Lenovo ThinkServer Diagnostics Standalone Edition

User's Guide

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Lenovo ThinkServer Diagnostics Standalone Edition

Contents

Chapter 1

Introduction

Lenovo® ThinkServer® Diagnostics Standalone Edition is a diagnostic tool that will run before your server boots into an operating system. The user can boot the diagnostics from a USB key inserted in their system. The Diagnostics tool can detect ThinkServer hardware components and display running status and firmware information. The screen resolution's default value is 1024x768 (Please note that the boot logo may be distorted on some widescreen monitors, but no functions will be impacted).

Chapter 2

Creating a Bootable USB key

1. Before you start, ensure that you prepare the bootable USB key on a Windows operating system.
2. Download the latest Diagnostics software package from the Lenovo Support web site:
    http://support.lenovo.com
3. Plug in the USB key, and run rufus-*.exe.
4. For the **Create a bootable disk using** option, select **ISO Image**.
5. Click the **Browse** button to select the image file of Lenovo ThinkServer Diagnostics Standalone Edition.
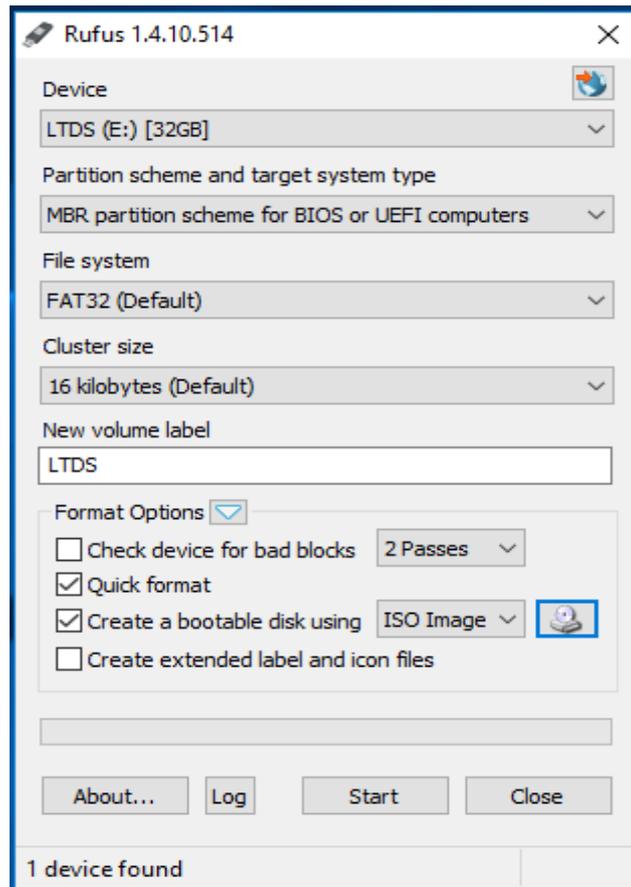
6. Select **ISO Image** in the filter drop-down list, and open the ***.img file.
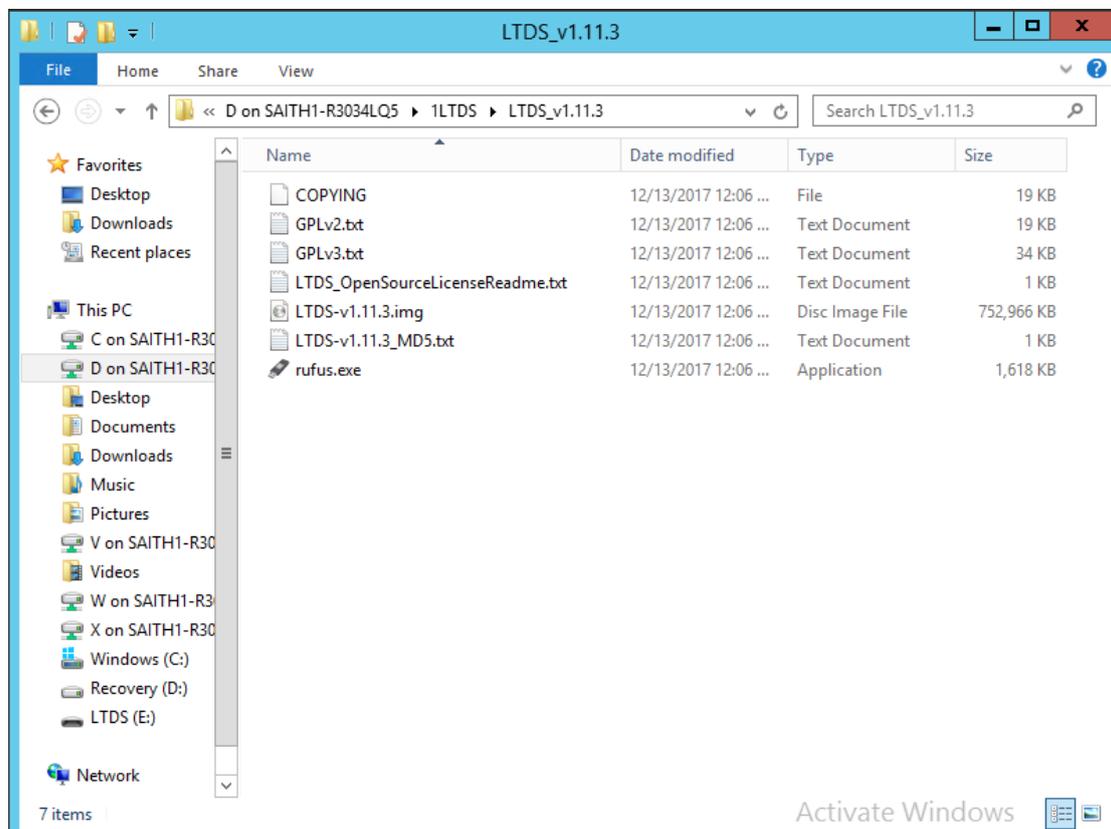
7. Click **Start**, and a prompt window is displayed. Click **OK** to continue.
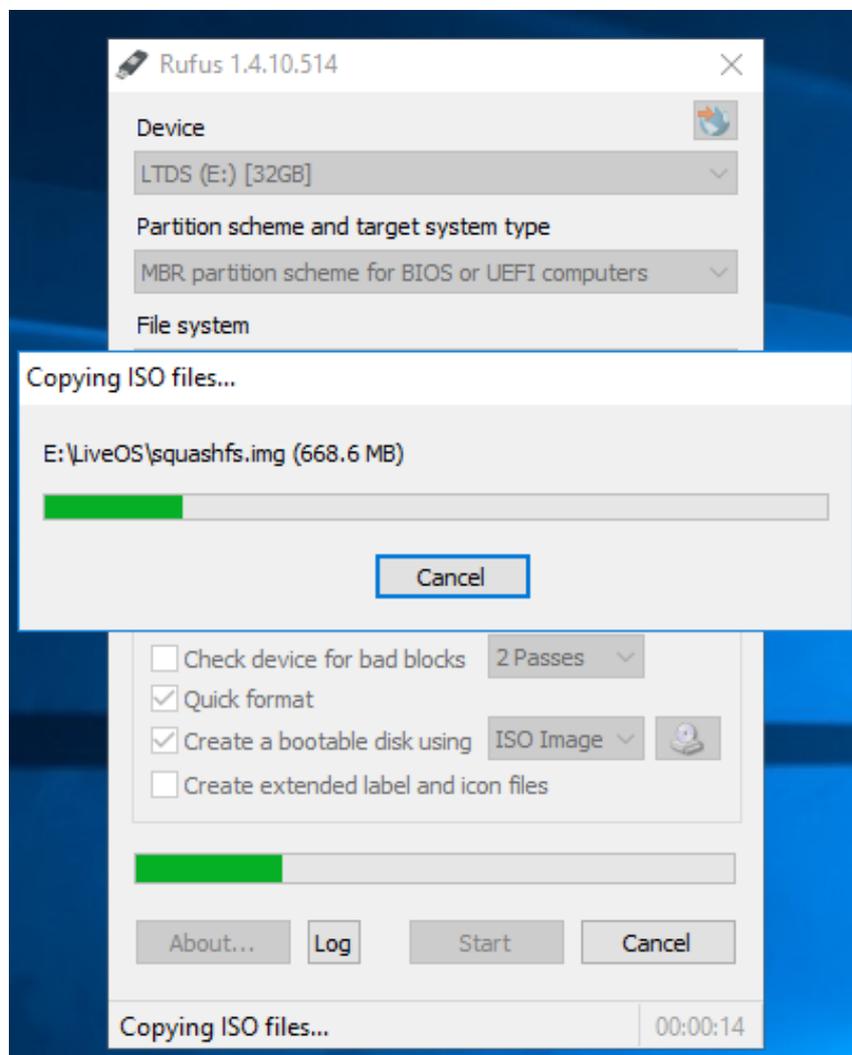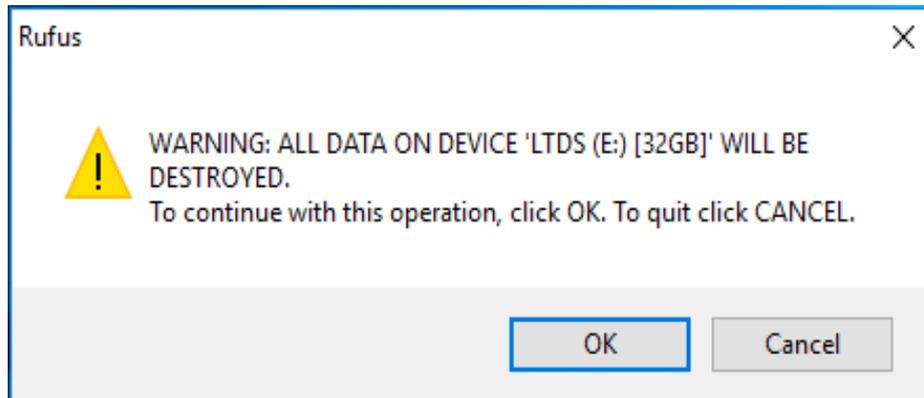
8. When the status bar at the bottom of the window displays **DONE**, click **Close**.
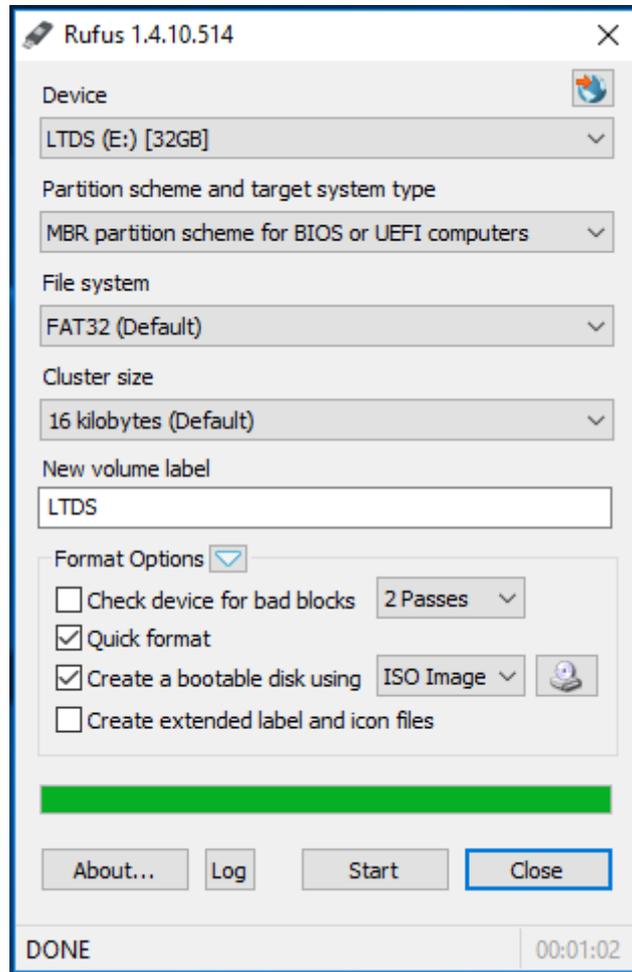
Chapter 3

Configuring BIOS Settings and Booting up

Lenovo ThinkServer Diagnostics Standalone Edition supports both UEFI and Legacy boot modes.

Note: Ensure that secure boot is disabled (default) in the BIOS setup.

Boot up in UEFI Mode

1. Turn on the server, and press F1 as soon as you see the logo screen to enter the BIOS setup menu.
2. Go to the **Boot Manager** page.
3. For **Boot Mode**, select **Auto** (default).
4. Go to the **Miscellaneous Boot Setting** page.
5. For **Storage OpRom Policy**, select **UEFI only** (default).
6. For **Video OpRom Policy**, select **Legacy only** (default).
7. For **Other PCIE device**, select **UEFI only** (default).
8. Press F10 to save the configuration and exit the BIOS setup menu.
9. Press F12 as soon as you see the logo screen to enter the boot menu.
10. Select **UEFI USB Disk Device** to boot from the USB key.

Boot up in Legacy Mode

1. Turn on the server, and press F1 as soon as you see the logo screen to enter the BIOS setup menu.
2. Go to the **Boot Manager** page.
3. For **Boot Option**, select **Auto**.
4. Go to the **Miscellaneous Boot Settings** page.
5. For **Storage OpRom Policy**, select **Legacy only**.
6. For **Video OpRom Policy**, select **Legacy only** (default).
7. For **Other PCIE device**, select **Legacy only**.
8. Go back to **Boot Manager**, and change **Boot Sequence** so that the legacy USB device is set as the first one.
9. Press F10 to save the configuration and exit the BIOS setup menu.
10. Press F12 as soon as you see the logo screen to enter the boot menu.
11. Select **Legacy USB Disk Device** to boot front the USB key.

Chapter 4

Main User Interface

Lenovo ThinkServer Diagnostics Standalone Edition provides a selectable menu for users to run test items.

```
+--------------------------------------------------------------+
|                                                              |
|              Lenovo ThinkServer Diagnostics                  |
|                   Standalone Edition                         |
|                                                              |
|                      Ver:1.11.3                              |
|                                                              |
+--------------------------------------------------------------+
|                                                              |
|  1. Full Function Test and collect information               |
|  2. Collect information only                                 |
|  3. Quick Memory Test                                        |
|  4. Extended Memory Test                                     |
|  5. Harddrive Test                                           |
|                                                              |
|                                                              |
|                                                              |
| I/i . Display Hardware Information                           |
| R/r . Reboot                                                 |
| P/p . Poweroff                                               |
+--------------------------------------------------------------+
|   Tue Dec 19 19:50:59 UTC 2017                               |
|                                                              |
+--------------------------------------------------------------+
Please Input your choice:
```

Test Items Description

1. Full Function Test and collect information

Enter **1** to choose **Full Function Test and collect information**, which includes collect information, Extended Memory Test, and Harddrive Test. A compressed log file will be generated in the configured path.

2. Collect information only

Enter **2** to collect system information (no functional testing is performed). After the system information is collected, a log file will be generated in the previously configured path as a ZIP file.

```
+----------------------------------------------------------------+
|                                                                |
|               Lenovo ThinkServer Diagnostics                   |
|                    Standalone Edition                          |
|                                                                |
|                      Ver:1.11.3                                |
|                                                                |
+----------------------------------------------------------------+
|                                                                |
|  1. Full Function Test and collect information                 |
|  2. Collect information only                                   |
|  3. Quick Memory Test                                          |
|  4. Extended Memory Test                                       |
|  5. Harddrive Test                                             |
|                                                                |
|                                                                |
| I/i . Display Hardware Information                             |
| R/r . Reboot                                                   |
| P/p . Poweroff                                                 |
+----------------------------------------------------------------+
|  Tue Dec 19 19:55:35 UTC 2017                                  |
|                                                                |
+----------------------------------------------------------------+
        Please Input your choice:2
        You select: 2
        Please wait ......

Lenovo XClarity Essentials OneCLI lxce_onecli01m-2.2.0
Licensed Materials - Property of Lenovo
(C) Copyright Lenovo Corp. 2013-2017 All Rights Reserved
The system is ThinkServer system, begin to inventory system information on ThinkServer.
Inventory device system_overview ...
Inventory device kernel_modules ...
Inventory device processes ...
Inventory device os_configuration ...
Inventory device hardware_inventory ...
Inventory device pci_information ...
Inventory device ExecutionLog ...
Inventory device LSI Info ...
```

```
Inventory device LSI PD List ...
Inventory device LSI FW Term Log ...
Inventory device LSI Event Log 1 ...
Inventory device LSI Event Log 2 ...
Inventory device LSI Event Log 3 ...
Inventory device LSI Event Log 4 ...
Inventory device LSI Event Log 5 ...
Inventory device PMC Info ...
Inventory device BMC Info ...
Inventory device SEL Info ...

Succeed in writing inventory result to /OneCli/logs/OneCli-2357-20171219-195542/OneCli-inventory-Unknown-Unknown-Unknown-2017121
9-195542.xml
Succeed in zipping xml to /OneCli/logs/OneCli-2357-20171219-195542/OneCli-inventory-Unknown-Unknown-Unknown-20171219-195542.zip
Succeed in writing HTML inventory result to /OneCli/logs/OneCli-2357-20171219-195542/OneCli-inventory-Unknown-Unknown-Unknown-20
171219-195542
        ###############################################
        Collect Information completed
        Please ensure USB stick is in the system
        Press Enter key to continue!
```

3. Quick Memory Test

Enter **3** to run **Quick Memory Test**. After the test, a compressed log file will be generated in the configured path.

```
+-----------------------------------------------------------------------+
|                                                                       |
|              Lenovo ThinkServer Diagnostics                           |
|                    Standalone Edition                                 |
|                                                                       |
|                      Ver:1.11.3                                       |
|                                                                       |
+-----------------------------------------------------------------------+
|                                                                       |
|   1. Full Function Test and collect information                       |
|   2. Collect information only                                         |
|   3. Quick Memory Test                                                |
|   4. Extended Memory Test                                             |
|   5. Harddrive Test                                                   |
|                                                                       |
|                                                                       |
| I/i . Display Hardware Information                                    |
| R/r . Reboot                                                          |
| P/p . Poweroff                                                        |
+-----------------------------------------------------------------------+
|   Tue Dec 19 20:04:53 UTC 2017                                        |
|                                                                       |
+-----------------------------------------------------------------------+
Please Input your choice:3
You select: 3
Please wait ......
=========================================
|    Lenovo ThinkServer Diagnostics     |
|           Memory Test                 |
|             V0.1.7                     |
```

```
        Please Input your choice:3
        You select: 3
        Please wait ......
=======================================
|    Lenovo ThinkServer Diagnostics    |
|              Memory Test             |
|                V0.1.7                |
=======================================
CoresNumber = 8
CPU VID:DID = 8086:2F00
PageSize    = 4 KB
System Type = 64 Bit
Total mem   = 15607 MB
Free mem    = 14294 MB
Got MemSize = 13782 MB
Trying mlock ...locked
Address=0x7feb01542000

Press ESC to EXIT
Cycle = 1/1
Start Time : 2017/12/19 20:05:00

  WR Test              :  [pass]

End Time :   2017/12/19 20:06:00

Test Over.
        #################################################
        Quick Memory Test completed
        Please ensure USB stick is in the system
        Press Enter key to continue!
```

4. Extended Memory Test

Enter **4** to run **Enhanced Memory Test**. After the test, a compressed log file will be generated in the configured path.

```
+----------------------------------------------------------------+
|                                                                |
|              Lenovo ThinkServer Diagnostics                    |
|                    Standalone Edition                          |
|                                                                |
|                      Ver:1.11.3                                |
|                                                                |
+----------------------------------------------------------------+
|                                                                |
|    1. Full Function Test and collect information               |
|    2. Collect information only                                 |
|    3. Quick Memory Test                                        |
|    4. Extended Memory Test                                     |
|    5. Harddrive Test                                           |
|                                                                |
|                                                                |
|                                                                |
| I/i . Display Hardware Information                             |
| R/r . Reboot                                                   |
| P/p . Poweroff                                                 |
+----------------------------------------------------------------+
|   Tue Dec 19 20:09:17 UTC 2017                                 |
|                                                                |
+----------------------------------------------------------------+
    Please Input your choice:4
    You select: 4
    Please wait ......
=========================================
|    Lenovo ThinkServer Diagnostics     |
|             Memory Test               |
|                V0.1.7                 |
=========================================
CoresNumber = 8
CPU VID:DID = 8086:2F00
PageSize    = 4 KB
System Type = 64 Bit
```

```
========================================
I     Lenovo ThinkServer Diagnostics     I
I              Memory Test                I
I                V0.1.7                   I
========================================
CoresNumber = 8
CPU VID:DID = 8086:2F00
PageSize    = 4 KB
System Type = 64 Bit
Total mem   = 15607 MB
Free mem    = 14294 MB
Got MemSize = 13782 MB
Trying mlock ...locked
Address=0x7f7d8eaf5000

Press ESC to EXIT
Cycle = 1/1
Start Time : 2017/12/19 20:09:22

  WR Test            :   [pass]
  Address Test       :   [pass]
  Random Test        :   [pass]
  March Test         :   [pass]
  BF Test            :   [pass]

End Time :   2017/12/19 20:23:07

Test Over.
      ################################################
      Extended memory Test completed
      Please ensure USB stick is in the system
      Press Enter key to save
```

5. Harddrive Test

Enter **5** to run a hard drive and RAID status diagnostic test. This test will check the storage device health in the system. After the test, a compressed log file will be generated in the previously configured path.

```
+----------------------------------------------------------------+
|                                                                |
|               Lenovo ThinkServer Diagnostics                   |
|                    Standalone Edition                          |
|                                                                |
|                      Ver:1.11.3                                |
|                                                                |
+----------------------------------------------------------------+
|                                                                |
|    1. Full Function Test and collect information               |
|    2. Collect information only                                 |
|    3. Quick Memory Test                                        |
|    4. Extended Memory Test                                     |
|    5. Harddrive Test                                           |
|                                                                |
|                                                                |
|  I/i . Display Hardware Information                            |
|  R/r . Reboot                                                  |
|  P/p . Poweroff                                                |
+----------------------------------------------------------------+
|                                                                |
|   Tue Dec 19 20:42:28 UTC 2017                                 |
|                                                                |
+----------------------------------------------------------------+
Please Input your choice:5
You select: 5
Please wait ......
```

```
SMART support is:      Available - device has SMART capability.
SMART support is:      Enabled
Temperature Warning:   Enabled

smartctl -s on /dev/bus/2 -d megaraid,35
smartctl 6.6 2017-02-22 r4392 [x86_64-linux-3.10.0-514.el7.x86_64] (daily-20170222)
Copyright (C) 2002-17, Bruce Allen, Christian Franke, www.smartmontools.org

=== START OF ENABLE/DISABLE COMMANDS SECTION ===
Informational Exceptions (SMART) enabled
Temperature warning enabled

smartctl -t short /dev/bus/2 -d megaraid,35
smartctl 6.6 2017-02-22 r4392 [x86_64-linux-3.10.0-514.el7.x86_64] (daily-20170222)
Copyright (C) 2002-17, Bruce Allen, Christian Franke, www.smartmontools.org

Short Background Self Test has begun
Use smartctl -X to abort test
^CTest is running. Remain 96%
^CTest is running. Remain 88%
^CTest is running. Remain 80%
Test is running. Remain 72%
Test is running. Remain 64%
Test is running. Remain 56%
Test is running. Remain 48%
^CTest is running. Remain 40%
Test is running. Remain 32%
Test is running. Remain 24%
Test is running. Remain 16%
Test is running. Remain 8%
Test Completed.
PASS

      ###############################################
      HDD Test completed
      Please ensure USB stick is in the system
      Press Enter key to continue!
```

I/i . Display Hardware Information

Enter **I** or **i** to display summarized hardware and Firmware information about the CPU, memory, RAID card, BIOS, PCI, and NIC card.

```
+--------------------------------------------------------------------+
|                                                                    |
|              Lenovo ThinkServer Diagnostics                        |
|                    Standalone Edition                              |
|                                                                    |
|                     Ver:1.11.3                                     |
|                                                                    |
+--------------------------------------------------------------------+
|                                                                    |
|  1. Full Function Test and collect information                     |
|  2. Collect information only                                       |
|  3. Quick Memory Test                                              |
|  4. Extended Memory Test                                           |
|  5. Harddrive Test                                                 |
|                                                                    |
|                                                                    |
| I/i . Display Hardware Information                                 |
| R/r . Reboot                                                       |
| P/p . Poweroff                                                     |
+--------------------------------------------------------------------+
|  Tue Dec 19 20:43:53 UTC 2017                                      |
|                                                                    |
+--------------------------------------------------------------------+
Please Input your choice:i
You select: i
######################################################################
#                       System Information                          #
######################################################################
Product Name   : ThinkServer TD350
BIOS Version   : TB5TS424
BMC  Version   :  4.19
----------------------------------------------------------------------
Socket Designation: CPU1 :      Version: Genuine Intel(R) CPU @ 3.40GHz
Socket Designation: CPU2 :      Version: Not Specified
```

```
####################################################################
#                      System Information                         #
####################################################################
Product Name   : ThinkServer TD350
BIOS Version   : TB5TS424
BMC  Version   :  4.19
-------------------------------------------------------------------
Socket Designation: CPU1 :      Version: Genuine Intel(R) CPU @ 3.40GHz
Socket Designation: CPU2 :      Version: Not Specified
-------------------------------------------------------------------
Found 2 ethernet controllers
-------------------------------------------------------------------

-------------------------------------------------------------------

-------------------------------------------------------------------
Memory Size    : 15607 MB
Total Slots    : 16
Used Slots     : 2
-------------------------------------------------------------------
Locator: CPU1 DIMM A1 :     Manufacturer: Hynix Semiconductor :    Size: 8192 MB
Locator: CPU1 DIMM A2 :     Manufacturer: NO DIMM :        Size: No Module Installed
Locator: CPU1 DIMM B1 :     Manufacturer: NO DIMM :        Size: No Module Installed
Locator: CPU1 DIMM B2 :     Manufacturer: NO DIMM :        Size: No Module Installed
Locator: CPU1 DIMM C1 :     Manufacturer: Hynix Semiconductor :    Size: 8192 MB
Locator: CPU1 DIMM C2 :     Manufacturer: NO DIMM :        Size: No Module Installed
Locator: CPU1 DIMM D1 :     Manufacturer: NO DIMM :        Size: No Module Installed
Locator: CPU1 DIMM D2 :     Manufacturer: NO DIMM :        Size: No Module Installed
Locator: CPU2 DIMM A1 :     Manufacturer: NO DIMM :        Size: No Module Installed
Locator: CPU2 DIMM A2 :     Manufacturer: NO DIMM :        Size: No Module Installed
Locator: CPU2 DIMM B1 :     Manufacturer: NO DIMM :        Size: No Module Installed
Locator: CPU2 DIMM B2 :     Manufacturer: NO DIMM :        Size: No Module Installed
Locator: CPU2 DIMM C1 :     Manufacturer: NO DIMM :        Size: No Module Installed
Locator: CPU2 DIMM C2 :     Manufacturer: NO DIMM :        Size: No Module Installed
Locator: CPU2 DIMM D1 :     Manufacturer: NO DIMM :        Size: No Module Installed
Locator: CPU2 DIMM D2 :     Manufacturer: NO DIMM :        Size: No Module Installed
-------------------------------------------------------------------
Found PCI Devices : 96
```

```
-------------------------------------------------------------------
Found PCI Devices : 96
-------------------------------------------------------------------
-------------------------------------------------------------------
| Product Name: ThinkServer TD350 | SN:  9999           | Model:   000
+------------------------------------------------------------------+
| LEPT      |  113.00.5      |  LTDE      |  1.09.0003
+------------------------------------------------------------------+
| Windows Driver Package |  113.00.4 | Linux Driver Package |  113.00.4
+------------------------------------------------------------------+
| BIOS      | TB5TS424    |       Release Date: 03/23/2017 ||  BMC      |  4.19
+------------------------------------------------------------------+
| Socket Designation: CPU1 | Version: Genuine Intel(R) CPU @ 3.40GHz
| Socket Designation: CPU2 | Version: Not Specified
+------------------------------------------------------------------+
| RAID      |  Lenovo ThinkServer RAID 110i |FW: N/A |FW Package Version:  NA
+------------------------------------------------------------------+
| Ethernet | 2
+------------------------------------------------------------------+

| 07:00.0 Ethernet controller: Intel Corporation I210 Gigabit Network Connection (rev 03)
| 08:00.0 Ethernet controller: Intel Corporation I210 Gigabit Network Connection (rev 03)
+------------------------------------------------------------------+
| Not Found Fibre Channel Card
+------------------------------------------------------------------+
| Not Found PCIE SSD Card
+------------------------------------------------------------------+
| Not Found TAPE Device
+------------------------------------------------------------------+
 OnBoard Hard Drive List
###################################################
Press Enter key to continue!
```

R/r . Reboot

Enter **R** or **r** to restart the machine.

P/p . Poweroff

Enter **P** or **p** to shut down the machine.

Chapter 5

Test Log

After completing the test, remove the USB key from the Lenovo ThinkServer system and insert it into another system. The compressed log files are located in the root path of the USB key. Extract the log files to a local directory.

Quick mem test Log

The Quick memory test log is a TXT file.

Quick_mem
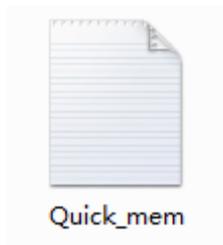
Extended mem test Log

The Extended memory test log is a TXT file.

Extended_mem
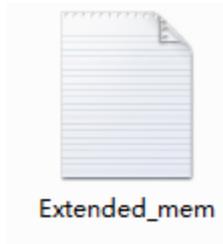
HDD test log

The HDD test log is a TXT file.

hdd
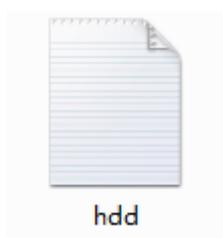
System information logs

There will be a folder about system information. The folder is named in the following way:

Onecli-*%PID%-%date%-%time%*

Raw Logs

Enter the **Onecli-*%PID%-%date%-%time%*** folder, and you can find system related information stored in TXT files and LOG files.
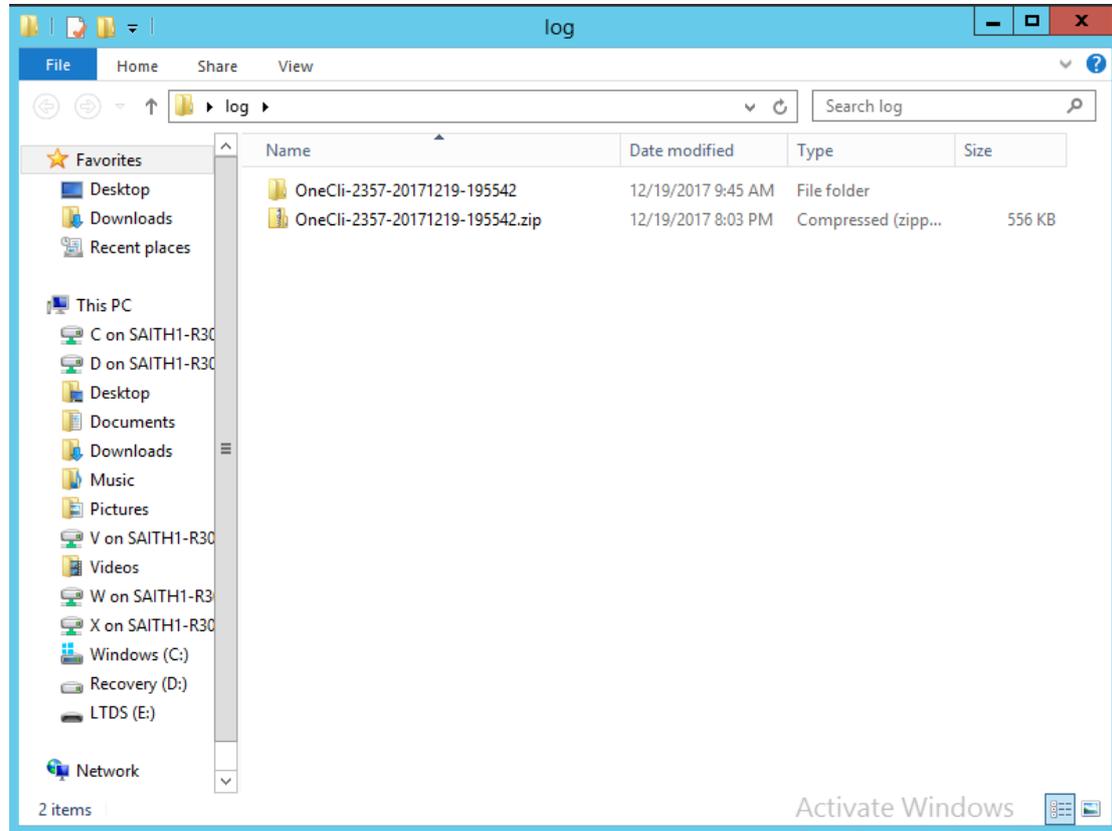
REPORTS directory

The reports directory stores the reports in HTML files. Users can open the HTML files to check system information.

Name ▲	Date modified	Type	Size
📁 OneCli-inventory-Unknown-Unknown-U...	12/19/2017 9:45 AM	File folder	
📁 usb	12/19/2017 9:45 AM	File folder	
📄 c0_fwtermlog.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 c0_pdlist.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 c0_raidevents.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 c0_showall.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 cmdline.log	12/19/2017 8:00 PM	Text Document	1 KB
📄 cpuinfo.log	12/19/2017 8:00 PM	Text Document	9 KB
📄 ctrlcount.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 dmesg.log	12/19/2017 8:00 PM	Text Document	77 KB
📄 dmidecode.log	12/19/2017 8:00 PM	Text Document	24 KB
📄 eventslog_convert.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 fruinfo.txt	12/19/2017 8:00 PM	Text Document	3 KB
📄 fwtermlog.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 interrupts.log	12/19/2017 8:00 PM	Text Document	5 KB
📄 laninfo.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 ledinfo.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 mcinfo.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 OneCli-2357-20171219-195542.log	12/19/2017 8:01 PM	Text Document	51 KB
📄 OneCli-inventory-Unknown-Unknown-U...	12/19/2017 8:01 PM	XML Document	4,130 KB
📄 OneCli-inventory-Unknown-Unknown-U...	12/19/2017 8:01 PM	Compressed (zipp...	180 KB
📄 pdlist.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 psuinfo.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 raidevents.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 sdrinfo.txt	12/19/2017 8:00 PM	Text Document	3 KB
📄 SEL_Hex.txt	12/19/2017 8:01 PM	Text Document	61 KB
📄 selfinfo.txt	12/19/2017 8:00 PM	Text Document	1 KB
📄 selinfo.txt	12/19/2017 8:00 PM	Text Document	107 KB
📄 sensor_with_id_string.txt	12/19/2017 8:01 PM	Text Document	5 KB
📄 sensorinfo.txt	12/19/2017 8:00 PM	Text Document	6 KB
📄 verinfo.txt	12/19/2017 8:00 PM	Text Document	1 KB

Inside the **Onecli-*%PID%-%date%-%time%*** folder, there are HTML log files. Users can open each one of them or simply open the index.html file to see the logs.
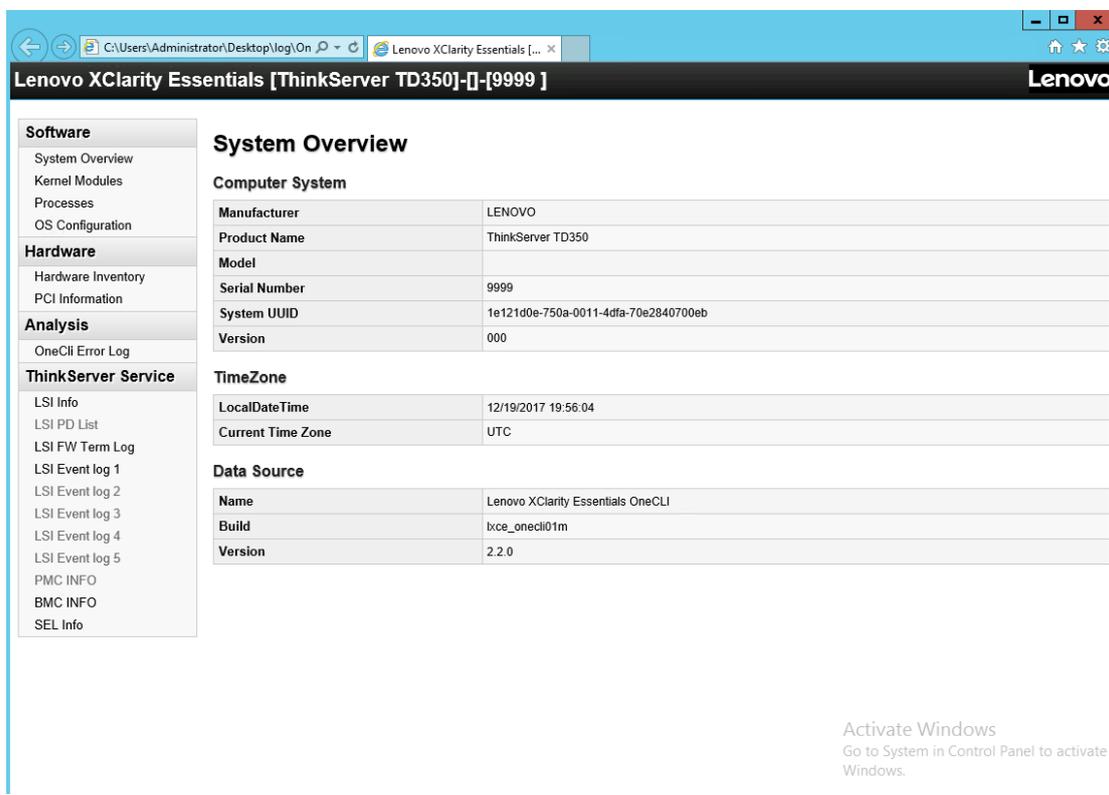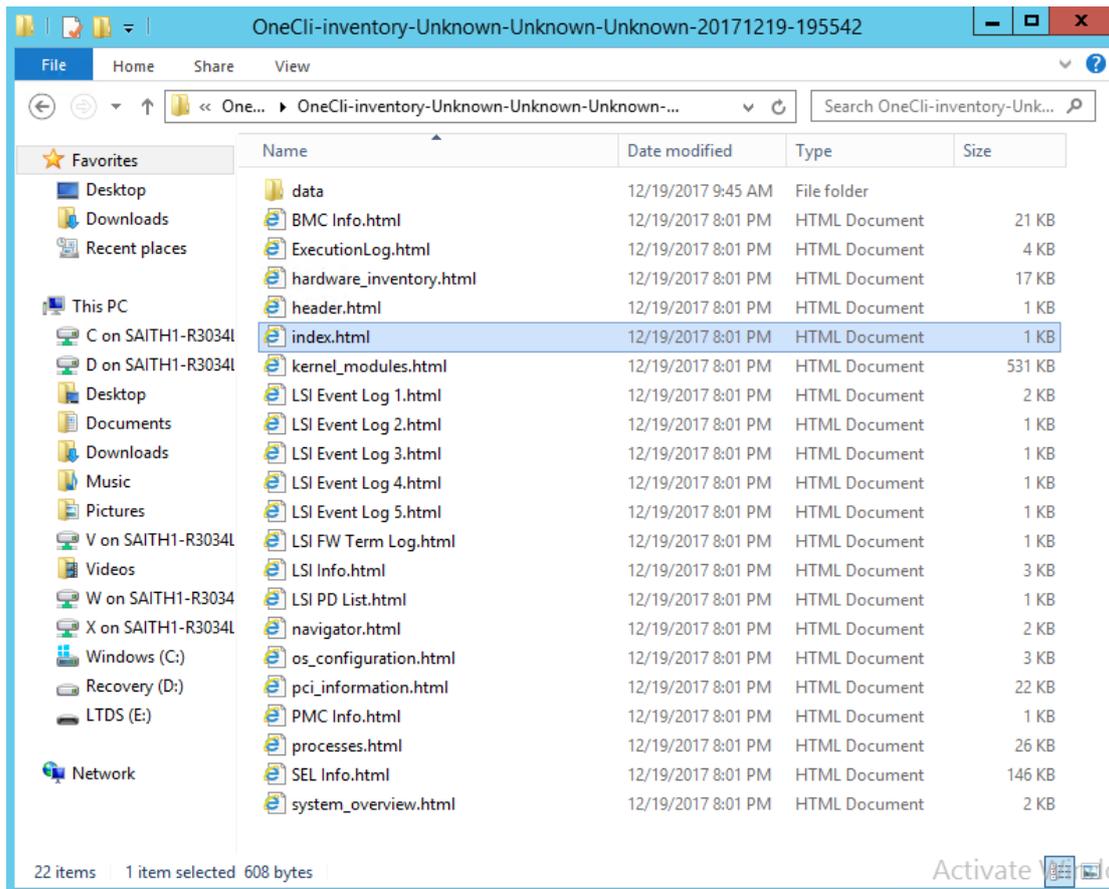
Following is an introduction of the information you can check on the page in the index.html file. You can check the information in each of the five categories.

In the **Software** category, you can check the following:
System Overview
The System Overview page provides a brief summary of the computer system and operating system.

Kernel Modules
Kernel Modules displays a list of the kernel modules, including Name, Description, Module state, Manufacture, Version and Path.

Processes
This page will display information about all running EXE processes.

OS Configuration
In **OS Configuration**, operation system configurations are provided: User Environment Variables.

In the **Hardware** category, you can check the following:
Hardware Inventory
In **Hardware Inventory**, complete hardware info is provided for: Processor(s), Memory, Storage, PCI Device, Removable Disk(s), Optical Disk(s), Network Adapter(s), and other devices.

PCI Information
The page will list detailed PCI devices information.

In the **Analysis** category, you can check the following:
Onecli Error Log
This page displays the Onecli error and warning logs while executing ToolsCenter Suite CLI.

ThinkServer Service
LSI Info
The **LSI Info** page shows specific details on the RAID controller and the current RAID configuration. In this page, the Product Name, Serial Number, SAS Address, Mfg. Date, System Time, Controller Time, FW Package Build, BIOS Version, FW Version, Driver Name, Driver Version, Bus Number, Device Number, Function Number items are displayed. Disk Group(s) information and Physical Disk(s) information are also displayed.

LSI PD List
The **RAID PD List** page shows specific details of the physical drives. This includes drive temp, SN, WWN, RAW Size, Link speed, etc. This information will be displayed when a RAID card is plugged in the system.

LSI FW Term Log
In **LSI FW Term Log**, Firmware log information is displayed for each adapter.

LSI Event log 1~5

The LSI Events page displays all events (fatal, critical warning and informational combined) and displays the Sequence#, Time, Class, Code, Locale, Event Description and Event Data. LSI Event log 1~4 displays 3000 events, and LSI Event log 5 displays the remaining events.

PMC INFO

The **PMC INFO** page shows specific details on the PMC RAID controller and the current PMC RAID configuration. In this page, the PMC Controller Basic Info, Version Info and PMC other info link are displayed.

BMC INFO

The **BMC INFO** page shows specific details of the BMC information. This includes FW information, self-test result, and PSU information acquired by BMC, BMC LAN information, Sensor data and BMC FRU information.

SEL Info

In the SEL Info page, the Caption, Description, Element name, Log name, Message Timestamp, Record Data, Record ID and Record Format for each event record will be shown.