Dell Open Networking (ON) Troubleshooting Guide

June 2015

Notes, Cautions, and Warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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About this Guide

This guide provides site preparation recommendations, step-by-step procedures for rack mounting and desk mounting, inserting optional modules, and connecting to a power source.

CAUTION: To avoid electrostatic discharge (ESD) damage, wear grounding wrist straps when handling this equipment.

WARNING: Only trained and qualified personnel can install this equipment. Read this guide before you install and power up this equipment. This equipment contains two power cords. Disconnect both power cords before servicing.

WARNING: This equipment contains optical transceivers, which comply with the limits of Class 1 laser radiation.

Figure 1. Class 1 Laser Product ID Tag

WARNING: When no cable is connected, visible and invisible laser radiation may be emitted from the aperture of the optical transceiver ports. Avoid exposure to laser radiation and do not stare into open apertures.

Information Symbols

This book uses the following information symbols:

NOTE: The Note icon signals important operational information.

CAUTION: The Caution icon signals information about situations that could result in equipment damage or loss of data.

WARNING: The Warning icon signals information about hardware handling that could result in injury.

WARNING: The ESD Warning icon requires that you take electrostatic precautions when handling the device.

Related Documents

For more information about the Open Networking (-ON) platforms, refer to the following documents.

- *Dell Open Networking (ON) Command Line Reference Guide*
- *Dell Open Networking (ON) Configuration Guide*
- *Dell Open Networking (ON) Getting Started Guide*
- *Dell Open Networking (ON) Installation Guide*
- *Dell Open Networking (ON) Release Notes*

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ONIE Diagnostics

This chapter describes system diagnostics and troubleshooting. After running the diagnostic tools, your system displays pass or fail test results. If all tests pass, the diagnostic tools exit normally. If a test fails, each diagnostic tool offers a different result.

NOTE: The troubleshooting package includes a README file that lists the tools version and the overall troubleshooting package version. For more information, refer to this README file.

NOTE: To download the Release Notes, go to http://www.dell.com/support.

This system uses the following troubleshooting tools:

- **Power-On Self Test (POST) diagnostic** — Automatically runs during the system power-on at the BIOS or U-boot level. This tool tests for catastrophic hardware failures that prevent booting the system. The error code is saved in CMOS for the next boot. There is no physical alarm indication.
- **Extended diagnostic application (EDA)** — Tests the hardware for system failures. This is an on-demand diagnostic tool. EDA verifies platform-specific hardware. There are options to perform diagnostics from a Quick Test to a thorough Intrusive test. If a test fails, you can halt or continue boot-up. If you select the `halt-on failure` option, EDA testing does not continue. If you do not select the `halt-on failure` option, EDA testing continues. Test results are saved in a user-defined storage area. There is no physical alarm indication.

NOTE: To test your hardware, Dell Networking strongly recommends using the EDA tool.

NOTE: EDA runs in the ONIE environment, not in the networking operating system. You must be at the ONIE prompt to run EDA.

Command Line Interface Options

Each diagnostic tool has the following options:

Command	Description
–h	Help topics. Use help to find software-specific tools.
test	Tests against the preconfigured test file.

Viewing S4810-ON System Information

To view your system information; for example, the model, part number, serial number, and service tag, follow these steps.

1. Reboot your system and enter U-Boot mode.
2. Enter the `sys_eeprom` command.

Example of the `sys_eeprom` Command

```
dell_s4810_on-> sys_eeprom
TlvInfo Header:
```

```
   Id String:    TlvInfo
   Version:      1
   Total Length: 73
TLV Name             Code Len Value
-------------------- ---- --- -----
MAC Addresses        0x2A   2 65
Base MAC Address     0x24   6 00:E0:0C:02:01:FD
Vendor Name          0x2D   4 Dell
Product Name         0x21   8 S4810-ON
Part Number          0x22  10 7590009602
Serial Number        0x23  13 HADL127B20077
Manufacturer         0x2B   1 1
Service Tag          0x2F   2 123A1B2
Label Revision       0x27   3 A00
CRC-32               0xFE   4 0x4AF6A929
Checksum is valid.
```

Boot Processes

After the BIOS or U-Boot hardware verifications, POST tests run to verify the CPU and memory prior to booting the system software.

After POST testing, there are three additional types of diagnostic tools you can use for testing your system.

- Manual diagnostic boot process — To run additional testing, manually download and run the EDA tool. The EDA tool reports and logs pass/fail results.
- ONIE with EDA — EDA is installed; you do not have to manually download the tool. Select the diagnostic option at boot-up. You can run this tool without a management interface.
- Autorun EDA — EDA is installed; you do not have to manually download the tool. Select the diagnostic option at boot-up. You can run this tool without a management interface. The system always launches EDA in Quick Test mode to verify the hardware components before loading the software. If there is a failure at boot-up, based on the EDA configuration, the software may or may not continue the boot process.

POST

POST diagnostics verifies system memory before the software loads. Test configuration parameters are saved in CMOS for the next boot-up.

EDA (Quick Test Mode)

Quick Test mode runs basic device access tests for the system hardware to verify that the device is active and responding.

In Quick Test mode, the EDA tool quickly tests if the hardware components are accessible. It confirms that the components respond to read access and in some cases, simple write access. Tests are read-only and non-destructive (except the `memtool` command, which does allow read/write operations).

Capturing Support Data from ONIE

To capture support data from ONIE, use the following commands.

1. Capture support data to the screen.

   ```
   ONIE:/ # dmesg
   ```

2. Capture support data to the `onie-support.tar.bz2 gzip` file.

```
ONIE:/ # onie-support <output_directory>
```

The ONIE support file includes the following:

- kernel_cmdline
- runtime-export-env
- runtime-process
- runtime-set-env
- log/messages
- log/onie.log

Changing the Default Grub Boot Entry

To view or set the default Grub boot entry, use the following command.
The onie-boot-mode command has two options —l (the default) and —o. The Grub boot default is to show the current default entry.

View or set the default Grub boot entry.

```
ONIE:/ # onie-boot-mode [-o <onie_mode>]
```

The -o command options include:

- install — ONIE OS Installer mode
- rescue — ONIE Rescue mode
- uninstall — ONIE OS Uninstall mode
- update — ONIE Self Update mode
- embed — ONIE Self Update mode and Embed ONIE
- diag — ONIE Self Update mode and Embed ONIE
- none — Uses System Default Boot mode. This mode uses the first ONIE boot menu entry.

The -l command option is:

- Lists the current default entry. This is the default.

Restoring the S4810–ON Factory Defaults

If you need to restore the S4810-ON factory defaults, reboot the system to ONIE Rescue using the run onie-rescue or run onie-diag commands. If it is not possible to do this with the operating system you installed, reboot the system and hit any key to stop autoboot.

CAUTION: Restoring factory defaults erases any installed operating system and requires a long time to erase storage.

1. To restore the S4810–ON factory defaults, run one of the following commands.
   U-boot mode

   run onie_rescue OR run onie_diag

   ONIE Rescue bypasses the installed operating system and boots the system into ONIE until you reboot the system.
2. Press ENTER to activate the console.

Example of the Optional `ONIE-uninstaller` Command

After ONIE Rescue completes, the system resets and boots to the ONIE console.

NOTE: Only use the optional `onie-uninstaller` command if you want to remove all the network operating software on your system except for ONIE. This command removes any installed network operating system.

```
ONIE:/ # onie-uninstaller
    Erasing unused NOR flash region
    Erasing 128 Kibyte @ 20000 - 100% complete.
    Erasing internal mass storage device: /dev/mmcblk0 (7832MB)
    Percent complete: 100%
```

Downloading the S4810–ON or S6000–ON Diagnostic Package

To download the diagnostic package on an S4810–ON or S6000–ON platform, follow these steps.

NOTE: Before you begin, go to http://www.dell.com/support and download the diagnostic package. You will need your Dell support access account to download the package.

NOTE: These steps only apply to the S4810–ON and S6000–ON platforms.

1. Enter the `onie-discovery-stop` command to stop the ONIE discovery mode.
2. Assign an ip address to the management interface and verify the network connectivity.

```
ONIE:/ # ifconfig eth0 10.10.10.10/0
ONIE:/ #
ONIE:/ #
ONIE:/ # ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 90:B1:1C:F4:9C:76
          inet addr:10.10.10.10  Bcast:10.10.10.10  Mask:10.0.0.0
          inet6 addr: fe80::92b1:1cff:fef4:9c76/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:18 errors:0 dropped:0 overruns:0 frame:0
          TX packets:24 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:1152 (1.1 KiB)  TX bytes:6864 (6.7 KiB)
          Interrupt:21 Memory:ff300000-ff320000

ONIE:/ # ping 10.10.10.14
PING 10.10.10.14 (10.10.10.14): 56 data bytes
64 bytes from 10.10.10.14: seq=0 ttl=62 time=1.357 ms
64 bytes from 10.10.10.14: seq=1 ttl=62 time=0.577 ms
^C
```

3. Upgrade the DIAG Installer. Again, boot to ONIE Rescue mode and install onie diag installer

   NOTE: The command `onie-nos-install`, shown in bold, is not available in S4810-ON ONIE version 1.0.0.1; instead use the `install_url ONIE:/bin # install_url` command.

```
ONIE:/ # onie-nos-install tftp://10.10.10.10/ON-DIAG/S4810/JUL-08-2014/diag-
installer-powerpc-dell_s4810_on_p2020-r0.bin
Stopping: discover... done.
Info: Fetching tftp://10.10.10.10/ON-DIAG/S4810/JUL-08-2014/diag-installer-
powerpc-dell_s4810_on_p2020-r0.bin ...
ON-DIAG/S4810/JUL-08 100% |*****************************| 1361k 0:00:00
ETA
ONIE: Executing installer: tftp://10.10.10.10/ON-DIAG/S4810/JUL-08-2014/
```

```
diag-installer-powerpc-dell_s4810_on_p2020-r0.bin
Verifying image checksum ... OK.
Preparing image archive ...
Preparing image archive ...sed -e '1,/^exit_marker$/d' /installer | tar xf
- OK.
Diag Installer: platform: powerpc-dell_s4810_on_p2020-r0
Erasing block: 128/128 (100%)
Writing kb: 16376/16384 (99%)
Verifying kb: 16376/16384 (99%)
ONIE:/ # umount: can't remount rootfs read-only
The system is going down NOW!
Sent SIGTERM to all processes
Sent SIGKILL toRestarting system.
Reset via the platform CPLD
```

4. Start ONIE diagnostics. To start the ONIE diagnostics for the S6000–ON, use the `onie-diag` option from the ONIE menu. To start the ONIE diagnostics for the S4810–ON, use the following procedure:
   a. Set the u-boot environment *onie_boot reason* using `ONIE:/ # onie-set-env onie_boot_reason diag` from the ONIE # prompt or using `dell_s4810_on > setenv onie_boot_reason diag` from the u-boot prompt.
   b. Reboot the system to launch and run the ONIE diagnostics.

```
Platform specific diag found and launching.....
*****************************
*  Diagnostics Application  *
*****************************
Dell Diag ./edatool version 1.3, package 1.5 2014/7/23
Dell Diag ./fantool - version 1.3 package 1.5 2014/7/23
Dell Diag ./gpiotool - version 1.3 package 1.5 2014/7/23
Dell Diag ./i2ctool - version 1.3 package 1.5 2014/7/23
Dell Diag ./memtool - version 1.4 package 1.5 2014/7/23
Dell Diag ./nvramtool - version 1.4 package 1.5 2014/7/23
Dell Diag ./pcitool - version 1.3 package 1.5 2014/7/23
Dell Diag ./pltool - version 1.4 package 1.5 2014/7/23
Dell Diag ./psutool - version 1.3 package 1.5 2014/7/23
Dell Diag ./temptool - version 1.3 package 1.5 2014/7/23
Testing PCI devices:
+ Checking PCI 00:00.0, ID=57197000 ..................... Passed
+ Checking PCI 01:00.0, ID=e41445b8 ..................... Passed
PCI devices: Overall test results ------------------- >>> Passed
Testing I2C devices:
Checking I2C devices on bus 0:
+ Checking Dev found @ 0x52 ...  ------  ------ 0x52  ..... Passed
+ Checking Dev found @ 0x54 ...  ------  ------ 0x54  ..... Passed
+ Checking Dev found @ 0x55 ...  ------  ------ 0x55  ..... Passed
+ Checking Dev found @ 0x56 ...  ------  ------ 0x56  ..... Passed
+ Checking Dev found @ 0x57 ...  ------  ------ 0x57  ..... Passed
+ Checking Dev found @ 0x68 ...  ------  ------ 0x68  ..... Passed
Checking I2C devices on bus 1:
+ Checking Dev found @ 0x40 ...  ------  ------ 0x40  ..... Passed
+ Checking Dev found @ 0x42 ...  ------  ------ 0x42  ..... Passed
+ Checking Dev found @ 0x49 ...  ------  ------ 0x49  ..... Passed
+ Checking Dev found @ 0x4a ...  ------  ------ 0x4a  ..... Passed
+ Checking Dev found @ 0x4c ...  ------  ------ 0x4c  ..... Passed
+ Checking Dev found @ 0x4d ...  ------  ------ 0x4d  ..... Passed
Checking I2C devices on bus 2:
I2C Devices: Overall test results ------------------- >>> Passed
Testing Programmable Devices:
PL Tool test:
+ Checking  System CPLD  0xffdf0000 Reg: 0x10 ..................... Passed
+ Checking  System CPLD  0xffdf0000 Reg: 0xa0 ..................... Passed
PL Tool: Overall test results ------------------------ >>> Passed
```

```
Power Supply Test all
Power Supply 1 ..................................... Passed
Power Supply 2 is not present
Power Supply Test .................................. Passed
Testing Temp sensor  devices:
+ Checking [CPU sensor]    = 38.0 C ................... Passed
+ Checking [MAC sensor]    = 43.0 C ................... Passed
+ Checking [Phy Right sensor]    = 39.0 C ................... Passed
+ Checking [Phy Left sensor]    = 40.0 C ................... Passed
Temp Sensors: Overall test results ------------------- >>> Passed
Fan Controller Short Test ............................. Passed
 Fan 1  speed is 12240 RPM
 Fan 2  speed is 12240 RPM
 Fan 3  speed is 12240 RPM
 Fan 4  speed is 12240 RPM
Testing Memory Regions:
Testing Memory Region 0:
Address Read Test ..................................... Passed
Address Write Test .................................... Passed
Address Walking 1's Test .............................. Passed
Address Walking 0's Test .............................. Passed
Data Read Test ........................................ Passed
Data Write Test ....................................... Passed
Data Walking 1's Test ................................. Passed
Data Walking 0's Test .... v     ............................... Passed
Data Sliding 1's Test ................................. Passed
Data Sliding 0's Test ................................. Passed
Data Pattern Test ..................................... Passed
Memory: Overall test results ------------------------- >>> Passed

EDA: Overall test results ---------------------------- >>> PASSED.
```

NOTE: To return to your networking operating software, enter the `reboot` command.

Troubleshooting Issues

To help you solve an issue, use the following troubleshooting solutions.

NOTE: The following troubleshooting solutions do not apply to the S4048–ON and S3048–ON platforms.

Table 1. Troubleshooting Issues and Solutions

Problem	Description and Solution
• A tool indicates a device as failing, but I do not believe this is correct. • A tool indicates a device as passing, but I do not believe this is correct.	• If the configuration file for the particular tool was somehow corrupted, the results may be non-deterministic or inaccurate. Download the diagnostic package again; this ensures a clean copy of the configuration files. Then, re-run the tool.
I need to verify the version of a specific EDA tool.	• All versions of the tools loaded from the diagnostic package are listed in the `/diag/README` file. When you run `edatool`, the output from the README file is output to the console and the `logfile /mnt/diag.log` file. • Any updates to tools are in the form of a new diagnostic package, which contains the corresponding README file.

Problem	Description and Solution
The `storagetool` command runs and indicates a failure, but I do not believe this is correct.	• To run tests, the storage tool requires that you mount the storage device. To verify that there are mounted devices, use the `mount` command. If the device is mounted, the results indicate a problem with the physical device.
The `pltool` command ran, reports a failure, and refers to a "mismatch". What does that mean?	• The `pltool` command compares the firmware versions of the device(s) to the expected latest revision. This message indicates that the firmware is not the most current. Contact your Dell Networking support representative.
The system is not allowing OS installation.	Run the following command: `ONIE#onie-boot-mode -o rescue` then follow the normal installation instructions.
For the S6000–ON platform only. The `Fantool` reports a failure, but the fans seem to be working correctly.	• This is a bug in `fantool` in the current S6000–ON EDA. The `fantool` reads the fan information and compares it to values expected when the fan is initialized and is in the power-up state.

Troubleshooting Tools

This section describes the diagnostic tools that provide debug and hardware tests.

NOTE: The following ONIE diagnostic tools do not apply to the S4048–ON and S3048–ON systems.

To use the troubleshooting tools manually, you must be at the ONIE prompt and navigate to `/mnt/diag/`. If you are not already at the ONIE prompt, reboot your system to Rescue mode. Refer to your network operating software documentation for the procedure to reboot your system to Rescue mode.

NOTE: EDA Quick Test mode only uses the tools in Access Only method for minimal system verification. EDA Extended mode uses the full system for debugging and verification.

The EDA tool is a script-based execution of the other troubleshooting tools. The configuration file is a command-line execution for all tools to run in order.

NOTE: After running the troubleshooting tools, the system reboots to the ONIE prompt. To return to your network operating software prompt, issue the `reboot` command.

edatool

The EDA tool (`edatool`) executes all of the other tools for testing and troubleshooting.

NOTE: For troubleshooting your system, Dell Networking strongly recommends using the EDA tool and not individual tool commands.

The `edatool` is script-based and is easily extended or narrowed to meet your requirements.

Example of the `edatool` Output

```
ONIE:/diag # ./edatool
****************************
```

```
*  Diagnostics Application  *
*****************************
Dell Diag ./edatool version 1.3, package 1.5 2014/7/23
Dell Diag ./fantool - version 1.3 package 1.5 2014/7/23
Dell Diag ./gpiotool - version 1.3 package 1.5 2014/7/23
Dell Diag ./i2ctool - version 1.3 package 1.5 2014/7/23
Dell Diag ./memtool - version 1.4 package 1.5 2014/7/23
Dell Diag ./nvramtool - version 1.4 package 1.5 2014/7/23
Dell Diag ./pcitool - version 1.3 package 1.5 2014/7/23
Dell Diag ./pltool - version 1.4 package 1.5 2014/7/23
Dell Diag ./psutool - version 1.3 package 1.5 2014/7/23
Dell Diag ./temptool - version 1.3 package 1.5 2014/7/23
Testing PCI devices:
+ Checking PCI 00:00.0, ID=57197000 ..................... Passed
+ Checking PCI 01:00.0, ID=e41445b8 ..................... Passed
PCI devices: Overall test results -------------------- >>> Passed
Testing I2C devices:
Checking I2C devices on bus 0:
+ Checking Dev found @ 0x52 ...  ------  ------ 0x52  ..... Passed
+ Checking Dev found @ 0x54 ...  ------  ------ 0x54  ..... Passed
+ Checking Dev found @ 0x55 ...  ------  ------ 0x55  ..... Passed
+ Checking Dev found @ 0x56 ...  ------  ------ 0x56  ..... Passed
+ Checking Dev found @ 0x57 ...  ------  ------ 0x57  ..... Passed
+ Checking Dev found @ 0x68 ...  ------  ------ 0x68  ..... Passed
Checking I2C devices on bus 1:
+ Checking Dev found @ 0x40 ...  ------  ------ 0x40  ..... Passed
+ Checking Dev found @ 0x42 ...  ------  ------ 0x42  ..... Passed
+ Checking Dev found @ 0x49 ...  ------  ------ 0x49  ..... Passed
+ Checking Dev found @ 0x4a ...  ------  ------ 0x4a  ..... Passed
+ Checking Dev found @ 0x4c ...  ------  ------ 0x4c  ..... Passed
+ Checking Dev found @ 0x4d ...  ------  ------ 0x4d  ..... Passed
Checking I2C devices on bus 2:
I2C Devices: Overall test results -------------------- >>> Passed
Testing Programmable Devices:
PL Tool test:
+ Checking  System CPLD  0xffdf0000 Reg: 0x10 ..................... Passed
+ Checking  System CPLD  0xffdf0000 Reg: 0xa0 ..................... Passed
PL Tool: Overall test results ------------------------ >>> Passed
Power Supply Test all
Power Supply 1 ........................................... Passed
Power Supply 2 is not present
Power Supply Test ........................................ Passed
Testing Temp sensor  devices:
+ Checking [CPU sensor]    = 31.0 C ....................... Passed
+ Checking [MAC sensor]    = 38.0 C ....................... Passed
+ Checking [Phy Right sensor]    = 40.0 C ....................... Passed
+ Checking [Phy Left sensor]    = 38.0 C ....................... Passed
Temp Sensors: Overall test results -------------------- >>> Passed
Fan Controller Short Test ................................ Passed
Fan 1  speed is 12240 RPM
Fan 2  speed is 12240 RPM
Fan 3  speed is 12240 RPM
Fan 4  speed is 12240 RPM
Testing Memory Regions:
Testing Memory Region 0:
Address Read Test ........................................ Passed
Address Write Test ....................................... Passed
Address Walking 1's Test ................................. Passed
Address Walking 0's Test ................................. Passed
Data Read Test ........................................... Passed
Data Write Test .......................................... Passed
Data Walking 1's Test .................................... Passed
Data Walking 0's Test .................................... Passed
Data Sliding 1's Test .................................... Passed
```

```
Data Sliding 0's Test ..................................... Passed
Data Pattern Test ......................................... Passed
Memory: Overall test results ------------------------- >>> Passed

EDA: Overall test results ---------------------------- >>> PASSED.
```

The EDA tool tests the platforms using the **default_eda_script.cfg configuration** file. This script dictates how EDA runs and which test runs first or multiple times. Each line of the script is the actual prompt command line including parameters.

pcitool

The PCI tool (`pcitool`) allows testing of the PCI devices.

In EDA Quick Test mode, `pcitool` completes a simple check on the PCI bus. The tool scans the PCI bus for all drivers and functions and writes the configuration registers to the configuration file.

Example of the `pcitool` Output

```
Syntax: ./pcitool <option>
                                    -h := show this help
                                  scan := scan all PCI devices
                                   all := scan and show all config data
                                  test := test using the default PCI test
config file
                 show <bus# dev# func#> := show config data for a specific
bus:dev.func
   read <bus# dev# func# offset count> := read 8-bit config register for
bus:dev.func
   write <bus# dev# func# offset data> := write 8-bit config register for
bus:dev.func
```

Example of the `pcitool` Configuation File Output

```
# more default_pci_list.cfg
Bus:Dev.Fn=00:00.0 ID=0c738086 NOT LISTED
  0c738086 00000007 06000002 00000000 00000000 00000000 00000000 00000000
  00000000 00000000 00000000 00008086 00000000 00000000 00000000 00000000
  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
  00000000 00000000 00000000 00000000 01080000 00000000 00020fb1 00000000
Bus:Dev.Fn=00:01.0 ID=0c468086 PCIe port
  0c468086 00100147 06040002 00010010 ff760004 00000000 00010100 000000f0
…
```

i2ctool

The `i2ctool` allows testing of the devices on the i2c bus.

In EDA Quick Test mode, `i2ctool` scans busses and identifies all of the devices. If a device is behind a MUX, `i2ctool` looks for devices through the MUX and, if present, a second-level MUX as well.

Example of the `i2ctool` Ouput

```
Syntax: ./i2ctool <option>
     -h := show this help
   test := test <user_i2c_file.cfg> the pre-programmed configuration
           # ./i2ctool test userI2cFile.cfg
   read := read I2C device with <bus> <dev> <address> <bytecount>
           # ./i2ctool read /dev/i2c-0 0x50 0x00 10
```

```
  write := write I2C device with  <bus> <dev> <address> <data0> ... <dataN>
           # ./i2ctool write /dev/i2c-0 0x50 0x00 0x0a 0x0b 0x0c
   scan := scan <bus_prefix> the I2C devices on the specified bus prefix
           # ./i2ctool scan /dev/i2c-
```

Example of the `i2ctool` Configuration File Output

```
# more gpio_00_i2c_devices.cfg
I2C devices found on bus #0: 10
Dev found @ 0x18,/dev/i2c-0,-,-,0x18,0x00,1
Dev found @ 0x30,/dev/i2c-0,-,-,0x30,0x00,1
Dev found @ 0x31,/dev/i2c-0,-,-,0x31,0x00,1
Dev found @ 0x32,/dev/i2c-0,-,-,0x32,0x00,1
Dev found @ 0x33,/dev/i2c-0,-,-,0x33,0x00,1
Dev found @ 0x3e,/dev/i2c-0,-,-,0x3e,0x00,1
Dev found @ 0x4d,/dev/i2c-0,-,-,0x4d,0x00,1
Dev found @ 0x50,/dev/i2c-0,-,-,0x50,0x00,1
Dev found @ 0x53,/dev/i2c-0,-,-,0x53,0x00,1
Dev found @ 0x69,/dev/i2c-0,-,-,0x69,0x00,1
I2C devices found on bus #1: 0
I2C devices found on bus #2: 2
Dev found @ 0x51,/dev/i2c-2,-,-,0x51,0x00,1
Dev found @ 0x59,/dev/i2c-2,-,-,0x59,0x00,1
```

memtool

The memory tool (`memtool`) tests system memory.

EDA Quick Test mode only completes simple access (read) tests. You can use `memtool` to test static memory areas, such as L2Cache mapped as SRAM or DRAM on a memory mapped device.

The memory configuration file consists of lines that describe a region of memory and the tests performed on that memory region. Therefore, you can have multiple entries for a region of memory. All parameters are separated by a : character. The following describes the configuration file parameters.

Parameter	Description
Region Name:	The region name referred to in all output.
Start Address:	The starting address for the region of memory in hexadecimal format (without the preceding 0x). If the operating software is defining how to manage memory, this is dynamic and you can use "-" for the start address and the memory uses malloc'd from the available system memory.
Size:	The size of the contiguous memory area (in bytes) in hexadecimal (without the preceding 0x). If memory is dynamic, use "-" for size and the tests use the maximum system memory.
Access:	The letter that describes how this memory is accessed: b — byte (8 bits) h — halfword (16 bits) w — word (32 bits) d — double-word (64 bits)
Increment:	How many bytes to increment to the next cell.

Parameter	Description
ECC:	Describes if ECC is supported — 0 or 1.
Chunk:	Describes how many kilo bytes (1024 bytes) are tested in one chunk. Tests multiple chunks across the memory region.
Max Cache:	The maximum cache size for this memory.
Cacheline:	The size of a cacheline.
Iterations:	The number of times to perform the tests.
Test:	The collection of bits that tell which test to perform on this region. The tests are performed in bit order. Some tests may not be performed due to time limitations and the purpose of the test (for example, *dim cache memory test* which is time consuming and destructive to data). To run an excluded test, you must specifically request the test. For example, to run all tests including the *dim cache memory* test, which is a 0x800, set the tests to `fff`. A-1 — run all available tests.
Descriptive Device:	The descriptive device (for example, SPD in the case of a dimm), is described in one comma-separated field of four parameters: address, type, start, and bytes.
Device Path:	The path to the device driver (for example, `/dev/i2c-0` for a PD on the i2c bus 0).
Address of Memory Description device (SPD):	Describes the memory organization (for example, dimm memory which has an SPD device) and the address of the device. For i2c devices, the address is presented in 7–bit hexadecimal format.
Type:	SPD
Range of bytes in the Description Device:	These two fields list the start and end registers to read descriptive entries for the device.

Example of the `memtool` Output

```
Syntax: ./memtool <option>
                                  -h := show this help
           test [[all]|list|region#] := test using the MEM test config file
                               info  := display configuration info of device
                    read [b|h|w] address := read the specified physical address
 write [b|h|w] address data [length] := write at the specified physical address
```

Example of the `memtool` Configuration File Output

```
//    Memory Configuration File
//
//    Example:
//    SystemRam:-:-:w:4:1:2800:0:0:1:-1:SPD:/dev/i2c-0:50:0,ff:
//    This describes the SystemRam which is dynamic in location and size.  It
is accessed by words //    and incremented addresses of 4 bytes. It is ECC
covered, and has a max chunk of 10KB max
//    cache and cacheline size (unused at this time) are 0.  The tests will be
performed once on this
//    region, and the -1 denotes to run all tests, excluding dim cache memory
test. The Descriptive
//   device is a SPD on /dev/i2c-0 at address 0x50, and we read registers 0-255.
```

```
//
//    Note: a '-' address and size denotes a dynamic ram allocation
//    ======================Tests================================
//    -1  : all Tests Run
//     0h : No Address Test
//     1h : Address Read Test (Access)
//     2h : Address Read|Modify|Write|Verify
//     4h : Address walking 1's
//     8h : Address walking 0's
//     00h : No Data Test
//     10h : Data Read Test (Access)
//     20h : Data Read|Modify|Write|Verify
//     40h : Data walking 1's
//     80h : Data walking 0's
//    100h : Data walking 1's
//    200h : Data walking 0's
//    400h : patterns (00ff, ff00, 55aa, aa55)
//    800h : Cache (cacheKiller - Not Part of ALL Tests)

SystemRam:-:-:d:8:1:2800:-1:-1:1:-1:i2c:0x52,SPD,0,255
```

pltool

The programmable logic tool (`pltool`) verifies access to the complex programmable logic devices (CPLD) and field programmable gate array (FPGA) and verifies versions.

The `pltool` generates its configuration file based on the platform database. The configuration file is generated with a specific version of devices in order to detect manufacturing misleads. The database holds all the versions and is updated when new versions are released.

The configuration file displays in tree format. The base is the chip that can have multiple registers and may or may not have bit descriptions and bit collection information. Each parameter in the tree is on an individual line separated by the "|" character.

Example of the `pltool` Output

```
Syntax: ./pltool <option>
                                        -h := show this help
                                     test := test using the test config file
                                     list := list devices and registers
      read [b|h|w] device offset [length]  := read the specified register
 write [b|h|w] device offset data [length] := write at the specified register
```

The configuration file displays in tree format. The base is the chip that can have multiple registers and may or may not have bit descriptions and bit collection information. Each parameter in the tree is on an individual line separated by the "|" character.

The following describes the C-row configuration file tree output.

C-Row Parameter	Description
C	The row identifier.
Type	CPLD, FPGA, or TPM.
Address	The address of the device. For CPLD on an I2C bus, this is an 8–bit address. For PCI, this is the bus:dev:function in a packed 32–bit word, 8–bits each. For memory, this is the address. LPC is unknown.
Name	The text name for the device.

C-Row Parameter	Description
Interface	i2c, pci, mem, io, or lpc.
Bus	For devices on multiple busses, this indicates the bus number (for example, 0 for i2c indicates /dev/i2c-0. For PCI, this holds the bus-dev-func in a 32–bit value with each byte representing bus, device and functions in that order (for example, 0x020304 represents bus 02, device 03, and function 04).
Version Reg	The register that contains the version for the device.
Version Mask	The bits to use to check the version.

The following describes the R-row configuration file tree output.

R-Row Parameter	Description
R	The register identifier.
Address	The register addresses (offset) in the device.
Register Size	Describes how many bits the register contains (for example, 8, 16, or 32).
Register Mask	Lists the valid bits in this register.
Name	The text name of this register.
Access Perm	Access permissions: RO — Read only RW — Read/Write RC — Clear on Read WO — Write only
Default Value	The default value of this register.
Testable	1 — The register can be tested against the default value. 0 — The register is not testable.
Version	The version of the register. There can be multiple definitions of a register based on the version. When the test creates a configuration file from a device list with several versions, a specific version is requested and if the version requested is the last version prior to or equal to the requested version, it is put into the configuration file.

The following describes the B-row configuration file tree output.

B-Row Parameter	Description
B	The bit row identifier.
Bit Number(s)	This can be either a single bit number or a range starting with the highest bit number (for example, 7 or 7:3).

B-Row Parameter	Description
Name	The name of the bit.
Access	The access type of the bit; the same as the register definition.
Default Value	The default value of the bits.

The following describes the I-row configuration file tree output.

I-Row Parameter	Description
I	The identifier row descriptor.
Value	The value of the collection of bits.
Meaning	The meaning of the collection of bits.

Example of the `pltool` Configuration File Output

```
# ./pltool
Programable Logic Tool
Syntax: ./pltool <option>
                                        -h := show this help
                                      test := test using the test config file
                                      list := list devices and registers
      read [b|h|w] device offset [length]  := read the specified register
 write [b|h|w] device offset data [length] := write at the specified register
```

Example of the `pltool` Configuration File Tree Output

```
# C - CHIP (Master | Slave -  Cpld or FPGA), Address, Name, Access
# R - Register, Offset, Mask, Name, RW , Default Val
# B - Bit(s), bitnum(s), Name, RW, Default Val
# I - Information on the bits
=====
C | CPLD | 0x31 | System CPLD | i2c | 0 | 0x00 | 0xf
R | 0x00 | 8 | 0xFF | Board Revision Reg | RO | 0x4A | 1 | 0x0
B |  7:4 | Board Stage | RO | 0x0
B |  3:0 | CPLD Revision | RO | 0x0
R | 0x01 | 8 | 0xFF | Software Reset Reg | RW | 0xFF | 0 | 0x0
B |  7 | Reserved | RW | 0x1
B |  6 | CFast Card Pres | RO | 0x1
B |  5 | CPU HRSTn | RW | 0x1
B |  4 | Super IO RST | RW | 0x1
B |  3 | PE_SATA_RST | RW | 0x1
B |  2 | PE_USB_RST | RW | 0x1
B |  1 | FORCE_RST | RW | 0x1
B |  0 | CPU_RST | RW | 0x1
=====
C | CPLD | 0x32 | Master CPLD | i2c | 0 | 0x01 | 0xf
R | 0x01 | 8 | 0xFF | Board Revision Reg | RW | 0x4C | 1 | 0x0
B |  7:4 | Board Stage | RO | 0x0
I |  4 | P2B-P2C Stage
I |  3 | P2A Stage
I |  2 | P1 Stage
I |  1 | P0 Stage
I |  0 | Testing Code
B |  3:0 | CPLD Revision | RW | 0x0
R | 0x02 | 8 | 0xFF | Power Enable Reg 1/2 | RO | 0x0 | 0 | 0x0
```

gpiotool

The `gpiotool` verifies the state of the GPIO signals.

This test is more commonly used in ODA Offline and Online modes. `gpiotool` can also change the GPIO values for I/O devices and internal CPU GPIOs.

Example of the `gpiotool` Output

```
Syntax: ./gpiotool <option>
    -h := show this help
   set := set GPIO pin
          # set pin# value
   get := get GPIO pin value
          # get pin#
```

storagetool

The storage tool (`storagetool`) tests the physical media and SMART status media, if supported.

`storagetool` is commonly used with ODA Offine testing.

Example of the `storagetool` Output

```
Syntax: ./storagetool <option>
                        -h := show this help
                      list := list devices
             test <device> := test devices (empty for all)
            smart <device> := get the smart status for a device (empty for all)
```

psutool

The power supply tool (`psutool`) reports information about the power supplies. It can read and write the power supply parameters.

NOTE: If you are missing a power supply unit, the `psutool` test reports a failure.

Example of the `psutool` Output (Preliminary Syntax)

```
Syntax: ./psutool <option>
                                -h := show this help
     test [[all] | power supply] := test using the default config file
           read <psu> <register> := read the register on the Power Supply
  write <psu> <register> <value> := write the value into the Power Supply
Register
```

fantool

The fan tool (`fantool`) reports information about fan availability and fan speed. `fantool` also allows control of the fan speeds.

NOTE: If you are missing a fan, the `fantool` test reports a failure.

Example of the `fantool` Output

```
Syntax: ./fantool <option>
                                                -h := show this help
                     test [[all] | fan controller] := test using the Fan
Controller config file
                                               init := Initialize the fans to the
default state
```

```
set <fan | all> [speed in RPM | low | mid | high] := sets the fan(s) to the
speed
                                    get <fan | all> := gets the speed of the
specified fan or all fans in RPM
```

In the `fantool` configuration output, the first six rows describe the six fans in your system and the devices that control the fans. The second portion lists the speeds for the fans: low, medium, high, and default.

The first portion of the output lists the fan IDs, name, the device that controls the fan, the fan address on the I2C bus, and the instance of the fan control within the chip. Also included is a description of which fan tray the fan is located in. The last two values in the configuration file output are the speed resolution and the number of pulses per second.

Example of the `fantool` Configuration File Output

```
0 | Fan 1 | MAX6620 | 0x2a | 0 | Fan Tray 0 | 4 | 2
1 | Fan 2 | MAX6620 | 0x2a | 1 | Fan Tray 0 | 4 | 2
2 | Fan 3 | MAX6620 | 0x29 | 0 | Fan Tray 1 | 4 | 2
3 | Fan 4 | MAX6620 | 0x29 | 1 | Fan Tray 1 | 4 | 2
4 | Fan 5 | MAX6620 | 0x29 | 2 | Fan Tray 2 | 4 | 2
5 | Fan 6 | MAX6620 | 0x29 | 3 | Fan Tray 2 | 4 | 2
=====
0 | 5 | 2000 | 9000 | 19000 | 18000
```

temptool

The temperature tool (`temptool`) allows access to the thermal sensors on the boards and devices.

Temperatures are reported in degrees C. `temptool` also allows you to set the temperature thresholds for error and monitoring.

Example of the `temptool` Output

```
Syntax: ./temptool <option>
    -h := show this help
  test := test the pre-programmed configuration
          # test <temperature_cfg_filename>
  show := show current temp device values for
          # show <temperature_cfg_filename>
```

nvramtool

The NVRAM tool (`nvramtool`) allows the setting of the control bits for POST testing.

Example of the `nvramtool` Output

```
Syntax: ./nvramtool <option>
                                        -h := show this help
                                    read := read nvram values at reg index
                        write <reg> <value> := write nvram value
```

3

Dell Diagnostics

The following describes the Dell diagnostics. These instructions apply to systems for which the ONIE diagnostics are not available.

Downloading the S4048–ON or S3048–ON Diagnostic Package

To install the S4048–ON or S3048–ON diagnostic package on your system, follow these steps.

NOTE: Before you begin, go to http://www.dell.com/support and download the diagnostic package. You will need your Dell support access account to download the package.

1. Boot your system to ONIE.
2. Enter the `onie-discovery-stop` command to stop the ONIE discovery mode (`ONIE:/ # onie-discovery-stop`).
3. Configure the management interface to download the image using `ONIE:/ # ifconfig eth0 10.10.10.10/12 up`. Also ping the server/network IP address.

```
ONIE:/ # ifconfig eth0 10.10.10.10/12 up
ONIE:/ # ping -c4 10.10.10.14
PING 10.10.10.14 (10.10.10.14): 56 data bytes
64 bytes from 10.10.10.14: seq=0 ttl=64 time=0.446 ms
64 bytes from 10.10.10.14: seq=1 ttl=64 time=0.198 ms
64 bytes from 10.10.10.14: seq=2 ttl=64 time=0.183 ms
64 bytes from 10.10.10.14: seq=3 ttl=64 time=0.163 ms

--- 10.10.10.14 ping statistics ---
4 packets transmitted, 4 packets received, 0% packet loss
round-trip min/avg/max = 0.163/0.247/0.446 ms
ONIE:/ #
```

4. Install the image using the `onie-nos-install` command.

```
ONIE:/ # onie-nos-install tftp://10.10.10.10/INSTALLER-DND-SK-1.0.0.3.bin
Stopping: discover... done.
ONIE: Executing installer: ./INSTALLER-DND-SK-1.0.0.3.BIN ...

INSTALLER-DND-SK-1.0   3% |*                               |   878k  0:00:29
ETA
INSTALLER-DND-SK-1.0  12% |***                             |  3477k  0:00:13
ETA
INSTALLER-DND-SK-1.0  22% |******                          |  6050k  0:00:10
ETA
INSTALLER-DND-SK-1.0  31% |*********                       |  8625k  0:00:08
ETA
INSTALLER-DND-SK-1.0  40% |************                    | 10986k  0:00:07
ETA
INSTALLER-DND-SK-1.0  48% |**************                  | 13062k  0:00:06
ETA
```

```
INSTALLER-DND-SK-1.0  56% |*****************              | 15268k  0:00:05
ETA
INSTALLER-DND-SK-1.0  66% |*******************            | 18026k  0:00:04
ETA
INSTALLER-DND-SK-1.0  75% |***********************        | 20535k  0:00:02
ETA
INSTALLER-DND-SK-1.0  84% |************************       | 22803k  0:00:01
ETA
INSTALLER-DND-SK-1.0  92% |***************************    | 25063k  0:00:00
ETA
INSTALLER-DND-SK-1.0 100% |*******************************| 27115k  0:00:00
ETA
INSTALLER-DND-SK-1.0 100% |*******************************| 27115k  0:00:00
ETA
ONIE: Executing installer: tftp://172.27.1.176/INSTALLER-DND-SK-1.0.0.3.bin
Verifying image checksum ... OK.
Preparing image archive from /installer ... Done.
Mounting /dev/sda3...Done.
Copying Images ...Done.
Installing Menu Entry ...Done
All Done
ONIE:/ # umount: can't remount rootfs read-only

The system is going down NOW!

Sent SIGTERM to all processes

Sent SIGKILL tosd 4:0:0:0: [sda] Synchronizing SCSI cache
Restarting system.
machine restart
```

5. After installing the diagnostic image, a new entry (`DELL-DIAG`) is added to the ONIE boot menu.
6. Select the `DELL-DIAG` option to boot the Diagnostics image.

NOTE: When you update ONIE, the `DELL-DIAG` option is removed. To recreate the `DELL-DIAG` option in the menu, you must install the `Dell Diag Entry updater`, as shown in the following example.

```
ONIE:/ #
ONIE:/ #
ONIE:/ # onie-nos-install tftp://10.16.127.35/DND-SK-DELL-DIAG-ENTRY-UPDATER
Stopping: discover... done.
Info: Fetching tftp://10.16.127.35/DND-SK-DELL-DIAG-ENTRY-UPDATER ...
DND-SK-DELL-DIAG-ENT 100% |*******************************| 15371   0:00:00
ETA
ONIE: Executing installer: tftp://10.16.127.35/DND-SK-DELL-DIAG-ENTRY-
UPDATER
Verifying image checksum ... OK.
Preparing image archive from /installer ... Done.
Installing Menu Entry ...Done.
ONIE:/ # umount: can't remount rootfs read-only
The system is going down NOW!
Sent SIGTERM to all processes
Sent SIGKILL tosd 4:0:0:0: [sda] Synchronizing SCSI cache
Restarting system.
machine restart
```

Using the Dell Diagnostic Test Suite

To run the Dell diagnostic test suite, use the following command.
Use the following step after the system boots up.

1. To run the Dell diagnostic test suite, select the `DELL-DIAG` option.

   NOTE: Use the up and down arrow keys to select which entry is highlighted. Press Enter to select an operating software-selected OS or enter `e` to edit the commands before booting. Enter `c` for a command line. The highlighted entry (*) executes automatically in the operating system.

   You will see a "Welcome to Grub" message at the beginning of the process and the `DCLI->` prompt at the end of the process.

```
GNU GRUB  version 2.02~beta2+e4a1fe391

+----------------------------+
|ONIE: Install OS            |
|ONIE: Rescue                |
|ONIE: Uninstall OS          |
|ONIE: Update ONIE           |
|ONIE: Embed ONIE            |
|ONIE: Diag ONIE             |
|*DELL-DIAG                  |
|Embed ONIE                  |
|                            |
|                            |
```

   NOTE: The following commands are available at the DCLI prompt.

2. At the `DCLI>` prompt, enter the `testall` command to run all the Dell diagnostics.
   You can enter any of the following commands to run a specific type of diagnostic. To run a specific test, use the `testall testlevel=<n>` command, where *n* = `0`, `1`, or `2`. The `testall` command runs all the Level tests.

   - `testall` — Runs all levels of tests (Level0, Level1, and Level2).
     - Level0 — tests the presences of the devices.
     - Level1 — tests the read/write access of the devices.
     - Level2 — runs Loopback tests.

NOTE: For all the S4048–ON tests to be successful, you must connect the following to your system:

a. USB-A device connected in the USB port.

b. Forty-eight 10 Gbps ports for small form-factor pluggable plus (SFP+) transceiver connections (back to back). For example, PORT1–>PORT2, PORT3–>PORT4, ... PORT47–>PORT48.

c. Six 40 Gbps ports for quad small form-factor pluggable plus (QSFP+) transceiver connections (back to back). For example, PORT49–>PORT50, PORT51–>PORT52, PORT53–>PORT54.

For all the S3048–ON tests to be successful, you must connect the following to your system:

a. USB 2.0 device connected in the USB port.

b. Forty-eight 10/100/1000Base-T RJ-45 ports. For example, PORT1–>PORT2, PORT3–>PORT4, ... PORT47–>PORT48.

c. Four 10 Gbps ports for small form-factor pluggable plus (SFP+) transceiver connections (back to back). For example, PORT49–>PORT50, PORT51–>PORT52, PORT53–>PORT54.

The following is an S4048–ON output example.

```
DCLI-> testall

           Dell Networking OS S4048-ON BOARD DIAGNOSTIC [0]


           PPId                    : CN08YWFG282983AQ0026
           PPId Revision           : A00
           Board Service Tag       : 64X8VS1
           System Cpld Rev         : 0x7
           Master Cpld Rev         : 0x7
           Slave Cpld Rev          : 0x3
           Image Build Version     : 1.0(0.3)


           Available free memory: 1752698880 bytes


                   LEVEL 0 DIAGNOSTIC

Starting test: BIOSVersionTest ......
The Booted Bios Version       : 3.21.0.1

BIOSVersionTest ............................. PASS
Starting test: BoardRevisionTest ......
System CPLD: Board Stage: 0x2, Cpld Rev: 0x7
BoardRevisionTest ........................... PASS
CpldAccessTest .............................. PASS
CpuSdramPresenceTest ........................ PASS
CpuTypeDetectTest ........................... PASS
FanAirFlowTypeTest .......................... PASS
FanStatusMonitorTest ........................ PASS
FanTrayPresenceTest ......................... PASS
Starting test: I2cAccessTest ......
I2C Devices Scanned   - 16
I2C Device PASS Count - 16
I2cAccessTest ............................... PASS
MgmtPhyAccessTest ........................... PASS
MgmtPhyPresenceTest ......................... PASS
PowerRailStatusTest ......................... PASS
```

```
PsuFanAirFlowTypeTest ..................... PASS
Starting test: PsuFanSpeedMonitorTest ......
PsuFanSpeedMonitorTest .................... PASS
PsuFanStatusMonitorTest ................... PASS
PsuPresenceTest ........................... PASS
PsuSourceTypeTest ......................... PASS
PsuStatusMonitorTest ...................... PASS
QsfpPlusModulePresenceTest ................ PASS
QsfpPlusPhyAccessTest ..................... PASS
RtcPresenceTest ........................... PASS
sfpPlusModulePresenceTest ................. PASS
sfpPlusPhyAccessTest ...................... PASS
Starting test: ShowTemperatureTest ......temperature monitor 0: current=
51.4, peak= 53.1
temperature monitor 1: current= 54.1, peak= 55.2
temperature monitor 2: current= 54.1, peak= 55.2
temperature monitor 3: current= 50.3, peak= 52.0
temperature monitor 4: current= 50.9, peak= 52.0
temperature monitor 5: current= 52.0, peak= 53.1
temperature monitor 6: current= 51.4, peak= 52.5
temperature monitor 7: current= 52.0, peak= 53.6
temperature monitor 8: current= 50.9, peak= 52.0
average current temperature is  51.9
maximum peak temperature is 55.2
ShowTemperatureTest ....................... PASS
SsdPresenceTest ........................... PASS
UsbAAccessTest ............................ PASS
UsbHostControllerAccessTest ............... PASS


                    LEVEL 1 DIAGNOSTIC

Starting test: DDR3MemTest ......
DDR3MemTest ............................... PASS
Starting test: dimmCacheMemoryTest ......
dimmCacheMemoryTest ....................... PASS
FanCntlrAccessTest ........................ PASS
FanCntlrSpeedTest ......................... PASS
FanTrayEepromAccessTest ................... PASS
HotSwapControllerAccessTest ............... PASS
I2cStressTest ............................. PASS
MainBoardEepromAccessTest ................. PASS
PsuEepromAccessTest ....................... PASS
QsfpPlusEepromAccessTest .................. PASS
QsfpPlusPhyExtLinkTest .................... PASS
QsfpPlusPhyLnkSpeedTest ................... PASS
RtcFunctionTest ........................... PASS
RtcRolloverTest ........................... PASS
sfpPlusPhyExtLinkTest ..................... PASS
sfpPlusPhyLnkSpeedTest .................... PASS
SsdFileCopyTest ........................... PASS
Trident2AccessTest ........................ PASS
TSensorAccessTest ......................... PASS
UsbFileCopyTest ........................... PASS


                    LEVEL 2 DIAGNOSTIC
CpuSnakeQsfpPlusExtLpbkTest ............... PASS
CpuSnakeQsfpPlusMacLpbkTest ............... PASS
CpuSnakeQsfpPlusPhyLpbkTest ............... PASS
CpuSnakeSfpPlusExtLpbkTest ................ PASS
CpuSnakeSfpPlusMacLpbkTest ................ PASS
```

```
CpuSnakeSfpPlusPhyLpbkTest ..................... PASS
MgmtPortMacLoopbackTest ........................ PASS
MgmtPortPhyLoopbackTest ........................ PASS


--------- Group Test Statistics ---------
Total        :  55
Passed       :  55
Failed       :   0
Not Appl     :   0
Elapsed time : 00H:06M:41S
Stop reason  : after completion
```

The following is an S3048–ON output example.

```
DCLI-> testall

           Dell Networking OS S3048-ON BOARD DIAGNOSTIC [0]


           PPId                      : CN123456DELLI2158989
           PPId Revision             : A00
           Board Service Tag         : SERVTAG
           MMC Rev          : 0x3
           SMC Rev          : 0x5
           Image Build Version       : 2-0(0-10)


           Available free memory: 1716424704 bytes


                   LEVEL 0 DIAGNOSTIC

B50282PhyAccessTest ............................ PASS
Starting test: BiosVerGet ......
The Booted Bios Version       : 3.24.0.1

BiosVerGet ..................................... PASS
CpuSdramPresenceTest ........................... PASS
CpuSdramSizeTest ............................... PASS
CpuTypeDetectTest .............................. PASS
FanAirFlowTypeTest ............................. PASS
FanCntlrAccessTest ............................. PASS
FanStatusMonitorTest ........................... PASS
FanTrayPresenceTest ............................ PASS
Helix4AccessTest ............................... PASS
Starting test: I2cAccessTest ......
I2C Devices Scanned   - 10
I2C Device PASS Count - 10
I2cAccessTest .................................. PASS
MgmtPhyAccessTest .............................. PASS
MgmtPhyPresenceTest ............................ PASS
MmcBoardRevisionTest ........................... PASS
PsuFanAirFlowTypeTest .......................... PASS
PsuFanSpeedMonitorTest ......................... PASS
PsuFanStatusMonitorTest ........................ PASS
PsuPresenceTest ................................ PASS
PsuSourceTypeTest .............................. PASS
PsuStatusMonitorTest ........................... PASS
RtcPresenceTest ................................ PASS
SfpPlusModulePresenceTest ...................... PASS
ShowTemperatureTest ............................ PASS
```

```
SmcBoardRevisionTest ........................... PASS
SsdPresenceTest ................................ PASS
UsbAAccessTest ................................. PASS
UsbHostControllerAccessTest .................... PASS

                    LEVEL 1 DIAGNOSTIC

B50282PhyExternalLinkTest ...................... PASS
B50282PhyLinkSpeedTest ......................... PASS
DDR3MemTest .................................... PASS
FanCntlrSpeedTest .............................. PASS
FanTrayEepromAccessTest ........................ PASS
I2cStressTest .................................. PASS
MainBoardEepromAccessTest ...................... PASS
PsuEepromAccessTest ............................ PASS
RtcFunctionTest ................................ PASS
RtcRolloverTest ................................ PASS
SfpPlusEepromAccessTest ........................ PASS
Starting test: SsdFileCopyTest ......
ERROR:Dir /f10/slot0 already present on MS-DOS partition
SsdFileCopyTest ................................ PASS
TSensorAccessTest .............................. PASS
UsbFileCopyTest ................................ PASS


                    LEVEL 2 DIAGNOSTIC

CpuSnake1gMacLpbkTest .......................... PASS
CpuSnake1gPhyLpbkTest .......................... PASS
CpuSnakeSfpPlusMacLpbkTest ..................... PASS
CpuSnakeSfpPlusPhyLpbkTest ..................... PASS
MgmtPortMacLoopbackTest ........................ PASS
MgmtPortPhyLoopbackTest ........................ PASS


--------- Group Test Statistics ---------
Total        :  47
Passed       :  47
Failed       :   0
Not Appl     :   0
Elapsed time : 00H:07M:27S
Stop reason  : after completion


DCLI->
```

NOTE: Entering the `reload` command at the `DCLI` prompt reloads the ONIE or OS installed on the system. It does not reload the Diagnostic tools.

Viewing the S6000–ON, S4048–ON, or S3048–ON System Information

To view your S6000–ON, S4048–ON, or S3048–ON system information; for example, the model, part number, serial number, and service tag, follow these steps.

1. Boot into ONIE.
2. Enter the `onie-syseeprom` command.

   ```
   ONIE:/ # onie-syseeprom
   ```

Example of the `onie-syseeprom` Command

```
TlvInfo Header:
   Id String:    TlvInfo
   Version:      1
   Total Length: 78
TLV Name             Code Len Value
-------------------- ---- --- -----
MAC Addresses        0x2A   2 129
Base MAC Address     0x24   6 00:05:33:6A:BF:4D
Vendor Name          0x2D   4 Dell
Product Name         0x21   8 S6000-ON
Part Number          0x22   6 08YWFG
Serial Number        0x23  12 DLCN13980015
Label Revision       0x27   3 A00
Manufacturer         0x2B   1 1
Service Tag          0x2F   2 ABC1AB2
Loader Version       0x29   8 3.20.1.1
CRC-32               0xFE   4 0xC1EB87D1
Checksum is valid.
```

Viewing the CPLD Versions

To view CPLD data, including the fan status, PSU status, current programmed version, and image packed version, use the `showSystemInfo` command at the `DCLI` prompt.

- Enter the `showSystemInfo` command to view the CPLD information.

```
DCLI-> showSystemInfo

************ S4048ON SYSTEM INFO ******************

Software Info:
        SW Name            : Dell Networking OS
        SW Version         : 1.0(0.3)


Board Info:
        Board Revision     : 0x2
        Board Service Tag  : 66D7VS1

CPLD Info:
        System CPLD Version: 7
        Master CPLD Version: 7
        Slvae CPLD Version : 3

Packed CPLD image Info:
        Packed System CPLD Version : 7
        Packed Master CPLD Version : 7
        Packed Slave CPLD Version  : 3

PPId Info:
        PPId               : TW0J09D32829849Q0001
        PPId Revision      : X01

SysEeprom Info:
        Base MAC Address   : 34:17:eb:f2:23:c4
        Country Code       : TW
        Part Number        : 0J09D3
        Manufacturer       : 28298
        Manufacture Date   : 10/02/2014 18:49:28
        Product Name       : S4000ON
```

```
Power Supply Info:
        Power Supply        : 1
         AirFlow Direction  : NORMAL
         Part Number        : 0T9FNW
         Serial Number      : TW0T9FNW2829849Q0041
         Sevice Tag         : AEIOU##

Fantray Info:
        FanTray[1]
         AirFlow Direction  : NORMAL
         Part Number        : 0MGDH8
         Serial Number      : TW0MGDH82829849Q0002
         Sevice Tag         : AEIOU##
        FanTray[2]
         AirFlow Direction  : NORMAL
         Part Number        : 0MGDH8
         Serial Number      : TW0MGDH82829849Q0003
         Sevice Tag         : AEIOU##
        FanTray[3]
         AirFlow Direction  : NORMAL
         Part Number        : 0MGDH8
         Serial Number      : TW0MGDH82829849Q0001
         Sevice Tag         : AEIOU##

*******************************************************
```

Restoring the S6000–ON, S4048–ON, or S3048–ON Factory Defaults

If you need to restore the S6000–ON, S4048–ON, or S3048–ON factory defaults, reboot the system to ONIE Rescue mode.

If it is not possible to do this with the operating system you installed, reboot the system and from Grub and select `ONIE: Rescue`.

CAUTION: Restoring factory defaults erases any installed operating system and requires a long time to erase storage.

ONIE Rescue bypasses the installed operating system and boots the system into ONIE until you reboot the system. After ONIE Rescue completes, the system resets and boots to the ONIE console.

1. Restore the S6000–ON, S4048–ON, or S3048–ON factory defaults from Grub using the `ONIE: Rescue` command.

   Use the up and down arrow keys to select which entry is highlighted. Press Enter to select an operating software-selected OS or enter `e` to edit the commands before booting. Enter `c` for a command line. The highlighted entry (*) executes automatically in the operating system.

   ```
   GNU GRUB  version 2.02~beta2+e4a1fe391

    +----------------------------------+
    | ONIE: Install OS                 |
    | ONIE: Rescue                     |
    | ONIE: Uninstall OS               |
    | ONIE: Update ONIE                |
    |*ONIE: Embed ONIE                 |
    | ONIE: Diag ONIE                  |
    | DELL-DIAG                        |
   ```

2. Press ENTER to activate the console.
3. You can also use the `onie-uninstall` command to return to the default ONIE settings.

```
ONIE:/ # onie-uninstall
Erasing unused NOR flash region Erasing 128 Kibyte @ 20000 - 100% complete.
Erasing internal mass storage device: /dev/mmcblk0 (7832MB) Percent
complete: 100%
```

4

Technical Support

This chapter contains the following sections:

Dell Support

Dell Support provides a range of documents and tools to assist you with effectively using Dell Networking equipment and mitigating the impact of network outages.

Through Dell Support you can obtain technical information regarding Dell Networking products, access to software upgrades and patches, and open and manage your Technical Assistance Center (TAC) cases. Dell Networking Support provides integrated, secure access to these services.

Accessing Support Services

The URL for Dell Support is http://www.dell.com/support. You must have a userid and password to access Support services. If you do not have a userid and password, you can request these at the website.

To request a userid, password, and Dell Support services, follow these steps.

1. On the Dell Networking Support page, click the **Account Request** link.
2. Fill out the User Account Request form and click **Send**. You will receive your userid and password by email.
3. To access Dell Support services, click the **LOGIN** link and enter your userid and password.

Contacting the Technical Assistance Center

How to Contact Dell Networking TAC	Log in to Dell Support at http://www.dell.com/support and select the Service Request tab.
Information to Submit When Opening a Support Case	• Your name, company name, phone number, and email address • Preferred method of contact • Model number • Software version number • Symptom description

Managing Your Case	Log in to Dell Support and select the **Service Request** tab to view all open cases and Return Materials Authorizations (RMAs).
Technical Documentation	Log in to Dell Support and select the **Documents** tab. You can access this page without logging in using the **Documentation** link on the Support page.
Contact Information	Web: http://www.dell.com. Email: Networking-Support@Dell.com Telephone: • US and Canada: 1.866.965.5800 • International: +1.800.456.3355

Requesting a Hardware Replacement

To request replacement hardware, follow these steps.

1. Determine the part number and serial number of the component.
   To list the numbers for all components installed in the chassis, use the `show hardware` command.
2. Request an RMA number from TAC by opening a support case. Open a support case by:
   - Using the Create Service Request form on the Support page.
   - Contacting Dell Networking directly by email or by phone.
   - Provide the following information when using email or phone:
     - Part number, description, and serial number of the component.
     - Your name, organization name, telephone number, fax number, and email address.
     - Shipping address for the replacement component, including a contact name, phone number, and email address.