HPE Data Collection Daemon (DCD) Release Notes

VMware ESXi

Version: 3.7.0.1

Hewlett Packard Enterprise

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About this document

This document provides details of the currently supported features, enhancement, installation, patches, bugs fixed across releases (if any), known problems, issues, their workarounds, policy details, and documentation details for Data Collection Daemon (DCD) on VMWare ESXi.

Revision History

The following table lists all the details about this document and its release history.

Document details	Date
Initial release of DCD for VMware ESXi.	6th June 2018
Updated for 1.2.5 Release	1st October 2018
Updated for 2.0.0.0 Release	13th May 2019
Updated for 2.1.0.0 Release	24th September 2019
Updated for 2.3.0.0 Release	17th February 2020
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Updated for 3.3.2.0 Release (VMware ESXi 7.0)	15th September 2021
Updated for 3.3.2.1 Release (VMware ESXi 6.5, 6.7)	15th September 2021
Updated for 3.4.2.0 Release (VMware ESXi 6.5, 6.7, 7.0)	20th October 2021
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Updated for 3.5.1.2 Release (VMware ESXi 6.5, 6.7, 7.0)	29th April 2022
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Updated for 3.5.1.2 Release (VMware ESXi 6.5, 6.7, 7.0)	14th October 2022
Updated for 3.6.3.3 Release (VMware ESXi 7.0)	6th December 2022
Updated for 3.6.3.4 Release (VMware ESXi 8.0)	7th December 2022
Updated for 3.7.0.1 Release (VMware ESXi 7.0, 8.0)	20th June 2023

Table 1: Revision History

Acknowledgments

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Open source tools

jsoncpp version 1.8.4: https://github.com/open-source-parsers/jsoncpp

Table of Contents

Introduction

This document discusses the most recent product information on Data Collection Daemon (DCD) which is supported on HPE Superdome Flex and HPE Superdome Flex 280 servers running VMware ESXi host operating system.

Data Collection Daemon (DCD) is an agentless service for HPE Mission Critical Superdome Flex Servers. DCD proactively monitors the health of hardware components that are visible to running operating system instance and reports any errors to management firmware running on Rack Management Controller (RMC) of Superdome Flex. The management service running on RMC processes the data and serves it out of band to client applications.

Features Supported

This version of DCD includes the following major features on VMware ESXi:

- o DCD collects inventory data for below listed components:
    1) ESXi Hypervisor
    2) SAS/SATA RAID Controller - MegaRAID 9361-4i Controller
    3) NVMe controllers - Intel P4800X, Samsung PM1725a & PM1725b, PM1733/1735
    4) Tri-Mode Storage RAID controllers – MegaRAID 9560-16i and 9560-8i
    5) Physical Drives - Superdome Base Chassis Drives (Internal Only)
    6) Universal Backplane Management (UBM) based storage enclosures connected to MegaRAID 9560 controllers
    7) RAID volumes (Logical drives) hosted by MegaRAID Controllers
    8) Ethernet devices – Intel adapters, Broadcom adapters and Mellanox adapters
    9) Fibre Channel Devices – Broadcom adapter and Marvell adapter
    10) GPU cards - NVIDIA

- o DCD proactively monitors the health of the MegaRAID Controllers, attached drives, RAID volumes, NVMe Controllers, Ethernet devices and Fibre channel devices and forwards state change events to RMC.

- o Logging is supported in DCD to log messages at different logging levels.

- o DCD can push the inventory to RMC immediately upon request from RMC.

- o A command line utility "dcdCli" is provided to test the DCD Event Infrastructure.

For more details on supported cards and drives, please refer to HPE Superdome Flex and HPE Superdome Flex 280 Documentation. For more details on supported inventory and events, please refer to README which is part of DCD documents in the /opt/hpe/dcd/ folder on product installation.

Enhancements and Defect Fixes

The following changes were introduced in DCD 3.7.0.1 **(VMware ESXi 7.0 and ESXi 8.0)**:

- o Updated part number table for new drive models.

- o Fixed an issue where DCD occasionally reports spurious DCD_FCHBA_LINK_DOWN / DCD_FCHBA_LINK_UP event for a Fibre Channel HBA port.

- o Fixed an issue where DCD occasionally reports spurious DCD_ETHERNET_LINK_DOWN / DCD_ETHERNET_LINK_UP event for an Ethernet port.

Prerequisites

DCD requires VMware ESXi device drivers to be installed on the Superdome Flex / Superdome Flex 280:

- o For VMware ESXi 8.0 and 7.0, HPE publishes a tested custom ISO image containing updated drivers (includes the third-party driver's bundle).

- o For VMware ESXi 6.5 and 6.7, the drivers are available from HPE vibsdepot and can be used to build custom VMware vSphere distributions.

Refer the following Technical Whitepaper for detailed information: Running VMware vSphere on HPE Superdome Flex Family of Servers.

Supported Hardware and Software

DCD runs on all hardware models of HPE Superdome Flex Systems.

Supported Firmware:

- o On HPE Superdome Flex 280, DCD requires firmware version 1.0.x or later. To enable all features introduced in this version of DCD, it is required to upgrade to HPE Superdome Flex 280 firmware version 1.40.x.

- o On HPE Superdome Flex, DCD requires firmware version 2.3.132 or later. To enable all features introduced in this version of DCD, it is required to upgrade to HPE Superdome Flex firmware version 3.60.x.

- o For HPE Superdome Flex 280 internal storage configurations, the following firmware requirements must be met:

Device	Firmware/Image Version Requirement
MegaRAID 9560 controller	52.20.0 or later
UBM3 storage enclosure backplane	1.14 or later
UBM6 storage enclosure backplane	1.00 or later

Supported Operating Systems:

DCD version 3.7.0.1 is supported on HPE Superdome Flex and HPE Superdome Flex 280 servers with the following versions of Operating Systems:

- o VMware ESXi 8.0, 8.0 U1
- o VMware ESXi 7.0, 7.0 U1, 7.0 U2, 7.0 U3

End of DCD Support for VMware ESXi 6.5 and ESXi 6.7

VMware has announced end of support plan for ESXi 6.5 and ESXi 6.7. Please visit the following webpage for more details: https://core.vmware.com/blog/reminder-vsphere-6567-end-general-support.
To align with VMware's end of support plan for ESXi 6.5 and ESXi 6.7, HPE does not plan to make any further DCD updates such as defect fixes and enhancements on these versions of the operating system. However, HPE will continue to provide the support on ESXi 7.0 and recommends upgrading to ESXi 7.0 and DCD version 3.5.1.2 or later to continue receiving DCD updates.

- • For ESXi 6.5, the last supported version of DCD is 3.5.1.2 which can be downloaded from location: http://vibsdepot.hpe.com/superdome/sdflex/dcd/march2022/hpe650/

- For ESXi 6.7, the last supported version of DCD is 3.5.1.2 which can be downloaded from location: http://vibsdepot.hpe.com/superdome/sdflex/dcd/march2022/hpe670/

Installation / Upgrade

Download the DCD component for VMware ESXi 8.0 and 7.0 from the following location:

http://vibsdepot.hpe.com/superdome/sdflex/dcd/june2023/

Download the DCD component for VMware ESXi 6.7 and 6.5 from the following location:

http://vibsdepot.hpe.com/superdome/sdflex/dcd/march2022/

DCD can be installed from the above location using any of the following command:

```
# esxcli software vib install -v <absolute-path-to-DCD-vib>
# esxcli software vib install -d <absolute-path-to-DCD-zip>
```

To upgrade the DCD from older vib package to newer one please use any of the following command:

```
# esxcli software vib update -v <absolute-path-to-DCD-vib>
# esxcli software vib update -d <absolute-path-to-DCD-zip>
```

To verify if DCD is installed please follow below commands on all VMware ESXi distributions:

- You can use "`esxcli software vib list | grep -i dcd`" to verify if DCD is installed.

For VMware ESXi 7.0 use following commands to check the status of DCD:

- To check the list of files delivered by DCD, you can use the following command:

  ```
  # ls –l /opt/hpedcd
  ```

- DCD service details and status can be checked using the following command:

  ```
  # /etc/init.d/hpedcd status
  ```

- DCD service can be started and stopped using the following commands:

  ```
  # To start the service:  /etc/init.d/hpedcd start
  # To stop the service:  /etc/init.d/hpedcd stop
  ```

For VMware ESXi 6.5 and ESXi 6.7, DCD service details and status can be checked using the following command:

```
# /opt/hpe/dcd/scripts/dcd_service.sh status
```

Known Behaviors, Limitations, and Workarounds

1) In DCD inventory and events for RAID volumes, the "DeviceName" parameter is an empty value. This is a known behavior.

2) Upon DCD un-installation on VMware ESXi 7.0, DCD product files may continue to remain under "/opt/hpedcd/vital" directory even after a system reboot.

3) When IPMI BT interface is disabled, DCD service exits gracefully reporting this condition in DCD log file but may attempt to restart a few times.

4) Upon DCD installation on VMware ESXi 6.5, the first DCD inventory will not contain NVMe controller and drive inventory information. This is a known behaviour which can be overcome by restarting DCD.

5) For MegaRAID 9560 controllers:

   a. DCD may not report serial number for an HPE 800GB / 1.6TB / 3.2TB / 6.4TB SAS MU SFF BC PM1645a SSD attached to MegaRAID 9560 when the disk is in UBad (Unconfigured Bad) state.

6) For a MegaRAID controller installed in any of the below locations, DCD reports the Physical Location as invalid (all Fs) for attached storage enclosure and physical drives. This happens due to a known issue with the management library used by DCD. It will be addressed in a future DCD release. At present, the storcli management utility can be used to monitor health of physical drives attached to the controller.

   a. Superdome Flex expansion chassis

   b. Superdome Flex non-monarch partitionable chassis

   c. Superdome Flex 280 expansion chassis

7) On VMware ESXi 8.0, DCD currently does not support monitoring MegaRAID storage controllers and attached drives. This support will be added in a future release of DCD.

Troubleshooting

o If DCD service does not start after successful installation, please check the syslog (/var/log/syslog.log) for any indication of failures. Use the following command to check if the DCD daemon process is running:

```
ps -TCcjstv | egrep -w "(WID|dcdExecutive)"
```

o The "dcdCli" command line utility enables customers to trigger test event from DCD. Test event help validate DCD's ability to monitor and generate events for supported hardware. The DCD test event feature can be used as follows:

```
dcdCli [-h][-t <Event-ID> | --test-event <Event-ID>]
```

Example of sending DCD test event:

```
[root@ch-080:/opt/hpedcd/bin] dcdCli -t 708
dcdCli: Test Event sent to RMC. Please check logs for details.
[root@ch-080:/opt/hpedcd/bin]
```

o For further details about troubleshooting DCD please refer to README.

System resources monitored by DCD on each OS

DCD inventories/monitors the following system resources on each OS:

Hardware Component	RMC	DCD		
		Linux (RHEL/SLES/OL)	Microsoft Windows	VMware ESXi❶
Chassis power supply	✓			
Chassis thermal	✓			
DIMMs	✓			
CPUs	✓			
PCIe cards	✓	❷		
Base I/O	✓			
SDF Fabric	✓			
Fans	✓			
MCA, system crashes	✓			
OS-critical system shutdown		✓	✓	✓
Ethernet cards		✓	✓	✓
InfiniBand HCAs		✓		
Fibre Channel cards		✓	✓	✓
NVMe cards		✓	✓	✓
GPU cards		✓❸		✓❸
TPM ownership by OS		✓	✓	
MegaRAID Configurations				❹
a) Storage Controller		✓	✓	✓
b) Physical Drive		✓	✓	✓
c) Logical Volume		✓	✓	✓
d) Storage Enclosure ❺		✓	✓	✓
SmartRAID Configurations				❻
a) Storage Controller		✓	✓	
b) Physical Drive		✓	✓	
c) Logical Volume		✓	✓	
d) Storage Enclosure ❺		✓	✓	
Embedded BaseIO (Intel RSTe SATA) Configurations			❻	❻
a) Storage Controller		✓		
b) Physical Drive		✓		
c) Logical Volume				
d) Storage Enclosure		N/A	N/A	N/A
SAS 9300-8e HBA Configurations ❻				

❶ As VMware ESXi 6.5 and 6.7 have reached end of support, HPE recommends upgrading to ESXi 7.0/8.0 to continue receiving DCD updates.

❷ DCD reports PCIe registers state during an AER on (a) SLES 15 SP2 and later; (b) RHEL 8.2 and later.

❸ DCD reports inventory of GPU cards. Monitoring is not supported.

❹ On VMware ESXi 8.0, DCD does not support MegaRAID storage configurations.

❺ DCD reports inventory of UBM-capable storage backplanes in the server. Applies to Superdome Flex 280 only.

❻ DCD does not support this storage configuration.

Enhancements and Defect Fixes In Previous Releases

The following changes were introduced in DCD 3.6.3.4 **(VMware ESXi 8.0 only)**:

o Added support for VMWare ESXi 8.0.

   Note: DCD on VMware ESXi 8.0 currently does not support monitoring MegaRAID storage configurations. This support will be added in a future release.

The following changes were introduced in DCD 3.6.3.3 **(VMware ESXi 7.0 only)**:

o Enhanced DCD support for Superdome Flex 280 chassis internal storage configurations involving MegaRAID 9560 to remove dependency on I/O loading rules.

o Enhanced DCD to exit gracefully when IPMI BT is disabled.

o Added support to inventory UBM6 backplanes in MegaRAID storage configurations.

o Added support to inventory GPU cards.

o Updated part number table for new drives, including Self Encrypting Drives (SED).

o Updated Broadcom storelib API to version 7.22.

o Added support to inventory storage enclosures attached to MegaRAID 9560 controllers on Superdome Flex 280 systems.

The following changes were introduced in DCD 3.5.1.2:

o Updated part number table for new SSD drives.

o Fixed an issue seen in MegaRAID configurations where the DCD service shutdown operation occasionally does not complete and times out.

o Fixed an issue where frequent calls to esxcli commands resulted in excessive logging in hostd.log of ESXi OS.

The following changes were introduced in DCD 3.4.2.0:

o Fixed an issue where Fibre Channel HBA inventory data may not get populated.

o Updated part number table for new SSD drives.

o Added support to inventory and monitor the following NVMe cards:

   1) Intel P4800X

   2) Samsung PM1725B (1.6 TB, 3.2 TB, 6.4 TB)

   3) Samsung PM1733/1735 (1.6TB, 3.2 TB, 6.4 TB)

The following changes were introduced in DCD 3.3.2.0**(VMware ESXi 7.0)** and 3.3.2.1**(VMware ESXi 6.5, 6.7):**

o Upgraded LSI MegaRAID storelib library to 7.18 version.

o Added support to report the following RAID volume consistency check events for LSI MegaRAID controllers:

   • DCD_VOLUME_CC_ERROR

   • DCD_VOLUME_CC_WARNING

   • DCD_VOLUME_CC_OK

o Added support to include a new attribute "HostControllerPhysicalLocation" in DCD logical drive inventory.

- o Added support to inventory and monitor the following Ethernet adapter:

    1) HPE Ethernet 10/25Gb 2-port 640SFP28 Adapter

- o Added support to report the following event as part of DCD FibreChannel monitoring:

    • DCD_FCHBA_LINK_UP

- o Added support to report the following events as part of DCD Ethernet monitoring:

    • DCD_ETHERNET_LINK_DOWN

    • DCD_ ETHERNET_LINK_UP

The following changes were introduced in DCD version 3.2.3.1: **(VMware ESXi 7.0 only)**

- o Fixed a segmentation fault that may occur during DCD service start-up.
- o 'DcdSwVersion' attribute is added under HostOSInfo.OSSoftwareSummary sub-tree in system inventory data.
- o Added support to inventory and monitor the following Ethernet adapter:

    1) Pensando DSP DSC-25 Enterprise 10/25Gb 2-port SFP28 Card

- o Updated part number table to include HPE Superdome Flex 280 drive models, generic firmware drive models and NVMe SSDs.
- o Added support to report the Manufacturer for HPE SATA disk drives.
- o Added support to inventory and monitor the following Broadcom storage controllers, attached physical drives and hosted RAID volumes:

    1) MegaRAID 9560-16i Tri-Mode Internal RAID

    2) MegaRAID 9560-8i Tri-Mode Internal RAID

- o Pre-enabled support to inventory NVMe drives attached to MegaRAID 9560 controllers.
- o Updated Storelib version used by DCD to 07.1404.0100.0000.
- o Fixed an issue where spare part number information is not reported for a Broadcom/LSI MegaRAID 9361-4i controller in JBOD mode.
- o Added support to inventory and monitor the following Ethernet adapters:

    1) HPE Ethernet 10Gb 2-port 537SFP+ Adapter

    2) HPE Ethernet 10Gb 2-port 535T Adapter

    3) HPE Ethernet 10Gb 2-port 524SFP+ Adapter

- o Added support to inventory and monitor the following FibreChannel Adapters:

    1) HPE SN1200E 16Gb Single Port Fibre Channel Host Bus Adapter

    2) HPE SN1100Q 16Gb Single Port Fibre Channel Host Bus Adapter

    3) HPE SN1610E 32Gb 1-port Fibre Channel Host Bus Adapter

    4) HPE SN1610Q 32Gb 1-port Fibre Channel Host Bus Adapter

The following changes were introduced in DCD version 3.1.3.0:

- o Fixed the issue of DCD_OS_LAST_SHUTDOWN_CRITICAL event being logged even for normal reboots. (Only for VMware ESXi 6.5 and 6.7. For VMware ESXi 7.0, this issue was fixed as part of DCD version 3.0.7.0.)
- o Added support to report the Manufacturer attribute for all resource types in the system inventory data.
- o Added support to report RAID battery related events in CAE for MegaRAID SAS 9361-4i controller.
- o Fixed an issue where the VolumeType attribute for a RAID 10 logical drive (managed by MegaRAID 9361-4i controller) was being reported as empty string (instead of "RAID10").

o Fixed handling of RAID volume consistency check related events for MegaRAID 9361-4i controller so that they are reported correctly to RMC.

o Fixed an issue where Part Number and Model attribute is not reported for all the ports of following Ethernet device:

     HPE Ethernet 10Gb 2-port 562SFP+ Adapter.

o Updated part number table for new SSD drives.

o Fixed an issue where invalid Physical Location information was being reported when multiple transport protocols are enabled on the same Fibre Channel adapter.

The following changes were introduced in DCD version 3.0.7.0:

o Added support for VMWare ESXi 7.0.

o Added support to inventory and monitor the following Ethernet devices:

     1) HPE Ethernet 1Gb 4-port 366T Adapter

     2) HPE Ethernet 10Gb 2-port 521T Adapter

o Added support to inventory and monitor the following Fibre channel devices:

     1) HPE SN1200E 16Gb 2p FC HBA

     2) HPE SN1100Q 16Gb 2p FC HBA

     3) HPE SN1610E 32Gb 2p FC HBA

     4) HPE SN1610Q 32Gb 2p FC HBA

o Added support for HPE Superdome Flex 280 servers. DCD now reports physical location information for the following types of devices on these servers:

     1) Embedded I/O devices

     2) PCIe add-on I/O cards

o Fixed the issue of DCD_OS_LAST_SHUTDOWN_CRITICAL event being logged even for normal reboots. (Only for VMware ESXi 7.0)

o Fixed the issue of "show chassis info" reporting missing disks as available in FRU inventory for MegaRAID 9361-4i controller.

o Corrected DCD behavior to generate DCD_VOLUME_ERROR event when a non-redundant physical drive of a degraded RAID 1 / RAID 5 / RAID 6 volume (hosted by LSI MegaRAID 9361-4i) fails or goes offline.

o Fixed the issue of TotalFreeSystemMemoryGiB and TotalSystemMemoryGiB attributes being populated as 0 (zero) in system inventory data on certain systems due to esxtop command being denied memory for execution.

The following changes were introduced in DCD version 2.3-0:

o Updated part number table for new SSD models.

The following changes were introduced in DCD version 2.1.0.0:

o Added PartNumber field for LSI MegaRAID 9361-4i in DCD Inventory JSON.

o Modified PartNumber field in DCD Inventory JSON for physical disk drives controllers to use the Spare Part Number.

o Updated part number information reported for specific models of HPE Ethernet adapters.

o Fixed the issue of DCD IPv4Addresses field not being Redfish-compliant when no IPv4 address is configured on the managed server.

o Fixed issue of RAID10 logical volume (configured on LSI MegaRAID 9361-4i) incorrectly showing volume type as "RAID01" in the inventory string.

o Fixed the issue of physical location field for Ethernet device, Drives and Storage Controller being displayed as FFFFFFFFFFFFFFFF in inventory and events.

- o   Integrated with newer version of storelib libstorelib.so.07.1203.0100.0000.

The following changes were introduced in DCD version 2.0.0.0:

- o   Added support to inventory and monitor Ethernet devices.

- o   Added support for VMWare ESXi 6.7.

The following changes were introduced in DCD version 1.2.5:

- o   Added support for two or more MegaRAID 9361-4i controllers per partition.

- o   Integrated with newer version of storelib libstorelib.so.07.0309.0100.0800.

- o   Fixed issue of DCD events not being generated if the inventory-refresh happens at a time when a stream of events from MegaRAID 9361-4i are being processed by DCD.

- o   Fixed issue of missing inventory on a partition where it takes DCD a long time (several minutes or more) to inventory the partition's hardware configuration.

Support Information

You can report defects related to Data Collection Daemon (DCD) by contacting your local Hewlett Packard Enterprise representative.