Lenovo ThinkServer Diagnostics

Windows Edition

For Microsoft Server 2008R2, 2012, 2012R2

User's Guide

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Contents

Chapter 1

Introduction

About Lenovo ThinkServer Diagnostics

The Lenovo ThinkServer Diagnostics user guide for your Lenovo® ThinkServer® product contains information about how to run the diagnostics program to assist you or Lenovo Service and Support personnel in the diagnosis of system issues.

The Lenovo Limited Warranty (LLW) contains the warranty terms that apply to the product you purchased from Lenovo. Read the LLW on the documentation DVD that comes with your server. A printable generic version of the latest LLW also is available in more than 30 languages at http://www.lenovo.com/warranty/llw_02. If you cannot obtain the LLW through the documentation DVD or Lenovo Web site, contact your local Lenovo office or reseller to obtain a printed version of the LLW, free of charge.

For warranty service, consult the worldwide Lenovo Support telephone list. Telephone numbers are subject to change without notice. The most up-to-date telephone list for Lenovo Support is always available on the Web site at http://www.lenovo.com/support/phone. If the telephone number for your country or region is not listed, contact your Lenovo

reseller or Lenovo marketing representative.

To obtain the most up-to-date information about the server, go to:
http://www.lenovo.com/thinkserver

Lenovo maintains pages on the World Wide Web where you can get the latest technical information and download documentation or device drivers and updates. To access the Lenovo Support Web site, go to:
http://www.lenovo.com/support

Chapter 2
Installation

Use the information and procedures in this chapter to install the Lenovo ThinkServer Diagnostics in the system you desire to test.

System Compatibility

Lenovo ThinkServer Diagnostics may be installed on any Windows Server 2008R2, Windows Server 2012 and Windows Server 2012R2 based system. **Microsoft .NET Framework 4.0 is required** and can be downloaded directly from Microsoft's website using the reference link below or by using the included .NET framework package located in the downloaded zip. http://www.microsoft.com/en-us/download/details.aspx?id=17718

For Windows Server Operating Systems, you may need to enable/install .NET Framework 4.0 by adding a Feature or Server Role. Use the link below to learn how to identify which versions of Microsoft.NET Framework are installed:
http://msdn.microsoft.com/en-us/kb/kbarticle.aspx?id=318785

For Server OS, the Desktop Experience feature is recommended to be installed in order to use the System Event Calendar function.

Installation

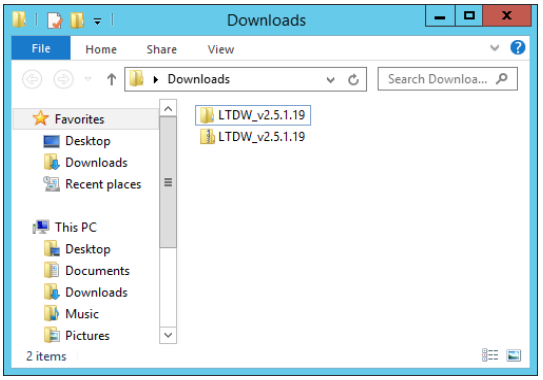
Lenovo ThinkServer Diagnostics is designed and packaged to run without any installation, setup or configuration, ideal for use with any portable USB FLASH storage device as well as local storage disks. In the following example, the Lenovo ThinkServer Diagnostics will be downloaded and extracted to the local disk drive.

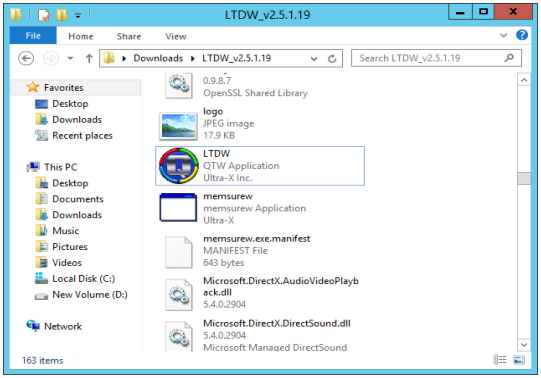
1. Download Lenovo ThinkServer Diagnostics from the Lenovo Support website: http://support.lenovo.com

2. Locate the downloaded zip file and extract.

3. Double click the new folder to view the folder contents and then locate the **LTDW.exe** file and double-click to launch.

   Note：Please don't contain spaces in the file path where extract the zip file. Otherwise it will lead to launch LTDW.exe again failed after you run LTDW.exe successfully at the first time.

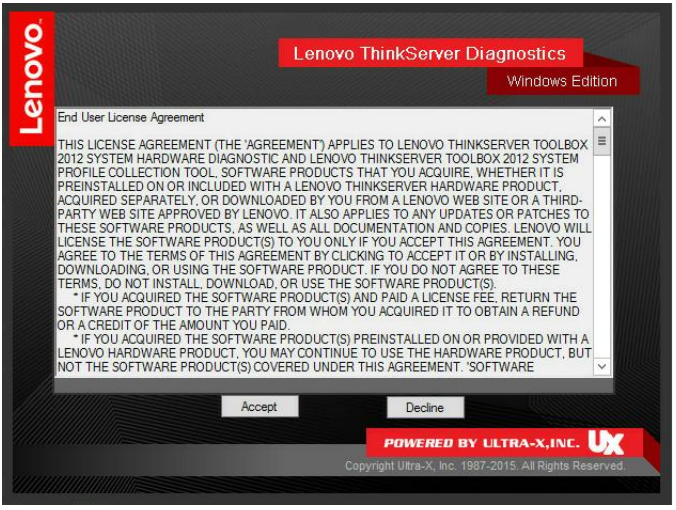




Immediately upon initialization, Lenovo ThinkServer Diagnostics will prompt for language selection. Choose the preferred language and then click the “Continue” button. The current version supports English, Simplified Chinese languages.

Following language selection, you will be prompted to review the End User License Agreement (EULA) terms and be asked to either Accept or Decline the terms. If you do not agree to the terms, click the Decline button and the program will close immediately. If you have

reviewed and agreed to the terms, click the Accept button to continue.



Once the EULA terms are accepted, the Lenovo ThinkServer Diagnostic splash screen will display.

Uninstalling

To uninstall Lenovo ThinkServer Diagnostics, simply delete the folder

and the original zip file.

Troubleshooting Start-Up Problems

1. Background programs can affect Windows (a multitasking / multithreading operating system) from acquiring accurate results. It is recommended to close all other applications, including background programs if possible.

2. Be sure Microsoft .NET 4.0 framework is installed. For Server OS, you may need to create a role or add feature as to enable .NET framework.

Important Notes

1. *In order to get the most accurate results from your system, run Lenovo ThinkServer Diagnostics after you have installed all updated vendor provided device drivers and windows updates.*
2. *In order to get the most accurate results from your system, it is recommended to use IE11 and above web browser.*
3. *Don't Support Intel X550-T2 card. It will cause network test fail when doing network test operation related this card.*

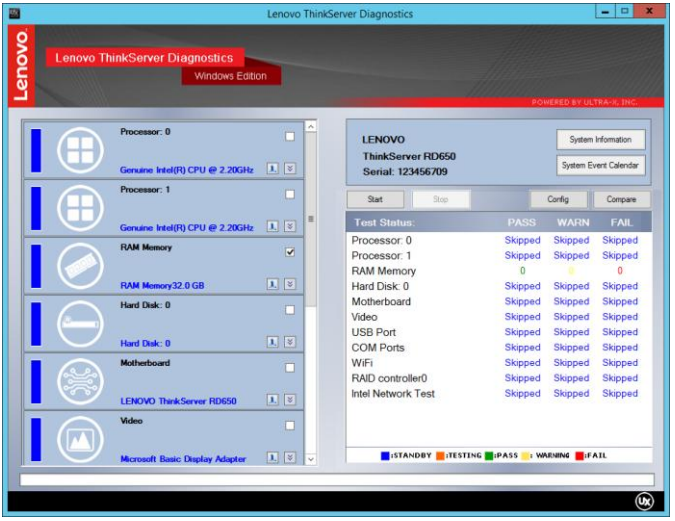
Chapter 3

Understanding the User Interface

Use the information and procedures in this chapter to grasp a general understanding of the Graphical User Interface. Learn how to modify Test Configuration, understand the Testing Process, set Advanced Configuration options and more.

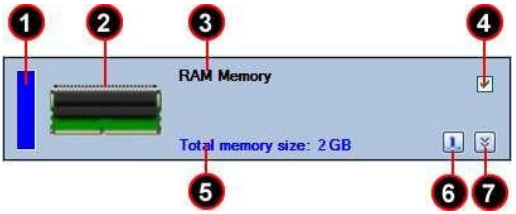
The Main Program Console

To better familiarize yourself with the main console, refer to the followingimages:



A) ***System Hardware Component Test Panel***

Lenovo ThinkServer Diagnostics auto detects available hardware and adds a component test panel for each hardware item.



1) **Test LED Status Box-** Displays a color that refers to the current status of the test: PASS(Green), FAIL(Red), STANDBY(Blue), TESTING(Orange).

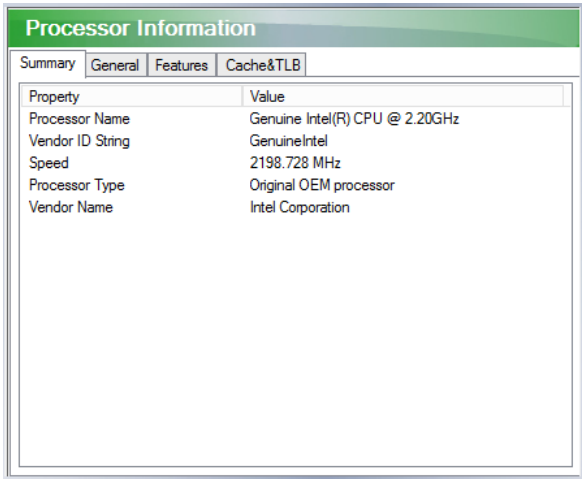
2) **Component Icon**

3) **Component Description**

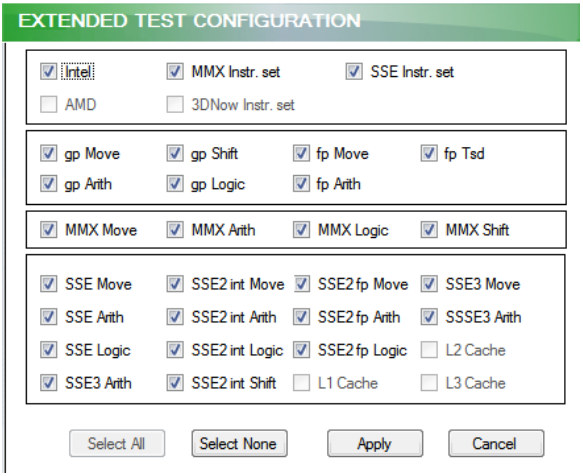
4) **Component Test Enable/Disable-** A check in the checkbox adds the component to the testing queue.

5) **Component Details –** Depending on the component, will display serial number, manufacturer info or size info.

6) **Information Button-** Use this button to display additional information detail for the component. See image below for example.



7) **Component Configuration Button-** Use this button to display and configure test options for the selected component. See image below for example.

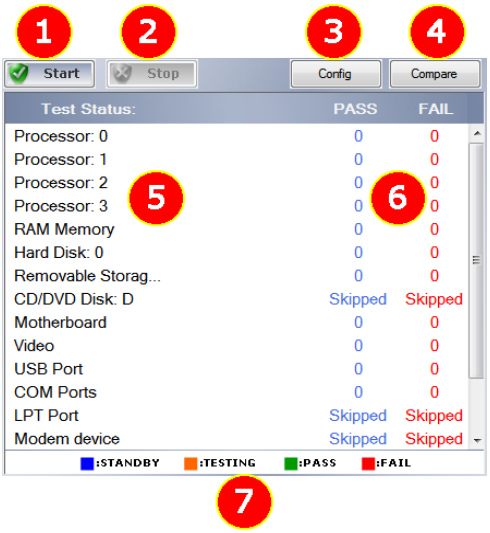


B) ***UUT Model/Version/Serial***

Lenovo ThinkServer Diagnostics displays system name and model information ideal for quick reference. Additional System Information and Event Calendar utilities help to assist in troubleshooting system issues.

1) **System Name, Model & Serial-**
2) **System Information Button-** Performs a System Information Collection process. Will generate XML & HTML output for use with Service and Support personnel to help in troubleshooting system issues.
3) **System Event Calendar Button-** Gathers critical Windows OS events and displays in a graphical yearly calendar.

C) ***Test List Status Panel***



1) **Start Button-** Starts testing.
2) **Stop Button-** Aborts testing.
3) **Configuration Button-** Provides configurable settings such as test method, duration, error handling and test results and log info.
4) **Hardware Compare Button-** Initializes the System Hardware Compare function.
5) **Component Test List-** Displays all test components.
6) **Pass / Fail Status-** Displays number loops that Passed, Failed or Skipped.
7) **LED Test Status Legend-** Color coded legend for quick reference of Test LED Status box.

Configuration

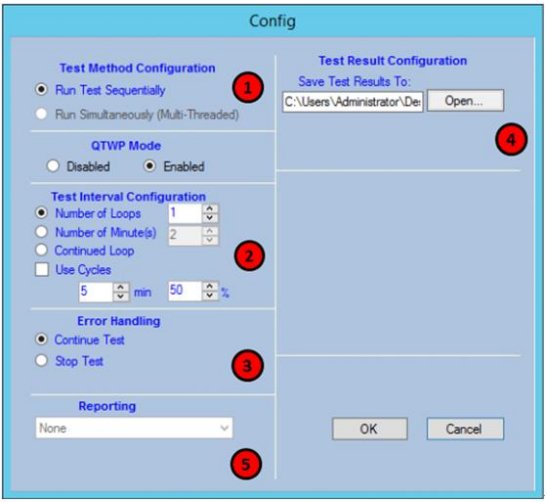
Lenovo ThinkServer Diagnostics will require configuration before running. To configure Lenovo ThinkServer Diagnostics, click the Configuration button.

1) **Test Method Configuration-** Choose the way Lenovo ThinkServer Diagnostics performs testing.
   - **Run Sequentially –** LTDW will run component testing one at a time.
2) **Test Interval Configuration-** Choose the test

period/duration. Select to run an infinite loop, run a specified number of loops, or run a specified number of minutes.

Cycles are used for advanced testing of CPU, Memory, Disk Drives, Video Graphics and Network only. DO not use cycles for any other components. During testing there may be periods of time when tests are active and periods when tests sleep. Both periods are defined a "cycle". You can set the cycle duration (by min) and the maximum percentage stress loading of system function. For example: 50% will make a load factor on devices of 50% of maximum.

3) **Error Handling-** Choose how LTDW will react when an error occurs.
4) **Test Result Configuration-** Use this option to specify the output report destination.
5) **Log File Configuration-** This function is disabled.



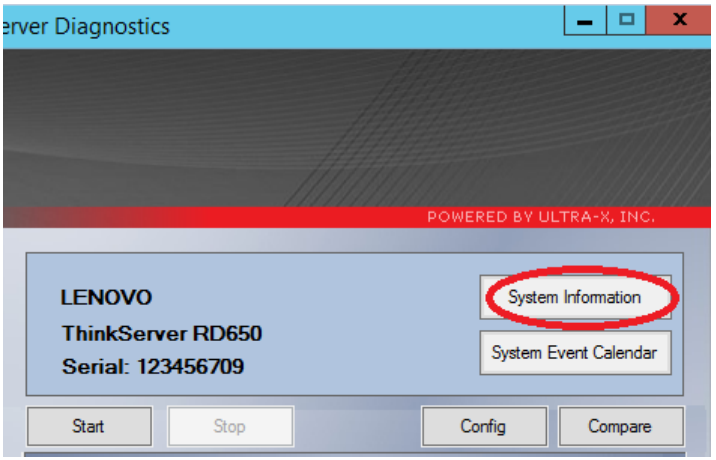
Chapter 4

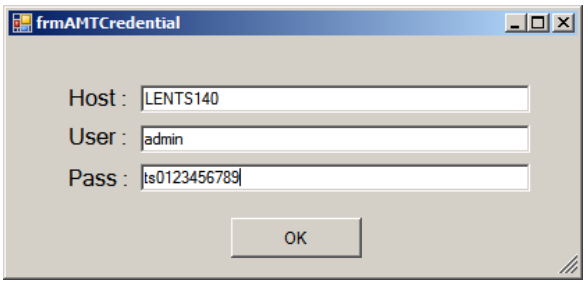
System Information Collection

Use the information and procedures in this chapter to run, view and understand the system information collected from your Lenovo ThinkServersystem.

Collecting Information

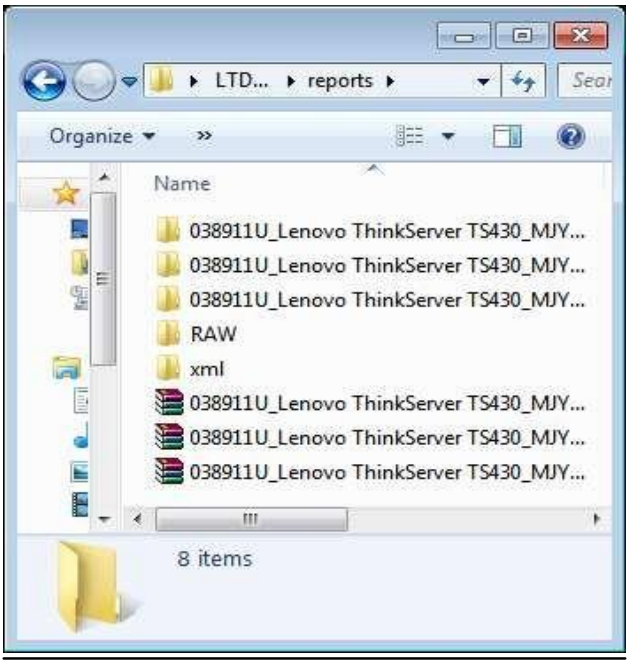
To begin the system information collection process, click the System Information button. If your Lenovo ThinkServer has Intel AMT capabilities and is provisioned, the system collection process will immediately prompt requesting Intel AMT credentials.





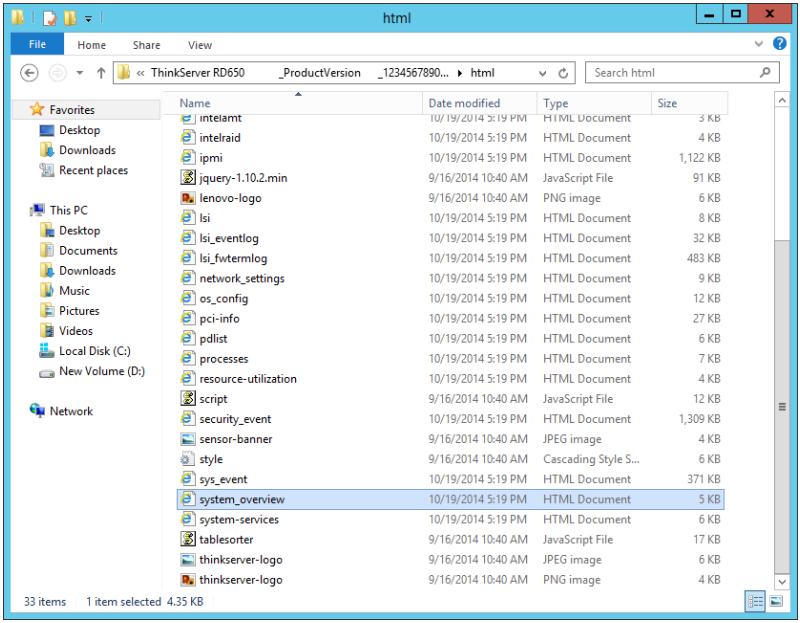
The collection process will take several minutes to complete depending on the system configuration.

Referencing Collected Information



At the completion of the collection process, the Lenovo ThinkServer Diagnostics saves a copy of the output to the **Reports** folder located in the same path from which the tool was initialized.

To view the information report, double-click the **Reports** folder then select the most recent folder (could be many depending on how many times you run the collection process. ***Folders are named with product name and serial with date and time).***



Finally, select the HTML file named – **System_Overview.html**
The report will display in your default system browser.
(If Internet Explorer is used, be sure to enable/allow ActivX)

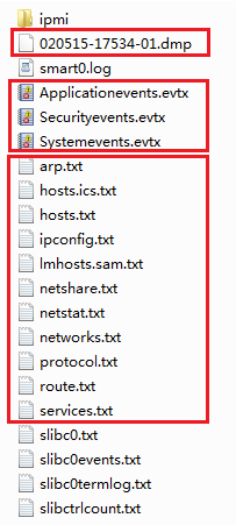
The top right will display the serial# of the Lenovo ThinkServer system highlighted in gold.

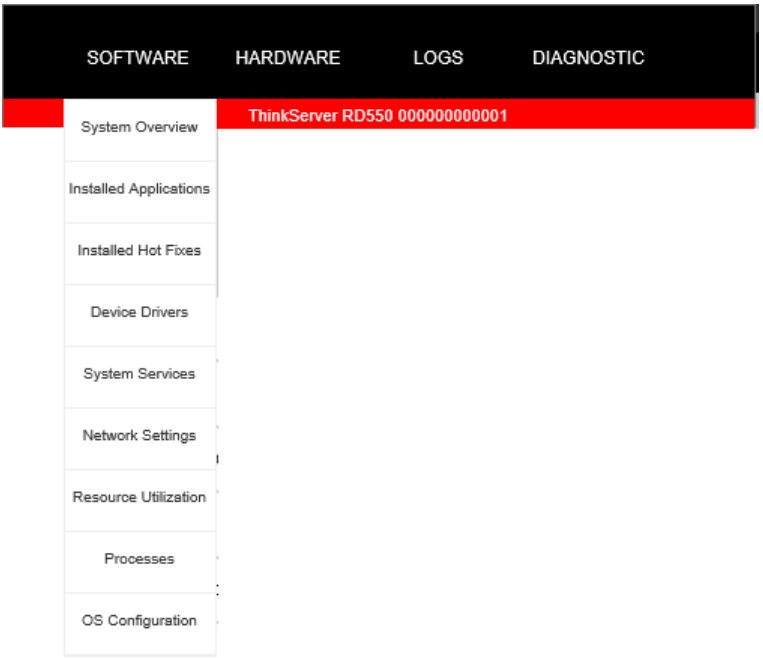
The Machine Type and Model will display on the top middle highlighted in red.

The corresponding ZIP file is password protected. Use the following password to extract the ZIP file.

Password = **len0vO**

Notes: In **raw** folder, there are raw txt format files, including LSI RAID logs, ipmi related logs, PMC adapter logs, and some files got from Windows OS (mini dump file etc.).





The navigation menu on the top middle consists of the following sub categories:

SOFTWARE

- System Overview
- Installed Applications
- Installed Hot Fixes
- Device Drivers
- System Services
- Network Settings
- Resource Utilization
- Processes
- OS Configuration

HARDWARE

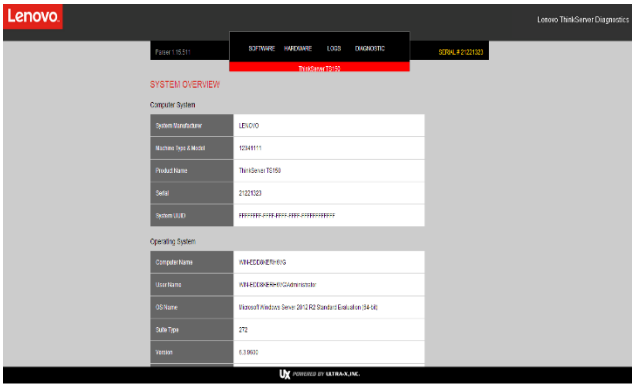
- Hardware Inventory
- RAID Controller
- PD List
- BMC Information
- Disabled Devices
- PCI Information

LOGS

- Application Events
- System Event
- Security Events
- IPMI SEL
- FW Term
- RAID Events
- Intel RAID
- Intel AMT

DIAGNOSTIC

The Diagnostic category consists of the diagnostic test log if diagnostic was performed prior to information collection.



SOFTWARE CATEGORY

System Overview

After collecting the computer data, your Internet Browser will open the results of the test. The System Overview page will provide a brief summary of the Computer System, Operating System, Time Zone and also display any disabled hardware devices.

Installed Applications

In the Installed Applications Menu, a list of each previously installed software package will appear. Program Name, Vendor and version information is listed.

Installed Hot Fixes

In the installing hot fixes menu, a list similar to the one in Installed Applications will appear. In this menu, each software patch that has been downloaded, or "Hot Fix" will appear. This menu will show the " Hot Fix" name, a description, if any, and the date that this fix was installed. Please scroll down to view all of the hot fixes, as this list may contain a large summary

Device Drivers

In the Device Driver menu, a test will run to find each driver that has been previously installed on your particular Lenovo Device. Once run, the Lenovo System Profile Collection Tool will produce a description of the driver, the date for which it was installed, the provider of the driver,

the specific version of the driver that was installed, the inf name, and the manufacture of the driver. Please scroll down to view all of the Device Driver, as this list may contain a large summary.

System Services

In the system services menu, a list of all System Services on your Lenovo device will be displayed. In the System Services menu, a list of the specific System Service, a caption, and description of that particular service will be shown. Please scroll down to view all of the System Services, as this list may contain a large summary.

Network Settings

In the network settings menu, Lenovo System Profile Collection Tool 2012 will provide the Network Settings of your device. This will provide three main lists; Global Settings, Network Adapter, and Network Configuration. Within each of these sections, you will find beneficial sub data about the network data.

***Note :** Network Adapter Speed is got from WMI. Its value is the estimate of the current bandwidth in bits per second.

Resource Utilization

This page will display brief utilization information with emphasis on memory.

Processes

In the running processes menu, your will be presented with all the present processes running on your Lenovo device. With each Process, the name, ID, User Mode Time, Kernel Mode Time, Priority, Memory Usage, and Creation Date will be provided. Please scroll down to view all of the Running Processes, as this list may contain a large summary.

OS Configuration

In this menu, information specific to the Operating System will be displayed. Windows Recovery Environment, Paging file, user accounts and other OS system specific environments are displayed.

HARDWARE CATEGORY

Hardware Inventory

In the Hardware Inventory menu, complete hardware info is provided for: Processor(s), Memory, Physical Disk(s), Logical Disk(s), Removable Disk(s), Optical Disk(s), Video Controller(s), Monitor(s), Motherboard, IDE/SCSI Controller(s), BIOS, Network Adapter(s), Audio Adapter(s), HID Devices, Printer(s) and other devices.

RAID Controller

The RAID controller shows specific details on the RAID controller and the current RAID configuration. In this menu, the model, BIOS version, firmware, MFG date, SAS Address, System Time, Controller Time, FW Package Build, Driver name, Driver version, and drive groups information are provided for each controller detected.

Below the Controller Information table, the Virtual Disk(s), Physical Disk(s) information and Physical Disk(s), Foreign and Topology information are also displayed.

RAID PD List

Physical Disk(s) (or PD) are displayed in columns for each RAID Controller detected. Information such as PD#, Sheild Counter, Media Error Count, Drive Temp, Predictive Failure Count, SMART Flag Alert, SN, WWN, Firmware Revision, Raw Size, Coerced Size, Non-Coerced Size, Device Speed and Link Speed are provided.

BMC Information

BMC Information is displayed for the onboard BMC device. Information includes: Management Controller (MC) Information, Self-Test, Version Info, PSU Info, Details on each PSU detected, Sensors, FRU Device(s), and LAN Print.

Note: Some BMC IPMI OEM commands(supported in RD350/RD450/RD550/RD650/TD350) are used in collecting this category information, so it is normal that some items' value(such as Version Info) in this category are empty while LTDW running in other server systems.

Disabled Devices

In the Disabled Devices menu, any device that is currently disabled is shown, along with the Manufacturer, and the Description of the disabled device.

PCI Information

In the PCI Information menu, details about each PCI (devices) is listed such as Availability, Caption, ConfigManagerErrorCode, DeviceID and device name.

LOGS CATEGORY

Application Events

In the Application Events menu, each application event is listed. With each application, the Category, Type, Event Code, Event ID, Event type, Message, Source, Log File, and Time will be provided. Please scroll down to view all of the installed devices, as this list may contain a large summary.

System Events

In the System Events menu, each system event that happens on your Lenovo device will be listed. The category, type, event code, event ID, event type, message, source, log file, and time will be provided. Please scroll down to view all of the system events, as this list may contain a large summary.

Security Events

In the Security Events menu, each Security Event will be logged and documented for you to see. (Delete) (is displayed). With each security event, the category, type, event code, event ID, event type, a message, source, log file, and time will be shown. Please scroll down to view all of the security events as this list may contain a large summary.

IPMI SEL

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

FW Term Log

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

RAID Events

The LSI Events menu displays the most recent 1024 events (fatal, critical

warning and informational combined) and displays the Sequence#, Seconds since last reboot, class, code, locale, description and target ID for each event record.

Intel RAID
The Intel RAID menu displays Controller, Array, Volume and End Devices specific to the onboard Intel RSTe Controller.

Intel AMT
In the Intel AMT menu, the Total# of Records and the Record#, Timestamp, Device Address, Type and Message for each event record will be shown.

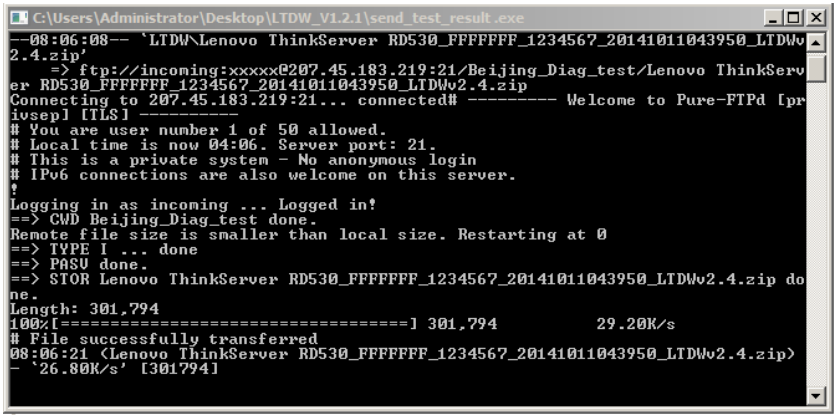
DIAGNOSTIC
The Diagnostic category consists of the diagnostic test log if diagnostic was performed prior to information collection.

Send Collected Report To Lenovo Support

If the tested Server is connected to the Internet, after information collection, user can look in the folder to find ***send_test_result.exe*** and double click it to run. It will send the latest Report zip file to Lenovo Service server.
If the tested Server cannot connect to the Internet, when the tests and information collection are finished, use removable storage to copy the whole LTDW folder to a computer which can connect to internet, then execute ***send_test_result.exe***.

Note:
Question - Does Lenovo ThinkServer Diagnostics change my system configuration?
LTDW will need user to install Microsoft .NET Framework. LTDW itself need no installation and will not change user's system configuration.

Question - Which kind of files will be uploaded to Lenovo?
LTDW Report zip file contains hardware inventory information, some hardware logs (LSI RAID etc.), OS logs, ipmi logs, which are useful for troubleshooting in Lenovo Support. The zip file has a password.



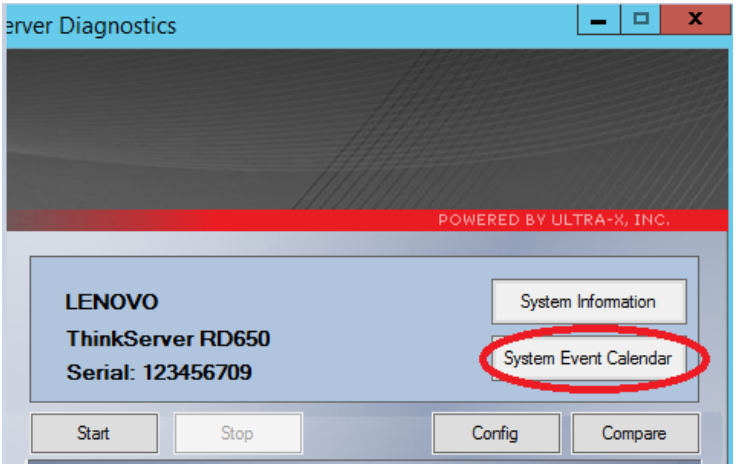
Chapter 5

System Event Calendar

Use the information and procedures in this chapter to run, view and understand the System Event Calendar generated for your Lenovo ThinkServersystem.

Generating the System Event Calendar

To generate and view the System Event Calendar, click the System Event Calendar button. Note: For Server OS, additional Windows Features must be installed such as Desktop Experience and Ink & HandwritingServices.

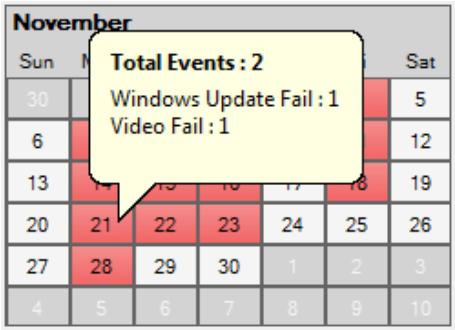


The generation process will take ~45 seconds to complete depending on the system configuration. Once complete, a yearly calendar graphic will display on top of the existing main console window.

Calendar Comprehension

Reference the graphical legend below to identify the color coded boxes displayed in the event calendar.

Clicking on a Red(Critical) or Yellow(Non-Critical) box will display a balloon image with details on the event as shown in the image below:



To print the report, click the Print icon located in the bottom middle of the screen.

Chapter 6

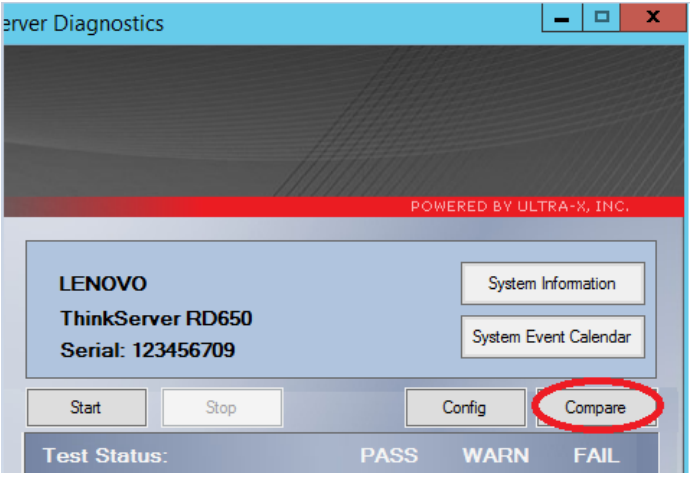
System Hardware Compare

Use the System Hardware Compare to generate a hardware profile of the system which can then later be used to compare to a current profile after an upgrade or hardware change was made.

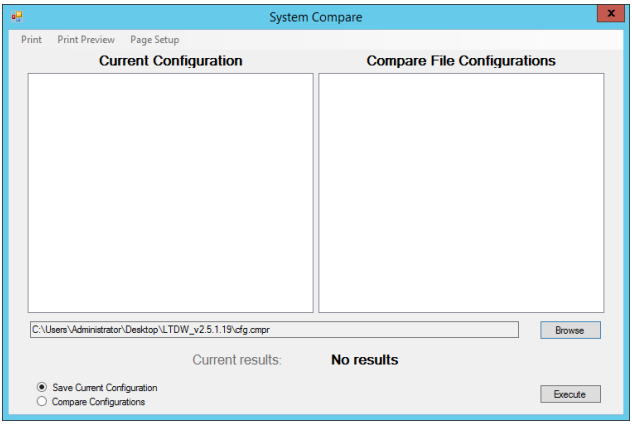
Generating a Hardware Profile

To generate a hardware profile:

1. Click the Compare button

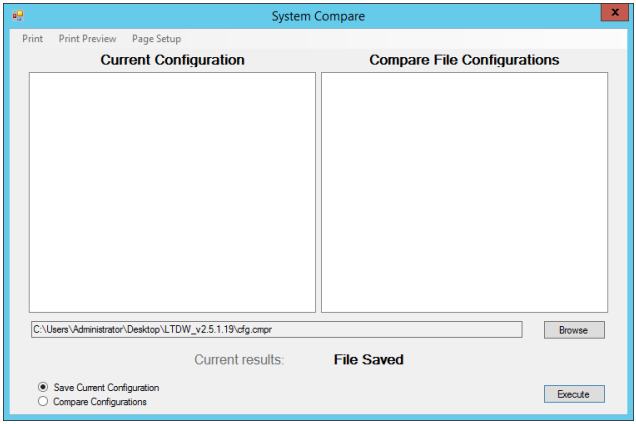


2. The System Compare window will appear.

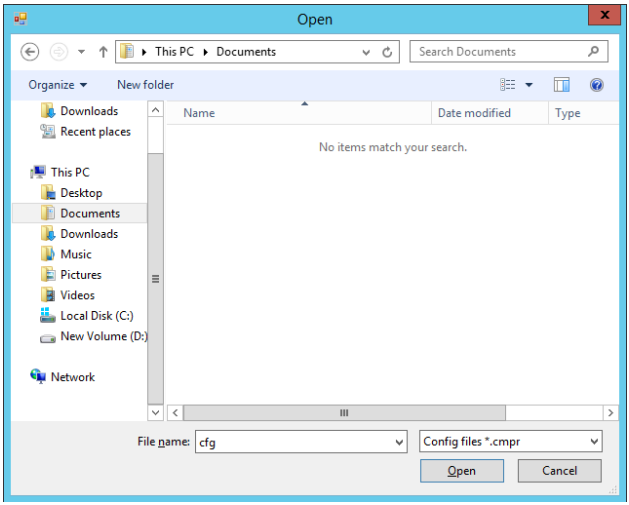


3. Click the Browse button to specify a filename and location of the hardware profile, then click the Open button.

4. Now press the Execute button on the lower right of the screen. You will notice the status change to “File Saved”. See image below for example.

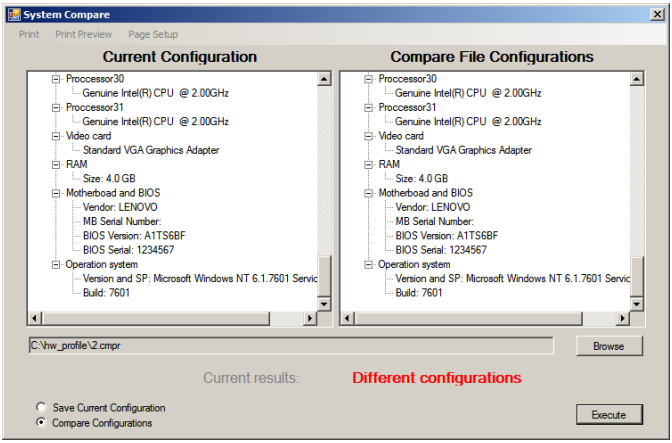


5. At this point you will exit the program and shut the system down. Perform the hardware installation upgrade as needed. When complete, power on the system and re-launch Lenovo ThinkServer Diagnostics.
6. At the System Compare window, click the Browse button, locate the hardware profile saved earlier and then click the OPEN button.



7. At the main System compare window, click the radio button labeled **"Compare Configuration"** and finally click the execute button

8. If hardware configuration is different, the program will highlight in red any discrepancies as shown in the example image below.



Chapter 7

Diagnostics

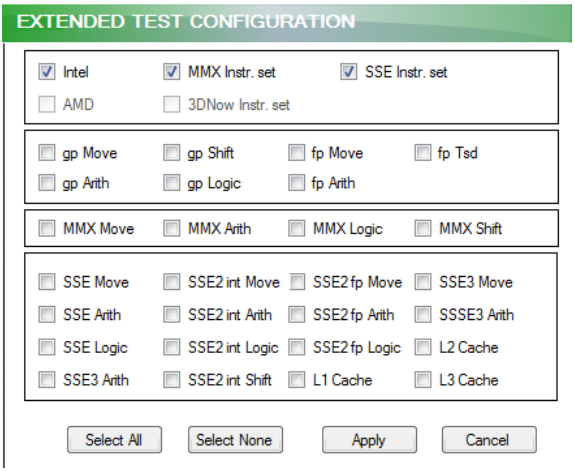
Use the information and procedures in this chapter to configure, execute and understand the diagnostic assessment from your Lenovo ThinkServersystem.

Test Descriptions

The following are test descriptions for each component.

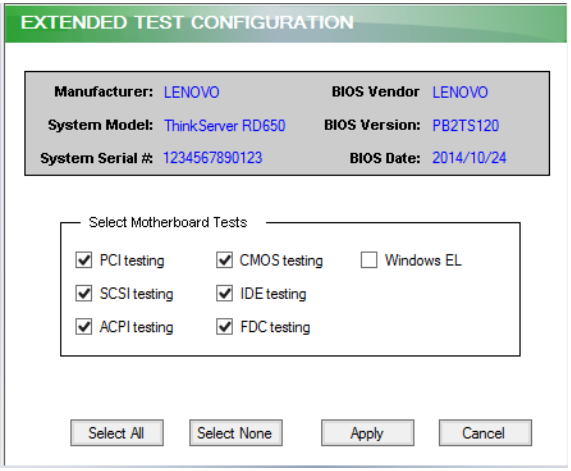
Processor

The CPU test performs several subtests to ensure proper functionality, control and response from each CPU core. The Lenovo System Hardware Diagnostic Tool supports single and multiple physical processors including multi-core based Intel & AMD x86 compatible processors.



Motherboard

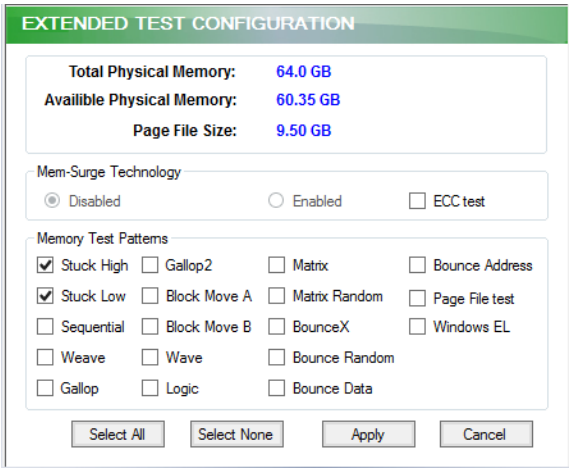
The Motherboard test performs several subtests, checks PCI Bus for compliance, CMOS RAM, RTC and more to ensure proper functionality including examination for missing or unknown device drivers.



Memory

Over 15 memory testing algorithms are used to assess RAM, including

proprietary algorithms developed and used exclusively by Ultra-X. For rigorous testing, be sure to select all memory patterns.



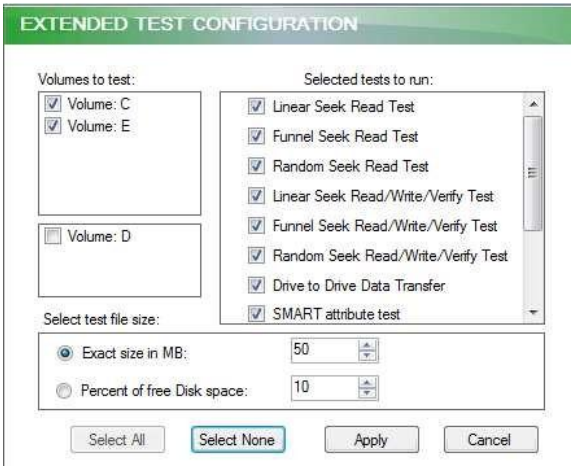
*Notes：Memory testing doesn't check sel log.

Fixed Storage Drive(s)

This function performs a series of non-destructive tests on the systems installed hard drives. Controller seek read, write and verify tests are performed to check a drive's overall condition.

Select the drive(s) you want to test from the Hard Drive Menu. Depending on the test size specified, the Seek and Read tests take some time to execute.

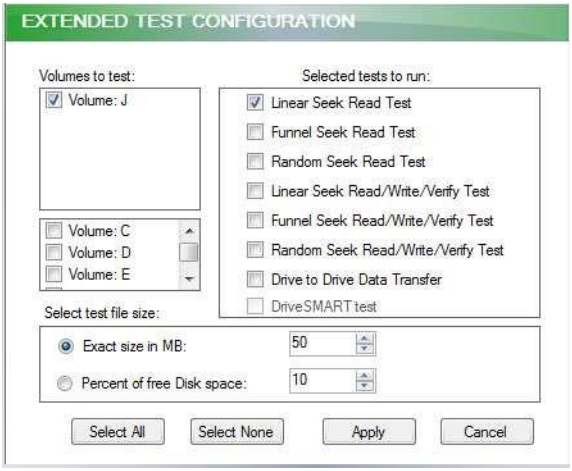
No data on the hard disk is altered or destroyed while running this test. If this test fails, it may indicate physical flaws; and/or logical (read/write) errors on the media, and/or mechanical or electrical problems with the hard drive sub-system.



Removable Storage Drive(s)

This function allows you to test USB FLASH, CompactFLASH, SD(HC), xD and other FLASH based multimedia.

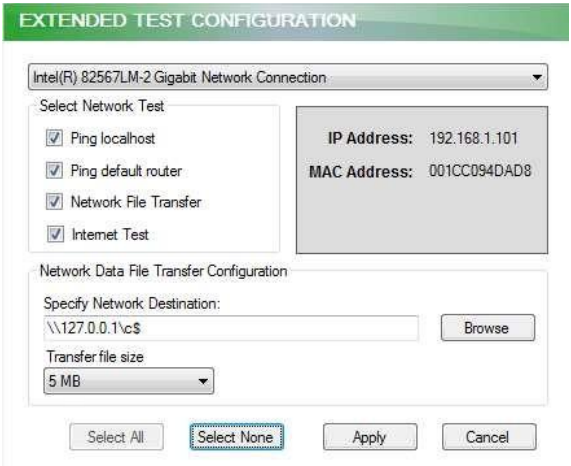
Select the drive(s) you want to test from the Volumes available. Depending on the test size specified, the Seek and Read tests take some time to execute.



Network

The Network test will test the system network adapter and its environment. Use the Configuration button to select to run a Network Data File transfer test, Ping local host test or Ping the network router test.

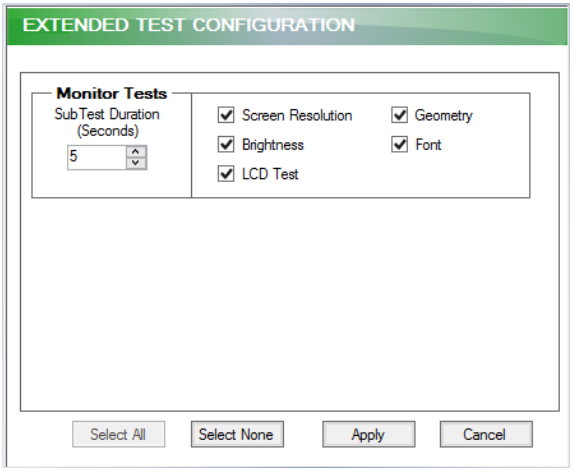
For Network Data Transfer test, be sure to specify the network destination. This can be a local or remote destination which can be chosen by using the Browse button. Select data file transfer size from the drop down menu. Depending on the test size specified, the transfer test may take some time to fully execute.



***Note : Don't support intel Fortville 2 port Mezz card, Intel 4*10Gb PCIE card and Intel CT2 card test, It shown "no compatible Network adapter detect.**

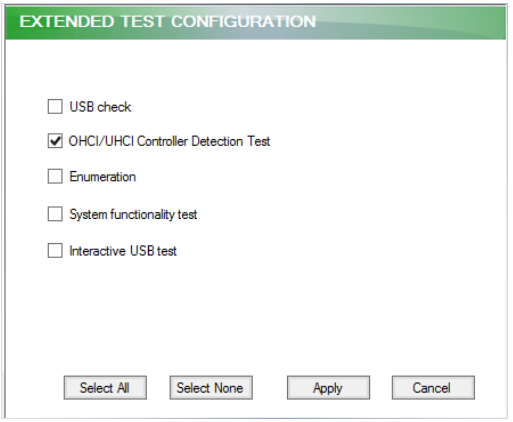
Video Graphics & Monitor

The Video Graphics & Monitor tests perform various functions to determine proper screen resolution, brightness, color, geometry and compliance.



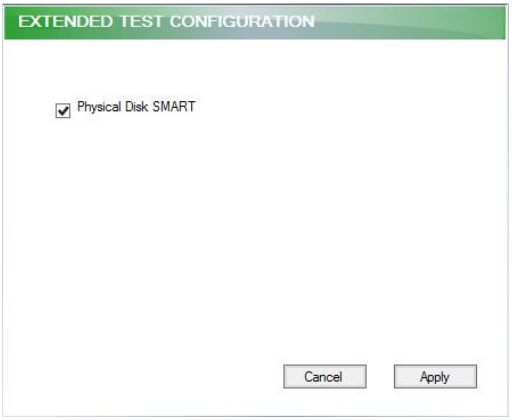
USB

The USB test will perform internal testing on the USB controller for presence, enumeration and PC system functionality. The Interactive USB test will require you to insert and remove any USB device into physical USB ports to check for live connection.



LSI RAID

The LSI RAID test will perform individual testing on each of the Physical Disks connected to the RAID controller. Each disk will be checked for any SMART related issues.



Serial Port(s)

This test checks serial ports under simulated Transmit/Receive conditions by using an External Serial Loopback Plug (supplied with QuickTech for Windows) which connects to a COM port's 9-pin connector.

Intel RSTe RAID

This feature provides only system information for the Intel RSTe RAID controller, array, volume, and end device.