Lenovo XClarity Provisioning Manager V3 User Guide

Version 3.0.3

Server Models

Following are server models supported by LXPM V3:

- Lenovo ThinkAgile: MX3330, MX3331, MX3530, MX3531, and MX450 IS
- Lenovo ThinkEdge SE450
- Lenovo ThinkSystem: SD630 V2, SD650 V2, SD650-N V2, SN550 V2, SR250 V2, SR630 V2, SR645, SR650 V2, SR665, SR670 V2, SR850 V2, SR860 V2, ST250 V2, and ST650 V2

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Contents

Chapter 1. Overview

This chapter provides an overview of the Lenovo XClarity Provisioning Manager V3 program (hereinafter referred to as LXPM V3). 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 V3 Introduction

LXPM V3 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
- Permanently erase all data on storage devices, clear all system logs, and reset the whole system to factory default

Note: When you are using LXPM V3, do not restart Lenovo XClarity Controller (also known as BMC).

Lenovo XClarity Provisioning Manager V3 startup

To start LXPM V3, 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 V3 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 V3 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 V3 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: • **Help**: View context-sensitive help information for each interface. • **HotKey**: View keyboard navigation information. • **Getting Started**: View a brief introduction to LXPM V3, 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 V3 version, copyright, and trademark information.
⤨	Exit LXPM V3 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.
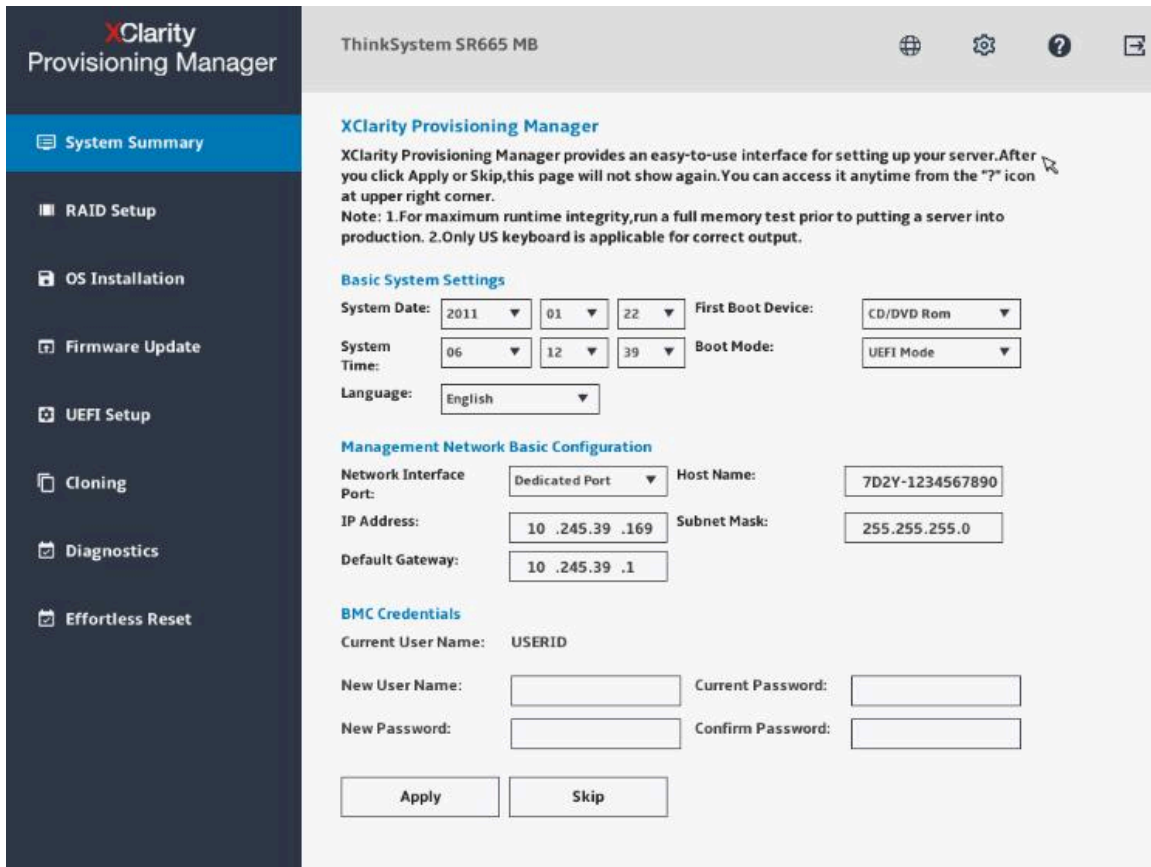
Chapter 2.   Using LXPM V3

This chapter provides information about using LXPM V3.

Getting started

Click ![help icon] on the top right corner of the LXPM V3 main interface; then, click **Getting Started**. The following interface is displayed.

Figure 1. Getting Started interface

In this interface, you can do the following:
- View a general introduction to LXPM V3.
- 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, hostname, 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, input the new user name and the current password, and click **Apply**.

- To modify the password, input the current password and the new password, input the new password again, and click **Apply**.
- To modify the user name and password at the same time, input the new user name, current password, and new password, input 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 LXPM V3 main interface. The following Network Settings window is displayed.
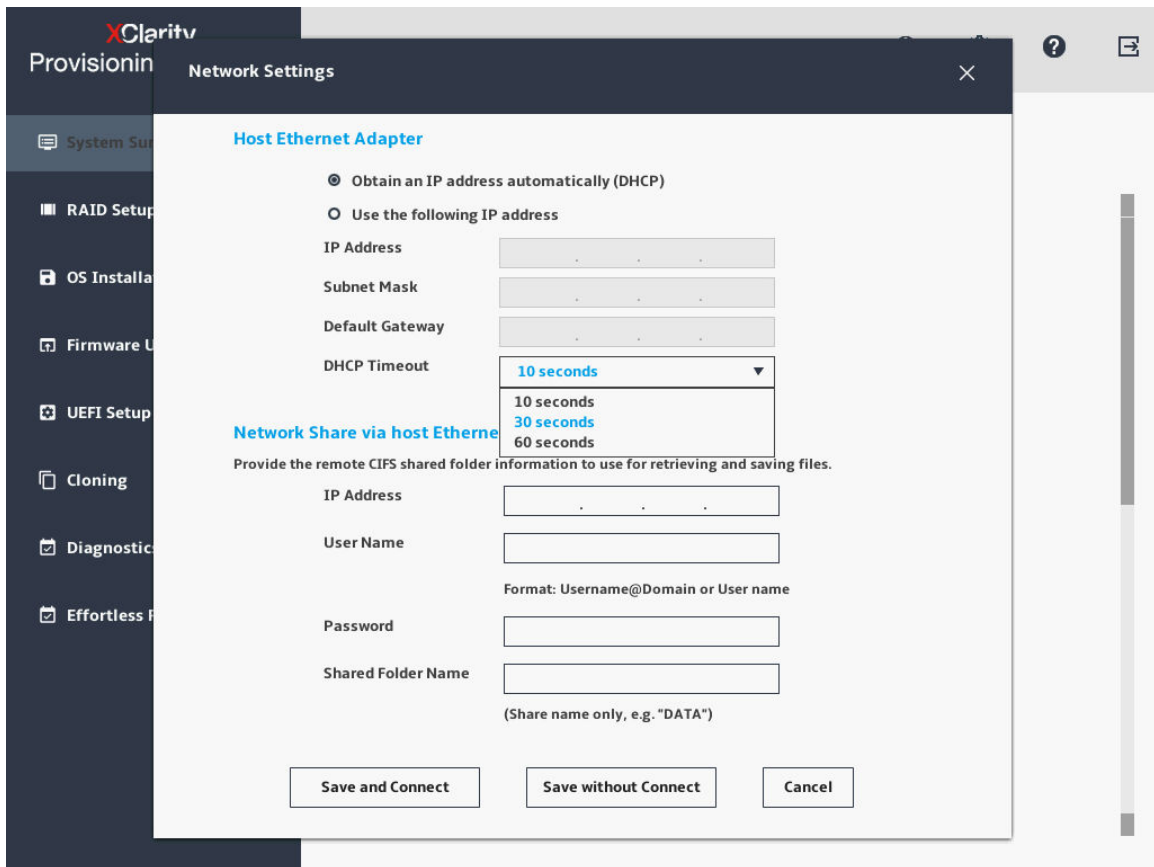
Figure 2. Network Settings window

2. Follow the instructions on the screen to configure the network settings.

   Note: If DHCP fails to obtain IP address, select **30 seconds** or more in the **DHCP Timeout** field.

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 LXPM V3 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
- Partition information
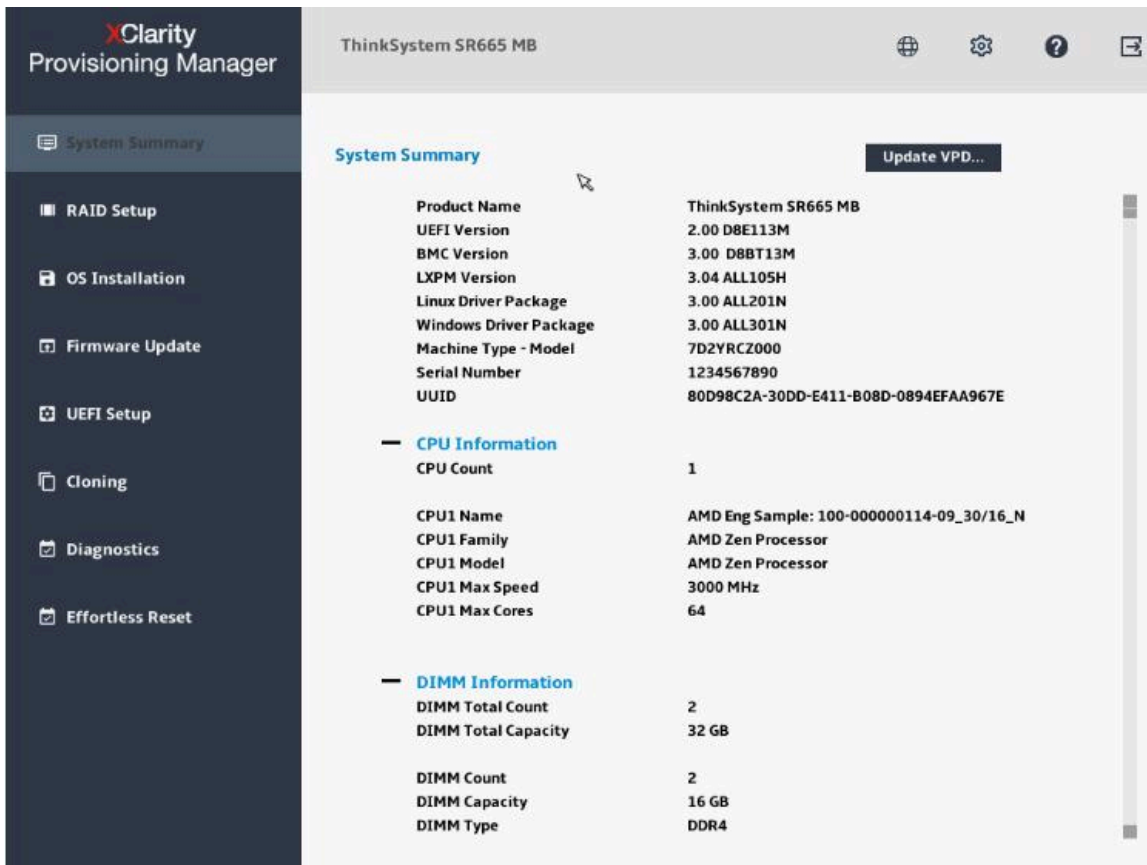
Figure 3. System Summary interface

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.
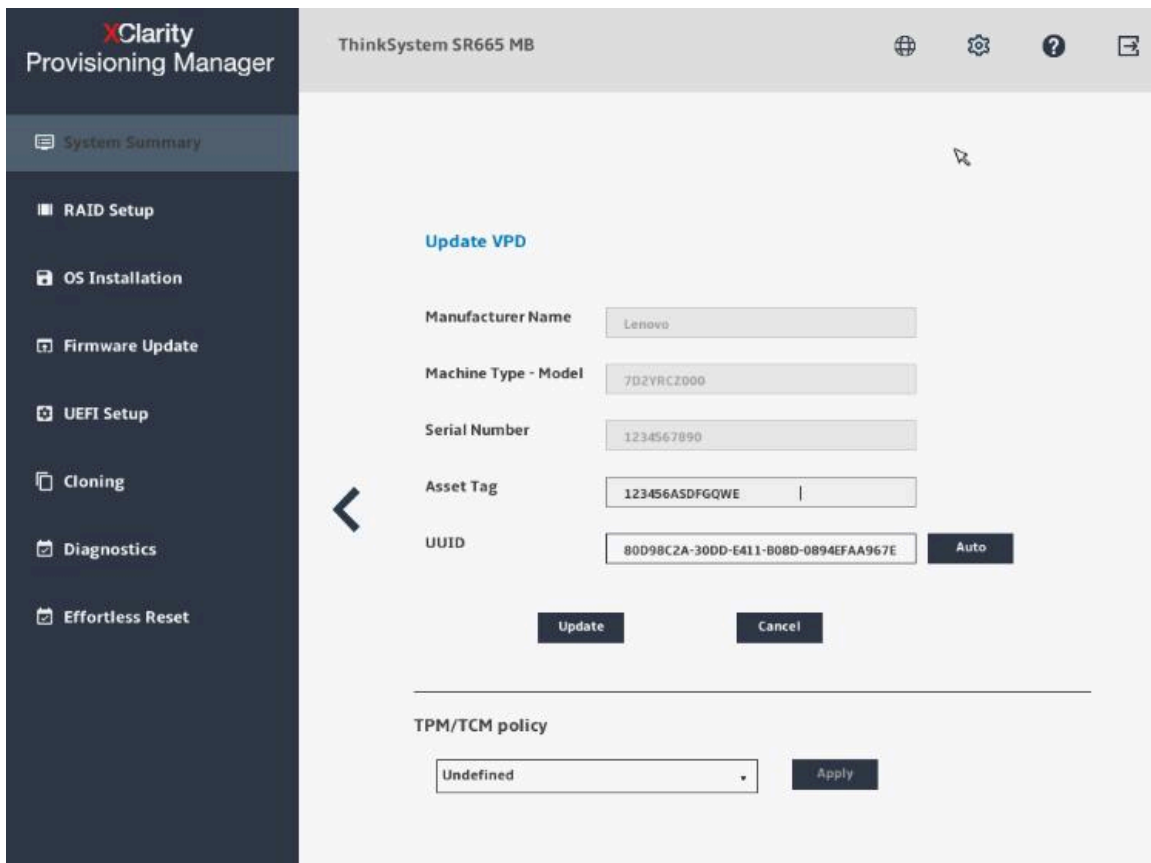
Figure 4. Update VPD

Notes:
- The Non-Volatile Memory express (NVMe) SSDs are recognized as PCIe devices and listed in the PCI device information section.

  Note: This is for servers with AMD processors only.
- 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 should 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.
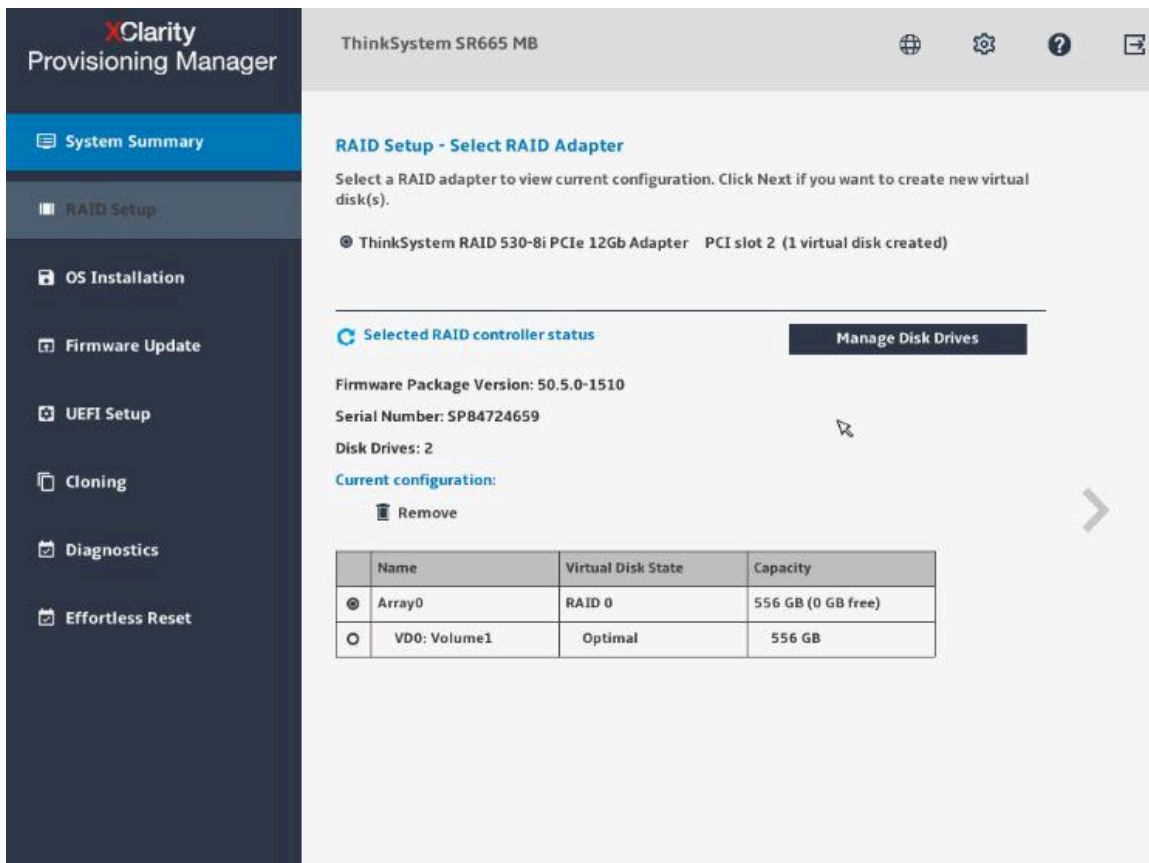
Figure 5. RAID Setup - Select RAID Adapter interface

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.

Note: 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.
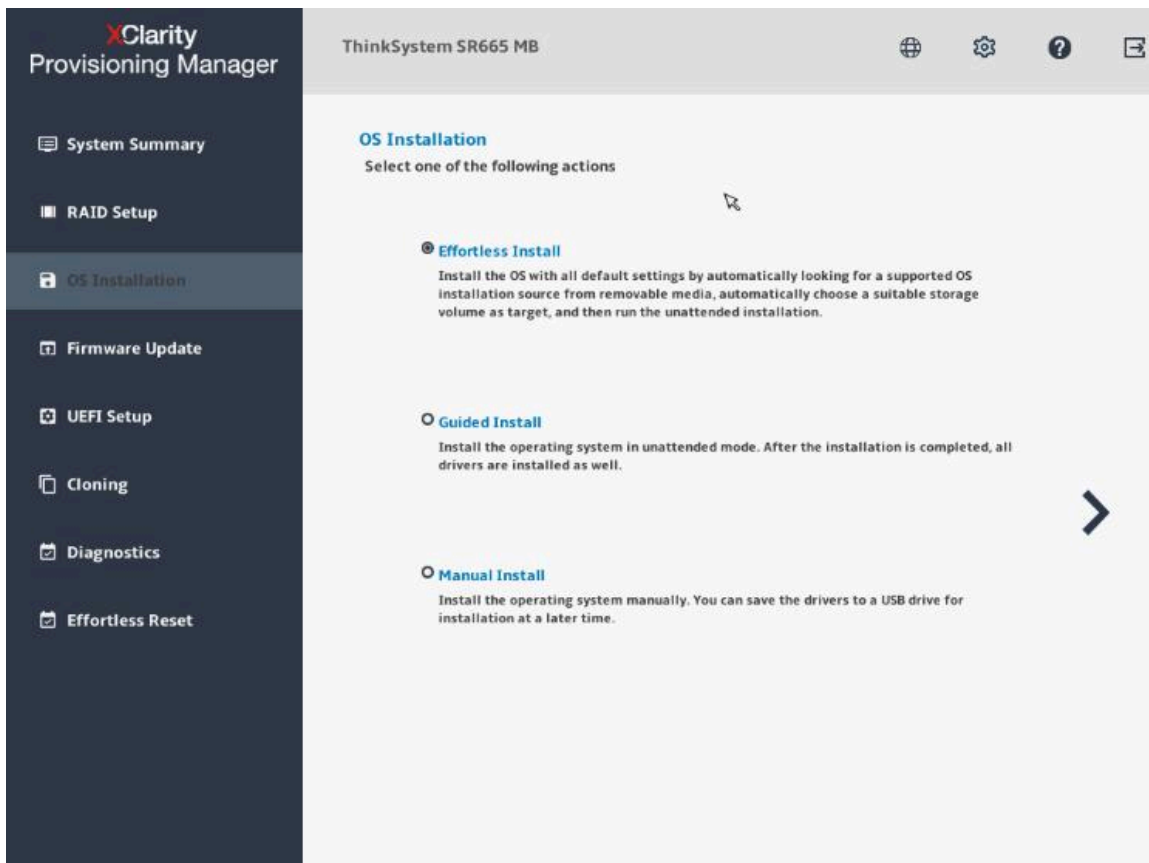
Figure 6. OS Installation interface

There are three types of installation for your selection:
- **Effortless Install**: Automatically detect, choose, and install an operating system and device drives with all default settings in an unattended mode.
- **Guided Install**: Install an operating system and device drivers in an unattended mode.
- **Manual Install**: Install an operating system and device drivers manually.

Note: 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.

Effortless Installation

Prerequisites

Ensure that the minimum space of the target storage device for installing the OS meets the following requirements:
- For Windows/VMware OS, the minimum space should be 10 GB.
- For Red Hat Enterprise Linux (RHEL)/SUSE Linux Enterprise Server (SLES) OS, the minimum space should be 24 GB.

Before performing effortless installation:
- Ensure that the boot mode is preset by doing one of the following:
  - Click ❓ on the top right corner of the LXPM V3 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 connected, you can prepare the operating system installation files through Lenovo XClarity Controller.

Performing effortless installation

In the OS Installation interface, select **Effortless Install** and click . Refer to one of the following to install an operating system:
- "Installing a Windows operating system" on page 13
- "Installing an RHEL operating system" on page 16
- "Installing an SLES operating system" on page 17
- "Installing a VMware operating system" on page 18

Notes:
- The default Administrator password for installing a Windows operating system is "PASSW0RD".
- The default root password for installing an RHEL/SLES/VMware operating system is "1234567".
- Users should reset the password when logging in to the operating system for the first time.

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.

Note: For the information about the operating system compatibility, refer to https://lenovopress.com/osig.

1. Verify that the installation settings are correct, and click .
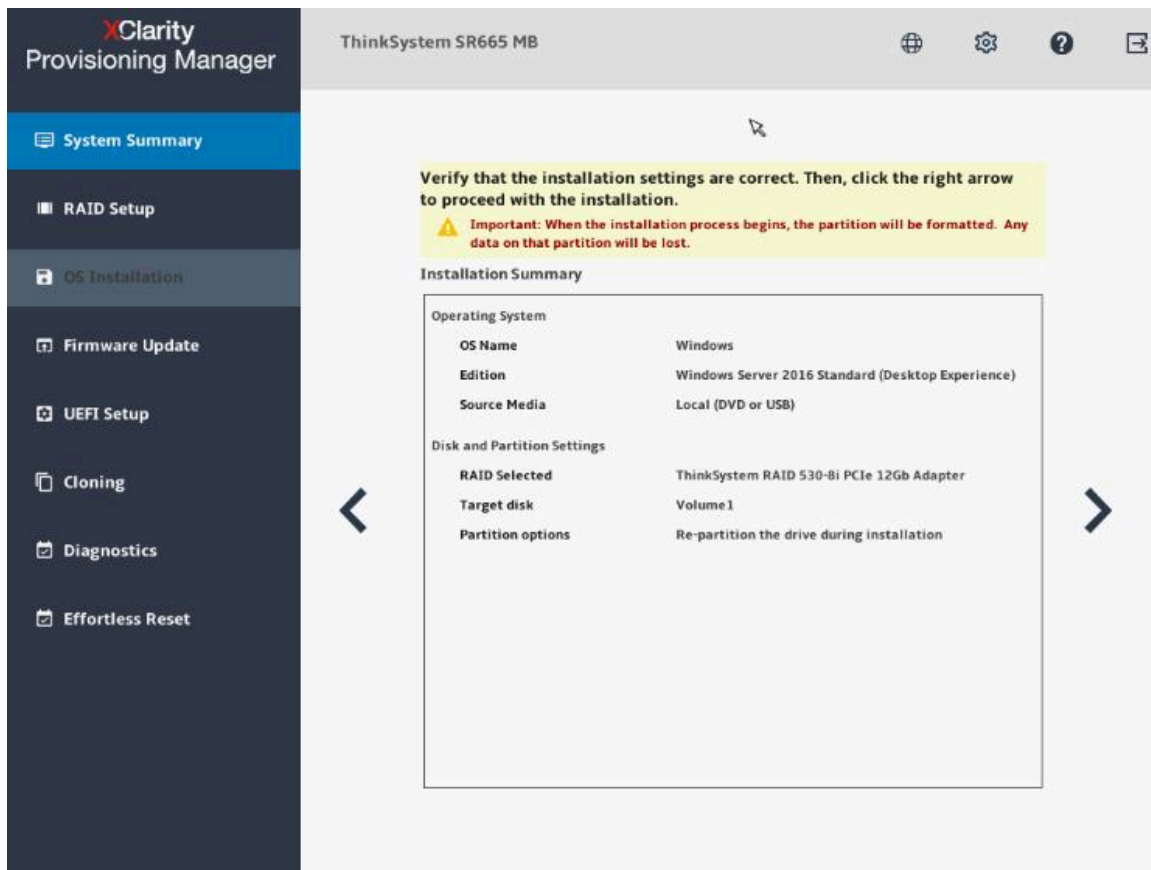
Figure 7. Installation Summary

2. Wait for several minutes, the Windows Setup window is displayed. Do one of the following based on your needs:
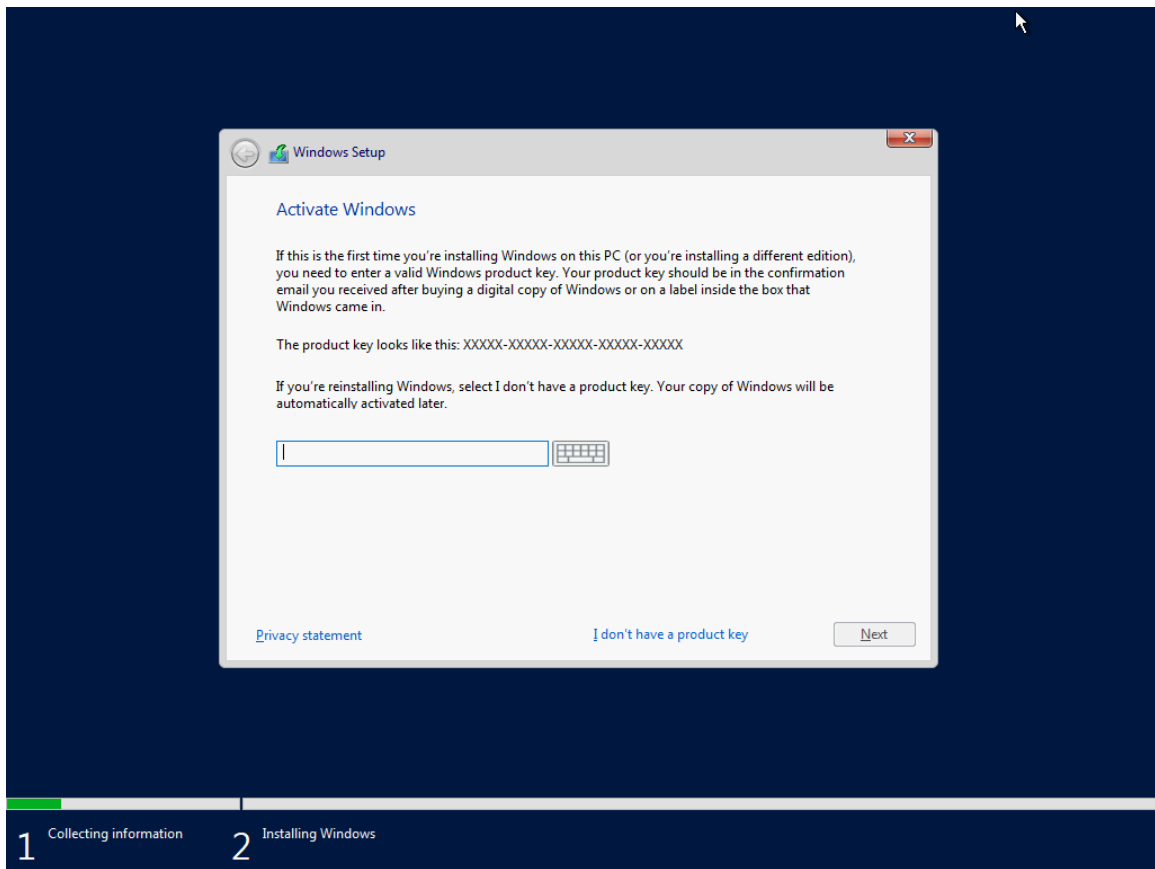
Figure 8. Activate Windows

- If you have a valid Windows product key, input the product key and click **Next** to start installation.
- If you don't have a valid Windows product key, click **I don't have a product key** to start installation.
3. After the installation procedure is completed, wait for several minutes, LXPM will be automatically restarted to make all installed drivers take effect.

Installing an RHEL 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 an RHEL operating system.

1. Verify that the installation settings are correct, and click ❯ to start installation.
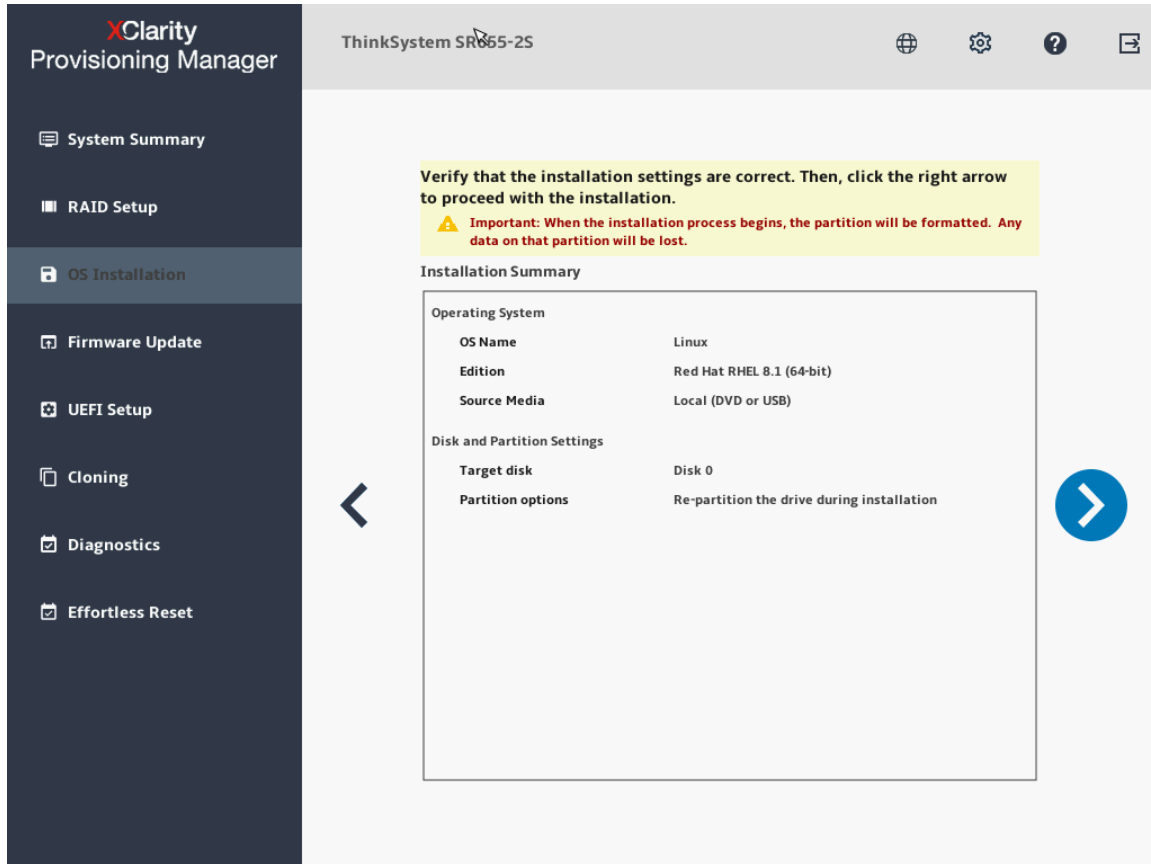
Figure 9. Installation Summary

2. Wait for several minutes until the installation procedure is completed. LXPM will be automatically restarted to make all installed drivers take effect.
3. Input user name and password, and click **Sign in** to enter into RHEL.

Installing an SLES 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 SLES operating system.

1. Verify that the installation settings are correct, and click ❯ to start installation.
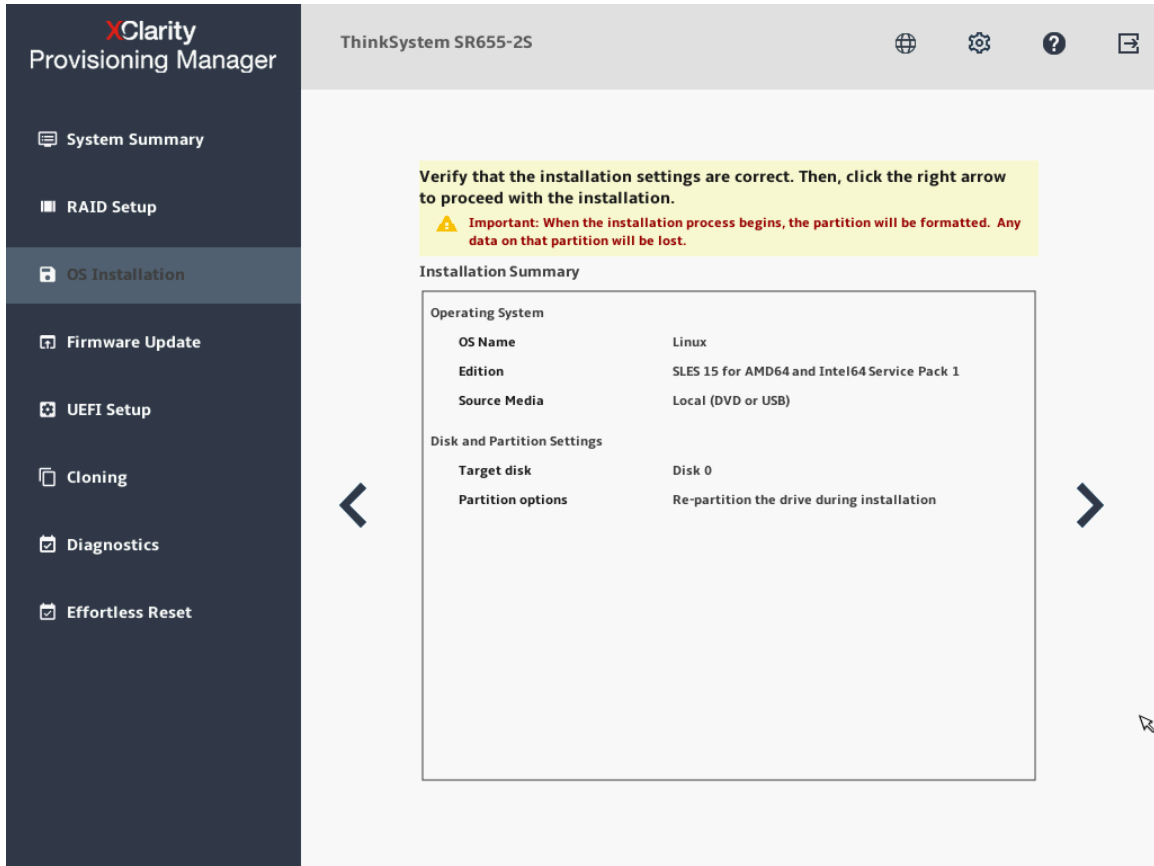
Figure 10. Installation Summary

2. Wait for several minutes until the installation procedure is completed. LXPM will be automatically restarted to make all installed drivers take effect.
3. Input user name and password, and click **Sign in** to enter into SLES.

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. Verify that the installation settings are correct, and click ❯ to start installation.
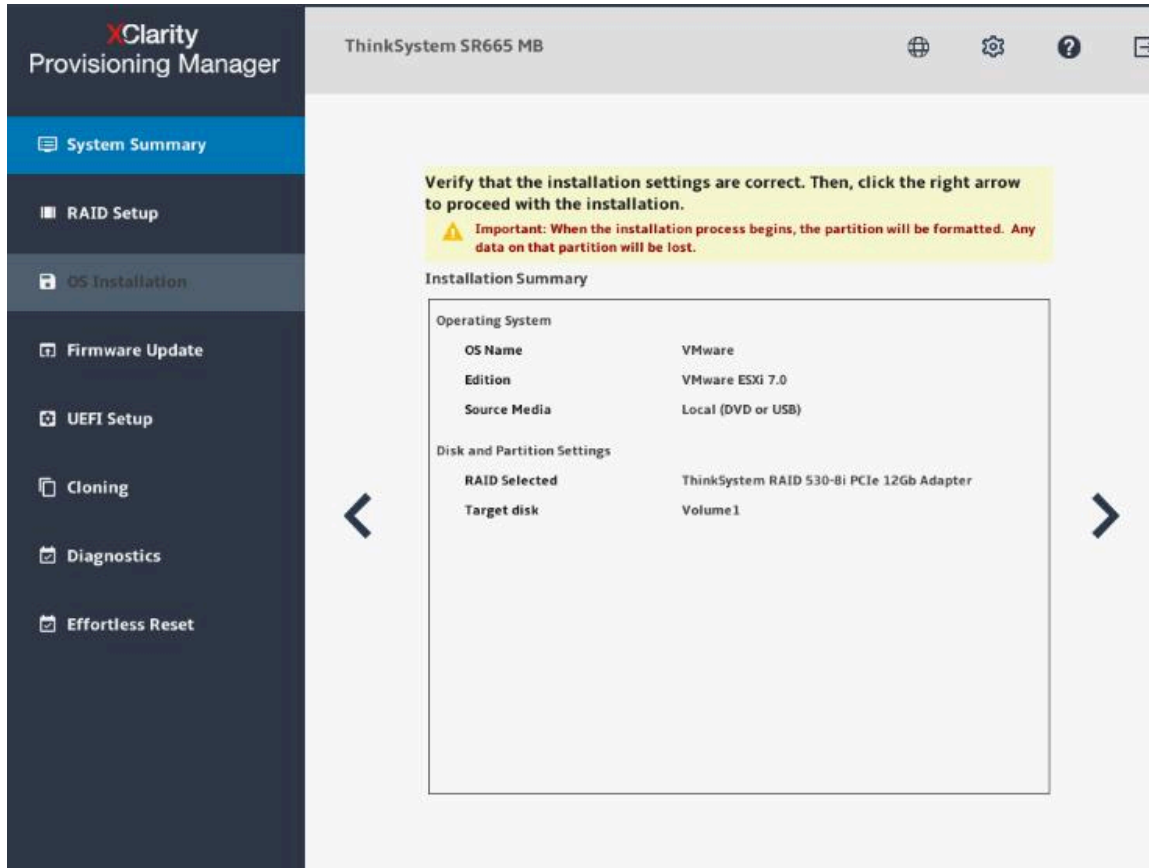
Figure 11. Installation Summary

2. Wait for several minutes until the installation procedure is completed. LXPM will be automatically restarted to make all installed drivers take effect.

   Note: If a warning window is displayed, press Enter to continue or just wait for several minutes and the installation will continue automatically.
3. When the VMware interface is displayed, press F2, input the authorized login name and password for local host, and press Enter to enter into VMware.

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 LXPM V3 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 connected, you can prepare the operating system installation files through Lenovo XClarity Controller. 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.

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 19
- "Installing a Linux operating system" on page 26
- "Installing a VMware operating system" on page 32

Device drivers will be automatically installed during guided installation. It's recommended to reboot the OS after the 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 36.

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.

Note: For the information about the operation system compatibility, refer to https://lenovopress.com/osig.
  1. **Drive Selection**
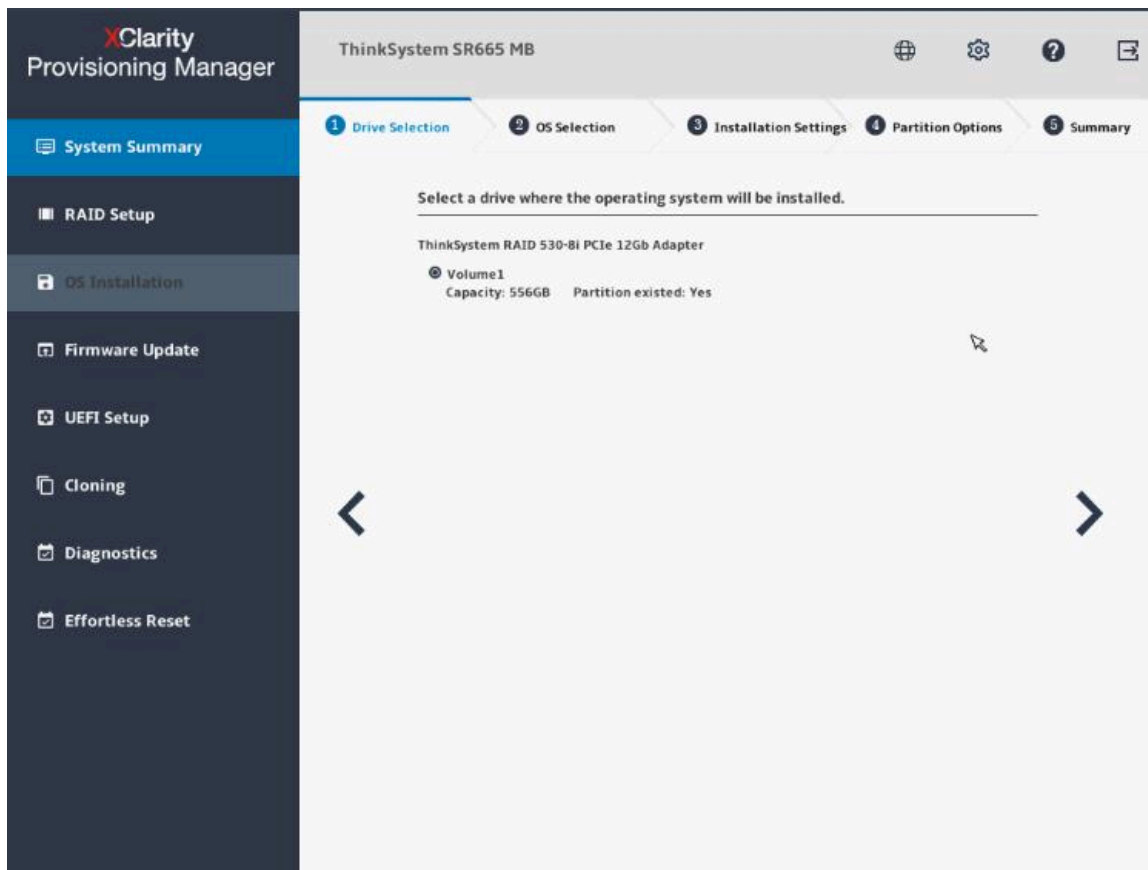
Figure 12. Drive Selection step (for Windows)

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.
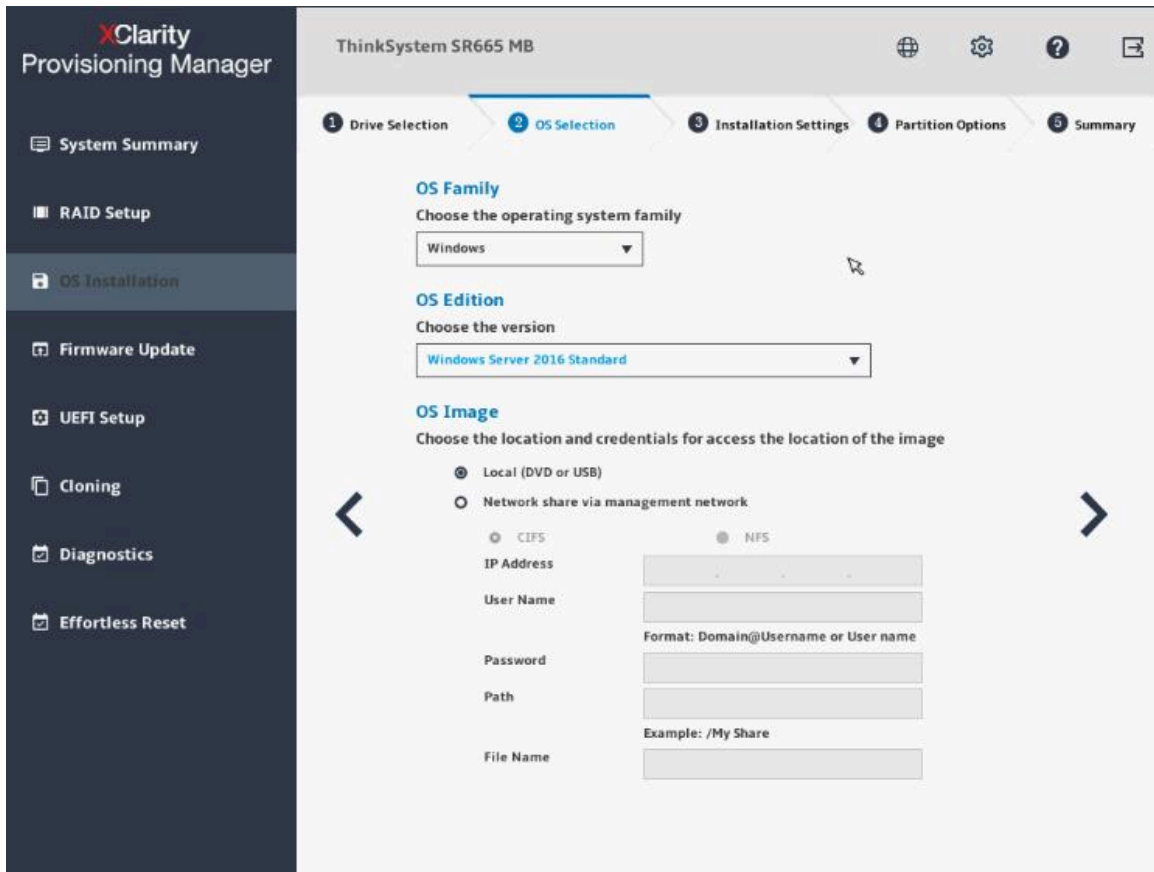
2. **OS Selection**

Figure 13. 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**
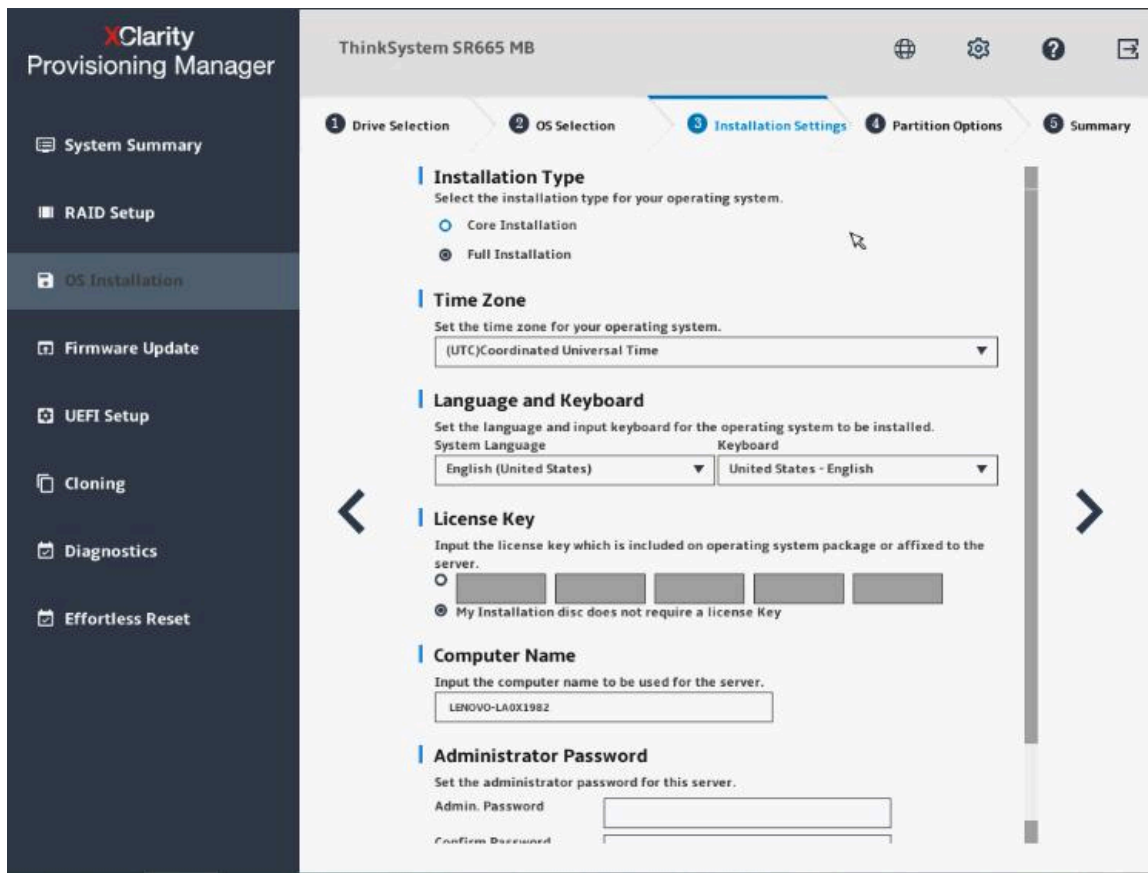
Figure 14. Installation Settings step – 1 (for Windows)

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**.
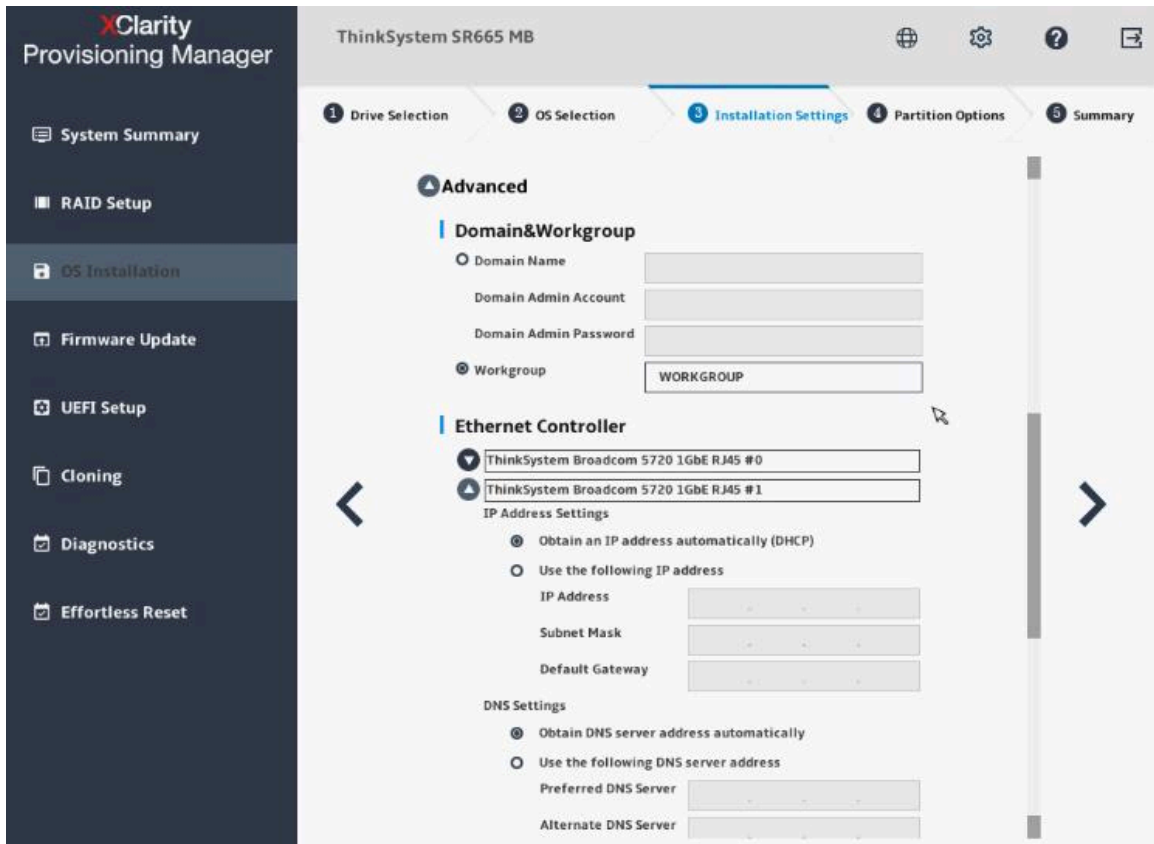
Figure 15. Installation Settings step – 2 (for Windows)

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
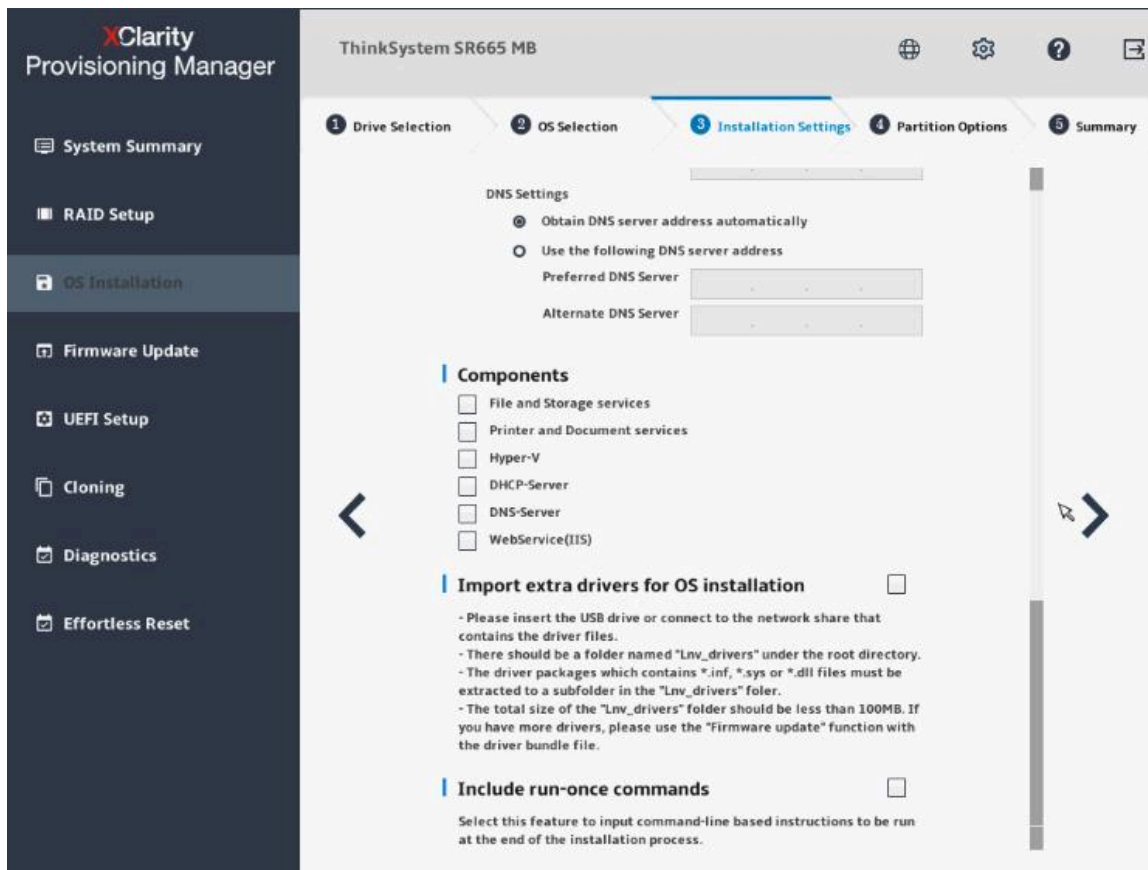
Figure 16. Installation Settings step – 3 (for Windows)

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. Input 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**
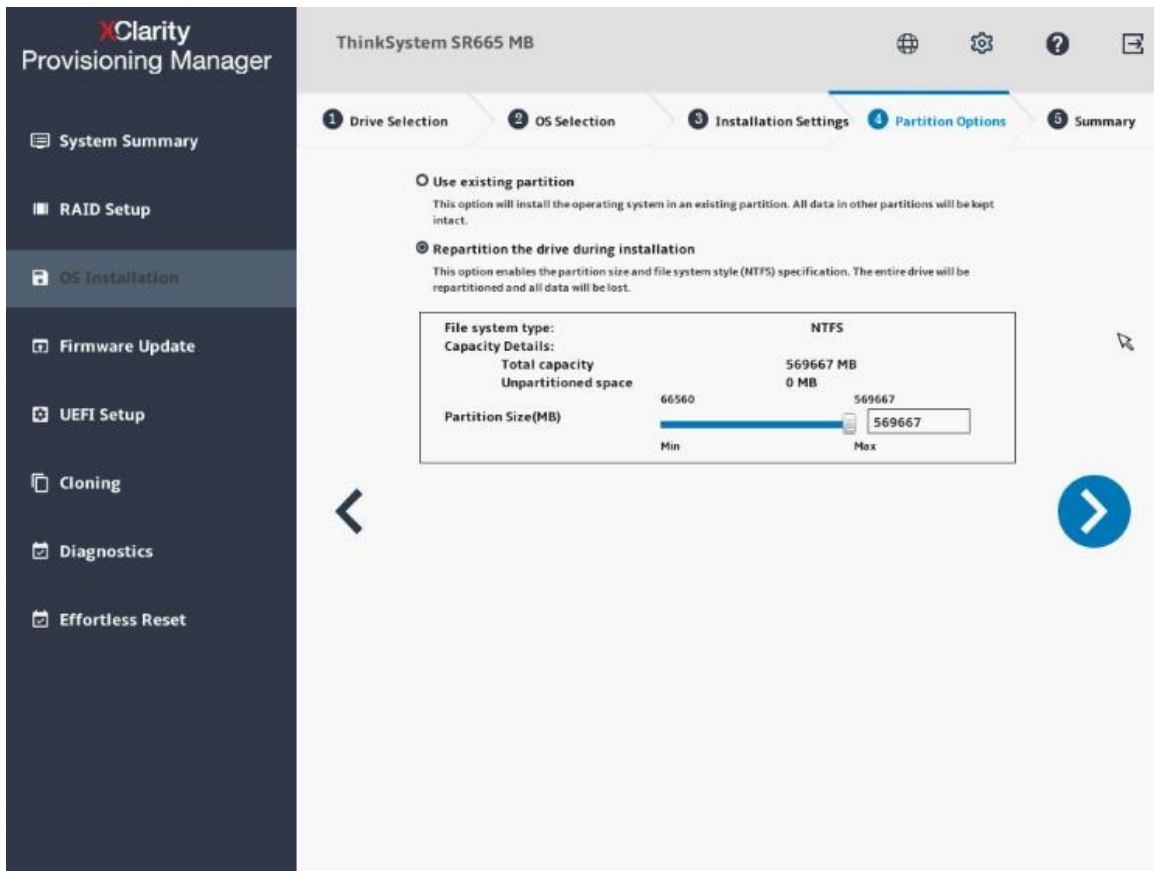
Figure 17. Partition Options step (for Windows)

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

5. **Summary**
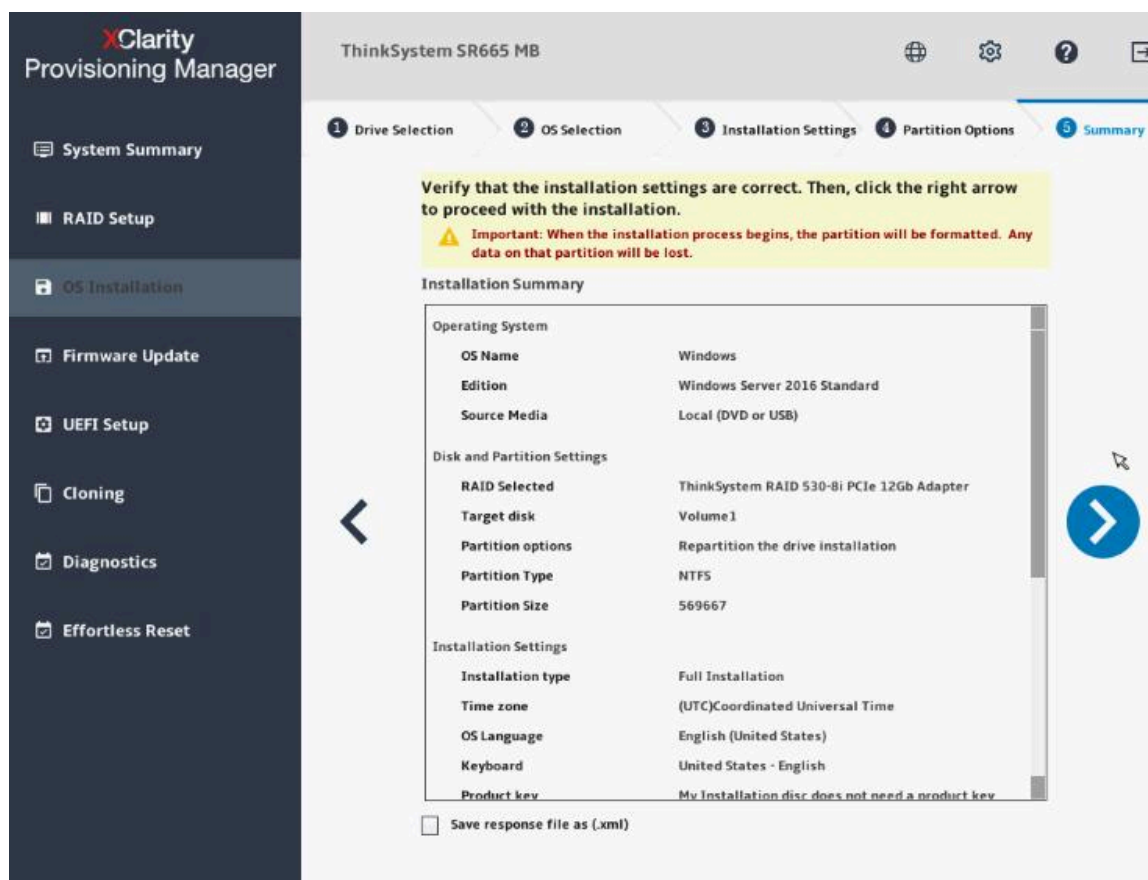
Figure 18. Summary step (for Windows)

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 36.

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 is completed.

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.

Notes:
- For the information about the operating system compatibility, refer to https://lenovopress.com/osig.
- The CentOS Linux operating systems can be installed on the server successfully. However, Lenovo servers provide only hardware-level support for CentOS.

For servers with AMD processors, if installed with SUSE Linux Enterprise Server 15.1 operating system, two image files are included: `Installer DVD` and `Packages DVD`. The image files are: `SLE-15-SP1-Installer-DVD-x86_64-GM-DVD1.iso` and `SLE-15-SP1-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 19. 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 20. 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 21. 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**.
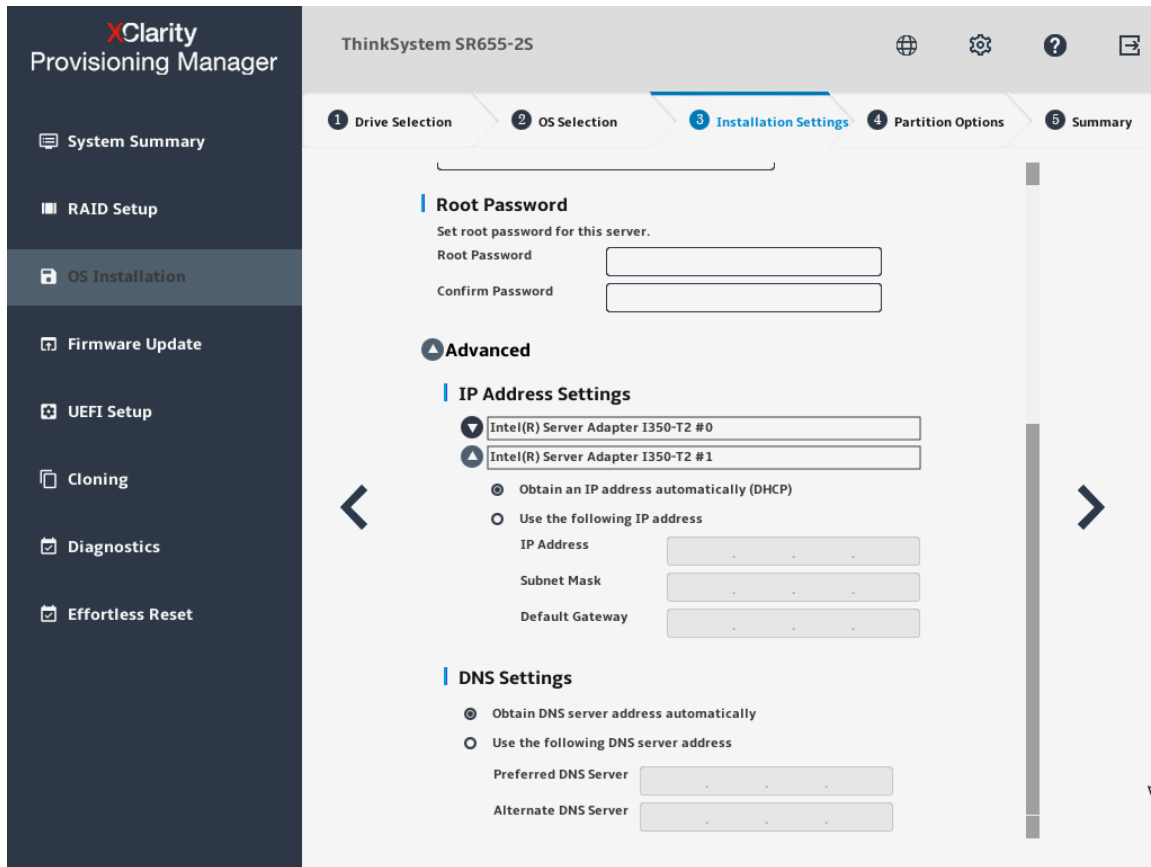
Figure 22. Installation Settings step – 2 (for Linux)

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**
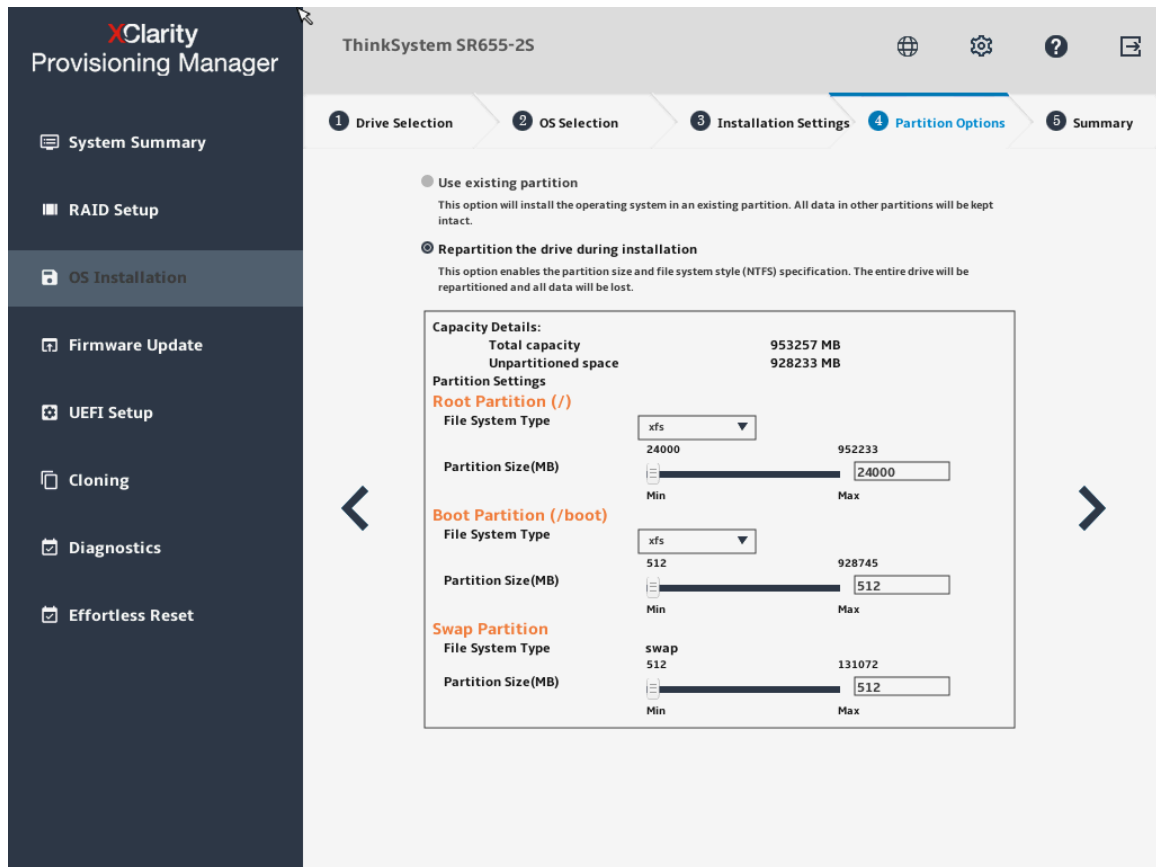
Figure 23. Partition Options step (for Linux)

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 on hard disk drives, and has slower access speed than RAM.

5. **Summary**
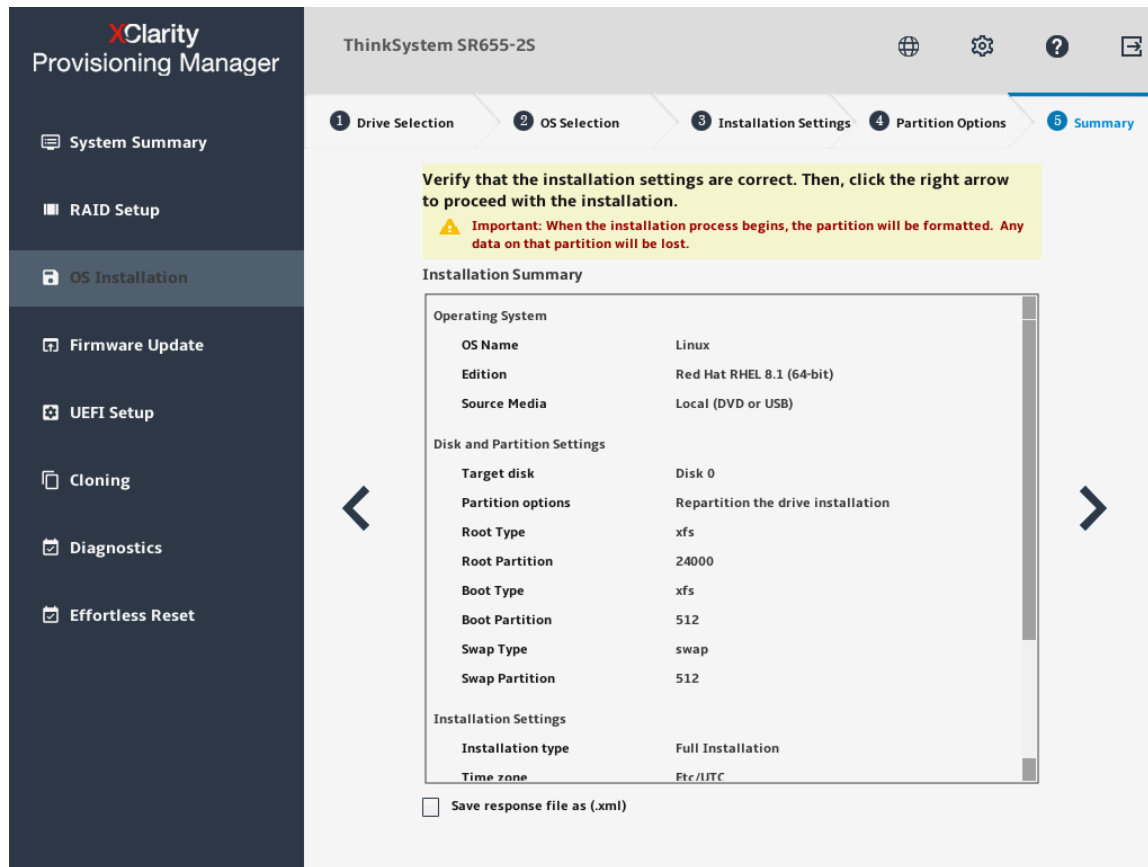
Figure 24. Summary step (for Linux)

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 36.

Click . The installation process starts. Wait until the installation is completed.

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.
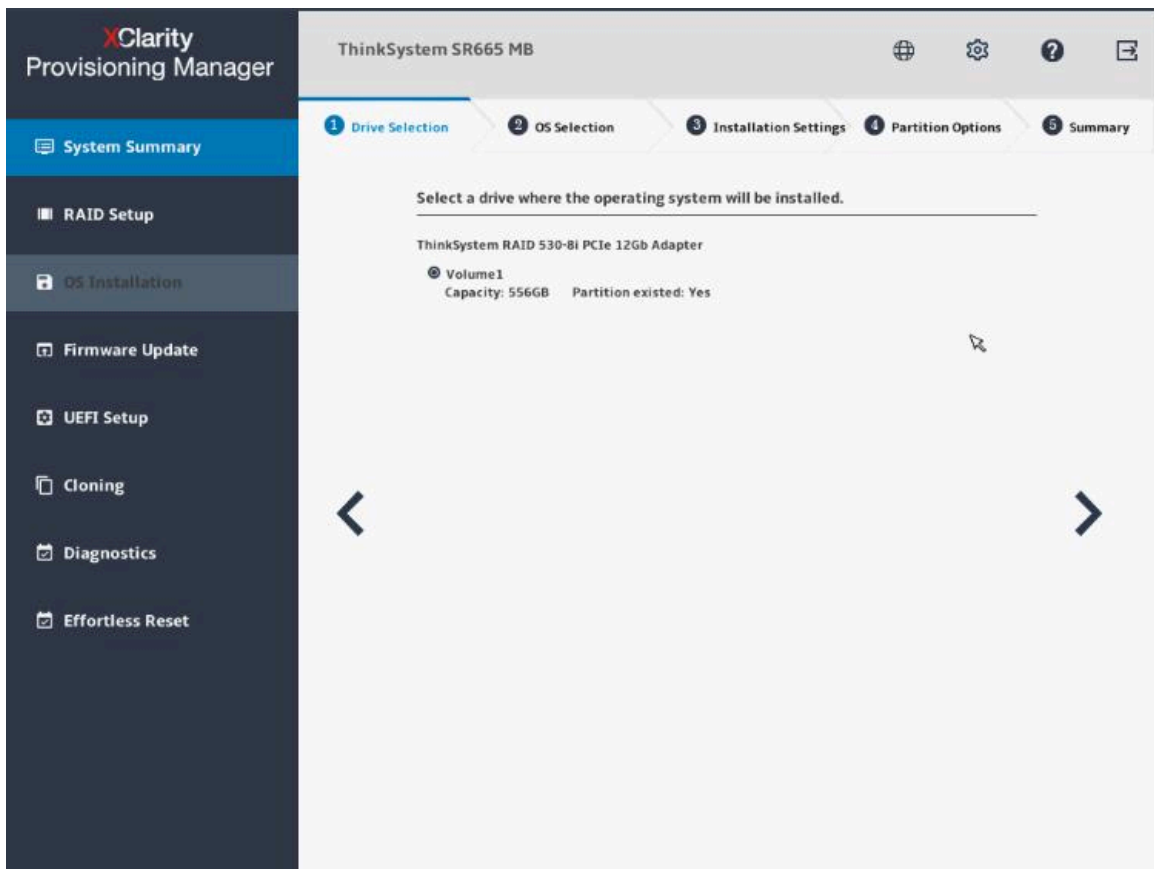
1. **Drive Selection**
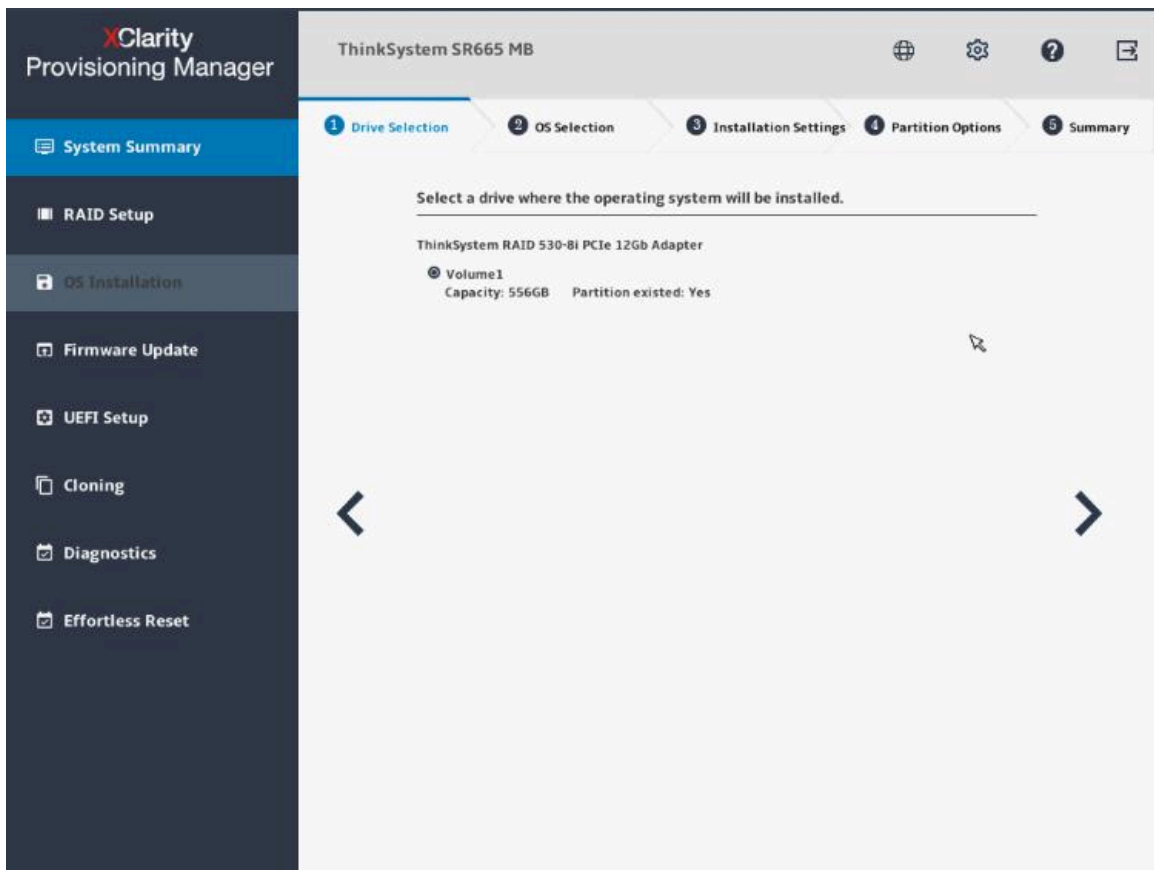
Figure 25. Drive Selection step (for VMware)

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.
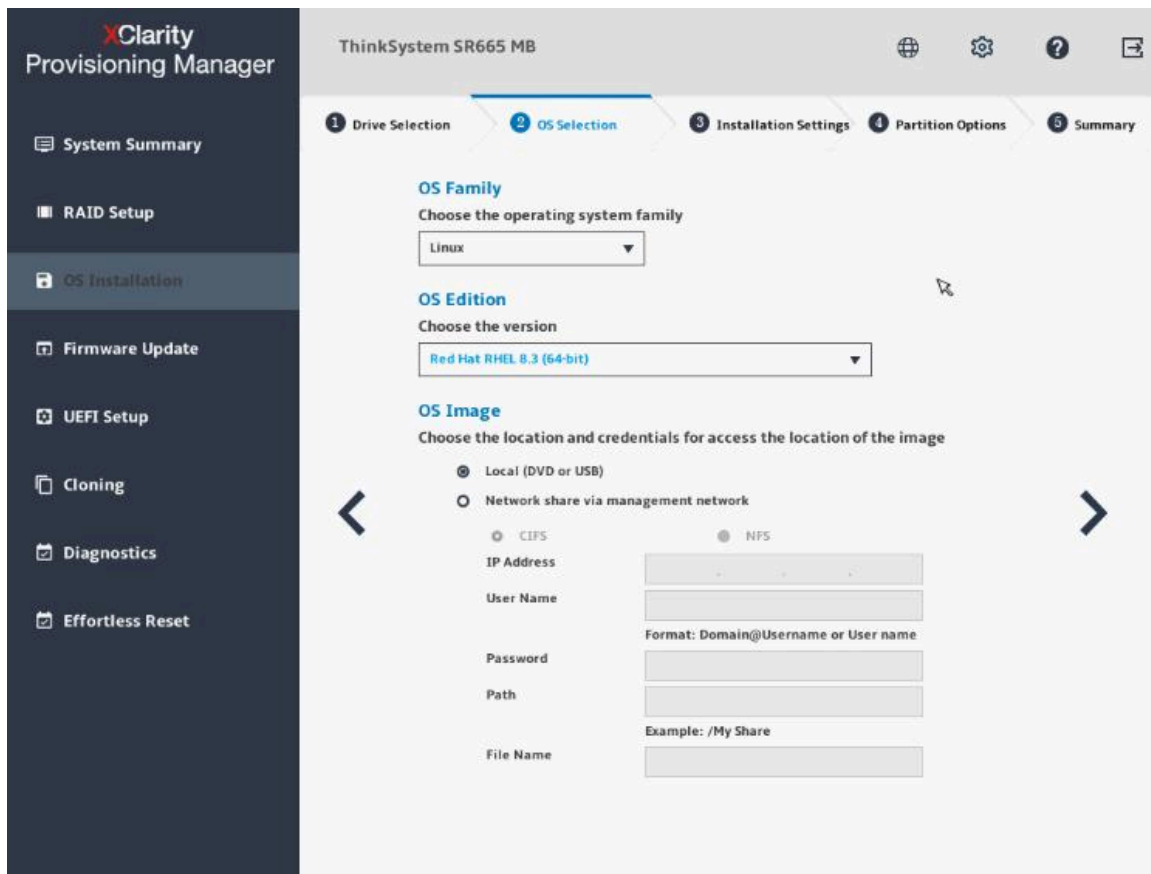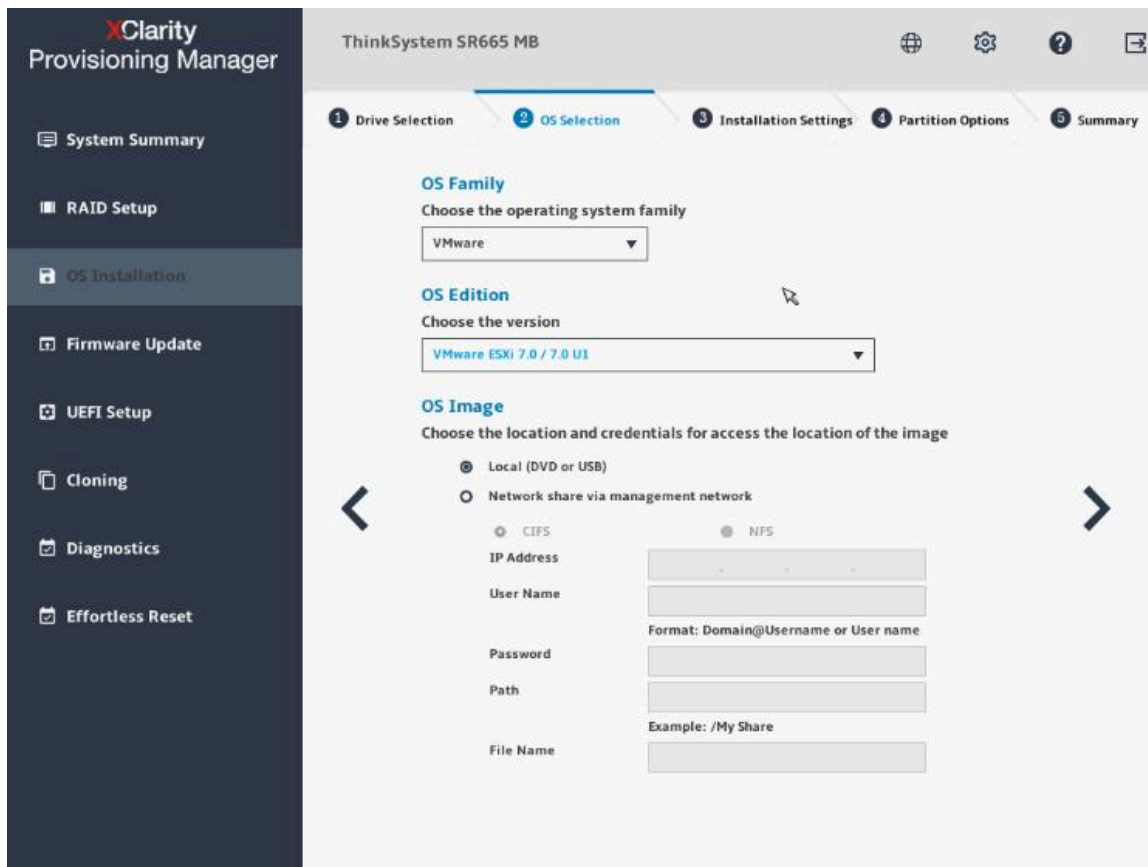
2. **OS Selection**

Figure 26. 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**
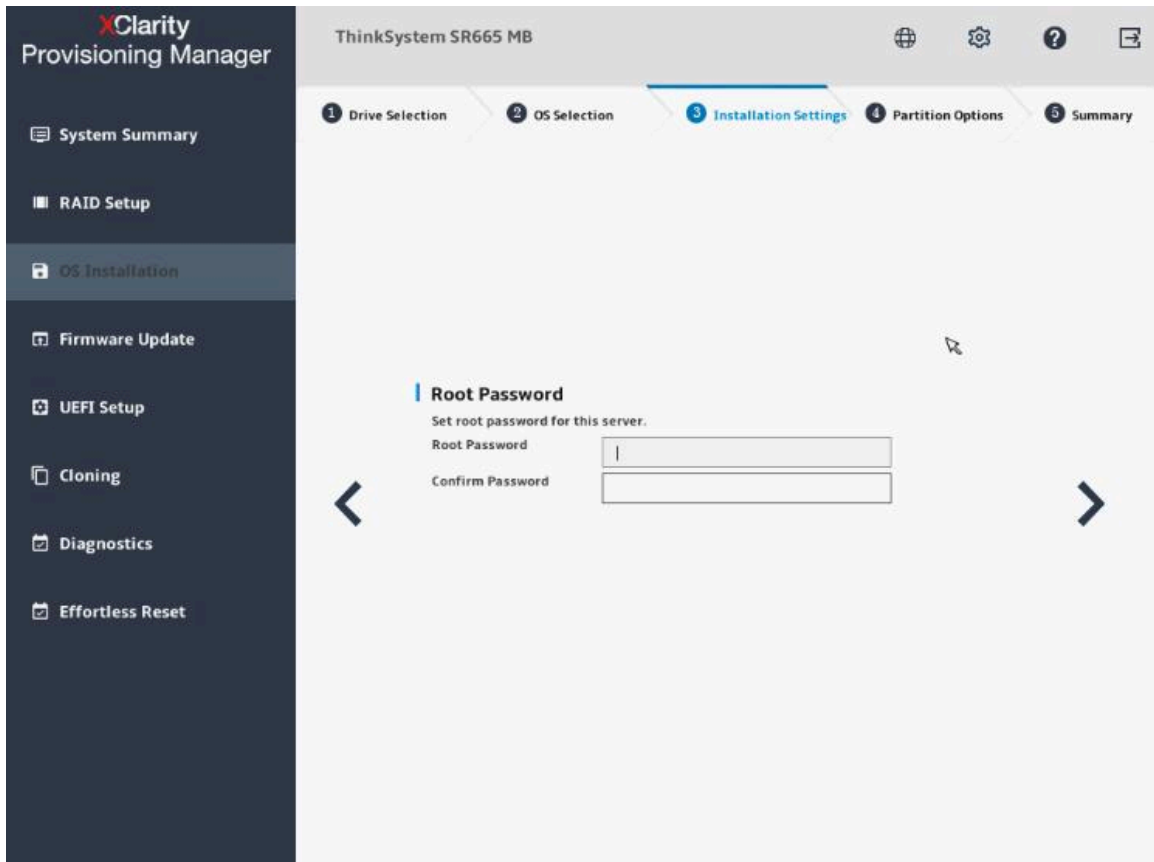
Figure 27. Installation Settings step for VMware)

Root Password: You can change your root password later from the operating system.
4. **Summary**
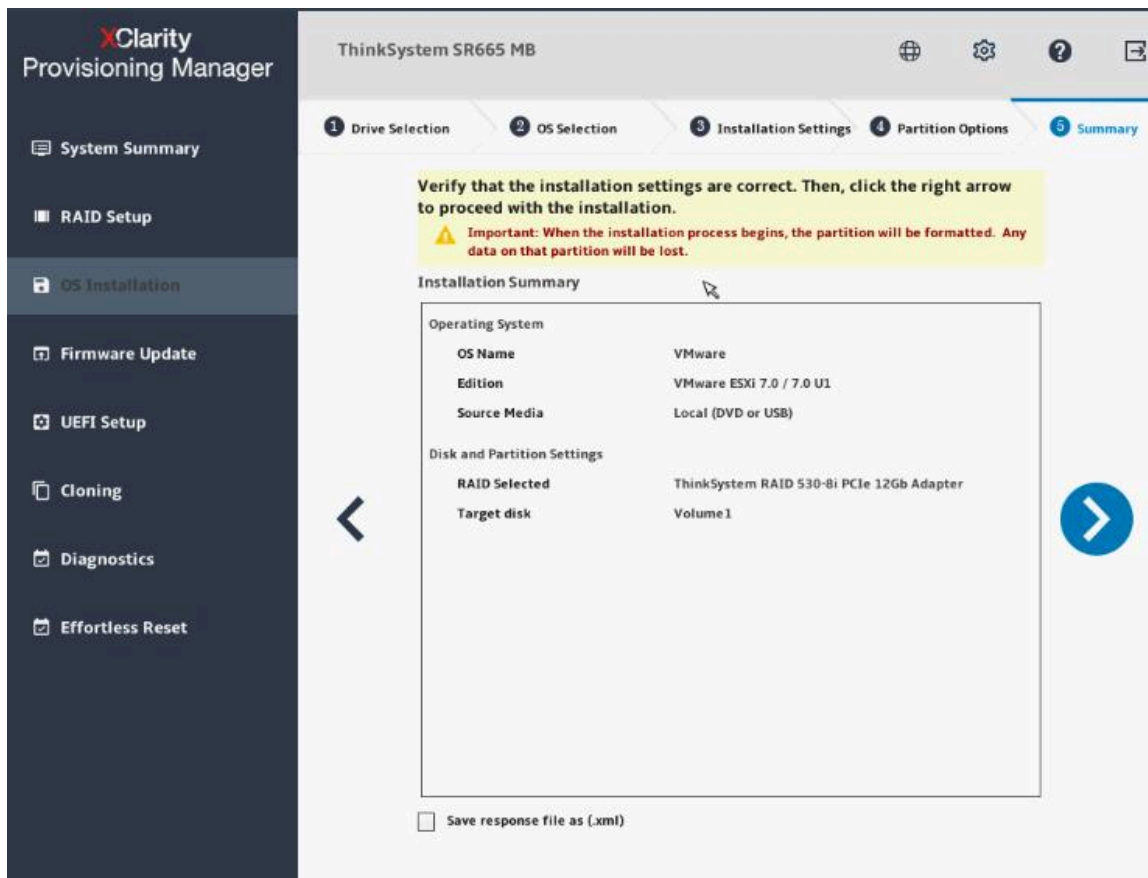
Figure 28. Summary step (for VMware)

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 36.

Click ❯. The installation process starts. Wait until the installation is completed.

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 boot mode is preset by doing one of the following:
    – Click ❓ on the top right corner of the LXPM V3 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:
      https://download.lenovo.com/servers_pdf/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 connected, you can prepare the operating system installation files through Lenovo XClarity Controller.

Installing an operating system manually

In the OS Installation interface, select **Manual Install** and click ❯. The following interface is displayed.
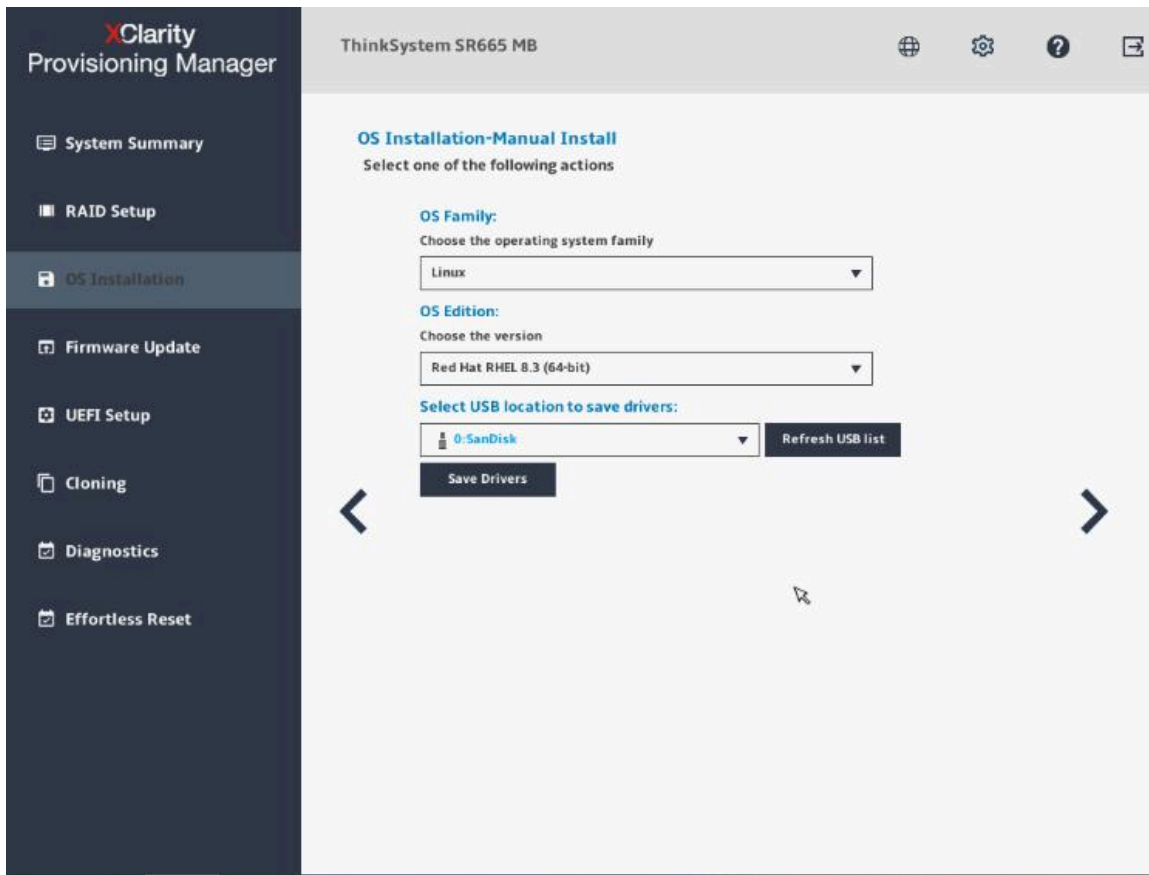
Figure 29. Manual Install interface

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 **Documentation**.
   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, LXPM V3, Windows drivers, and Linux drivers for your server in the Firmware Update interface. To download the update packages, go to: http://datacentersupport.lenovo.com.
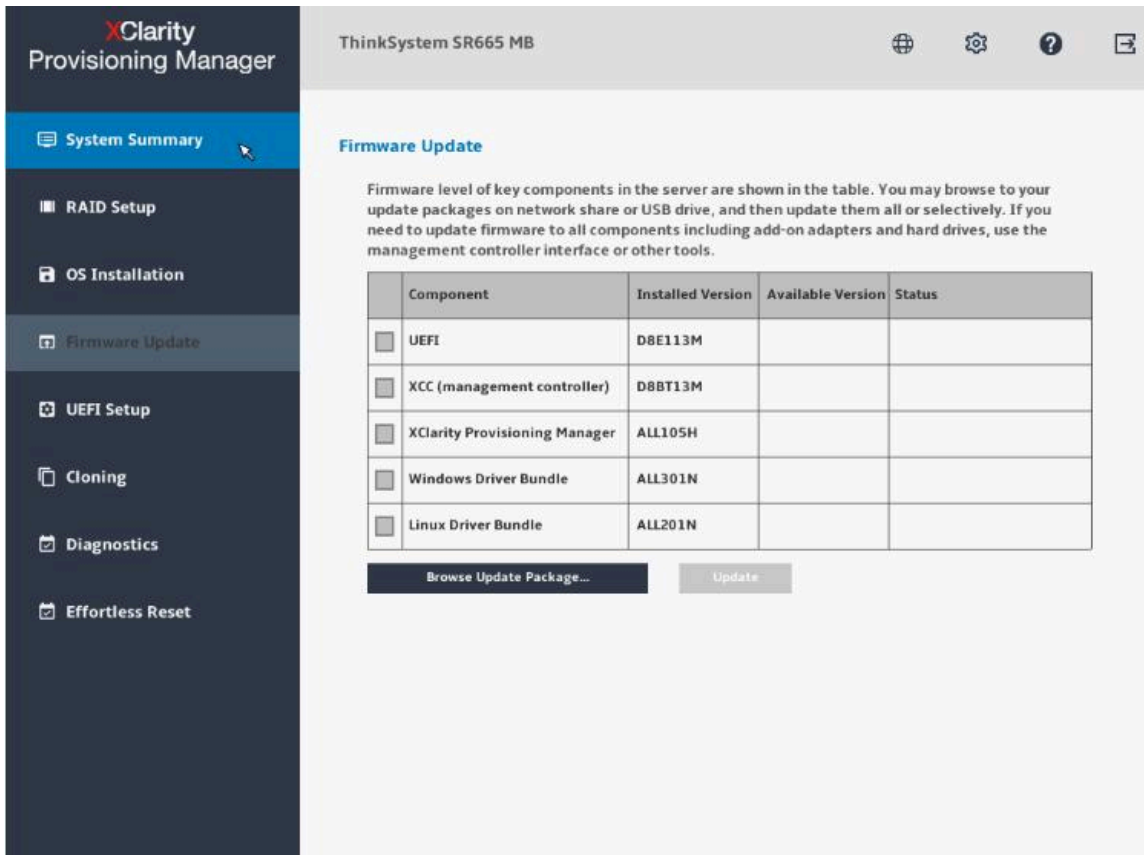
Figure 30. Firmware Update interface

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 LXPM V3, 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.
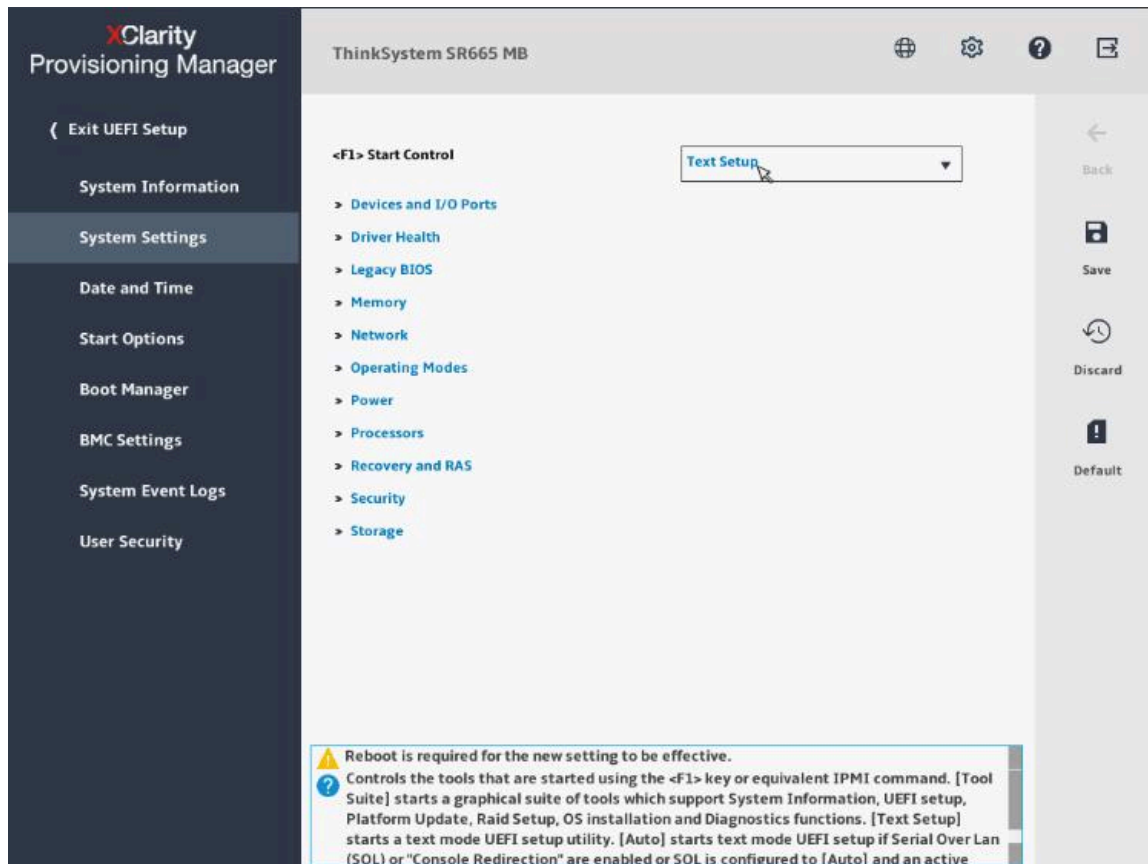
Figure 31. UEFI Setup interface

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. For more information about UFEI, refer to UEFI manual for ThinkSystem server.

Intel Optane Persistent Memory (PMEM) management

PMEMs can be managed in the UEFI Setup interface. Go to **UEFI Setup → System Settings → Intel Optane PMEMs** to configure and manage PMEMs.
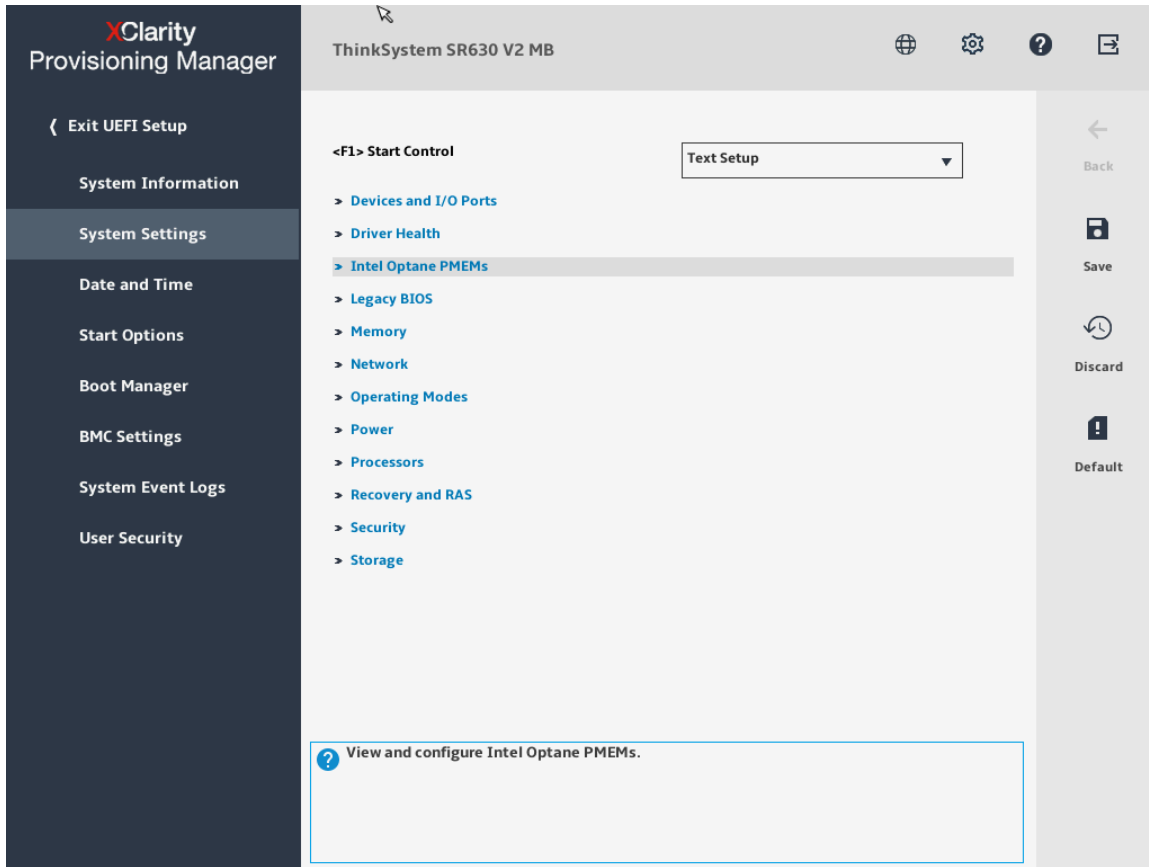
Figure 32. PMEM management

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:
• **PMEM details**

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

  – Firmware version
  – Configuration status
  – Raw capacity
  – Memory capacity

- App Direct capacity
- Unconfigured capacity
- Inaccessible capacity
- Reserved capacity
- Percentage remaining
- Security state
- Master Passphrase Status
- **Goals**
  - **Memory Mode [%]**

    Select this option to define the percentage of PMEM capacity that is invested in system memory, and hence decide the PMEM mode:
    - **0%:** App Direct Mode
    - **100%:** Memory Mode

    Go to **Goals ➔ Memory Mode [%]**, select the memory percentage, 0 or 100%, and reboot the system.

    Notes:
    - Before changing from one mode to another:

      1. Make sure the capacity of installed PMEMs 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 PMEMs. 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 PMEMs ➔ 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 PMEM settings, and do not represent the current PMEM status.
  - **Persistent Memory Type**

    In App Direct Mode, the PMEMs 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 PMEMs ➔ Goals ➔ Persistent Memory Type**, select **App Direct Not Interleaved** and reboot the system.

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

  You can create, delete and view namespaces here. To create a namespace, define the name of namespace, select a Region ID and set the capacity value (GB). Then, it becomes a persistent space. To delete a namespace, select the namespace and delete it.
- **Security**

  - Enable Security

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

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

   Notes:
   - Single PMEM 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 PMEMs 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 PMEMs enter "exceeded" state with a system warning message, and the PMEM 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 PMEMs 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 PMEM unit, including encrypted one. This data deletion method is recommended before returning or disposing a malfunctioning unit, or changing PMEM mode. To perform secure erase, go to **Security ➙ Press to Secure Erase**.
• **PMEM Configuration**

PMEM 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 PMEM diagnostics (see). To adjust the selectable percentage that the warning message requires, go to **Intel Optane PMEMs ➙ PMEM 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.
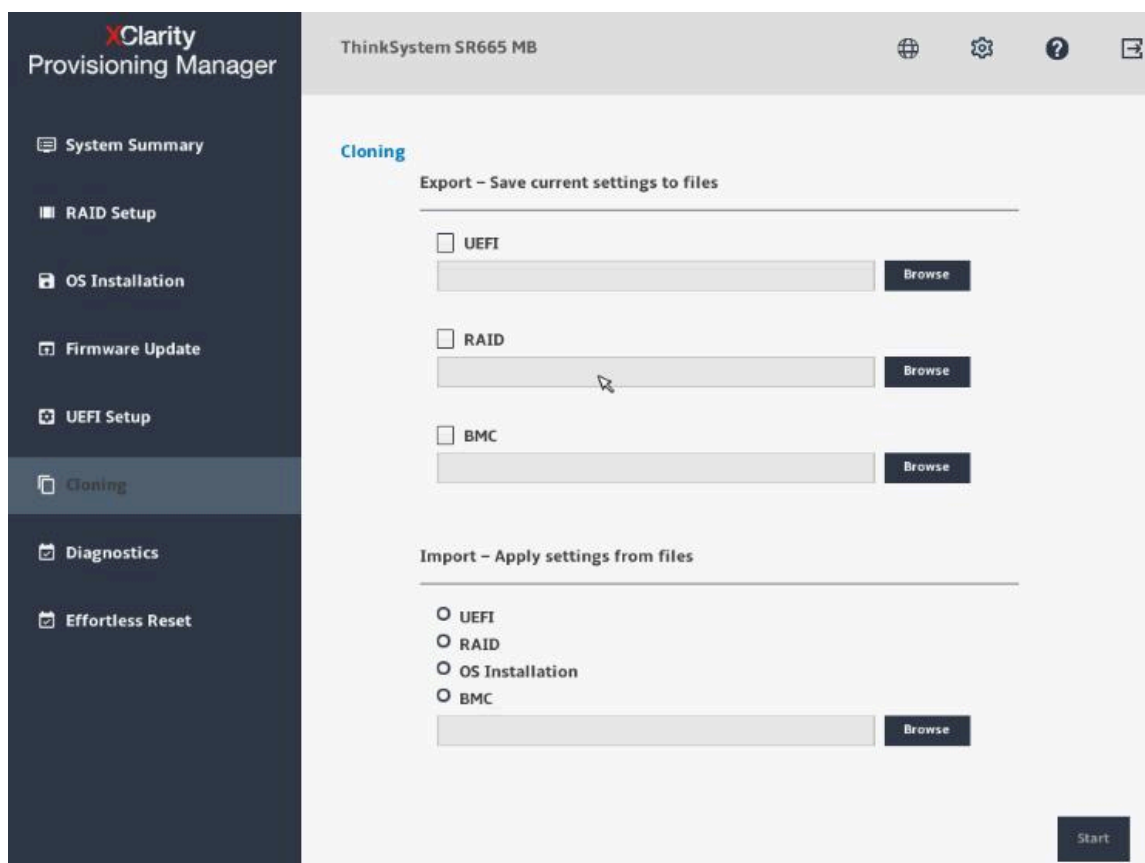
Figure 33. Cloning interface

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 36.

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 is completed.

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.
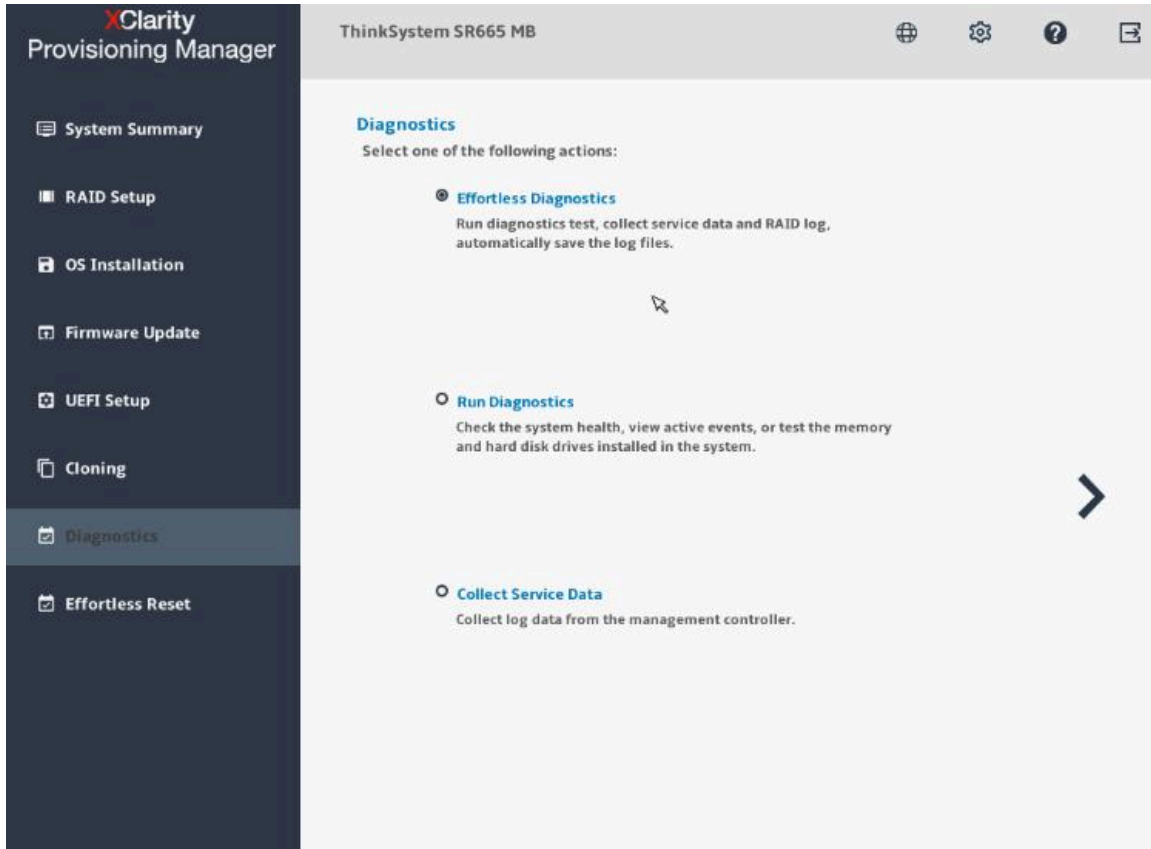
Figure 34. Diagnostics interface

There are three types of operation for your selection:
- **Effortless Diagnostic**: Run system diagnostic and collect all system log in one package.
- **Run Diagnostics**: View health status of server components, check active events, run memory test, disk drive test, and collect RAID logs.
- **Collect Service Data**: Collect service data manually.

Effortless diagnostic

To run system diagnostic and collect all system log in one package, perform effortless diagnostic.

To perform effortless diagnostic, 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 **Effortless Diagnostic** and click ❯. The Select device window is displayed.
3. In the Select device window, select a location to save the log and click **OK** to perform effortless diagnostic. The process takes several minutes.

4. When the diagnostics process is completed, the Confirmation window will be displayed. Click **Save Log**, then the log will be saved in the USB storage drive or the shared network. Provide the file to the Lenovo service personnel for problem determination.
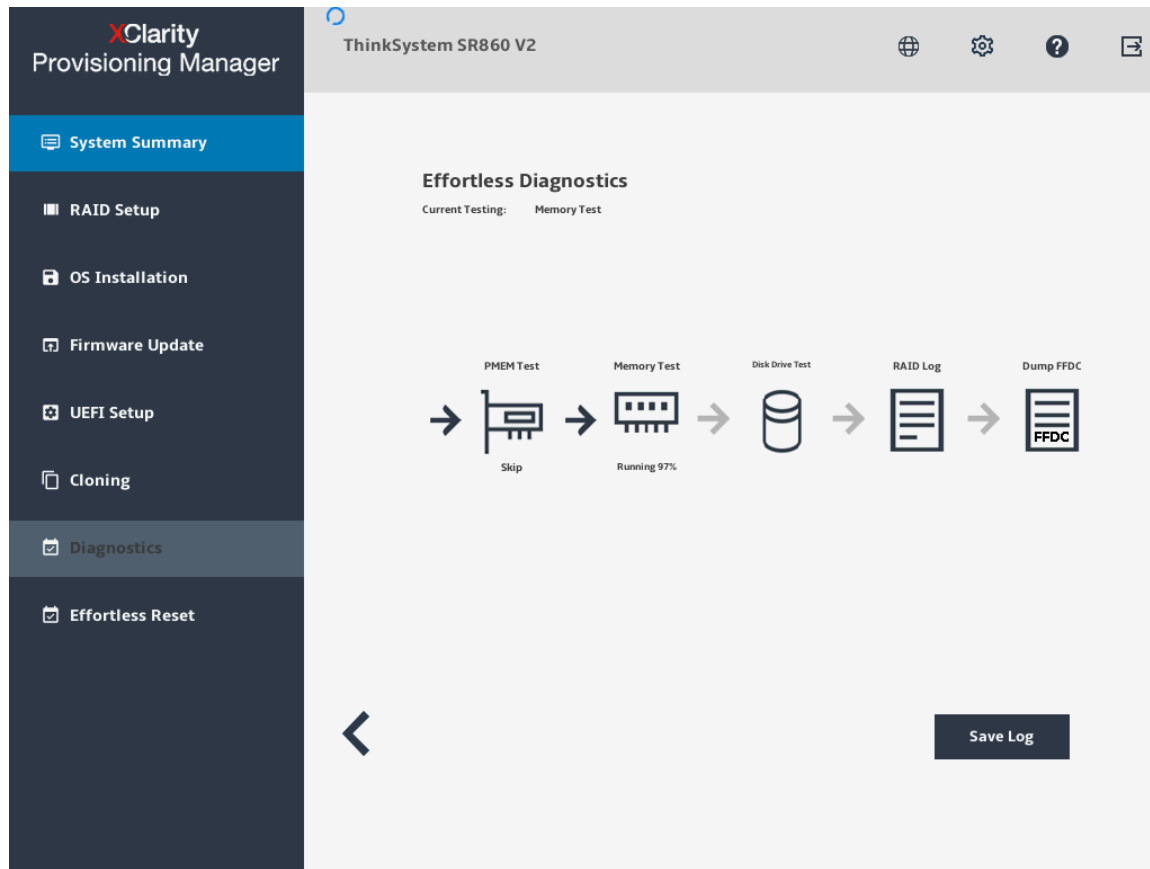
Figure 35. Effortless diagnostic

Running diagnostics

To view health status of server components, check active events, run memory test, disk drive test, and collect RAID logs, perform the "Run Diagnostics" function.

Select **Run Diagnostics** and click ❯ . The following four 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 Drvie Test**: Run the disk drive test.
- **RAID Log**: Collect the logs for the selected RAID adapters.
- **PMEM Test**: Run Intel® Optane™Persistent memory test.

   Note: This item is for servers with Intel processors only.

Figure 36. Dashboard interface

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

Running memory test
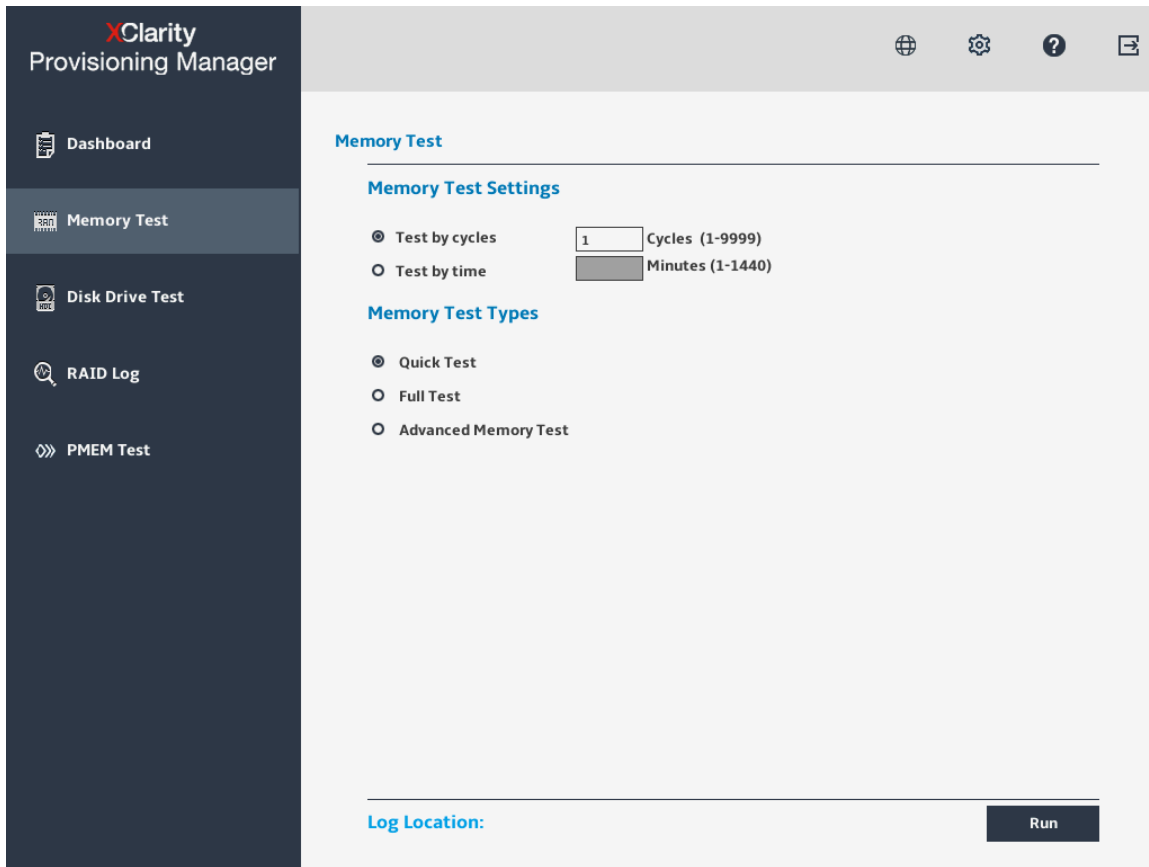
Figure 37. Memory Test interface

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	• 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			
Advanced 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 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 needs, 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.
   • 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.
   • You can press Esc to stop the test.
4. If you want to save the test result after the testing process is completed, click **Save**.

   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.
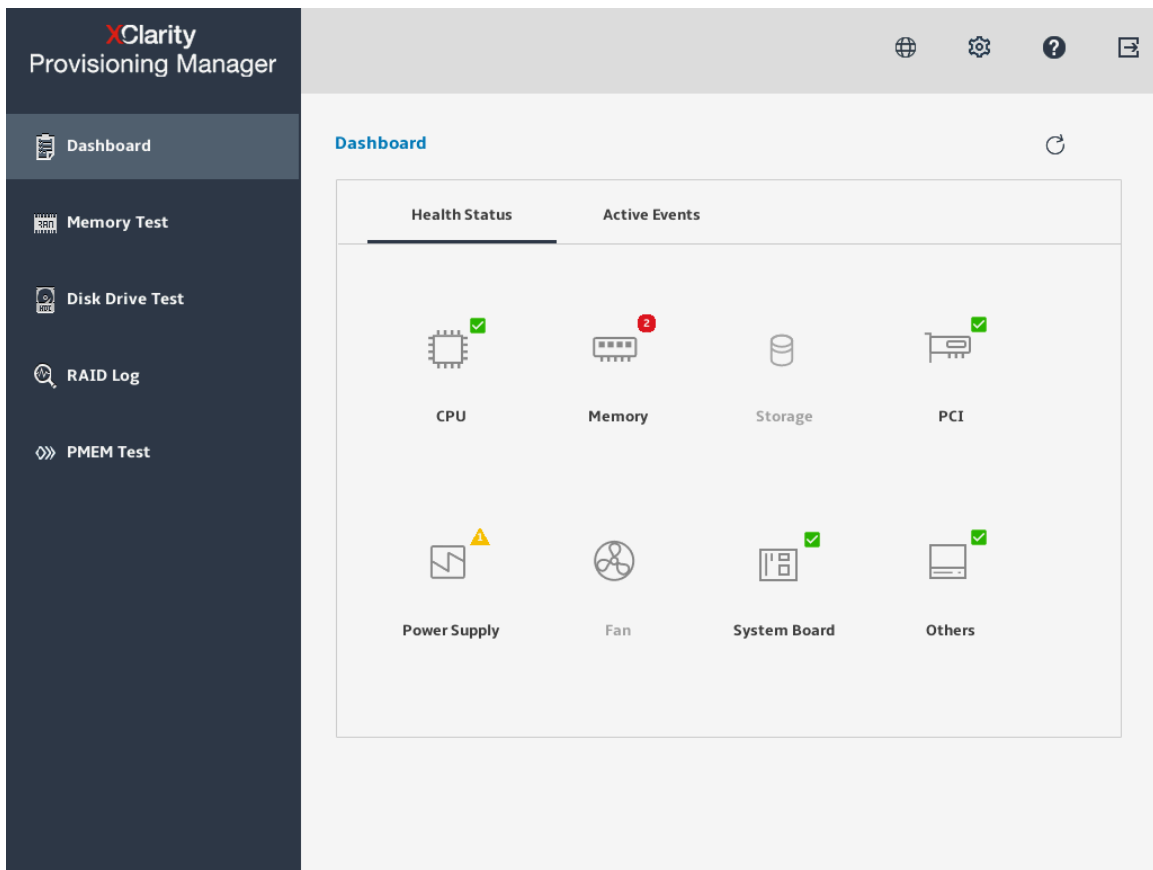5. To exit this interface and return to the Diagnostics interface, click ⊟, and then click **OK** in the Exit window.

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.

   Notes:
   - The mouse pointer is not active during the collecting process.
   - Only the Broadcom HardsWare RAID Adapter series support the log collection function. M.2/RSTe/ NVMe RAID Controller does not support this function because the adapter cannot save the raid log.
4. After the collecting process is completed, 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

   Note: You can press Esc to stop the test.
6. To exit this interface and return to the Diagnostics interface, click 🖃, and then click **OK** in the Exit window.

Running PMEM test

To run PMEM 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 **PMEM 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 PMEMs.
   - **Config diagnostics**: Verify whether the BIOS platform configuration matches the installed hardware or not.
   - **FW diagnostics**: Verify the firmware consistency for installed PMEMs.

     Note: This test cannot verify whether the installed firmware is the optimal version or not.
   - **Security diagnostics**: Verify the consistent security state for installed PMEMs.

     Note: It is recommended that security setting is enabled for all installed PMEMs.
4. If you want to save the test result, click **Save**after the testing process is completed.

   Note: The test result will be saved in a test_PMEM_%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.

Collecting service data

To collect service data manually, perform the "Collect Service Data" function.

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 is completed, 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.

Effortless Reset

In the Effortless Reset interface, you can permanently erase all data on storage devices, clear all system logs, and reset the whole system to factory default, including credentials and networking.

Prerequisites

Before performing effortless reset, disable the security drive.

CAUTION:
Effortless reset will cause data loss, back up your data before performing effortless reset.

To perform effortless reset, do the following:
1. Click the **Effortless Reset** tab in the left pane to enter into the Effortless Reset interface.
2. Input XCC/BMC user name and password, and click **OK**.
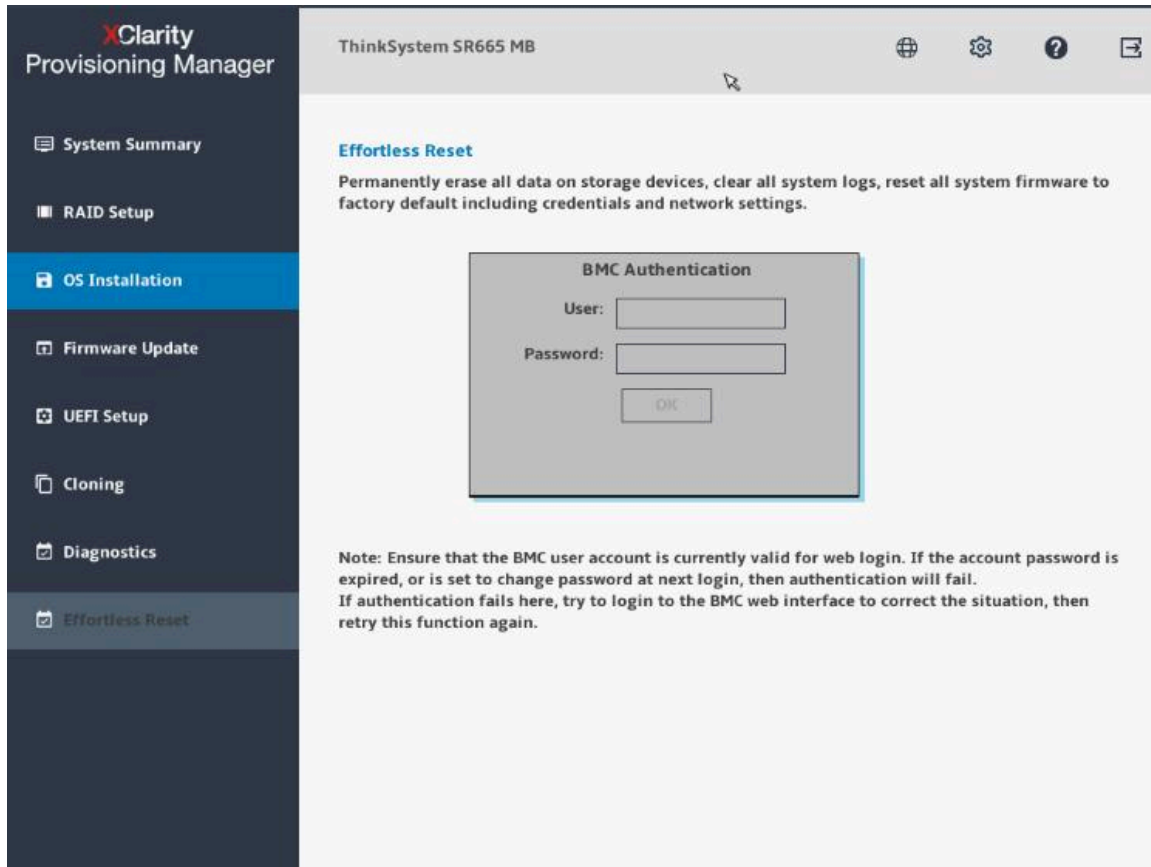
Figure 38. Input user name and password

3. Select one or more of the following, input **YES** to confirm the reset action, and click **Start**.
   - To erase the data on all RAID volumes and all disk devices (including HDD, SSD, and SED), select **Permanently erase all data on storage devices**.
   - To clear all system logs, including LSI RAID Event Log and System Event Log (SEL), select **Clear all system logs**.
   - To reset the credentials and networking of UEFI, BMC, TPM, and CMOS to factory default settings, select **Reset all system to factory default, including credentials and networking**.

Figure 39. Select item to be deleted

4. When the following page is displayed, wait until the whole progress is completed.

Figure 40. Effortless reset progress

Chapter 3. Troubleshooting

This chapter provides information about basic troubleshooting methods to help you solve problems that might occur while using LXPM V3.
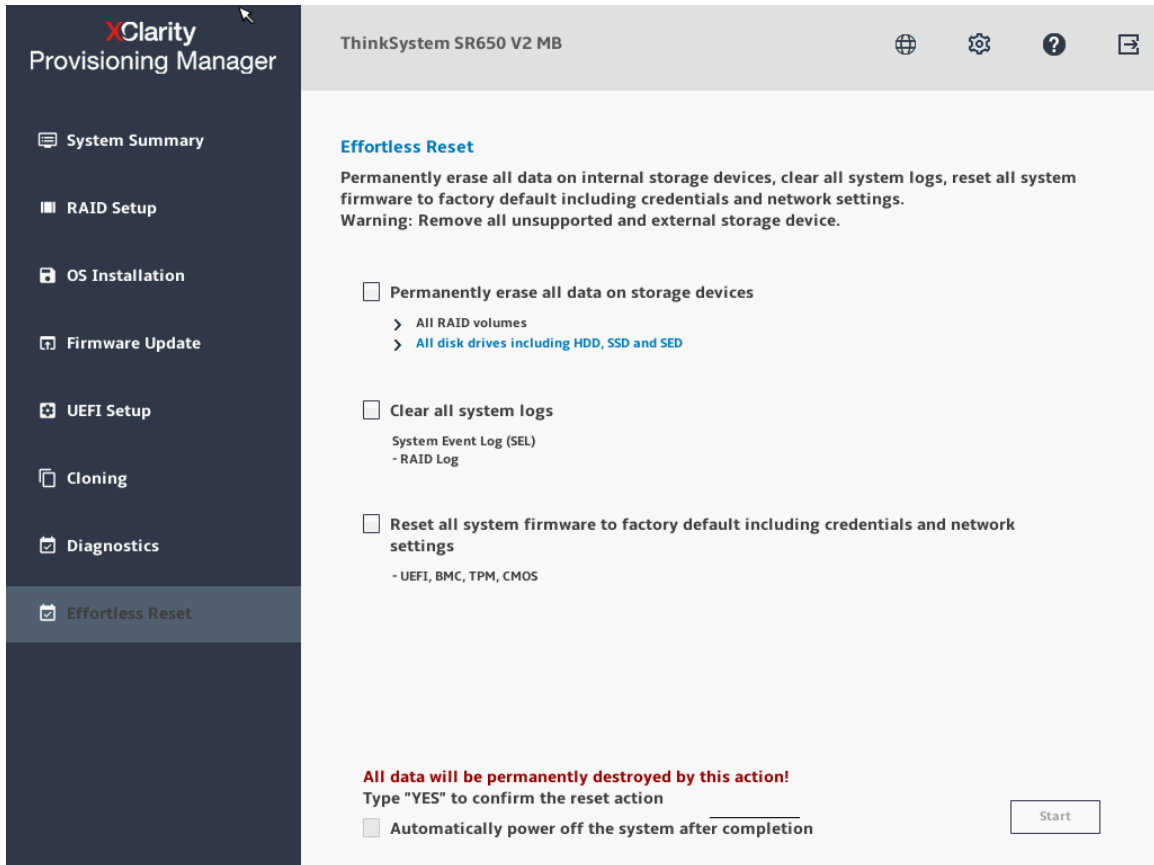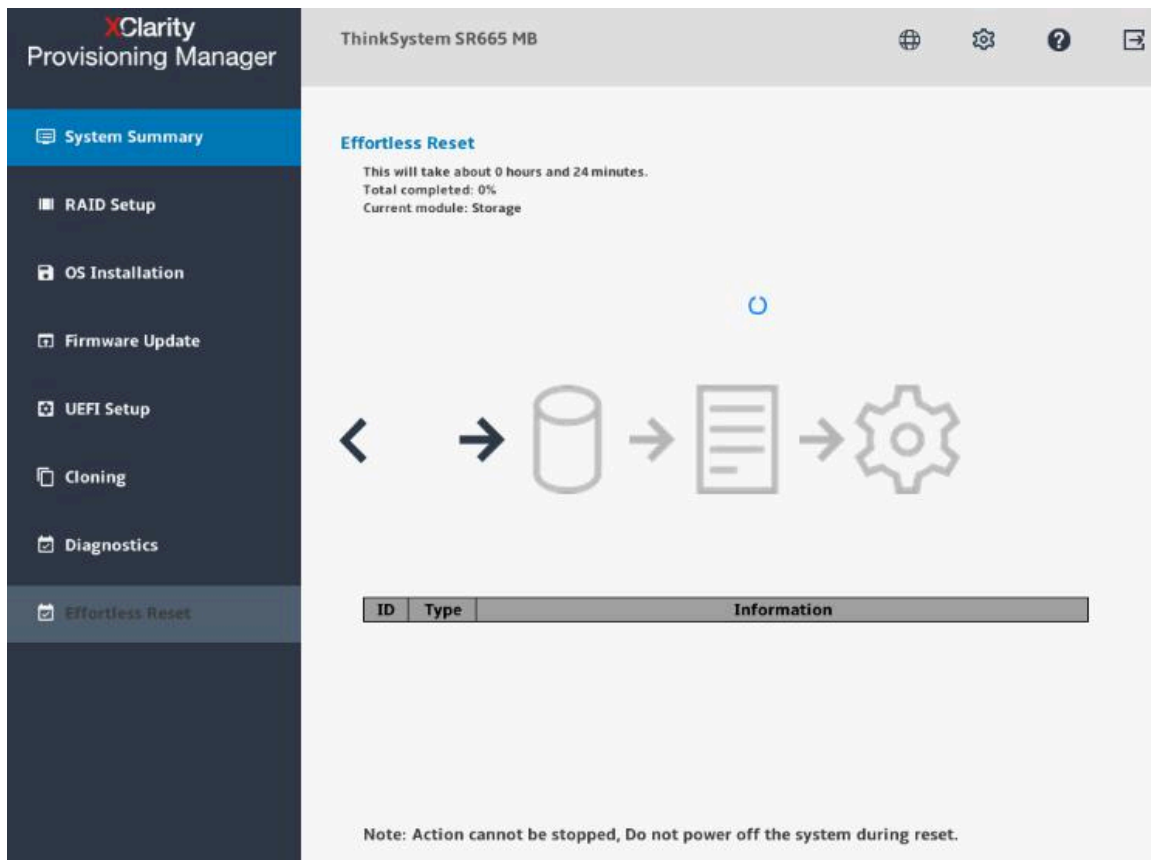
If you cannot diagnose and solve a problem by using the information in this chapter, go to http://datacentersupport.lenovo.com for additional troubleshooting resources. You also can get help and information by telephone through the Customer Support Center. The most up-to-date telephone list for Lenovo Support is always available on the Web site at:
https://datacentersupport.lenovo.com/supportphonelist

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.
LXPM V3 cannot start the operating system medium.	Do one of the following: • 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 9.

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