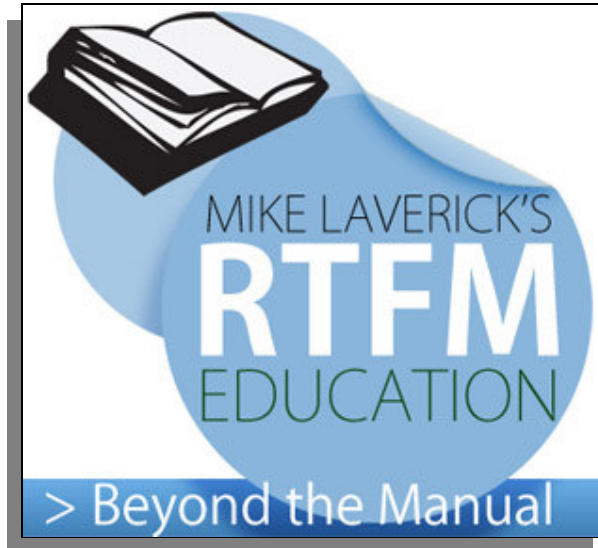


White Paper:

Third Party PSPs – EMC Power Path for VMware

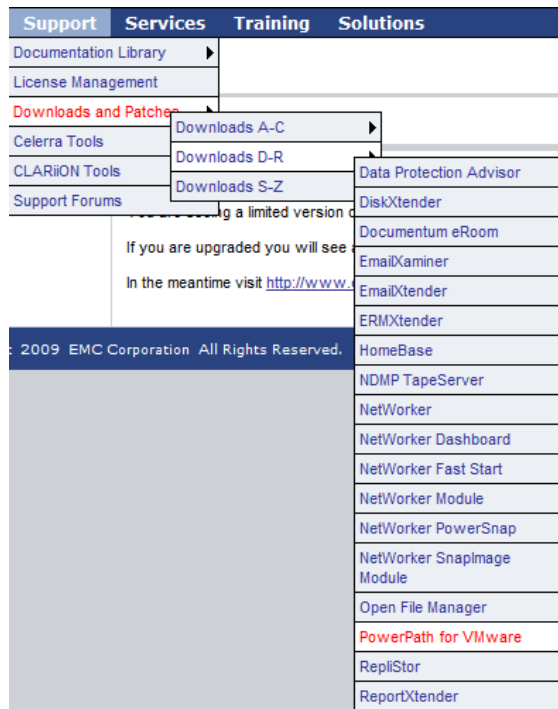
Document Version: 1.1



Many vendors have responded positively to VMware creating a Pluggable Storage Architecture (PSA) by developing their own Path Selection Plug-ins (PSP). These PSPs can be downloaded from the storage vendors website, and extend the capabilities of your ESX host to include advanced multipathing and load-balancing feature. Generally, these PSP are not for free and will require a license to function correctly. As an example VMware has allowed their PowerPath technology to be available to VMware ESX. I want to use EMC's PowerPath for VMware as an example. Begin first by downloading the PSP file. However, after the installation you will have to carry out a reboot of the ESX host, so you may as well begin with putting the ESX host into maintenance mode.

Install EMC PowerPath for VMware

1. Login or register for an EMC PowerLink account at <https://powerlink.emc.com>
2. Once logged in to EMC Power Link navigate to **Support >> Downloads and Patches >> Downloads D-R** and select **PowerPath for VMware**



3. Next download the **PowerPath/VE N.N.0 for VMware vSphere** and the **PowerPath/VE N.N.0 Rtools for Windows(32bit)** if you carry out your management via Windows or **PowerPath/VE N.N.0 Rtools for RHEL5(64bit)** if you carry out your management from Redhat Linux

There are number of ways of then uploading and installing the PowerPath/VE N.N.0 for VMware vSphere to the ESX host. A method that works for both ESX4 "Classic" and ESX4i is the vhostupdate utility – which is available in the VMware vSphere4 Remote CLI or VMware Management Assist. Both offer a "remote" CLI interface to the ESX host. You can use the

vihostupdate –query to inspect the ESX host to see if additional plug-ins have already been restored with the command:

vihostupdate.pl --query --server esx1.vi4book.com

```
-----Bulletin ID-----      -----Installed-----      -----Summary-----
EMC-PP5.4.0.00.00-b257      2009-07-13T12:49:28      PowerPath for ESX
```

To upload and install the bundle:

vihostupdate.pl --server esx1.vi4book.com --install --bundle=C:\EMCPower.VMWARE.N.N.b257.zip

If for whatever reason you need to late uninstall the bulletin this can be achieved with

vihostupdate.pl --remove --bulletin EMC-PP5.N.N.NN.NN-bNNN --server esx1.vi4book.com

4. After the install **claim a maintenance window on the ESX host and reboot it**. After the reboot you should see that the LUNs that support PowerPath will be listed as being “owned” by PowerPath:

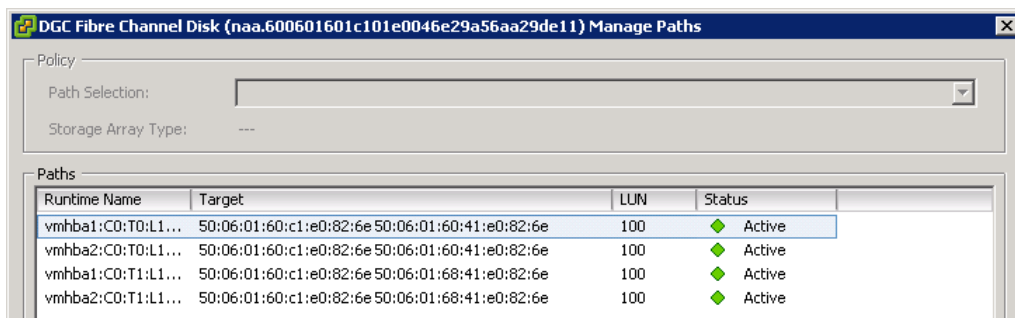
Details

vmhba1
 Model: ISP2312-based 2Gb Fibre Channel to PCI-X HBA
 WWN: 20:00:00:e0:8b:85:2e:54 21:00:00:e0:8b:85:2e:54
 Targets: 11 Devices: 16 Paths: 23

View: Devices Paths

Name	Runtime Name	LUN	Type	Transport	Capacity	Owner
DGC Fibre Channel Disk (naa.6006...	vmhba1:C0:T0:L1...	100	disk	Fibre Channel	50.00 GB	PowerPath
DGC Fibre Channel Disk (naa.6006...	vmhba1:C0:T0:L1	1	disk	Fibre Channel	50.00 GB	PowerPath
DGC Fibre Channel Disk (naa.6006...	vmhba1:C0:T0:L2	2	disk	Fibre Channel	100.00 G	PowerPath
DGC Fibre Channel Disk (naa.6006...	vmhba1:C0:T0:L3	3	disk	Fibre Channel	50.00 GB	PowerPath
DGC Fibre Channel Disk (naa.6006...	vmhba1:C0:T0:L50	50	disk	Fibre Channel	200.00 G	PowerPath
DGC Fibre Channel Disk (naa.6006...	vmhba1:C0:T0:L51	51	disk	Fibre Channel	70.00 GB	PowerPath
SEAGATE Fibre Channel Disk (naa....	vmhba1:C0:T4:L0	0	disk	Fibre Channel	33.92 GB	NMP
SEAGATE Fibre Channel Disk (naa....	vmhba1:C0:T9:L0	0	disk	Fibre Channel	33.92 GB	NMP
SEAGATE Fibre Channel Disk (naa....	vmhba1:C0:T3:L0	0	disk	Fibre Channel	33.92 GB	NMP

Additionally, in the Multipathing dialog boxes you will be able to see that all the paths are marked as being Active/Active:



If an EMC partner you can request licenses using the licensekeys@emc.com email address, alternatively if you a customer speak to your EMC representative to request a 45-day trial. After which time you can decide if you want to purchase the product

After installing the PowerPath bundle to the ESX host, install the EMC RTOOLS. We need to do this so we can find out the unique identifier that is created by PowerPath for each ESX host. This unique identify is used to license the product to receive all the features and benefits of PowerPath. The method below is “unserved” licensing where the license files are merely attached to the correct ESX hosts using the rpowermt utility

5. After installing EMC RTOOLS, open a Microsoft Command Prompt and type this command:

rpowermt host=esx1.vi4book.com check_registration

The first time you run this command you will be asked to set a “lockbox” passphrase. This uses an encrypted file (lockedbox.clb) to hold all the credentials for the ESX hosts. This passphrase must have a least 8 characters, use upper and lowercase, a numeric and special character.

PowerPath License Information:

Host ID : 4a5b1736-b958-589c-c19b-0015600ea5b
Type : n/a
State : unlicensed
Days until expiration : 0

Repeat this step for each ESX host making a note of the Host ID and the FQDN of your server. When the license files are sent to you copy them to the same location as the lockedbox.clb file in my case:

C:\Documents and Settings\Administrator\My Documents\EMC\PowerPath\rpowermt

The licenses should have .lic extension, in my case the licenses files actually had .txt extension, so I had to rename them. Once the files have been copied to this location you can use the rpowermt utility to register or license each ESX host:

rpowermt host=esx4.vi4book.com register

If you are looking for more information the rpowermnt command then you should look for the “EMC PowerPath/VE Version 5.4 for VMware vSphere - Installation and Administration Guide” (P/N 300-008-703) and the “EMC PowerPath/VE Version 5.4 for VMware vSphere - Licensing Guide” (P/N 300-009-188) which is available from EMCs PowerLink website.

The rpowermt utility from EMC can be used to view and modify the configuration of PowerPath. Below are some sample commands as example of what you can do:

List HBA Paths to the Array:

rpowermt host=esx1.vi4book.com display paths

Below you can see a report from my EMC Clarrion Array with two HBA's plugged into two different fibre-channel switches, giving the four paths in total that one would normally see to each controller (or Storage Processor) on the array (A0, B0, A0, B0).

```
CLARiiON logical device count=6
=====
----- Host Bus Adapters ----- Storage System ----- I/O Paths -----
### HW Path ID Interface Total Dead
=====
1 vmhba2 CK200073400479 SP A0 6 0
1 vmhba2 CK200073400479 SP B0 6 0
2 vmhba1 CK200073400479 SP A0 6 0
2 vmhba1 CK200073400479 SP B0 6 0
=====
```

List LUNS (devices) visible to the ESX Host and Owned by PowerPath

rpowermt host=esx1.vi4book.com display dev=all | more

Below you can see the ESX host LUN is granted to the server by virtue of being in a Storage Group called "SanFran Cluster". You can also see its universally unique NNA name together with the friendly name of the LUN "LUN_50_200GB_TEMPLATES". Finally, you can see that currently "SPA" owns the LUN

```
Pseudo name=emcpower4
CLARiiON ID=CK200073400479 [SanFran_Cluster]
Standard UID=naa.600601601c101e005c4b58e5c5ade11 [LUN_50_200GB_TEMPLATES]
state=alive; policy=CLAROpt; priority=0; queued-I/Os=0
Owner: default=SP A, current=SP A Array failover mode: 1
=====
### HW Path Host I/O Paths Stor Interf. I/O Path Mode State Q-I/Os Stats Errors
=====
2 vmhba1 C0:T1:L50 SP B0 active alive 0 0
2 vmhba1 C0:T0:L50 SP A0 active alive 0 0
1 vmhba2 C0:T1:L50 SP B0 active alive 0 0
1 vmhba2 C0:T0:L50 SP A0 active alive 0 0
=====
```