This document provides instructions for replacing and installing an NVRAM module for Data Domain DD9500 and DD9800 systems.

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Revision history

Table 1 Document revision history

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<tr>
<th>Revision</th>
<th>Date</th>
<th>Description</th>
</tr>
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<tr>
<td>03</td>
<td>October 2016</td>
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</tr>
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</tr>
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</table>

Related documentation

EMC provides a variety of document types to support our products. End-user documents include user guides, hardware installation guides, administrator guides, software guides, part replacement guides, release notes, and others. Integration documents describe how to integrate Data Domain systems with third party backup applications, and compatibility matrices show which components are compatible with each other.

This document refers to other EMC documents by title. To locate a referenced document, go to the EMC Support website at https://support.emc.com, enter the document title in the search box, and click the search button.

Note

Hard copies of a document may be out of date. Always check for the current version of a document before you start an upgrade or begin a significant configuration change.

Tools and supplies needed

For a list of recommended tools and supplies for field work, see the document titled FE Toolkit Inventory and Common Procedures for FRU Tasks at https://support.emc.com.

Overview: DD9500 and DD9800 NVRAM module

The 8-GB NVRAM module is located in slot 0. The figure shows the location of the NVRAM and IO modules at the rear of the chassis inside the red rectangle.
Identify a failed NVRAM module

Procedure

1. Log in as sysadmin.

2. Enter the `alerts show current` command for alert information about battery and NVRAM card status or the `alerts show current-detailed` command for detailed alert information about battery and NVRAM card status. The following is an example output.

```
# alerts show current
Id  Post Time               Severity  Class    Object  Message
--  ----------------------- -------- --------- ------- ---------------------------------
18  Wed Nov 5 18:08:53 2014 CRITICAL HWFailure Slot=NA EVT-NVRAM-00201: A hardware fault was detected with an NVRAM card and it may need to be replaced
20  Wed Nov 5 18:11:40 2014 CRITICAL Environment EVT-NVRAM-00001: DDFS cannot be enabled
```

3. Enter the `enclosure show chassis` command for detailed information about the chassis.

```
# enclosure show chassis
This command may take up to a minute to complete. Please wait...
Enclosure 1
Chassis:
  Chassis Part Number 100-555-009-01
  Chassis Serial Number NVT04135100078
  BMC Device Revision 1
  BMC Firmware Revision 1.60
  IPMI Version 2.0
  BIOS Version EAPLO162
  BIOS Release Date 10/24/2014

Chassis Sub-components:
  Name                Product ID  Family ID  Part No.  Serial No.  Rev
  --------  ------------------  --------  ---------  ----------  ---
  IO Board  Management Module Rev C  000b0021  313-169-000C-00  NVT02135100110 na
  Mid-plane Chassis  002a0008  100-555-009-01  NVT04135100078 na
```
4. Enter the `system show hardware` command for information about the NVRAM module.

```
# system show hardware
```

```
Slot  Vendor     Device                            Ports
----  --------   -------------------------------   --------------
M      Broadcom   BCM5719 1GbE                      Ma, Mb, Mc, Md
0      EMC        NVRAM 8GB Model 3
1      Broadcom   Quad Port 10GbE SR                1a, 1b, 1c, 1d
2      EMC        PMC Quad Port 6 Gbps SAS          2a, 2b, 2c, 2d
3      EMC        PMC Quad Port 6 Gbps SAS          3a, 3b, 3c, 3d
4      Broadcom   Quad Port 10GbE SR                4a, 4b, 4c, 4d
5      Broadcom   Quad Port 10GbE SR                5a, 5b, 5c, 5d
6      EMC        PMC Quad Port 6 Gbps SAS          6a, 6b, 6c, 6d
7      Broadcom   Quad Port 10GbE SR                7a, 7b, 7c, 7d
8      EMC        Dual Port 16 Gbps Fibre Channel   8a, 8b
9      (empty)    (empty)
10     EMC        Dual Port 16 Gbps Fibre Channel   10a, 10b
11     (empty)    (empty)
```

5. Enter the `enclosure show nvram` command to check information about the NVRAM.

```
# enclosure show NVRAM
```

```
Enclosure 1
Cannot get NVRAM card and battery info. Check NVRAM card and battery interconnect and their power connection.

**** Error retrieving information (**** Error retrieving NVRAM card information.).
```

6. Enter the `system show nvram` command to check battery and NVRAM status.

```
# system show NVRAM
```

```
NVRAM
Cards:
Card  Component
----  -----------------------   -----------------------------------------
1    Slot                      0
     Firmware version          0.0.78
     Memory size               7.93 GiB
```
Errors                    0 memory (0 uncorrectable), 0 PCI, 0 controller
Flash controller Errors   0 Cfg Err, 0 PANIC, 0 Bus Hang, 0 Bad Blk Warn, 0 Bkup Err, 0 Rstr Err
Board temperature         39 C
CPU temperature           48 C
Number of batteries        1

NVRAM Batteries:

<table>
<thead>
<tr>
<th>Card</th>
<th>Battery</th>
<th>Status</th>
<th>Charge</th>
<th>Charging</th>
<th>Time To Full</th>
<th>Temperature</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>ok</td>
<td>95 %</td>
<td>enabled</td>
<td>0 mins</td>
<td>37 C</td>
<td>4.044</td>
</tr>
</tbody>
</table>

7. Enter the `enclosure show misconfiguration` command to verify if the NVRAM is missing. The following example output indicates that the NVRAM is missing from Slot 0.

```
# enclosure show misconfiguration
Memory DIMMs:  
   No misconfiguration found.
IO Cards:      
Slot   Device       Status
----   ----------   -------
0       NVRAM       missing

CPUs:  
   No misconfiguration found.
Disks:  
   No misconfiguration found.
```

8. Enter the `enclosure show misconfiguration` command to verify if the NVRAM is misplaced in the wrong slot. The following example output indicates that the NVRAM is misplaced in Slot 9.

```
# enclosure show misconfiguration
Memory DIMMs:  
   No misconfiguration found.
IO Cards:      
Slot   Device       Status
----   ----------   -------
0       NVRAM       missing
9       NVRAM       misplaced

CPUs:  
   No misconfiguration found.
Disks:  
   No misconfiguration found.
```

Remove and install the NVRAM module

The following instructions describe how to remove and install the NVRAM module.
Shut down and disconnect the system

Procedure
1. Disable the filesystem using the `filesys disable` command.

   **Note**
   If the filesystem is not shut down, you will not be able to erase the data from the NVRAM and you will get a message such as **** This operation is not allowed when the filesystem is enabled **** Error retrieving information (This operation is not allowed when the filesystem is enabled).

2. After the filesystem is shutdown, erase the data from the NVRAM, by entering the `system erase nvram-flash` command.

   **Note**
   You must be a qualified personnel with the sysadmin user privilege to use this command, otherwise you will get a message such as **** This command is not available for this user.

   **Note**
   If the NVRAM is preventing the system to boot and the `system erase nvram-flash` command cannot be used to erase the NVRAM, run the offline diagnostic utility Erase NVRAM data. For details about the offline diagnostic utility, see the EMC Data Domain Operating System Offline Diagnostics Suite User's Guide for your release.

3. Stop the system using the `system poweroff` command to allow the proper shut down of the filesystem and other system components.

   If the system that requires NVRAM replacement is the active node of an HA pair, run the `ha failover` command to failover to the standby node before replacing a component. The failover process takes 10 minutes to complete.

   **Note**
   The `system poweroff` command completes when the front panel blue LED turns off.

   For help connecting to a system using a laptop computer and terminal emulator, see the document *FE Toolkit Inventory and Common Procedures for FRU Tasks* at https://support.emc.com.
4. Disengage the wire clips, then disconnect the four AC power cords from the rear of the system.

Remove and install an NVRAM module

Note

- Place modules on a clean ESD-protected work surface.
- Be careful not to touch the components on the module.
- The NVRAM module, located in slot 0, is removed and inserted similar to the other I/O modules.

Procedure

1. Move the cable management assembly (CMA) arms out of the way to access the NVRAM module.
2. Grasp the blue handle trigger to release the NVRAM module. The ejector button should release.

Note

Do not remove the NVRAM until the ejector button has released and popped out.

Figure 2  NVRAM module ejector handle (rear of system)

3. Pull on the handle to remove the module from the chassis.
4. Align and slide a replacement module into the bay until it seats in its connector.
5. Apply firm pressure on the front of the module until it seats fully into the slot.
6. Push the ejector button in to secure the module.
The blue ejector indicates that the module is correctly seated. If the blue ejector button does not remain seated, then the module is not fully inserted. Push on the module handle to complete the seating process.

Reconnect the system

Procedure

1. Engage power by reconnecting all AC power cords.
2. Reconnect the wire clips for the AC cords.
3. Check to see that the service LED on the Management module glows green.

Note

The service LED lights up within 30 seconds after you connect the AC power cords.

4. In the front of the DD9500/DD9800 system, press the power button to turn the power on the system.
5. Check that the front blue power LED (with the circle with a dot) also turns on.

Figure 3  Power LED and power button

6. For HA systems that were failed over to the standby node before the component replacement, optionally fail the system back to the original active node. Run the ha
status command to verify that the HA pair can failover and the ha failover on
the current active node to restore the original active node.

Verify NVRAM

Procedure

1. Enter the enclosure show chassis command to check the battery and NVRAM chassis status.

Note

The NVRAM battery might take up to 1.5 hours to get fully (100%) charged depending on how discharged the NVRAM battery is at the time of the installation. However the filesystem is enabled when the battery capacity is above 80%, which should take a shorter time.

2. Enter the system show hardware command to check information about the NVRAM module.

3. Enter the system show nvram command to check battery and NVRAM status.

<table>
<thead>
<tr>
<th># system show nvram</th>
</tr>
</thead>
</table>

NVRAM

Cards:

<table>
<thead>
<tr>
<th>Card</th>
<th>Component</th>
<th>--------------------------</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Slot</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Firmware version</td>
<td>0.0.78</td>
</tr>
<tr>
<td></td>
<td>Memory size</td>
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<tr>
<td></td>
<td>Flash controller Errors</td>
<td>0 Cfg Err, 0 PANIC, 0 Bus Hang, 0 Bad Blk Warn, 0 Bkup Err, 0 Rstr Err</td>
</tr>
<tr>
<td></td>
<td>Board temperature</td>
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<tr>
<td></td>
<td>--------</td>
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<td>enabled</td>
<td>0 mins</td>
<td>37 C</td>
<td>4.044</td>
</tr>
</tbody>
</table>

Verify NVRAM
4. Enter the `enclosure show misconfiguration` command to verify if the NVRAM is in the correct slot.

```
# enclosure show misconfiguration
Memory DIMMs:
  No misconfiguration found.
IO Cards:
  No misconfiguration found.
CPUs:
  No misconfiguration found.
Disks:
  No misconfiguration found.
```

5. Enter the `alerts show current` or `alerts show current-detailed` command to check alert information about battery and NVRAM card status.

**Complete the procedure**

**Procedure**

1. Return the failed or replaced part(s) to EMC Data Domain. Reuse the packaging from the new part(s) and use the included prepaid waybill for shipping. Reference the RMA number on the outside of the package.

2. Send an autosupport report from the system by entering the `autosupport send` command.
NVRAM Module Replacement

Complete the procedure