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# 15 EMC PowerPath Powermt Command Examples – Display, Check, Remove, Config, Restore

by Ramesh Natarajan on October 19, 2010

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If your server has two HBA cards connected to EMC SAN storage device, you can implement load-balancing, and fail-over on the HBA cards using the **EMC PowerPath** software.

**Powermt** management utility helps you manage I/O paths from the server to the EMC storage device. In this article, let us discuss how to use powermt command with practical examples.

## 1. powermt display – Display High Level HBA I/O Paths

powermt display command (without any arguments), displays the available HBAs and their current status. The following examples, shows that there are 2 HBAs connected to the server, both the HBAs are in active condition with 2 I/O path's each. qla2xxx indicates that it is using the Q-Logic HBA card.

This also indicates that the connected EMC device is CLARiiON, as it displays a value for “CLARiiON logical device count” as 1.

```
# powermt display
Symmetrix logical device count=0
CLARiiON logical device count=1
Hitachi logical device count=0
Invista logical device count=0
HP xp logical device count=0
Ess logical device count=0
HP HSx logical device count=0
=====
----- Host Bus Adapters -----   ----- I/O Paths -----   ----- Stats -----
###  HW Path                          Summary   Total    Dead   IO/Sec  Q-IOs  Errors
=====
    1  qla2xxx                          optimal   2        0      -       0       0
    2  qla2xxx                          optimal   2        0      -       0       0
```

## 2. powermt display dev=all – Display All Attached LUNs

This is the most frequently used powermt command, which will display all the attached logical devices to the server.

```
# powermt display dev=all
Pseudo name=emcpowera
CLARiiON ID=AAA00000000000 [dev-server]
Logical device ID=1111111111111111 [LUN 1]
state=alive; policy=CLAROpt; priority=0; queued-IOS=0
Owner: default=SP B, current=SP B      Array failover mode: 1
=====
----- Host ----- - Stor - -- I/O Path - -- Stats ---
### HW Path          I/O Paths   Interf.   Mode    State  Q-IOS  Errors
=====
    1 qla2xxx          sdd       SP A4    active  alive   0      0
    1 qla2xxx          sde       SP B4    active  alive   0      0
    2 qla2xxx          sdf       SP A5    active  alive   0      0
    2 qla2xxx          sdg       SP B5    active  alive   0      0
Pseudo name=emcpowerb
CLARiiON ID=AAA00000000000 [dev-server]
Logical device ID=2111111111111111 [LUN 2]
state=alive; policy=CLAROpt; priority=0; queued-IOS=0
Owner: default=SP A, current=SP A      Array failover mode: 1
=====
----- Host ----- - Stor - -- I/O Path - -- Stats ---
### HW Path          I/O Paths   Interf.   Mode    State  Q-IOS  Errors
=====
    1 qla2xxx          sdh       SP A4    active  alive   0      0
    1 qla2xxx          sdi       SP B4    active  alive   0      0
    2 qla2xxx          sdj       SP A5    active  alive   0      0
    2 qla2xxx          sdk       SP B5    active  alive   0      0
```

The above indicates that there are two LUNs attached to the dev-server with 4 I/O paths from the server to the SAN storage device.



The above command output indicates the following:

- **Pseudo name=emcpowera** – The device name that can be used by the server. For example, /dev/emcpowera.
- **CLARiiON ID=AAA00000000000 [dev-server]** - EMC CLARiiON CX3 serial number and the server name.
- **Logical device ID=1111111 [LUN 1]** – LUN number. For example, LUN 1.
- **state=alive; policy=CLAROpt;** – This displays that this particular LUN is valid and using the CLAROpt policy.
- **Owner: default=SP B, current=SP B** – This indicates that the default (and current) owner for this LUN is storage processor SP B.

### 3. powermt display dev=emcpowera – Display specific LUN

When there are multiple LUNs connected to a server, you might want to view information about a specific LUN by providing the logical name of the LUN as shown below.

```
# powermt display dev=emcpowera
Pseudo name=emcpowera
CLARiiON ID=AAA00000000000 [dev-server]
Logical device ID=1111111111111111 [LUN 1]
state=alive; policy=CLAROpt; priority=0; queued-IOs=0
Owner: default=SP B, current=SP B      Array failover mode: 1
=====
----- Host ----- - Stor - -- I/O Path - -- Stats ---
### HW Path          I/O Paths  Interf.  Mode   State  Q-IOs  Errors
=====
  1 qla2xxx          sdd      SP A4   active alive    0      0
  1 qla2xxx          sde      SP B4   active alive    0      0
  2 qla2xxx          sdf      SP A5   active alive    0      0
  2 qla2xxx          sdg      SP B5   active alive    0      0
```

If the device is not available, you'll get a "Bad dev value" as shown below.

```
# powermt display dev=emcpowerc
Bad dev value emcpowerc, or not under Powerpath control.
```

#### 4. powermt check\_registration – Display PowerPath Registration Key / Status

If you've lost the PowerPath registration key that you've used during the [EMC PowerPath installation](#), you can retrieve it using the following command.

```
# powermt check_registration
Key AAAA-BBBB-CCCC-DDDD-EEEE-FFFF
  Product: PowerPath
  Capabilities: All
```

#### 5. powermt display options – Display EMC PowerPath Options

Displays the high level EMC SAN array options as shown below.

```
# powermt display options
  Default storage system class: all
  Show CLARiiON LUN names:      true
  Path Latency Monitor: Off
  Path Latency Threshold: 0 Sec.
  Storage
  System Class  Attributes
  -----
  Symmetrix    periodic autorestore = on
               status = managed
  CLARiiON     periodic autorestore = on
               status = managed
  Hitachi      periodic autorestore = on
               status = managed
  Invista      periodic autorestore = on
               status = managed
  HP xp        periodic autorestore = on
               status = managed
  Ess          periodic autorestore = on
               status = managed
  HP HSx       periodic autorestore = on
               status = managed
```

#### 6. powermt display hba\_mode – Display PowerPath HBA Mode

This is similar to #1, but displays whether hba is enabled or not, as shown in the last column of the output.

```
# powermt display hba_mode
Symmetrix logical device count=0
CLARiiON logical device count=1
Hitachi logical device count=0
Invista logical device count=0
HP xp logical device count=0
Ess logical device count=0
HP HSx logical device count=0
```

```

=====
----- Host Bus Adapters ----- I/O Paths ----- Stats
### HW Path Summary Total Dead Q-IOs Mode
=====
    1 qla2xxx          optimal          2          0          0 Enabled
    2 qla2xxx          optimal          2          0          0 Enabled
=====

```

## 7. powermt display path – Display available I/O Paths.

This displays all available path for your SAN device.

```

# powermt display paths
Symmetrix logical device count=0
=====
----- Host Bus Adapters ----- Storage System ----- - I/O Paths -
### HW Path ID Interface Total Dead
=====
CLARiiON logical device count=1
=====
----- Host Bus Adapters ----- Storage System ----- - I/O Paths -
### HW Path ID Interface Total Dead
=====
    1 qla2xxx          AAA000000000000    SP A4          1          0
    1 qla2xxx          AAA000000000000    SP B4          1          0
    2 qla2xxx          AAA000000000000    SP A5          1          0
    2 qla2xxx          AAA000000000000    SP B5          1          0
Hitachi logical device count=0
=====
----- Host Bus Adapters ----- Storage System ----- - I/O Paths -
### HW Path ID Interface Total Dead
=====
Invista logical device count=0
=====
----- Host Bus Adapters ----- Storage System ----- - I/O Paths -
### HW Path ID Interface Total Dead
=====
HP xp logical device count=0
=====
----- Host Bus Adapters ----- Storage System ----- - I/O Paths -
### HW Path ID Interface Total Dead
=====
Ess logical device count=0
=====
----- Host Bus Adapters ----- Storage System ----- - I/O Paths -
### HW Path ID Interface Total Dead
=====
HP HSx logical device count=0
=====
----- Host Bus Adapters ----- Storage System ----- - I/O Paths -
### HW Path ID Interface Total Dead
=====

```

## 8. powermt displays port\_mode – Display Port Status

Displays the status of the individual ports on the HBA. i.e Whether the port is enabled or not.

```

# powermt display port_mode
Storage class = Symmetrix
=====
----- Storage System ----- -- I/O Paths -- --- Stats ---
ID Interface Wt_Q Total Dead Q-IOs Mode
=====
Storage class = CLARiiON
=====
----- Storage System ----- -- I/O Paths -- --- Stats ---
ID Interface Wt_Q Total Dead Q-IOs Mode
=====
AAA000000000000    SP A4          256          1          0          0 Enabled
AAA000000000000    SP B4          256          1          0          0 Enabled
AAA000000000000    SP A5          256          1          0          0 Enabled
AAA000000000000    SP B5          256          1          0          0 Enabled
=====

```

## 9. powermt version – Display EMC PowerPath Version

How to identify the version number of EMC PowerPath software?

```
# powermt version
EMC powermt for PowerPath (c) Version 5.3 (build 185)
```

## 10. powermt check – Check the I/O Paths

If you have made changes to the HBA's, or I/O paths, just execute powermt check, to take appropriate action. For example, if you have manually removed an I/O path, check command will detect a dead path and remove it from the EMC path list.

```
# powermt check
Warning: storage_system I/O path path_name is dead.
Do you want to remove it (y/n/a/q)?
```

Note: If you want powermt to automatically remove all dead paths, without any confirmation, execute “powermt check force”.

## 11. powermt set mode hba – Forcefully set the mode for a specific HBA

You can change the mode of a specific HBA to either standby or active using this command. Following example, changes HBA #1's mode from active to standby.

```
# powermt set mode=standby hba=1
```

After the above command, you can see the mode for HBA#1 changed to standby, as shown below.

```
# powermt display dev=all
Pseudo name=emcpowera
CLARiiON ID=AAA00000000000 [dev-server]
Logical device ID=1111111111111111 [LUN 1]
state=alive; policy=CLAROpt; priority=0; queued-IOs=0
Owner: default=SP B, current=SP B      Array failover mode: 1
=====
----- Host ----- - Stor - -- I/O Path - -- Stats ---
### HW Path          I/O Paths  Interf.  Mode   State  Q-IOs Errors
=====
  1 qla2xxx           sdd      SP A4   standby alive  0      0
  1 qla2xxx           sde      SP B4   standby alive  0      0
  2 qla2xxx           sdf      SP A5   active  alive  0      0
  2 qla2xxx           sdg      SP B5   active  alive  0      0
```

**Note:** Path mode can also be “unlic” indicating that you’ve not registered the PowerPath with proper License key.

**Note:** Some powermt commands (for example, powermt set port\_disable), is restricted to certain platform and storage type — On AIX and Solaris, only Fibre channel is supported. On HP-UX, only iSCSI and Fibre are supported. On Linux, Only iSCSI (HBAs) and Fibre are supported.

## 12. powermt remove – Delete an I/O Path

Use this command to remove any specific I/O path (or) a whole device.

The following example has 4 I/O Paths.

```
# powermt display dev=all
=====
----- Host ----- - Stor - -- I/O Path - -- Stats ---
### HW Path          I/O Paths  Interf.  Mode   State  Q-IOs Errors
=====
  1 qla2xxx           sdd      SP A4   standby alive  0      0
  1 qla2xxx           sde      SP B4   standby alive  0      0
  2 qla2xxx           sdf      SP A5   active  alive  0      0
```

```
2 qla2xxx          sdg          SP B5          active  alive          0          0
```

To remove I/O Path `sdd`, execute the following `powermt remove` command.

```
# powermt remove dev=sdd

# powermt display dev=all
=====
----- Host ----- - Stor - -- I/O Path - -- Stats ---
### HW Path          I/O Paths  Interf.  Mode   State  Q-IOs  Errors
=====
  1 qla2xxx          sde       SP B4    standby alive    0       0
  2 qla2xxx          sdf       SP A5    active  alive    0       0
  2 qla2xxx          sdg       SP B5    active  alive    0       0
```

Following will remove all I/O Path for a particular device. i.e To remove `/dev/emcpowera`, do the following. If the `/dev/emcpowera` is mounted and used by some program, following command will not work.

```
# powermt remove dev=emcpowera
```

### 13. powermt config – Configure PowerPath

This command checks for available EMC SAN logical devices and add those to PowerPath configuration list. `Powermt config` command, sets some of the options to it's default values. For example, write `throttling = off`, `HBA mode = active`, `CLARiiON policy = CLAROpt`, etc.

Possible EMC SAN LUN policy values are: `Adaptive`, `BasicFailover`, `CLAROpt`, `LeastBlocks`, `LeastIos`, `NoRedirect`, `Request`, `RoundRobin`, `StreamIO`, or `SymmOpt`.

After you execute the `powermt config`, if you don't like any of the default values, you should change it accordingly.

```
# powermt config
```

### 14. powermt restore – Make Dead I/O Path Alive

If you have dead I/O paths, and if you've done something to fix the issue, you can request PowerPath to re-check the paths and mark it as active using `powermt restore` command.

When you execute `powermt restore`, it does an I/O path check. If a previously dead path is alive, it will be marked as alive, and if a previously alive path is dead, it will be marked as dead.

For some reason, if you see the default owner and the current owner of a particular LUN is not the same storage processor, then execute the following command, which will make the current owner of the LUN same as the default owner.

```
# powermt restore dev=all
```

Instead of `dev`, you can also specify class in the `powermt restore` command. Class can be one of the following depending on your system.

- `symm` – Symmetrix
- `clariion` - CLARiiON
- `invista` – Invista
- `ess` – IBM ESS
- `hitachi` – Hitachi Lightning TagmaStore
- `hpxp` - HP StorageWorks XP, or EVA series
- `hphsx` – HP StorageWorks EMA, or MA
- `all` – All systems

### 15. Powermt Save and Load – Save and Restore PowerPath Configurations

## powermt save – Save the current Powerpath Configuration

If you are changing the PowerPath configurations for testing purpose, you can save the current configuration using powermt save command.

Use this method to backup the current PowerPath Configurations.

```
# powermt save
```

This will save the current powermt configuration to /etc/powermt.custom file. Following is the partial content of this file.

```
# cat /etc/powermt.custom
global:version:5.3.0.0.0:4.1.0
path_c:sdd:sdd:qla2xxx:0x111
path_c:sde:sde:qla2xxx:0x111
adapter: 1: 1:qla2xxx:0x111:1:0:111:0:111:0
adapter: 2: 2:qla2xxx:0x111:1:0:111:0:111:0
arrPort_c:04000000:04000000:111:111
mpext_cfg:unused:Mp:0:symm:0:0
...
...
```

If you want to store the current PowerPath configuration to a different file, do the following.

```
# powermt save file=/etc/powermt.21-Aug-2010
```

## powermt load – Load a previously saved EMC PowerPath Configuration

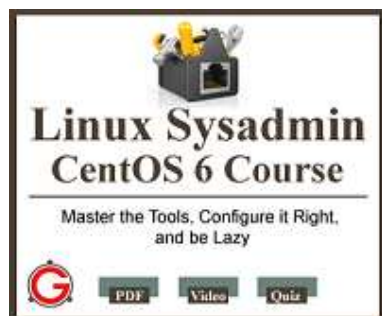
When you are testing EMC PowerPath configuration, if you are not satisfied with the new configuration, you can go back to the previous configuration.

For example, to restore the configuration to a specific file that you created in the above powermt save example, do the following.

```
# powermt load file=/etc/powermt.21-Aug-2010
```



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[1](#) Yogesh Upadhyay October 19, 2010 at 4:05 am

Gr888.....Thanks a Lot .....keep it Up

Plz provide some powerpath configuration for linux

[2](#) Henry Hall October 20, 2010 at 7:19 am

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[3](#) mahadevan November 20, 2010 at 4:48 am

Hi, Thanks a lot....

[4](#) Kiran Kumar December 14, 2010 at 6:24 am

Hi Ramesh,

How are you doing ? I had been following your articles some months before when i was only working on Linux and left following your articles quite some time. But guess what now i am into storage and when i searched for powerpath, i have been brought to your website again for Storage ??? Wow!!!! you are a kind of man who holds all the information about the Technology no matters what it is.....

Thanks for the Post,  
Kiran

[5](#) Ahmed Shahzad February 14, 2011 at 2:28 pm

It was really helpful keep the good work up and running .  
If i have a specific question abt. powermt can I email you.

thanks

[6](#) Alex Reyes February 17, 2011 at 12:00 pm

hi, it was very helpful.



How can I get the WWNs with Clarion EMC?

Thanks a lot

[7](#) srinivas September 29, 2011 at 1:19 am

how can i get those commands in a pdf format?

[8](#) ken October 18, 2011 at 12:10 pm

Thanks for excellent cheat sheet.

In past I had used Veritas DMP but never used EMCpowerpath before and your page makes me expert.!!!

Now I can update my resume !!

[9](#) chidanand November 20, 2011 at 6:29 am

Hi Ramesh,

Thanks For giving Such A great Things and Info Thank you very much and i want more commands which are used in storage and TSM backup commands.. please send to my mail Id

[10](#) Vishal Singh March 19, 2012 at 9:00 am

Thanks for giving such a beautiful article.....

[11](#) DineshD March 25, 2012 at 4:48 am

very useful and knowledgeable

[12](#) MY May 23, 2012 at 4:19 am

Thanks for this, understand that the CLARiiON always come with the server name. I noticed that the Symmetrix doesn't have this features. Is there anyway we can have the servername printed on the same level of powermt command?

[13](#) Rikalv07 October 20, 2012 at 7:16 pm

Ramesh,

We were working on a migration needing to track the errors being shown using the powermt config command. As we resolved the cabling issue, is there a way to reset the error counts that are shown from the powermt config output?

[14](#) Sanjiv Shiraguppi January 15, 2013 at 2:00 am

This article explains more points for me on powerpath.

Excellent.

Thanks.....

Sanjiv Shiraguppi

[15](#) Darshan March 8, 2013 at 7:38 am

Awesome

[16](#) Lee June 17, 2013 at 3:39 am

Does the “powermt check” command also clear historical errors?

[17](#) Aks June 26, 2013 at 11:16 pm

Really appreciate your efforts in giving such a detailed explanation...Hats off..

[18](#) abdul March 2, 2014 at 4:17 am

Excellent,

I have question, how to clear the historic errors. for now, we are rebooting the node. Is there any command to clear ?

[19](#) Abc April 18, 2014 at 12:53 am

HI!

“powermt restore” command will clear error counters!! 😊

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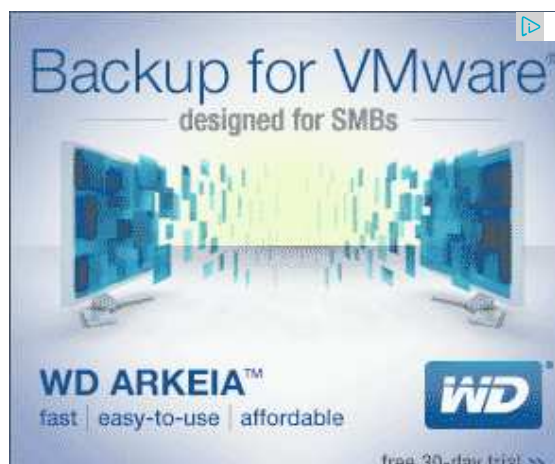
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Ramesh Natarajan



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