



EMC[®] PowerPath[®] Virtual Appliance

Version 2.0.1

Installation and Configuration Guide

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03

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Revision history

The following table presents the revision history of this document.

Table 1 Revision history

Revision	Date	Description
02	October 2015	Version 2.0 SP 1 (2.0.1)
01	March 2015	First release of the product.

CHAPTER 1

Deploying the Virtual Appliance

This section contains the following topics:

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Deploy the EMC PowerPath Virtual Appliance

Deploy the EMC PowerPath Virtual Appliance from an OVA file using a VMware vSphere client/WebClient.

Before you begin

- Download the EMC PowerPath Virtual Appliance New Deployment file from EMC Online Support. This package contains the OVA file.

Note

Depending on user settings such as browser updates and other factors not related to PowerPath/VE, some internet browsers might not download the EMC PowerPath Virtual Appliance OVA file correctly. If that occurs, try downloading the OVA file with a different internet browser or check the browser settings.

- Details of the VMware vCenter server where you are installing the virtual appliance.
- Details of the Datastore you can use for installation.
- Details of the local area network (LAN) shared by your VMware vSphere servers, to minimize deployment time. Deployment time should take approximately 5 to 15 minutes. Installation across a WAN could take 2 hours or more.
- For IPv4 and IPv6: Static IP address to assign to your appliance. This should be the same unique IP address specified in the served license file. Fully qualified server name; this should be the same Server name specified in the served license file. Gateway. Netmask (IPv4 only). Prefix length (IPv6 only). DNS servers
- NTP (time) server IP address
- Password you want to assign to the virtual appliance

Procedure

1. Open vSphere client and connect to the vCenter server managing your VMware environment.
2. Navigate to **File > Deploy OVF Template**.
By design, the vSphere client lists the option of deploying the OVF template. However, the EMC PowerPath Virtual Appliance deploys an OVA template.
3. In Source, browse to the location of your OVA file.
4. Click **Next**.
5. Review the details of the loaded OVA file in **OVF Details** and then click **Next**.
6. Review the End User License Agreement. Click **Accept** and then **Next** to continue.
7. In **Name and Location**:
 - a. Type Name: (EMC PowerPath Virtual Appliance VM) can be anything, no restrictions.
 - b. Specify an Inventory Location for the appliance within your VMware environment.
 - c. Click **Next**.
8. Select a host or cluster where the appliance will run and then click **Next**.
9. Select a resource pool associated with the host or cluster where the appliance will run and then click **Next**.

This step is necessary only if a resource pool has been predefined.

10. Select a destination network and then click **Next**.

The selected destination network must have an IP Pool associated with it.

11. Select the virtual disk format, and then click **Next**.

The Datastore and Available space (GB) fields are automatically populated.

12. In IP Address Allocation:

- a. Under **Choose the IP allocation policy to use**, select **Fixed**.
- b. Select the internet protocol: IPv4 or IPv6.
- c. Click **Next**.

13. In Properties:

- a. Set the fully qualified host name of the appliance.

For example,

```
myHost.emc.com
```

You cannot change the hostname of the appliance after deployment. If you have to change the hostname, delete the appliance and redeploy it with the new hostname. If you need to change the hostname for a longer running appliance, the preferred method is to set up an alias in your domain name server (DNS) to resolve the appliance hostname.

- b. (Optional) Set a space-separated list of domains used in the network.

For example,

```
emc.com myhostname.emc.com
```

- c. Set the name or IP address of an NTP server to use for synchronizing the appliance date and time.

For example,

```
pool.ntp.org
```

- d. Set the time zone of the appliance. For example, US/Eastern.
- e. Set appliance Linux “root” password to the password for the root user of the appliance.

This password is used to log into the console in the vSphere Client or to SSH into the appliance. This password is stored in clear text.
- f. For IPv4 and IPv6, set a static IP address for the appliance, netmask applied to IP addresses (IPv4 only), prefix length (IPv6 only), gateway IP address for hosts in the network, and set a comma-separated list of domain name servers (DNS) available in the network.

The static IP address for the appliance should be the unique IP address specified in the served license file. To change the IP address of the appliance after deployment, re-deploy the appliance.

An example of a comma-separated list of domain name servers (DNS) is as follows.

```
192.168.0.1, 192.168.0.2
```

You must independently register the hostname for your appliance with your domain name servers (DNS). The appliance does not validate hostnames.

Hostnames not registered with the corresponding DNS may prevent normal operation.

g. Click **Next**.

14. In **Ready to Complete**, verify the list of properties for the appliance and then click **Power On after Deployment**.

15. Click **Finish**.

A status bar appears in the VMware vSphere client/WebClient showing the deployment progress.

16. After deployment is complete, click **Close**.

After you finish

Use one of the following methods to verify if the deployment is successfully completed.

- Launch a browser and point to `https://host_name`, where *host_name* is the FQDN of the Appliance Virtual Machine or its IP address.
- Log into the virtual appliance. Check if the Tomcat server is running.

```
# /etc/init.d/tomcat7 status
```

Reconfigure the EMC PowerPath Virtual Appliance

You can use vCenter to reconfigure the appliance properties.

Procedure

1. Open vSphere client, and connect to the vCenter server managing your VMware environment.
2. Right-click the appliance name and then select **Power Off**.
3. Right-click the appliance and then select **Edit Settings**.
4. In Virtual Machine Properties, select the **Options** tab.
5. Select **Properties**.
6. Change the properties in the right-hand side of the window and then click **OK**.
7. Right-click the appliance name and then select **Power On**.

Starting the appliance

Start the appliance using vSphere client after deployment. The appliance may take few minutes to start for the first time depending on the environment. You can monitor the progress on the vSphere console.

Procedure

1. In the vSphere Client, right-click the appliance name.
2. Select **Power > Power On**.

The status appears in the **Recent Tasks** bar.

Verifying the appliance deployment

After deploying the appliance, verify that it is working.

Procedure

1. In the vSphere client, navigate to the **VMs and Templates** view.
2. From the configured resource pool, find the resource pool you selected for the appliance.
The new appliance is listed under the resource pool.
3. In the console, log in to the appliance with the credentials you defined during the deployment.
4. Verify the services.

CHAPTER 2

Configuring the Virtual Appliance

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Log into the appliance using SSH

Access the appliance from your local machine using SSH to view and manage the applications, such as RTOOLS and the PowerPath/VE Electronic License Manager System (ELMS), that are automatically deployed using the virtual appliance.

Procedure

1. From your local machine, connect through SSH to the virtual machine that you have deployed.
2. Log into SSH as root.
3. Type the username and password that you set up when you created the virtual appliance.

Change the PowerPath Virtual Appliance password

Using SSH or vSphere client, you can change the appliance password.

For security reasons, you should change this password after you first deploy the appliance. Make note of the new password.

Procedure

- In the PowerPath Virtual Appliance web console, navigate to **Security > Change Password**.
- Using the CLI:
 - a. Login as the root user to Linux guest OS.
 - b. Type **passwd**
 - c. Press **Enter**.
 - d. Type a new password and confirm it.

Add a PowerPath host

Add a PowerPath for AIX, HP-UX, Linux, Solaris, or Windows host to EMC PowerPath Virtual Appliance for license reporting and PowerPath host monitoring.

PowerPath hosts can be also added from PowerPath Monitor tab. For more information refer to [Monitor PowerPath hosts on page 23](#).

Procedure

1. Navigate to **Inventory > PowerPath Hosts**.
2. Click **Add Host**.
3. Perform one of the following steps:
 - Discover the host by hostname or IP address.
 - Discover the host by an IP range.
 - Import PowerPath Viewer connections list.
4. Click **OK**.

Add a VMware vCenter server

Add a VMware vCenter server to EMC PowerPath Virtual Appliance for license deployment and PowerPath monitoring.

Before you begin

In order to discover vCenter, your vCenter user must contain the following privileges. The user should have the privileges from the vCenter level to the corresponding managed hosts.

Note

You can also use the PowerPath Monitor context menu to add a VMware vCenter server.

In the vCenter UI, perform one of the following steps:

Note

If the privileges were set after adding the vCenter to EMC PowerPath Virtual Appliance then wait for the next vCenter poll interval or remove the vCenter from EMC PowerPath Virtual Appliance and then add it back.

- Grant Administrator privilege to the requested user.
- Add a new role with below privileges to the requested user:
 - **Validate session** found under **Sessions**
 - **View and stop sessions** found under **Sessions**
 - **CIM interaction** found under **Host > CIM**
 - **Change settings** found under **Host > Configuration**

Procedure

1. Navigate to **Inventory > vCenter Servers**.
2. Click **Add vCenter**.
3. Type the host name or IP address of the VMware vCenter server.
4. Type the port to the VMware vCenter server or use the default port of 443.
5. Type a username and password of the user with the above-mentioned privileges, and then click **OK**.
6. Select the Register plugin checkbox to register EMC PowerPath Virtual Appliance vCenter plugin.

Refer to [Registering and enabling a vCenter Plugin on page 19](#).

Edit VMware vCenter user credentials

If VMware vCenter user credentials changed, update the credentials with the following procedure.

Note

You can also use the [PowerPath Monitor on page 23](#) context menu to edit VMware vCenter user credentials.

Procedure

1. Navigate to **Inventory > vCenter Servers**.
2. Select the VMware vCenter for which you want to change the credentials.
3. Click **Edit Credentials**.
4. Change the username or password, or both, and then click **OK**.
5. Select the **Register plugin** checkbox to register the PowerPath Virtual Appliance vCenter plugin.
Refer to [Registering and enabling a vCenter plugin](#) for more information.
6. Click **OK**.

Remove a VMware vCenter server

Remove a disconnected VMware vCenter server.

Procedure

1. Navigate to **Inventory > vCenter Servers**.
2. Select the VMware vCenter server that you want to remove and then select **Remove**.
3. Click **OK**.

Results

The PowerPath/VE hosts are removed from the EMC PowerPath Virtual Appliance but remain licensed.

Note

When a VMware vCenter server is removed from the virtual appliance, the PowerPath/VE licenses for the ESXi hosts managed by that VMware vCenter server are not removed. The trial licenses applied to any of PowerPath/VE hosts remain continue to be valid. However, the number is reflected in **PowerPath Licenses > Summary**.

Note

You can also use the [PowerPath Monitor on page 23](#) context menu to remove a VMware vCenter server.

Change the interval at which to poll the PowerPath/VE hosts

Use this procedure to change the interval at which PowerPath Virtual Appliance polls the ESXi hosts for changes.

This procedure applies to PowerPath/VE for VMware ESXi hosts only.

Note

If more than 100 PowerPath hosts are added to Virtual Appliance, you should increase default polling interval. For a large configuration, polling interval should be set to 4 hours.

Procedure

1. Navigate to **System > Settings**.

2. Use the slider to change the poll interval.

You can select from 10 minutes to 4 hours. The default is 30 minutes.

Setup RabbitMQ messaging over AMQP

Use the following procedure to setup RabbitMQ messaging over AMQP.

EMC PowerPath Virtual Appliance collects events from PowerPath hosts and sends them to the message queue provided by RabbitMQ. RabbitMQ is enabled by default in EMC PowerPath Virtual Appliance.

Procedure

1. In the PowerPath Virtual Appliance web console, navigate to **Security** > **RabbitMQ** to add the credentials for the RabbitMQ queue.

You can test the RabbitMQ connection with the new user by adding a message and clicking **Send**.

2. Subscribe to the RabbitMQ queue.

The subscription requires a RabbitMQ client.

Registering and enabling a vCenter Plugin

PowerPath Virtual Appliance supports the vCenter plugin on vSphere vCenter 5.5 and above (only vCenter Web Client is supported). The vCenter plugin provides a minimal view of the PowerPath Virtual Appliance GUI. Only the details of ESXi hosts belonging to the current instance of a vCenter server are displayed.

The Web client plugin can be registered on the vCenter server in two ways. Select one of the following options:

- Register the plugin while adding or editing the vCenter properties in the PowerPath Virtual Appliance. Browse to the **Inventory** > **vCenter Servers** tab, select the **Register Plugin** checkbox in the **Add vCenter** dialog box, and then click **OK**.
- After adding a vCenter to the Virtual Appliance, browse to the **Inventory** > **vCenter Servers** page, and click the **Register vCenter Plugin** button on the bottom of the page.

By default script based plugins are disabled in vCenter Web Client. To enable script the plugin on vCenter server follow these steps:

Procedure

1. Edit the `webclient.properties` file, and then append the following line at the end of the file (if not already added): `scriptPlugin.enabled = true`

You can locate the `webclient.properties` file in the following locations of the vCenter server:

- On vCenter server 5.x:
 - `/var/lib/vmware/vsphere-client` on the VMware vCenter Server Appliance
 - `%ALLUSERSPROFILE%\Application Data\VMware\vsphere Web Client` on Windows 2003
 - `%ALLUSERSPROFILE%\VMware\vsphere Web Client` on Windows 2008/2012

- On vCenter server 6.0.x:
 - `/etc/vmware/vsphere-client/` on VMware vCenter Server Appliance
 - `%ALLUSERSPROFILE%\VMware\vCenterServer\cfg\vsphere-client` on Windows 2008/2012
- 2. Restart the vSphere Web client service on the vCenter server.
 - On Windows-based vCenter appliances, restart the service with name `vSphere Web Client`
 - On Linux-based vCenter appliances, run `/etc/init.d/vsphere-client restart`

Results

Access the plugin after registering and enabling it. Use the short-cut, **EMC PowerPath/VE License Manager**, located in the vCenter Web client.

Note

If you use the default self-signed certificate of Virtual Appliance, open the PowerPath Virtual Appliance GUI in a new tab in order to accept the certificate before accessing plugin via the vCenter web client.

Enable VMware Tools

Enable VMware Tools to enhance the performance of the virtual machine's guest operating system and improve management of the virtual machine.

Perform one of the following steps:

Procedure

- On PowerPath Virtual Appliance, run `/opt/ADG/etc/init.d/check-vmware-tools`
This script configures VMware Tools and starts it.
- Perform the following procedure:

- a. Configure VMware Tools.

```
/usr/bin/vmware-config-tools.pl
```

Respond to the questions the installer displays on the screen.

- a. Type **no** to change the path to the gcc binary.
- b. Type **no** to change the path to the kernel headers.
- c. Press **Enter** to continue.
- d. Type **no** to enable the VMware Host-Guest Filesystem feature.
- e. Type **yes** to enable the drag and copy feature.
- f. Type **yes** to enable VMware automatic kernel modules.

- b. On PowerPath Virtual Appliance, start VMware Tools.

```
/etc/init.d/vmware-tools start
```

Use the self-signed certificate that installs with PowerPath Virtual Appliance

PowerPath Virtual Appliance ships with a 1024-bit SSL certificate issued by EMC Corporation which is used to generate or regenerate a host-based SSL certificate and key using the customer's host name at PowerPath Virtual Appliance boot time.

This certificate expires 3650 days after PowerPath Virtual Appliance installation.

Create a CSR and self-signed certificate using OpenSSL

Use this procedure to create a certificate signing request (CSR) and a self-signed certificate using OpenSSL.

The PowerPath Virtual Appliance employs the SLES 11 Operating System and to assist with the steps in this procedure, ships with the secure shell and openssl utilities, and the vi and vim editors installed.

Consult your companies' information security department for assistance with SSL certificate and key generation.

Procedure

1. Generate a Private Key.

This example creates a 1024-bit RSA key using Triple-DES.

```
openssl genrsa -des3 -out server.key 1024
```

The OpenSSL documentation provides more information on the command syntax.

2. Generate a CSR.

```
openssl req -new -key server.key -out server.csr
```

Fill in the prompts for your organization, such as country name, state or province, locality name, and other attributes of the certificate.

3. Remove the passphrase from the key to avoid entering it each time the web server is started.

If you are getting a certificate signed by a third-party certificate authority (CA) then this is your final step.

```
cp server.key server.key.org
openssl rsa -in server.key.org -out server.key
```

The newly created server.key file does not include the passphrase in the key.

4. Generate a self-signed certificate.

```
openssl x509 -req -days 365 -in server.csr -signkey server.key -out server.crt
```

A temporary certificate good for 365 days is generated.

After you finish

[Install an SSL certificate on the PowerPath Virtual Appliance on page 22](#)

Install an SSL certificate on the PowerPath Virtual Appliance

Use this procedure to install an SSL certificate on the PowerPath Virtual Appliance host.

Before you begin

Ensure that you have created a self-signed certificate or obtained a certificate signed by a third-party certificate authority (CA) or by an in-house CA for the PowerPath Virtual Appliance host. [Create a CSR and self-signed certificate using OpenSSL on page 21](#) provides more information.

Procedure

1. Using a terminal emulator program, log into the PowerPath Virtual Appliance as root using secure shell.

```
ssh -l root hostname
```

2. Place the generated certificate and key files in the directories listed below.

	Directory
Certificate	/etc/apache2/ssl.crt
Key file	/etc/apache2/ssl.key
Certificate chain	/etc/apache2/ssl.crt

For certificate chain, either put all of the certificates in the directory as separate files or create a single PEM file from all of the certificates by concatenating the certificate PEM files together. All of the certificates in the CA chain must be in PEM format before concatenating them into a single file. Their key will be the bottom most key in the certification chain (this is called the key for the leaf certificate).

3. Edit the PowerPath Virtual Appliance `/etc/apache2/httpd-EMCPower.conf` file to point to the certificate and key files.

- For the certificate and key file, modify the `SSLCertificateFile` and `SSLCertificateKeyFile` lines.

```
SSLCertificateFile /etc/apache2/ssl.crt/customers_cert_file.crt
SSLCertificateKeyFile /etc/apache2/ssl.key/
customers_key_file.key
```

- If the CA certificate chain is in separate files, modify the `SSLCACertificatePath` line.

```
SSLCACertificatePath /etc/apache2/ssl.crt
```

- If there is only a single CA certificate or if a chain of CA certificate PEM files have been concatenated together into a single file, modify the `SSLCACertificateFile` line.

```
SSLCACertificateFile /etc/apache2/ssl.crt/ca_cert_filename
```

4. Restart the Apache server daemon.

```
/etc/init.d/apache2 restart
```

5. (optional) Connect to the PowerPath Virtual Appliance with a web browser to verify the certificate.

```
https://hostname_or_ip_address/LicenseReportingApplication/
```

CHAPTER 3

Monitoring PowerPath hosts

This chapter includes the following topics:

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- [PowerPath Monitor views](#) 24

Overview of PowerPath host monitoring

The PowerPath Monitor, available in versions 2.0.1 and later, provides host monitoring capabilities including device/path monitoring. The monitor displays PowerPath volume, path, and bus details.

Monitoring is provided for the following PowerPath-supported platforms:

- ESXi
- Windows
- Linux
- AIX
- HP-UX
- Solaris

The tree view on the left side of the PowerPath Monitor view block displays physical and ESXi hosts. Physical PowerPath hosts are organized under their corresponding user-defined host groups (created from the inventory tab). ESXi hosts are grouped under corresponding vCenter to which they belong. Entries in the host tree view are highlighted with an icon to indicate the state.

PowerPath Monitor views

The PowerPath Monitor displays tabs for the Host Group Tree view , Summary view, LUN view and BUS view.

Summary view

When you select a host, the Host Summary view launches with information on the status of the devices and paths of the host, with configured PowerPath options, current host state, and LUN and Path summary details display. Host state warnings are highlighted at the top and bottom of Summary view.

Summary view provides following details:

Table 2 Host details and descriptions

Host details fields	Description
Host State as of	The last time stamp when the host information was retrieved by the PowerPath Virtual Appliance.
IP	IP of the host
Host Name	FQDN of host as known to PowerPath Virtual Appliance (via DNS)
PowerPath Version	Version of PowerPath running on the host
Status	PowerPath Virtual Appliance connection status to the management component on the host
License	License is valid or host is unlicensed
Platform	OS platform (LINUX, AIX, WINDOWS, HPUX, ESXi, SOLARIS)
OS Version	OS Version of the selected PowerPath host. This is displayed only from PowerPath versions later than PowerPath 6.0 for all

Table 2 Host details and descriptions (continued)

Host details fields	Description
	platforms except Linux which needs PowerPath version later than 6.0 SP1.
Path and LUN state	
Path State	Total number of dead/alive paths
LUN State	Total number of dead/alive volumes
PowerPath Options	
Performance Monitor	If PMI is enabled or disabled
Performance Monitor Interval	PMI interval in seconds (displayed only if PMI is enabled)
Path Latency Monitor	If Path latency monitoring is enabled or disabled
Path Latency Monitoring Threshold	Path Latency Monitoring Threshold (displayed only if path latency monitoring is enabled)
Autostandby: Proximity (prox)	If Autostandby prox is enabled or disabled
IOPF Auto Standby	If IOPF auto standby is enabled or disabled
IOPF Aging Period	IOPF aging period in days
IOPF Limit	IOPF limit
Auto Host Registration	If Auto host registration is enabled or disabled (Displayed only for PP 6.0 and above)
Persist Path Information	If Path information persistence is enabled or disabled

Summary tab also displays following warning/errors:

- Connection related:
 - Connection failure
 - Maximum allowed number of connections exceeded (Non-ESXi hosts only)
- Host unlicensed
- Volume related warnings
 - Number of volumes with a single live path
 - Number of degraded volumes. This includes dead paths as well as volumes with invalid policy.

LUN view

LUN view provides details of LUNs and paths of the selected host. Right-click on table header to select columns that you want to view. This selection is not persistent across multiple sessions.

LUN view provides following details:

Volume Details	
Name	Name of the Volume
Array Type	Type of array to which the Volume belongs

Alive/Total Paths	Ratio of live to total paths
Array Name(s)	Name of arrays to which a volume is connected.
Policy	Multipathing policy for the device
Device ID	Logical device ID of the volume
Storage Group	Storage group to which the volume belongs
LUN Name	Name of the LUN from array side
Queued IOs	Number of IOs queued for the volume
Standard UID	For ESXi only
Path Details	Number of IOs queued for the path
Queued IOs	
HBA Port	
Array Port	
Mode	
State	
ALUA State	
ALUA State	

BUS view

BUS view shows the association between HBA Ports > Array > Array Ports along with the IOs queued for the bus.

Icon State in both LUN view and BUS view:

- Green— Normal: All the paths to the volume/BUS are live
- Yellow—Degraded: A few path to the volume/BUS are dead
- Red—Error: All paths to the volume/BUS are dead

The following context menu options are available, based on the node that you selected:

- Repoll
- Repoll non-ESXi hosts
- Repoll Group
- Add Host
- Create New Group
- Edit Host
- Add vCenter
- Edit vCenter
- Remove vCenter
- Repoll ESXi Hosts
- Edit Group
- Remove Host
- Remove Group

CHAPTER 4

Managing PowerPath licenses

This section contains the following topics:

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- [Delete a PowerPath/VE license](#)..... 28
- [View the PowerPath/VE license inventory](#)..... 29
- [Export licensed PowerPath and PowerPath/VE host details](#)..... 29
- [Export unlicensed PowerPath and PowerPath/VE host details](#)..... 29

Add a PowerPath/VE license

Add EMC PowerPath/VE for VMware vSphere licenses to the EMC PowerPath Virtual Appliance.

Before you begin

If you are uploading the license key from your local machine, download the license key to your local machine.

This procedure applies to EMC PowerPath/VE for VMware vSphere hosts only. To add licenses on PowerPath for AIX, HP-UX, Linux, Solaris, or Windows hosts, use the `emcpreg` command or Windows PowerPath Administrator GUI.

Note

You can also add a PowerPath/VE license from the PowerPath Virtual Appliance vCenter plugin.

Procedure

1. Navigate to **PowerPath Licenses** > **PowerPath/VE License Inventory**.
2. Click **Add License**.
3. Perform one of the following steps:
 - Paste the license key in the **Add License** dialog box.
 - Upload the license key.
 - a. Click **Choose file**.
 - b. Navigate to the license key location on your local computer and then select the license key.
 - c. Click **OK**.
4. Click **OK**.

Delete a PowerPath/VE license

Delete EMC PowerPath/VE for VMware vSphere licenses from the EMC PowerPath Virtual Appliance.

This procedure applies to EMC PowerPath/VE for VMware vSphere hosts only. This operation cannot be undone. To delete licenses on PowerPath for AIX, HP-UX, Linux, Solaris, or Windows hosts, use the `emcpreg` command or Windows PowerPath Administrator GUI.

Note

You can also delete a PowerPath/VE license from the PowerPath Virtual Appliance vCenter plugin.

Procedure

1. Navigate to **PowerPath Licenses** > **PowerPath/VE License Inventory**.
2. Select the license to be deleted, and then click **Delete License**.

View the PowerPath/VE license inventory

View the inventory of PowerPath/VE licenses added or present in the EMC PowerPath Virtual Appliance.

Note

You can also view the PowerPath/VE licenses from the EMC PowerPath Virtual Appliance vCenter plugin.

Procedure

- Navigate to **PowerPath Licenses** › **PowerPath/VE License Inventory**.

Results

A list of all PowerPath/VE licenses added or present in the EMC PowerPath Virtual Appliance is displayed.

Export licensed PowerPath and PowerPath/VE host details

Export license details for licensed PowerPath and PowerPath/VE hosts.

Procedure

1. Browse to **PowerPath Licenses** › **Licensed Hosts**.
2. Click **Export**.

Results

The license details are exported to a CSV (Comma Separated Value) file.

Export unlicensed PowerPath and PowerPath/VE host details

Export license details for unlicensed PowerPath and PowerPath/VE hosts.

Procedure

1. Browse to **PowerPath Licenses** › **Unlicensed Hosts**.
2. Click **Export**.

Results

The license details are exported to a CSV (Comma Separated Value) file.

CHAPTER 5

Upgrading the Virtual Appliance

This section contains the following topic:

- [Upgrade from EMC PowerPath Virtual Appliance 1.2.x](#) 32
- [Upgrade from PowerPath Virtual Appliance 2.0.0 and later](#) 33

Upgrade from EMC PowerPath Virtual Appliance 1.2.x

You can upgrade from EMC PowerPath Virtual Appliance Version 1.2.x using the `export_vApp1.2.x_Config` script.

Before you begin

- Download the EMC PowerPath Virtual Appliance package from EMC Online Support. This package contains the upgrade script required to upgrade the EMC PowerPath Virtual Appliance.
- The CST Standalone Lockbox passphrase is required after an upgrade from earlier versions of EMC PowerPath Virtual Appliance to the current version . You will be prompted to re-enter the passphrase when you attempt to run the first `rpowermt` command on virtual appliance.

If the passphrase is lost, recreate the lockbox and re-enter the PowerPath/VE host information and credentials in order to perform `rpowermt` commands, or supply the host username and password on the `rpowermt` command line.

The upgrade to EMC PowerPath Virtual Appliance Version 2.0.1 from vApp 1.2.x is supported only by using the upgrade script. You must have root privileges to carry out the upgrade. To upgrade from version 1.0 or 1.1 to 2.0.1, you must deploy EMC PowerPath Virtual Appliance 2.0 afresh and then manually add the license files existing in version 1.0 or 1.1 into the 2.0 PowerPath Virtual Appliance web console.

For script-based upgrade, refer to the video on the PowerPath EMC Community Network for a demonstration on upgrading to EMC PowerPath Virtual Appliance 2.0.1: <https://community.emc.com/videos/26034>

Procedure

1. Unzip the `export_vApp1.2.x_Config` script and then copy it to the EMC PowerPath Virtual Appliance 1.2 VM.
2. SSH into the EMC PowerPath Virtual Appliance 1.2 VM and then run the script to export the EMC PowerPath Virtual Appliance 1.2 configuration.

```
chmod +x export_vApp1.x_Config
./ export_vApp1.2.x_Config
```

3. Copy the resulting `export_vApp1.2.x_Config.zip` file to the local desktop or a remote location.
4. Take note of the EMC PowerPath Virtual Appliance deployment parameter details.

The parameters are not copied from EMC PowerPath Virtual Appliance 1.2 for security reasons and therefore requires manual re-entry in EMC PowerPath Virtual Appliance 2.0.1 .

```
Virtual Appliance Deployment Parameters
=====
Host name       : <>
Search Domain  : <>
IP              : <>
Subnet mask     : <>
Gateway        : <>
DNS Server     : <>
NTP Server     : <>
```

5. Power down the EMC PowerPath Virtual Appliance 1.2 VM.

Note

Do not delete the EMC PowerPath Virtual Appliance 1.2 VM until after successful EMC PowerPath Virtual Appliance 2.0.1 import.

6. Deploy EMC PowerPath Virtual Appliance 2.0.1 with the same EMC PowerPath Virtual Appliance Deployment Parameters as EMC PowerPath Virtual Appliance 1.2.
7. Power up the EMC PowerPath Virtual Appliance 2.0.1 VM.
8. In the 2.0.1 PowerPath Virtual Appliance web console, navigate to **System > Settings > Import Config ZIP** and then import the `vAppl.2.x_Config.zip` file.

After you finish

- After successful import, EMC PowerPath Virtual Appliance 1.2 can be deleted.
- Reboot is not required after upgrades using the upgrade script.

Upgrade from PowerPath Virtual Appliance 2.0.0 and later

You can upgrade from 2.0.0 to 2.x directly without using a script.

Before you begin**Procedure**

1. Download the upgrade package from EMC Online Support and then copy the file to the Virtual Appliance VM.
2. SSH into the PowerPath Virtual Appliance VM and then run the following commands.
 - a. Run `cd <Directory in which the applianceUpdate.zip is copied>`
 - b. Unzip the upgrade package: `unzip applianceUpdate.zip`
 - c. Run `cd applianceUpdate`
 - d. Run `/bin/bash applianceUpdate`
 - e. Reboot the PowerPath Virtual Appliance: `Reboot`

Results

Verify that the upgrade completed successfully by viewing the log in the `/opt/ADG/update/logs` directory.

Expanding root file system of PowerPath Virtual Appliance

It is recommended that you increase the size of root file system in case of upgrade from PowerPath Virtual Appliance 2.0.0

Before you begin

Add a new 10 GB disk from storage to PowerPath Virtual Appliance (VM).

To expand the root file system, follow these steps:

Procedure

1. Run `df`
2. Run `cat /proc/partitions`
3. Run `ls -l /sys/class/scsi_host`

4. Run `echo "- - -" > /sys/class/scsi_host/hostX/scan`. Where X is 0, 1, or 2
5. Run `cat /proc/partitions`
6. Run `fdisk -l /dev/sdb` on the new disk.
7. Run `vgdisplay`
8. Run `vgextend systemVG /dev/sdb`
9. Run `vgdisplay`
10. Run `lvextend -L +5GB /dev/systemVG/LVRoot`
11. Run `resize2fs /dev/systemVG/LVRoot`
12. Run `df`

CHAPTER 6

Uninstalling the Virtual Appliance

This section contains the following topics:

- [Uninstall the EMC PowerPath Virtual Appliance](#)..... 36

Uninstall the EMC PowerPath Virtual Appliance

Using your vSphere client, you can shut down and remove the EMC PowerPath Virtual Appliance from your VMware inventory.

Procedure

1. Open the vSphere Client and connect to the vCenter server managing your appliance.
2. Right-click the appliance in the left pane of the **Inventory > VMs and Templates** window for the vSphere Client and then select **Power > Shut Down Guest**.
3. Right-click the appliance and then select **Delete from Disk**.

APPENDIX A

Types of licenses and license status

This section contains the following topics:

- [Types of PowerPath/VE licenses](#)..... 38
- [License status](#)..... 38

Types of PowerPath/VE licenses

Explains the types of license supported by EMC PowerPath/VE for VMware vSphere.

Served license

The Served licensing model uses a license server to store, distribute and manage PowerPath/VE licenses. In this model, the Electronic License Manager System (ELMS) distributes the PowerPath/VE licenses to vSphere hosts. You install the license configuration file on the PowerPath/VE ELMS and it manages the licenses for all the PowerPath/VE hosts for which the license was generated.

Unserved license

The Unserved licensing model binds PowerPath/VE to a specific vSphere host. More accurately, to a vSphere unique system ID. An Unserved license is only valid for the specific vSphere host for which it was generated. An Unserved license is static; it cannot be used on another vSphere host.

It does not use a license server. Rather, the PowerPath/VE license is stored on the remote (rpowermt) PowerPath server. This type of license is also known as the Node Locked license.

Master Key license

The Master Key license is a special case of Unserved license. This license model is available to customers with an Enterprise License Agreement only. A Master Key license is locked to a domain subnet, for example *.abc.def.com. In this case, it must contain the Virtual Appliance's subnet. It allows `rpowermt` commands to be run against any PowerPath/VE host regardless of the host's address or domain.

Trial license

The EMC PowerPath Virtual Appliance comes with a 45-day trial license period for an unlimited number of PowerPath/VE version hosts. The addition of Permanent or Temporary license keys to the PowerPath/VE hosts that are using Trial licenses will transition respective licenses that are added.

The Trial licenses are automatically pushed to all unlicensed PowerPath/VE hosts.

Overdraft

Served licenses contain an overdraft count which provides a temporary buffer of 10% above the count of licenses purchased.

The overdraft feature provides a temporary buffer license when the number of PowerPath/VE hosts exceed the number of PowerPath/VE licenses. The overdraft count applies to the Served licenses only.

License status

The following table provides a list of license status indicators and descriptions.

Table 3 License status





Indicator	Description
	License that is due to expire or the license is valid but is unused
	Valid license

Table 3 License status (continued)

Indicator	Description
	Expired license
	Invalid license

