

Dell EMC PowerOne System

Getting Started Guide

Notes, cautions, and warnings

 **NOTE:** A NOTE indicates important information that helps you make better use of your product.

 **CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

Contents

Revision history.....	4
Chapter 1: Introduction.....	5
Chapter 2: Configuration information.....	6
Gather configuration information for initial deployment.....	6
Recommended display settings for PowerOne Navigator.....	12
Chapter 3: Managing VMware licenses.....	13
Add and assign VMware licenses.....	13
Downgrade to VMware vSphere 6.7.....	13

Revision history

Date	Document revision	Description of changes
November 2020	1.4	<p><i>Gather configuration information for initial deployment - Management subnets</i></p> <ul style="list-style-type: none"> • Updated screenshot for fabric network port numbers • Updated the Routable IP ranges and added a note on OOB management network
June 30, 2020	1.3	<p><i>Gather configuration information for initial deployment</i></p> <ul style="list-style-type: none"> • Updated VMware licenses • Added PowerOne minimum architecture with external workload <p><i>Managing VMware licenses - new section</i></p> <p><i>Downgrade to VMware vSphere 6.7 - new topic</i></p>
June 11, 2020	1.2	<p><i>Gather configuration information for initial deployment</i></p> <ul style="list-style-type: none"> • Updated Network IP range for vSphere Management Cluster to support PowerOne system versions 1.1.0 and 1.2.0. • Removed the <i>Storage configuration</i> fields. • Updated VMware licenses
March 2020	1.1	<p>Added the following topic that was previously in the <i>Dell EMC PowerOne System Administration Guide</i>:</p> <ul style="list-style-type: none"> • <i>Recommended display settings for PowerOne Navigator</i> <p>Updated the following topic:</p> <p><i>Gather configuration information for initial deployment</i></p> <ul style="list-style-type: none"> • Added a link to a Microsoft Word version of the Configuration Information table so easily record the values for your site. • Added two reserved subnet IP addresses for PowerOne uplinks and PowerOne IP fabric uplinks. • Added a table for vSphere and NSX network subnet layout.
November 2019	1.0	Initial release

Introduction

Congratulations on your purchase of PowerOne, the Dell EMC fully engineered, highly automated, all-in-one system that harnesses the power of Dell Technologies.

The Dell EMC PowerOne System brings together Dell Technologies compute, storage, networking, virtualization, and data protection into one streamlined autonomous infrastructure system. With all-in-one simplicity, autonomous operations, and flexible consumption options, PowerOne can accelerate the shift of your organization from traditional operations to modern cloud outcomes.

The highly available PowerOne Controller is the core of the system, which is designed to remove operational complexity. The PowerOne Controller, designed exclusively for PowerOne, provides a 'single system' administrative experience through its centralized intelligent automation capability.

Use your *Dell EMC PowerOne System Getting Started Guide* to prepare for the initial deployment of PowerOne and to begin configuring Cluster Resource Groups (CRG). It includes the types of information to gather before beginning the initial deployment steps. The target audience for this document is those personnel preparing for the initial deployment of PowerOne.

Configuration information

Gather configuration information for initial deployment

Before you begin initial deployment, you must gather the following information. This information serves as a site checklist to ensure that you have the proper information available before initial deployment.

i **NOTE:** This information is entered during the initial deployment process and must be correct. Once the data is entered and the configuration of your PowerOne has completed, you cannot easily go back to fix errors. Check all data thoroughly before advancing to the next step. The information that you collect below should be carefully reviewed and confirmed before you begin.

See the following Word document if you must record values in this table (HTML-only). [Customer configuration information](#)

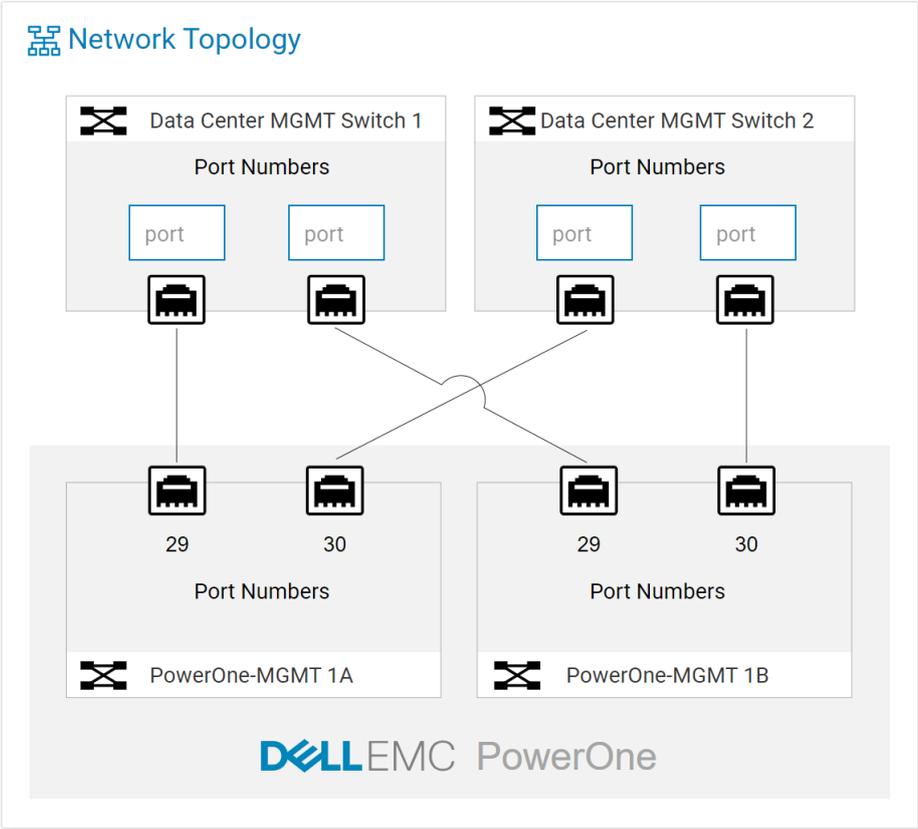
Data center services	Value requirements	Value
Location		
Organization	Required Enter the full legal company or personal name. Do not use special characters such as &, @ or \$. Include any suffixes such as Ltd., Inc. or Corp. No apostrophes (') allowed.	
Organizational unit	Required No apostrophes (') allowed.	
Street name		
City/locality	Required No apostrophes (') allowed.	
State/region	Required Provide the full name such as Texas, Sussex, Normandy. Do not abbreviate. No apostrophes (') allowed.	
Country	Required Select Country from list values provided in the Navigator.	
Data center ID		
Data center aisle (hall)		
Network Services		

Data center services	Value requirements	Value
PowerOne Domain Name	<p>Provide a valid subdomain within the Data Center DNS.</p> <p>Length is greater than two and less than 64 characters.</p> <p>Contains only lowercase letters, numbers, periods, and hyphens</p> <p>Cannot start or end with a hyphen. Cannot include a double hyphen (--).</p> <p>Restriction: You cannot use powerone.local because it is used internally in PowerOne,</p>	
Data Center DNS servers	<p>Provide at least one DNS server (IP address). Up to two DNS IP addresses can be specified.</p> <p>The DNS servers enable PowerOne to resolve external names, such as dell.com.</p>	
Data Center NTP Servers	<p>Ensures that system time remains accurate. You can provide up to two IP addresses for NTP sources.</p>	
System log server	<p>By default, PowerOne has its own syslog server.</p> <p>Optionally, you can forward logs to another specified syslog server (IP address).</p>	

SNMP

SNMP v2 trap destinations	<p>Optional - up to three enabled (IP addresses).</p> <p>If a trap destination is supplied, the corresponding community string and port number must also be provided.</p>	
Community strings	<p>These strings are for access privileges, typically read-only or read/write.</p> <p>If entered, they must be fewer than 17 characters that cannot include & or #.</p> <p>If a community string is supplied, the corresponding trap destination and port number must also be provided.</p>	
Port Number	<p>Must be numeric integer (0-65536). A commonly used SNMP Trap Port number is 162.</p> <p>If a port number is supplied, the corresponding trap destination and community string must also be provided.</p>	
PowerOne SNMP Management - Device community strings	<p>Enter the optional read-only and read/write community password strings.</p> <p>If entered, they must be fewer than 17 characters that cannot include & or #.</p>	

Management network information	Value requirements	Value
Physical connectivity		
Number of upstream switches (customer switches) into which the PowerOne out-of-band (OOB) management switches connect.	Two is recommended.	

Management network information	Value requirements	Value
Data center management switch port numbers	Provide port numbers to which the PowerOne management port connects. The following screenshot shows how this connection looks in PowerOne Navigator:	
 <p>The diagram, titled 'Network Topology', illustrates the network configuration. At the top, there are two 'Data Center MGMT Switch' boxes, labeled '1' and '2'. Each switch box contains a 'Port Numbers' section with two 'port' labels. Below each switch box are two server icons representing network ports. At the bottom, there are two 'PowerOne-MGMT' boxes, labeled '1A' and '1B'. Each box contains a 'Port Numbers' section with two ports labeled '29' and '30'. Lines connect the ports of the management switches to the ports of the PowerOne management nodes. The Dell EMC PowerOne logo is visible at the bottom of the diagram area.</p>		
Link speed of the uplink connections from the OOB management switch to the customer switch.	Select link speed value (10 Gbps or 40 Gbps). 40 Gbps is recommended (default). 10 Gbps is optional.	
IP subnets		
Four IP subnets for PowerOne uplinks	Required The subnet mask must be /30 or /31. Do not use any on the reserved network list below: 172.16.0.0/16 172.17.0.0/16 172.21.105.0/24 172.30.0.0/16 192.168.1.0/24 192.168.101.0/24 192.168.102.0/23 192.168.200.0/24 192.168.201.0/24	

Management network information	Value requirements	Value
	192.168.202.0/24 192.168.203.0/24 192.168.253.0/24	
Routing protocol		
Routing protocol	OSPF, BGP, or Static	
If OSPF: Nonzero Area ID	Enter a nonzero area ID (1-65535). This area is set up as a Not-So-Stubby Area (NSSA).	
If BGP: Customer Autonomous System (AS) Number	Enter a nonzero AS Number (1-65535). Consult the Network Administrator for the AS Number.	
PowerOne Autonomous System (AS) Number	Static - cannot be changed.	65010
Management subnets		
Routable IP ranges (See note below.)	Provide four subnets for the following networks: <ul style="list-style-type: none"> • OOB management network - Subnet mask must be /24. (default is 192.168.101.0/24) • iDRAC management network - Subnet mask must be /23. (Default is 192.168.102.0/23) • PowerOne management network - Subnet mask must be /24. (Default is 192.168.255.0/24) • Storage management network - Subnet mask must be /24. (Default is 192.168.201.0/24) 	

NOTE: When configuring PowerOne with a domain name or subdomain and Out-of-Band (OOB) Routable IP ranges, you must define entries within the customer's local DNS server.

As shown in the table above for Routable IP Ranges for the OOB network, a 192.168.101.0/24 network is listed as the default. The 50th IP address in this range is the PowerOne DNS server that must be configured in the customer DNS server. If you were to keep this default network configuration, 192.168.101.50 is the PowerOne DNS server value. If you were to use a different network schema such as 10.240.213.0/24, then 10.240.213.50 is the PowerOne DNS Server value.

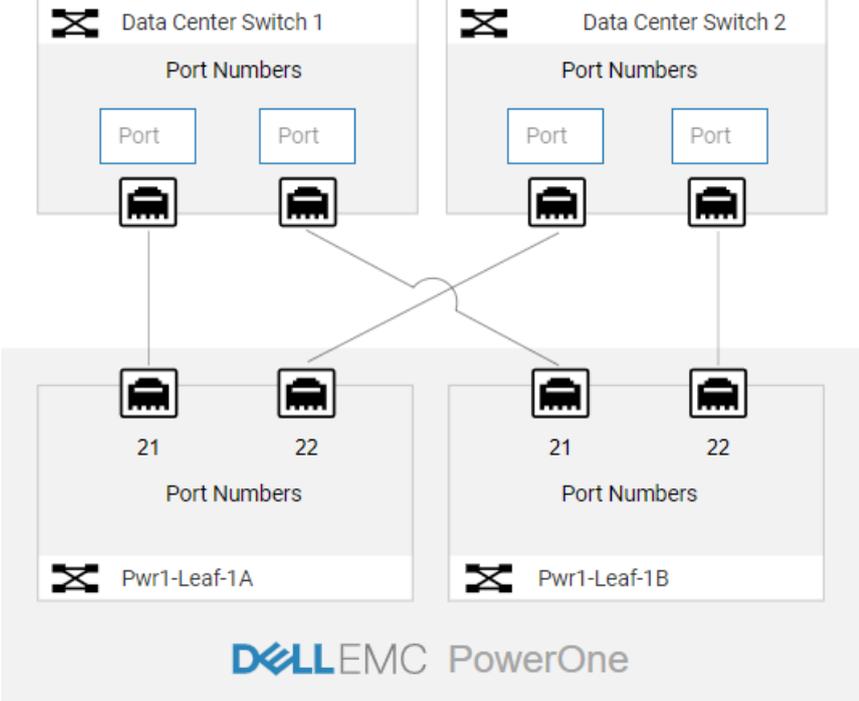
This PowerOne DNS Server IP address must be defined as a delegation for a subdomain off an existing customer domain or as a forwarder for a net-new domain name (that is, not a subdomain off an existing domain).

For example, if your domain is `acme.com`, and you want to create the subdomain `powerone.acme.com` for PowerOne then you would *delegate* `powerone.acme.com` from your DNS servers to the PowerOne DNS server.

However, if you want to create a new domain, such as `power1.com`, that is not currently controlled by your internal DNS server, you would *forward* requests for that domain to the PowerOne DNS server

The customer local DNS Server configuration entries should be completed before the installation of PowerOne begins.

System Fabric	Value requirements	Value
Physical connectivity		
Number of upstream switches (customer switches) to which the PowerOne IP Fabric switches connect.	Two are recommended.	
Link speed of all connections	Select link speed value (10 Gbps, 40 Gbps, or 100 Gbps).	

System Fabric	Value requirements	Value
Fabric network port numbers	<p>Provide port numbers to which the PowerOne fabric port connects.</p> <p>The following screenshot shows how this connection looks in PowerOne Navigator:</p>	
<p>Network Topology</p>  <p>The diagram illustrates a network topology with two Data Center Switches at the top, labeled 'Data Center Switch 1' and 'Data Center Switch 2'. Each switch has two ports, each labeled 'Port'. These ports are connected to two PowerOne leaf switches at the bottom, labeled 'Pwr1-Leaf-1A' and 'Pwr1-Leaf-1B'. Each leaf switch has two ports, labeled '21' and '22'. The Dell EMC PowerOne logo is visible at the bottom of the diagram.</p>		
<p>IP subnets</p>		
Four IP subnets for PowerOne IP fabric uplinks	<p>The subnet mask must be /30 or /31. Do not use any on the reserved network list below:</p> <ul style="list-style-type: none"> 172.16.0.0/16 172.17.0.0/16 172.21.105.0/24 172.30.0.0/16 192.168.1.0/24 192.168.101.0/24 192.168.102.0/23 192.168.200.0/24 192.168.201.0/24 192.168.202.0/24 192.168.203.0/24 192.168.253.0/24 	
<p>Routing protocol</p>		

System Fabric	Value requirements	Value
Protocol for exchange of routing information	Static or BGP	
If BGP - Customer Autonomous System (AS) number	Must be numeric (1-65535).	
PowerOne Autonomous System (AS) Number	Static - cannot be changed.	65009

Platform	Value requirements	Value
Network IP range	<p>Specify an IP subnet range which is segmented into multiple networks including the ones that are required for ESXi Management and vMotion as follows:</p> <ul style="list-style-type: none"> PowerOne system version 1.2.0 specify /21 PowerOne system version 1.1.0 specify /20 <p>Networks that are used in workload CRGs are also allocated from this IP range.</p> <p>NOTE: See the table below for use cases that indicate how the subnet range is allocated.</p>	
VMware licenses	<p>Enter the following version 6.7 license keys:</p> <ul style="list-style-type: none"> ESXi * vCenter * NSX-v (NSX Data Center Enterprise Plus) Life-cycle manager (Optional) vRealize Operations (vROps) <p>* If you have a vSphere 7.0 license key, you must downgrade it to vSphere 6.7. See Downgrade to vSphere 6.7</p> <p>See Managing VMware licenses for more information:</p>	
PowerOne minimum architecture with external workloads	Would you like to connect your PowerMax to an external workload?	Yes or No

vSphere and NSX network subnet layout

The following table provides use cases that indicate how the subnet range is allocated.

Use Case	Default VLAN ID	Mask	Description
Platform Controller Cluster			
ESXi Mgmt	1611	/26	Designed to scale to 10 hosts + vSphere/vROps / NSX appliances and +13 fabric addresses. Management of ESXi hosts (VMK'S), vCenter, vRops.
ESXi vMotion	1612	/27	Designed to scale to 10 hosts. vMotion (VMK'S) or ESXi hosts in the management cluster and +13 fabric addresses.
ESXi VTEP	1614	/26	Designed to scale to 10 hosts (two VTEP addresses each). NSX-V VTEP (VMK'S) for ESXi hosts in the management cluster and +13 fabric addresses.
Uplink 1	2711	/28	Interface to Leaf-1A for NSX-V to IP Fabric BGP routing. 10 Edge appliance peers to leaf using BGP (11 addresses for peering), a few extra for vRNI and jump boxes.

Use Case	Default VLAN ID	Mask	Description
Uplink 2	2712	/28	Interface to Leaf-1B for NSX-V to IP Fabric BGP routing. 10 Edge appliance peers to leaf using BGP (11 addresses for peering), a few extra for vRNI and jump boxes.
vROps Mgmt	N/A	/27	vROps management network (192.168.10.0/27) including appliance IPs, LB IPs, and Gateway.  NOTE: This subnet does not have a VLAN ID because it is an overlay network.
CRG/Compute Cluster			
ESXi Mgmt	1641	/24	Designed to scale to 240 hosts (minus mgmt cluster). Management of ESXi hosts (VMK'S). Aligned to pod size (240 blades + 13 fabric addresses)
ESXi VMotion	1642	/24	Designed to scale to 240 hosts (minus mgmt cluster). vMotion (VMK'S) or ESXi hosts in the compute clusters. Aligned to pod size (240 blades + 13 fabric addresses)
ESXi TEP	1644	/23	Designed to scale to 240 hosts (minus mgmt cluster). 250 hosts are boundary for TEP L2 subnet. NSX-T VTEP (VMK'S) for esxi hosts in the computer clusters. Aligned to pod size ((240 blades * 2)+ 13 fabric addresses)
Edge TEP	1649	/27	Aligned to edge scaling. (NSX-T - transport node 10 per edge cluster +13 fabric addresses)
Uplink 1	1647	/28	Interface to Leaf-1A for NSX-T to IP Fabric BGP routing. 10 Edge appliance peers to leaf using BGP (11 addresses for peering), a few extra for vRNI and jump boxes.
Uplink 2	1648	/28	Interface to Leaf-1B for NSX-T to IP Fabric BGP routing. 10 Edge appliance peers to leaf using BGP (11 addresses for peering), a few extra for vRNI and jump boxes.

Recommended display settings for PowerOne Navigator

Observe these recommendations to optimize your user experience with Navigator.

Use the latest version of Chrome or Firefox for the best experience with Navigator. Navigator is also compatible with Safari and Edge.

Use the following display settings to optimize your user experience in Navigator:

- Minimum recommended resolution—1366x768
- Maximum recommended scale and layout—100%
- Orientation—Landscape

Managing VMware licenses

During initial deployment, temporary VMware licenses are used to stand up and configure various PowerOne components. Before you use PowerOne, Field Services must activate your VMware licenses in VMware vCenter.

Add and assign VMware licenses

Customers add and assign VMware licenses to the vCenter Server asset to run VMware products.

See *VMware licenses* in the topic, [Gather configuration information for initial deployment](#), for the required information.

See the following VMware document to add licenses and assign the licenses to the vCenter Server asset:

<https://docs.vmware.com/en/VMware-Validated-Design/4.3/com.vmware.vvd.sddc-deploya.doc/GUID-7A574BC8-CCE4-4545-BC2D-B0CF2E1F45E0.html>

See the following VMware document to assign licensing for the NSX-V instance:

<https://docs.vmware.com/en/VMware-Validated-Design/4.3/com.vmware.vvd.sddc-deploya.doc/GUID-FD6A4069-BBCA-416C-96E3-20E7B0F40C95.html>

Downgrade to VMware vSphere 6.7

If the customer has a vSphere 7.0 license key, they must downgrade it to a vSphere 6.7 license key using the VMware License Portal.

Steps

1. Obtain the vSphere 7.0 license key by redeeming the vSphere 7.0 Partner Activation Code (PAC).
2. Using the VMware License Portal, downgrade the vSphere 7.0 license key as outlined in the following article: <https://kb.vmware.com/s/article/2006975>

Perform this step in the VMware License Portal before the vSphere 6.7 key is applied to the vSphere 6.7 software.

Next steps

Before you use PowerOne, Field Services activates your VMware licenses using VMware vCenter.