

# **VERITAS Array Integration Layer 4.2**

## **Array Configuration Guide**

**Solaris**

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# EMC CLARiiON Storage Array Requirements

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The following sections list requirements for EMC CLARiiON storage arrays:

- ◆ [“Supported Models”](#) on page 1
- ◆ [“Physical Connection Requirements”](#) on page 1
- ◆ [“Supported Array Vendor CLI and Array Firmware Versions”](#) on page 1
- ◆ [“Device Setup Requirements/Configuration”](#) on page 1
- ◆ [“VAIL Provider Setup Requirements/Configuration”](#) on page 2
- ◆ [“Verifying CLI/API Functionality”](#) on page 2

## Supported Models

FC 4700, FC 4700-2, CX200, CX400, CX600

## Physical Connection Requirements

For full discovery, make the following physical connection:

- ◆ Network connection between each array and the host where the CLARiiON VAIL provider is installed

## Supported Array Vendor CLI and Array Firmware Versions

For information about supported CLI and firmware versions, see the Hardware Compatibility List (HCL) for your product.

## Device Setup Requirements/Configuration

**Storage array host.** The CLARiiON array has two Storage Processors (SP). You can configure each SP with a separate IP address and configure the CLARiiON VAIL provider for both IP addresses. If you do this and one IP address stops responding, the CLARiiON VAIL provider can then access the array through the other IP address. See [“VAIL Provider Setup Requirements/Configuration”](#) on page 2 for information about configuring the CLARiiON VAIL provider for a second CLARiiON IP address. The CLARiiON VAIL



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provider does not use the second IP address until after a rescan. A rescan occurs whenever the provider or array polling interval elapses or when you manually issue a rescan. You can issue a rescan through the VERITAS EMC Clariion Control Panel on the VEA GUI.

**Access Logix enabled.** Storage array firmware must have Access Logix enabled.

**Shared Access Configuration.** Storage array host must have “Shared Access Configuration,” which requires Access Logix enabled.

**NaviCLI.** Install NaviCLI on the host where the CLARiiON VAIL provider is installed. Install NaviCLI at the default location /opt/Navisphere/bin. If you want to install NaviCLI at a location other than the default location, use the VERITAS EMC Clariion Control Panel on the VEA GUI to change the path to NaviCLI.

## VAIL Provider Setup Requirements/Configuration

**Configuring both CLARiiON Storage Processors.** CLARiiON arrays have two Storage Processors (SP). If you want to enable use of the second SP in case the first SP stops responding, configure the CLARiiON VAIL provider for both IP addresses (see “[Storage array host](#)” on page 1). Configure the second IP address as if you are configuring another CLARiiON array.

**VAIL Provider Setup.** You configure the CLARiiON VAIL provider through the VERITAS EMC Clariion Control Panel on the VEA GUI. For CLARiiON storage arrays, enter the following values:

### CLARiiON VAIL Provider Setup Requirements

Field	Value
IP Address	IP address, name, or the fully qualified domain name for one array Storage Processor
Polling Interval	Leave blank unless you have an unusual situation where you need to rescan more often than the default of 30 minutes.

## Verifying CLI/API Functionality

To verify that the required CLI/APIs are installed and functioning, perform the following tasks on the host where the CLARiiON VAIL provider is installed. Install all specified software on the host and storage array and perform any specified configuration described in this section for the array and host before performing these tasks.

To use the NaviCLI from the command line, log on as root. Ensure that the host where NaviCLI is installed has an entry in the agent configuration file in the storage array for root. The entry is similar to root@DBED\_host\_IPaddress.

---

### ▼ To verify that NaviCLI is installed

- ❖ Issue the following command. If the NaviCLI is installed, information will be returned for NaviCLI:

```
pkginfo -l NAVICLI
```

### ▼ To determine the NaviCLI version

- ❖ After verifying that NaviCLI is installed, enter the following at the command line:

```
navicli -help
```

The NaviCLI version is returned. Verify the installed version is supported. See [“Supported Array Vendor CLI and Array Firmware Versions”](#) on page 1.

### ▼ To verify that Access Logix is installed on the array

- ❖ After verifying that NaviCLI is installed, enter the following at the command line:

```
navicli -h arrayIPAddress storagegroup -status
```

where *arrayIPAddress* is the IP address, the fully qualified domain name, or name of one of the Storage Processors in the array

If Access Logix is installed, information about Data Access Control is displayed. For example:

```
Data Access control: ENABLED
```

If Access Logix is not installed, an error message similar to the following is displayed:

```
This command is not supported by this version of Core  
software.
```

### ▼ To determine the Access Logix or Base (firmware) software version

- ❖ After verifying that NaviCLI is installed, list the software and versions installed in the array. Enter the following at the command line:

```
navicli -h arrayIPAddress getall -host
```

where *arrayIPAddress* is the IP address, the fully qualified domain name, or name of one of the Storage Processors in the array

Verify that the version of the Base software with Active State set to Yes has Access Logix enabled. If the Base software version is specified as supported in your product HCL, Access Logix is enabled in that version. See [“Supported Array Vendor CLI and Array Firmware Versions”](#) on page 1.



---

## ▼ To verify that the NaviCLI can communicate with CLARiiON arrays

- ❖ After verifying that NaviCLI is installed, enter the following at the command line:

```
navicli -h arrayIPAddress networkadmin -get
```

where *arrayIPAddress* is the IP address, the fully qualified domain name, or name of one of the Storage Processors in the array

If the NaviCLI can communicate with the array, information similar to the following is displayed:

```
Storage Processor:                SP A
Storage Processor Network Name:    RENG_CX600A
Storage Processor IP Address:      10.150.90.95
Storage Processor Subnet Mask:     255.255.248.0
Storage Processor Gateway Address: 10.150.88.1
```

If this command succeeds, CommandCentral can use the *arrayIPAddress* to communicate with the array. See [“VAIL Provider Setup Requirements/Configuration”](#) on page 2.

If the array address is incorrect or the Storage Processor is not accessible, an error message similar to the following is displayed:

```
Error: networkadmin command failed Cannot access device
```

# EMC Symmetrix Storage Array Requirements

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The following sections list requirements for EMC Symmetrix storage arrays:

- ◆ [“Supported Models”](#) on page 5
- ◆ [“Physical Connection Requirements”](#) on page 5
- ◆ [“Supported Array Vendor CLI and Array Firmware Versions”](#) on page 5
- ◆ [“Device Setup Requirements/Configuration”](#) on page 5
- ◆ [“Verifying CLI/ API Functionality”](#) on page 7

## Supported Models

EMC Symmetrix 8000 Series: 8430, 8530

EMC Symmetrix 3000 Series: 3400, 3630

EMC Symmetrix DMX Series: DMX1000S

## Physical Connection Requirements

For full discovery, make the following physical connections:

- ◆ Fibre Channel connection between each array and the host where the Symmetrix VAIL provider is installed

## Supported Array Vendor CLI and Array Firmware Versions

For information about supported CLI and firmware versions, see the Hardware Compatibility List (HCL) for your product.

## Device Setup Requirements/Configuration

**EMC Solutions Enabler (SYMCLI).** To support discovery, install EMC Solutions Enabler on the host where the Symmetrix VAIL provider is installed. For instructions on installing EMC Solutions Enabler, see your vendor documentation.



---

If you want to install EMC Solutions Enabler at a location other than the default location, use the EMC Symmetrix Control Panel on the VEA GUI to input the install location to the EMC Symmetrix VAIL provider.

**LUN Visibility.** To fully discover an array, the host on which EMC Solutions Enabler is installed must be able to see a VCMDB LUN in the storage array. In addition to the VCMDB LUN, one other LUN in the array should be visible to the host where Solutions Enabler is installed. This LUN acts as a “gatekeeper” and enables communication between the host and the storage array. If the VCMDB LUN is the only LUN in the array that is visible to the host, Solutions Enabler uses it as the gatekeeper, but this is not an optimal configuration. If a second LUN is not visible to the host, determine whether the LUNs in the array are all masked or zoned away from the host where Solutions Enabler is installed. Verify that the VCMDB and other gatekeeper devices are not in the NR (Not Ready) state. See the EMC Host Connectivity Guide documentation for information about performing Fabric Configuration, Device Mapping, and Device Masking operations required to make gatekeeper devices visible to the host where Solutions Enabler is installed.

Exclude the VCMDB and other gatekeeper devices from multipathing.

**Configuration Data Corruption.** Do not run more than one tool (GUI or CLI) at the same time that alters the device masks on an array because this can corrupt array configuration data.

**World Wide Names (WWNs).** EMC limits the number of World Wide Names(WWNs) that can be assigned to a single FA port to 32. If more than 32 WWNs are assigned to an array port, EMC Solutions Enabler returns an error message. To assign new HBA WWNs to an array port that already has the maximum 32 WWNs assigned to it, first remove some of the WWNs from the port to create available slots in the database. For instructions, see your vendor documentation.

---

## Verifying CLI/API Functionality

This section describes how to verify EMC Solutions Enabler functionality.

**Installing and Verifying Solutions Enabler Licenses.** To enable EMC Symmetrix discovery, install and enable the following set of EMC licenses on the host where Solutions Enabler is installed:

### EMC Solutions Enabler Licenses

License	Purpose	Representative Command to Determine Presence or Absence of License
BASE	Enables the Base component, which includes routine commands such as <code>symdev</code> , <code>symcfg</code> , and <code>syndisk</code>	<code>symdev list</code>
Configuration Mgr	Enables the <code>symconfigure</code> command, which is used for management operations such as LUN binding and LUN creation and deletion	<code>symconfigure query</code>
Dev Masking	Enables the <code>symmask</code> and <code>symmaskdb</code> commands, which are used for management operations for LUN masking	<code>symmaskdb list database</code>
TimeFinder	Enables the <code>symmir</code> command, which is used for discovery and management of Timefinder snapshots	<code>symmir -sid someSymArrayID -f textFileName attach</code> <i>someSymArrayID</i> is the ID of a Symmetrix array <i>textFileName</i> is a text file containing the device numbers of an STD and BCV device pair in the specified array that have no TimeFinder relationship If the attach operation succeeds, you can restore the original STD-BCV relationship by issuing the following command: <code>symmir -sid someSymArrayID -f textFileName detach</code>



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**Verifying EMC Solutions Enabler licenses are installed.** Before performing any license verification, verify that EMC Solutions Enabler is installed on the host where the CommandCentral Server or Agent is installed. See [“To determine where the EMC Solutions Enabler is installed”](#) on page 9 and [“To determine the EMC Solutions Enabler version”](#) on page 9.

You can determine what Solutions Enabler licenses are installed and enabled by looking at the contents of the `symapi_licenses.dat` file. The file is located at `/usr/emc/API/symapi/config`. The following is an example of the contents of the `symapi_licenses.dat` file:

```
License Key: XXXX-XXXX-XXXX-XXXX WIDESKY Feature: TimeFinder / Symmetrix
License Key: XXXX-XXXX-XXXX-XXXX WIDESKY Feature: BASE / Symmetrix
License Key: XXXX-XXXX-XXXX-XXXX WIDESKY Feature: ConfigChange / Symmetrix
License Key: XXXX-XXXX-XXXX-XXXX WIDESKY Feature: SERVER / Symmetrix
License Key: XXXX-XXXX-XXXX-XXXX WIDESKY Feature: DevMasking / Symmetrix
```

Licenses can be bundled together, in which case you might not see all installed and enabled licenses in the `symapi_licenses.dat` file. If all of the required licenses are not listed, change to the directory where the EMC Solutions Enabler is installed and run the commands shown in [“EMC Solutions Enabler Licenses”](#) on page 7. If the license for the command is not installed an error message is displayed. If that occurs, install the license following the procedure in [“To Install the EMC Solutions Enabler licenses.”](#)

## ▼ To Install the EMC Solutions Enabler licenses

1. Change to the directory where the EMC Solutions Enabler is installed. See [“To determine where the EMC Solutions Enabler is installed”](#) on page 9.
2. Invoke the WideSky License Management Facility (LMF):

```
symlmf
```

The following is displayed:

```
  E M C      W I D E S K Y

                                WIDESKY LICENSE MANAGEMENT FACILITY

Register WIDESKY License Key (y/[n]) ?
```

3. Enter **y** to input a license key.

The following is displayed:

```
Enter WIDESKY License Key      :
```

- 
4. Enter the license key in the format specified by EMC documentation. If you enter a valid key, a message similar to the following is displayed:

```
The WideSky License Key for the BASE feature was  
successfully registered.
```

```
Register WIDESKY License Key (y/[n]) ?
```

5. To enter more license keys, continue at [step 3](#).

To exit, enter **n**.

**Verifying CLI/API Functionality.** To verify that the required CLI/APIs are installed and functioning, perform the following tasks on the host where the EMC Solutions Enabler is installed. Install all specified software on the host and storage array and perform any specified configuration before performing these tasks. Log on as “root.”

#### ▼ To determine where the EMC Solutions Enabler is installed

- ❖ EMC Solutions Enabler (SYMCLI) creates soft links for all SYMCLI binaries at `/usr/symcli/bin`. If these links are not present, issue the following command at the root directory:

```
find . -name symcfg -print
```

The path to where Solutions Enabler is installed is displayed. For example:

```
./opt/emc/WideSky/V5.2.0/bin/symcfg
```

If Solutions Enabler is not installed, a path is not returned. If no path is displayed, see [“EMC Solutions Enabler \(SYMCLI\)”](#) on page 5.

#### ▼ To determine the EMC Solutions Enabler version

1. At the command line, change to the directory where Solutions Enabler is installed. See [“To determine where the EMC Solutions Enabler is installed”](#) on page 9.
2. Enter the following at the command line:

```
./symcli
```

The SYMCLI version number and other information is displayed. For example:

```
Symmetrix Command Line Interface (SYMCLI) Version V5.2.0.0  
(Edit Level: 425)
```

```
built with SYMAPI Version V5.2.0.0 (Edit Level: 425)
```

3. Verify the EMC Solutions Enabler version is supported.



▼ **To determine the array firmware version**

1. At the command line, change to the directory where Solutions Enabler is installed. See [“To determine where the EMC Solutions Enabler is installed”](#) on page 9.
2. Enter the following at the command line:

```
./symcfg list
```

A list of all connected Symmetrix arrays is displayed. For example:

S Y M M E T R I X						
SymmID	Attachment	Model	Mcode Version	Cache Size (MB)	Num Phys Devices	Num Symm Devices
000182504558	Local	3400	5266	2048	1	755

3. Determine the microcode version, which is 5266 in this example; verify that the version is supported.

▼ **To determine whether the Symmetrix arrays and physical devices are visible to the host**

1. At the command line, change to the directory where Solutions Enabler is installed. See [“To determine where the EMC Solutions Enabler is installed”](#) on page 9.
2. Enter the following at the command line:

```
./symcfg discover
```

A message similar to the following is displayed:

```
This operation may take up to a few minutes. Please be
patient...
```

3. If the previous command did not return an error message, enter the following at the command line:

```
./symcfg list
```

A list of all connected Symmetrix arrays is displayed. For example:

S Y M M E T R I X						
SymmID	Attachment	Model	Mcode Version	Cache Size (MB)	Num Phys Devices	Num Symm Devices
000182504558	Local	3400	5266	2048	1	755



4. Verify that all connected Symmetrix arrays are listed. If a connected array is not listed, this could mean that no device in that array is visible to the host. See [“LUN Visibility”](#) on page 6 for more information.
5. If the previous command returned a list of arrays, enter the following at the command line for each array listed:

```
./sympd -sid symmetrixId list
```

*symmetrixId* is one of the IDs returned by the `symcfg list` command.

A list of all devices in the specified array that are visible to the host is displayed. For example:

```
./sympd -sid 000182504558 list
```

```
Symmetrix ID: 000182504558
```

Device Name	Directors	Device	Cap (MB)
Physical	Sym SA :P DA :IT Config	Attribute	Sts
/dev/rdisk/c1t1d0s2	0000 01B:0 02A:D1 2-Way Mir	N/Grp'd VCM	WD 8

6. For each connected Symmetrix array, verify that at least one physical device is listed. If you see an error message similar to “Gatekeeper not found,” this means that no LUNs in the specified array are visible to the host. If this occurs, see [“LUN Visibility”](#) on page 6.

#### ▼ To determine whether a VCMDB device for each array is visible to the host

**Note** To enable full discovery and management of a Symmetrix array, the VCMDB in that array must be visible to the host where the EMC Solutions Enabler is installed.

1. At the command line, change to the directory where Solutions Enabler is installed. See [“To determine where the EMC Solutions Enabler is installed”](#) on page 9.
2. Determine the VCMDBs that are visible to the host. Enter the following at the command line:

```
./vcmbfind
```

Information is returned for each VCMDB that is visible to the host. For example:

```
# ./vcmbfind
@(#) vcmbfind, Copyright EMC Corp. 2002 Revision: V5.2-425 $
ADAPTER      WWN      PATHNAME      FA
pci@1f,0     20000001730027b0  /dev/rdisk/c1t1d0s2  1ba
```



3. Determine the VC MDB for each Symmetrix array that is attached to the host. Enter the following at the command line:

```
./sympd list -vcm
```

Information is returned listing the VC MDB for each array that is visible to the host. For example:

```
C:\Program Files\EMC\WideSky\bin>sympd list -vcm

Symmetrix ID: 000182504558

Device Name          Directors          Device
-----
Physical            Sym  SA :P DA :IT  Config          Attribute      Sts  Cap
-----
/dev/rdsk/clt1d0s2    0000 01B:0 02A:D1  2-Way Mir      N/Grp'd VCM WD  8
```

4. Verify that each VC MDB listed in the [step 3](#) display is also listed in the [step 2](#) display.

▼ **To determine whether a VC MDB device for each array is in the ready state**

1. At the command line, change to the directory where Solutions Enabler is installed. See [“To determine where the EMC Solutions Enabler is installed”](#) on page 9.
2. Determine the state of each VC MDB that is visible to the host where Solutions Enabler is installed. Enter the following at the command line:

```
./symdev list -vcm
```

Information is returned listing the state of each VC MDB that is visible to the host. For example:

```
# ./symdev list -vcm

Symmetrix ID: 000182504558

Device Name          Directors          Device
-----
Sym Physical            SA :P DA :IT  Config          Attribute      Sts  Cap
-----
0000 /dev/rdsk/clt1d0s2    01B:0 02A:D1  2-Way Mir      N/Grp'd VCM WD  8
```



- 
3. Notice that the status (Sts) of the VCMDB (VCM) is WD (Write Disabled), meaning the device is ready. If the status is NR, meaning Not Ready, the VCMDB cannot be used. If the VCMDB status is NR, make the device ready. Issue the following command:

```
symdev -sid symmetrixId ready symDeviceID
```

*symmetrixId* is the array ID and *symDeviceID* is the Symmetrix device ID

To make ready the VCMDB in the proceeding example (whose *symDeviceID* is 0000), issue the following at the command line:

```
./symdev -sid 000182504558 ready 000
```





# Hewlett-Packard StorageWorks EVA Storage Array Requirements

---

The following sections list requirements for CommandCentral Storage to properly discover and manage Hewlett-Packard StorageWorks EVA storage arrays:

- ◆ “Supported Models” on page 15
- ◆ “Physical Connection Requirements” on page 15
- ◆ “Supported Array Vendor CLI and Array Firmware Versions” on page 15
- ◆ “Device Setup Requirements/Configuration” on page 16
- ◆ “VAIL Provider Setup Requirements/Configuration” on page 16
- ◆ “Verifying CLI/API Functionality” on page 16

## Supported Models

StorageWorks Enterprise Virtual Array (EVA) 5000

## Physical Connection Requirements

For full discovery, make the following physical connections:

- ◆ Fibre Channel connection between each HP EVA storage array and the HP OpenView Storage Management Appliance (Management Appliance) host that is managing the array
- ◆ Network connection between each Management Appliance and the host where the HP EVA VAIL provider is installed

For more information, consult the documentation supplied with your Hewlett-Packard storage array or visit the Hewlett-Packard web site (<http://www.hp.com>).

## Supported Array Vendor CLI and Array Firmware Versions

For information about supported CLI and firmware versions, see the Hardware Compatibility List (HCL) for your product.



---

## Device Setup Requirements/Configuration

**HP OpenView Storage Management Appliance host.** : Configured with:

- ◆ An Administrator-level account with valid login credentials (user name and password)
- ◆ IP address

**HP Storage System Scripting Utility (SSSU).** Install HP Storage System Scripting Utility (SSSU) on the host where the HP EVA VAIL provider is installed.

For more information, consult the documentation supplied with your Hewlett-Packard storage array or visit the Hewlett-Packard web site (<http://www.hp.com>).

## VAIL Provider Setup Requirements/Configuration

You configure the HP EVA VAIL provider through the HP EVA Control Panel in the VEA GUI. For HP StorageWorks EVA storage arrays, enter the following values:

### HP EVA Storage Arrays VAIL Provider Setup Requirements

Field	Value
IP Address	IP address, name, or the fully qualified domain name for the HP Open-View Storage Management Appliance host
User Name	“administrator” <b>Note</b> This is the Command View EVA account that the HP EVA VAIL provider uses to manage HP EVA arrays
Password	Password for the Command View EVA “administrator” Login <b>Note</b> Ensure that you are using the password to log in to the Command View EVA administrator account and not the password to log in to the Management Appliance administrator account. For more information, contact your Hewlett-Packard customer representative.
Polling Interval	Leave blank unless you have an unusual situation where you need to rescan more often than the default of 30 minutes.

## Verifying CLI/API Functionality

To verify that the required CLI/ APIs are installed and functioning, perform the following tasks on the host where the SSSU is installed. Install all specified software on the host and storage array and perform any specified configuration before performing these tasks. Log on as root.



---

## ▼ To verify the functionality of the SSSU CLI

- ❖ Run the SSSU in interactive mode by entering `/opt/CPQhsv/bin/sssu` (if you did not install the SSSU at this default location, enter the path to the SSSU). If the CLI is installed and functioning correctly, a message similar to the following is displayed:

```
SSSU Build 8 for hp command view eva 3.1
NoSystemSelected>
```

## ▼ To verify that SSSU can communicate with HP Command View EVA

---

**Note** Use this procedure to verify the SSSU can communicate with the HP Command View EVA and that the Command View EVA can communicate with the EVA arrays that it is managing.

---

1. Install the required software and perform any configuration specified for the Management Appliance and storage arrays. Use information in this section as a guide.
2. Start the SSSU in interactive mode (see [“To verify the functionality of the SSSU CLI”](#) on page 17).
3. On the host where the SSSU is installed, enter the following at the command line:

```
select manager Management_Appliance_IP_address
username=administrator password=administrator_password
```

*Management\_Appliance\_IP\_address* is the IP address of the HP Management Appliance that is managing the HP EVA arrays.

*administrator* is the user name for the HP Command View EVA account that CommandCentral Storage uses to manage the HP EVA arrays.

*administrator\_password* is the user-specified password to access the Command View EVA administrator account.

4. Enter the following at the command line:

```
show cell
```

The names of the HP EVA arrays that the Command View EVA is managing are displayed at the command line. The display looks similar to the following (where Veritas is the name of an HP EVA array):

```
NoCellSelected> show cell
Cells available on this Manager:
  Veritas
NoCellSelected>
```





# Hitachi HiCommand Storage Array Requirements

---

The following sections list requirements for Hitachi storage arrays that use the HiCommand® management framework:

- ◆ “Supported Models” on page 19
- ◆ “Physical Connection Requirements” on page 19
- ◆ “Supported Array Vendor CLI and Array Firmware Versions” on page 20
- ◆ “Device Setup Requirements/Configuration” on page 20
- ◆ “VAIL Provider Setup Requirements/Configuration” on page 21

## Supported Models

The following Hitachi arrays use the HiCommand management framework:

- ◆ Hitachi Freedom Storage Lightning 9900V Series 9970V and 9980V Storage Arrays
- ◆ Hitachi Freedom Storage Thunder 9500V Series Storage Arrays
- ◆ Hitachi Freedom Storage Thunder 9200 Storage Arrays
- ◆ Hitachi Freedom Storage Lightning 9900 Series Storage Arrays

## Physical Connection Requirements

For full discovery, make the following physical connections:

- ◆ Network connection between the Hitachi HiCommand Server and the host where the HiCommand VAIL provider is installed
- ◆ Network connection between the HiCommand storage arrays and the Hitachi HiCommand Server

For more information, consult the documentation supplied with your Hitachi HiCommand storage array or visit the Hitachi Web site (<http://www.hds.com>).



---

## Supported Array Vendor CLI and Array Firmware Versions

The Hitachi HiCommand VAIL provider does not require a vendor CLI to discover the HiCommand arrays. For information about supported array firmware and HiCommand server versions, see the Hardware Compatibility List (HCL) for your product.

### Device Setup Requirements/Configuration

**Hitachi HiCommand Server.** Configured with:

- ◆ An administrator-level account with valid login credentials (username and password)
- ◆ An IP address
- ◆ A separate administrative-level user account for the HiCommand VAIL provider to use to manage the HiCommand arrays. Ensure that no user is logged on to this account. “[VAIL Provider Setup Requirements/Configuration](#)” on page 21 describes how to configure the HiCommand VAIL provider to use this account information.
- ◆ The Hitachi arrays to manage. Use the HiCommand DeVice Manager to configure the HiCommand server.
- ◆ The host where the HiCommand VAIL provider is installed if the HiCommand Server is configured to accept requests from only specified hosts.

**Hitachi HiCommand Server software.** The Hitachi HiCommand Server software *cannot* be co-resident with other software. See HiCommand documentation for more information.

**Hitachi 9900 Series and 9900V Series.** Configure SNMP on the storage array Service Processor (SVP) host. Use the storage array SVP to enter the IP address of the Hitachi HiCommand Server. Also ensure the following:

- ◆ SVP notebook on the array is running:
  - ◆ Microsoft Windows 98 (for the 9900 Series)
  - or
  - ◆ Microsoft Windows 2000 (for the 9900V Series)
- ◆ SVP is running in View mode.
- ◆ SVP is *not* running in Modify mode; if it is, change the mode to View using the SVP console.
- ◆ SNMP traps are *not* enabled in the SVP

**Configuring arrays for HiCommand Server management.** If an array is configured to accept requests from only specified hosts, ensure that the HiCommand Server is listed.

---

**Hitachi LUN Security license.** To use LUN Security, the Hitachi LUN Security license must be installed. Contact Hitachi for purchase this license. If you already have it, see your vendor documentation for details.

**Hitachi Remote Console.** Disable any Hitachi Remote Consoles because they will interfere with array management. See your vendor documentation for details.

### **VAIL Provider Setup Requirements/Configuration**

You configure the HiCommand VAIL provider for the Hitachi HiCommand Servers (not the arrays) through the HiCommand Arrays Control Panel on the VEA GUI. For HiCommand Servers, enter the following values:

#### **HiCommand VAIL Provider Setup Requirements**

---

<b>Field</b>	<b>Value</b>
HiCommand Server IP Address	IP address, name, or the fully qualified domain name for the HiCommand Server. The HiCommand VAIL provider communicates with the HiCommand Server through default port 2001. You can change the HiCommand Server communication port when you specify the HiCommand Server IP Address by making an entry similar to the following:  <code>myHiCommandServer.mydomain:2001</code>
User Name	Valid administrative-level username for the HiCommand Server
Password	Valid administrative-level password for the HiCommand Server
Polling Interval	Leave blank unless you have an unusual situation where you need to rescan more often than the default of 30 minutes.

---





# IBM TotalStorage Enterprise Storage Server (ESS/Shark) Storage Array Requirements

5

The following sections list requirements for IBM ESS (Shark) storage arrays:

- ◆ “[Supported Models](#)” on page 23
- ◆ “[Physical Connection Requirements](#)” on page 23
- ◆ “[Supported Array Vendor CLI and Array Firmware Versions](#)” on page 23
- ◆ “[Device Setup Requirements/Configuration](#)” on page 23
- ◆ “[VAIL Provider Setup Requirements/Configuration](#)” on page 24
- ◆ “[Verifying CLI/API Functionality](#)” on page 24

## Supported Models

ESS 800, ESS F10, ESS F20

## Physical Connection Requirements

For full discovery, make the following physical connection:

- ◆ Network connection between each array and the host where the IBM Shark VAIL provider is installed

For more information, consult the documentation supplied with your IBM storage array or visit the IBM web site (<http://www.ibm.com>).

## Supported Array Vendor CLI and Array Firmware Versions

For information about supported CLI and firmware versions, see the Hardware Compatibility List (HCL) for your product.

## Device Setup Requirements/Configuration

**IBM Enterprise Storage Server (ESS/Shark).** Configured with an:

- ◆ Administrator-level account with valid login credentials (username and password)
- ◆ IP address



---

**IBM Enterprise Storage Server Command Line Interface (ESSCLI).** Install IBM Enterprise Storage Server Command Line Interface (ESSCLI) on the host where the IBM Shark VAIL provider is installed. The ESSCLI requires jre 1.3.1 or higher installed on the machine where the ESSCLI is installed. Install ESSCLI at the default location `/opt/ibm2105cli`. If you want to install ESSCLI at a location other than the default location, use the `vaildiag` command line tool to change the path to ESSCLI. See [“Setting an Array Provider CLI Path”](#) on page 32 for information about setting the path to a CLI.

### VAIL Provider Setup Requirements/Configuration

You configure the Shark VAIL provider through the IBM Shark Control Panel on the VEA GUI. For IBM ESS Storage Arrays, enter the following values:

#### ESS Storage Arrays VAIL Provider Setup Requirements

Field	Value
Specialist IP Address	IP address, name, or the fully qualified domain name for the IBM Enterprise Storage Server (ESS) (the host running the IBM ESS software)
Specialist User Name	Valid administrator-level username for the ESS
Specialist Password	Valid administrator-level password for the ESS
Polling Interval	Leave blank unless you have an unusual situation where you need to rescan more often than the default of 30 minutes.

**Primary ESS.** If there is more than one ESS array in your storage network, you can designate one of the Enterprise Storage Servers (ESS) to manage all the ESS arrays. If this is the case, then only configure the IBM Shark provider for the primary ESS; otherwise, you must configure the IBM Shark provider for each ESS array separately.

### Verifying CLI/API Functionality

To verify that the required CLI/APIs are installed and functioning, perform the following tasks on the host where ESSCLI is installed. Install all specified software on the host and storage array and perform any specified configuration before performing these tasks. Log on as root.

---

## ▼ To determine whether ESSCLI can access a Shark array

1. Issue the following command at the command line:

```
pathToESSCLI esscli -s specialistIP -u userName -p passWord  
list server
```

*pathToESSCLI* is the path to the location where ESSCLI is installed. On UNIX, the path is similar to the following:

```
/opt/ibm2105cli/
```

*specialistIP* is the IP address, fully qualified domain name, or array name of a Shark array

*userName* is the username that the Shark provider uses to log on to the Shark array

*passWord* is the password for *userName*

2. If ESSCLI is functioning correctly and can access the Shark array, information about the array is displayed in a format similar to the following:

```
Mon Nov 04 16:35:09 PST 2002 IBM ESSCLI 2.1.0.0
```

Server	Model	Mfg	WWN	CodeEc	Cache	Nvs	Racks
2105.23029	800	013	5005076300C0978D	2.0.1.48	8GB	2048MB	1

If the specified Shark array is unreachable or the IP address is incorrect, an error message similar to the following is displayed:

```
esscli 202: The specified server address is not known to the network.  
java.net.UnknownHostException: adjf  
    at java.net.InetAddress.getAllByName0(InetAddress.java:591)  
    at java.net.InetAddress.getAllByName0(InetAddress.java:560)  
    at java.net.InetAddress.getByName(InetAddress.java:469)  
    at java.net.Socket.<init>(Socket.java:121)  
    at com.ibm.jsse.JSSESocket.<init>(Unknown Source)  
    at com.ibm.jsse.JSSESocketFactory.createSocket(Unknown Source)  
    at com.ibm.net.ssl.internal.www.protocol.https.n.e(Unknown Source)  
    at com.ibm.net.ssl.internal.www.protocol.https.e.a(Unknown Source)  
    at com.ibm.net.ssl.internal.www.protocol.https.s.m(Unknown Source)  
    at com.ibm.net.ssl.internal.www.protocol.https.s.<init>(Unknown Source)  
    at com.ibm.net.ssl.internal.www.protocol.https.n.<init>(Unknown Source)  
    at com.ibm.net.ssl.internal.www.protocol.https.n.a(Unknown Source)  
    at com.ibm.net.ssl.internal.www.protocol.https.n.a(Unknown Source)  
    at com.ibm.net.ssl.internal.www.protocol.https.HttpURLConnection.conne  
    at rsCliSeascape.rsCliSecConnectThread.run(rsCliSenderImpl.java:2528)  
Operation Failed. RC=2
```





## Using the vaildiag CLI Tool

---

**A**

VERITAS Array Integration Layer (VAIL) software interfaces third-party hardware storage arrays with VERITAS storage software. VAIL providers are software modules that enable VERITAS applications to discover, query, and manage third-party storage arrays.

A VAIL provider manages a specific type of third-party storage array. VAIL supports the following providers:

- ◆ vx\_hicommand, which interfaces Hitachi HiCommand arrays
- ◆ vx\_emc\_symmetrix, which interfaces the EMC Symmetrix arrays
- ◆ vx\_emc\_clariion, which interfaces the EMC CLARiiON arrays
- ◆ vx\_ibmshark, which interfaces the IBM ESS (Shark) arrays
- ◆ vx\_netapp, which interfaces the Network Appliance (NetApp) arrays
- ◆ vx\_vrts\_cimvail, which interfaces CIM managed arrays
- ◆ vx\_sun\_t300, which interfaces the SUN T3 and T3+ arrays
- ◆ vx\_hp\_eva, which interfaces the HP EVA arrays
- ◆ vx\_hds\_9900, which interfaces Hitachi Freedom Storage Lightning 9900 Series arrays (note that these arrays can also be managed by the HiCommand provider)
- ◆ vx\_hp\_512, which interfaces the HP xp48 and xp512 arrays
- ◆ vx\_cisco\_mds, which interfaces Virtual Enclosures
- ◆ vx\_cpq\_ra8000, which interfaces Compaq arrays

You can use the vaildiag CLI tool to:

- ◆ Help diagnose array discovery problems
- ◆ Get configuration information for Hitachi, CLARiiON, and IBM ESS arrays that are configured for discovery by a host
- ◆ Set the path to a third-party array vendor CLI
- ◆ Rescan a storage array or VAIL provider



The `vaildiag` CLI tool is installed at the default location of `/opt/VRTSvail/bin` on all hosts where VAIL is installed, so you can run `vaildiag` on the host that you are querying. You can use the `vaildiag CONNECT` option to connect to and query a different host. For information about `vaildiag`, see “[vaildiag](#)” on page 33 or the `vaildiag` online manual page.

## Listing Installed VAIL Providers

You can use `vaildiag` to get a list of all providers installed on a host. Verify that all expected providers are installed. The provider names displayed by this command are the names that you can use to specify an individual VAIL provider to `vaildiag` if, for example, you want `vaildiag` to execute a command for only one provider.

### ▼ To get a list of installed VAIL providers

- ❖ Enter the following command:

```
./vaildiag /PROVIDERS
```

## Listing Discovered Storage Arrays

You can get a list of discovered storage arrays.

### ▼ To get a list of discovered arrays

- ❖ Enter the following command:

```
./vaildiag /SHOWARRAYS -all
```

A list of discovered arrays for the specified host, similar to the following, is displayed:

```
Connecting to server: vail-sol8.red.veritas.com
```

```
Name      : HITACHI  9960 (30646)
Provider   : vx_hicommand
State      : Normal
State Desc:
```

```
Name      : EMC CLARiION (APM00031201102)
Provider   : vx_emc_clariion
State      : Normal
State Desc:
```

## Listing Configured Arrays

You can get a list of all out-of-band storage arrays and Hitachi HiCommand servers that are configured on a host for discovery. The arrays that are listed using the configured switch include all out-of-band arrays and HiCommand servers that are configured for discovery and all discovered in-band arrays.

If all attached out-of-band arrays are not listed by `/SHOWARRAYS -all`, use the configured switch to get a list of all arrays that are configured for discovery.

Hitachi arrays are managed through the HiCommand framework, a vendor server. In this case, the individual arrays are not configured for discovery. Instead, the HiCommand server is configured for discovery.

Compare the configured list with the discovered list to determine which configured arrays or servers are not being discovered.

### ▼ To get a list of configured servers

- ❖ Enter the following command:

```
./vaildiag /SHOWARRAYS -configured
```

Use this list to determine whether all of the configured HiCommand servers and out-of-band arrays are also discovered.

## Rescanning Array Providers

The `vaildiag` tool has two commands that you can use to update status information for storage arrays. The following rescan commands are available:

- ◆ `/RESCAN [-provider ProviderName|-all] | [-array ArrayID -provider ProviderName]`

Rescans the specified storage arrays for updated status information. You can rescan the SCSI bus and all arrays attached to the machine, a single array, or all arrays managed by the VAIL provider.

`provider ProviderName` rescans the storage arrays that are managed by the VAIL provider specified by *ProviderName*. The names of the providers loaded on the machine can be obtained using the `vaildiag /PROVIDERS` command.

`all` - rescans all storage arrays attached to the machine for updated status and rescans the SCSI bus for devices.



`array ArrayID`-rescans the array specified by `ArrayID`. When you specify an array ID, you must also specify `-provider ProviderName`. You can obtain Array IDs for the discovered storage arrays by issuing the `vaildiag /SHOWARRAYS` command. You can obtain provider names for the providers loaded on the machine by issuing the `vaildiag /PROVIDERS` command.

- ◆ `/RESCANDEVICES`

Rescans the SCSI bus for devices.

## Setting the VAIL Provider Polling Interval

You can use `vaildiag` to set the polling interval for array providers. The polling interval determines how often the VAIL provider queries the storage arrays it manages for updated status.

### ▼ To set the provider polling interval

- ❖ Issue a command similar to the following:

```
/SETDEFPOLLINGINT -provider ProviderName -pollinginterval  
minutes
```

`provider ProviderName` specifies the VAIL provider whose polling interval you are setting. To obtain a `ProviderName` list for all VAIL providers on the machine, issue the `vaildiag /PROVIDERS` command.

`pollinginterval minutes` specifies the polling interval for the VAIL provider. If you enter an invalid value, the default value is used. The minimum interval is 1 minute; the default value is 30 minutes.

## Viewing the VAIL Provider Polling Interval

You can use `vaildiag` to view the polling interval for array providers. The polling interval determines how often the VAIL provider queries the storage arrays it manages for updated status.

### ▼ To view a provider polling interval

- ❖ Issue a command similar to the following:

```
/GETDEFPOLLINGINT -provider ProviderName
```

`provider ProviderName` specifies the VAIL provider whose polling interval you are getting. To obtain a *ProviderName* list for all VAIL providers on the machine, issue the `vaildiag /PROVIDERS` command.

## Setting Array Provider Optional Parameters

You can use `vaildiag` to set optional parameters for array providers that use them. Syntax for this command is:

```
/SETOPTIONALPROVPARAM [-provider ProviderName] [-parameter1\
Value1] [-parameter2 Value2][...]
```

`provider ProviderName` specifies the array provider whose optional parameters you are setting. To obtain a *ProviderName* list for all array providers on the machine, issue the `vaildiag /PROVIDERS` command.

`-parameter1 Value1 -parameter2 Value2 ...` specify key/value pairs for the optional parameters

Optional parameters can be used to specify the location of a CLI or API that an array provider uses to communicate with a storage array, or for other purposes. To get a list of a provider's optional parameters, issue the `/GETOPTIONALPROVPARAM` command on the provider.



## Setting an Array Provider CLI Path

Some array providers use a CLI or API installed on the host to communicate with the arrays they are managing. If you install the CLI in a location other than the default location, you can use `vaildiag` to specify the location where the CLI is installed. For example, the EMC Solutions Enabler (SYMCLI) uses the `cliexepath` key value to set the CLI path.

The following example shows how to use `vaildiag` to set the EMC Solutions Enabler install path:

```
vaildiag /SETOPTIONALPROVPARAM -provider vx_emc_symmetrix  
-cliexepath "/opt/SYMCLI"
```

## vaildiag

### NAME

vaildiag - configures VAIL providers to manage storage arrays

### SYNOPSIS

```
vaildiag /command
```

### DESCRIPTION

vaildiag configures VERITAS Array Integration Layer (VAIL) providers to manage storage arrays.

### OPTIONS

/HELP

Displays help for vaildiag.

/CONNECT -server *serverName* [-username *UserName*

-password *Password*]

Connects the machine where vaildiag is running to the specified server. Use this option with another option.

-server *serverName* specifies the server to connect to, where *serverName* is the name of the server. If this option is not specified, the connection is to the local host.

-username *UserName* specifies the operating system username to log on to the server.

-password *password* specifies the password to log on to the server.

If you specify -username and -password, the password will be displayed when you enter it. To avoid displaying the password, omit -username and -password. vaildiag then prompts for the username and the password, which it does not echo



The following is an example of using /CONNECT to display a list of VAIL providers installed on a different host:

```
# ./vaildiag /CONNECT -server targetHost /PROVIDERS
Enter User name: Administrator
Enter Password:
Sample client connected successfully...
Connecting to server: targetHost
```

```
Provider          : vx_sun_t300
Provider          : vx_ibmshark
Provider          : vx_hp_eva
Provider          : vx_hicommand
Provider          : vx_hds_9900
Provider          : vx_hp_512
Provider          : vx_cisco_mds
Provider          : vx_emc_symmetrix
Provider          : vx_emc_clariion
Provider          : vx_cpq_ra8000
#
```

#### /PROVIDERS

Lists the VAIL providers loaded on the server.

#### /RESCAN [-provider *ProviderName*] [-all] [-array *ArrayID*]

Rescans the specified storage arrays for updated status information. You can rescan all arrays attached to the server and the SCSI bus, a single array, or all arrays managed by one VAIL provider. Issue RESCAN to discover a storage array that you added, modified, or removed from a VAIL provider.

-provider *ProviderName* rescans storage arrays for updated status. The storage arrays that are rescanned are those that are managed by the VAIL provider specified by *ProviderName*. Issue vaildiag /PROVIDERS to obtain the names of the providers loaded on the host.

-all rescans all storage arrays attached to the server for updated status and rescans the SCSI bus for devices.

-array *ArrayID* rescans the array specified by *ArrayID*. When you specify an array ID, you must also specify -provider *ProviderName*. You can obtain Array IDs for the discovered storage arrays by issuing the

vaildiag /SHOWARRAYS command. You can obtain provider names for the providers loaded on the host by issuing the vaildiag /PROVIDERS command.

/RESCANDEVICES

Rescans the SCSI bus for devices.

/SHOWARRAYS -all | -normal | -unhealthy | -configured

[-provider *ProviderName*]

Displays a list of storage arrays attached to the server that match the specified criteria. You can display all arrays, arrays in a normal or unhealthy state or configured arrays. You can display arrays for all providers or, optionally, arrays managed by a specified VAIL provider.

-configured lists all configured storage arrays attached to the server. A configured array is an in-band storage array that is discovered by a VAIL provider or an out-of-band array that is added to a VAIL provider for management. An out-of-band array could be configured but not yet discovered by the VAIL provider.

You can optionally specify -provider *ProviderName* for a list of configured arrays managed by a specific VAIL provider.

-all lists all discovered storage arrays attached to the server. A configured out-of-band array is not discovered by the VAIL provider until a rescan is issued for the array or the provider.

You can optionally specify -provider *ProviderName* for a list of all discovered arrays managed by a specific VAIL provider.

-normal lists all discovered storage arrays that are not in an error or warning state.

You can optionally specify -provider *ProviderName* for a list of normal arrays managed by a specific VAIL provider.

-unhealthy lists all discovered storage arrays that are in an error or warning state.

You can optionally specify -provider *ProviderName* for a list of unhealthy arrays managed by a specific VAIL provider.

-provider *ProviderName* lists all configured storage arrays managed by the VAIL provider specified by *ProviderName*. The names of the VAIL providers loaded on the host can be obtained by issuing the vaildiag /PROVIDERS command.



```
/ADDARRAY -provider ProviderName [-arrayid ArrayID]  
[-username UserName] [-password Password]  
[-encoding EncodingMethod] [-pollinginterval minutes]  
[-optionalparam OptionalParameters]
```

Adds a storage array to be managed by the specified VAIL provider. You can specify a user name and password to log on to the array, if required, and any optional parameters used by the storage array. You can also specify a polling interval, which determines how often the VAIL provider queries this array for status changes. After you add the array, issue the vaildiag /RESCAN command to discover the added array.

-provider *ProviderName* specifies the VAIL provider to manage the storage array. To obtain a list of VAIL providers on the host, issue the PROVIDERS command.

-arrayid *ArrayID* specifies the array to add. *ArrayID* can be either the IP address or the name of the array being added. If the storage array requires the VAIL provider to specify a port number to communicate with the array, you can optionally specify -arrayid *ArrayID:PortNumber* where *PortNumber* identifies the port the provider uses for communication.

-username *UserName* specifies the user name to log on to the storage array.

-password *Password* specifies the password to log on to the storage array. The password is displayed if you use this option. To avoid displaying the password, do not specify the -password option. vaildiag then prompts for the password, which it does not echo.

-encoding *EncodingMethod* specifies the encoding used for the password. Currently unused.

-pollinginterval *minutes* specifies, in minutes, how often the VAIL provider queries this storage array for status changes. If you do not specify this parameter, if you enter 0, or if you enter an invalid value, the default polling interval for the VAIL provider is used. The minimum interval is 1 minute. Use the provider default value unless your array requires a longer polling interval.

-optionalparam *OptionalParameters* specifies optional parameters used by some storage arrays. For example:

```
-optionalparam  
"SNMPReadCommunity=public,SNMPWriteCommunity=public"
```

---

```
/MODIFYARRAY -provider ProviderName
```

```
[-orgarrayid OriginalArrayId] [-arrayid ArrayID]
```

```
[-username UserName] [-pollinginterval minutes]
```

```
[-optionalparam OptionalParameters]
```

Changes information about a storage array that is managed by a provider. You can use this command to change the user name to log on to the storage array, to change the polling interval for the array, or change optional parameters. You can also use this command to change the array ID. After you modify the array, issue the `vaildiag /RESCAN` command to rediscover the array.

`-provider ProviderName` specifies the provider that is managing the storage array. To obtain a *ProviderName* list for all providers on the host, issue the `vaildiag /PROVIDERS` command.

`-orgarrayid OriginalArrayId` identifies the array whose information you are changing. This is the array ID that you specified when you added the storage array to the provider using the `vaildiag /ADDARRAY` command. *OriginalArrayId* can be either the IP address or the name of the array. You can get a list of array IDs for managed arrays by using the `SHOWARRAYS` command.

`-arrayid ArrayID` if you are changing the array ID, this parameter specifies the new array ID. *ArrayID* can be either the IP address or the name of the array. If the storage array requires the provider to specify a port number to communicate with the array, you can optionally specify `-arrayid ArrayID:PortNumber` where *PortNumber* identifies the port the provider uses for communication.

`-username UserName` specifies the new user name to log on to the storage array if you are changing the user name. Issue the `vaildiag /CHANGEPASSWORD` command if the new user name has a different password.

`-pollinginterval minutes` specifies, in minutes, how often the provider queries this storage array for status changes. The minimum interval is 1 minute. Use the provider default value unless your array requires a longer polling interval.

`-optionalparam OptionalParameters` specifies new optional parameters used by some storage arrays if you are changing a storage array's optional parameters.

`-optionalparam`

"SNMPReadCommunity=public,SNMPWriteCommunity=public"



`/REMOVEARRAY -provider ProviderName [-arrayid ArrayID]`

Removes the specified out-of-band storage array from management by the specified provider. After you issue the REMOVE option, issue the `vaiddiag /RESCAN` command to remove the array.

`-provider ProviderName` specifies the provider that is managing the storage array. To obtain a *ProviderName* list for all providers on the host, issue the `vaiddiag /PROVIDERS` command.

`-arrayid ArrayID` specifies the array to remove. *ArrayID* can be either the IP address or the name of the array being removed. An *ArrayID* list for the managed storage arrays attached to the server can be obtained by issuing the `vaiddiag /SHOWARRAYS` command.

`/SETDEFPOLLINGINT -provider ProviderName`

`-pollinginterval minutes`

Sets the default polling interval, in minutes, used by the specified provider. This interval is used if you do not set a polling interval, enter 0, or enter an invalid interval for a storage array that is managed by this provider. The minimum interval is 1 minute; if you enter 0, or an invalid value, or do not set this parameter, the provider built-in interval of 30 minutes is used. Use the built-in value unless your arrays requires a longer polling interval.

`-provider ProviderName` specifies the provider whose default polling interval you are setting. To obtain a *ProviderName* list for all providers on the host, issue the `vaiddiag /PROVIDERS` command.

`-pollinginterval minutes` specifies the default polling interval for the provider.

The minimum interval is 1 minute; the built-in value is 30 minutes.

`/SHOWDEFPOLLINGINT -provider ProviderName`

Displays the default polling interval, in minutes, for the specified provider. This interval is used if you do not set a polling interval or enter an invalid interval for a storage array that is managed by this provider.

`-provider ProviderName` specifies the provider whose default polling interval you are displaying. To obtain a *ProviderName* list for all providers on the host, issue the `vaiddiag /PROVIDERS` command.

`/CHANGEPASSWORD -provider ProviderName [-arrayid ArrayID]`

`[-password Password] [-encoding EncodingMethod]`

Changes the password to log on to the specified array.

`-provider ProviderName` specifies the provider that manages the storage array whose password you are changing. To obtain a *ProviderName* list for all providers on the host, issue the `vaiddiag /PROVIDERS` command.

-arrayid *ArrayID* specifies the array ID of the storage array whose password you are changing. *ArrayID* can be either the IP address or the name of the array. An *ArrayID* list for the managed storage arrays attached to the server can be obtained by issuing the vaiddiag /SHOWARRAYS command.

-password *Password* the new password to log on to the storage array. The password is displayed if you use this option. To avoid displaying the password, do not specify the -password option. vaiddiag then prompts for the password, which it does not echo.

-encoding *EncodingMethod* specifies the encoding used for the password. Currently unused.

```
/SETOPTIONALPROVPARAM -provider ProviderName [-parameter1
Value1] [-parameter2 Value2] [...]
```

Enables setting optional parameters for a provider. Optional parameters are specific to each provider. To obtain a *ProviderName* list for all providers on the host, issue the vaiddiag /PROVIDERS command.

-provider *ProviderName* specifies the provider whose parameters you are setting.

-parameter1 *Value1* -parameter2 *Value2* ... specify parameter key/value pairs that you are setting for the specified provider.

The following example specifies a CLI path for an array provider that uses a CLI to communicate with storage arrays:

```
C:/vaiddiag.exe /SETOPTIONALPROVPARAM -provider
vxExampleProvider -cliexepath "C:/ExampleProvider
CLI1"
```

```
/GETOPTIONALPROVPARAM -provider ProviderName
```

Displays the optional parameters for the specified provider. You can issue GETOPTIONALPROVPARAM to display a list of the optional parameter names.

-provider *ProviderName* specifies the provider whose parameters you are displaying. To obtain a *ProviderName* list for all providers on the host, issue the vaiddiag /PROVIDERS command.

```
/SHOWTASKS -all | -done | -inprogress [-provider ProviderName]
```

Displays the specified task types for all providers or, optionally, for the specified provider. Generally, tasks are array management functions that take a noticable time to complete. You can use this command to check the progress of tasks.

-all displays all tasks

-done displays only tasks that have completed

-inprogress displays only tasks that have started, but not completed



-provider *ProviderName* specifies a provider to display tasks for. To obtain a *ProviderName* list for all providers on the host, issue the `vaiddiag /PROVIDERS` command.

`/SETPURGEPERIOD -period minutes`

Specifies how long to retain information about a task after the task has completed. You cannot display information about a completed task after the purge period expires for that task.

-period *minutes* specifies time, in minutes, to retain information about a task after it completes.

`/ADDARRAYMANAGER -provider ProviderName -arraymanager  
ArrayManagerName -address ArrayManagerAddress [-username  
Username] [-password Password] [-encoding EncodingMethod]  
[-port ArrayManagerPort] [-pollinginterval minutes]  
[-namespace Namespace] [-ignoreflag IgnoreArrayManager]  
[-optionalparam OptionalParameters]`

---

**Caution** Currently unimplemented.

---

Adds an array manager for discovery. Some arrays are managed by a vendor management appliance or management server. This command configures the array manager, rather than individual arrays, for discovery. When the array manager is discovered, all of the arrays that it manages are also discovered. Some legacy storage arrays have a management appliance or server which is configured for discovery as if it is an array rather than a management appliance or server. See the configuration example for your array in [“EXAMPLES”](#) on page 45 to determine whether to configure the array or an array manager for discovery.

-provider *ProviderName* specifies the provider that manages the array manager that is added with this command. To obtain a *ProviderName* list for all providers on the host, issue the `vaiddiag /PROVIDERS` command.

-arraymanager *ArrayManagerName* specifies a user selected name for the array manager

-address *ArrayManagerAddress* specifies the IP address, host name, or fully qualified domain name of the array manager

-username *Username* specifies username to log on to the array manager

- password *Password* specifies password to log on to the array manager. The password is displayed if you use this option. To avoid displaying the password, do not specify the -password option. vaildiag then prompts for the password, which it does not echo.
- encoding *EncodingMethod* specifies the encoding used for the password. Currently unused.
- port *ArrayManagerPort* specifies the array manager port that the provider uses to communicate with the array manager
- pollinginterval *minutes* specifies, in minutes, how often the provider queries this array manager for status changes in the arrays it is managing. If you do not specify this parameter, if you enter 0, or if you enter an invalid value, the default polling interval for the provider is used. The minimum interval is 1 minute. Use the provider default value unless your array manager requires a longer polling interval.
- namespace *Namespace* specifies the namespace used by the array manager. Not all array managers use namespace.
- ignoreflag *IgnoreArrayManager* specifies whether to configure and use the information in this command or to configure the information and ignore it. Provides the ability to create registry entries, but not use them immediately. Valid values are 1 and 0 where 1 means ignore the information and 0 means use the configuration information specified by /ADDARRAYMANAGER for array discovery. If you do not specify ignoreflag the default value is 0.
- optionalparam *OptionalParameters* specifies optional parameters used by some storage array managers.

/REMOVEARRAYMANAGER -provider *ProviderName* -arraymanager  
*ArrayManagerName*

---

**Caution** Currently unimplemented.

---

Removes the specified array manager from management by the specified provider. After you issue the REMOVE option, issue the vaildiag /RESCAN command to remove the array manager.

-provider *ProviderName* specifies the provider that is managing the array manager. To obtain a *ProviderName* list for all providers on the host, issue the vaildiag /PROVIDERS command.

-arraymanager *ArrayManagerName* specifies the user selected name for the array manager to remove



```
/MODIFYARRAYMANAGER -provider ProviderName -arraymanager  
ArrayManagerName -address ArrayManagerAddress [-username  
Username] [-password Password] [-encoding EncodingMethod]  
[-port ArrayManagerPort] [-pollinginterval minutes]  
[-namespace Namespace] [-ignoreflag IgnoreArrayManager]  
[-optionalparam OptionalParameters]
```

---

**Caution** Currently unimplemented.

---

Changes information about a storage array manager that is managed by a provider. You can use this command to change the user name to log on to the array manager, to change the polling interval for the array manager, or change optional parameters. You can also use this command to change the array manager address. After you modify the array manager, issue the vaildiag /RESCAN command to rediscover the arrays controlled by the array manager.

-provider *ProviderName* specifies the provider that manages the array manager that is modified with this command. To obtain a *ProviderName* list for all providers on the host, issue the vaildiag /PROVIDERS command.

-arraymanager *ArrayManagerName* specifies the user selected name for the array manager

-address *ArrayManagerAddress* specifies the new IP address, host name, or fully qualified domain name of the array manager

-username *Username* specifies the new username to log on to the array manager

-password *Password* specifies the new password to log on to the array manager. The password is displayed if you use this option. To avoid displaying the password, do not specify the -password option. vaildiag then prompts for the password, which it does not echo.

-encoding *EncodingMethod* specifies the new encoding used for the password. Currently unused.

-port *ArrayManagerPort* specifies the new array manager port that the provider uses to communicate with the array manager

-pollinginterval *minutes* specifies, in minutes, how often the provider queries this array manager for status changes in the arrays it is managing. The minimum interval is 1 minute. Use the provider default value unless your array manager requires a longer polling interval.

-namespace *Namespace* specifies the new namespace used by the array manager. Not all management array managers use namespace.

-ignoreflag *IgnoreArrayManager* specifies whether to configure and use the information in this command or to configure the information and ignore it. Provides the ability to create registry entries, but not use them immediately. Valid values are 1 and 0 where 1 means ignore the information and 0 means use the configuration information specified by /ADDARRAYMANAGER for array discovery. If you do not specify ignoreflag the default value is 0.

-optionalparam *OptionalParameters* specifies optional parameters used by some storage array managers.

```
/SHOWARRAYMANAGERS -configured|-all [-provider ProviderName]
```

---

**Caution** Currently unimplemented.

---

Displays a list of storage array managers attached to the server that match the specified criteria. You can display all array managers that have been discovered or array managers that are configured for discovery. You can display array managers for all providers or, optionally, array managers for a specified provider.

-configured lists all configured array managers. A configured array manager is an array manager that is added to a provider for discovery. An array manager could be configured but not yet discovered by the provider.

You can optionally specify -provider *ProviderName* for a list of configured array managers for a specific provider.

-all lists all discovered array managers. A configured array manager is not discovered by the provider until a rescan is issued for the array manager or the provider.

You can optionally specify -provider *ProviderName* for a list of all discovered arrays managed by a specific provider.

-provider *ProviderName* lists all configured array managers for the provider specified by *ProviderName*. The names of the providers loaded on the host can be obtained by issuing the vaildiag /PROVIDERS command.

```
/SHOWARRAYMANAGER -provider ProviderName -arraymanager  
ArrayManagerName
```



---

**Caution** Currently unimplemented.

---

Displays information about the specified array manager.

-provider *ProviderName* specifies the provider that manages the array manager. To obtain a *ProviderName* list for all providers on the host, issue the vaildiag /PROVIDERS command.

-arraymanager *ArrayManagerName* specifies the user selected name for the array manager

```
/ADDARRAYTYPEFILTERS -filterName filtername -vendorTokenList  
vendortokenlist -modelTokenList modeltokenlist
```

Creates a filter that specifies which arrays are or are not managed

-filterName *filtername* user specified filter name that is used for a registry key name

-vendorTokenList *vendortokenlist* comma delimited list of array vendors that specify whether the vendor's arrays are or are not managed

-modelTokenList *modeltokenlist* comma delimited list of array models that specify whether these arrays are or are not managed

```
/REMOVEARRAYTYPEFILTERS -filterName filtername
```

Deletes the array management filter specified by *filtername*.

-filterName *filtername* specifies the filter to delete

```
/SHOWARRAYTYPEFILTERS
```

Displays the array type filters.

```
/ADDARRAYTYPEFILTERVENDORTOKEN -filterName filtername
```

```
-vendorToken vendortoken
```

Adds a new vendor token to the specified array type filter

-filterName *filtername* filter to add the vendor token to

-vendorToken *vendortoken* array vendor token to add to the specified array type filter

```
/REMOVEARRAYTYPEFILTERVENDORTOKEN -filterName filtername
```

```
-vendorToken vendortoken
```

Removes the specified vendor token from the specified array type filter

-filterName *filtername* filter to remove the vendor token from

-vendorToken *vendortoken* array vendor token to remove from the specified array type filter

```

/ADDARRAYTYPEFILTERMODELTOKEN -filterName filtername
-modelToken modeltoken
    Adds a new array model token to the specified array type filter
    -filterName filtername filter to add the array model token to
    -modelToken modeltoken array model token to add to the specified
    array type filter

/REMOVEARRAYTYPEFILTERMODELTOKEN -filterName filtername
-modelToken modeltoken
    Removes the specified array model token from the specified array type
    filter
    -filterName filtername filter to remove the array model token
    from
    -modelToken modeltoken array model token to remove from the
    specified array type filter

/GETDRVCONFIGFLAG
    Displays the drvconfigflag setting in the lddl provider. If the flag is TRUE,
    the lddl provider issues the drvconfig command on UNIX hosts to
    rescan hardware and build device nodes.

/SETDRVCONFIGFLAG -flag TRUE|FALSE
    Sets the drvconfigflag in the lddl provider.
    -flag specifies whether to enable or disable lddl running drvconfig. Set
    flag to TRUE to enable the lddl provider to issue the drvconfig
    command on UNIX hosts. Set flag to FALSE to disable the lddl
    provider from running drvconfig. Default value is FALSE.

```

## EXAMPLES

Example 1: Adding an HP xp48 or xp512 array for discovery

Specify the following parameters to add an xp array for discovery:

provider - provider managing the array

arrayid - IP address, host name, or fully qualified domain name of the array host

optionalparam - value of SNMP Read Community and SNMP Write Community strings in the storage array. The default value used is public, so do not specify this parameter unless the values in the array are not public.

Issue a command similar to the following to add an array for discovery:



```
vaildiag /ADDARRAY -provider vx_hp_512 -arrayid myxp.domain.com
-optionalparam
"SNMPReadCommunity=public,SNMPWriteCommunity=public"
```

### Example 2: Adding Hewlett-Packard StorageWorks EVA arrays for discovery

Specify the following parameters to add HP EVA arrays for discovery:

**provider** - provider managing the OpenView Storage Operations Manager (CommandView EVA)

**arrayid** - IP address, host name, or fully qualified domain name of the host where OpenView Storage Operations Manager (CommandView EVA) is installed

**username** - username to log on to OpenView Storage Operations Manager (CommandView EVA), which is always “administrator” for the HP EVA.

**password** - password to log on to OpenView Storage Operations Manager (CommandView EVA)

---

**Note** You do not add an individual HP EVA array for discovery. Instead you add the OpenView Storage Operations Manager (CommandView EVA) that is managing one or more HP EVA arrays. After you add the OpenView Storage Operations Manager (CommandView EVA), all arrays that it manages are discovered.

---

Issue a command similar to the following to add arrays for discovery:

```
vaildiag /ADDARRAY -provider vx_hp_eva -arrayid 25.156.80.10
-username administrator -password
<password_to_log_onto_CommandView_EVA>
```

---

**Note** The password is displayed if you use the `-password` option. To avoid displaying the password, do not specify this option. `vaildiag` then prompts for the password, which it does not echo.

---

If you have more than one OpenView Storage Operations Manager (CommandView EVA), add all of them for discovery.

### Example 3: Adding an EMC CLARiiON array for discovery

Specify the following parameters to add an EMC CLARiiON array for discovery:

**provider** - provider managing the array

arrayid - IP address, host name, or fully qualified domain name of one of the array Storage Processors. Each CLARiiON array can have up to two Storage Processors with two different IP addresses. The CLARiiON VAIL provider can use the second IP address if the first IP address stops responding. To enable this capability, add the second IP address as if you are adding another CLARiiON array.

Issue a command similar to the following to add an array for discovery:

```
vairdiag /ADDARRAY -provider vx_emc_clariion -arrayid  
25.156.80.10
```

Example 4: Adding a Hitachi Freedom Storage Lightning 9900 Series 9910 or 9960 array for discovery

---

**Note** If you are not managing these arrays through the Hitachi HiCommand framework, follow the procedure in this example. If you are managing these arrays through the HiCommand framework, see [“Example 5: Adding Hitachi HiCommand Arrays for discovery”](#) on page 47 for information about how to add the arrays for discovery.

---

Specify the following parameters to add a Hitachi Freedom Storage Lightning 9900 Series 9910 or 9960 array for discovery:

provider - provider managing the array

arrayid - IP address, host name, or fully qualified domain name of the array host

optionalparam - value of SNMP Read Community and SNMP Write Community strings in the storage array. The default value used is public, so do not specify this parameter unless the values in the array are not public.

Issue a command similar to the following to add an array for discovery:

```
vairdiag /ADDARRAY -provider vx_hds_9900 -arrayid  
myhds.domain.com -optionalparam  
"SNMPReadCommunity=public,SNMPWriteCommunity=public"
```

Example 5: Adding Hitachi HiCommand Arrays for discovery

The following Hitachi arrays are managed through the HiCommand framework:

Hitachi Freedom Storage Lightning 9900V Series 9970V and 9980V Storage Arrays

Hitachi Freedom Storage Thunder 9500V Series Storage Arrays

Hitachi Freedom Storage Thunder 9200 Storage Arrays

Specify the following parameters to add Hitachi HiCommand arrays for discovery:

provider - provider managing the HiCommand server



`arrayid` - IP address, host name, or fully qualified domain name of the HiCommand server. If you want to change the default port (2001) that the provider uses to communicate with the HiCommand server, specify `IPAddress:NewPortNumber`.

`username` - username to log on to the HiCommand server

`password` - password to log on to the HiCommand server

---

**Note** You do not add an individual HiCommand array for discovery. Instead, you add the HiCommand server that is managing one or more HiCommand arrays. After you add the HiCommand server, all arrays that it manages are discovered.

---

Issue a command similar to the following to add arrays for discovery:

```
vaildiag /ADDARRAY -provider vx_hicommand -arrayid  
myHiCommandServer:2002 -username HiCommandServerLogin -password  
<password_to_log_onto_HiCommand_server>
```

---

**Note** The password is displayed if you use the `-password` option. To avoid displaying the password, do not specify this option. `vaildiag` then prompts for the password, which it does not echo.

---

If you have more than one HiCommand server managing arrays, add all of the HiCommand servers.

#### Example 6: Adding SUN StoreEdge Sun T3 and T3+ arrays for discovery

Specify the following parameters to add a SUN T3 or T3+ array for discovery:

`provider` - provider managing the SUN T3 or T3+ arrays

`arrayid` - IP address, host name, or fully qualified domain name of the T3 or T3+ array

`username` - username to log on to the array

`password` - password to log on to the array

Issue a command similar to the following to add an array for discovery:

```
vaildiag /ADDARRAY -provider vx_sun_t300 -arrayid  
T3.mydomain.com -username loginName -password  
<password_to_log_onto_T3_array>
```

---

**Note** The password is displayed if you use the `-password` option. To avoid displaying the password, do not specify this option. `vaildiag` then prompts for the password, which it does not echo.

---

Example 7: Adding IBM TotalStorage Enterprise Storage Server (ESS/Shark) arrays for discovery

---

**Note** Shark arrays are managed by the IBM ESS Specialist, which can be installed in each array. You can have one ESS Specialist manage one or more storage arrays. If you are managing more than one array through a single Specialist, add that Specialist only for discovery; do not add the individual arrays that the Specialist is managing. After you add an ESS Specialist, all arrays that it manages are discovered.

---

---

**Note** The ESS Specialist has the capability to failover to a second IP address in case of a failure in the Specialist. To use the failover capability, specify the Specialist failover IP address (with the `optionalparam` argument) when you add the Specialist for discovery.

---

Specify the following parameters to add Shark arrays for discovery:

`provider` - provider managing the Shark arrays  
`arrayid` - IP address, host name, or fully qualified domain name of the ESS Specialist  
`username` - username to log on to the ESS Specialist  
`password` - password to log on to the ESS Specialist  
`optionalpara` - ESS Specialist failover IP address

Issue a command similar to the following to add arrays for discovery. This command also shows how to specify the failover IP address:

```
vaildiag /ADDARRAY -provider vx_ibmshark -arrayid  
myESSSpecialist.domain.com -username SpecialistUser -password  
<password_to_log_onto_Specialist> -optionalparam  
"FailoverIP=SharkFailoverIP.domain.com"
```

---

**Note** The password is displayed if you use the `-password` option. To avoid displaying the password, do not specify this option. `vaildiag` then prompts for the password, which it does not echo.

---

If you have more than one ESS Specialist, add all of them.

Example 8: Adding Virtual Enclosures in Cisco MDS switches for discovery

VERITAS Storage Foundation *for Networks* creates Virtual Enclosures, which are analogous to storage arrays, in Cisco MDS switches.

Specify the following parameters to add Virtual Enclosures for discovery:



provider - provider managing the Virtual Enclosures

arrayid - IP address, host name, or fully qualified domain name of the host where Storage Foundation *for Networks* is installed

username - username to log on to the host where Storage Foundation *for Networks* is installed

password - password to log on to the host where Storage Foundation *for Networks* is installed

Issue a command similar to the following to add Virtual Enclosures for discovery:

```
vaildiag /ADDARRAY -provider vx_cisco_mds -arrayid  
myNVMhost.domain.com -username NVMUser -password  
<password_to_log_onto_NVMhost>
```

---

**Note** The password is displayed if you use the -password option. To avoid displaying the password, do not specify this option. vaildiag then prompts for the password, which it does not echo.

---

If you have more than one host running Storage Foundation *for Networks*, add all of the hosts.

#### Example 9: Adding a Network Appliance array for discovery

Specify the following parameters to add a NetApp array for discovery:

provider - provider managing the NetApp arrays

arrayid - IP address, host name, or fully qualified domain name of the array

username - username to log on to the array

password - password to log on to the array

Issue a command similar to the following to add a NetApp array for discovery:

```
vaildiag /ADDARRAY -provider vx_netapp -arrayid  
myNetApp1.domain.com -username User -password  
<password_to_log_onto_NetApp>
```

---

**Note** The password is displayed if you use the -password option. To avoid displaying the password, do not specify this option. vaildiag then prompts for the password, which it does not echo.

---

#### Example 10: Adding HP xp128 and xp1024 CIM arrays for discovery

Specify the following parameters to add an xp128 or 1024 array for discovery:

provider - provider managing the xp128 or 1024 arrays

arrayid:port - arrayid is the IP address, host name, or fully qualified domain name of the host where Command View XP and the SMI-S XP provider are installed. port optionally specifies the port that the CIM provider uses to communicate with the SMI-S XP provider, where the default port is 5988.

username - username to log on to the host where the Command View XP and the SMI-S provider are installed

password - password to log on to the host where the Command View XP and the SMI-S XP provider are installed

optionalparam - specify the namespace that the SMI-S XP provider is configured to use (see vendor documentation for this information) and a unique user determined name for the registry entry under which the CIM provider stores configuration information for the SMI-S XP.

Issue a command similar to the following to add an xp128 or 1024 array for discovery:

```
vaildiag /ADDARRAY -provider vx_vrts_cimvail -arrayid  
myHPCIMOM.domain.com:5988 -username User -password  
<password_to_log_onto_XPSMIS> -optionalparam  
Namespace=root,FriendlyName=HPXPCIMOMInfo
```

---

**Note** The password is displayed if you use the -password option. To avoid displaying the password, do not specify this option. vaildiag then prompts for the password, which it does not echo.

---

Example 11: Adding LSI Logic, IBM FastT, or StorageTek BladeStore CIM arrays for discovery

Specify the following parameters to add supported LSI Logic, IBM FastT, or StorageTek BladeStore arrays for discovery:

provider - provider managing these arrays

arrayid:port - arrayid is the IP address, host name, or fully qualified domain name of the host where the vendor SMI-S provider is installed. port optionally specifies the port that the CIM provider uses to communicate with the SMI-S provider, where the default port is 5988.

username - username to log on to the host where the the SMI-S provider is installed

password - password to log on to the host where the SMI-S provider is installed



optionalparam - specify the namespace that the SMI-S provider is configured to use (see vendor documentation for this information) and a unique user determined name for the registry entry under which the CIM provider stores configuration information for the SMI-S.

Issue a command similar to the following to add a supported array for discovery:

```
vaildiag /ADDARRAY -provider vx_vrts_cimvail -arrayid  
myLSICIMOM.domain.com:5988 -username User -password  
<password_to_log_onto_LSISMIS> -optionalparam  
Namespace=root/lsissi,FriendlyName=LSICIMOMInfo
```

---

**Note** The password is displayed if you use the -password option. To avoid displaying the password, do not specify this option. vaildiag then prompts for the password, which it does not echo.

---

## NOTES

By default, vaildiag resides in /opt/VRTSvail/bin on UNIX and in c:\Program Files\VERITAS\VERITAS Array Providers\bin on Windows