Problem determination and troubleshooting

System event logs in BIOS, POST beeps, and UEFI diagnostic program

Lenovo

ThinkSystem ST50 problem determination procedures

The ThinkSystem ST50 does not have Lenovo XClarity Controller (XCC) or first failure data capture (FFDC) log support. Users can download Lenovo XClarity Provisioning Manager (LXPM) Lite and install it using a USB device. LXPM Lite enables users to create RAID arrays, install operating systems and drivers, and run diagnostics.

The following procedures can also be used to isolate and resolve issues, and to gather information while servicing the ThinkSystem ST50:

- View system event logs in BIOS
- Listen to POST beeps while starting up the server
- Use the LXPM Lite or UEFI diagnostic program to test server components

Note: Visit the Lenovo XClarity Provisioning Manager Lite (LXPM Lite) Web page for more information and to download software packages.

Event logs overview

System event logs are available in the Setup Utility. Start the server and press F1 to access the Setup Utility. Then, go to **Security** → **System Event Log** → **View System Event Log** to access the list of events.

Event logs

Logs of the system events are available in the Setup Utility. The table on the right is the list of events that may appear in the system event log.
Follow the steps to access the list of events and click the steps to view the screen shots.

Step 1: Start the server

Step 2: press F1 to access Setup Utility

Step 3: go to Security

Step 4: go to System Event Log

Step 5: go to View System Event Log

Step 6: check event logs

List of POST error messages
Setup data integrity check failure
Memory size decreased
Fan failure
Power supply overload
BIOS password changed
BIOS Setup data changed
Chassis intrusion
Password retry count exceeded
SATA device configuration changed
BIOS updated
Option ROM over Shadow RAM size
Hard disk password changed
PCI Mem Conflict
System event log cleared

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Start the server.

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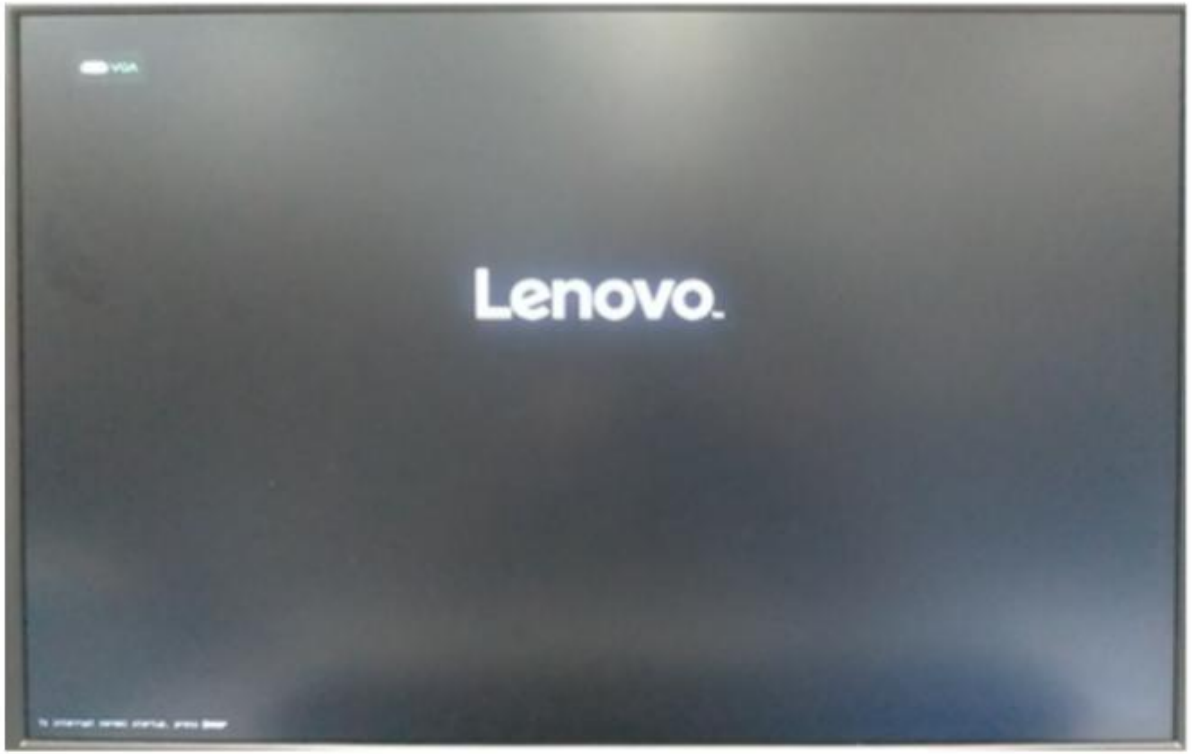

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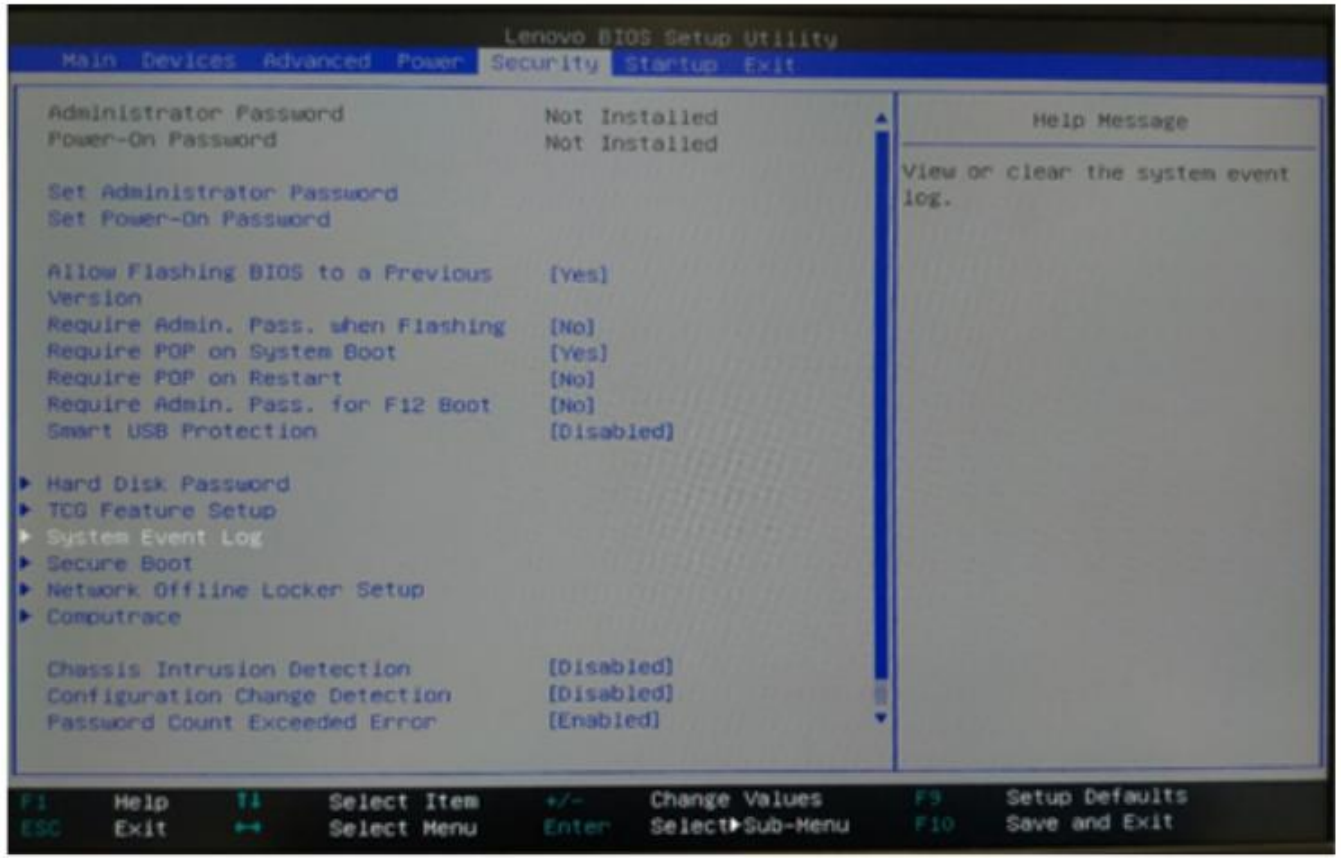

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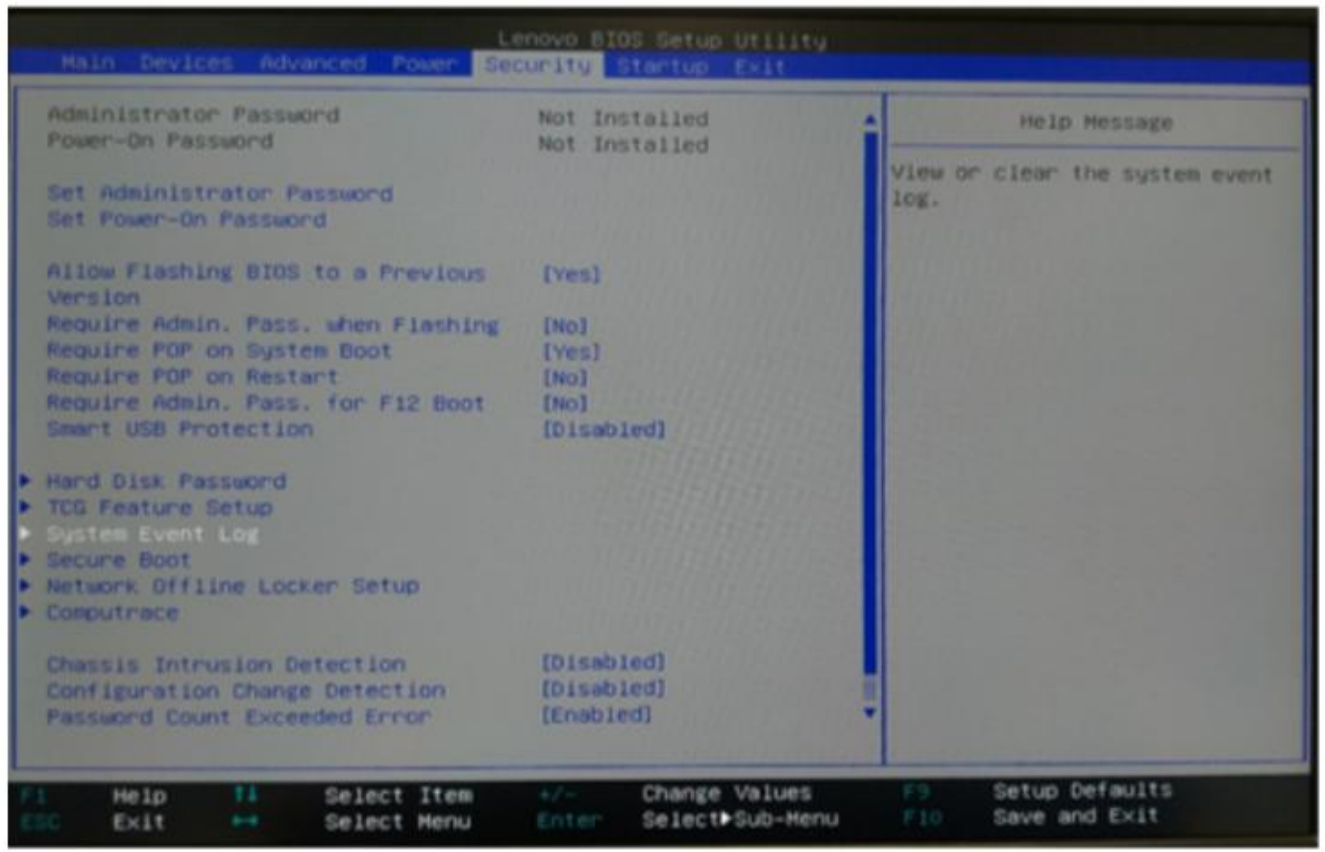

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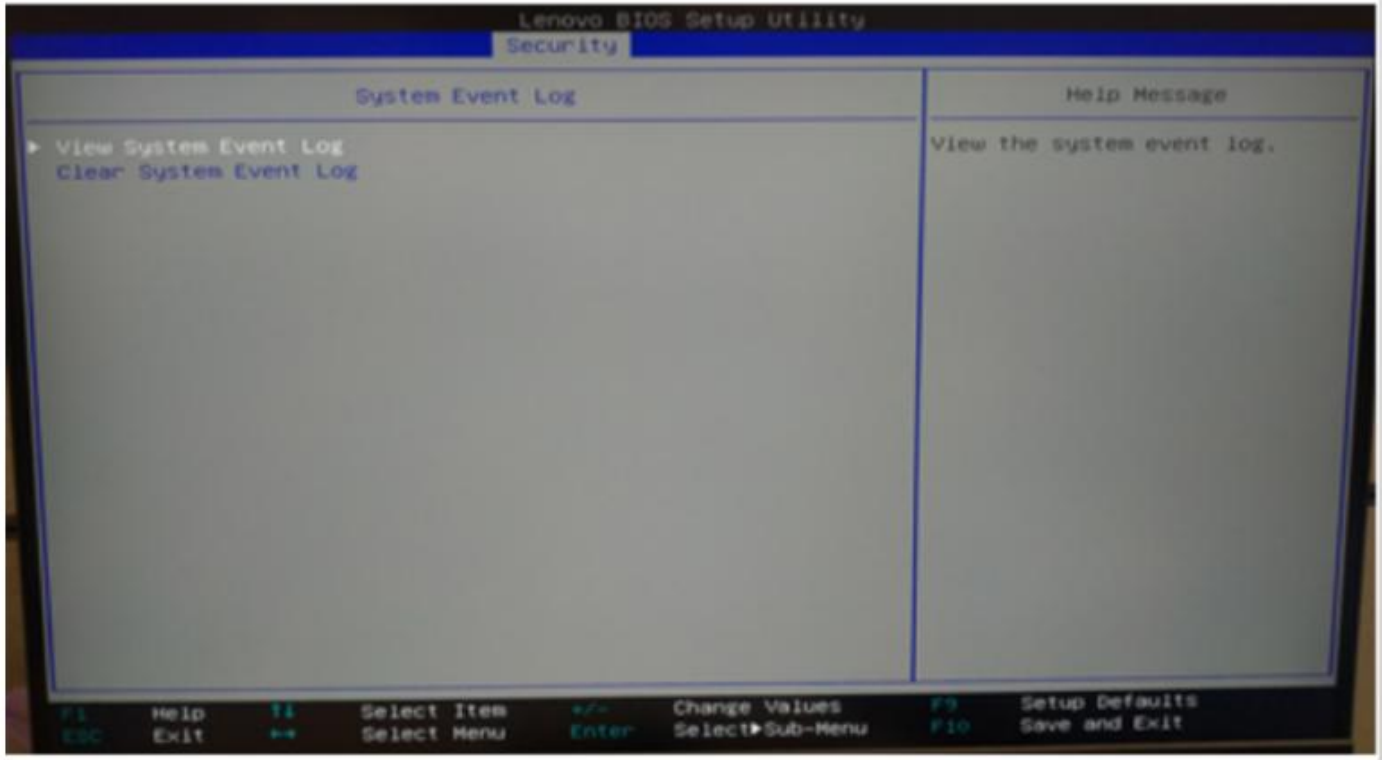

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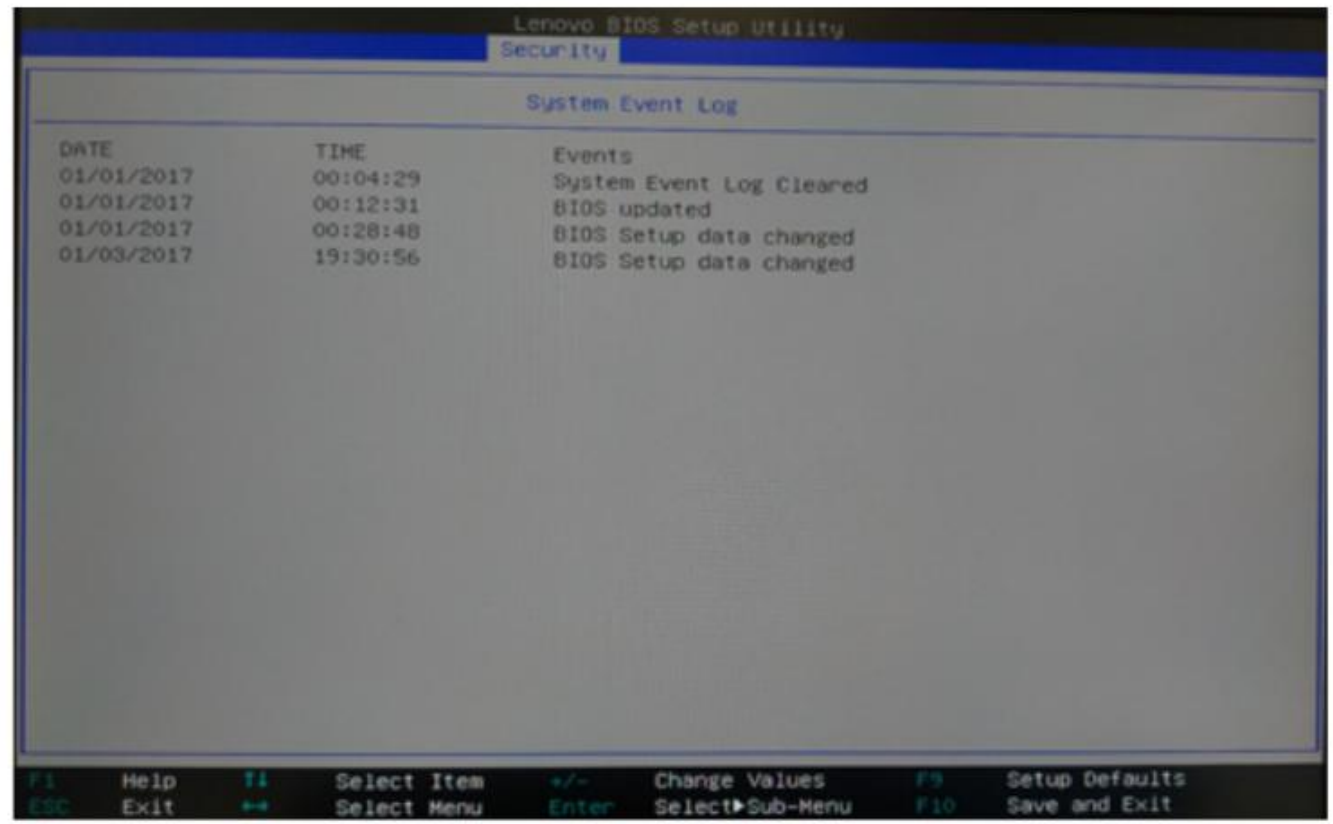

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POST beeps

The ThinkSystem ST50 also supports POST beeps for problem determination. Users can listen to the POST beeps while starting up the server.

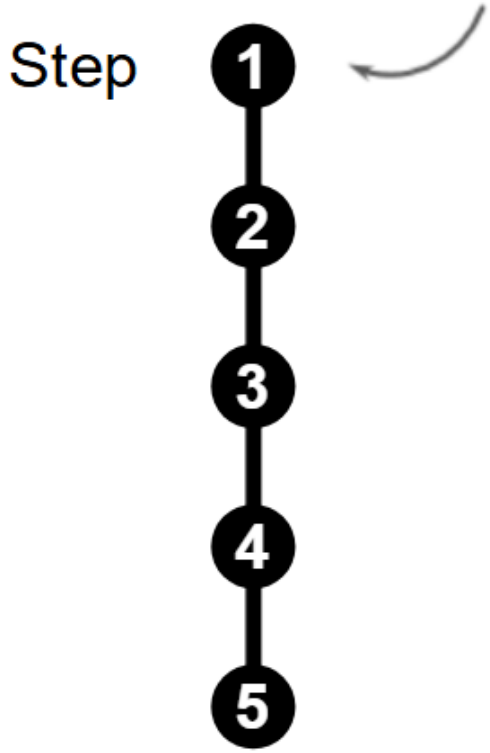
Beep	Error description
Two short ones	There is one or more POST error.
Three short ones followed by one long one	No memory is detected by the system.
Two long ones followed by three short ones	No video adapter is detected by the system.
Four long ones	• Error 8998 - No enough shadow RAM resources for option ROM: insufficient RAM resources • Error 8999 - No enough PCIe/PCI MMIO resources: insufficient PCIe/PCI MMIO resources

Click error codes to view more details.

Note: A short beep lasts about 0.5 seconds, while a long one lasts about one second.

UEFI diagnostic program

Click each step to run the UEFI diagnostic program.



The UEFI diagnostic program is preinstalled on the server. It enables users to test server components, view system information, and check and recover bad sectors on the internal storage devices. The options on the main screen are as follows:

Diagnostics items	Tools
• CPU • Monitor • Motherboard • PCIe • Storage	• System information • Recovery bad sectors tool • Generate configuration file • Execute form configuration file • Exit application

UEFI diagnostic program

Step 1

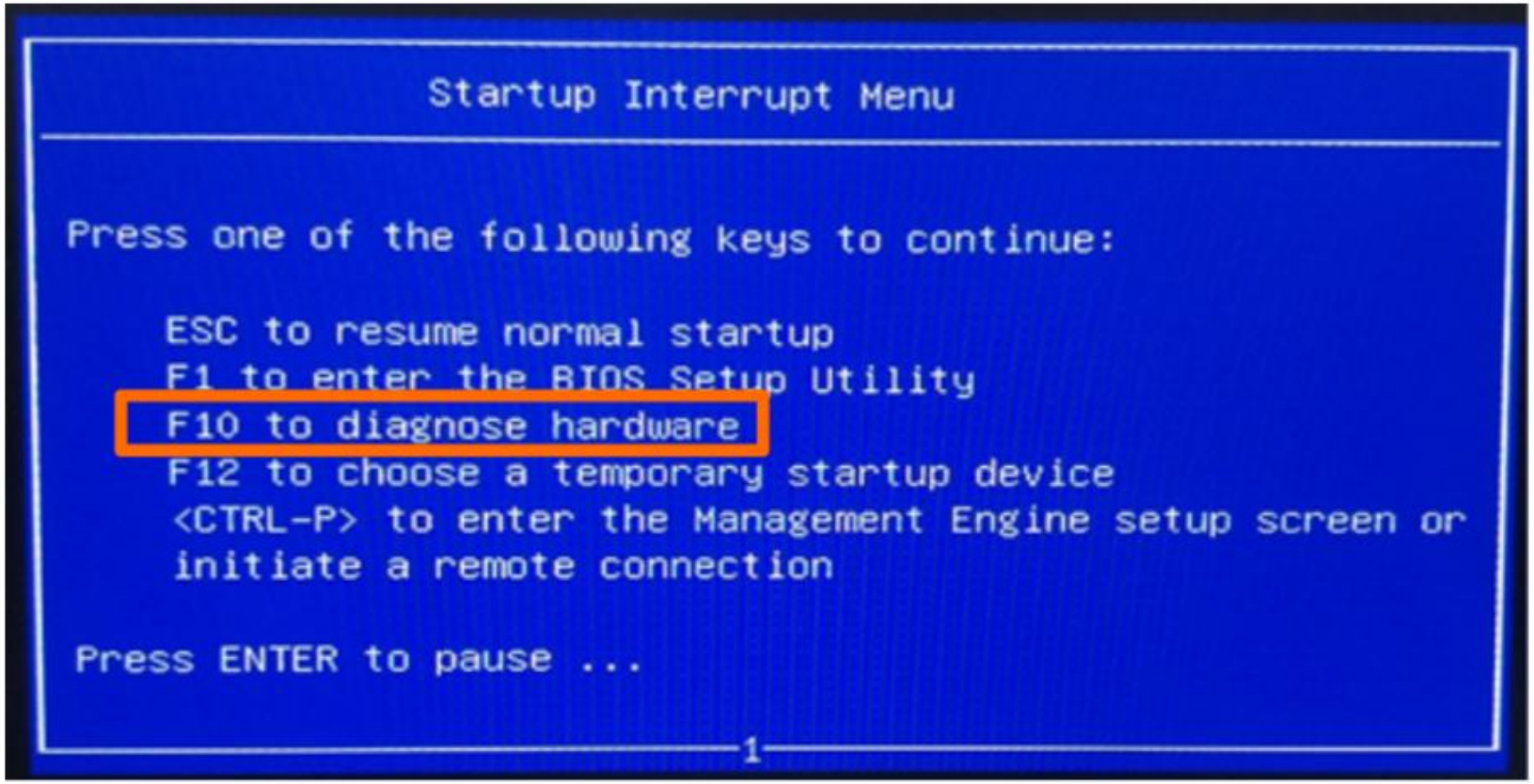
2

3

4

5

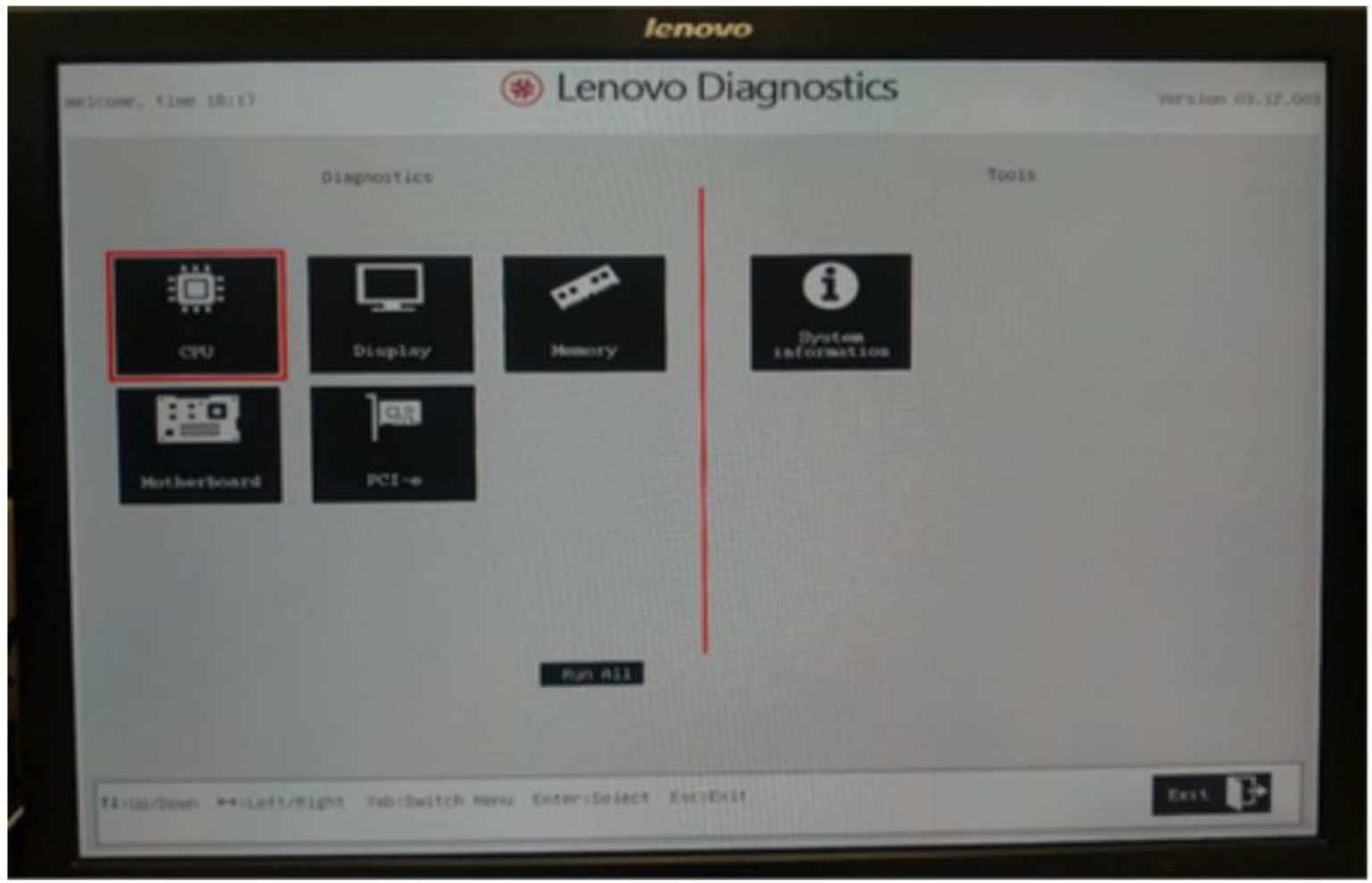
Step 1: Power on server, press **ENTER** when the center of the monitor shows **LENOVO**; or repeatedly press the **F10** key. The main UEFI diagnostic program is displayed.



UEFI diagnostic program

Step 1 2 3 4 5

Step 2: Follow the instructions on the screen to use the diagnostic program.



UEFI diagnostic program

Step

1

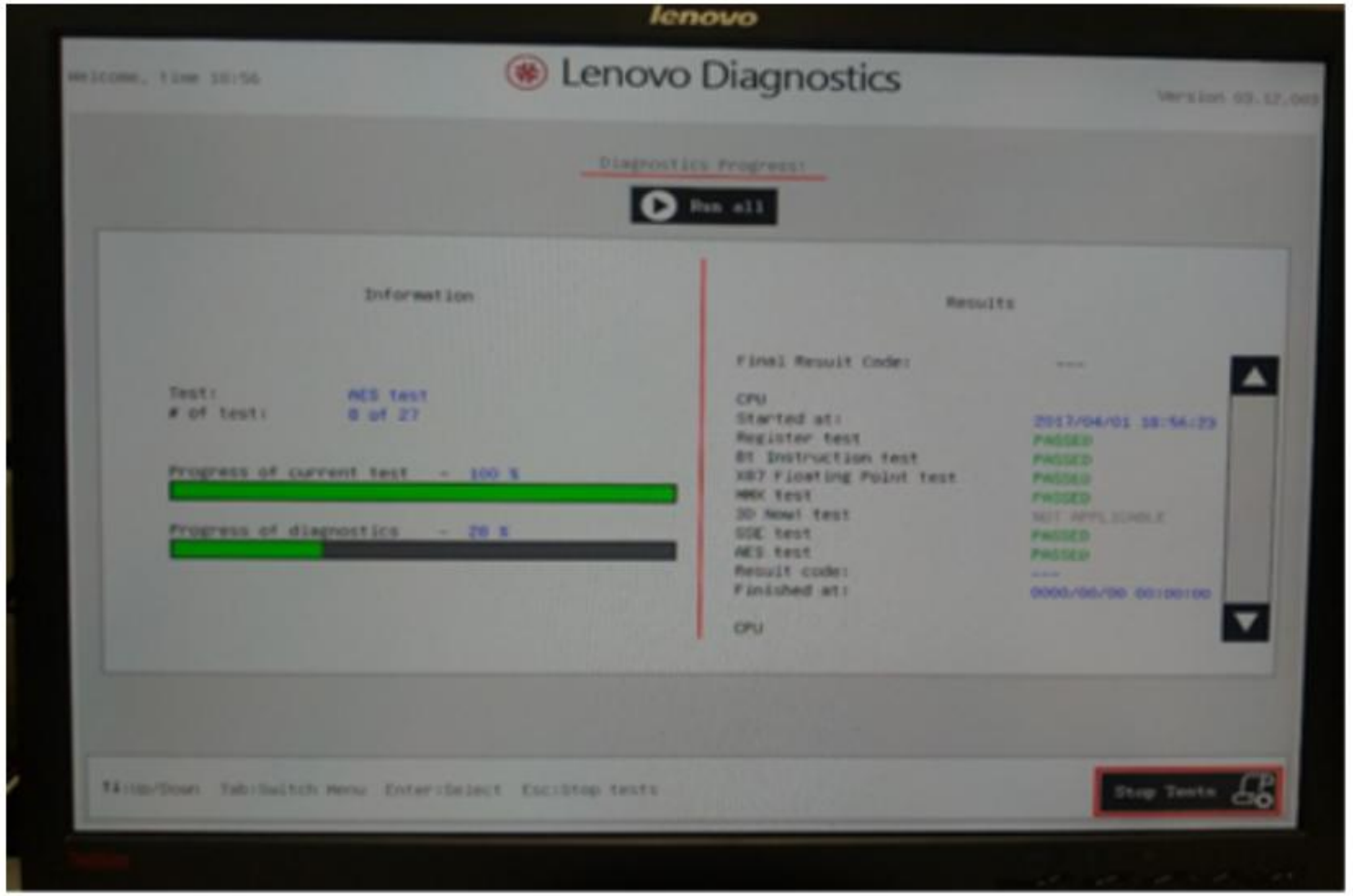
2

3

4

5

Step 3: The duration of component tests may vary depending on the different diagnostic options.



UEFI diagnostic program

Step

1

2

3

4

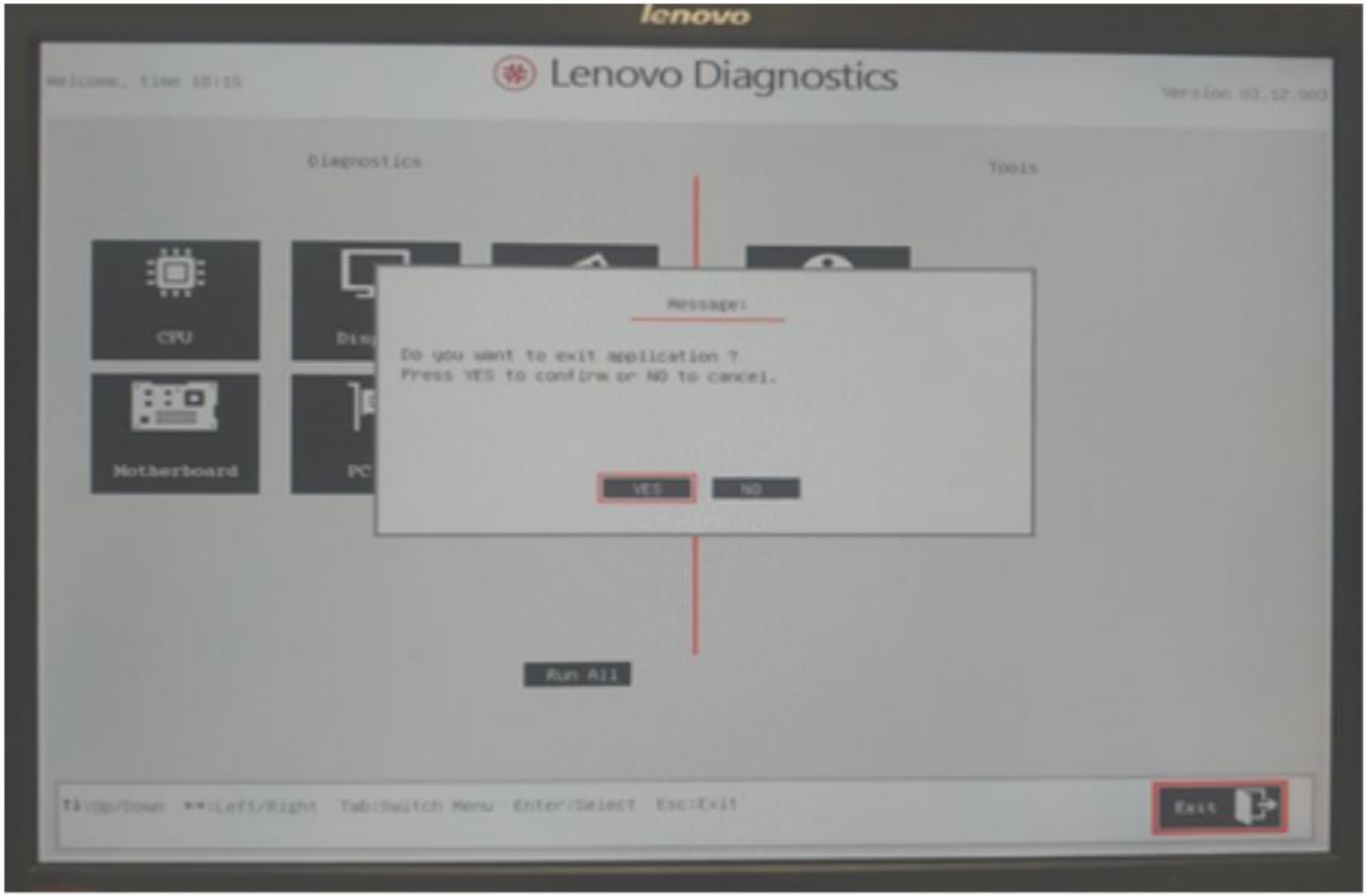
5

Step 4: The results will be displayed on screen, and users can save the log file to a USB drive.

UEFI diagnostic program

Step 5: Use Esc to exit the program.

Step 1 2 3 4 5



Lenovo

UEFI firmware upgrades for the ThinkSystem ST50

UEFI firmware upgrade procedures for the ThinkSystem ST50 are OS dependent. To upgrade firmware, users can use one of the following:

- a USB memory stick (FAT16, FAT32, and exFAT formatted)
- VMware
- Windows Server 2016
- RHEL 7.5 (Kernel Version: 3.10)

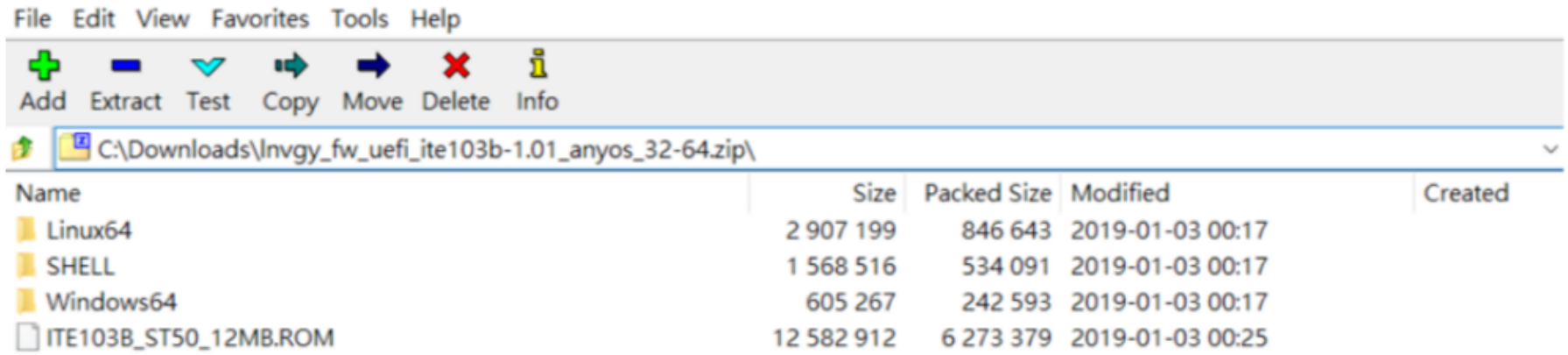
Please visit the Lenovo Data Center Support Web site to download the latest firmware versions and device drivers.

Note: NTFS format is not supported for firmware upgrades using USB memory sticks.

UEFI firmware package

Un-zip the downloaded firmware package to see the contents, which include upgrade tools and the firmware ROM. Follow the readme instructions to upgrade the firmware. Click the buttons to view details.

- Package content
- Windows instructions
- Linux instructions
- USB instructions



Note: The firmware package and instructions may differ from version to version. Visit the Web site for latest information.

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Package content

Windows instructions

Linux instructions

USB instructions

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```
--CONTENTS--
1 - Installation Instructions
2 - Flash under Operating System


*******************************************************************************
*                        1. Installation Instructions                         *
*                                                                             *
*     This flash under operating system (64-bit) utility provides             *
*     the ability to update the system BIOS from a Windows application.       *
*                                                                             *
*     The utility may be downloaded from the internet and unpacked            *
*     Please follow steps in section 2 to launch the Windows based flash      *
*     application to update your system BIOS.                                 *
*                                                                             *
*                                                                             *
*******************************************************************************


*******************************************************************************
*                      2. Flash Under Operating System                        *
*                                                                             *
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```
*         Setup utility. They may have to be re-entered after updating      *
*         the BIOS.                                                         *
*                                                                           *
*     2.  Click on the Start button and type cmd.exe,  Right-click on       *
*         the cmd.exe application and select run as administrator to        *
*         open the Command Prompt with Administrator privilege.            *
*                                                                           *
*     3.  In the "Command Prompt" window, change to the directory where the *
*         above files were extracted.                                       *
*                                                                           *
*     4.  Enter the command "flash64.cmd" and press the Enter key to start  *
*         the flashing process.                                             *
*                                                                           *
*     5.  The update may take up to 2 minutes. Do not power off or restart  *
*         the system during this procedure!                                 *
*                                                                           *
*     6.  When the BIOS update process ends, please restart system manually.*
*                                                                           *
*     7.  The BIOS update process ends with above six steps.                *
*                                                                           *
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 2 - UEFI Shell Installation Instructions

-----------------------------------------------------------------------
SUPPORTED OPERATING SYSTEMS
-----------------------------------------------------------------------
* RHEL 7.5 (Kernel Version:3.10)


*************************************************************************
*               2. UEFI Shell Installation Instructions                 *
*                                                                       *
*     1.  Please make note of any settings you have changed in the BIOS *
*         Setup utility. They may have to be re-entered after updating  *
*         the BIOS.                                                     *
*     2.  Open Terminal with SU (superuser) or root permission.         *
*     3.  In the Terminal, change to the directory where the "Linux64"  *
*         files were extracted.                                         *
*     4.  Enter the command "FBIOS.SH" and press the Enter key to start *
*         the flashing process.                                         *
*     5.  Update may take up to 3 minutes. Do not power off or restart the *
```

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-----------------------------------------------------------------------
* Non-OS
* VMware
* Windows Server 2016
* RHEL 7.5  (Kernel Version:3.10)


*************************************************************************************
*              2. UEFI Shell Installation Instructions                              *
*                                                                                   *
*     1.  Please make note of any settings you have changed in the BIOS             *
*         Setup utility. They may have to be re-entered after updating              *
*         the BIOS.                                                                 *
*     2.  Copy "efi" folder and all files include uEFI ROM to USB disk              *
*         root folder. (To make the SHELL bootable USB disk, make sure              *
*         the bootX64.efi file's path must be                                      *
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*         root folder. (To make the SHELL bootable USB disk, make sure          *
*         the bootX64.efi file's path must be                                  *
*          "FS0:\efi\boot\bootX64.efi")                                        *
*     3.  Please disable Secure Boot options in Security menu and check         *
*         CSM options is disabled in Startup menu before flash BIOS.            *
*     4.  Run UEFI mode and boot to USB disk. (Press F12 to UEFI USB disk).     *
*     5.  System will auto flash via startup.nsh                                *
*     6.  Update may take up to 3 minutes. Do not power off or restart the      *
*         system during this procedure!                                         *
*     7.  After the flash update is complete. Don't forget to remove the        *
*         flash device and press ALT+CTRL+DEL to restart system.                *
*                                                                               *
*                                                                               *
*********************************************************************************
```

Summary

This course enabled you to:

- Describe the features of the Lenovo ThinkSystem ST50 server.
- Describe server features and specifications.
- Identify the server diagram.
- Describe the problem determination procedures of ST50.