Run device failure diagnostics

ONTAP Systems

Thripura Naidu Parangsam, Martin Houser
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Running diagnostics can help you determine why access to a specific device becomes intermittent or why the device becomes unavailable in your storage system.

1. At the storage system prompt, switch to the LOADER prompt: `halt`
2. Enter the following command at the LOADER prompt: `boot_diags`

   > You must run this command from the LOADER prompt for system-level diagnostics to function properly. The boot_diags command starts special drivers designed specifically for system-level diagnostics.

3. Run diagnostics on the device causing problems by entering the following command: `sldiag device run [-dev devtype|mb|slotslotnum] [-name device]`
   - -dev *devtype* specifies the type of device to be tested.
     - `ata` is an Advanced Technology Attachment device.
     - `bootmedia` is the system booting device..
     - `cna` is a Converged Network Adapter not connected to a network or storage device.
     - `env` is motherboard environmentals.
     - `fcache` is the Flash Cache adapter, also known as the Performance Acceleration Module 2.
     - `fcal` is a Fibre Channel-Arbitrated Loop device not connected to a storage device or Fibre Channel network.
     - `fcvi` is the Fiber Channel Virtual Interface not connected to a Fibre Channel network.
     - `interconnect` or `nvram-ib` is the high-availability interface.
     - `mem` is system memory.
     - `nic` is a Network Interface Card not connected to a network.
     - `nvram` is nonvolatile RAM.
     - `nvmem` is a hybrid of NVRAM and system memory.
     - `sas` is a Serial Attached SCSI device not connected to a disk shelf.
     - `serviceproc` is the Service Processor.
     - `storage` is an ATA, FC-AL, or SAS interface that has an attached disk shelf.
     - `toe` is a TCP Offload Engine, a type of NIC.
   - `mb` specifies that all the motherboard devices are to be tested.
   - `slot`*slotnum* specifies that a device in a specific slot number is to be tested.
   - `-name` *`device`* specifies a given device class and type.
4. View the status of the test by entering the following command: `sldiag device status`

   Your storage system provides the following output while the tests are still running:

```
There are still test(s) being processed.
```

After all the tests are complete, the following response appears by default:

```
*> <SLDIAG:_ALL_TESTS_COMPLETED>
```

5. Identify any hardware problems by entering the following command: `sldiag device status [-dev devtype|mb|slotslotnum] [-name device] -long -state failed`

   The following example shows how the full status of failures resulting from testing the FC-AL adapter are displayed:

```
*> **sldiag device status fcal -long -state failed**

TEST START ------------------------------------------
DEVTYPE: fcal
NAME: Fcal Loopback Test
START DATE: Sat Jan  3 23:10:56 GMT 2009

STATUS: Completed
Starting test on Fcal Adapter: 0b
Started gathering adapter info.
Adapter get adapter info OK
Adapter fc_data_link_rate: 1Gib
Adapter name: QLogic 2532
Adapter firmware rev: 4.5.2
Adapter hardware rev: 2

Started adapter get WWN string test.
Adapter get WWN string OK wwn_str: 5:00a:098300:035309

Started adapter interrupt test
Adapter interrupt test OK

Started adapter reset test.
Adapter reset OK

Started Adapter Get Connection State Test.
Connection State: 5
Loop on FC Adapter 0b is OPEN

Started adapter Retry LIP test
Adapter Retry LIP OK
```

```
ERROR: failed to init adaptor port for IOCTL call

ioctl_status.class_type = 0x1

ioctl_status.subclass = 0x3

ioctl_status.info = 0x0
 Started INTERNAL LOOPBACK:
INTERNAL LOOPBACK   OK
Error Count: 2  Run Time: 70 secs
>>>>> ERROR, please ensure the port has a shelf or plug.
END DATE: Sat Jan  3 23:12:07 GMT 2009

LOOP: 1/1
TEST END ------------------------------------------
```

If the system-level diagnostics tests…	Then…
Resulted in some test failures	Determine the cause of the problem. a. Exit Maintenance mode by entering the following command: `halt` b. Perform a clean shutdown and disconnect the power supplies. c. Verify that you have observed all the considerations identified for running system-level diagnostics, that cables are securely connected, and that hardware components are properly installed in the storage system. d. Reconnect the power supplies and power on the storage system. e. Repeat Steps 1 through 5 of *Running device failure diagnostics*.

If the system-level diagnostics tests…	Then…
Resulted in the same test failures	Technical support might recommend modifying the default settings on some of the tests to help identify the problem. a. Modify the selection state of a specific device or type of device on your storage system by entering the following command: `sldiag device modify [-dev devtype|mb|slot_slotnum_] [-name device] [-selection enable|disable|default|only]` `-selection enable|disable|default|only` allows you to enable, disable, accept the default selection of a specified device type or named device, or only enable the specified device or named device by disabling all others first. b. Verify that the tests were modified by entering the following command: `sldiag option show` c. Repeat Steps 3 through 5 of *Running device failure diagnostics*. d. After you identify and resolve the problem, reset the tests to their `default` states by repeating substeps 1 and 2. e. Repeat Steps 1 through 5 of *Running device failure diagnostics*.
Were completed without any failures	There are no hardware problems and your storage system returns to the prompt. a. Clear the status logs by entering the following command: `sldiag device clearstatus [-dev devtype|mb|slot_slotnum_]` b. Verify that the log is cleared by entering the following command: `sldiag device status [-dev devtype|mb|slot_slotnum_]` The following default response is displayed: `SLDIAG: No log messages are present.` c. Exit Maintenance mode by entering the following command: `halt` d. Enter the following command at the Loader prompt to boot the storage system: `boot_ontap` You have completed system-level diagnostics.

If the failures persist after repeating the steps, you need to replace the hardware.