



Lenovo XClarity Provisioning Manager User Guide



Server Models

Following are server models supported by LXPM:

- Lenovo ThinkSystem: SD530, SD650, SE350, SN550, SN850, SR150, SR158, SR250, SR258, SR530, SR550, SR570, SR590, SR630, SR650, SR670, SR850, SR850P, SR860, SR950, ST250, ST258, ST550, and ST558.
- Lenovo ThinkAgile HX Series: HX1321, HX1520-R, HX1521-R, HX2320, HX2321, HX2720-E, HX3320, HX3321, HX3520-G, HX3521-G, HX3720, HX3721 Node, HX5520, HX5520-C, HX5521, HX5521-C, HX7520, HX7521, HX7820, HX7820 for SAP HANA, HX7821, HX7821 for SAP HANA, and Enclosure
- Lenovo ThinkAgile MX Series: MX Certified Node on SR650, MX1020, MX1021, and MX3520
- Lenovo ThinkAgile VX Series: ThinkAgile VX Enclosure and VX3720

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Chapter 1. Overview

This chapter provides an overview of the Lenovo XClarity Provisioning Manager V1 program (hereinafter referred to as LXPM V1). This chapter contains information about the program introduction, program startup, main interface, buttons displayed on the program interfaces, keyboard navigation, and how to download useful information.

Lenovo XClarity Provisioning Manager V1 Introduction

LXPM V1 combines the functions of configuring Unified Extensible Firmware Interface (UEFI), configuring Redundant Array of Independent Disks (RAID), and updating applications and firmware. It also enables you to install the supported operating systems and associated device drivers, run diagnostics, and collect service data.

This program has the following features:

- Easy-to-use, language-selectable interface
- Integrated help system
- Automatic hardware detection
- Ability to install an operating system and device drivers in an unattended mode or manually
- Ability to clone the settings in one server to other similarly configured Lenovo servers
- Supports RAID setup
- Supports firmware and applications update
- Supports UEFI setup
- Contains diagnostic utility


Note: When you are using LXPM V1, do not restart Lenovo XClarity Controller (also known as BMC).

Lenovo XClarity Provisioning Manager V1 startup

To start LXPM V1, do the following:

1. Turn on the server. Press F1 as soon as you see the logo screen.
2. If you have set a password, enter the correct password.
3. Wait for several seconds. LXPM V1 opens.

Note: If the text-based interface for UEFI Setup opens instead of the program, go to **System Settings** → **<F1> Start Control** and select **Tool Suite**. Then, restart the server and repeat step 1 to step 3 to open the program.











4. Click  on the top right corner of the interface and select the language in which you want to view the program. Then, you can start to use the program.

Notes:

- When LXPM V1 opens, if there is any system error or warning, a window will be displayed. Follow the guidance of the window to go to the Diagnostics interface to see the detailed information for the error or warning.
- After disabling **USB Mass Storage Driver Support** in **UEFI Setup** → **System Settings** → **Device and I/O Ports** → **USB Configuration**, text-based interface will replace LXPM V1 for UEFI Setup.

Buttons on the interfaces

The following table provides information about the buttons appear on the interfaces.

Button	Description
	Select the language to be displayed.
	Display the Network Settings window. For details, refer to “Configuring network settings” on page 7 .
	Click this button to display the following items: <ul style="list-style-type: none"> • Help: View context-sensitive help information for each interface. • HotKey: View keyboard navigation information. • Getting Started: View a brief introduction to LXPM, do some basic system settings and management network settings, and modify the Lenovo XClarity Controller credentials. • License Agreement: View Lenovo license agreement. • Third-party Licenses: View the third-party licenses. • About: View the LXPM version, copyright, and trademark information.
	Exit LXPM or the current interface.
	Return to the previous interface.
	Save changes.
	Discard changes and load previous values.
	Load the optimized default values.
	Return to the previous step.
	Go to the next step.

Keyboard navigation

Note: Only United States layout keyboard is applicable in the user interface.

Both mouse and keyboard are supported in navigation. The following are the keys used for keyboard navigation:

- Ctrl+Tab: Switch between the left pane and the right pane.
- Tab: Move forward to the next selectable item in the active pane.
- Shift+Tab: Move backward to the previous selectable item in the active pane.
- Space: Same as a click when a button is active.
- Up arrow: Scroll up.
- Down arrow: Scroll down.
- Ctrl+L: Load the language menu.
- Ctrl+N: Load the network settings page.
- Ctrl+H: Display the help menu.
- Ctrl+X: Exit.

For UEFI Setup, the following keys can be used for keyboard navigation:

- Enter: Select.

- +: Increase the value.
- -: Decrease the value.
- Esc: Return to the previous interface.
- F1: Display the help information.
- F2: Load the previous values.
- F3: Load the optimized default values.
- F4: Save and exit UEFI Setup.


Downloading useful information

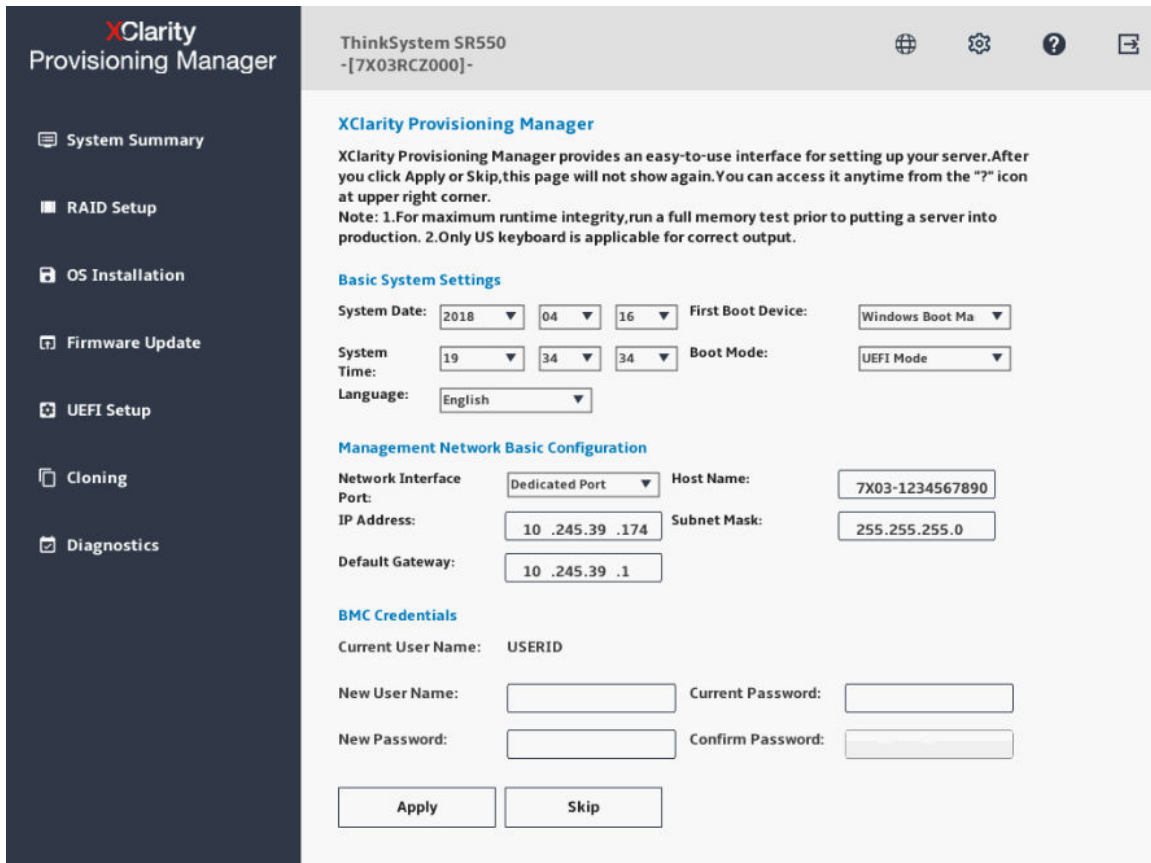
- **UpdateXpress System Packs (UXSPs):**
 - Lenovo releases the firmware and device drivers in bundles called UXSPs. Go to <https://datacentersupport.lenovo.com> to download UXSPs.

Chapter 2. Using Lenovo XClarity Provisioning Manager

This chapter provides information about using Lenovo XClarity Provisioning Manager.

Getting started

Click  on the top right corner of the Lenovo XClarity Provisioning Manager main interface; then, click **Getting Started**. The following interface is displayed.



ThinkSystem SR550
-[7X03RCZ000]-

XClarity Provisioning Manager

XClarity Provisioning Manager provides an easy-to-use interface for setting up your server. After you click Apply or Skip, this page will not show again. You can access it anytime from the "?" icon at upper right corner.

Note: 1. For maximum runtime integrity, run a full memory test prior to putting a server into production. 2. Only US keyboard is applicable for correct output.

Basic System Settings

System Date: 2018 04 16 First Boot Device: Windows Boot Ma
System Time: 19 34 34 Boot Mode: UEFI Mode
Language: English

Management Network Basic Configuration

Network Interface Port: Dedicated Port Host Name: 7X03-1234567890
IP Address: 10 .245.39 .174 Subnet Mask: 255.255.255.0
Default Gateway: 10 .245.39 .1

BMC Credentials

Current User Name: USERID
New User Name: Current Password:
New Password: Confirm Password:

Apply Skip

Figure 1. Getting Started interface

In this interface, you can do the following:

- View a general introduction to Lenovo XClarity Provisioning Manager.
- Configure basic settings for the server, including system date, system time, language, first boot device, and boot mode.
- Configure the Lenovo XClarity Controller basic settings, including network interface port, IP address, default gateway, host name, and subnet mask.
- Modify the Lenovo XClarity Controller credentials.


Modifying Lenovo XClarity Controller credentials

To modify the Lenovo XClarity Controller credentials, do one of the following:

- To modify the user name, type the new user name and the current password, and click **Apply**.
- To modify the password, type the current password and the new password, type the new password again, and click **Apply**.
- To modify the user name and password at the same time, type the new user name, current password, and new password, type the new password again, and click **Apply**.

Configuring network settings

To configure the network settings, do the following:

1. Click  on the top right corner of the Lenovo XClarity Provisioning Manager main interface. The following Network Settings window is displayed.

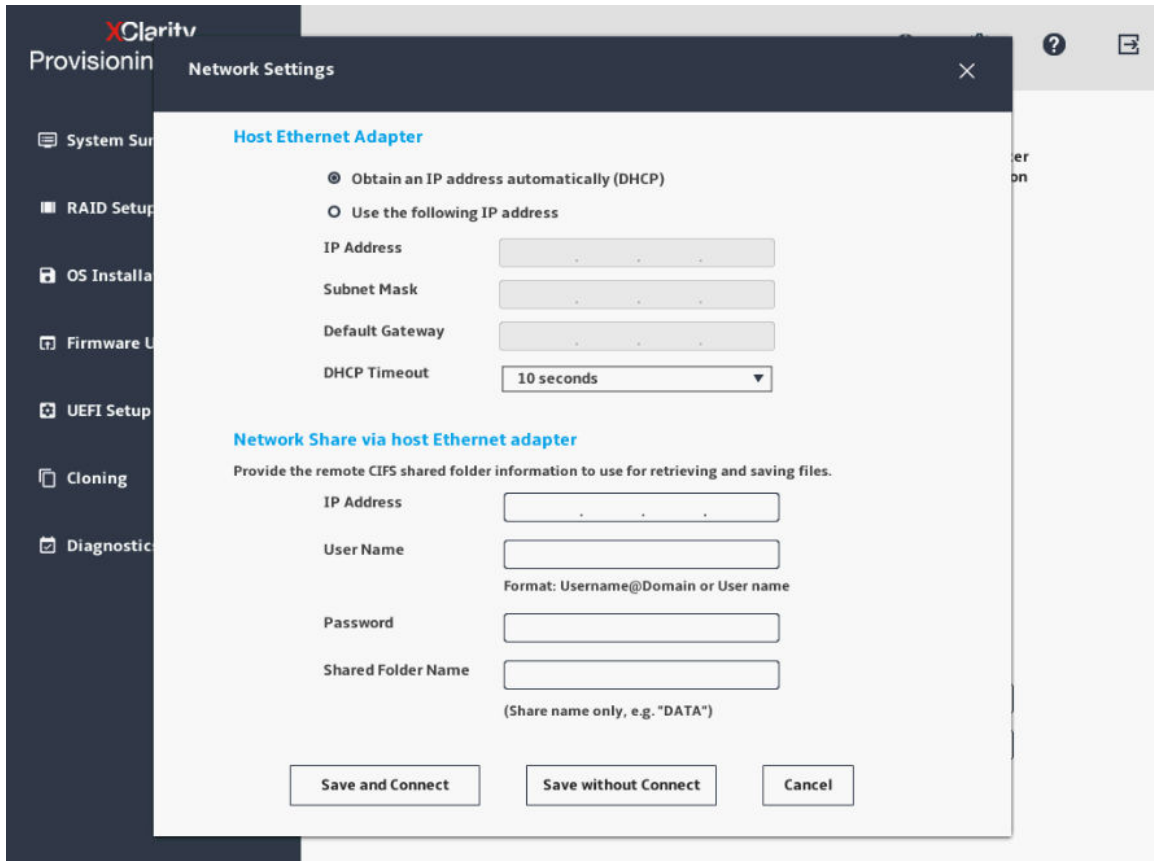


Figure 2. Network Settings window

2. Follow the instructions on the screen to configure the network settings.
3. After configuring the network settings, click one of the following buttons according to your needs:
 - **Save and Connect:** Save the settings and connect to the shared network. If the network cannot be connected, an error message will be displayed.
 - **Save without Connect:** Save the settings without connecting to the shared network. When you click the button, a confirmation window is displayed. Click **Continue** to save the settings without connecting, or click **Cancel** to go back to the Network Settings window.
 - **Cancel:** Discard the changes and exit the Network Settings window.

System Summary

Click the **System Summary** tab in the left pane to view the following system information in the right pane:

- Product name
- UEFI, BMC, and Lenovo XClarity Provisioning Manager version information
- Machine type and serial number
- Universally Unique Identifier (UUID)
- Operating system driver package information
- CPU information
- DIMM information
- PCI device information
- Disk drive information

XClarity Provisioning Manager ThinkSystem SR550 -[7X03RCZ000]-

System Summary

RAID Setup

OS Installation

Firmware Update

UEFI Setup

Cloning

Diagnostics

System Summary

Product Name ThinkSystem SR550 [Update VPD...](#)

UEFI Version 1.40 TEE123N

BMC Version 1.90 CDI323Q

LXPM Version 1.40 PDL115M

Machine Type - Model 7X03RCZ000

Serial Number 1234567890

UUID 00C97221-0762-E211-9705-0894EF3C8822

Linux Driver Package 1.40 PDL215M

Windows Driver Package 1.40 PDL315M

CPU Information

CPU Count 1

CPU#1

CPU Name Intel(R) Xeon(R) Gold 6130 CPU @ 2.10GHz

CPU Family Intel Xeon Processor

CPU Model Skylake Processor

CPU Max Frequency 3700 MHz

Core Count 16

DIMM Information

DIMM Total Count 2

DIMM Type#1

DIMM Capacity 16 GB

DIMM Type DDR4

XClarity Provisioning Manager ThinkSystem SR655 -[7Y00]-

System Summary

RAID Setup

OS Installation

Firmware Update

Cloning

Diagnostics

CPU Count 1

CPU#1

CPU Name AMD EPYC 7262 8-Core Processor

CPU Family AMD Processor

CPU Model AMD Processor

CPU Max Frequency 3400 MHz

Core Count 8

DIMM Information

DIMM Total Count 1

DIMM Type#1

DIMM Capacity 16 GB

DIMM Type DDR4

DIMM Speed 2933 MHz

DIMM Vendor Samsung

DIMM Count 1

PCI Device Information

PCI Device Count 3

PCI Device Description

ThinkSystem QLogic QLE2770 32Gb 1-Port PCIe Fibre Channel Adapter[SLOT5]

ThinkSystem 810-4P NVMe Switch Adapter [SLOT6]

ThinkSystem U.2 PM1733 Entry NVMe PCIe 4.0 x4 Hot Swap SSD [BAY 7]

Disk Drive Information

Disk Drive Device Quantity 1

MODEL#:MZWLJ1T9HBJR SN#:S5LHNE0MC00144

Figure 3. System Summary interface

You can click **Update VPD...** to enter the Update VPD interface to update some Vital Product Data (VPD), such as asset tag and UUID. You also can check or configure the TPM/TCM policy in the Update VPD interface.

Notes:

- The Non-Volatile Memory express (NVMe) SSDs are recognized as PCIe devices and listed in the PCI device information section.
- If the Intel® Volume Management Device (VMD) feature for the PCI root port is enabled in the UEFI Setup interface, the NVMe SSDs and NVMe switch adapters will not be displayed in the PCI device information section.
- For a running server, device changes will not be displayed in the System Summary interface in real time. To view the latest device information, you need to restart the server.
- When **Legacy BIOS** is set to **Disable** in the UEFI Setup interface, all hard disk drives will be displayed in the disk drive information section. When **Legacy BIOS** is set to **Enable**, the hard disk drives connected to the RAID adapters will not be displayed.

RAID Setup

Click the **RAID Setup** tab in the left pane to enter the wizard for configuring RAID and disk settings for the installed RAID adapters. The following is the first interface for the wizard.

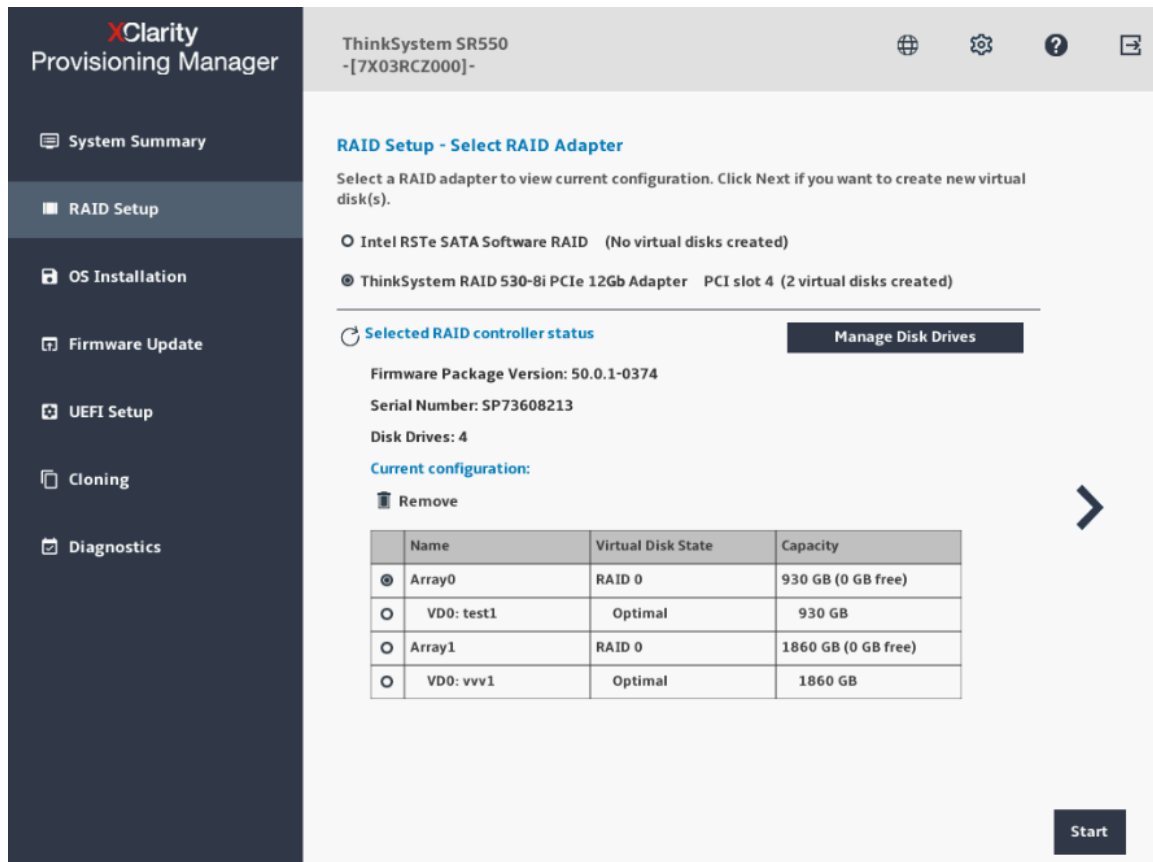






Figure 4. RAID Setup - Select RAID Adapter interface

To configure RAID and disk settings, follow the wizard to do the following:







1. Select the RAID adapter you want to configure. The basic information and current configuration for the selected RAID adapter will be displayed.
2. If you want to delete a disk array or a virtual disk for the selected RAID adapter, select the disk array or virtual disk you want to delete and click **Remove**. Then, follow the instructions on the screen to delete it.
3. If you want to view or change the drive status for the selected RAID adapter, click **Manage Disk Drives** to enter the Manage Disk Drives interface. In this interface, all the drives connected to the selected RAID adapter are listed. You can change the drive status according to your needs. Then, click  and confirm to save changes and return to the "RAID Setup - Select RAID Adapter" interface or click  to discard changes and return to the "RAID Setup - Select RAID Adapter" interface.

Note: If you are configuring the ThinkSystem™ M.2 with Mirroring Enablement Kit, you cannot change the drive status, but only can view the drive status in the Manage Disk Drives interface.

4. Click  or click **Start** to enter the "RAID Setup - Select RAID configuration type" interface and do one of the following:
 - Select **Simple configuration** and go to step 5.

- Select **Advanced configuration** and select **Create new disk array and virtual disk** in the drop-down list box. Then, go to step 6.
 - Select **Advanced configuration** and select **Use free capacity on the existing disk array** in the drop-down list box. Then, go to step 7.
5. Click  to enter the “RAID Setup - Set RAID level and hot spare” interface. Select the RAID level and choose to select or clear the **Add Hot Spare Drive** check box. If the check box is selected, one of the drives is assigned for dedicated hot spare function. Then, go to step 9.

Notes:

- If you are configuring the ThinkSystem M.2 with Mirroring Enablement Kit, you can choose RAID 0 or RAID 1 as the RAID level. Choose RAID 1 to implement mirroring.
 - If you are configuring integrated software RAID or ThinkSystem M.2 with Mirroring Enablement Kit, the **Add Hot Spare Drive** check box will not be displayed.
6. Click  to enter the “RAID Setup - Select RAID Level and Select Drives” interface. Select the RAID level and the drives for the new disk array, and set the role for each drive. Then, go to step 8.
7. Click  to enter the “RAID Setup - Select Disk Array” interface. All the disk arrays that have free space will be displayed. Select a disk array for the new virtual disk.
8. Click  to enter the “RAID Setup - Create and Edit Virtual Disk” interface. You can create new virtual disks. Then, you can edit or remove the new virtual disks. Follow the instructions on the screen to do the configuration.
9. Click  to enter the “RAID Setup - Verify settings” interface. Double check the settings and click . A confirmation window is displayed.
10. Click **Yes** to enter the “RAID Setup - Creating Virtual Disk(s)” interface. The virtual disk creation result is displayed.
11. Click  to return to the first interface of the wizard and view the current configuration of the selected RAID adapter.

OS Installation

Click the **OS Installation** tab in the left pane to enter the OS Installation interface. The OS Installation interface provides a configuration wizard for installing an operating system.

Notes:

- If you want to configure RAID settings before installing an operating system, it is recommended to do the configuration in the RAID Setup interface. If you do the configuration in UEFI Setup, you must restart your server before installing the operating system to ensure that the RAID configuration takes effect.
- Before installing an operating system, if any disk drive is configured as part of a RAID array, go to **UEFI Setup → System Settings → Devices and I/O Ports** to check the setting of **Onboard SATA Mode**. If **AHCI** is selected, change it into **RAID**.

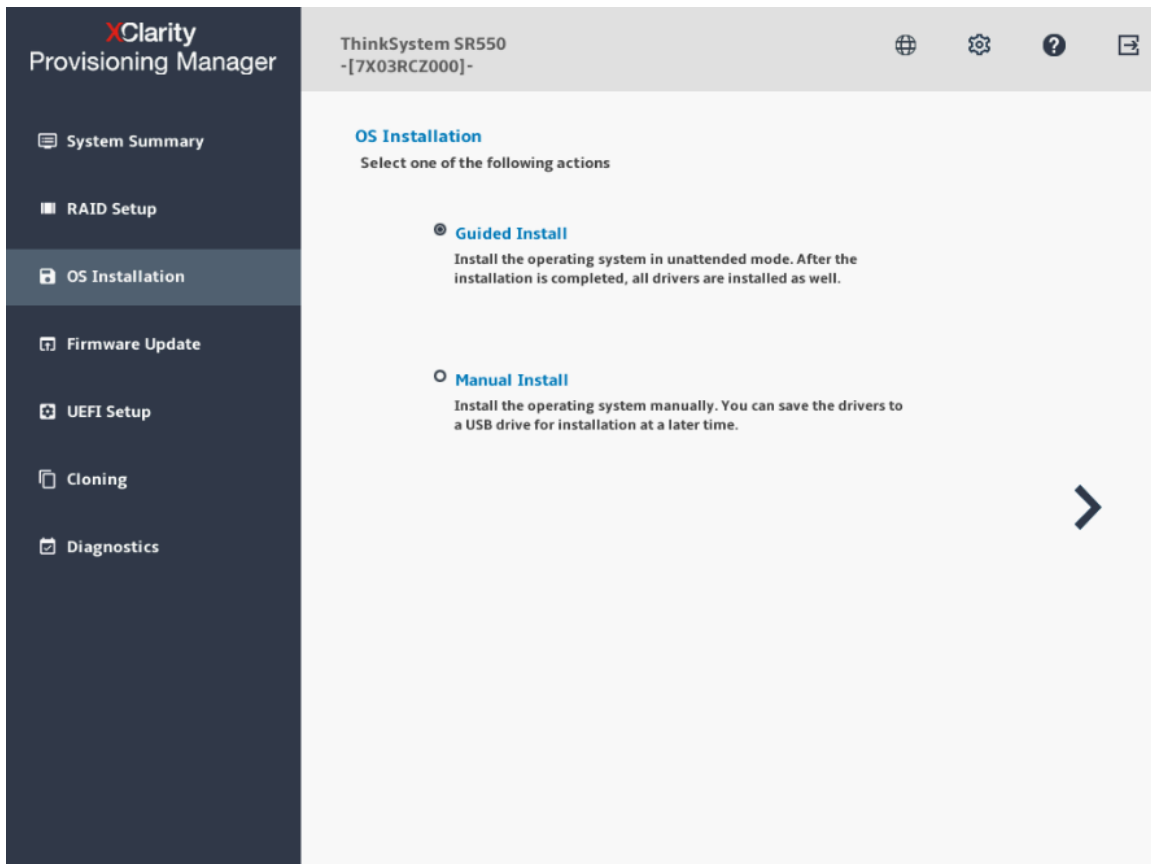


Figure 5. OS Installation interface

There are two types of installation for your selection:

- **Guided Install:** Install an operating system and device drivers in an unattended mode.
- **Manual Install:** Install an operating system and device drivers manually.

Notes:


- The Microsoft® Windows Server® version 1803 operating system is not supported by some Lenovo servers. For detailed information about the operating system compatibility with Lenovo servers, go to: <https://lenovopress.com/osig>

- The device drivers installed with the operating system are not complete. To view the complete list of the supported device drivers, refer to the readme files included in the Windows® Driver Bundle update package and Linux® Driver Bundle update package. To download the update packages, go to: <http://datacentersupport.lenovo.com>

Guided installation

Prerequisites

Before performing guided installation:

- Ensure that the boot mode is preset by doing one of the following:
 - Click  on the top right corner of the Lenovo XClarity Provisioning Manager main interface and click **Getting Started**. Set the boot mode to be **UEFI Mode**.
 - Go to **UEFI Setup** → **Boot Manager** → **Boot Modes** → **System Boot Mode** and select **UEFI Mode**.
- Ensure that operating system installation files are prepared in one of the following:
 - CD or DVD

Note: Ensure that the disc is clean and the version and architecture of the operating system are correct.

- USB storage drive

To create a USB installation medium, refer to the documentation at:


http://cn.download.lenovo.com/ibmdl/pub/pc/pccbbs/thinkservers/how_to_create_usb_os_installation_media.pdf

- Shared network based on management network

Note: Ensure that the Ethernet connector for system management is active and can connect to the specified IP address. If the shared network is a CIFS server based on Linux Samba, the Samba configuration file "/etc/samba/smb.conf" shall have "ntlm auth = yes" in the "[global]" section.

If the shared network is connected, you can prepare the operating system installation files by Lenovo XClarity Controller or by Lenovo XClarity Provisioning Manager.

Performing guided installation

In the OS Installation interface, select **Guided Install** and click . Refer to one of the following to install an operating system:

- “Installing a Windows operating system” on page 15
- “Installing a Linux operating system” on page 22
- “Installing a VMware operating system” on page 29

Device drivers will be automatically installed during guided installation. It is recommended to reboot the OS after guided installation is completed to make all drivers take effect. You also can export the operating system installation settings to a response file. For more information, refer to “Exporting an operating-system-installation response file” on page 34.

Installing a Windows operating system

The wizard provides a step by step guidance for installing an operating system. Follow the instructions on the screen and the tips listed below to install a Windows operating system.

1. Drive Selection

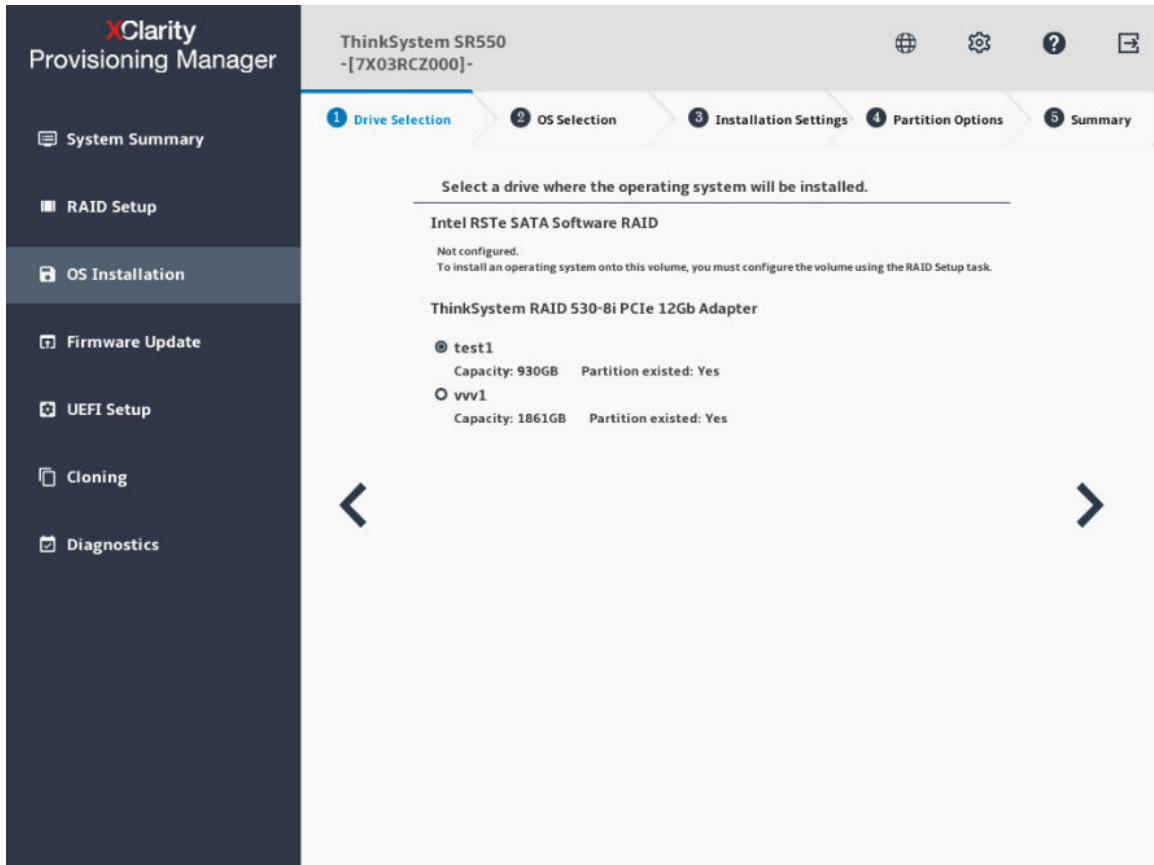


Figure 6. Drive Selection step (for Windows)

Attention: The selected drive will be formatted during the installation. Back up all data on it before the installation.

Note: The drivers will be installed automatically after the OS installation. It is recommended to restart your server to ensure that all installed drivers take effect.

2. OS Selection

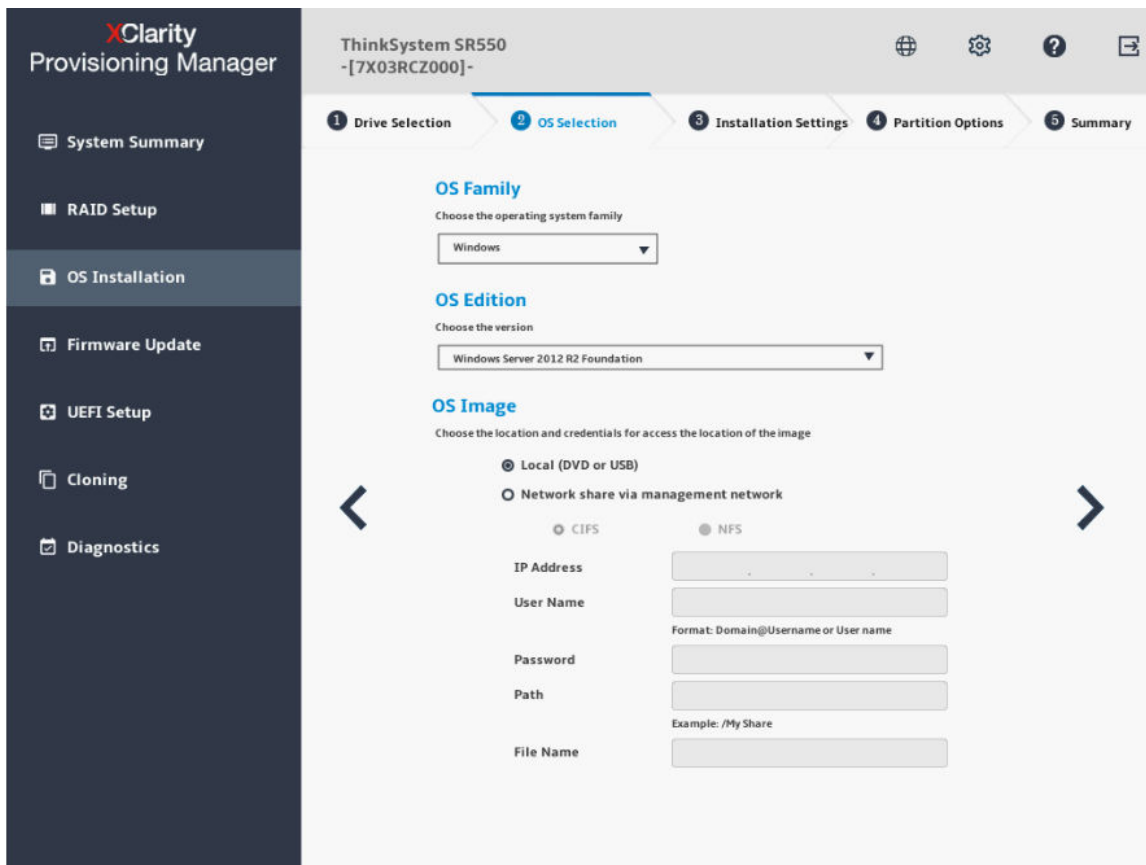


Figure 7. OS Selection step (for Windows)

The IP address is made up of four parts separated by dots. The following table lists the valid value range for each part.

IP Address	Part 1	Part 2	Part 3	Part 4
Valid values	1 – 223	0 – 255	0 – 255	0 – 255

3. Installation Settings

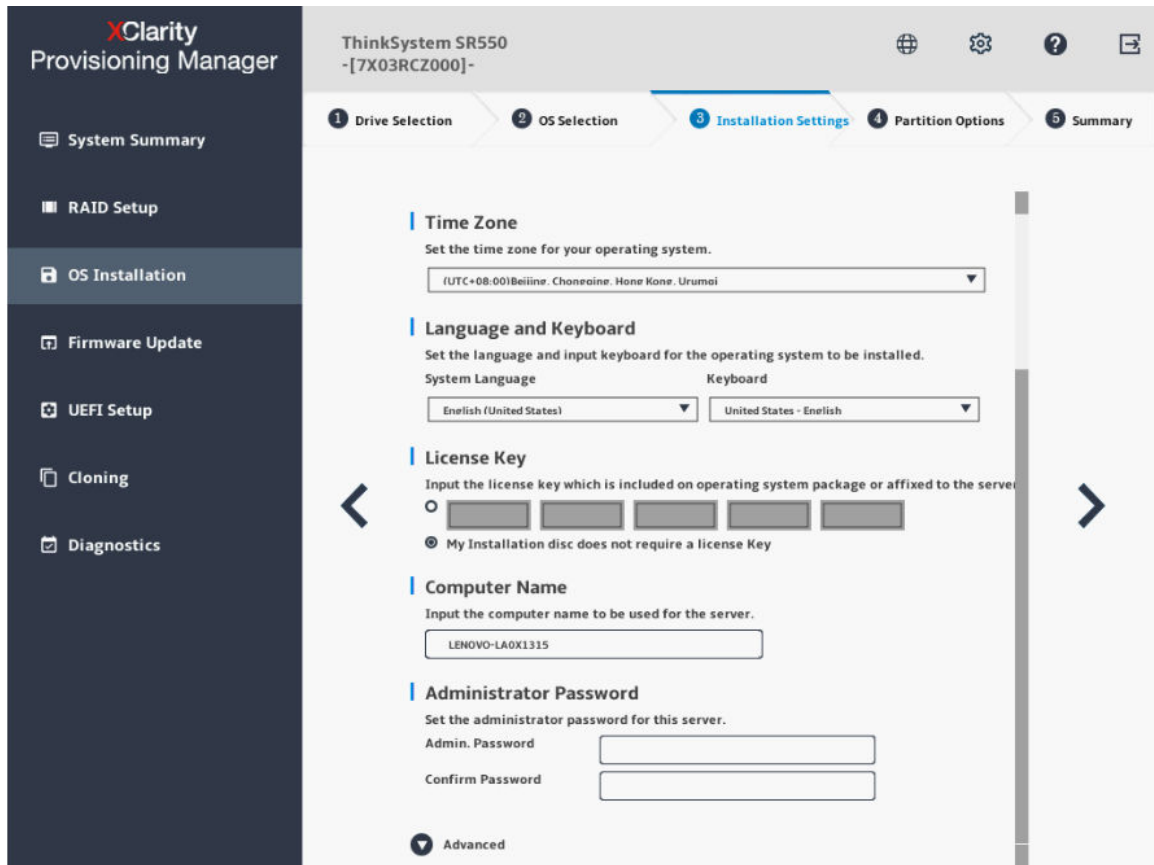


Figure 8. Installation Settings step – 1 (for Windows)

Administrator Password: You can change your administrator password later from the operating system.

If you want to do advanced configurations, expand the list by clicking the arrow icon next to **Advanced**.

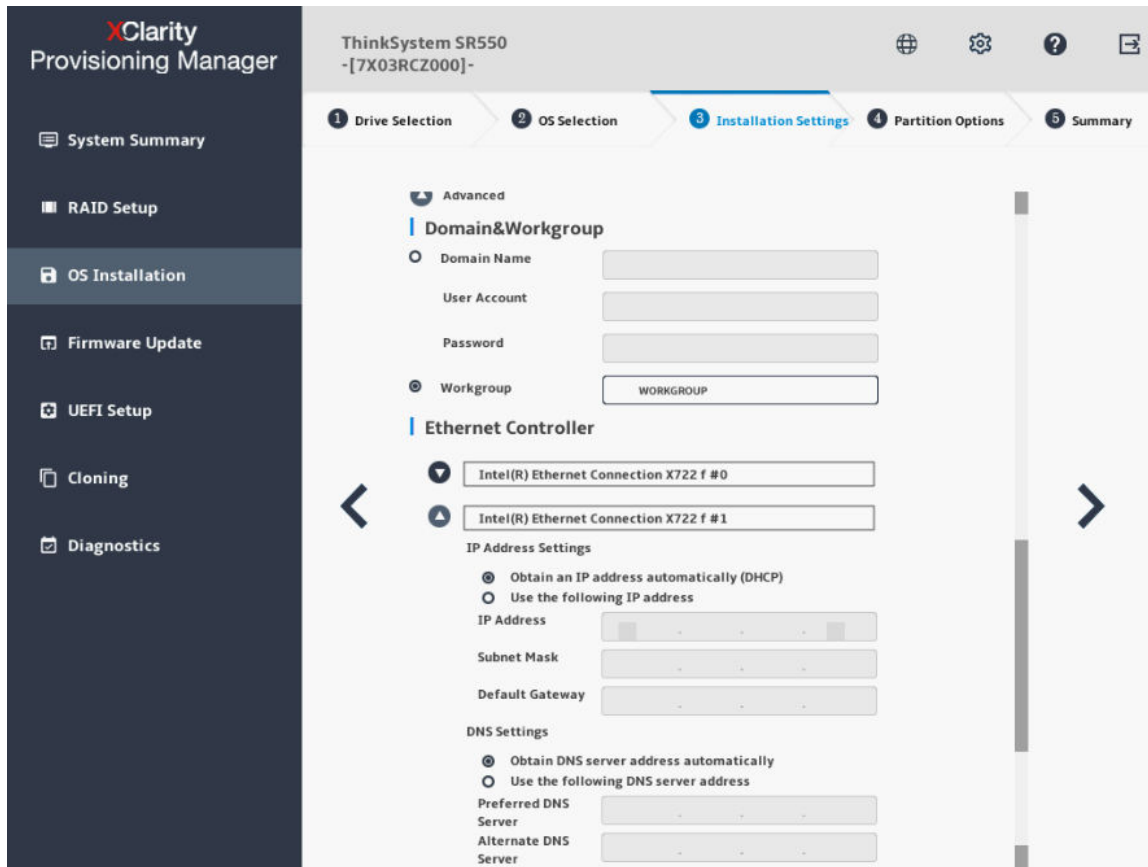


Figure 9. Installation Settings step – 2 (for Windows)

Refer to the following table for the valid values when you type the required address information.

Address	Part 1	Part 2	Part 3	Part 4
IP Address	1 – 126; 128 – 223	0 – 255	0 – 255	1 – 254
Subnet Mask	0 – 255	0 – 255	0 – 255	0 – 255
Default Gateway	0 – 255	0 – 255	0 – 255	0 – 255
Preferred DNS Server	1 – 126; 128 – 223	0 – 255	0 – 255	0 – 255
Alternate DNS Server	1 – 126; 128 – 223	0 – 255	0 – 255	0 – 255

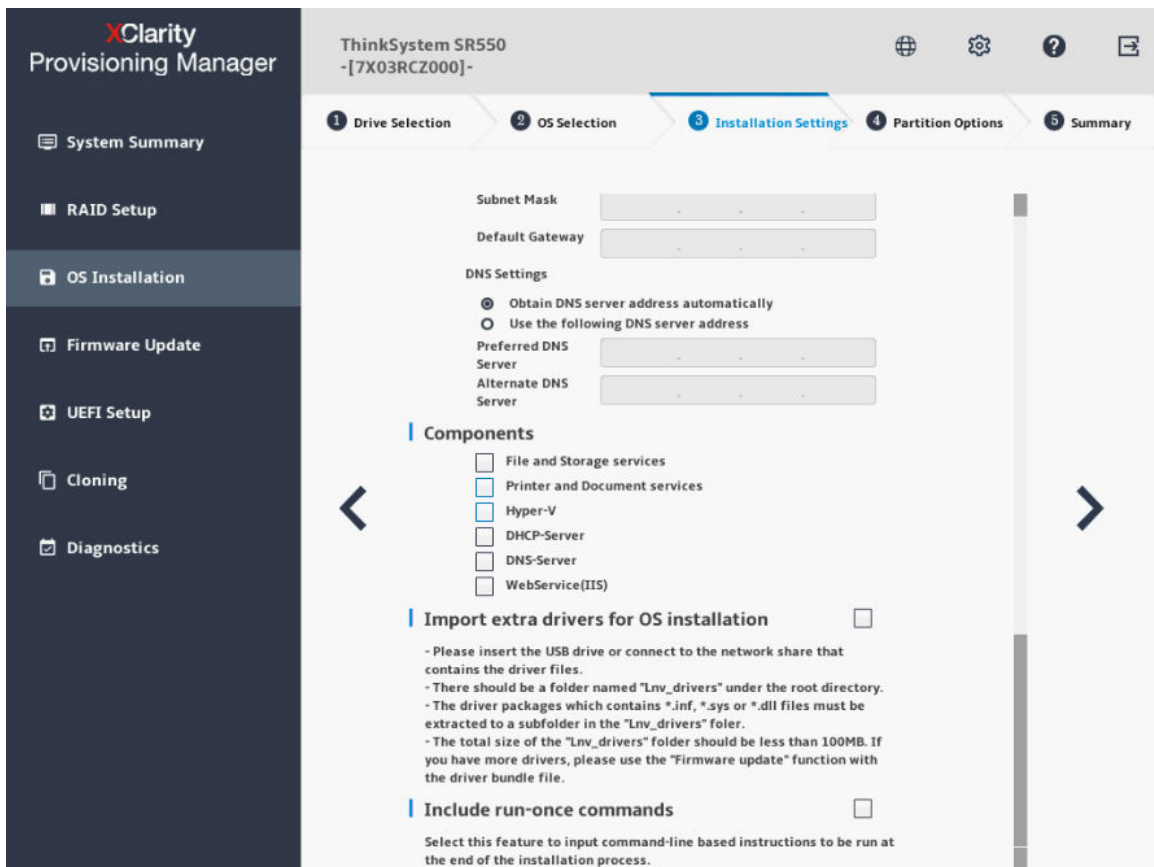


Figure 10. Installation Settings step – 3 (for Windows)

Components: You can select one or more components for installation according to your requirements.

Include run-once commands: If you want to run specified commands at the end of the installation process, select the check box. A command-type area is displayed. Type one command and click **Add**. The command is added to the command list. You can add five commands at most. If you want to remove a certain command, select it and click **Remove**. The commands in the command list will be run one time only and in the order you type them.

4. Partition Options

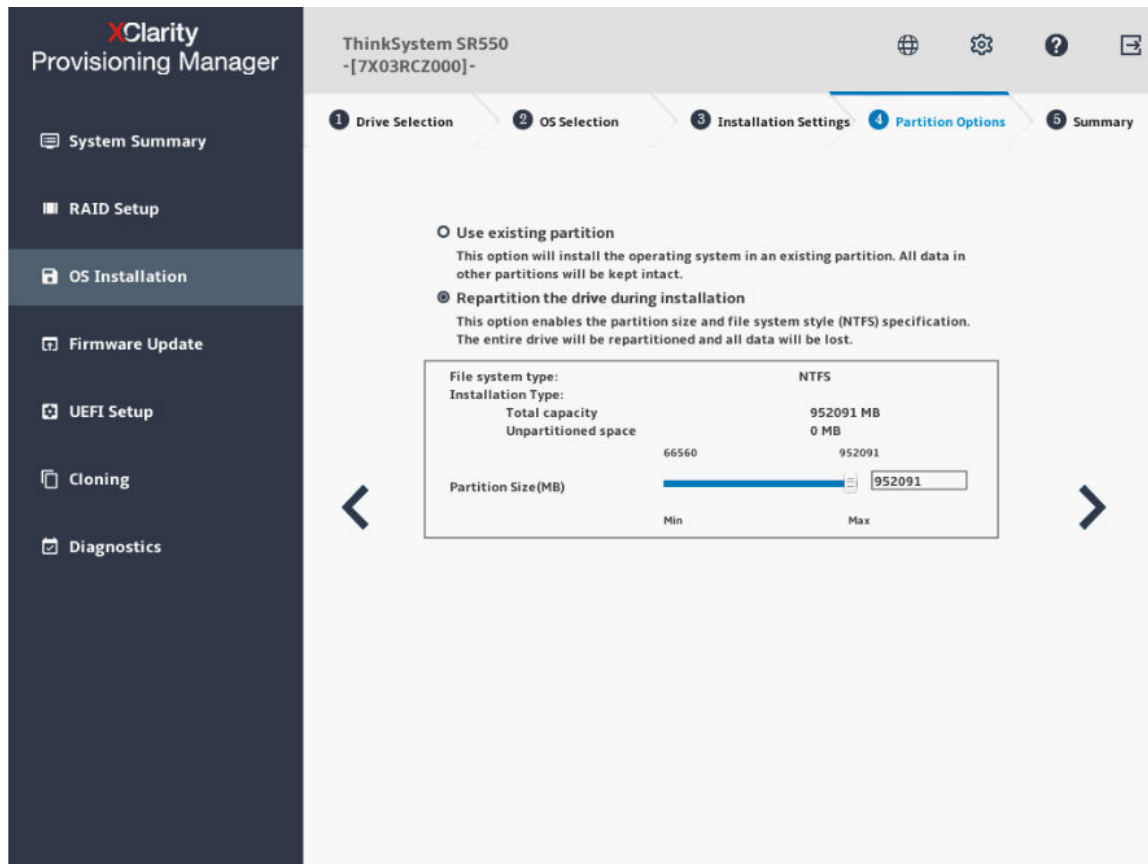


Figure 11. Partition Options step (for Windows)

If no existing partition is detected on the drive, select **Repartition the drive during installation**.

5. Summary

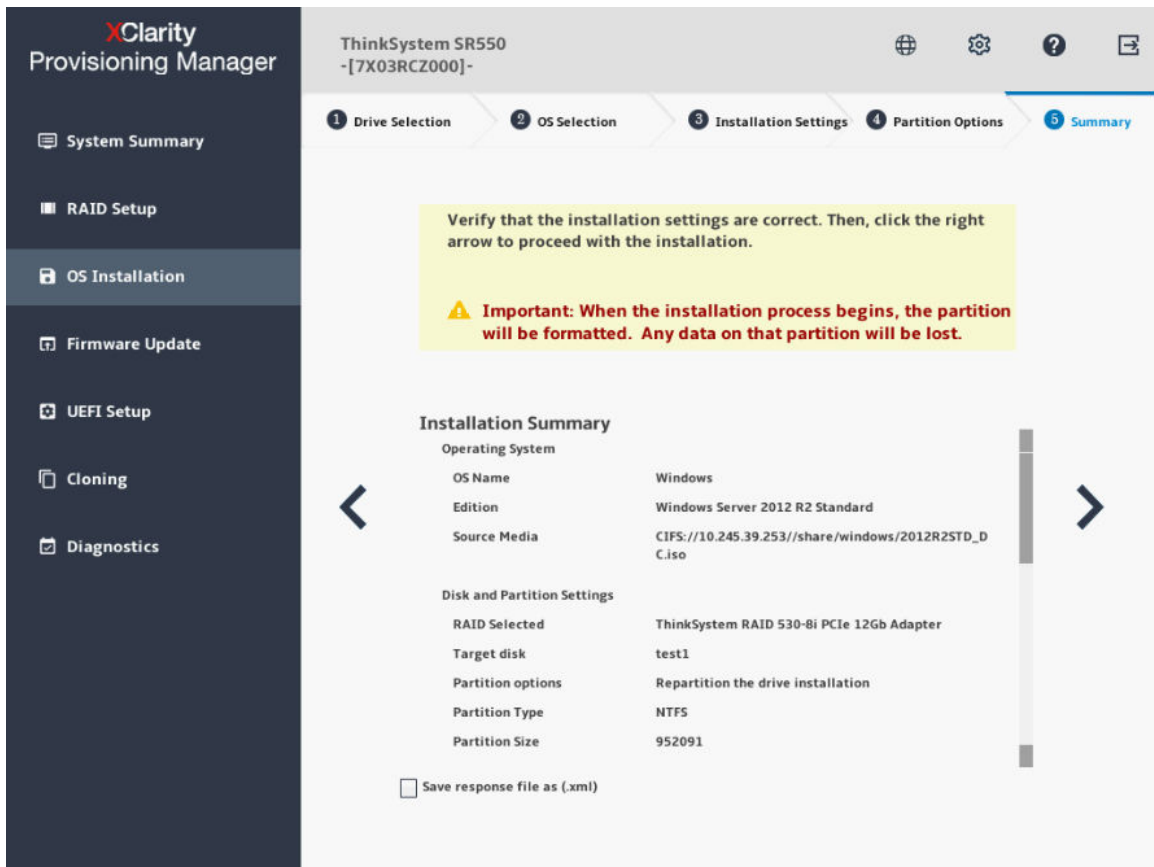




Figure 12. Summary step (for Windows)

If you want to change some settings, click  until you return to the page where you can make the changes.

If you want to export the operating system installation settings to a response file, refer to [“Exporting an operating-system-installation response file”](#) on page 34.

Click . The license agreement page for the operating system is displayed. Read and accept the license agreement. Click **Next**. The installation process starts. Wait until the installation finishes.

Installing a Linux operating system

The wizard provides a step by step guidance for installing an operating system. Follow the instructions on the screen and the tips listed below to install a Linux operating system.

Note: The CentOS Linux operating systems can be installed on the server successfully. However, Lenovo servers provide only hardware-level support for CentOS. For more information about CentOS compatibility with Lenovo servers, go to:

<https://lenovopress.com/osig>

For SUSE Linux Enterprise Server 15 and 15.1 operating system, two image files are included: Installer DVD and Packages DVD. For example, if your operating system is SUSE Linux Enterprise Server 15, the image files are: SLE-15-Installer-DVD-x86_64-GM-DVD1.iso and SLE-15-Packages-x86_64-GM-DVD1.iso.

If **Core Installation** is selected, only the Installer DVD image file is required. If **Full Installation** is selected, both image files are required at the same time. To prepare two image files, you can use one of the following forms:

- Two discs (physical or virtual)
- Two USB storage drives
- One disc (physical or virtual) and one USB storage drive
- One USB storage drive including both image files

To create a USB storage device including both image files, do the following:

1. Prepare a USB storage drive with an FAT32 partition and a minimum of 8 GB of free storage space.
2. Extract the Installer DVD image file to the root folder of the USB storage drive.
3. Create a packages sub folder in the root folder.
4. Extract the Package DVD image file to the packages sub folder.

1. Drive Selection

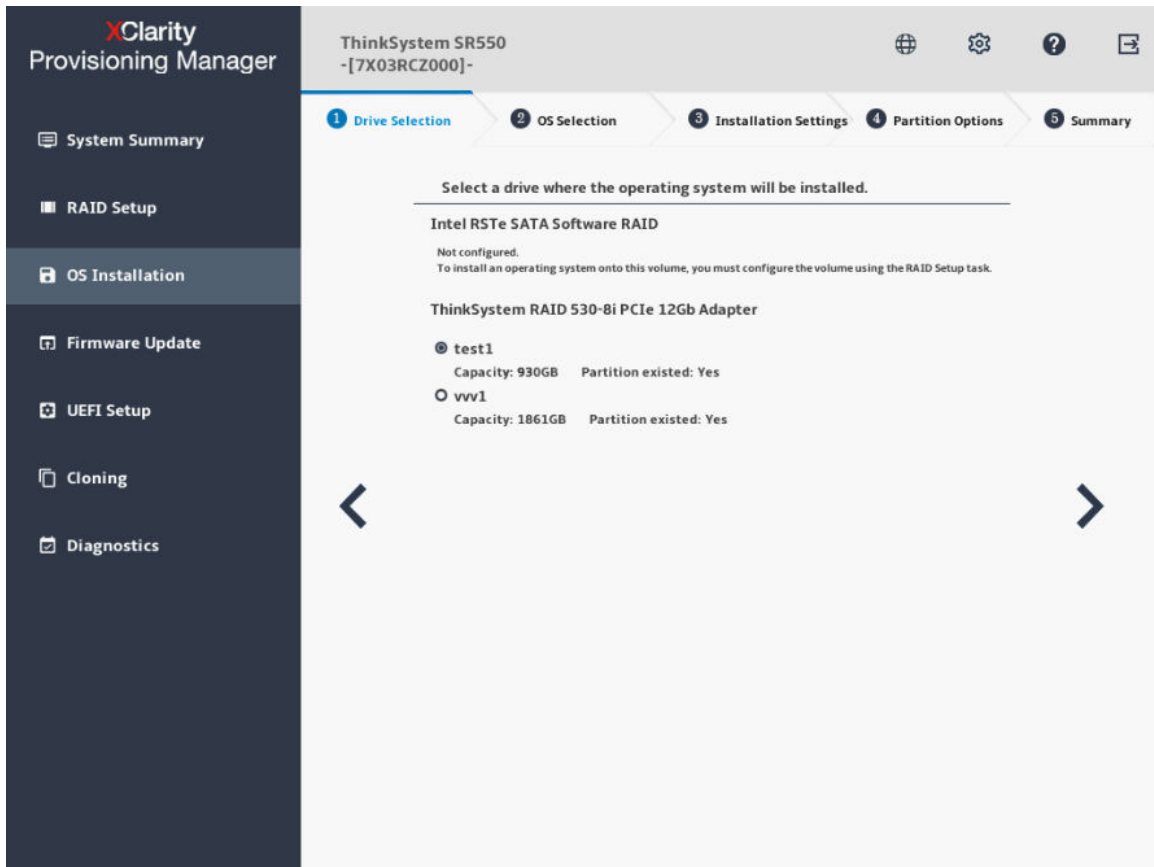


Figure 13. Drive Selection step (for Linux)

Attention: The selected drive will be formatted during the installation. Back up all data on it before the installation.

Note: The drivers will be installed automatically after the OS installation. It is recommended to restart your server to ensure that all installed drivers take effect.

2. OS Selection

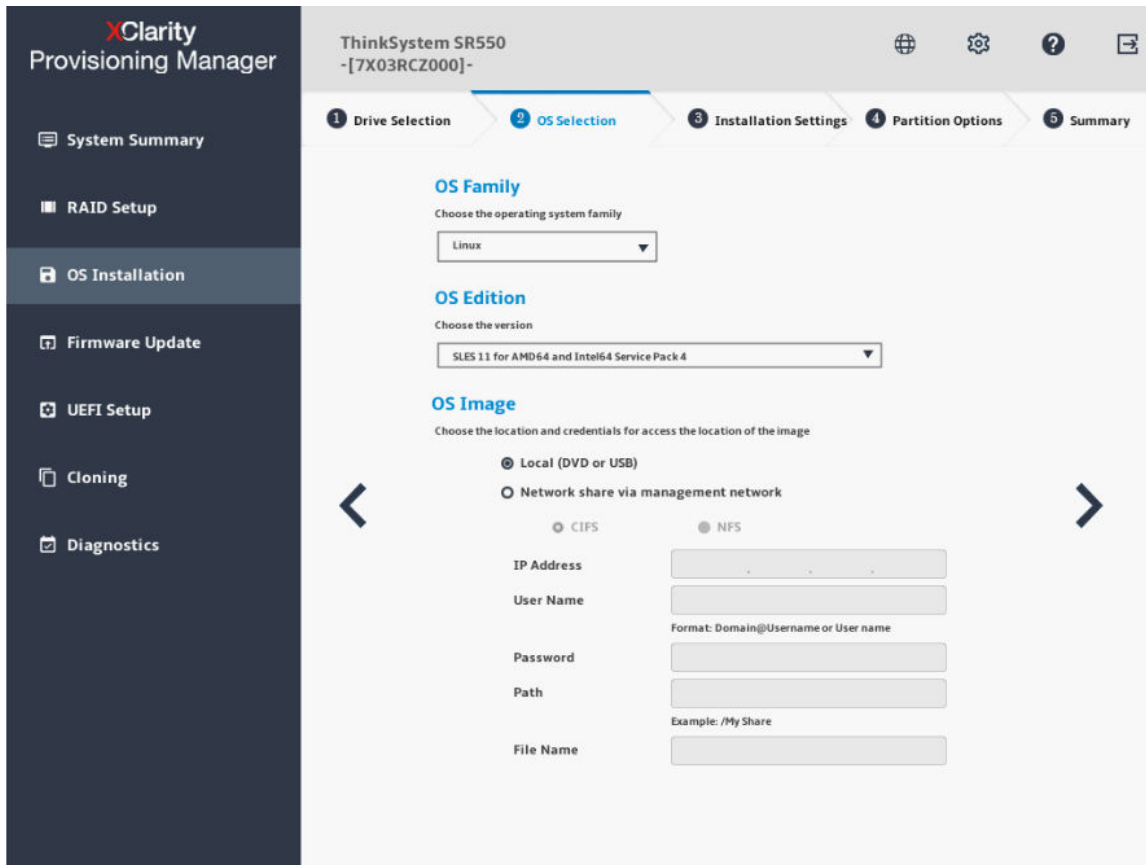


Figure 14. OS Selection step (for Linux)

The IP address is made up of four parts separated by dots. The following table lists the valid value range for each part.

IP Address	Part 1	Part 2	Part 3	Part 4
Valid values	1 – 223	0 – 255	0 – 255	0 – 255

3. Installation Settings

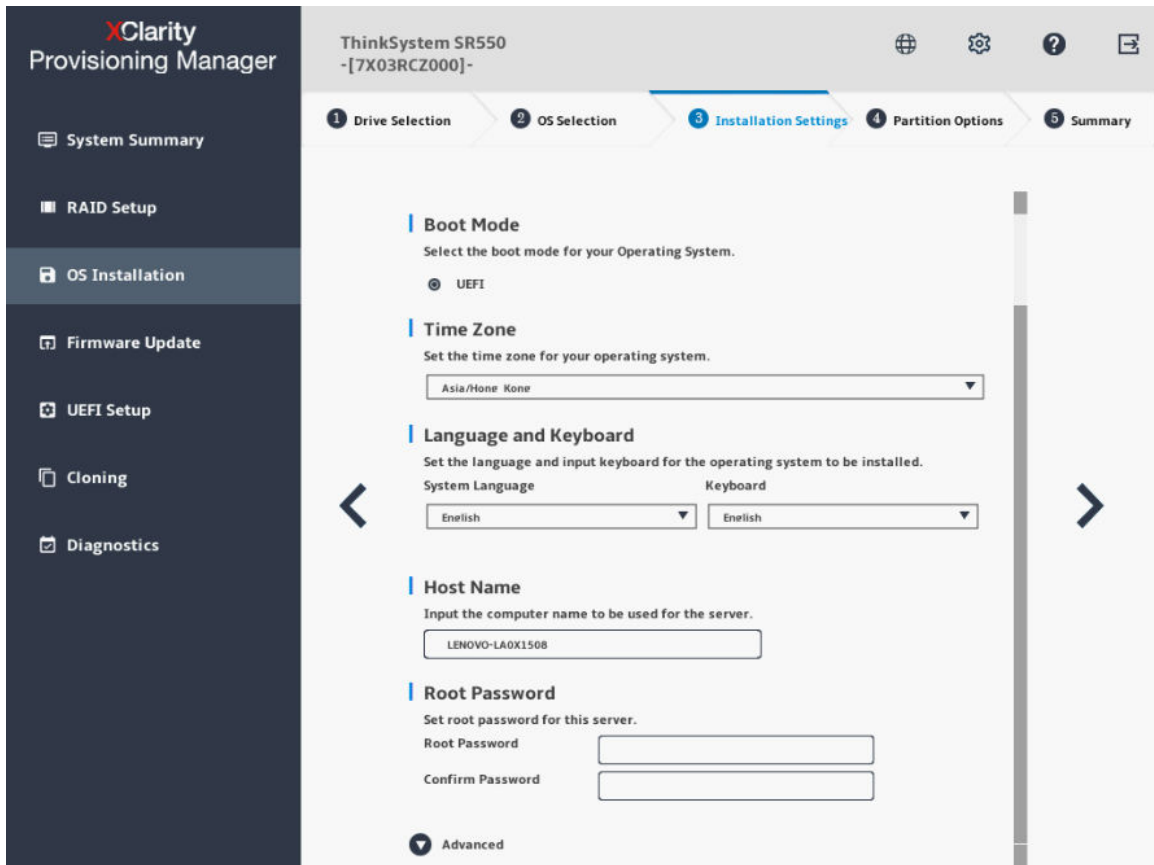


Figure 15. Installation Settings step – 1 (for Linux)

Root Password: You can change your root password later from the operating system.

If you want to do advanced configurations, expand the list by clicking the arrow icon next to **Advanced**.

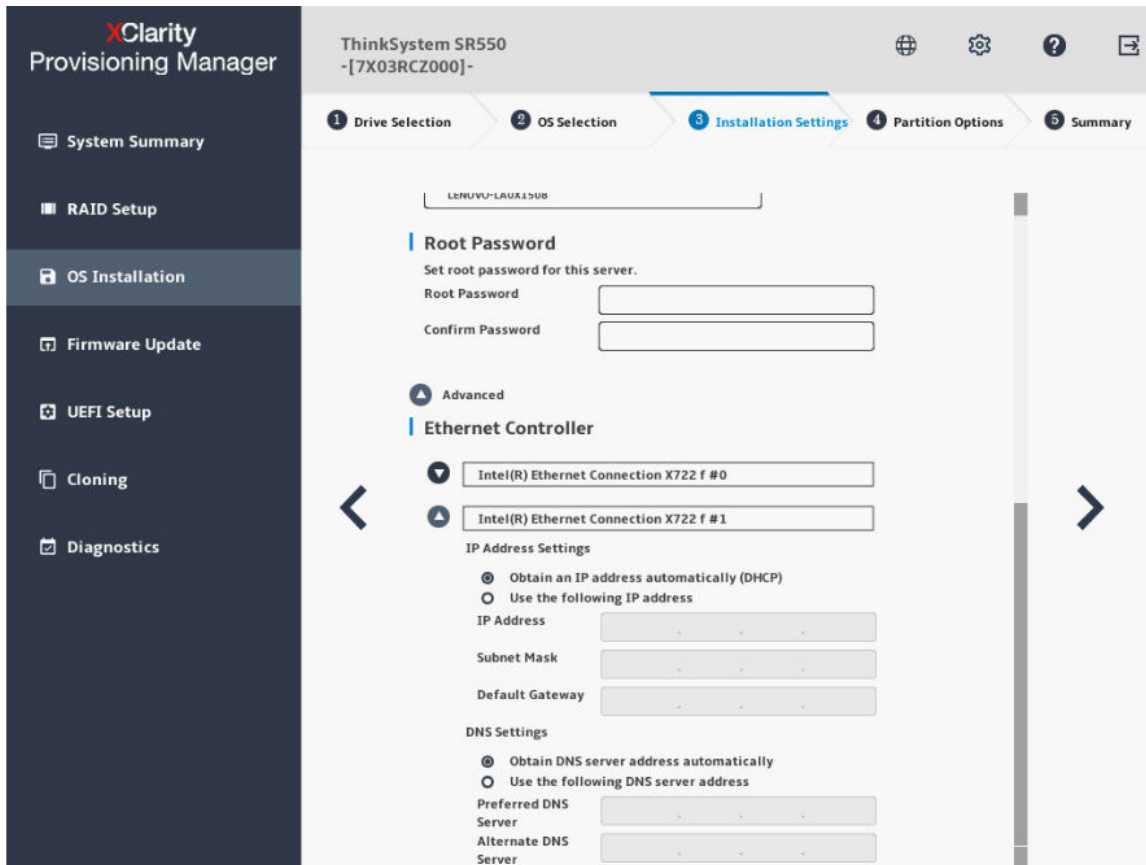


Figure 16. Installation Settings step – 2 (for Linux)

Refer to the following table for the valid values when you type the required address information.

Address	Part 1	Part 2	Part 3	Part 4
IP Address	1 – 126; 128 – 223	0 – 255	0 – 255	1 – 254
Subnet Mask	0 – 255	0 – 255	0 – 255	0 – 255
Default Gateway	0 – 255	0 – 255	0 – 255	0 – 255
Preferred DNS Server	1 – 126; 128 – 223	0 – 255	0 – 255	0 – 255
Alternate DNS Server	1 – 126; 128 – 223	0 – 255	0 – 255	0 – 255

4. Partition Options

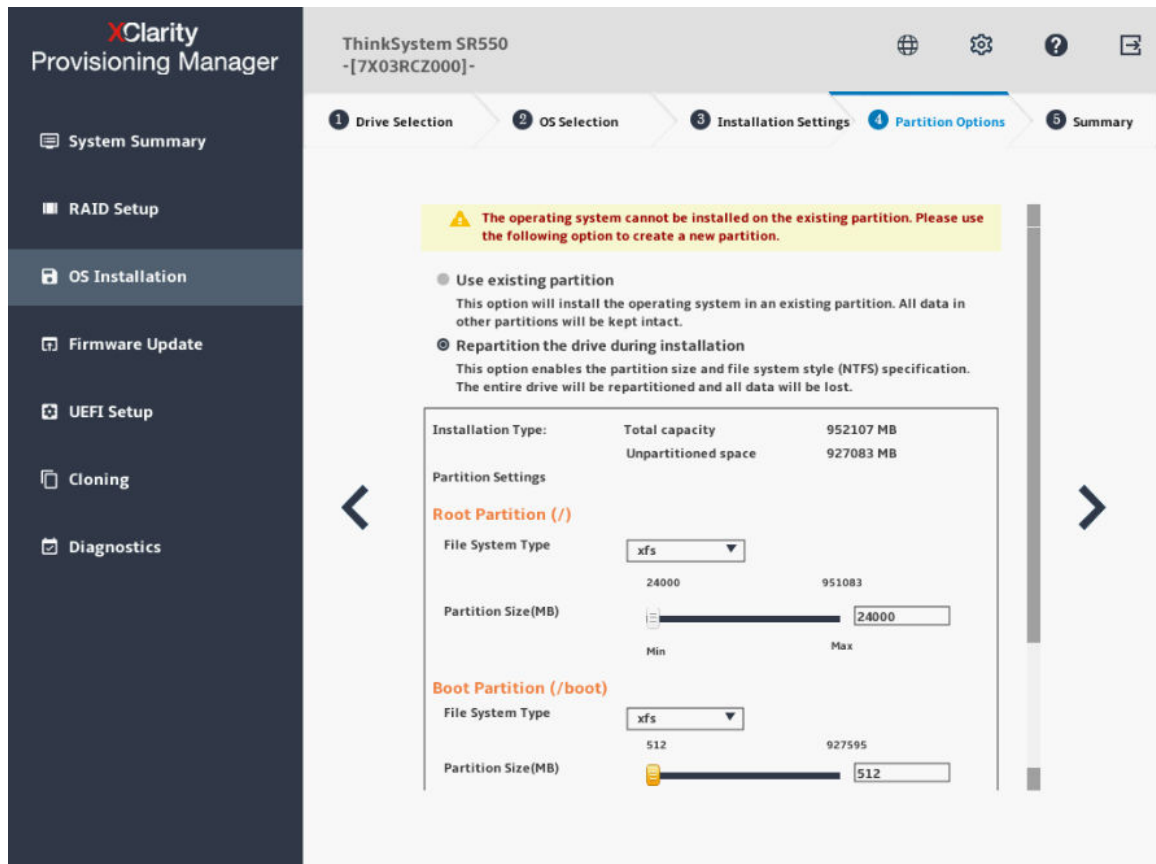


Figure 17. Partition Options step (for Linux)

If no existing partition is detected on the drive, select **Repartition the drive during installation**.

Root Partition: The root partition size depends on the space required for the operating system and applications.

Boot Partition: This partition contains files required to start the operating system.

Swap Partition: Swap partition is the virtual memory in Linux. When the Random Access Memory (RAM) is full, data will be stored on the swap partition temporarily. Although swap partition can be used to store data, it should not be considered as a replacement for RAM. It is located on hard disk drives, and has slower access speed than RAM.

5. Summary

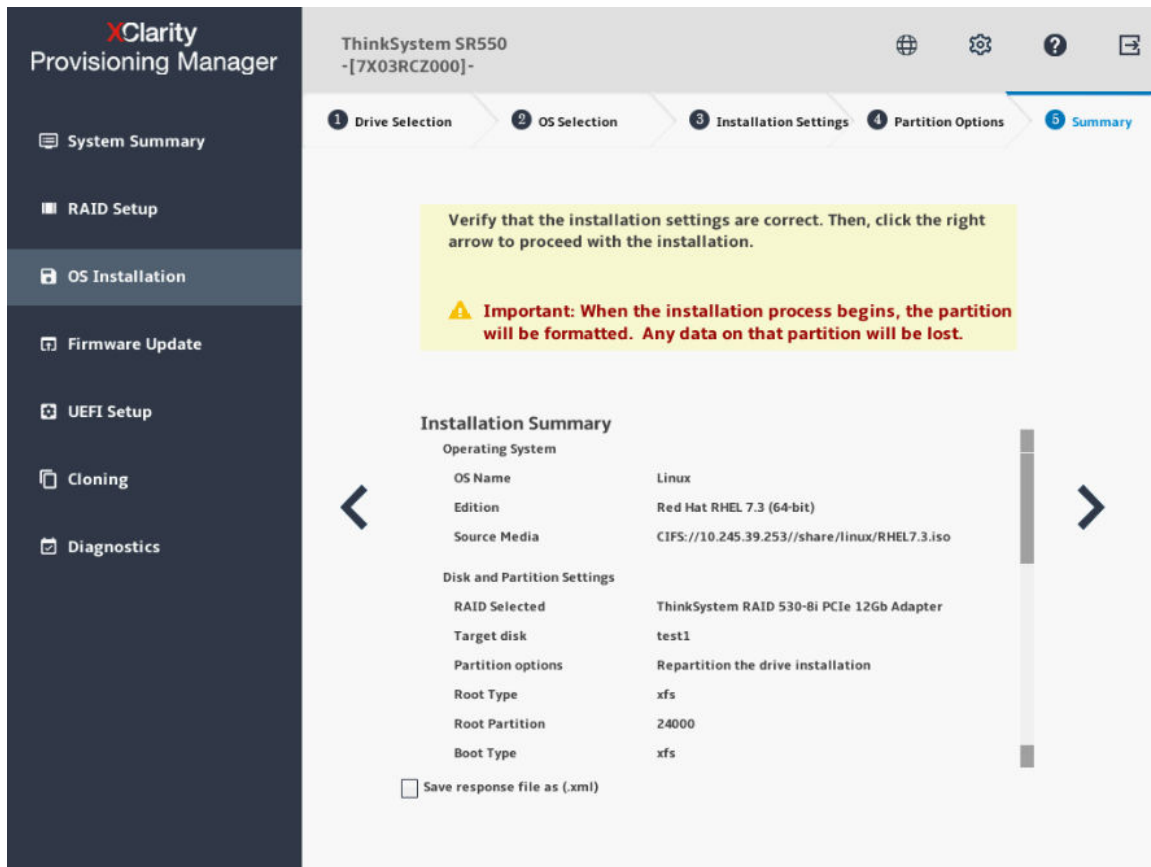



Figure 18. Summary step (for Linux)

If you want to change some settings, click  until you return to the page where you can make the changes.

If you want to export the operating system installation settings to a response file, refer to [“Exporting an operating-system-installation response file”](#) on page 34.

Click . The installation process starts. Wait until the installation finishes.

Installing a VMware operating system

The wizard provides a step by step guidance for installing an operating system. Follow the instructions on the screen and the tips listed below to install a VMware® operating system.

1. Drive Selection

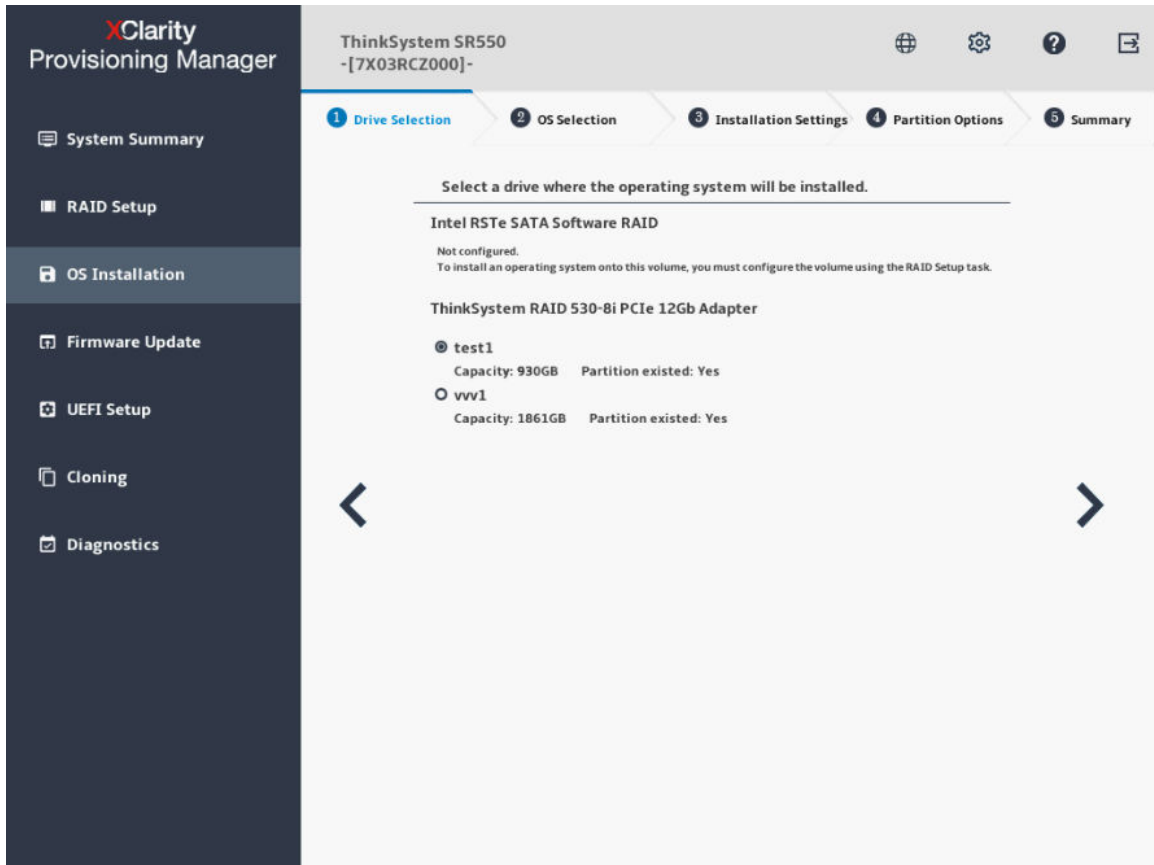


Figure 19. Drive Selection step (for VMWare)

Attention: The selected drive will be formatted during the installation. Back up all data on it before the installation.

Note: The drivers will be installed automatically after the OS installation. It is recommended to restart your server to ensure that all installed drivers take effect.

2. OS Selection

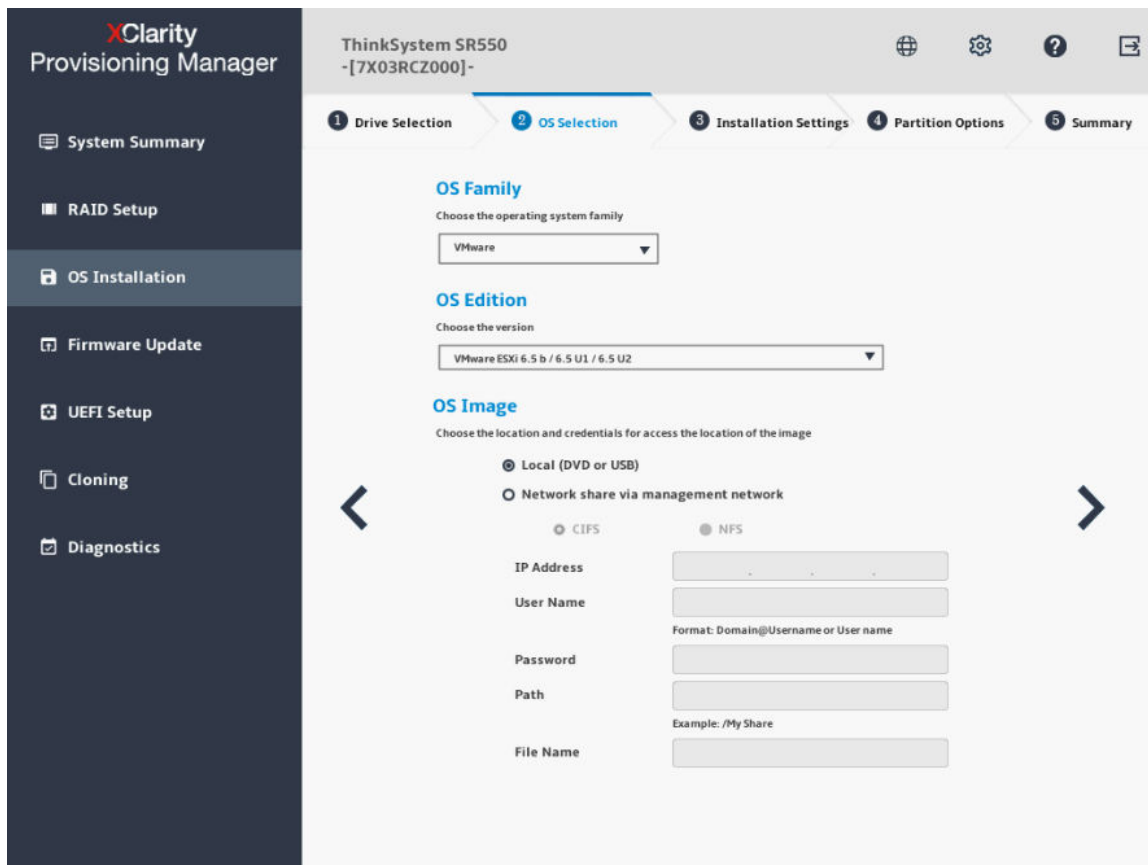


Figure 20. OS Selection step (for VMware)

The IP address is made up of four parts separated by dots. The following table lists the valid value range for each part.

IP Address	Part 1	Part 2	Part 3	Part 4
Valid values	1 – 223	0 – 255	0 – 255	0 – 255

3. Installation Settings

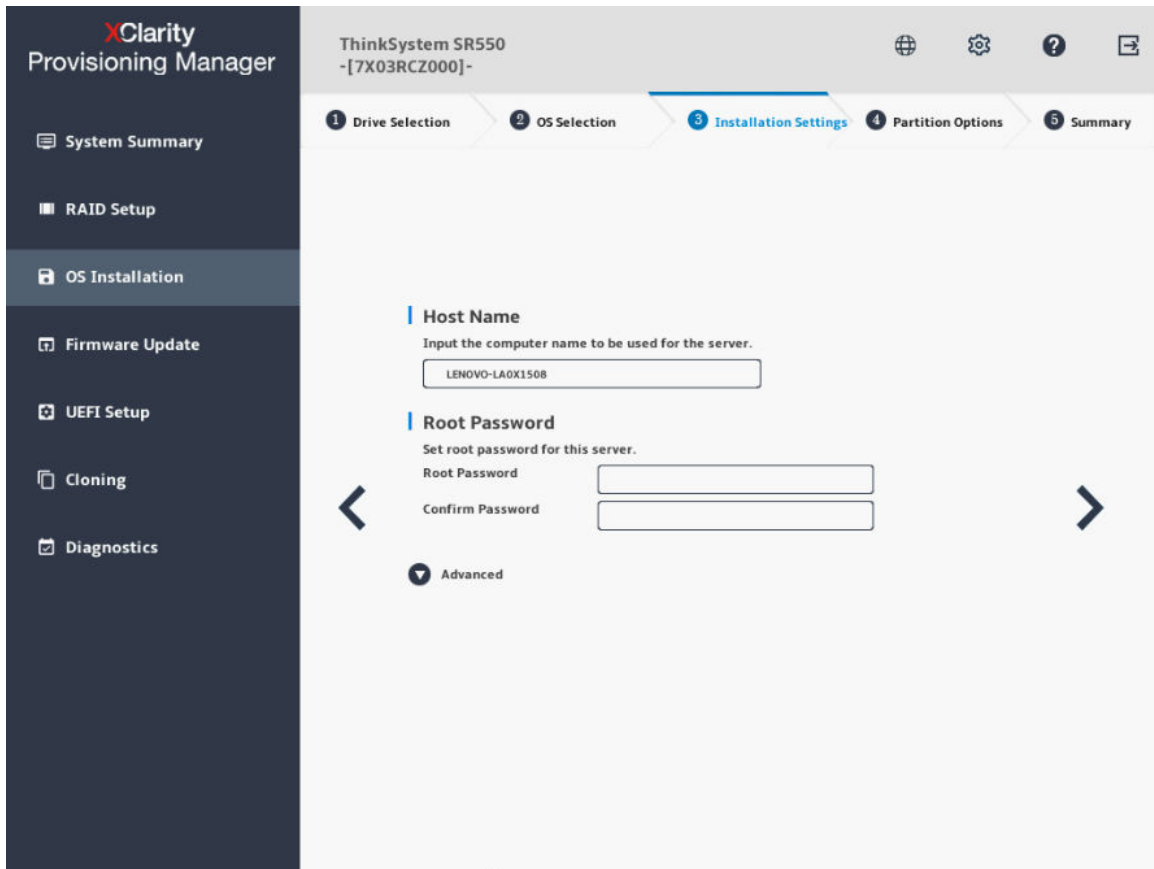


Figure 21. Installation Settings step – 1 (for VMware)

Root Password: You can change your root password later from the operating system.

If you want to do advanced configurations, expand the list by clicking the arrow icon next to **Advanced**.

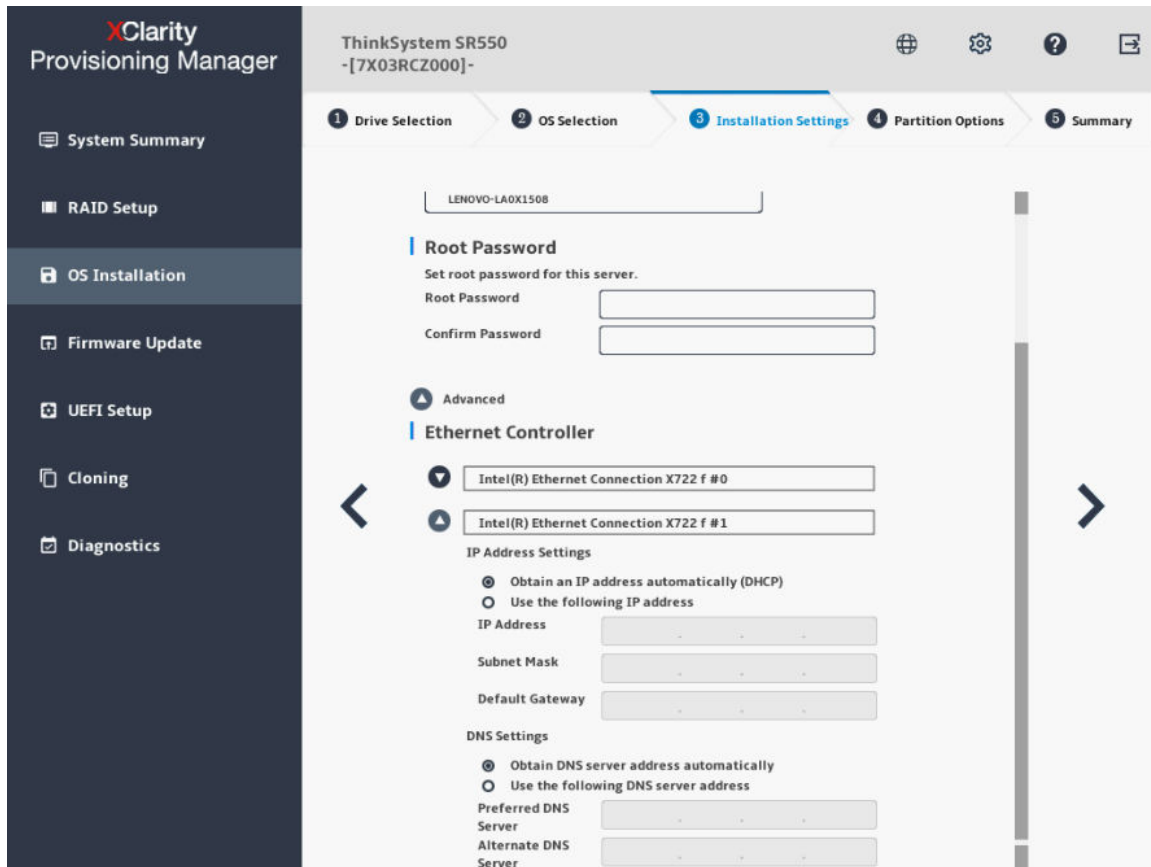


Figure 22. Installation Settings step – 2 (for VMware)

Refer to the following table for the valid values when you type the required address information.

Address	Part 1	Part 2	Part 3	Part 4
IP Address	1 – 126; 128 – 223	0 – 255	0 – 255	1 – 254
Subnet Mask	0 – 255	0 – 255	0 – 255	0 – 255
Default Gateway	0 – 255	0 – 255	0 – 255	0 – 255
Preferred DNS Server	1 – 126; 128 – 223	0 – 255	0 – 255	0 – 255
Alternate DNS Server	1 – 126; 128 – 223	0 – 255	0 – 255	0 – 255

4. Summary

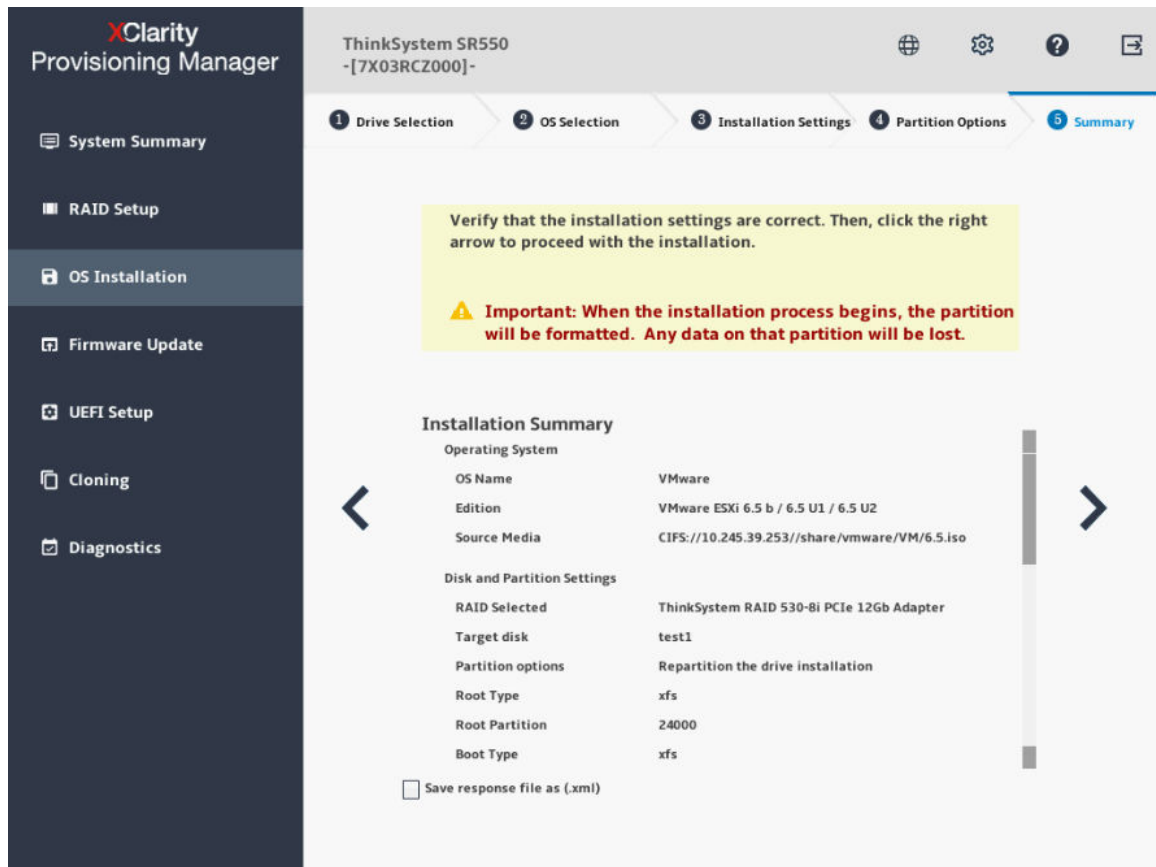



Figure 23. Summary step (for VMware)

If you want to change some settings, click  until you return to the page where you can make the changes.

If you want to export the operating system installation settings to a response file, refer to [“Exporting an operating-system-installation response file”](#) on page 34.

Click . The installation process starts. Wait until the installation finishes.


Exporting an operating-system-installation response file

You can export the operating system installation settings to a response file. Later, you can clone the settings in this response file to other similarly configured Lenovo servers.

To export an operating-system-installation response file, do the following:

1. Attach a USB storage drive to the server or connect your server to a shared network. For instructions on how to connect to a shared network, refer to “[Configuring network settings](#)” on page 7.

Note: The USB storage drive should include an FAT32 partition.

2. Follow the wizard to go through the Drive Selection, OS Selection, Installation Settings, Partition Options, and Summary steps.
3. In the Summary step, select the **Save response file as (.xml)** check box, and click . The Save Response File window is displayed.
4. Select the location to save the response file and input a file name.
5. Click **Save**. Wait for several minutes until the saving process is completed.

Manual installation

Prerequisites

Before installing an operating system manually, ensure that the operating system installation files are prepared in one of the following forms:

- CD or DVD

Note: Ensure that the disc is clean and the version and architecture of the operating system are correct.

- USB storage drive

To create a USB installation medium, refer to the documentation at:

https://download.lenovo.com/servers_pdf/how_to_create_usb_os_installation_media.pdf

- Shared network

Ensure that the Ethernet connector for system management is active and can connect to the specified IP address.

Installing an operating system manually

In the OS Installation interface, select **Manual Install** and click **>**. The following interface is displayed.

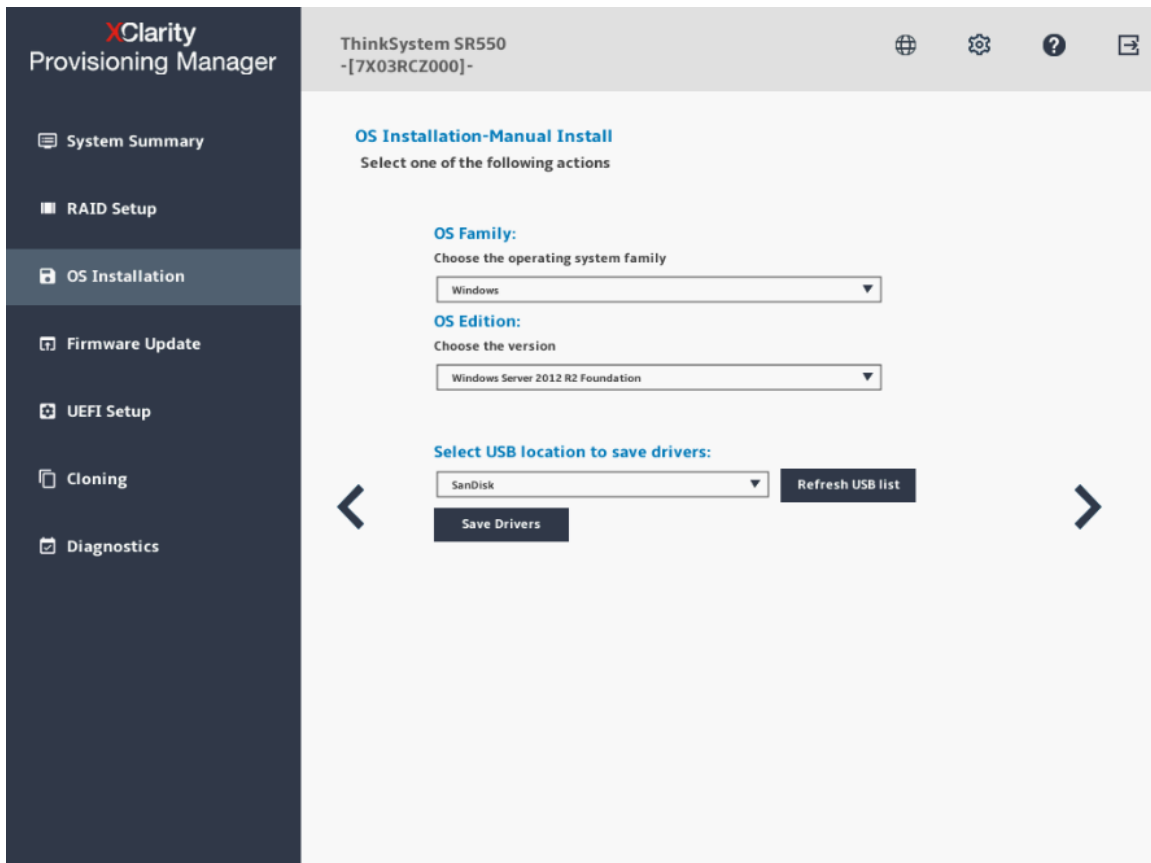


Figure 24. Manual Install interface

Do the following to install an operating system manually:

1. Select the operating system you want to install, select a location to save the drivers, and click **>**.

Note: If no USB storage drive is detected, the **Save Drivers** button is dimmed.

2. Select **Begin the installation** and click **>**. The server will boot from the operating system medium and the operating system installation process starts.

Note: You also can select **Reboot system** to restart the server if you want to do other configuration.

3. Install the operating system manually. To get instructions on how to install a specific operating system manually, do the following:
 - a. Go to <http://datacentersupport.lenovo.com> and navigate to the support page for your server.
 - b. Click **How-tos & Solutions**.
 - c. Select an operating system and the installation instructions will be displayed.
4. After the operating system installation process is completed, install the drivers saved in step 1 by yourself.

Firmware Update

Click the **Firmware Update** tab in the left pane to enter the Firmware Update interface. You can update the UEFI firmware, Lenovo XClarity Controller, Lenovo XClarity Provisioning Manager, Windows Driver Bundle, and Linux Driver Bundle for your server in the Firmware Update interface. To download the update packages, go to:

<http://datacentersupport.lenovo.com>.

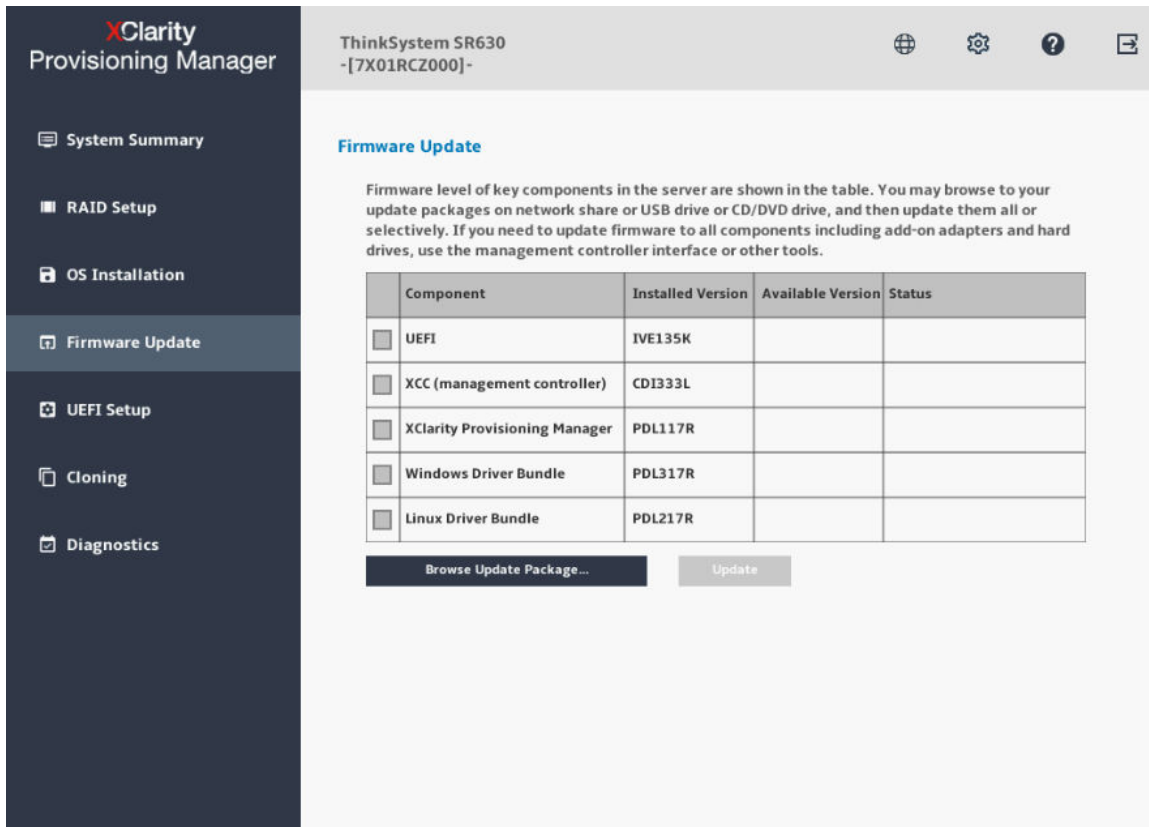


Figure 25. Firmware Update interface

To update firmware, do the following:

1. If the update package is stored on a USB storage drive, insert the USB storage drive into the server. If the update package is stored in a shared network folder, ensure that you have configured the network settings. For instructions on how to configure the network settings, refer to [“Configuring network settings” on page 7](#).
2. Click **Browse Update Package....** The Select File window is displayed.
3. Select the corresponding XML file in the update package and click **OK**. The check box for the item you want to update will be enabled and the version information will be displayed in the **Available Version** column.

Notes:

- If the available version is later than the current version, the check box will be selected automatically.
- If the selected XML file is a bundled file with multiple items, the check boxes for those items will be enabled, and the version information for those items will be displayed in the **Available Version** column.

- If the selected XML file is not for your server, an error message will be displayed. The check box will not be enabled and the version information will not be displayed.

4. Select the items you want to update.

Notes:

- If the available version is earlier than or the same as the current version, a confirmation window will be displayed. Click **Yes** to continue or click **No** to exit.
 - If the XML file for the selected item is not compatible with your server, or does not meet the system configuration requirements, an error message will be displayed, and the check box will not be selected.
 - If the XML file for the selected item is not compatible with the XML files for other selected items, an error message will be displayed, and the check box will not be selected.
5. Click **Update**. The update process takes several minutes. When the **Status** for all the items are shown as **Success**, the update process is completed.

Notes:

- If you are updating UEFI firmware or Lenovo XClarity Controller, the server will be restarted automatically.
- If you are updating Lenovo XClarity Provisioning Manager, a confirmation window will be displayed. Click **Yes** to restart the server or click **No** to cancel.

UEFI Setup

Click the **UEFI Setup** tab in the left pane to enter the UEFI Setup interface. In the UEFI Setup interface, you can view and change the UEFI settings of your server.

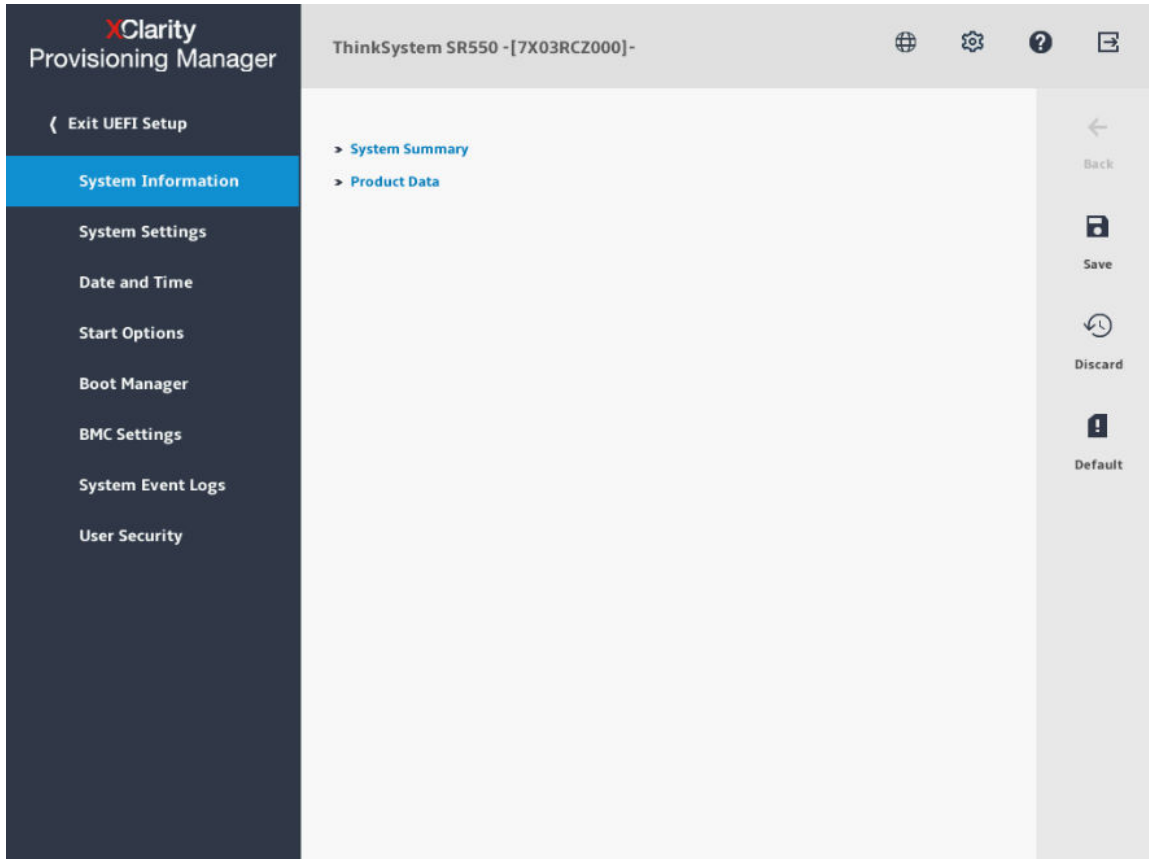









Figure 26. UEFI Setup interface

The UEFI Setup interface consists of the following subinterfaces. Click the tab in the left pane to display the corresponding subinterface in the right pane.

Note: Depending on the UEFI version of your server, some subinterface information might differ slightly from the following.

- **System Information:** View basic information about your server, such as system identification data, processor speed, DIMM information, and firmware version.
- **System Settings:** View and change various server settings.
- **Date and Time:** Set the date and time of the server.
- **Start Options:** Select an option to restart your server from it.
- **Boot Manager:** View and change the server boot options, such as the boot sequence, boot priority for various devices, and boot mode.
- **BMC Settings:** View and set BMC (Lenovo XClarity Controller) configuration parameters.
- **System Event Logs:** View and clear the system event logs.
- **User Security:** Set or modify passwords.

Note: The **Save** button , **Discard** button , and **Default** button  on the right side of the interface might not be applicable for some settings, such as BMC settings and RAID adapter settings. If there are options in the setting interfaces for you to save changes, discard changes, or load default settings, you must click these options instead of using the **Save** button , **Discard** button , and **Default** button .

For detailed information, refer to the integrated help system. Click  on the top right corner of an interface and click **Help** to view the help information for each interface.

DC Persistent Memory Module (DCPMM) management

DCPMMs can be managed in the UEFI Setup interface. Go to **UEFI Setup** → **System Settings** → **Intel Optane DCPMMs** to configure and manage DCPMMs.

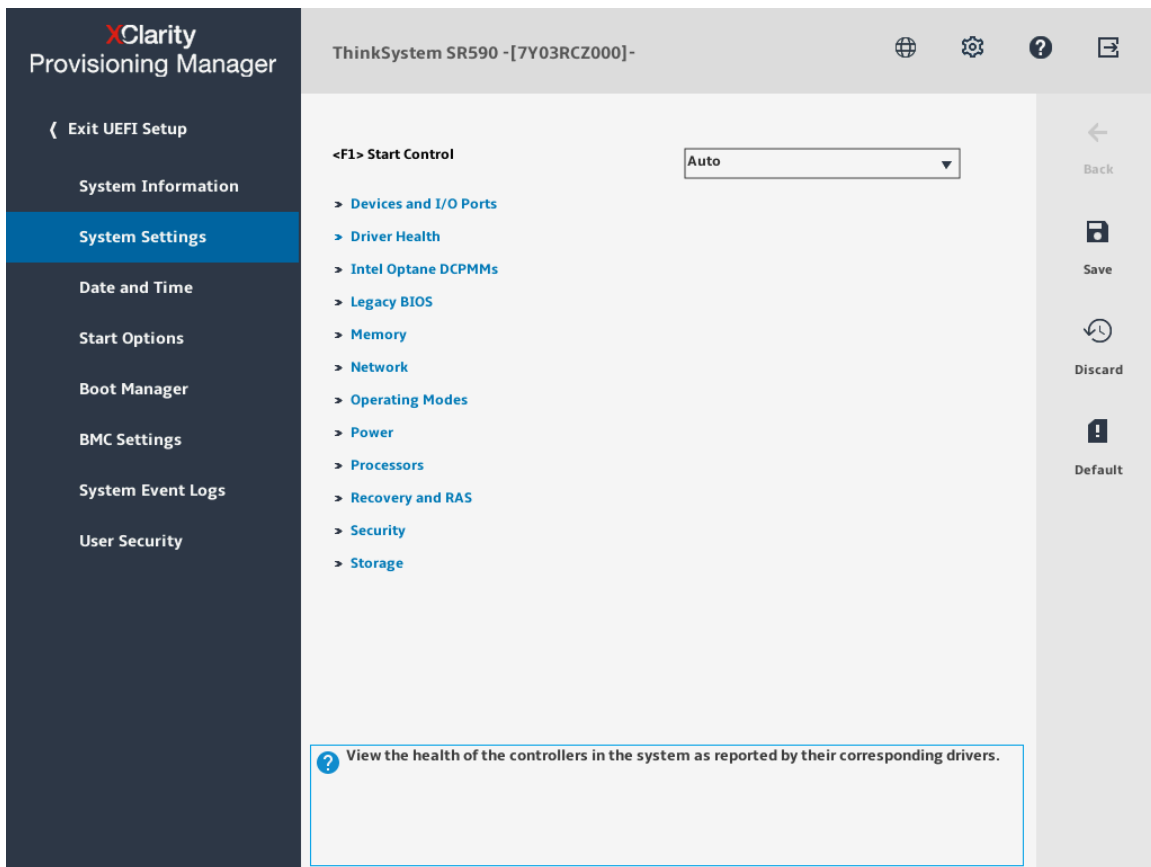


Figure 27. DCPMM management

Note: If the text-based interface of Setup Utility opens instead of the Lenovo XClarity Provisioning Manager, go to **System Settings** → **<F1> Start Control** and select **Tool Suite**. Then, restart the system and press **F1** as soon as the logo screen appears to open Lenovo XClarity Provisioning Manager.

Following are the available management options:

- **Intel Optane DCPMM details**

Select this option to view the following details concerning each of the installed DCPMMs:

- Firmware version
- Configuration status
- Raw capacity

- Memory capacity
- App Direct capacity
- Unconfigured capacity
- Inaccessible capacity
- Reserved capacity
- Percentage remaining
- Security state

- **Goals**

- **Memory Mode [%]**

Select this option to define the percentage of DCPMM capacity that is invested in system memory, and hence decide the DCPMM mode:

- **0%:** App Direct Mode
- **1-99%:** Mixed Memory Mode
- **100%:** Memory Mode

Go to **Goals → Memory Mode [%]**, input the memory percentage, and reboot the system.

Notes:

- Before changing from one mode to another:
 1. Make sure the capacity of installed DCPMMs and DRAM DIMMs meets system requirements for the new mode.
 2. Back up all the data and delete all the created namespaces. Go to **Namespaces → View/Modify/Delete Namespaces** to delete the created namespaces.
 3. Perform secure erase on all the installed DCPMMs. Go to **Security → Press to Secure Erase** to perform secure erase.
- After the system is rebooted and the input goal value is applied, the displayed value in **System Configuration and Boot Management → Intel Optane DCPMMs → Goals** will go back to the following default selectable options:
 - **Scope:** [Platform]
 - **Memory Mode [%]:** 0
 - **Persistent Memory Type:** [App Direct]

These values are selectable options for DCPMM settings, and do not represent the current DCPMM status.

- **Persistent Memory Type**

In App Direct Mode and Mixed Memory Mode, the DCPMMs that are connected to the same processor are by default interleaved (displayed as **App Direct**), while memory banks are used in turns. To set them as not interleaved in the Setup Utility, go to **Intel Optane DCPMMs → Goals → Persistent Memory Type [(DCPMM mode)]**, select **App Direct Not Interleaved** and reboot the system.

Note: Setting DCPMM App Direct capacity to not interleaved will turn the displayed App Direct regions from one region per processor to one region per DCPMM.

- **Regions**

After the memory percentage is set and the system is rebooted, regions for the App Direct capacity will be generated automatically. Select this option to view the App Direct regions.

- **Security**

- Enable Security

DCPMMs can be secured with passphrases. Two types of passphrase protection scope are available for DCPMM:

- **Platform:** Choose this option to run security operation on all the installed DCPMM units at once. Platform passphrase is stored and automatically applied to unlock DCPMMs before operating system starts running, but passphrase still has to be disabled manually for secure erase.
- **Single DCPMM:** Choose this option to run security operation on one or more selected DCPMM units.

Notes:

- Single DCPMM passphrases are not stored in the system, and security of the locked units needs to be disabled before the units are available for access or secure erase.
- Always make sure to keep records of the slot number of locked DCPMMs and corresponding passphrases. In the case the passphrases are lost or forgotten, the stored data cannot be backed up or restored, but you can contact Lenovo service for administrative secure erase.
- After three failed unlocking attempts, the corresponding DCPMMs enter “exceeded” state with a system warning message, and the DCPMM unit can only be unlocked after the system is rebooted.

To enable passphrase, go to **Security → Press to Enable Security**.

- Secure Erase

Note: If the DCPMMs to be secure erased are protected with a passphrase, make sure to disable security and reboot the system before performing secure erase.

Secure erase cleanses all the data that is stored in the DCPMM unit, including encrypted one. This data deletion method is recommended before returning or disposing a malfunctioning unit, or changing DCPMM mode. To perform secure erase, go to **Security → Press to Secure Erase**.

- **DCPMM Configuration**

DCPMM contains spared internal cells to stand in for the failed ones. When the spared cells are exhausted to 0%, there will be an error message, and it is advised to back up data, collect service log, and contact Lenovo support.

There will also be a warning message when the percentage reaches 1% and a selectable percentage (10% by default). When this message appears, it is advised to back up data and run DCPMM diagnostics (see [“Running diagnostics” on page 44](#)). To adjust the selectable percentage that the warning message requires, go to **Intel Optane DCPMMs → DCPMM Configuration**, and input the percentage.

Cloning

Click the **Cloning** tab in the left pane to enter the Cloning interface. In the Cloning interface, you can clone settings in one server to other similarly configured Lenovo servers. The Cloning interface includes the following two sections:

- **Export:** Used to export UEFI, RAID, and BMC settings for the current server to response files respectively and save the response files to a USB storage drive or a shared network folder.
- **Import:** Used to import UEFI, RAID, BMC, and operating system installation settings from response files.

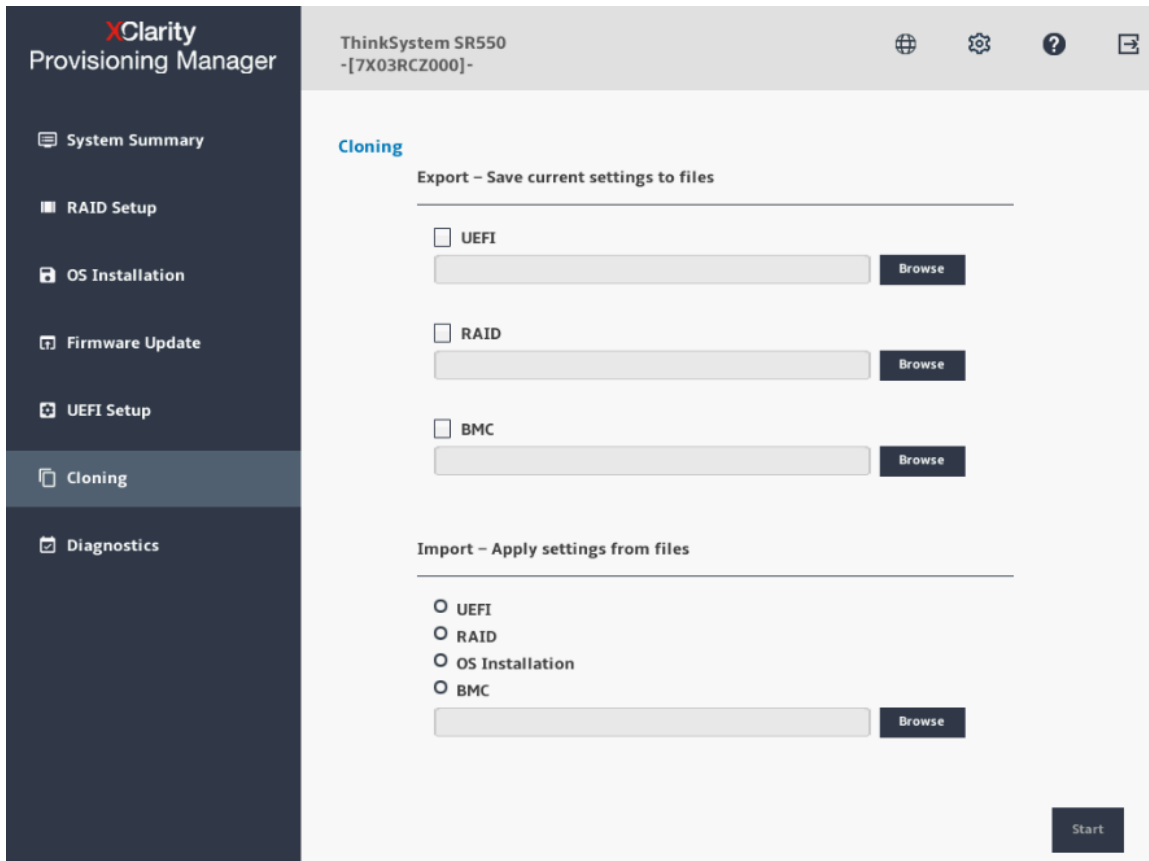


Figure 28. Cloning interface


Exporting response files

To export UEFI, RAID, or BMC settings to response files, do the following:

1. Attach a USB storage drive to the server or connect your server to a shared network. For instructions on how to connect to a shared network, refer to [“Configuring network settings” on page 7](#).

Note: The USB storage drive should include an FAT32 partition.

2. In the Export section, click the **Browse** button for the item you want to export. The Save Response File window is displayed.
3. Select the location to save the response file and input a file name.
4. Click **Save** to return to the Cloning interface. The check box for the item you want to export will be selected automatically.

5. If necessary, repeat step 2 to step 4 to select other items you want to export.
6. Click  or **Start** and wait for several minutes until the exporting process is completed.


To export operating system installation settings to a response file, refer to [“Exporting an operating-system-installation response file” on page 34](#).



Importing response files

Prerequisites

- Before importing a UEFI response file, ensure that the UEFI version for the target server and the source server is the same.
- Before importing a BMC response file, ensure that the BMC version for the target server and the source server is the same.
- Before importing a RAID response file, ensure that the target server and the source server have same RAID configuration.
- Before importing an operating-system-installation response file, ensure that the target server and the source server have the same RAID adapter installed, and the capacity of the disk drive under the RAID adapter for the target server is greater than the partition size in the response file.

To import UEFI, RAID, BMC, or operating system installation settings saved in response files to your server, do the following:

1. If the response file is stored on a USB storage drive, insert the USB storage drive into the server. If the response file is stored in a shared network folder, ensure that you have configured the network settings. For instructions on how to configure the network settings, refer to [“Configuring network settings” on page 7](#).
2. In the Import section, click the **Browse** button. The Select File window is displayed.
3. Select the corresponding response file. The selected file name is displayed in the **File Name** field.
4. Click **OK** to return to the Cloning interface. The item you want to import will be selected automatically.
5. If you are importing a UEFI, RAID, or BMC response file, click  or **Start**. The importing process starts. Wait for several minutes until the importing process is completed.

If you are importing an operating-system-installation response file, click , the Installation Summary page appears. The settings in the operating-system-installation response file are listed in this page. You can edit some settings according to your need. Then, click  or **Start** to start the operating system installation process. Wait until the installation finishes.

Diagnostics

Click the **Diagnostics** tab in the left pane to enter the Diagnostics interface. In the Diagnostics interface, you can run diagnostics and collect service data.

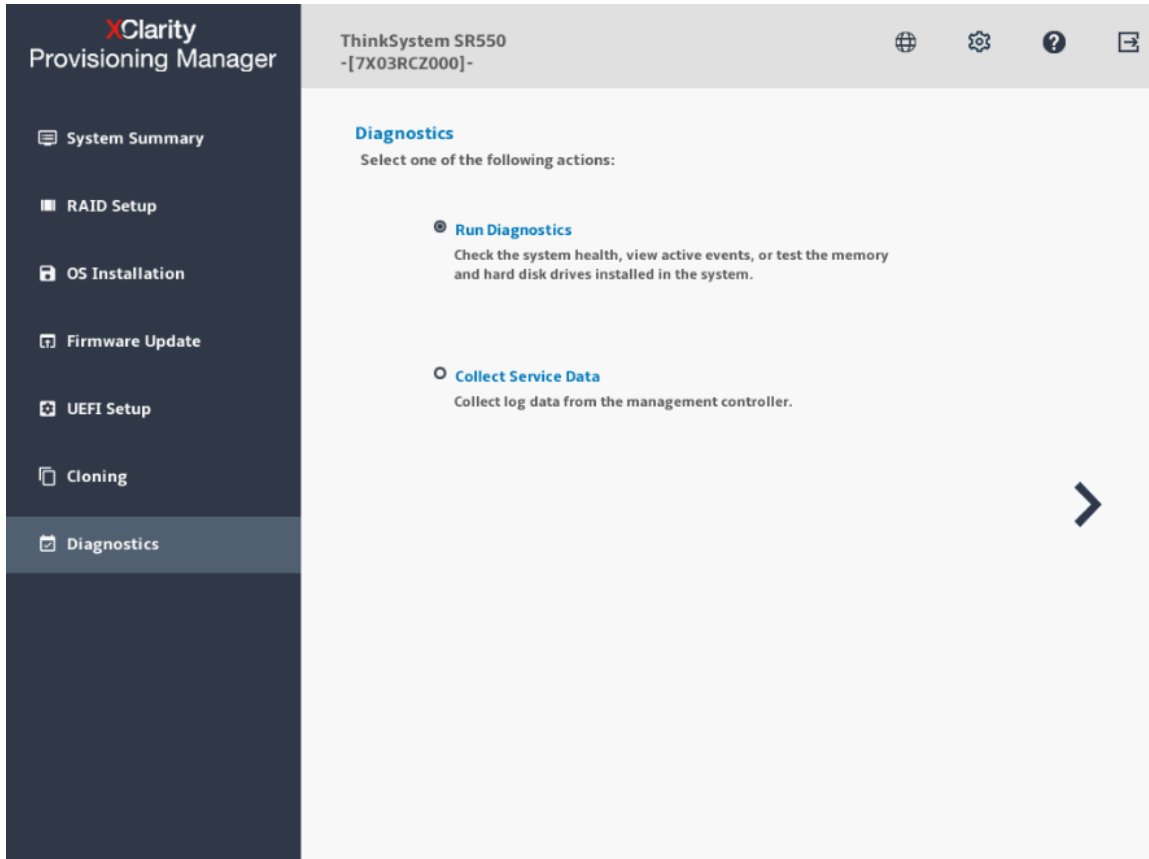


Figure 29. Diagnostics interface

Running diagnostics

Select **Run Diagnostics** and click . The following five tabs are displayed in the left pane:

- **Dashboard:** View the health status of each server component and check the active events if any one of the components has a problem.
- **Memory Test:** Run the memory test.
- **Disk Drive Test:** Run the disk drive test.
- **RAID Log:** Collect the logs for the selected RAID adapters.
- **DCPMM Test:** Run DC Persistent Memory Module test.

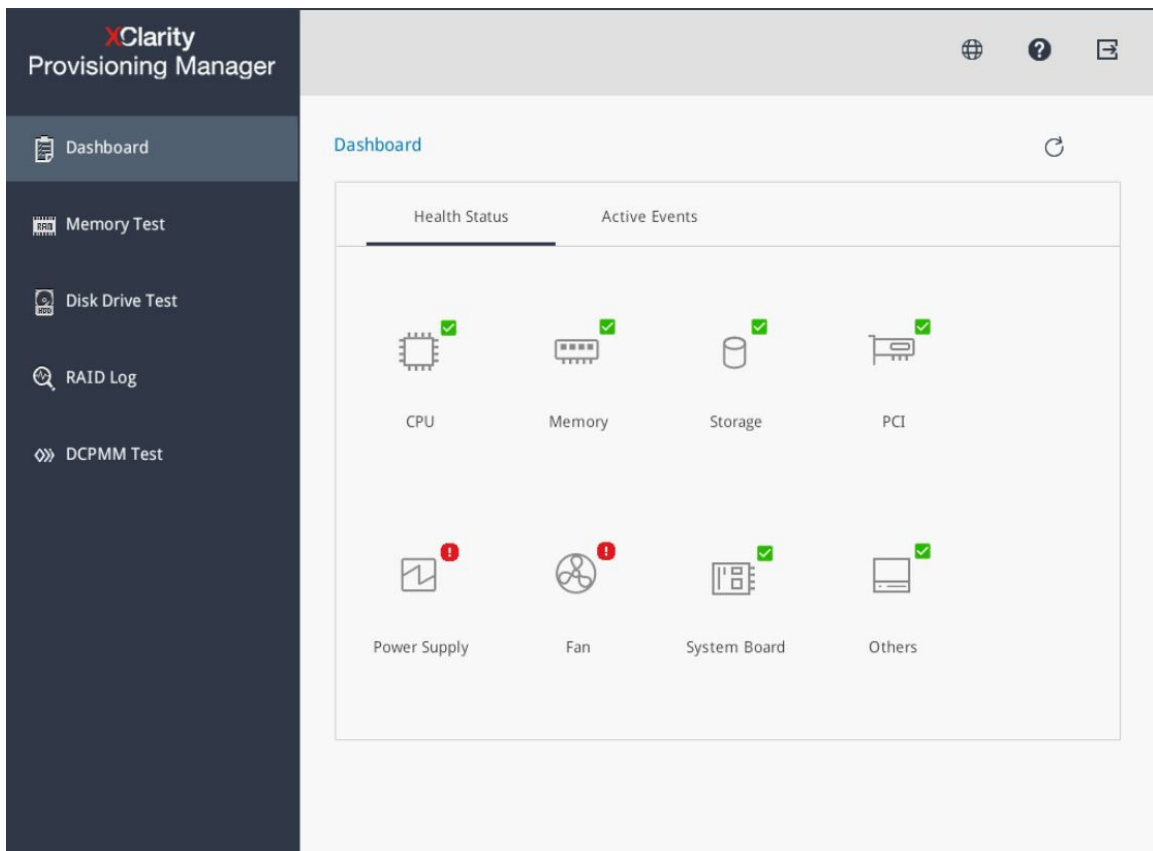

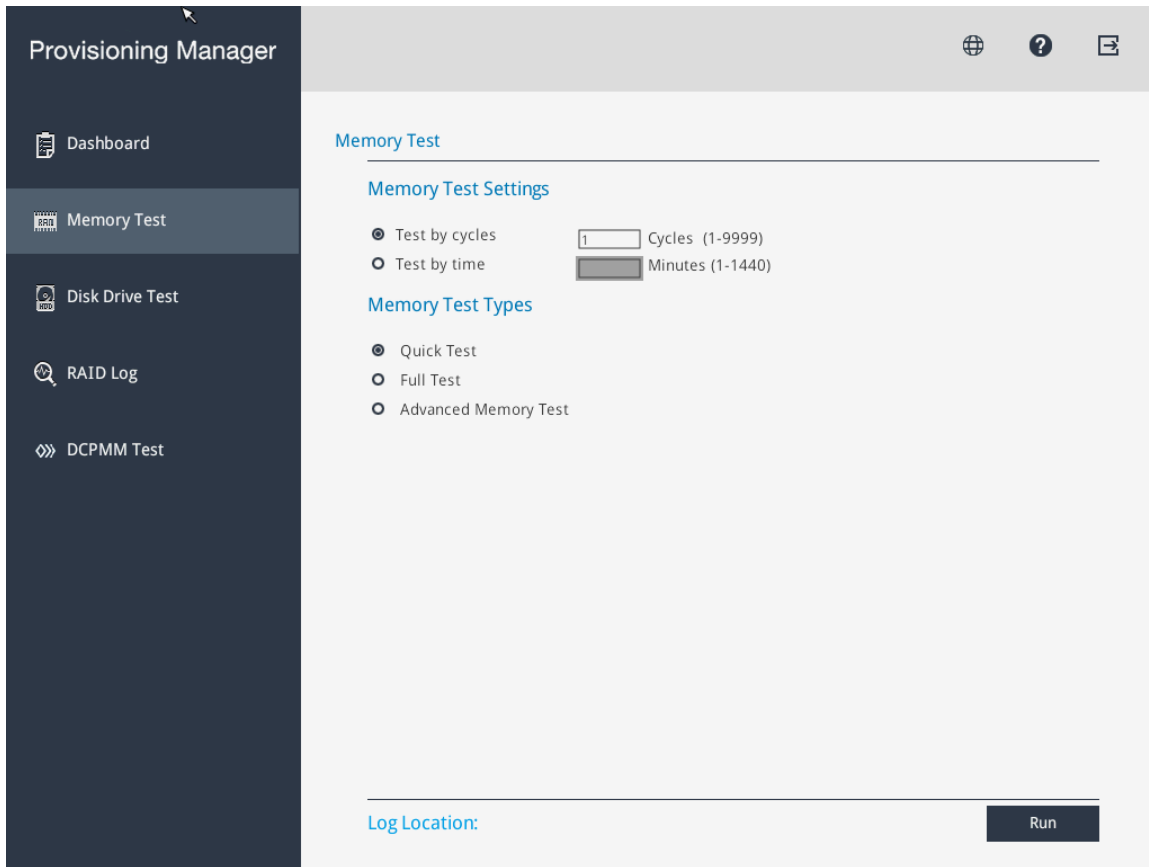


Figure 30. Dashboard interface

To exit this interface and return to the Diagnostics interface, click  and then click **Exit**.

Running memory test



To run memory test, do the following:

1. If you want to save the test result, attach a USB storage drive to the server or connect your server to a shared network. For instructions on how to connect to a shared network, refer to [“Configuring network settings” on page 7](#).
2. Click the **Memory Test** tab.

3. Select the test options based on your need, and click **Run** to start testing.

Memory Test Types	Function	Memory Test Settings	Log format	Log save location	Notes
Quick Test	Quick Test is selected as the default test type and it only runs the WriteRead test pattern.	Support	test_ mem_% date%. txt	USB flash drive or website	<ul style="list-style-type: none"> • The mouse pointer is not active during the test process. • After the testing process is completed, the test result will be displayed to show you if the test is passed or failed. • You can press Esc to stop the test.
Full Test	Full Test runs all test patterns and takes a long time to finish.	Support			
Ad- vanced Memory Test	Advanced Memory Test runs complicated data test patterns for memory during UEFI POST. The test time depends on the DIMM configuration. The system will be restarted when running the test, and a dialog will be displayed on the Memory Test page after the test. You can save the logs.	Not Support	test_ adv_ mem_% date%. txt	USB flash drive	/

4. Click **Save** after the testing process is completed if you want to save the test result.

Note: The test result will be saved in a test_mem_%date%.txt file in the USB storage drive or the shared network folder. The file includes more details than the test result displayed on the interface.

Running DCPMM test

To run DCPMM test, do the following:

1. If you want to save the test result, attach a USB storage drive to the server or connect your server to a shared network. For instructions on how to connect to a shared network, refer to [“Configuring network settings” on page 7](#).
2. Click the **DCPMM Test** tab.

Note: The mouse pointer is not active during the testing process.

3. Select one of the following test options according to your need:

- **Select All:** Run the following four test options.
- **Quick diagnostics:** Verify the basic health status for installed DCPMMs.
- **Config diagnostics:** Verify whether the BIOS platform configuration matches the installed hardware or not.
- **FW diagnostics:** Verify the firmware consistency for installed DCPMMs.

Note: This test cannot verify whether the installed firmware is the optimal version or not.

- **Security diagnostics:** Verify the consistent security state for installed DCPMMs.

Note: It is recommended that security setting is enabled for all installed DCPMMs.

4. Click **Save** after the testing process is completed if you want to save the test result.

Note: The test result will be saved in a test_DCPMM_%date%.txt file in the USB storage drive or the shared network folder. The file includes more details than the test result displayed on the interface.

For DCPMMs, the following memory modes are available:

- **App Direct Mode:** In this mode, DCPMMs act as independent and persistent memory resources directly accessible by specific applications, and Dynamic Random Access Memory (DRAM) DIMMs act as system memory.
- **Memory Mode:** In this mode, DCPMMs act as volatile system memory, while any installed DRAM DIMMs act as cache.
- **Mixed Memory Mode:** In this mode, some percentage of DCPMM capacity is directly accessible to specific applications, while the rest serves as system memory.

In App Direct Mode:

- DCPMM test (DCPMM health test) is for DCPMMs.
- Memory test (stress test) is for DRAM DIMMs. The tested memory capacity is the available capacity of DRAM DIMMs.

In Memory Mode and Mixed Memory Mode:

- DCPMM test (DCPMM health test) is for DCPMMs.
- Memory test (stress test) is for DCPMMs. The tested memory capacity is the available capacity of DCPMMs configured as system memory.

Note: It might take a very long time for the DCPMMs memory test processing.

Running disk drive test

To run disk drive test, do the following:

1. If you want to save the test result, attach a USB storage drive to the server or connect your server to a shared network. For instructions on how to connect to a shared network, refer to [“Configuring network settings” on page 7](#).
2. Click the **Disk Drive Test** tab.
3. Select the test options according to your need, and click **Run** to start testing.

Notes:

- **Short Self Test** is selected as the test type by default.
 - The mouse pointer is not active during the testing process.
 - You can press Esc to stop the test.
 - If you are running test for NVMe SSDs, no matter you select **Short Self Test** or **Long Self Test**, the test item only includes the Self-Monitoring, Analysis, and Reporting Technology (SMART) flag status.
4. Click **Save** after the testing process is completed if you want to save the test result.

Notes:

- The test result will be saved in a test_hdd.txt file in the USB storage drive or the shared network folder. The file includes more details than the test result displayed on the interface.
- If two M.2 drives are configured as a RAID array, the drives are not supported in the disk drive test. If you want to use disk drive test function to test the M.2 drives, do not configure them as a RAID array.

Collecting RAID logs

To collect RAID logs, do the following:

1. If you want to save the logs, attach a USB storage drive to the server or connect your server to a shared network. For instructions on how to connect to a shared network, refer to [“Configuring network settings” on page 7](#).



2. Click the **RAID Log** tab.
3. Select the RAID adapter that you want to collect the logs and click **Collect RAID Log** to start the collection.

Note: The mouse pointer is not active during the collecting process.

4. After the collecting process is finished, the summary information for the RAID adapter will be displayed. You can click **View Recent Log** to see the recent logs of the RAID adapter.
5. If you want to save the detailed logs, click **Save Detailed Log**. The collected logs will be saved in three TXT files in the USB storage drive or the shared network folder. The three TXT files include the following information respectively:
 - Basic information about the RAID adapter
 - Firmware logs for troubleshooting
 - Event logs for the RAID adapter

Collecting service data

To collect service data, do the following:

1. Attach a USB storage drive to the server or connect your server to a shared network. For instructions on how to connect to a shared network, refer to [“Configuring network settings” on page 7](#).
2. In the Diagnostics interface, select **Collect Service Data** and click  to collect the service data. The process takes several minutes.
3. When the collecting process completes, click . The collected service data will be saved in a ffdc.tzz file.
4. Select a location to save the file and click **Save**. The ffdc.tzz file will be saved to the USB storage drive or the shared network folder. Provide the file to the Lenovo service personnel for problem determination.

Note: If the USB storage drive is not available in the list, click the refresh button to display it.

Chapter 3. Troubleshooting

This chapter provides information about basic troubleshooting methods to help you solve problems that might occur while using Lenovo XClarity Provisioning Manager.

If you cannot diagnose and solve a problem by using the information in this chapter, go to <http://datacentersupport.lenovo.com> for additional troubleshooting resources. You also can get help and information by telephone through the Customer Support Center. The most up-to-date telephone list for Lenovo Support is always available on the Web site at: <https://datacentersupport.lenovo.com/supportphonenumberlist>

The following table lists typical symptoms you might experience and the suggested actions.

Symptom	Action
The process for installing an operating system continuously loops.	Make more space available on the hard disk drive.
Lenovo XClarity Provisioning Manager cannot start the operating system medium.	Do one of the following: <ul style="list-style-type: none">• Ensure that the disc has no problem.• Ensure that your server can connect to the shared network correctly.• Ensure that the USB installation medium is created correctly. Refer to: http://cn.download.lenovo.com/ibmdl/pub/pc/pccbbs/thinkservers/how_to_create_usb_os_installation_media.pdf
No drive is found in OS Installation → Guided Install → Drive Selection .	Ensure that you have configured a RAID adapter for the server in the RAID Setup interface. For instructions on how to configure a RAID adapter, refer to “RAID Setup” on page 11.

Lenovo