructure. XClarity integrates easily into Lenovo servers to automate provisioning and operations management, and into Lenovo switches and storage to automate operations management.
- Lenovo XClarity Integrator for ServiceNow (free download)
  Lenovo XClarity Integrator (LXCI) for ServiceNow is a plug-in for ServiceNow that integrates with Lenovo XClarity Administrator (LXCA). It retrieves inventory data from LXCA into the ServiceNow configuration management database (CMDB), and enables event management, including viewing the information of fans, power supplies, and switches, and monitoring events of the Lenovo servers.
  https://datacentersupport.lenovo.com/us/en/solutions/ht506884
- Lenovo XClarity Integrator for Microsoft Azure Log Analytics (free download)
  Lenovo XClarity Integrator (LXCI) for Microsoft Azure Log Analytics is a plug-in for Microsoft Azure Log Analytics that integrates with Lenovo XClarity Administrator (LXCA). It manages events and finds potential problems of the Lenovo servers managed by LXCA, including events, alerts, user accounts, firmware updates, configuration, operating system deployments, power, thermal, and battery.
  https://datacentersupport.lenovo.com/us/en/solutions/ht506712
- Lenovo XClarity Integrator for Nagios (free download, requires Lenovo XClarity Administrator installed)
  Lenovo XClarity Integrator for Nagios retrieves alerts from XClarity Administrator, and makes them available to Nagios.
  https://datacentersupport.lenovo.com/us/en/solutions/ht507298
- Lenovo XClarity Essentials Plug-in for Nagios (free download)
  Lenovo XClarity Essentials Plug-in for Nagios is a stand-alone plugin for Nagios that retrieves health status from individual Lenovo ThinkSystem servers.
  https://datacentersupport.lenovo.com/us/en/solutions/ht507403

Ordering information for those integrators requiring a license is described in the Download and ordering information section.

Support entitlement for Lenovo XClarity Integrators for VMware and Microsoft, is included in Lenovo XClarity Pro offering which is described in the next section.

Lenovo XClarity Pro

Lenovo XClarity Pro provides the following entitlement:

- Lenovo XClarity Administrator Configuration Pattern feature entitlement
- Lenovo XClarity Administrator OS deployment feature entitlement
- Reporting XClarity Administrator software problems using Call Home
- Lenovo XClarity Administrator Service & Support
- Lenovo XClarity Integrator for Microsoft Service & Support
- Lenovo XClarity Integrator for VMware Service & Support

Lenovo XClarity Administrator is available for download from the following URL:
https://datacentersupport.lenovo.com/us/en/xclaritytrial

This download provides Lenovo XClarity Administrator base functionality plus a 90-day trial evaluation licenses for XClarity Administrator features Configuration Patterns and bare metal operating system deployment.

Note: Reporting XClarity Administrator software problems using Call Home, and Service and Support for XClarity Administrator and XClarity Integrators are only available with an XClarity Pro purchase.

The following table compares features included with XClarity Administrator base and with addition of XClarity Pro license.

Table 1. Comparing Lenovo XClarity Administrator and Lenovo XClarity Pro features

Feature	Lenovo XClarity Administrator	Lenovo XClarity Pro
Licensing and Support		
License	Free	Licensed
Service and Support	No	Yes
Key Features		
REST APIs and XClarity Integrators	Yes	Yes
Auto-discovery and asset management	Yes	Yes
Real-time monitoring, fault handling, alert notification, and call home	Yes	Yes
Firmware update management	Yes	Yes
Configuration patterns	No	Yes
Operating system and hypervisor installation	No	Yes
Reporting XClarity Administrator software problems using Call Home	No	Yes

Lenovo XClarity mobile app

The Lenovo XClarity mobile app provides management functions on Android and iOS devices:

- View the status summary of all hardware.
- Monitor the detailed status of each device.
- Monitor the inventory of each device.
- Monitor audit events, hardware and management events, alerts, and jobs.
- Perform power actions on a device.
- Take action on common system level tasks to minimize the risk of disruptions and downtime
- Forward emails to share inventory, alert and event information.
- On ThinkSystem servers: Perform initial configuration of servers, retrieve diagnostic information (virtual LCD) and perform actions, Initiate Lenovo XClarity Administrator management from a mobile device.

Support requirements are as follows:

- Supports Android 7 to 11, and iOS 10 and later.
- Requires Lenovo XClarity Administrator v1.2.1 or later.

Note:

- Android 5 is supported only for XClarity Mobile 2.3.0 and earlier.
- The facial recognition feature of iPhone X/XR/XS devices is not supported.

The following figure shows the Inventory screen of the mobile app.

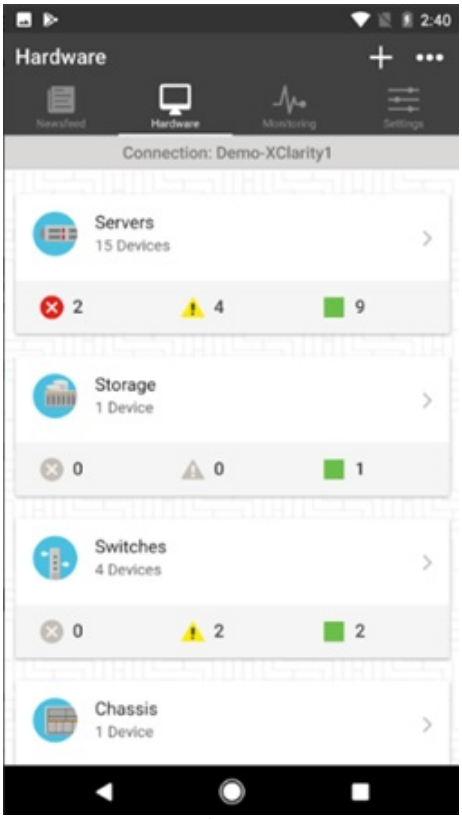

Figure 2. Lenovo XClarity mobile app

The mobile app is available for download from these app stores:

- Google Play
- Apple iTunes

Management tasks

By using Lenovo XClarity Administrator, users can perform the following tasks that are described in this section.

- User Management
- Hardware monitoring
- Hardware management
- Configuration management
- Operating system deployment
- Firmware updates
- Task automation using scripts

User Management

Lenovo XClarity Administrator provides a centralized authentication server to create and manage all user accounts and to manage and authenticate user credentials. The authentication server is created automatically when the management server first starts. The User accounts, which are used to log on and manage the Lenovo XClarity Administrator, can also be used for all chassis and servers that are managed by the Lenovo XClarity Administrator. When you create a user account, you control the level of access, such as whether the account has read/write authority or read-only authority, by using role groups.

When devices are initially managed by Lenovo XClarity Administrator, a predefined set of role groups can have permission to access the devices by default. This predefined set is empty by default until it is configured. You can change the role groups that can access specific managed devices. When permission is given to certain role groups, only users that are members of those role groups can see and act on those specific devices.

By default, devices are managed using XClarity Administrator managed authentication to log in to the devices. When managing rack servers and Lenovo chassis, you can choose to use managed authentication or local authentication to log in to the devices.

The following figure shows the Lenovo XClarity Administration interface for security that comprises of user management, roles, and other security settings. Including the ability which was added with v3.2.0 to use and external CyberArk identity-management system as an external password vault to store XClarity Administrator and Lenovo XClarity Controller credentials.

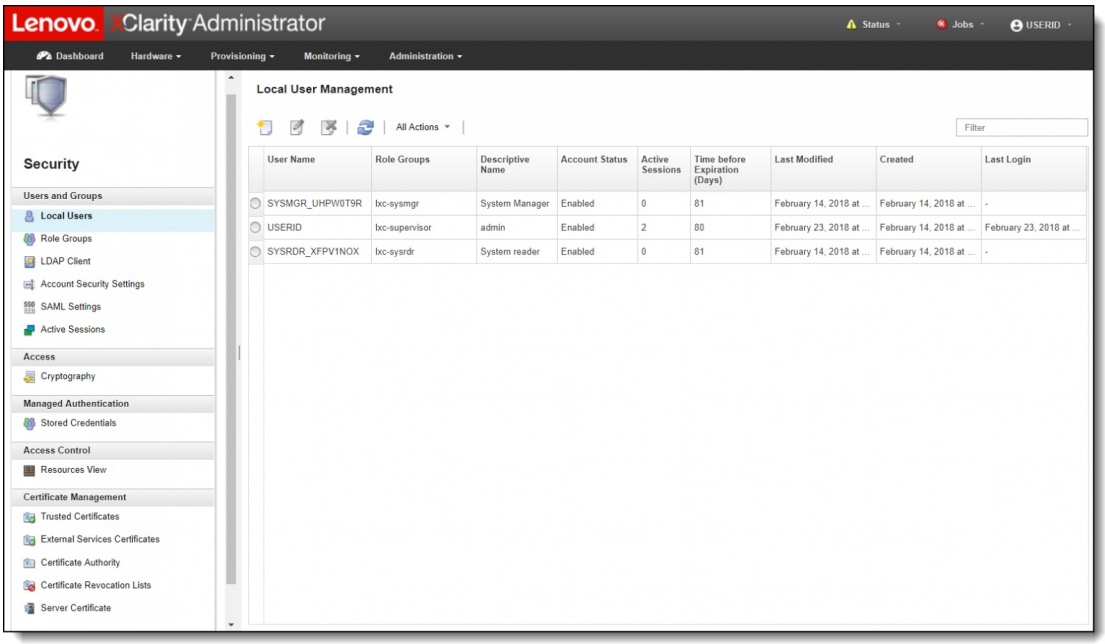

Figure 3. User management interface

Hardware monitoring

Lenovo XClarity Administrator provides a centralized view of events and alerts that are generated from managed endpoints, such as chassis components, servers, storage devices and network switches. When an issue is detected an event is passed to the Lenovo XClarity Administrator. That event is displayed in the alerts list that is available within the user interface. A status bar also is available that provides overall status information on the main XClarity Administrator interface. An example list of alerts is shown in the following figure. This view can be filtered to show specific alert severity. Additionally, the view can also be filtered by dates and alert sources or via the search filter.

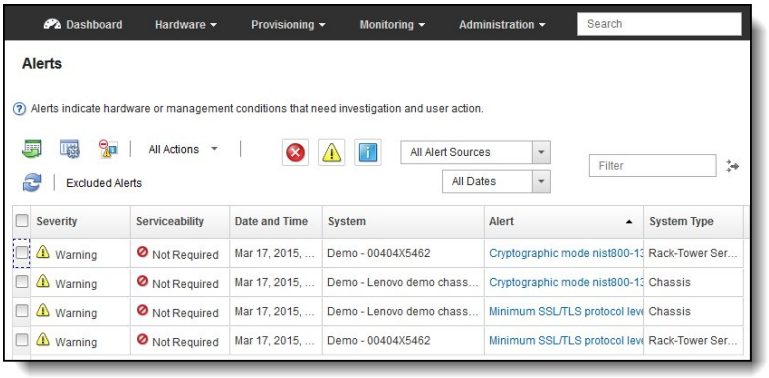

Figure 4. Alerts and actions

Hardware management

There are various management tasks for each supported endpoint, including viewing status and properties, configuring system information and network settings, starting the CMM/BMC/IMM/XCC web interfaces, and remote control for the severs and Flex nodes. Note, the Feature on Demand (FoD) key for remote presence is required on ThinkSystem, ThinkAgile Solutions, NeXtScale, and System x servers if not included as standard. The options available for Power Actions on a selected ThinkSystem server is shown in the following figure.

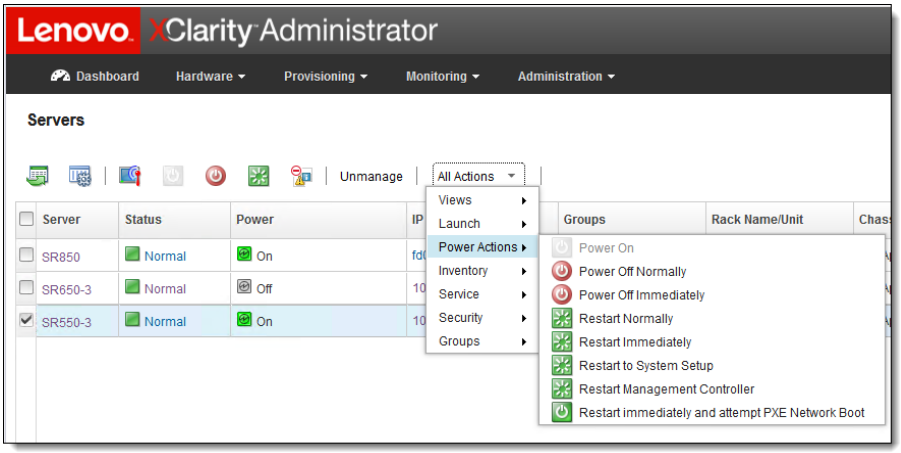

Figure 5. Hardware Management

Configuration management

Configuration patterns provide a way to ensure that you have consistent configurations applied to managed servers. Server patterns are used to provision or pre-provision a managed server by configuring local storage, I/O adapters, boot setting, firmware, ports, IMM, and UEFI settings. Server patterns also integrate support for virtualizing I/O addresses so you can virtualize Flex System fabric connections or re-purpose servers without disruption to the fabric.

You can also determine whether the settings on a server are in compliance with the server profile assigned. The settings on a server can become out of compliance with its server profile if settings are changed without using Configuration Patterns or if an issue occurred during deployment, such a firmware issue or an invalid setting.

Operating system deployment

Lenovo XClarity Administrator can be used to manage the OS images repository and deploy operating system images to managed servers. To deploy an operating system image from Lenovo XClarity, at least one of the network interfaces (Eth0 or Eth1) must have IP network connectivity to the server network interface that is used to access the host operating system. It also must be configured with an IPv4 address. Note, the Feature on Demand (FoD) key for remote presence is required on ThinkSystem, ThinkAgile Solutions, NeXtScale, and System x servers if not included as standard.

Firmware updates

Within Lenovo XClarity, you can manage the firmware updates repository and apply and activate firmware updates for managed endpoints. Compliance policies can be started to flag managed endpoints that do not comply with the defined firmware rules. Refreshing the repository and downloading updates requires an Internet connection. If Lenovo XClarity has no Internet connection, you can manually import updates to the repository. The firmware apply and activate interface is shown in the following figure.

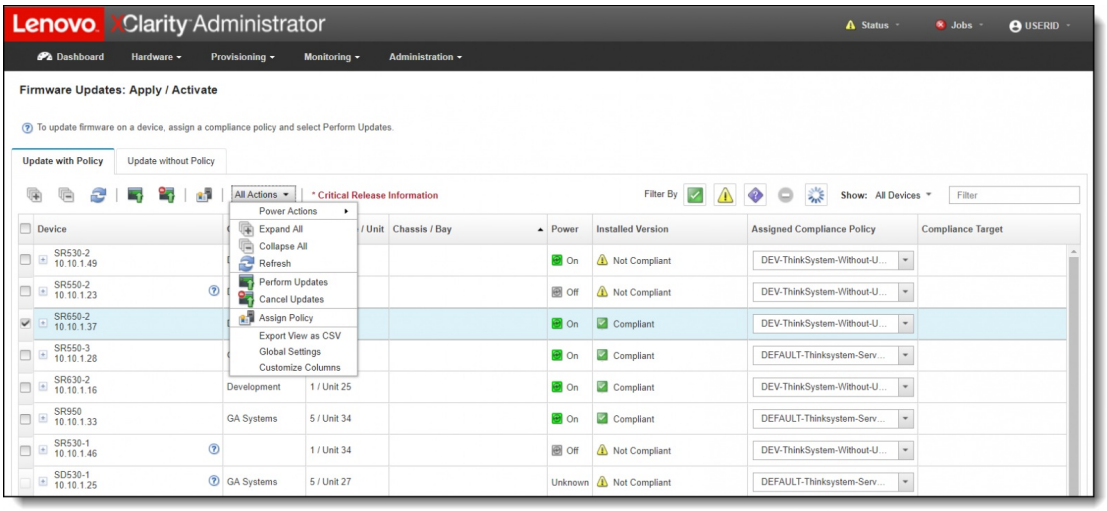

Figure 6. Firmware updates

Task automation using scripts

Lenovo XClarity Administrator provides REST APIs and a PowerShell Toolkit, Python Toolkit and Ruby toolkit, which can be used to generate scripts to automate management functions.

Lenovo XClarity Administrator set of easy-to-use APIs can be used to access XClarity Administrator data and services from applications running outside of the XClarity Administrator framework. This allows for integration of XClarity Administrator capabilities into other software. These APIs are based on the REST architecture and are accessed via the HTTPS protocol. More information on the XClarity Administrator REST API is available at the following link: https://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca_restapis.doc/rest_apis.html

Lenovo XClarity Administrator PowerShell (LXCAPSTool) toolkit provides a library of cmdlets to automate provisioning and resource management from a Microsoft PowerShell session. The cmdlets use Lenovo XClarity REST APIs and can automate the following functions:

- Logging in to XClarity Administrator
- Managing and unmanaging chassis, servers, storage devices, and top-of-rack switches (devices)
- Collecting inventory data for devices and components
- Deploying an operating-system image to one or more servers
- Configuring servers through the use of Configuration Patterns
- Applying firmware updates to devices
- Managing user accounts
- Monitoring events

XClarity Administrator offers a PyLXCA toolkit which provides a Python-based library of commands and APIs to automate provisioning and resource management from an OpenStack environment, such as Ansible or Puppet.

The PyLXCA toolkit provides an interface to Lenovo XClarity Administrator REST APIs to automate functions such as:

- Logging in to Lenovo XClarity Administrator
- Managing and unmanaging chassis, servers, storage systems, and top-of-rack switches (endpoints)

- Viewing inventory data for endpoints and components
- Deploying an operating-system image to one or more servers
- Configuring servers through the use of Configuration Patterns
- Applying firmware updates to endpoints

Lenovo also provides the Lenovo XClarity Ruby toolkit which is supported to automate resource management from an OpenStack environment, such as Ansible, Chef, or Puppet. The Ruby toolkit provides an interface to Lenovo XClarity Administrator REST APIs to automate functions (see Lenovo XClarity Administrator Ruby toolkit) such as:

- Logging in to XClarity Administrator
- Managing and unmanaging chassis, servers, storage devices, and top-of-rack switches (devices)
- Viewing inventory data for devices and components
- Deploying an operating-system image to one or more servers
- Configuring servers through the use of Configuration Patterns
- Applying firmware updates to devices

Download and ordering information

Migrating from v1.x.x? For information on migrating to XClarity Administrator v2.1.x from a previous release (1.x.x) please refer to the Lenovo XClarity Administrator Quick Start Guide.

Tip: If running a version of XClarity v1.x.x you must update to v1.4.1 then you must migrate your system to v2.0.0 then upgrade to v2.1.0.

Lenovo XClarity Administrator is available to download from Lenovo at the following link:

https://datacentersupport.lenovo.com/us/en/xclaritytrial

The free download includes a 90-day evaluation license for Configuration Patterns and Operating System Deployment to allow you to evaluate these licensed components.

Lenovo XClarity Integrators for Microsoft are also available to download for free from the following links (XClarity Pro License required for technical support):

- Microsoft Windows Admin Center:
  https://datacentersupport.lenovo.com/us/en/solutions/HT507549
- Microsoft System Center (MSSC):
  https://datacentersupport.lenovo.com/documents/lnvo-manage

Lenovo XClarity integrator for VMware is also available to download for free from the following link (XClarity Pro License required for technical support):

- VMware vCenter:
  https://datacentersupport.lenovo.com/documents/lnvo-vmware
- VMware vRealize Integration Offering are all available from the following link:
  https://datacentersupport.lenovo.com/us/en/documents/lnvo-vmro

Note: The free downloads for both XClarity Administrator and XClarity Integrators do not include any entitlement for technical support. To gain entitlement for technical support, you will need to purchase a license for Lenovo XClarity Pro per physical managed device.

Each **Lenovo XClarity Pro** license provides the following entitlements for a single device (for details on which devices XClarity Administrator can managed see Supported Devices in the online help):

- Service and support for Lenovo XClarity Integrator for Microsoft & VMware
- Service and support for XClarity Administrator
- Advanced functions within XClarity Administrator:
  - Configuring servers using Configuration Patterns
  - Deploying operating systems
  - Reporting XClarity Administrator problems using software Call Home (Call Home for hardware alerts are not affected.)

You must purchase a license for each managed device to be entitled to service and support. However, compliance is determined based on the number of managed devices that support the advanced functions. The license is not tied to a specific device.

Lenovo XClarity Pro editions are available with a 1-year, 3-year, or 5-year software subscription and support. Lenovo XClarity Pro is available on a per-managed-endpoint basis or per-managed-chassis basis. The per-chassis licenses offer a more cost-effective way of purchasing licenses for the Flex System environment.

The part numbers are listed in the following tables.

Table 2. Lenovo XClarity Pro part numbers: Per managed endpoint

Description	Part number
Lenovo XClarity Pro, per Managed Endpoint w/1 Yr SW S&S	00MT201
Lenovo XClarity Pro, per Managed Endpoint w/3 Yr SW S&S	00MT202
Lenovo XClarity Pro, per Managed Endpoint w/5 Yr SW S&S	00MT203

Table 3. Lenovo XClarity Pro part numbers: Per managed chassis

Description	Part number
Lenovo XClarity Pro, per Managed Chassis w/1 Yr SW S&S	00MT198
Lenovo XClarity Pro, per Managed Chassis w/3 Yr SW S&S	00MT199
Lenovo XClarity Pro, per Managed Chassis w/5 Yr SW S&S	00MT200

When you purchase XClarity Pro, the order is fulfilled via electronic software delivery (ESD) using the Lenovo Key Management System (LKMS). The order is placed onto LKMS using an email address for the end user who has ordered the code. This email address is where the Activation Code is sent in PDF format (the email will come from lkmsdev@lenovo.com). The recipient email address is the login to the LKMS system for administration and to manage the LKMS inventory.

The Activation code is redeemed via LKMS and the information about the *end customer* should be entered during the redemption process.

For more information on how to redeem the Authorization Code, downloading the XClarity Administrator License key, and importing the license key into the XClarity Administrator appliance, refer to Installing the full-function enablement license in the online help.

Licenses are installed using a license activation key file, in .KEY format or as a .zip file (which consists of multiple .key files). After you redeem licenses, you can create an activation key for all or a subset of your available licenses (Note this can only be done at the time of redemption), and then download and install the activation key in XClarity Administrator per instructions as described in Installing the full-function enablement license in the online help.

Note: The number of managed devices must not exceed the total number of licenses in all active license keys. If XClarity Administrator is not in compliance with the installed licenses (for example, if licenses expire or if managing additional devices exceeds the total number of active licenses), you have a grace period of 90 days to install appropriate licenses. Each time XClarity Administrator becomes non-compliant, the grace period resets to 90 days. If the grace period (including the free trial) ends before licenses are compliant, advanced functions are disabled for all devices.

For example, if you manage an additional 100 ThinkSystem servers and 20 rack switches in an existing XClarity Administrator instance, you have 90 days to purchase and install 100 additional licenses before advanced functions are disabled in the user interface (for all devices). Licenses for the 20 rack switches are not needed to use the advanced functions; however, they are needed if you want service and support. If advanced functions are disabled, the advanced functions are re-enabled after you install enough licenses to be back in compliance. If you are using a free trial license or you have a grace period to become compliant, and you upgrade to a later version of XClarity Administrator, the trial license or grace period resets to 90 days.

The following table shows details on what happens to each of the premium functions on different versions of XClarity Administrator after the 90 day grace/evaluation period has expired. For more information, see the Installing the full-function enablement license in the online help.

Table 4. What happens to premium features when license/grace period expires

XClarity Administrator Feature	XClarity Administrator Version 2.6 and earlier	XClarity Administrator Versions 2.7 and 2.8	XClarity Administrator Version 3.0 and later
Server configuration	A warning is displayed when the grace period expires.	A warning is displayed when the grace period expires.	Licensing is enforced. This feature is disabled when the grace period expires.
Operation system deployment	A warning is displayed when the grace period expires.	A warning is displayed when the grace period expires.	Licensing is enforced. This feature is disabled when the grace period expires.
Call Home for XClarity Administrator issues (Software Call Home)	Licensing is enforced. The Software Call Home feature is disabled when licenses are out of compliance. There is no grace period for this feature. Note: Call Home for hardware alerts is not affected.	Licensing is enforced. The Software Call Home feature is disabled when licenses are out of compliance. There is no grace period for this feature. Note: Call Home for hardware alerts is not affected.	Licensing is enforced. The Software Call Home feature is disabled when licenses are out of compliance. There is no grace period for this feature. Note: Call Home for hardware alerts is not affected.

Supported Host Systems

The Lenovo XClarity management appliance runs in a virtual machine on the host system. Refer to Supported host systems for supported Hypervisors for deployment of Lenovo XClarity Administrator Appliance.

Notes:

1. CentOS Linux is no longer updated by Red Hat. Consider migrating to Red Hat Enterprise Linux instead (see the the Red Hat article How to convert from CentOS Linux or Oracle Linux to RHEL).
2. For VMware ESXi 6.7 U2, you must use the ISO image VMware-ESXi-6.7.0.update02-13981272-LNV-20190630.iso or later).

For VMware, the virtual machine is available as an OVF template. For Hyper-V and Nutanix AHV, the virtual machine is a virtual-disk image (VHD). For KVM, the virtual machine is available as qcow2 format.

Important: For Hyper-V environments that run on Linux guests with a 2.6 kernel base and that use large amounts of memory for the virtual appliance, you must disable the use of non-uniform memory access (NUMA) on the Hyper-V Settings Panel from Hyper-V Manager. Changing this setting requires you to restart the Hyper-V service, which also restarts all running virtual machines. If this setting is not disabled, XClarity Administrator virtual appliance might experience problems during initial startup.

Hardware requirements

The host system that is running the Lenovo XClarity virtual machine has the following minimum requirements. Depending on the size of your environment and your use of Configuration Patterns, additional resources might be required for optimal performance:

- Two virtual microprocessors
- 8 GB of memory
- A minimum of 192 GB of storage for use by Lenovo XClarity virtual appliance
- Display with a minimum resolution of 1024 pixels in width (XGA)

For more information about minimum hardware recommendations based on the number of managed devices in your environment, see the Lenovo XClarity Administrator Performance white paper:
https://download.lenovo.com/servers_pdf/Lenovo_XClarity_Performance_Guide_V3.5.0.pdf

Supported Managed Endpoints

XClarity Administrator supports the following endpoints. Click the links for support and limitations information for manageable devices (such as servers, switches, storage, and CMMs) and other I/O devices and options, see the following compatibility pages for each device type:

- ThinkSystem rack and tower servers
- Flex System and ThinkSystem devices in Flex System chassis
- Converged HX, NeXtScale, ThinkAgile
- System x Servers
- ThinkServer rack and tower servers
- RackSwitch devices
- Storage devices (DM Series, DE Series and older Lenovo storage)

Related links

For more information, see the following resources:

- Lenovo XClarity website:
  https://www.lenovo.com/us/en/data-center/software/management/
- Free XClarity Administrator download (includes 90-day trial license for Configuration Patterns and OS Deployment)
  https://datacentersupport.lenovo.com/us/en/xclaritytrial
- Lenovo XClarity demonstration videos:
  https://lenovopress.com/lp0037-lenovo-xclarity-demonstrations
- Lenovo XClarity Online Product Information Center (InfoCenter):
  https://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.common.nav.doc/ic-homepage.html
- Lenovo XClarity product publications:
  https://sysmgt.lenovofiles.com/help/topic/com.lenovo.lxca.doc/printable_doc.html
- Lenovo XClarity discussion forum
  https://forums.lenovo.com/t5/Lenovo-XClarity/bd-p/xc01_eg
- Lenovo XClarity Administrator performance, tips and techniques
  https://download.lenovo.com/servers_pdf/Lenovo_XClarity_Performance_Guide_V3.5.0.pdf
- Lenovo XClarity support page
  https://datacentersupport.lenovo.com/solutions/ht507079-lenovo-support-plan-lenovo-xclarity
- Lenovo XClarity Administrator appliance download, software updates and Repository Packs download page
  https://datacentersupport.lenovo.com/documents/LNVO-LXCAUPD
- Lenovo Key Management System
  https://fod.lenovo.com/lkms
- Lenovo Key Management System user guide, *Using Lenovo Features on Demand*
  https://lenovopress.com/redp4895
- Lenovo Software Warranty Lookup
  https://datacentersupport.lenovo.com/warrantylookup
- Lenovo XClarity Controller (XCC) Online Documentation
  - XClarity Controller with Intel Xeon SP (1st, 2nd Gen) Online Documentation
    https://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.doc/product_page.html
  - XClarity Controller with Intel Xeon SP (3rd Gen) and AMD EPYC (2nd, 3rd Gen) Online Documentation
    https://sysmgt.lenovofiles.com/help/topic/com.lenovo.systems.management.xcc.amd.doc/product_page.html
- Lenovo ThinkSystem System Manager (TSM) Online Documentation
  https://thinksystem.lenovofiles.com/help/topic/7Y98/bmc_user_guide.pdf
- Integrated Management Module 2 (IMM) Online Documentation
  http://systemx.lenovofiles.com/help/topic/com.lenovo.sysx.imm2.doc/product_page.html
- Chassis Management Module 2 (CMM2) Online Documentation
  http://flexsystem.lenovofiles.com/help/topic/com.lenovo.acc.cmm.doc/cmm_product_page.html
- Chassis Management Module 1 (CMM) Online Documentation
  http://flexsystem.lenovofiles.com/help/topic/com.ibm.acc.cmm.doc/cmm_product_page.html

Related product families

Product families related to this document are the following:

- Lenovo XClarity

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