NetWitness® Platform XDR

Version 12.1.0.0

PowerVault (Dell MD1400-16TB) Setup Guide

NETWITNESS

Platform XDR

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Contents

About this Document

This document provides instructions for installing a PowerVault external storage device on NetWitness Series 5 and Series 6 (Network) Decoder, Log Decoder, Concentrator, Archiver, and Hybrid hosts.

The hardware setup instructions in this document are for hardware only; they do not apply to a specific release of NetWitness Platform software. This document is for new hardware only. It is not intended for PowerVaults with preexisting data.

For NetWitness Platform 11.5 and later, use the hardware connection information in this guide, but refer to *Storage Guide for NetWitness Platform Version 11.5 and later* for instructions on how to allocate storage for your hardware.

> **Caution:** If you are adding a previously used PowerVault and would like to preserve the data, DO NOT follow the instructions in this guide. Contact Netwitness Customer Support. Running the script on a previously used PowerVault could erase any existing data.

> **Note:** When viewing a printed guide, be aware that a newer version of the guide may be available online at **NetWitness Link** in NetWitness® Platform under Hardware Setup Guides: https://community.netwitness.com/t5/netwitness-platform-hardware/series-6-hardware-setup-guide/ta-p/572346

Hardware Description

The NetWitness PowerVault (Dell MD 1400) high capacity storage device is a drive array enclosure powered by EMC/Dell. PowerVault is used to extend the usable storage on the NetWitness Series 5 and Series 6 (Network) Decoder, Log Decoder, Concentrator, Archiver, and Hybrid hosts.

High-Level Capacity Information

PowerVault:

- Stores up to 192 TB for a single enclosure.

- Accommodates up to 12 hot-pluggable 3.5" and 2.5" drives (2.5" available with adapter).

- Allows you to daisy-chain eight PowerVaults (four enclosures per channel).

- Provides improved device monitoring and management.

- Is compatible with Dell OpenManage/iDRAC system management technology.

Enclosure Options

Type	Host	SKU	Specification
High Density	Network Decoder, Log Decoder, Archiver, Log Hybrid, Network Hybrid	192TB (NW-PV-A-N)	Dell Storage MD1400 12 x 16 TB NL-SAS SED
High Density	Network Decoder, Log Decoder, Archiver, Log Hybrid, Network Hybrid	128TV (NW-PV-B-N)	Dell Storage MD 1400 8 x 16TB NL-SAS SED
High Performance	Concentrator	103TB (NW-PV-C-N)	Dell Storage MD 1400 6 x 16TB NL-SAS SED, 2 x 3.8TB SSD SED
High Performance	Concentrator	155TB (NW-PV-D-N)	Dell Storage MD 1400 9 x 16TB NL-SAS SED, 3 x 3.8TB SSD SED

PowerVault Storage Enclosures Supported

SKU	Series 5 & 6 Core Hosts (R630 &R640)	Series 5 Hybrid Host (R730)	Series 6 Hybrid Host (R740)
NW-PV-A-N	Eight	One	One
NW-PV-B-N	Eight	One	One
NW-PV-C-N	Eight	NA	NA
NW-PV-D-N	Eight	NA	NA
Mixed Modes	Four DACs and Four PowerVault		Two, 96TB (NW-PV-C-N) / 128 TB (NW-PV-B-N) Power-Vaults

Capability with NetWitness Platform Series 5 or 6 Hosts

NetWitness Platform Series 5 or 6 hosts are shipped with the software to support a PowerVault installation. The initial setup of a PowerVault in your network involves these steps:

1. Review site requirements and safety information.

2. Install PowerVault.

Package Contents

Refer to the documentation that is included with the PowerVault. The *Dell Storage MD1400 Enclosures Hardware Owner's Manual* (https://topics-cdn.dell.com/pdf/md1400om_en-us.pdf) contains detailed instruction on all the optional setups you can implement with PowerVault to address the needs of your environment.

> **Note:** The PowerVault comes with two SAS cables. You only need one cable to connect the PowerVault to a Series 5 or 6 host. Use a cable with the mini-to-mini-SAS connectors to connect the PowerVault to a Series 5 or 6 host.

Customer Supplied Materials

You do not need to supply any materials.

Front View of the PowerVault
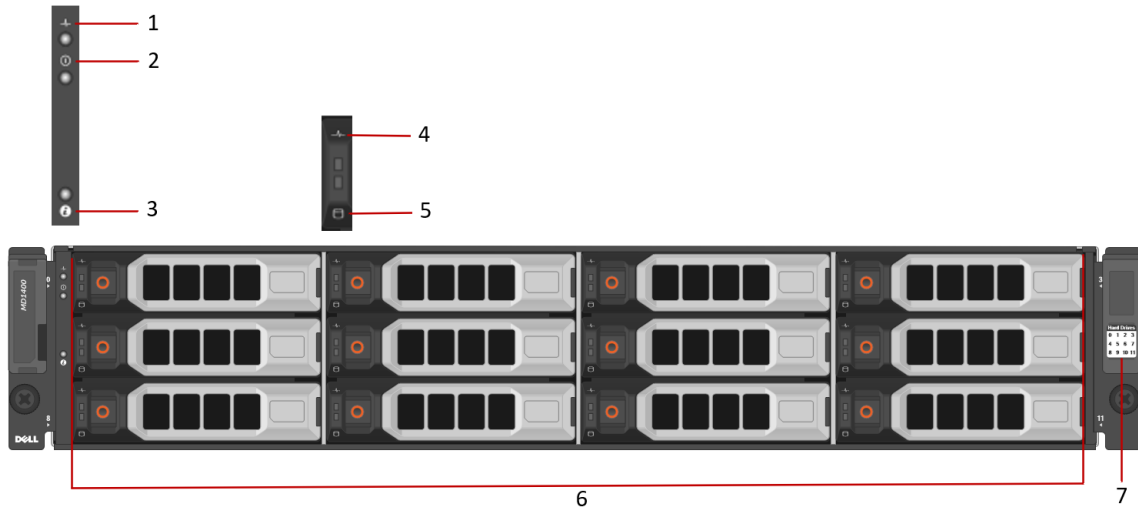
Item numbers 1-3 are indicators located on the front control panel, which indicate the status of the enclosure. Item numbers 4-5 are hard disk drive indicators. For more detailed information, see The *Dell Storage MD1400 Enclosures Hardware Owner's Manual* (https://topics-cdn.dell.com/pdf/md1400om_en-us.pdf).

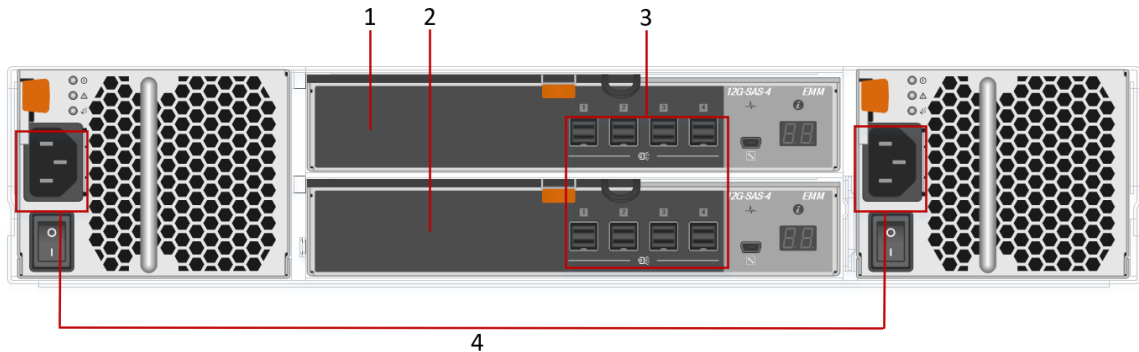| Key	Description
1	Enclosure status LED. The enclosure status LED on the front control panel lights when the enclosure power is on. • Lights solid blue during normal operation. • Blinks blue when a host server is identifying the enclosure or when the system identification button is pressed. • Blinks amber or remains solid amber for a few seconds and then turns off when the enclosure management modules (EMMs) are booting or resetting. • Blinks amber for an extended time when the enclosure is in a warning state. • Remains solid amber when the enclosure is in the fault state.
2	Power LED. The power LED on the front control panel lights when at least one power supply unit is supplying power to the enclosure.
3	System identification button. The system identification button on the front control panel can be used to locate a particular enclosure within a rack. When the button is pressed, the system status indicators on the control panel blink blue until the button is pressed again.

Key	Description
4	Hard disk drive status indicator. • **Blinks green two times per second:** Identify hard disk drive or preparing for removal • **Off:** The hard disk drive is ready for insertion or removal. This can also be an indicator of a drive failure. • **Blinks green, amber, and off:** Hard disk drive predicted failure • **Blinks amber four times per second:** Hard disk drive failed • **Blinks green slowly:** Hard disk drive rebuilding • **Steady green:** Hard disk drive online • **Blinks green for three seconds, amber for three seconds, and turns off in six seconds:** Rebuild aborted
5	Hard disk drive activity indicator (green).
6	Hard disk drives. **High Density:** Total - 12 Drives • Slots 0-11: 3.5 inch SAS hot-swappable hard drives **High Performance:** Total - 12 Drives • Slots 0-2: 2.5 inch SSD (in 3.5 in carrier) hot-swappable solid state drives • Slots 4-11: 3.5 inch SAS hot-swappable hard drives
7	Hard drives table, which shows the PowerVault drive slot locations.

PowerVault Front View Showing Drive Numbers

The PowerVault drive locations are listed on a table to the right on the front of the PowerVault. The drive numbers are also labeled in this diagram. For information on how to flash and replace the hard disk drives, see the *Hard Disk Drive Replacement Guide* in the Hardware Setup Guides on NetWitness Link: https://community.netwitness.com/t5/netwitness-platform-hardware/series-6-hardware-setup-guide/ta-p/572346.

Rear View of the PowerVault

Key	Description
1	Primary enclosure management module (EMM 0). The EMM provides: • a data path between the enclosure and the host server. • enclosure management functions for your enclosure.
2	Secondary EMM (EMM 1)
3	SAS ports. Each set of ports has a Primary port and an Expansion port. In each set, the Primary port is closer to the center of the chassis. There are two rows of ports. In each row, the ports are labeled 1 to 4 from left to right. Start with the upper row port 1. You can daisy chain using the rest of the ports if you have multiple PowerVaults connected to a Series 5 or 6 host.
4	Power Input Connections

For more detailed information, see The *Dell Storage MD1400 Enclosures Hardware Owner's Manual* (https://topics-cdn.dell.com/pdf/md1400om_en-us.pdf).
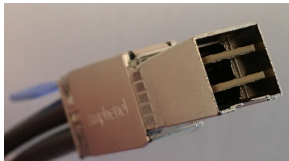
PowerVault Cable

You receive multiple cables with the PowerVault. Both connectors on PowerVault cables are square, **Mini-SAS (Codename SFF-8088)** connectors. You use these cables to connect:

- A PowerVault to a host.

- A PowerVault to another PowerVault in a daisy chain.

The following figures shows a **Mini-SAS** connector.

Note: You must insert the cable correctly at both ends with the correct side up. If you have done this correctly, you hear a click and a green light displays on the rear of the PowerVault and the rear of the Series 5 or Series 6 host indicating a live connection.

DAC Cables

You can Install PowerVaults and 15-Drive DACs on a Series 5 or Series 6 Host (Mixed Mode). The DAC has two types of cables:

- A cable with a **Mini-SAS (Codename SFF-8088)** connector at one end of the cable and a rectangular **Mini-SAS HD (Codename SFF-8614)** connector at the other end. You connect the square, **Mini-SAS (Codename SFF-8088)** connector to the host and the rectangular **Mini-SAS HD (Codename SFF-8614)** connector to the first DAC.

- Multiple cables with a rectangular **Mini-SAS HD (Codename SFF-8614)** at both ends of the cable to connect a DAC to another DAC in a daisy chain.

The following figure shows a rectangular **Mini-SAS HD (Codename SFF-8614)** connector.

Monitoring PowerVault Through IDRAC

You can monitor PowerVault MD array communication through the Integrated Dell Remote Access Controller (IDRAC). Refer to the "Monitoring network devices using web interface" and "Monitoring network devices using RACADM" sections of the *Integrated Dell Remote Access Controller 8/7 Version 2.60.60.60 User's Guide* (https://topics-cdn.dell.com/pdf/idrac7-8-lifecycle-controller-v2606060_users-guide_en-us.pdf) for information on how to monitor network devices through IDRAC.

PowerVault Support by Host

This topic lists the maximum number of PowerVaults you can attach to NetWitness physical hosts.

Unencrypted PowerVaults

Series 5 - R630 Core (Decoder, Log Decoder, Concentrator, and Archiver) Host supports the following unencrypted PowerVaults:

- Eight unencrypted PowerVaults.

- In mixed mode, supports up to four unencrypted PowerVaults and four unencrypted DACs for a total of eight external storage devices.

Series 5 - R730 Hybrid Host supports one, unencrypted, 192TB (NW-PV-A-N) or 128TB (NW-PV-B-N) PowerVault.

Series 6 - R640 Core Host supports the following unencrypted PowerVaults:

- Eight unencrypted PowerVaults.

- In mixed mode, supports up to four unencrypted PowerVaults and four unencrypted DACs for a total of six external storage devices.

Series 6 - R740 Hybrid Host supports one, unencrypted, 128TB (NW-PV-B-N) or 192 TB (NW-PV-A-N) PowerVault.

Encrypted PowerVaults

Series 6 - R640 Core (Decoder, Log Decoder, Concentrator, and Archiver) Host supports up to four, SED (Self Encrypted Drive) PowerVaults. A Decoder or Archiver installed on a Series 6 R640 requires 192 TB (NW-PV-A-N) or 128 TB (NW-PV-B-N) SED PowerVaults. A Concentrator installed on a Series 6 R640 requires 103 TB (NW-PV-C-N) or 156 TB (NW-PV-D-N) SED PowerVaults. NetWitness does not support encrypted PowerVaults for:

- Series 5 hosts, (that is, R630 core hosts and R730 hybrid hosts).

- Series 6 R740 hybrid host.

Install PowerVault without Encryption

This topic describes how to install a PowerVault without encryption on NetWitness Series 5 and Series 6 Decoder, Log Decoder, Concentrator, Archiver, and Hybrid physical hosts.

Prerequisites

Make sure that you have the following required software:

- **NetWitness Platform** - The recommended versions are 11.5.0.0 and later.

  To verify the version, in the Administration Services view (Administration > Services), the release version is displayed to the right of each service listed. To check the version at the command line, run the following command:

  ```
  rpm -qa | grep nw
  ```

  Results example:

  ```
  rsa-nw-concentrator-11.5.0.0-11293.5.0c5da3886.el7.x86_64.rpm
  ```

> **Caution:** If you are adding a previously used PowerVault and would like to preserve the data, DO NOT follow the instructions in this guide. Contact NetWitness Customer Support. Running the script on a previously used PowerVault could erase any existing data.

Introduction

The following table contains the summarized installation instructions for different deployments, and detailed procedures are in individual subsections. The deployment scenarios are:

- Multiple PowerVaults in a Concentrator, (Network) Decoder, Log Decoder, and Archiver deployment.

- A single PowerVault in a Hybrid deployment.

Attach and Configure a PowerVault without Encryption

This table summarizes the steps you must complete to attach and configure a PowerVault without encryption. The scenarios are shown in detail in the topics following immediately the table.

NetWitness Platform 11.5 and Later

Deployment Scenario	Tasks
Concentrator, Archiver, Decoder, and Log Decoder (Multiple PowerVaults)	1. Connect the PowerVaults to the physical host before powering on the physical host as described in Connect PowerVaults to a Concentrator, Archiver, Decoder, or Log Decoder Physical Host . 2. Follow the instructions in the *Storage Guide for NetWitness Platform Version 11.5 and Later* to allocate storage for your hardware.
Hybrid	1. Connect the PowerVault to the physical host before powering on the physical host as described in Connect a PowerVault to a Hybrid . 2. Follow the instructions in the *Storage Guide for NetWitness Platform Version 11.5 and Later* to allocate storage for your hardware.

Connect PowerVaults to a Concentrator, Archiver, Decoder, or Log Decoder Physical Host

You can connect one or more PowerVaults to a NetWitness Series 5 or Series 6 Concentrator, Archiver, Decoder, or Log Decoder physical hosts. You can only add four PowerVaults per port for a total of eight PowerVaults per PERC H830 (Series 5) RAID controller or five per PERC H840 (Series 6) RAID controller.

> **Note:** 1.) If you are attaching more then 3 PowerVaults to a single port you may received the following Error message:
>
> `  The total number of enclosures connected to connector 00, has exceeded the maximum allowable limit of 3 enclosures. Please remove the extra enclosure and then restart your system.` This error was caused by PERC profile settings. From factory, PERC profile is set to PD64. Setting the profile to PD240 corrects the issue. Profile PD240 is labeled as "default", however, this is not set from factory. To set the PD Profile:
> 1. Enter the DELL PERC 10 Configuration Utility. See Navigating to Dell PERC 10 configuration utility.
> 2. Click Main Menu > Controller Management > Advanced Controller Properties > Profile Management. Current profile and profile properties are displayed.
> 3. Change profile using the Choose Profile option.
> 4. Select Set Profile. Click Reboot.
> 2.) The PowerVault comes with two SAS cables. You only need one cable to connect the PowerVault to the physical host. For NetWitness Series 5 physical hosts, use a cable with the mini-SAS connector.

1. Ensure that the physical host is powered off.

2. Connect one end of the SAS cable to the **left** port of the RAID controller on the back of the Concentrator, Archiver, Decoder, or Log Decoder physical host.

3. Connect the other end of the SAS cable to the PowerVault unit.

   When you connect the first PowerVault to the RAID controller, make sure that you insert the cable into the **Primary SAS port** on the PowerVault as shown in the following figures.

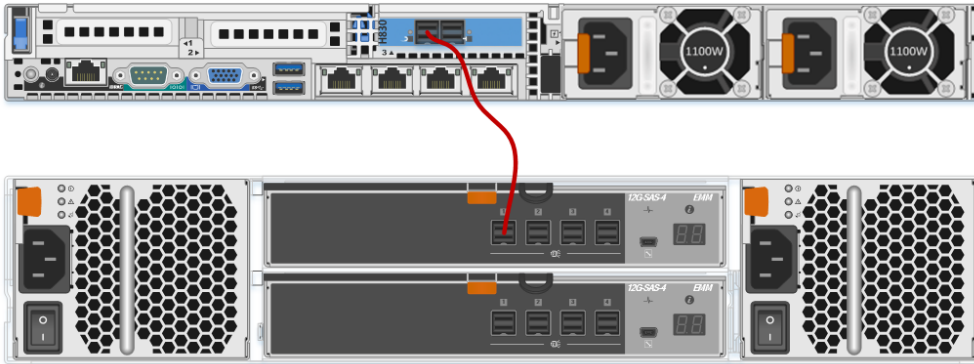### Series 5 Physical Hosts

Series 5 - R630

The following figure shows an R630 host (port 0) connected to a PowerVault (port 1 in top row of ports) using a mini-to-mini SAS cable.
The PERC830 card for the R630 is installed in slot #3. This means that:

- Port 0 is on the left and port 1 is on the right on the R630.

- You must attach the cable to the R630 with the connector's blue tab on the top.

- You must attach the other end the cable to the PowerVault with the connector's blue tab on the top.

- You know if the cable is properly connected when you hear a click as the cable locks into place and see the green port light illuminate on the R630.
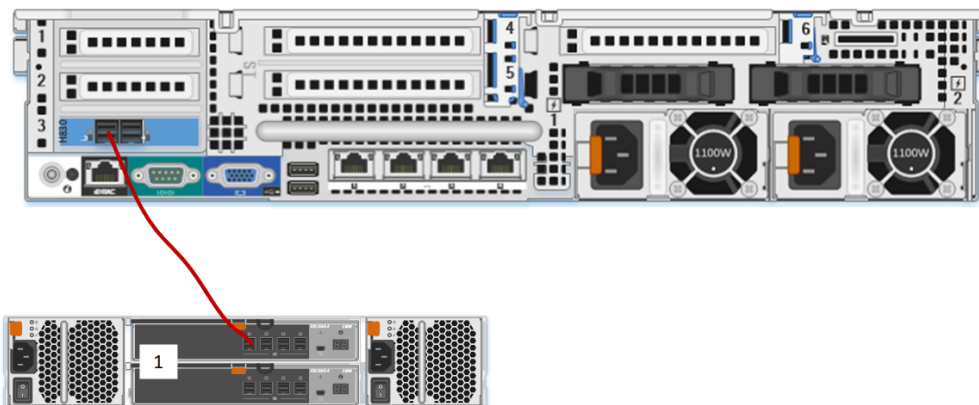

Series 5 - R730 (Hybrid)

The following figure shows an R730 host (port 0) connected to a PowerVault (port 1 in top row of ports) using a mini-to-mini SAS cable.
The PERC830 card for the R730 is installed in slot #3. This means that:

- Port 0 is on the left and port 1 is on the right on the R730.

- You must attach the cable to the R730 with the connector's blue tab on the top.

- You must attach the other end the cable to the PowerVault with the connector's blue tab on the top.

- You know if the cable is properly connected when you hear a click as the cable locks into place and see the green port light illuminate on the R730.

Series 6 Physical Hosts

Series 6 - R640

The following figure shows Series 6 - R640 host (port 0) connected to PowerVault (port 1 in top row of ports) using a mini-to-mini SAS cable.

The PERC H840 card for the R640 is installed in slot #1. This means that:

- Port 0 is on the left and port 1 is on the right on the R640.

- You must attach the cable to the R640 with the connector's blue tab on the top.

- You must attach the other end the cable to the PowerVault with the connector's blue tab on the top.

- You know if the cable is properly connected when you hear a click as the cable locks into place and see the green port light illuminate on the R640.
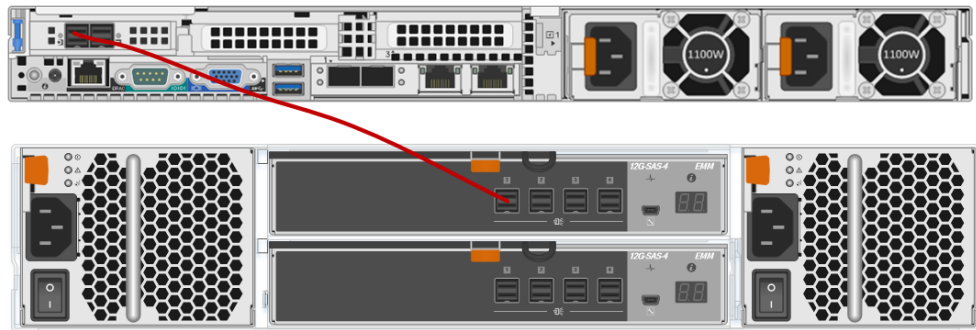
Series 6 - R740xd (Hybrid)

The following figure shows Series 6 - R740 hybrid host Port 0 connected to a PowerVault's Port 1 in top row of ports using a mini-to-mini SAS cable.

The PERC H840 card for the R740 is installed in slot #4 **inverted (upside down)** in this slot. This means that:

- **Port 0 is on the right and Port 1 is on the left on the R740 Hybrid**.

- **You must attach each cable to the R740 with the connector's blue tab on the bottom as shown in the following picture**.

- You must attach the other end the cable to the PowerVault with the connector's blue tab on the top.

- You know if the cable is properly connected when you hear a click as the cable locks into place and see the green port light illuminate on the R740.
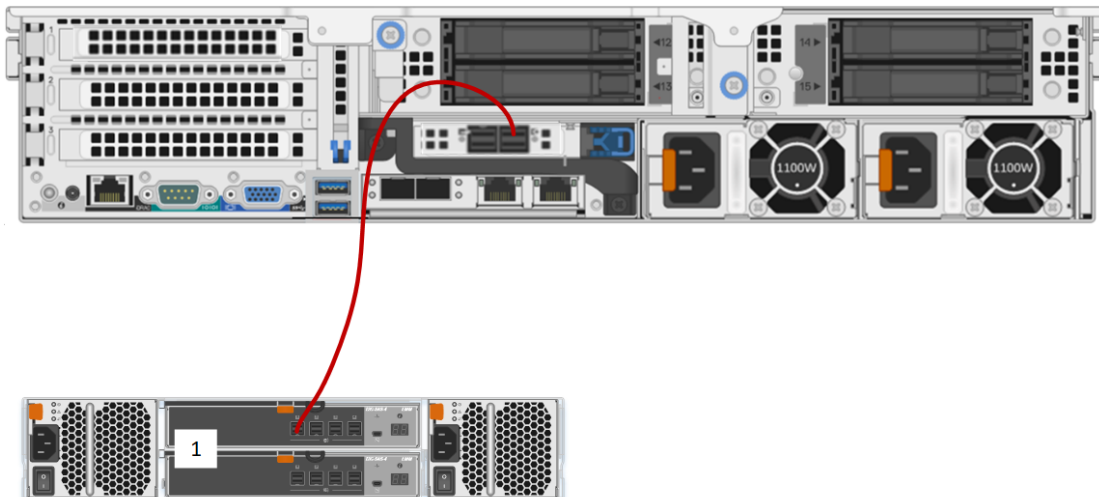
4. When you connect two or more PowerVaults to the RAID controller, make sure that you:

   a. Connect the **Primary** Port 1 of the first PowerVault to Port 0 of the Decoder RAID controller.

   b. Daisy chain up to three additional PowerVaults to the first PowerVault.

   c. Connect the **Primary** Port 1 of the second PowerVault to Port 1 of the Decoder RAID controller.

   d. Daisy chain up to three additional PowerVaults to the first PowerVault.

   > **Note:** If you are only connecting two PowerVaults, each PowerVault should be connected to a dedicated port on the R630 or R640 physical hosts for improved performance.

   The following figure shows you how to connect eight PowerVaults to an NetWitness Series 5 and Series 6 physical hosts.

   Series 5 - R630 Attached to Eight PowerVaults
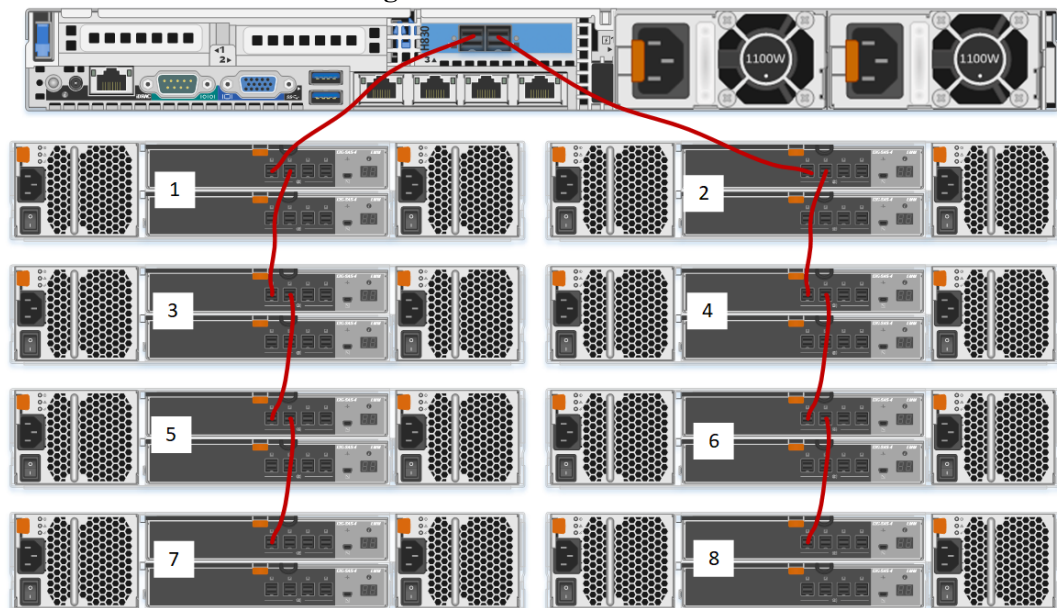
Series 6 - R640 Attached to Eight PowerVaults
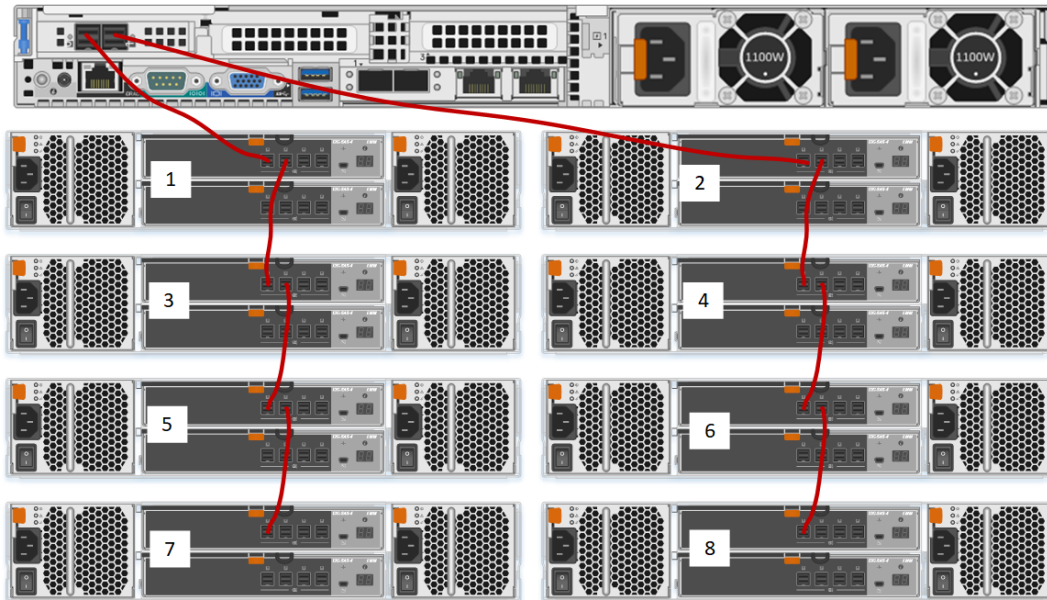
5. When you finish the cabling, ensure that the PowerVault is powered on and then power on
   the physical host.

Connect a PowerVault to a Hybrid

> **Note:** The PowerVault comes with two SAS cables. You only need one cable to connect the PowerVault to the physical host. NetWitness Series 5 physical hosts require different cables. For NetWitness Series 6 physical hosts, use a cable with the mini-SAS connector.

To connect a PowerVault to a Series 6 Hybrid:

Follow the instructions In the Connect PowerVaults to a Concentrator, Archiver, Decoder, or Log Decoder Physical Host procedure above and connect the NetWitness Series Series 6 Hybrid physical host to only one PowerVault.

To connect a PowerVault to a Hybrid physical host:

1. Ensure that the physical host is powered off.

2. Connect one end of the mini-to-mini SAS cable to the Port 0 of the RAID controller on the back of the Series 5 Hybrid physical host.

3. Connect the other end of the mini-to-mini SAS cable to the PowerVault unit (Port 1 in the following example).

    When you connect the first PowerVault to the RAID controller, make sure that you insert the cable into the **Primary SAS port** on the PowerVault as shown in the following figure.

    Series 5 R730 Hybrid
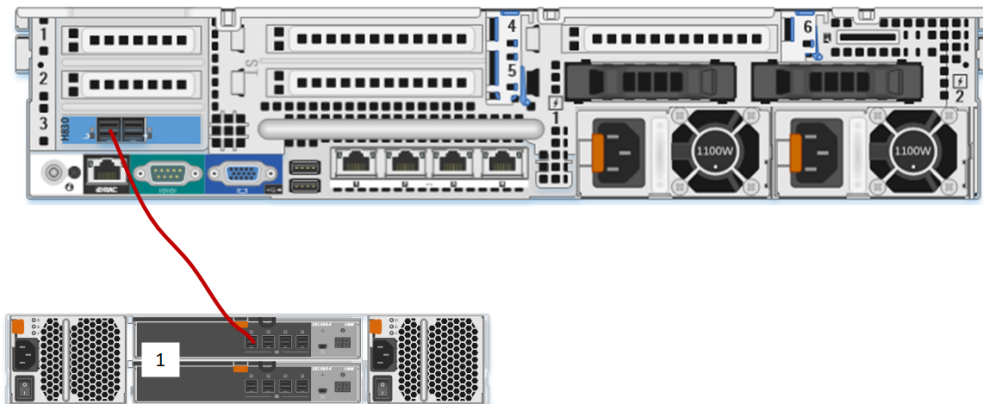
Series 6 R740xd Hybrid

The PERC H840 card for the R740 is installed in slot #4 **inverted (upside down)** in this slot. This means that:

- The R740 Port 0 is on the right and you connect this port to Port 1 in the top row of ports on the first PowerVault (that is 1 in the following illustration).

- The R740 Port 1 is on the left and you connect this port to Port 1 in the top row of ports on the second PowerVault (that is 2 in the following illustration).
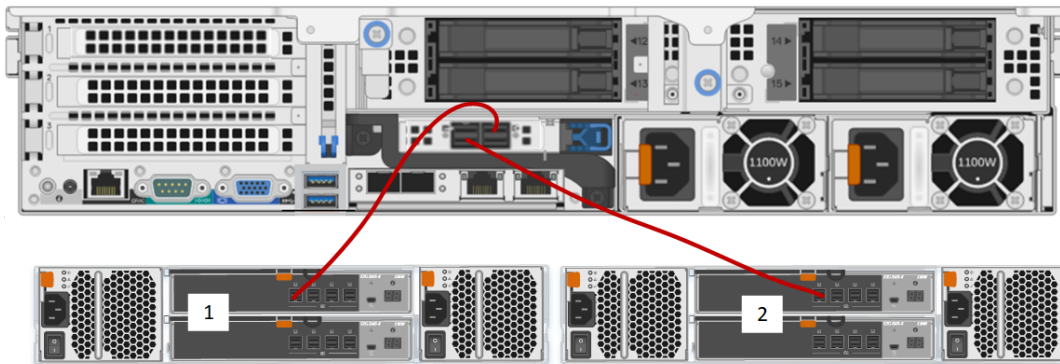
4. When you finish the cabling, make sure that the PowerVault is powered on and then power on the physical host.

Note: Refer to Storage Guide for instructions on how to allocate storage for your hardware.

Caution: After configuring the PowerVault the first time for a service, there is a possibility of background RAID initialization running for at least 24 hours. During this initialization, disk I/O performance may be affected.

Install PowerVault with Encryption on a Series 6 R640 Host

This topic describes how to install a PowerVault with Self Encrypted Drives (SED) on an NetWitness Series 6 Archiver, Concentrator, Log Decoder, or (Network) Decoder (R640) host with encrypted PowerVault external storage. Currently, encrypted PowerVault external storage is:

- Not Supported for Series 5 Hosts

- Not Supported for Series 6 Hybrid (R740) Host

Minimum NetWitness Platform Software Versions

For NetWitness Platform Software 11.x, the minimum version is rsa-nw-11.5.0.0.15521.

> **Caution:** If you are adding a previously used PowerVault and would like to preserve the data, DO NOT follow the instructions in this guide. Contact NetWitness Customer Support. Running the script on a previously used PowerVault could erase any existing data.

Attach and Configure New PowerVault with Encryption

This table summarizes the tasks you must complete to attach and configure a PowerVault with Encryption. The tasks are shown in detail in the topics following immediately the table.

NetWitness Platform 11.5 and Later

Deployment Scenario	Tasks
Concentrator, Archiver, Log Decoder or (Network) Decoder to Multiple PowerVaults	1. Connect the PowerVaults to the host before powering on the host as described in Connect PowerVaults to an Archiver, Concentrator, Log Decoder, or (Network) Decoder Host . 2. Follow the instructions in the *Storage Guide for NetWitness Platform Version 11.5 and Later* to allocate storage for your hardware.

Connect PowerVaults to an Archiver, Concentrator, Log Decoder, or (Network) Decoder Host

If you are encrypting the PowerVaults, you can connect one to four PowerVaults to an NetWitness Series 6 Archiver, Concentrator, Log Decoder, or (Network) Decoder host.

> **Note:** If you are attaching more then 3 PowerVaults to a single port you may receive the following Error message:
>
> ```
>   The total number of enclosures connected to connector 00, has
> exceeded the maximum allowable limit of 3 enclosures. Please remove
> the extra enclosure and then restart your system.
> ```
> This error was caused by the PERC profile settings. From the factory, the PERC profile is set to PD64. Setting the profile to PD240 corrects the issue. Profile PD240 is labeled as "default", however, this is not set from the factory.
> To set the PD Profile:
> 1. Enter the DELL PERC 10 Configuration Utility. See Navigating to Dell PERC 10 configuration utility.
> 2. Click Main Menu > Controller Management > Advanced Controller Properties > Profile Management. Current profile and profile properties are displayed.
> 3. Change profile using the Choose Profile option.
> 4. Select Set Profile. Click Reboot.

The PowerVault comes with two SAS cables. You only need one cable to connect the PowerVault to the host. For an NetWitness Series 6 host, use a cable with the mini-mini SAS connector.

1. Ensure that the host is powered off.

2. Connect one end of the SAS cable to the **left** port of the RAID controller on the back of the Archiver, Concentrator, Log Decoder, or (Network) Decoder, host.

3. Connect the other end of the SAS cable to the PowerVault unit.

When you connect the first PowerVault to the RAID controller, make sure that you insert the cable into the **Primary SAS port** on the PowerVault as shown in the following figure.

The following figure shows an NetWitness Series 6 (R640) host (port 0) connected to a PowerVault (port 1 in top row of ports) using a mini-to-mini SAS cable.
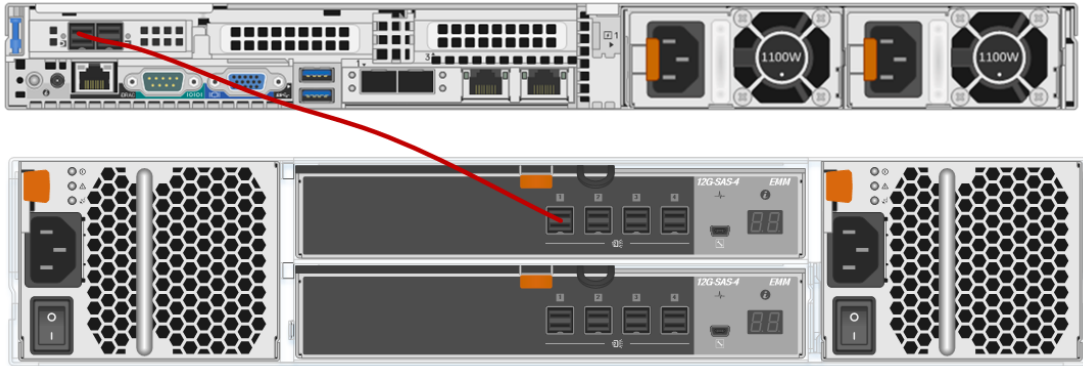
4. For the **Series 6 - R640** host, you can connect two to four PowerVaults to the RAID controller if you are encrypting the PowerVaults.

   a. Connect the **Primary** Port 1 of the first PowerVault to Port 0 of the Decoder RAID controller.

   b. Daisy chain up to three additional PowerVaults to the first PowerVault.

   The following figure shows you how to connect multiple PowerVaults to an NetWitness

   Series 6 hosts. You can attach up to four PowerVaults. You connect the first PowerVault to Port 0 of the Series 6 - R640 host and daisy-chain PowerVaults two, three, and four to the first PowerVault.
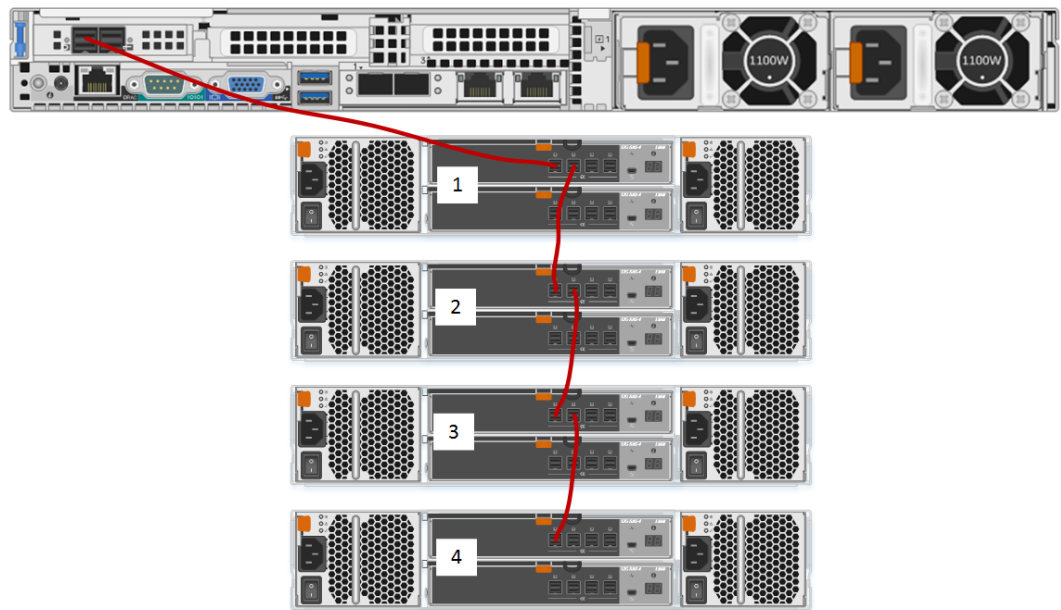
5. When you finish the cabling, ensure that the PowerVault is powered on and then power on the host.

Install PowerVaults and 15-Drive DACs on a Series 5 or Series 6 Host (Mixed Mode)

This topic describes how to install PowerVault and 15-Drive DAC external storage devices on a NetWitness:

- Series 5 Decoder, Log Decoder, and Archiver host. The Series 5 host must have an additional H830 PERC Card installed.

- Series 6 Decoder, Log Decoder, and Archiver host. The Series 6 host must have an additional H840 PERC Card installed.

Contact your NetWitness sales rep for information on how to purchase PERC Cards.

> **Note:** For information on how to install the PERC Cards, see the *NetWitness Platform PCI Expansion Card Installation Guide*.

Minimum NetWitness Platform Software Versions

For NetWitness Platform Software 11.x, the minimum version is 11.5.0.0.

> **Caution:** If you are adding a previously used external storage device and would like to preserve the data, DO NOT follow the instructions in this guide. Contact NetWitness Customer Support. Running the script on a previously used external storage device could erase any existing data.

Introduction

The following table contains the summarized installation instructions for different deployments, and detailed procedures are in individual subsections. The deployment scenario is two PowerVaults and two 15-Drive DACs in a (Network) Decoder, Log Decoder, and Archiver deployment.

High-Level Procedure

This table summarizes the two PowerVaults and two 15-Drive DAC external storage deployment scenario.

NetWitness Platform 11.5 and Later

Deployment Scenario	Tasks
Archiver, Decoder, and Log Decoder (two PowerVaults and two 15-Drive DACs)	1. Connect the PowerVaults and 15-Drive DACs to the host before powering on the host as described in Connect External Storage Devices to an Archiver, Decoder, or Log Decoder Host. 2. Follow the instructions in the *Storage Guide for NetWitness Platform Version 11.5 and Later* to allocate storage for your hardware.

Connect External Storage Devices to NetWitness Series 5 or Series 6 Archiver, Decoder, or Log Decoder Hosts

You can connect one to four PowerVaults and one to four 15-Drive DACs to NetWitness Series 5 or Series 6 Archiver, Decoder, or Log Decoder hosts.

> **Note:** A PowerVault Cable has a **Mini-SAS** square connector at both ends of the cable. You use this type of cable for both the initial connection to the host and the daisy chain from PowerVault to PowerVault. The DAC requires two types of cables (see DAC Cables).
> The first DAC connected to the host requires a cable with a square **Mini-SAS** connector at one end and a rectangular **Mini-SAS HD** connector at the other end. You attach the square **Mini-SAS** connector to the host and attach the rectangular **Mini-SAS HD** connector to the first DAC. You daisy chain a DAC to another DAC with cables that have rectangular **Mini-SAS HD** connectors at both ends.

Connect External Storage Devices to Series 5 (R630)

1. Ensure that the host is powered off.

2. Connect one end of the SAS cables to the ports of the RAID controller on the back of the Archiver, Decoder, or Log Decoder host.

3. Connect the other end of the SAS cables to the External Storage units. See

a. Connect the **Primary** Port 1 of the first PowerVault to Port 0 of the PERC Card on the left using a cable with square **Mini-SAS (Codename SFF-8088)** to square **Mini-SAS (Codename SFF-8088)** connectors.

b. Daisy chain up to three additional PowerVaults to the first PowerVault using cables with square **Mini-SAS (Codename SFF-8088)** to square **Mini-SAS (Codename SFF-8088)** connectors.

c. Connect the **Primary** Port 1 of the first 15-Drive DAC to Port 0 of the PERC Card on the right using a cable with rectangular **Mini-SAS HD (Codename SFF-8614)** to square **Mini-SAS (Codename SFF-8088** connectors.

d. Daisy chain up to three additional 15-Drive DACs to the first 15-Drive DAC using cables with rectangular **Mini-SAS HD (Codename SFF-8614)** to rectangular **Mini-SAS HD (Codename SFF-8614)** connectors.

The following figure shows an NetWitness Series 5 (R630) host connected to four PowerVaults and four 15-Drive DACs.
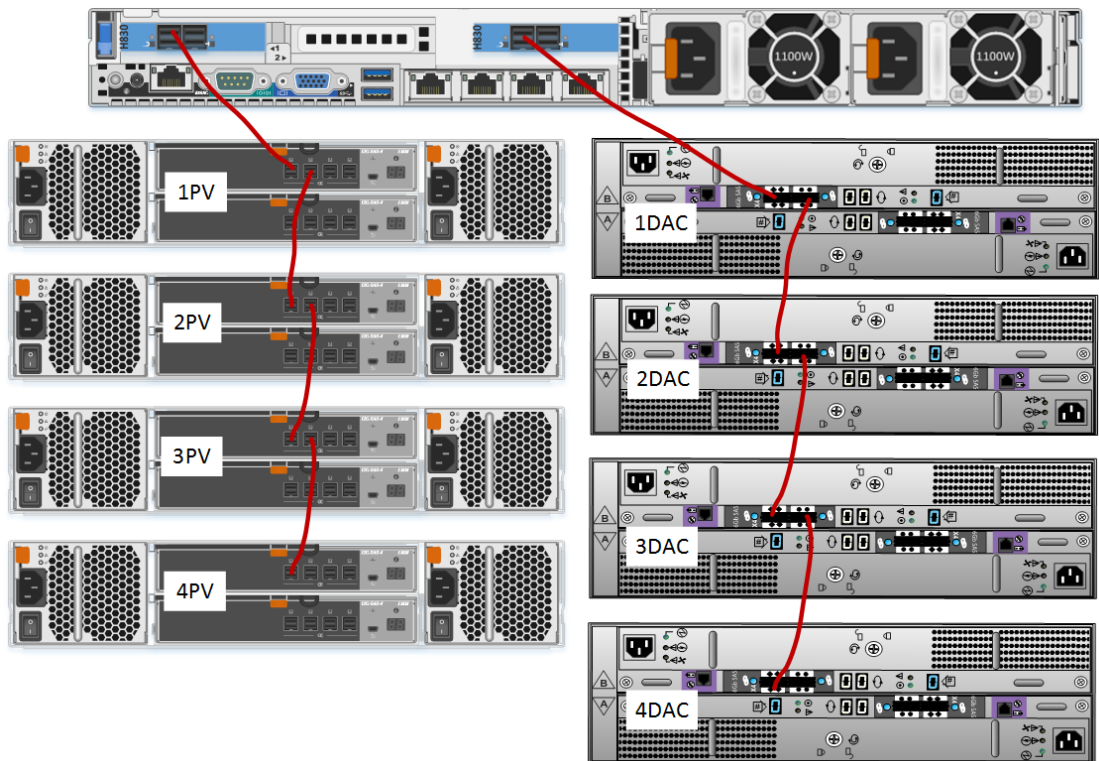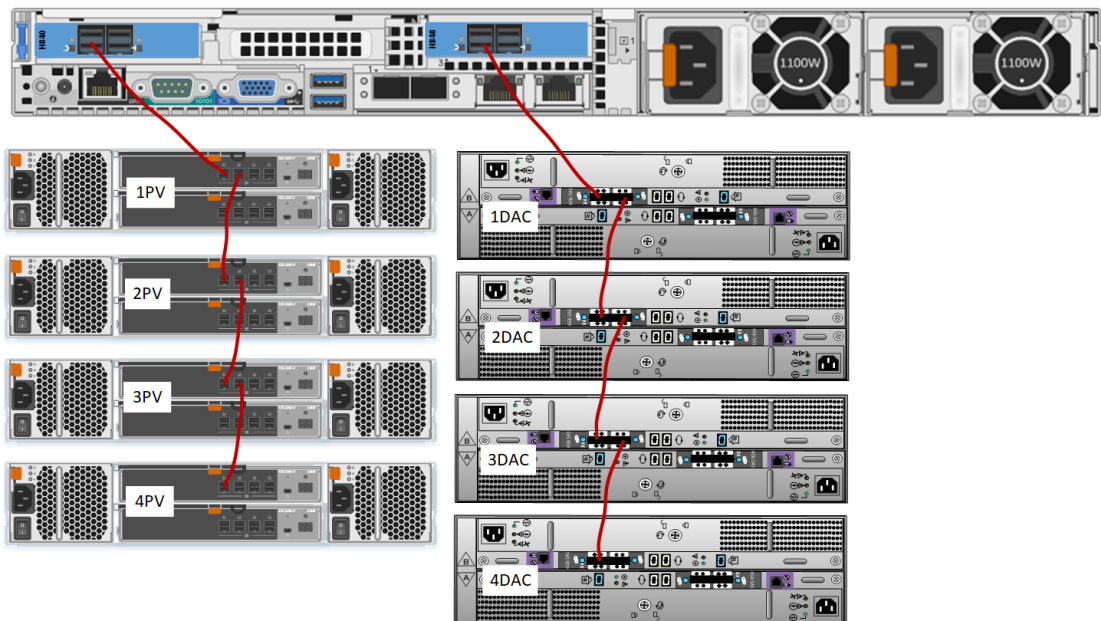
4. When you finish the cabling, make sure that the external storage devices are powered on and then power on the host.

- Make sure that you have a live connection to PowerVaults.
  - Make sure that the green light next to the Port 0 of the left PERC Card on the NetWitness Series 5 host is green.
  - Make sure that the green lights next to the PowerVault ports are green.
- Make sure that you have a live connection to the 15-Drive DACs.
  - Make sure that the green light next to the Port 0 of the right Card on the NetWitness Series 5 is green.
  - Make sure that the blue lights next to the 15-Drive DACs are blue.

Connect External Storage Devices to Series 6 (R640)

1. Ensure that the host is powered off.

2. Connect one end of the SAS cables to the ports of the RAID controller on the back of the Archiver, Decoder, or Log Decoder host.

3. Connect the other end of the SAS cables to the External Storage units.

   a. Connect the **Primary** Port 1 of the first PowerVault to Port 0 of the PERC Card on the left using a cable with square **Mini-SAS Codename SFF-8088)** to square **Mini-SAS (Codename SFF-8088)** connectors.

   b. Daisy chain up to three additional PowerVaults to the first PowerVault using cables with square **Mini-SAS (Codename SFF-8088)** to square **Mini-SAS (Codename SFF-8088)** connectors.

   c. Connect the **Primary** Port 1 of the first 15-Drive DAC to Port 0 of the PERC Card on the right using a cable with rectangular **Mini-SAS HD (Codename SFF-8614)** to square **Mini-SAS(Codename SFF-8088)** connectors.

   d. Daisy chain up to three additional 15-Drive DACs to the first 15-Drive DAC using cables with rectangular **Mini-SAS HD (Codename SFF-8614)** to rectangular **Mini-SAS HD (Codename SFF-8614)** connectors.

   The following figure shows an NetWitness Series 6 (R640) host connected to four PowerVaults and two 15-Drive DACs.

4. When you finish the cabling, make sure that the external storage devices are powered on and then power on the host.

   • Make sure that you have a live connection to PowerVaults.

      • Make sure that the green light next to the Port 0 of the left PERC Card on the NetWitness Series 6 host is green.

- Make sure that the green lights next to the PowerVault ports are green.

- Make sure that you have a live connection to the 15-Drive DACs.

  - Make sure that the green light next to the Port 0 of the right Card on the NetWitness Series 6 host is green.

  - Make sure that the blue lights next to the 15-Drive DACs are blue.

Install PowerVault on Core Appliance Used as a Hybrid

This topic describes how to install a PowerVault on NetWitness Series 5 (R630) and Series 6 (R640) used as a hybrid. In this context , a hybrid refers to:

- Log Hybrid - runs the Log Collector, Log Decoder, and Concentrator services on one host (Series 5 - R630 or Series 6 - 640).

- Network Hybrid - runs the Concentrator and Decoder services on one host (R630 or R640).

Note: You can install PowerVault with or without Encryption on a NetWitness Series 5 (R630) and Series 6 (R640) used as a hybrid.

Introduction

The following table contains the summarized installation instructions for different deployments, and detailed procedures are in individual subsections. The deployment scenarios are:

- Multiple PowerVaults in a Concentrator, (Network) Decoder, Log Decoder, and Archiver deployment.

- A single PowerVault in a Hybrid deployment.

High-Level Procedure

NetWitness Platform 11.5 and Later

Deployment Scenario	Tasks
Log Hybrid or Network Hybrid Running on Core Appliance	1. Connect a Concentrator PowerVault (NW-PVHP56, NW-PVHP113, or NW-PVHPE78) to an R630 or R640 the physical host before powering on the physical host as described in Install PowerVault on Core Appliance Used as a Hybrid. 2. Follow the instructions in the *Storage Guide for NetWitness Platform Version 11.5 and Later* to allocate storage for your hardware.

Connect PowerVaults to a Core Physical Host Used as a Hybrid

You can connect one or more PowerVaults to a NetWitness Series 5 - R630 or Series 6 - R640 physical host Used as a hybrid (Log Hybrid or Network Hybrid).

Caution: You must attach a Concentrator PowerVault (that is, NW-PV-C-N (103 TB) or NW-PV-D-N (155TB)) to port 0 and configure it first.

You can only add four PowerVaults per port for a total of eight PowerVaults per PERC H830 (Series 5) RAID controller or five per PERC H840 (Series 6) RAID controller.

Note: 1.) If you are attaching more then 3 PowerVaults to a single port you may received the following Error message:

```
  The total number of enclosures connected to connector 00, has
exceeded the maximum allowable limit of 3 enclosures. Please remove
the extra enclosure and then restart your system.
```
This error was caused by PERC profile settings. From factory, PERC profile is set to PD64. Setting the profile to PD240 corrects the issue. Profile PD240 is labeled as "default", however, this is not set from factory. To set the PD Profile:
1. Enter the DELL PERC 10 Configuration Utility. See Navigating to Dell PERC 10 configuration utility.
2. Click Main Menu > Controller Management > Advanced Controller Properties > Profile Management. Current profile and profile properties are displayed.
3. Change profile using the Choose Profile option.
4. Select Set Profile. Click Reboot.
2.) The PowerVault comes with two SAS cables. You only need one cable to connect the PowerVault to the physical host. For NetWitness Series 5 physical hosts, use a cable with the mini-SAS connector.

1. Ensure that the physical host is powered off.

2. Connect one end of the SAS cable to the **left** port of the RAID controller on the back of the physical host.

3. Connect the other end of the SAS cable to the PowerVault unit.
   When you connect the first PowerVault to the RAID controller, make sure that:

   a. It is a Concentrator PowerVault (NW-PV-C-N 103TB or NW-PV-D-N 155TB). If you attach additional PowerVaults, they do not need to be Concentrator PowerVaults.

   b. You insert the cable into the **Primary SAS port** on the PowerVault as shown in the following figures.

Series 5 - R630 Host

The following figure shows an R630 host (port 0) connected to a PowerVault (port 1 in top row of ports) using a mini-to-mini SAS cable.
The PERC830 card for the R630 is installed in slot #3. This means that:

- Port 0 is on the left and port 1 is on the right on the R630.

- You must attach the cable to the R630 with the connector's blue tab on the top.

- You must attach the other end the cable to the PowerVault with the connector's blue tab on the top.

- You know if the cable is properly connected when you hear a click as the cable locks into place and see the green port light illuminate on the R630.

Concentrator PowerVault (that is, NW-PV-C-N 103TB or NW-PV-D-N 155TB)
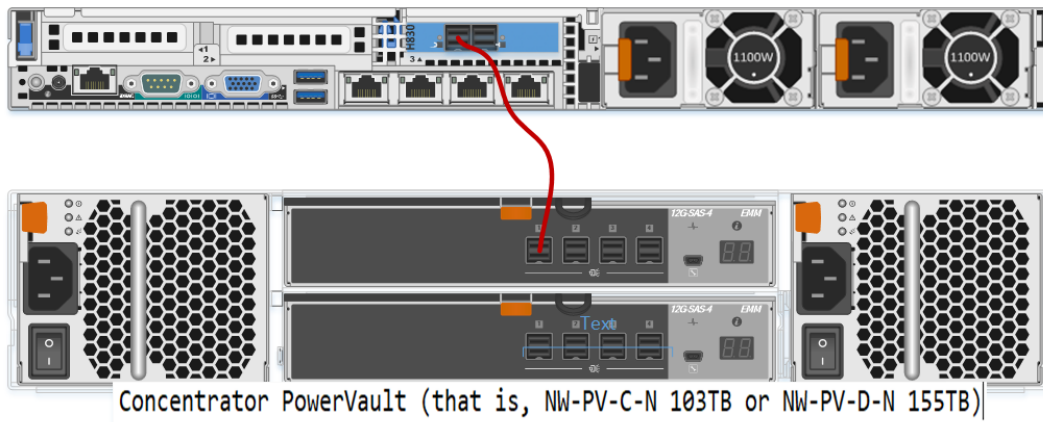
Series 6 - R640 Physical Hosts

The following figure shows Series 6 - R640 host (port 0) connected to PowerVault (port 1 in top row of ports) using a mini-to-mini SAS cable.

The PERC H840 card for the R640 is installed in slot #1. This means that:

- Port 0 is on the left and port 1 is on the right on the R640.

- You must attach the cable to the R640 with the connector's blue tab on the top.

- You must attach the other end the cable to the PowerVault with the connector's blue tab on the top.

- You know if the cable is properly connected when you hear a click as the cable locks into place and see the green port light illuminate on the R640.


Concentrator PowerVault (that is, NW-PV-C-N 103TB or NW-PV-D-N 155TB)
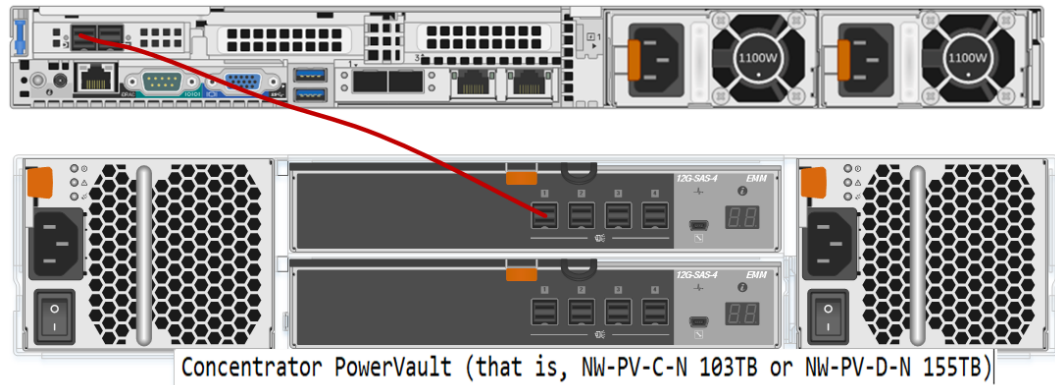
4. When you connect two or more PowerVaults to the RAID controller, make sure that you:

- Connect the **Primary** Port 1 of the first Concentrator PowerVault to Port 0 of the RAID controller.
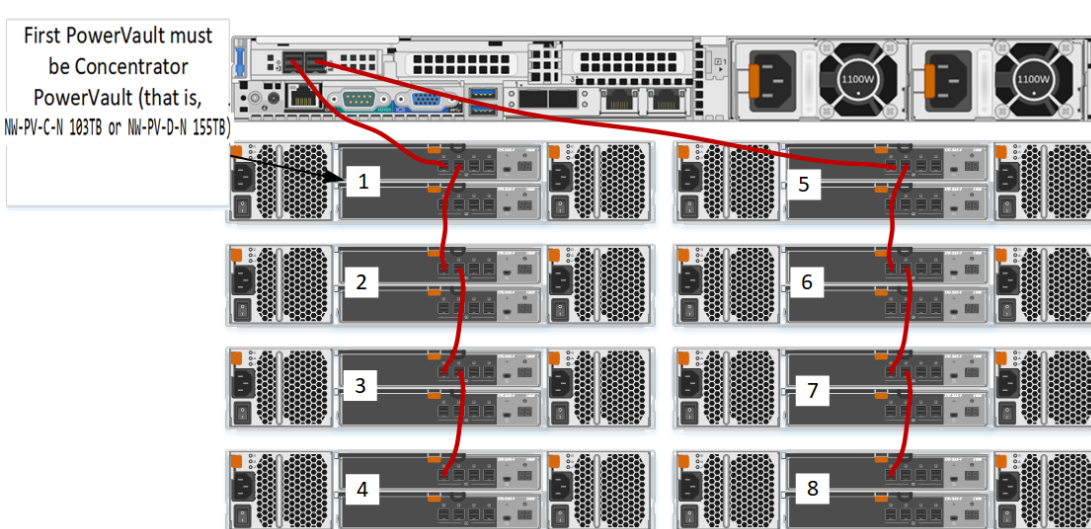
Daisy chain up to three additional PowerVaults to the first PowerVault.

The following figure shows you how to connect eight PowerVaults to a

NetWitness Series 5 and Series 6 physical hosts.

Series 5 - R630 Attached to Eight PowerVaults
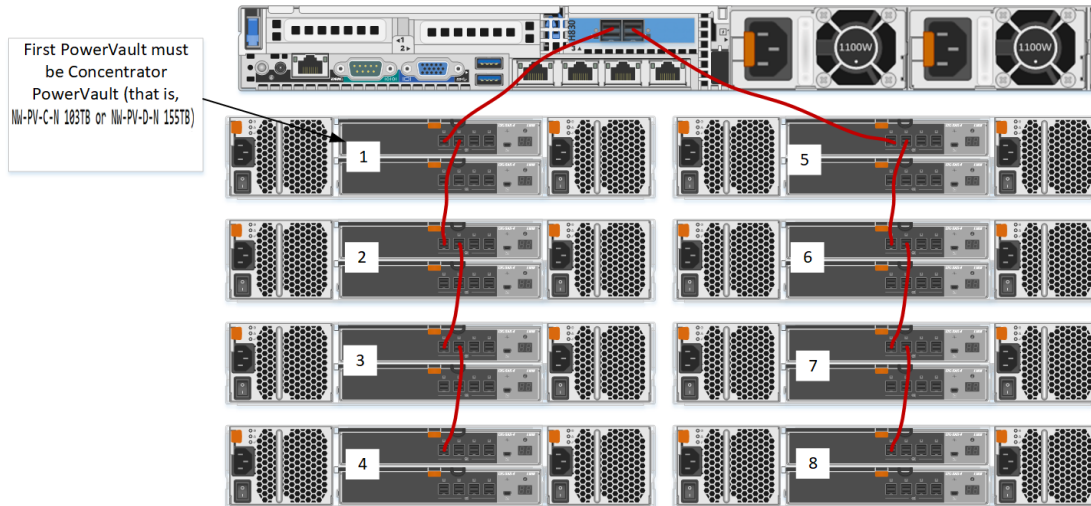
Series 6 - R640 Attached to Eight PowerVaults

5. When you finish the cabling, make sure that the PowerVault is powered on and then power on the physical host.

Revision History

Date	Description
September 12, 2019	Includes latest documentation defect corrections.
February 12, 2020	Added PowerVault front view information, added EMM back view information, and updated the *Dell Storage MD1400 Enclosures Hardware Owner's Manual* hyperlink. Also updated the following tables: Enclosure Options, Unencrypted PowerVault Storage Enclosures Supported, and Encrypted PowerVault Storage Enclosures Supported.
October 2022	Removed 11.5 and earlier references.