

Lenovo XClarity Controller (XCC) Support on ThinkSystem Servers

Reference Information

Lenovo ThinkSystem servers contain an integrated service processor, XClarity Controller (XCC), which provides advanced service-processor control, monitoring, and alerting functions. The XCC consolidates the service processor functionality, super I/O, video controller, and remote presence capabilities into a single chip on the server system board. The XCC is based on the Pilot4 XE401 baseboard management controller (BMC) using a dual-core ARM Cortex A9 service processor.



Figure 1. ThinkSystem servers include the XClarity Controller integrated service processor

Features

There are three levels of features of XCC: Standard, Advanced and Enterprise:

XClarity Controller Standard offers the following capabilities:

- Gathering and viewing system information and inventory
- Monitoring system status and health
- Alerting and notifications
- Event logging
- Configuring network connectivity
- Configuring security
- Updating system firmware
- Configuring server settings and devices
- Real-time power usage monitoring
- Remotely controlling server power (Power on, Power off, Restart)
- Managing FoD activation keys
- Redirecting serial console via IPMI
- Capturing the video display contents when an operating system hang condition is detected
- FIPS 140-2 compliant encryption

XClarity Controller Advanced Upgrade adds the following functionality to the Standard features:

- Remotely viewing video with graphics resolutions up to 1920x1200 at 60 Hz with 16 bits per pixel
- Remotely accessing the server using the keyboard and mouse from a remote client
- Ability to record and replay the video from a remote control session
- Remotely deploying an operating system
- Component replacement logs
- Syslog alerting
- Redirecting serial console via SSH
- Security Key Lifecycle Manager (SKLM)
- IP Address blocking
- Displaying graphics for real-time and historical power usage data and temperature

XClarity Controller Enterprise Upgrade adds the following functionality to the Advanced features:

- Capping power usage
- Mapping the ISO and image files located on the local client as virtual drives for use by the server
- Mounting the remote ISO and image files via HTTPFS, CIFS, and NFS
- Collaborating across up to six users of the virtual console
- Virtual console chat
- Ability to capture and replay the server's boot-up video
- Ability to capture and replay the server's video information leading up to the point where the operating system may hang or crash.
- Out-of-band (OOB) performance monitoring - System performance metrics
- Controlling quality and bandwidth usage of the virtual console

Management interfaces

There are two ways to access the XCC management processor remotely:

- Command-line interface. To access the CLI interface, use SSH to log in to the management processor.
- Web-based interface. To access the web-based interface, point your browser to the IP address for the management processor. The new intuitive interface includes at-a-glance visualizations and simple access to common system actions. The dashboard is shown in the following figure.

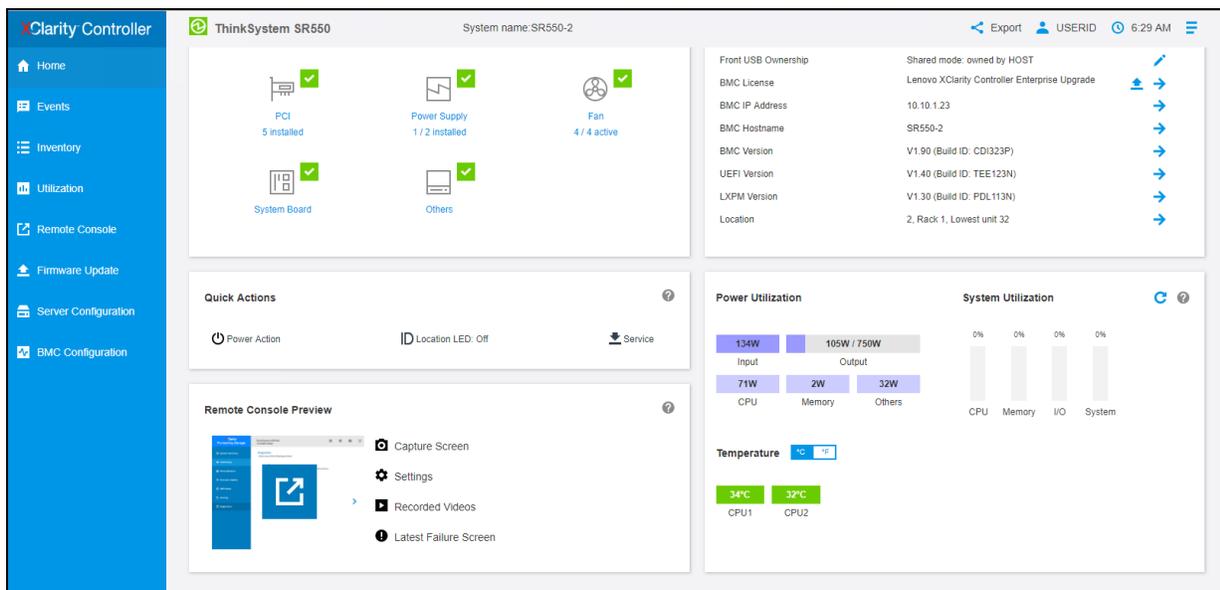


Figure 2. Lenovo XClarity Controller dashboard

XCC can also be accessed remotely through industry-standard interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0
- Simple Network Management Protocol (SNMP)
 - Version 3 supported (no SET commands)
 - Version 1 supported, traps only*
- Common Information Model (CIM-XML)
- Data Center Manageability Interface (DCMI) Version 1.5
- Representational State Transfer (REST) support
- Redfish support (DMTF compliant) with specification version 1.2.0 and schema version 2017.1
- Web browser - HTML 5-based browser interface (Java and ActiveX not required) using a responsive design (content optimized for device being used - laptop, tablet, phone) with NLS support

* Support for SNMP v1 requires updated XCC firmware. Depending on the server model, this is v1.4.0, v2.10 or v2.12 (or newer). For specifics, consult the change history file for the XCC firmware for your server at <https://datacentersupport.lenovo.com>.

Access via the XClarity Mobile app

XCC can also be managed locally from the XClarity Mobile app on a phone or table. The mobile device is physically attached to the server via a USB cable connected to a front USB port with XClarity Controller access.

Note: The ThinkSystem SD650 dense server does not support the use of the XClarity Mobile app.

The steps to enable this tethering function are as follows:

1. If you haven't done so already, install the XClarity Mobile app on your mobile device.
2. Enable USB Management on the server, by holding down the ID button for 3 seconds (or pressing the dedicated USB management button if one is present)
3. Connect the mobile device via a USB cable to the server's USB port with the management symbol 
4. In iOS or Android settings, enable Personal Hotspot or USB Tethering
5. Launch the XClarity Mobile app

Once connected you can see the following information via a Virtual Operator Panel:

- System status, firmware, network, health, and alerts information (read only, no login required)
- Server management functions including configuring systems management and network settings, and controlling system power (power on, power off, restart) (XClarity login credentials required)

Part numbers

Models of ThinkSystem servers come with either XClarity Controller Standard, Advanced or Enterprise, depending on the server type and the model. The servers will be delivered with the stated version already active. The following table shows the field upgrades available for models that come with XCC Standard or XCC Advanced.

Important considerations:

- If you will be using XClarity Administrator for tasks such as remote control and OS deployment then the XCC Enterprise level must be used on the server.
- Lenovo ThinkSystem XClarity Controller Enterprise license includes license for Lenovo XClarity Energy Manager

Table 1. XClarity Controller field upgrades

Part number	Feature code	Description
4L47A09132	AVUT	ThinkSystem XClarity Controller Standard to Advanced Upgrade (for servers that have XCC Standard)
4L47A09133*	AVUU	ThinkSystem XClarity Controller Advanced to Enterprise Upgrade (for servers that have XCC Advanced) (requires XCC Advanced*)

* The Enterprise Upgrade requires that XCC already be at the Advanced level. If the server currently has XCC Standard, you must first apply the XCC Standard to Advanced Upgrade before applying the XCC Advanced to Enterprise Upgrade.

For configure-to-order (CTO) models, you can specify the XCC level you require by selecting the appropriate XCC feature code as listed in the following table:

- XCC Standard - if both AVUT and AUPW are not in the order
- XCC Advanced - select feature AVUT
- XCC Enterprise - select feature AUPW

Table 2. XClarity Controller Upgrades for configure-to-order

Feature code	Description
AVUT	ThinkSystem XClarity Controller Standard to Advanced Upgrade
AUPW	ThinkSystem XClarity Controller Standard to Enterprise Upgrade

Server support

The following table shows what level of XCC is included with each ThinkSystem server.

Table 3. Server support

Server	XCC Standard	XCC Advanced	XCC Enterprise
SE350 (7Z46 / 7D1X)	Supported	Most models**	Some models**
ST50 (7Y48/7Y50)	Not supported	Not supported	Not supported
ST250 (7Y45/7Y46)	Most models*	Upgrade	Upgrade
SR150 (7Y54)	Most models*	Upgrade	Upgrade
SR250 (7Y51/7Y52)	Most models*	Upgrade	Upgrade
ST550 (7X09 / 7X10)	Most models*	Upgrade	Upgrade
SR530 (7X07 / 7X08)	Most models*	Upgrade	Upgrade
SR550 (7X03 / 7X04)	Most models*	Upgrade	Upgrade
SR570 (7Y02 / 7Y03)	Most models*	Upgrade	Upgrade
SR590 (7X98 / 7X99)	Most models*	Upgrade	Upgrade
SR630 (7X01 / 7X02)	Most models*	Upgrade	Upgrade
SR635 (7Y98 / 7Y99)	Not supported	Not supported	Not supported
SR650 (7X05 / 7X06)	Most models*	Upgrade	Upgrade
SR655 (7Y00 / 7Z01)	Not supported	Not supported	Not supported
SR670 (7Y36 / 7Y37 / 7Y38)	Configure-to-order	Configure-to-order	Configure-to-order
SR850 (7X18 / 7X19)	N/A	Most models**	Upgrade
SR860 (7X69 / 7X70)	N/A	Most models**	Upgrade
SR950 (7X11 / 7X12 / 7X13)	N/A	N/A	All models
SD530 (7X21)	Most models*	Upgrade	Upgrade
SD650 (7X58)	Configure-to-order	Configure-to-order	Configure-to-order
SN550 (7X16)	N/A	N/A	All models
SN850 (7X15)	N/A	N/A	All models

* Most models include XCC Standard, however some country-specific models have Advanced or Enterprise levels. Check the model tables in the server product guide for specifics.

** Most models include XCC Advanced, however some country-specific models have Standard or Enterprise levels. Check the model tables in the server product guide for specifics.

Additional information

For more information, consult these resources:

- [XClarity Controller product web page](#)
- [TCP/IP Ports Used by XCC](#)
- [XClarity Controller online documentation](#)
- [XClarity Controller Redfish REST API documentation](#)
- [XClarity Controller Overview videos](#):
 - Playlist item 6: Lenovo XClarity Mobile App demo
 - Playlist item 10: Lenovo XClarity Controller Overview

Related product families

Product families related to this document are the following:

- [Lenovo XClarity](#)

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.
1009 Think Place - Building One
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

© Copyright Lenovo 2019. All rights reserved.

This document, LP0880, was created or updated on September 30, 2019.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
<http://lenovopress.com/LP0880>
- Send your comments in an e-mail to:
comments@lenovopress.com

This document is available online at <http://lenovopress.com/LP0880>.

Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at <https://www.lenovo.com/us/en/legal/copytrade/>.

The following terms are trademarks of Lenovo in the United States, other countries, or both:

Lenovo®

ThinkSystem

XClarity®

The following terms are trademarks of other companies:

ActiveX® is a trademark of Microsoft Corporation in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.