Using VADIAG on HP-UX

This document describes the VADIAG (Virtual Array) commands supported in the offline diagnostic environment (ODE) for HP-UX systems.

VADIAG Command Summary

The following table lists the VADIAG commands and their brief descriptions.

Command	Description
ARRAYINDEX	Selects the specified array for testing.
CLRLOG	Clears the logs of either the selected controller or disk.
CREATELUN	Adds a LUN to the selected array.
DELETELUN	Removes a LUN from the selected array.
DESCRIBE	Displays configuration information for the selected array.
DISPFILES	Displays the firmware images found on the ODE media.
DISPMAP	Displays the arrays connected to the specified bus.
DISPVOLSET	Displays the disk volume set serial number.
DISKINFO	Displays revision information for the selected array and disks installed in each JBOD enclosure.
DISKSTATE	Displays the state of the disks installed in the array enclosures (including the Map disks).
DOWNLOAD	Downloads the image file to the specified array controller, disk, or JOBOD LCC.
ENCLOSURE	Selects the JBOD enclosure connected to the selected array.
FRU	Selects the specified component either for testing or to get information from.
FORMAT	Formats either the array subsystem or a disk.
HELP	Lists either all VADIAG commands or detailed information for a specified command.
INQUIRY	Displays SCSI Inquiry data for the selected array controller, disk, or JBOD controller.
LCCINFO	Displays information about the JBOD LCCs connected to the array.
LOOPPAIR	Selects the controller loop pair.
RANGE	Selects a range of blocks to be tested by ROMT and WRTMT.
READLOG	Reads the logs of the specified controller or disk.

Command	Description
RECOVER	Reconstructs data mapping and array configurations.
REQSENSE	Displays SCSI Sense data for the selected array controller, disk, or JBOD controller.
RESETARRAY	Resets the selected array.
ROMT	Performs a read only test on the selected disk.
SETOPTIONS	Displays and modifies SCSI mode parameters for the selected array controller.
SHOWENV	Displays the current settings for these variables: CONTROLLER, ENCLOSURE, LOOPPAIR, RANGE, SLOT, and TESTDEVICE.
SHUTDOWN	Puts the selected array in the shutdown state.
SLOT	Selects the specified disk for testing.
TESTDEVICE	Selects the specified controller, disk, or JBOD LCC for testing.
UNSETVARS	Unsets these variables: DISK, ENCLOSURE, LOOPPAIR, SLOT, and TESTDEVICE.
UTILINFO	Displays an example of VADIAG commands.
WRTMT	Performs a destructive write/read test on the selected disk.

ARRAYINDEX

Selects the array to be tested

Syntax

arrayindex [*arrayindex*]

Description

This command sets the ARRAYINDEX variable to an array controller's device index number. The array controller is chosen from the numbers displayed by the **dispmap** command. The ARRAYINDEX variable is an index to the array to be tested, while the LOOPPAIR, ENCLOSURE, and SLOT variables select the appropriate component within the array.

Changing the value of ARRAYINDEX causes the value of LOOPPAIR, ENCLOSURE, and SLOT to be set to NOT SET. You must set these variables to an appropriate value.

Options

arrayindex – A device index number returned by the **dispmap** command.

Examples

To display the current value of ARRAYINDEX:

```
VADIAG> arrayindex

ArrayIndex: 0
```

To set the value of ARRAYINDEX to the array controller whose device index number is 1.

```
VADIAG> arrayindex 1
```

CLRLOG

Clears device logs.

Syntax

clrlog

Description

This command clears the selected device logs. Use either the **testdevice** or **fru** command to select controller or disk logs within the array.

Example

```
VADIAG> clrlog
```

CREATELUN

Creates a Logical Unit Number (LUN).

Syntax

createlun

Description

This command creates a LUN on the selected array, which provides a virtual disk to the host.

Examples

To create a LUN:

```
VADIAG>   createlun
Do you want to create a Snapshot LUN (y/[n])?   n
Enter the number of the LUN to create: 7
Enter the LUN size in the form <capacity>MB or <capacity>GB: 10MB
LUN 7 was successfully created.
```

To create a snapshot LUN:

```
VADIAG> createlun
Do you want to create a Snapshot LUN (y/[n])? y
Enter the number of the Snapshot LUN to create: 8
Enter the number of the Snapshot Parent LUN: 7
LUN 8 was successfully created.
```

DELETELUN

Deletes a Logical Unit Number (LUN).

Syntax

deletelun

Description

This command deletes a LUN on the selected array. All information stored on the LUN is lost and the previously used physical storage is freed.

Example

```
VADIAG> deletelun

Enter the number of the LUN to delete: 8

**************************************************************************
* D A T A L O S S W A R N I N G!
**************************************************************************
* Continuing with DELETELUN WILL DEFINITELY RESULT IN DATA LOSS. All
* information stored on the LUN to be deleted will be lost and the
* physical storage previously used will be freed.
**************************************************************************

LUN 8 Selected.

Delete selected LUN (y/[n])? y

LUN 8 was successfully deleted.
```

DESCRIBE

Displays configuration information for an array.

Syntax

describe [-c [*FruLocation*] | -d [*FruLocation*] | -e [*FruLocation*] | -f | -l [*LUN*] | -s | -m | -?]

Description

This command displays configuration information for the selected array. Use the **arrayindex** command to select the array.

Options

This command supports the following options:

-c *FruLocation*	Display controller information, or display information for the controller identified by *FruLocation*.
-d *FruLocation*	Display disk information, or display information for the disk identified by *FruLocation*.
-e *FruLocation*	Display enclosure information, or display information for the enclosure identified by *FruLocation*.
-f	Display a summary of all elements in the array.
-l *LUN*	Display the current LUN information, or display information for the LUN identified by *LUN*.
-m	Display the missing disks (use -v for verbose mode).
-s	Display miscellaneous subsystem settings.
-?	Display expanded usage message.

Examples

To display information for the array controllers:

```
VADIAG> describe -c
```

To display information for disk 2 in the main enclosure:

```
VADIAG> describe -d m/d2
```

To display configuration information for the selected array:

```
VADIAG> describe

ARRAY INFORMATION
   Vendor ID:              HP
   Product ID:             A6188A
   Array WWN:              0x50060B0000000000
   Array Serial Number:    00usp1001027
   Alias:                  daveg_cass

ARRAY INFORMATION
   Array State:            System Warning
   Firmware Version:       38370HP01P0330010935
   Product Revision:       IJMTU00004

CAPACITY USAGE (MB=2^20):
   Total Disk Enclosures:            1
   Total Disks                       7
   Total Physical Size:              170893 MB
   Allocated to Non-SnapShot LUNs:   15360 MB
   Configured as SnapShot LUNs:      15360 MB
   Used as Active Hot Spare:         68359 MB
   Used by Non-Included Disks:       0 MB
   Used for Redundancy:              61880 MB
   Unallocated (avail for LUNs):     9934 MB

THE FOLLOWING WARNING(S) EXIST:
   GBIC Problem
```

DISPFILES

Displays firmware information.

Syntax

dispfiles

Description

This command displays a list of all the firmware files found on the LIF (Logical Interchange Format) volume. The list contains the following information:

- **File name**. Firmware file's name.
- **Intended Product ID**. Firmware file's intended product.
- **Rev**. New revision contained in the firmware file.
- **Size**. Exact byte size of the firmware image.

Example

```
VADIAG> dispfiles
```

DISPMAP

Displays the device map.

Syntax

dispmap

Description

This command displays a list of all the array controllers found on the system. The list includes the following fields:

- **Array Indx**. Device index number which is used by other VADIAG commands to reference a specific array controller. An asterisk (*) next to this field indicates this controller is selected for testing.
- **Path**. Logical path to each array. The path construct is the same as the PDC and MAPPER's path. An array with dual controllers has two different logical paths. Therefore, two different device index numbers will access the same array.
- **Product ID**. Product identification. This is what MAPPER displays as the product string.
- **Rev**. The disk drive's firmware revision.
- **Size**. The approximate size of the LUN in either megabytes (MB), gigabytes (GB), or terabytes (TB). The size of the LUN might not match the information specified by the vendor because of differences in calculation methods.

Example

```
VADIAG> dispmap

Array
Indx   Path                    Product ID                    Rev    Size
----   --------------------    --------------------------    -----  ------
* 0    8/4.8.0.108.0.0.0       HP A6188A Disk Array (Ctrl)   HP01   10 GB
```

DISPVOLSET

Displays internal disk volume set serial number.

Syntax

dispvolset

Description

This command displays a table that includes the internal disk's FRU, storage type, state, firmware revision, capacity, and volume set serial number. The storage type (Map/User column) indicates if the disk is used for user data storage (US), meta data storage (MS) (Map Disk), or both.

Example

```
VADIAG> dispvolset
```

Fru	Map/ User	Drive State	Rev	Capacity	Volume Set Serial Number
M/D7	US/MS	Included	HPK0	34179 MB	000004F60000002A
M/D8	US/MS	Included	HPK1	17089 MB	000004F60000002A
M/D12	US	Included	HPK1	17089 MB	000004F60000002A
M/D3	US	Included	HPK1	17089 MB	000004F60000002A
M/D4	US	Included	HPC2	17089 MB	000004F60000002A
M/D5	US	Included	HPK0	34179 MB	000004F60000002A
M/D6	US	Included	HPK0	34179 MB	000004F60000002A

DISKINFO

Returns device revision information.

Syntax

diskinfo

Description

This command returns basic revision information about the controller and all recognized disks within the selected array. Additional revision information might be available using the **inquiry** command.

The storage type (Map/User column) indicates if the disk is used for user data storage (US), meta data storage (MS) (Map Disk), or both. The EID column shows the enclosure ID. An asterisk (*) in the Disk Slot column indicates the selected disk slot.

Example

```
VADIAG> diskinfo

        Loop        Disk   Map/
Fru     Pair   EID  Slot   User   Vendor ID Product ID    Rev    Capacity
------- -----  ---  ----   -----  --------- ------------ -----  ---------
M/D7    255    0    22     US/MS  HP 18.2G  ST318451FC   HPC4   17089 MB
M/D1    255    0    16     US/MS  HP 18.2G  ST318451FC   HPC4   17089 MB
M/D3    255    0    18     US     HP 18.2G  ST318451FC   HPC4   17089 MB
M/D5    255    0    20     US     HP 18.2G  ST318451FC   HPC4   17089 MB
JA0/D1  0      0    0      US     HP 18.2G  ST318451FC   HPC4   17089 MB
JA0/D2  0      0    1      US     HP 18.2G  ST318451FC   HPC4   17089 MB
JA0/D3  0      0    2      US     HP 18.2G  ST318451FC   HPC4   17089 MB
JA0/D5  0      0    4      US     HP 18.2G  ST318451FC   HPC4   17089 MB
JA0/D7  0      0    6      US     HP 18.2G  ST318451FC   HPC4   17089 MB
M/D9    255    0    24     US     HP 18.2G  ST318451FC   HPC4   17089 MB
M/D13   255    0    28     US     HP 36.4G  ST336704FC   HPC3   34179 MB
M/D14   255    0    29     US     HP 18.2G  ST318451FC   HPC4   17089 MB
```

DISKSTATE

Displays the physical disk drive map.

Syntax

diskstate

Description

This command displays the state of the selected controller and the state of the disk drives located in the main enclosure. The storage type (Map/User column) indicates if the disk is used for user data storage (US), meta data storage (MS) (Map Disk), or both. The EID column shows the enclosure ID. An asterisk (*) in the Disk Slot column indicates the selected disk slot. The Initialization State column indicates the result of the controller's attempt to initialize the disk during power-on or disk addition.

Example

```
VADIAG> diskstate

          Loop         Disk   Map/
Fru       Pair   EID   Slot   User   Drive State   Initialization State
--------- -----  -----  -----  -----  ------------  ----------------------
M/D7      255    0      22     US/MS  Included      Ready
M/D1      255    0      16     US/MS  Included      Ready
M/D3      255    0      18     US     Included      Ready
M/D5      255    0      20     US     Included      Ready
JA0/D1    0      0      0      US     Included      Ready
JA0/D2    0      0      1      US     Included      Ready
JA0/D3    0      0      2      US     Included      Ready
JA0/D5    0      0      4      US     Included      Ready
JA0/D7    0      0      6      US     Included      Ready
M/D9      255    0      24     US     Included      Ready
M/D13     255    0      28     US     Included      Ready
M/D14     255    0      29     US     Included      Ready
```

DOWNLOAD

Downloads firmware to the array controller or the disk drive.

Syntax

download

Description

This command transfers the image contained in the selected firmware file to either the array controller or internal disk. The **fru** command selects which device is issued the download. This command warns you if the firmware file is not compatible with the selected array.

Because this command is potentially damaging if misused, **download** always displays the following message just before performing the download:

```
WARNING: This command is destructive, and downloading an incorrect
firmware file will render your disk drive useless. Also, do not switch
anything on or off on the computer while a download operation is in
process!
```

Example

```
VADIAG> download
```

ENCLOSURE

Sets the enclosure ID.

Syntax

enclosure [*enclosure ID*]

Description

This command sets the ENCLOSURE variable which is used to access JBOD LCCs and disks. The ENCLOSURE variable along with the LOOPPAIR and SLOT variables identify the component of interest.

The ENCLOSURE variable should always be set to a value of 0.

Examples

To set the enclosure ID to 0:

```
VADIAG> enclosure 0
```

To display the current value of ENCLOSURE:

```
VADIAG> enclosure
EnclosureID: 0
```

FORMAT

Formats the array subsystem or an internal disk.

Syntax

format

Description

This command formats the entire array subsystem or an internal disk. A subsystem format is rejected if any LUNs exist.

Example

To format internal disk 3:

```
VADIAG> fru m/d3
VADIAG> format
```

FRU

Selects components for testing.

Syntax

fru [*fru*]

Description

This command selects a component (for example, disk or controller) for testing. For the selected component, it sets the correct values for the LOOPPAIR, ENCLOSURE, SLOT, and TESTDEVICE variables. You can manually set these variables, but it is much easier and less error prone to use the **fru** command.

Examples

To select disk 2 in the main enclosure:

```
VADIAG> fru m/d2
```

To select controller 0:

```
VADIAG> fru m/c0
```

To display the current value of FRU:

```
VADIAG> fru
FRU: M/C1
```

INQUIRY

Returns SCSI Inquiry data (all pages).

Syntax

inquiry

Description

This command returns SCSI Inquiry data on the selected FRU. You can select a controller, a disk, or a JBOD LCC with the **testdevice** or **fru** command.

Example

To issue an **inquiry** command to drive 2 in the main enclosure:

```
VADIAG> fru m/d2
VADIAG> inquiry
```

LCCINFO

Displays information about the JBOD LCCs connected to the array.

Syntax

lccinfo

Description

This command displays information about the JBOD LCCs connected to the array. The EID column shows the enclosure ID. A value of 0xFF in the Slot column indicates that the **lccinfo** command could not determine the LCC's slot location. An asterisk (*) in the Slot column indicates the selected LCC.

Example

```
VADIAG> lccinfo

          Loop                                                    State
Fru       Pair   EID Slot   Vendor ID Product ID   Rev    State     Value
--------- -----  --- -----  --------- -----------  -----  --------- -----
JA0/C0    0      0   128    HP        A6214A       HPP1   Ready     0x01
JA0/C1    0      0   129    HP        A6214A       HPP1   Ready     0x01
```

LOOPPAIR

Sets the controller loop pair.

Syntax

looppair [*loop pair*]

Description

This command sets the LOOPPAIR variable which is used to access JBOD LCCs and disks. The LOOPPAIR variable along with the ENCLOSURE and SLOT variables identify the component of interest.

The LOOPPAIR variable should always be set to a value of 255.

Examples

To set the loop pair to 255:

```
VADIAG> looppair 255
```

To display the current value of LOOPPAIR:

```
VADIAG> looppair
LoopPair: 255
```

RANGE

Selects blocks for testing by the ROMT and WRTMT commands.

Syntax

range [*start_block*/[*end_block*]],[*start_block*/[*end_block*]],...

Description

This command selects multiple blocks for testing by the **romt** and **wrtmt** commands. The value of the RANGE variable identifies the selected blocks.

Examples

To select block 4000 and blocks 6000 through 7000:

```
VADIAG> range 4000,6000/7000
```

To display the value of the RANGE variable:

```
VADIAG> range
The selected disk has blocks from 0 to 20971519
Range: NOT SET
```

READLOG

Reads device logs.

Syntax

readlog

Description

This command returns the selected internal device logs. You can select controller logs or disk logs using the **testdevice** or **fru** command.

Example

To read the logs from controller 0:

```
VADIAG> fru m/c0
VADIAG> readlog
```

RECOVER

Reconstructs data mapping and array configuration.

Syntax

recover

Description

This command instructs the target to attempt to reconstruct data mapping and array configuration information from the physical drives after the loss of NVRAM contents. The recover operation also performs a parity scan to correct any drive parity inconsistencies. This command is typically used when the subsystem is in the No Map state. The **readlog** command can be used to help evaluate the results after using the **recover** command.

REQSENSE

Returns SCSI Sense data.

Syntax

reqsense

Description

This command returns SCSI Sense data on the selected FRU. You can select a controller, a disk, or a JBOD LCC with the **testdevice** or **fru** command.

Example

To issue a **reqsense** command to controller 0:

```
VADIAG> fru m/c0
VADIAG> reqsense
```

RESETARRAY

Issues a hard reset to the array.

Syntax

resetarray

Description

This command causes the array to perform a hard reset.

Example

```
VADIAG> resetarray
```

ROMT

Performs a read test.

Syntax

romt

Description

This command performs a read-only test on the selected disk. It is designed to test only internal disks and not the array itself. Use either the **enclosure**, **looppair**, and **slot** commands or the **fru** command to select the disk for testing. Pressing either Ctrl-c or Ctrl-y causes the test to abort.

Example

To execute a test on disk 2 in the main enclosure:

```
VADIAG> fru m/d2
VADIAG> romt
```

SETOPTIONS

View and modify SCSI Mode parameters.

Syntax

setoptions

Description

This command returns SCSI mode sense parameters on the selected array and enables you to modify changeable parameters.

Example

```
VADIAG> setoptions
Parameter information for ArrayIndex 0

Subsystem Parameter              Value   Subsystem Parameter               Value
-------------------------------- ------- -------------------------------- -------
1   Subsystem State              Ready   17  Reserved                     0
2   Overcommit Enabled           OFF     18  Controller 1 Port 0 Loop ID  107
3   Host Spare Desired           OFF     19  Reserved                     0
4   Part                         OFF     20  Enable Manual Override       OFF
5   Rebuild in Progress          OFF     21  Manual Override Destination  OFF
6   Auto-Rebuild                 ON      22  Embedded Processor Download  OFF
7   Auto-Include                 ON      23  Language                     English
8   Balance in Progress          OFF     24  Capacity Depletion Threshold 0
9   Optimize in Progress         OFF     25  Reserved                     0
10  Migrating Write Destination  OFF     26  Write Working Set Interval   8640
11  LUN Security Enabled         OFF     27  Subsystem Identifier         1
12  Rebuild Priority             ON      28  Rebuild Progress             0
13  Cntrl Download in Progress   OFF     29  Reserved                     0
14  Shutdown Completion Control  OFF     30  Microcode Download Progress  0
15  Unit Attention               ON      31  Cntrl 0 Host Port Behavior   1
16  Controller 0 Port 0 Loop ID  109     32  Cntrl 1 Host Port Behavior   1


Select the number of the parameter to modify.[Return quits]:
```

SHOWENV

Displays the current environment variable settings.

Syntax

showenv

Description

This command displays the current value of these environment variables: ARRAYINDEX, TESTDEVICE, LOOPPAIR, ENCLOSURE, SLOT, RANGE, and FRU.

Example

```
VADIAG> showenv

ArrayIndex:    0
TestDevice:    Controller
LoopPair:      255
EnclosureID:   0
Slot:          0
Range:         NOT SET
FRU:           M/C0
```

SHUTDOWN

Puts the array into the shutdown state.

Syntax

shutdown

Description

This command requests that the array stop normal I/O operation and save all map information to physical drive storage.

Example

```
VADIAG> shutdown
```

SLOT

Sets the disk slot.

Syntax

slot [*slot*]

Description

This command sets the SLOT variable which is used to access the main enclosure disks. The SLOT variable along with the LOOPPAIR and ENCLOSURE variables identify the component of interest. It might be easier to use the **fru** command to identify the component because it automatically sets the LOOPPAIR, ENCLOSURE, and SLOT variables.

In ODE, the main enclosure disk slots (1-15) are in the range of 16 through 30.

Examples

To select the disk in slot 9:

```
VADIAG> slot 24 ((16 + 9) - 1)
VADIAG> looppair 255 (main enclosure)
VADIAG> enclosure 0 (main enclosure)
```

To display the current value of SLOT:

```
VADIAG> slot
Slot: 1
```

TESTDEVICE

Selects devices for testing.

Syntax

testdevice [*controller* | *disk* | *lcc*]

Description

This command selects either the controller, disk, or JBOD LCC as the device to test and where the command can be executed by any one of the devices. If only the controller can execute the command, then the TESTDEVICE variable will not have any meaning because the command will still go to the controller even if TESTDEVICE is set to the disk. It might be easier to use the **fru** command to select the device because it automatically sets the LOOPPAIR, ENCLOSURE, SLOT, and TESTDEVICE variables.

Examples

To set the testdevice to the controller for a firmware download

```
VADIAG> testdevice controller
VADIAG> download
```

To display the value of TESTDEVICE:

```
VADIAG> testdevice
TestDevice: Controller
```

UNSETVARS

Unsets all environment variables.

Syntax

unsetvars

Description

This command lets you unset (or clear) the following environment variables: TESTDEVICE, LOOPPAIR, ENCLOSURE, SLOT, RANGE, and FRU. The variables are changed to a NOT SET condition.

Example

```
VADIAG> unsetvars

ArrayIndex:   0
TestDevice:   NOT SET
LoopPair:     NOT SET
EnclosureID:  NOT SET
Slot:         NOT SET
Range:        NOT SET
FRU:          NOT SET
```

UTILINFO

Utility Information.

Syntax

utilinfo

Description

This command describes how to run VADIAG in some scenarios.

Example

```
VADIAG> utilinfo
```

WRTMT

Performs a write/read test.

Syntax

wrtmt

Description

This command performs a write-then-read test on the selected disk. It is designed to test only internal disks and not the array itself. Use either the **enclosure**, **looppair**, and **slot** commands or the **fru** command to select the disk for testing. Pressing either Ctrl-c or Ctrl-y causes the test to abort.

WARNING! This is a destructive command and can cause data loss.

Example

To execute a test on disk 2 in the main enclosure:

```
VADIAG> fru m/d2
VADIAG> wrtmt
```