



**Hewlett Packard**  
Enterprise

*HPE Plexxi HCN™*

*Plexxi Getting Started Guide*

*Small and Medium Deployments*

*Switch-Control 3.2.2-4.1.0 and Connect 2.4.0-3.1.0*

Part Number: P12885-001  
Published December 2018  
Edition: 1

## Notices

The information contained herein is subject to change without notice. The only warranties for Hewlett Packard Enterprise products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. Hewlett Packard Enterprise shall not be liable for technical or editorial errors or omissions contained herein.

Confidential computer software. Valid license from Hewlett Packard Enterprise required for possession, use, or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

Export of the information contained in this publication may require authorization from the U.S. Department of Commerce.

Links to third-party websites take you outside the Hewlett Packard Enterprise website. Hewlett Packard Enterprise has no control over and is not responsible for information outside the Hewlett Packard Enterprise website.

## Acknowledgements

Microsoft and Windows are U.S. registered trademarks of Microsoft Corporation. Adobe® and Acrobat® are trademarks of Adobe Systems Incorporated.

Java and Oracle are registered trademarks of Oracle and/or its affiliates. UNIX® is a registered trademark of The Open Group.

Intel®, Itanium®, Pentium®, Intel Inside®, and the Intel Inside logo are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

## Safety

The Plexxi Switch system is classified as a class 1 telecommunications laser product employing embedded class 1 lasers and complies with the following:

THIS PRODUCT COMPLIES WITH FDA RULE 21 CFR SUBCHAPTER J IN EFFECT AT DATE OF MANUFACTURE. PRODUCT COMPLIES WITH 21 CFR 1040.10 AND 1040.11

PRODUIT CONFORME SELON LE SOUS CHAPITRE J DU DOCUMENT FDA RÈGLE 21 CFR EN VIGUEUR LORS DE LA DATE DE FABRICATION. PRODUIT CONFORME SELON 21CFR 1040.10 ET 1040.11.

Electrotechnical Commission (IEC) 60825-1, 60825-2

This product is classified as a: CLASS 1 LASER PRODUCT

APPAREIL À LASER DE CLASSE 1

This unit is intended to be installed in a Restricted Access Location only with access only by trained personnel.



**Warning:** The primary hazards of exposure to invisible laser radiation from an optical fiber communications system are:

- Damage to the eye by viewing an unterminated optical fiber or fiber optic connector.
- Damage to the eye from invisible laser radiation from viewing a cut fiber or a broken fiber.

Never attempt to view optical connectors that may be emitting laser energy and always avoid possible exposure to invisible optical laser radiation. Using optical fiber scopes or magnifying lenses may increase the possibility for an eye hazard. It is recommended that you use an optical power meter to determine if there is optical laser radiation present or use a remote video display inspection tool to inspect connectors.



## Table of Contents

Notices.....	2
Acknowledgements .....	2
Safety.....	2
Contacting Plexxi Support.....	4
<b>1 Installation and Cabling Assumptions.....</b>	<b>5</b>
<b>2 Creating a Direct Connect Network .....</b>	<b>6</b>
Direct Connecting 2, 2S, 2P and 2SP Switches.....	6
Direct Connecting 2e and 3eq Switches (2 Switches) .....	7
Direct Connecting 2e and 3eq Switches (4 Switches) .....	8
<b>3 Creating a PSI Network .....</b>	<b>9</b>
Connecting Switches 2e and 3eq to the PSI.....	9
Looping Back Unused PSI Ports .....	9
Connecting Multiple PSI Devices to Expand the Fabric .....	9
PSI Network Example.....	10
<b>4 Running px-setup .....</b>	<b>11</b>
<b>5 Deploying a Plexxi Control VM using OVA .....</b>	<b>12</b>
Supported.....	12
VM Requirements .....	12
Downloading the OVA File.....	12
Deploying the Plexxi Control VM .....	12
<b>6 Deploying a Plexxi Connect VM using OVA.....</b>	<b>14</b>
Supported.....	14
VM Requirements .....	14
Downloading the OVA File.....	14
Deploying the Plexxi Connect VM.....	14
<b>7 Creating Pack Configurations in Plexxi Connect.....</b>	<b>16</b>
Configuring the Plexxi Control Configuration.....	16
Configuring VMware vSphere Configurations.....	16
Registering the vSphere Plugin with VMware .....	16
Configuring Nutanix Prism Configurations.....	17
<b>8 Configuring 3<sup>rd</sup>-Party MLAG/LAG Uplinks to Plexxi Switches.....</b>	<b>18</b>
Nutanix MLAG/LAG.....	18
MLAG/LAG with Cisco .....	21
MLAG/LAG with Arista.....	24



## Contacting Plexxi Support

Plexxi Support services are available to answer questions and to make sure your software and hardware operate properly.

Contact Plexxi Support at:

[support@plexxi.com](mailto:support@plexxi.com)

1.888.415.9809 (US/Canada toll-free)

+1 603-782-0702 (US/International)

<http://support.plexxi.com>



# 1 Installation and Cabling Assumptions

This procedure assumes the following:

- You are knowledgeable in network administration, cable management, optical cable cleaning and handling.
- The switches have been unpacked and installed in racks, power cables installed, and rack power is on. Refer to the appropriate hardware installation document for each Plexxi switch.
- You have all transceivers and cables needed:
  - to connect Plexxi switches to each other, creating the Plexxi fabric.
  - to connect uplink ports to non-Plexxi switches.
  - For management cabling, connect the Plexxi MGMT port to an external out-of-band Layer 2 switch.
- The latest Plexxi Switch software is installed on the Plexxi switches.
- You have an internet connection to download installers, etc.
- You have a console connection to a switch in the fabric.
- Your network architecture and connections has been designed and you have access to all port, cabling and configuration information as needed, including IP addresses of switches, controller, NTP server, DNS server, SNMP server/services, as well as time zones and host names.
- You have all usernames and passwords to be used for Plexxi Switch, Plexxi Control and Plexxi Connect software access.

## 2 Creating a Direct Connect Network

In a direct connect network, Plexxi switches are connected directly without the use of a PSI device (see next chapter).

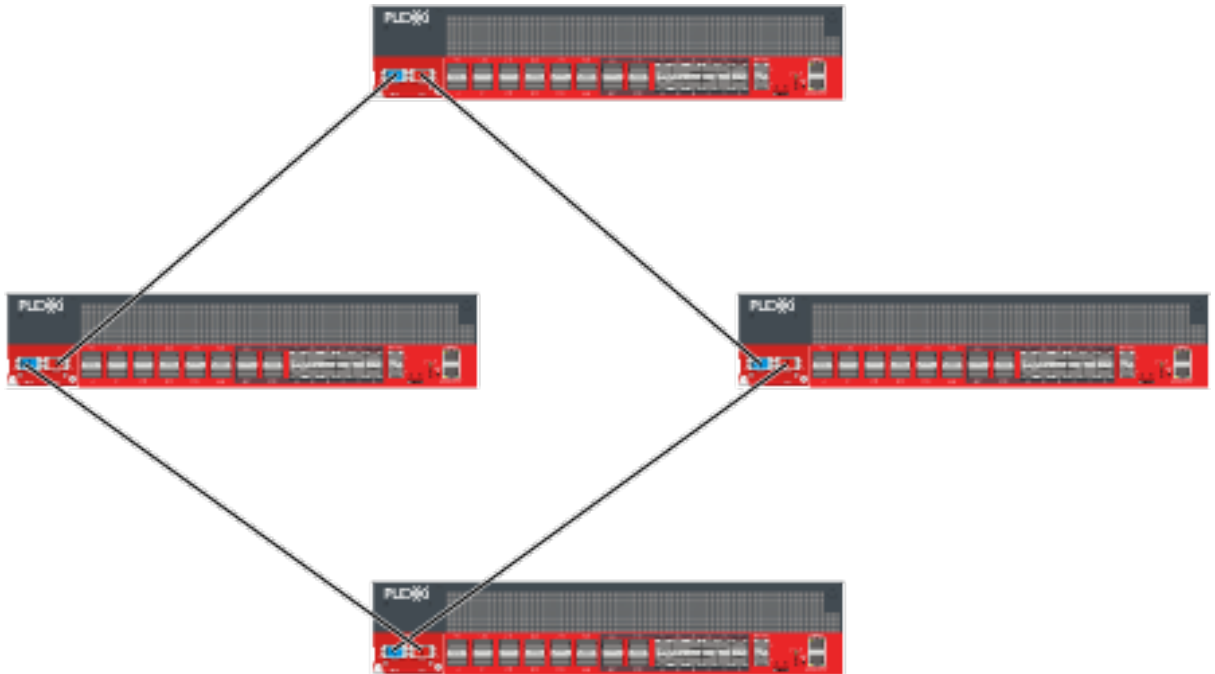
Any number of Plexxi switches that contain LightRail connectors (Switches 2, 2S, 2P and 2SP) can be connected together using direct-connect; directly connected through the LightRail ports with MTP cables.

As many as seven Plexxi Switches 2e and 3eq that connect through QSFP ports can be connected together using direct connect. You should not directly connect Plexxi 3eq and 2e switches in a network if the deployment is expected to grow beyond seven switches.

You cannot **directly connect** Switches 2e, 3eq to Switches 2, 2S, 2P and 2SP.

### Direct Connecting 2, 2S, 2P and 2SP Switches

For these switches, simply connect the LightRail cables East and West to the neighbor switches. Repeat this for each switch to complete the fabric. For example:



## Direct Connecting 2e and 3eq Switches (2 Switches)

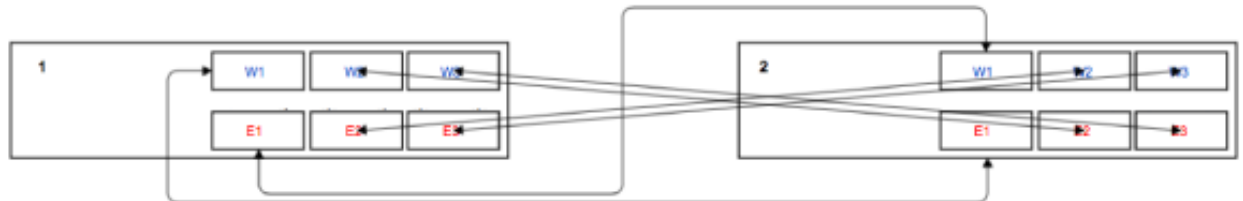
- The following three connections connect Plexxi 3eq or 2e switches:

W1 to E1, W2 to E2, W3 to E3

- QSFP DAC or AOC cables connect from the top ports (W1, W2, W3) of one switch to the bottom ports (E1, E2, E3) of the next switch.

To direct connect 2e and 3eq switches (see example below):

- Number the switches to connect starting with 1.
- Begin cabling Switch 1, then cable switch 2.
- For each switch, connect W1 to the next numbered switch E1, for W2 skip over a switch and connect to the E2 port, and for W3, jump over 2 switches and plug into the E3 port of the third switch.



From	To	From	To
<b>Switch 1</b>		<b>Switch 2</b>	
W1	Switch 2 E1	W1	Switch 1 E1
W2	Switch 2 E2	W2	Switch 1 E2
W3	Switch 2 E3	W3	Switch 1 E3

## Direct Connecting 2e and 3eq Switches (4 Switches)

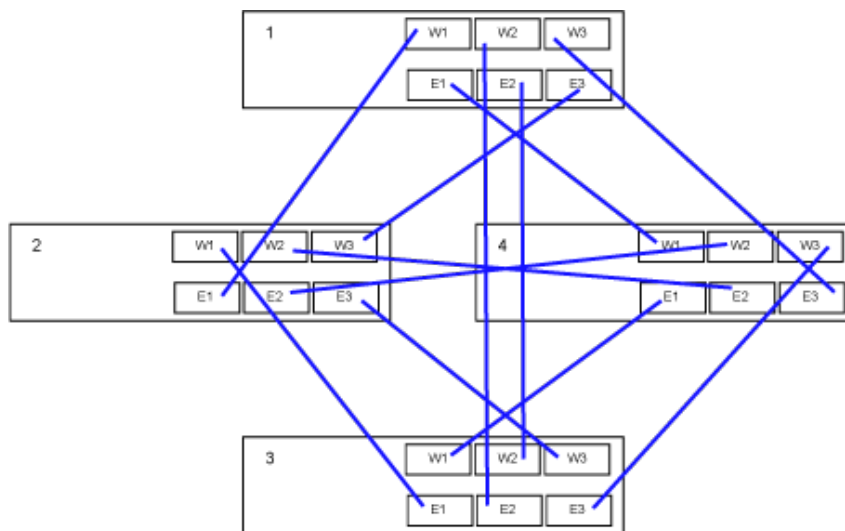
- The following three connections connect Plexxi 3eq or 2e switches:

W1 to E1, W2 to E2, W3 to E3

- QSFP DAC or AOC cables connect from the top ports (W1, W2, W3) of one switch to the bottom ports (E1, E2, E3) of the next switch.

To direct connect 2e and 3eq switches (see example below):

- Number the switches to connect starting with 1.
- Begin cabling Switch 1, then cable switch 2, etc.
- For each switch, connect W1 to the next numbered switch E1, for W2 skip over a switch and connect to the E2 port, and for W3, jump over 2 switches and plug into the E3 port of the third switch.



From	To	From	To	From	To
<b>Switch 1</b>		<b>Switch 2</b>		<b>Switch 3</b>	
W1	Switch 2 E1	W1	Switch 3 E1	W1	Switch 4 E1
W2	Switch 3 E2	W2	Switch 4 E2	W2	Switch 1 E2
W3	Switch 4 E3	W3	Switch 1 E3	W3	Switch 2 E3
<b>Switch 4</b>					
W1	Switch 1 E1				
W2	Switch 2 E2				
W3	Switch 3 E3				

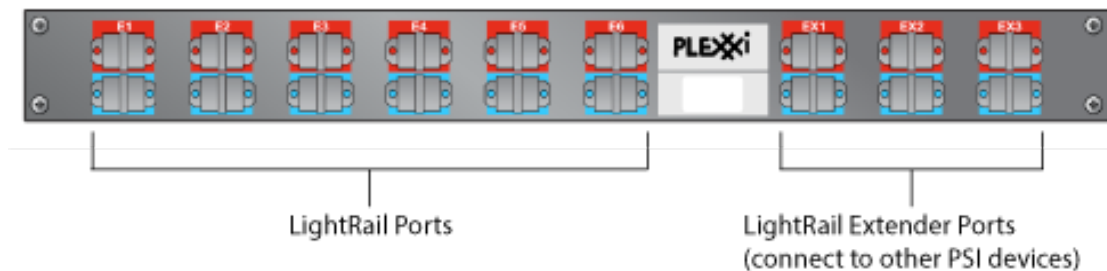


### 3 Creating a PSI Network

The Plexxi Pod Switch Interconnect (PSI) device, illustrated below, is designed to accommodate the following Plexxi network installation scenarios:

- Connecting more than seven Plexxi 2e and 3eq switches
- Creating a Plexxi network of any size that contains both Plexxi switches with LightRail connectors (2P, 2SP) and switches without (2e and 3eq).

You can create a network of four or more Plexxi switches by connecting switches to a Plexxi Pod Switch Interconnect (PSI) device, shown here:



Using a PSI, you can create a network topology that includes any Plexxi switch.

#### Connecting Switches 2e and 3eq to the PSI

Connect Plexxi PSI Interconnect LightRail ports to Plexxi Switch QSFP ports following the West-to-East convention. Plug the 24-fiber connector into the Plexxi PSI Interconnect port and the three 12-fiber connectors of the MTP cable to transceivers installed in the QSFP ports on the Plexxi Switch.

You need to match the label number (1, 2, and 3) on the 12-fiber side of the MTP connectors with a specific port number on Plexxi Switch. Connect to the appropriate QSFP port in the appropriate direction, West or East.

#### Looping Back Unused PSI Ports

You must loopback any unused PSI ports, including the extender ports, using 10-inch 24F MTP cables. The next section illustrates looped back ports in 4-switch PSI configuration.

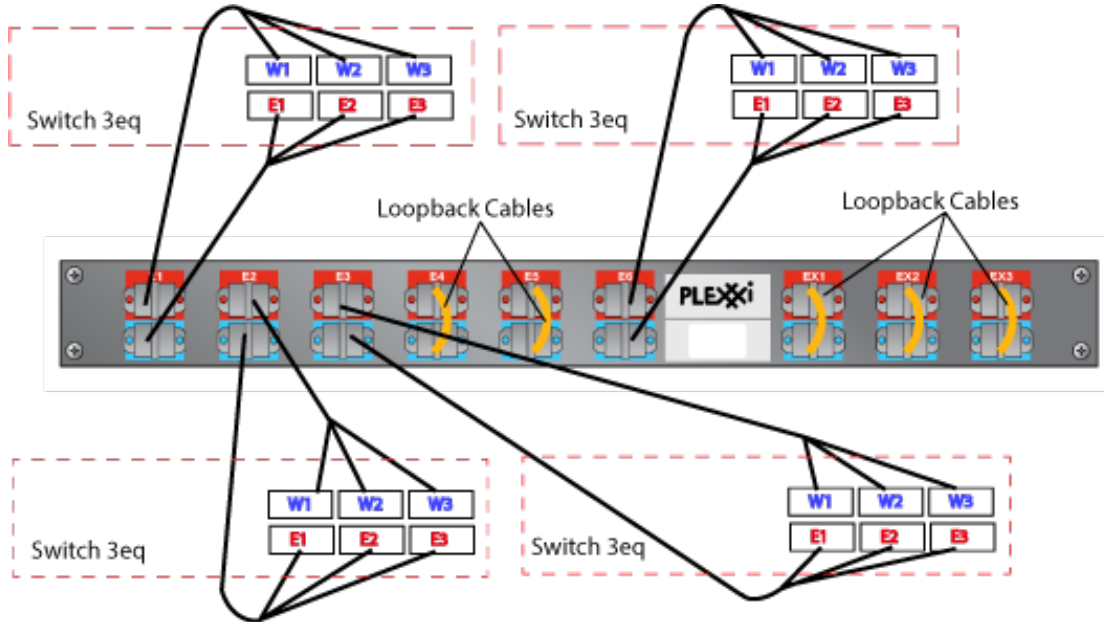
#### Connecting Multiple PSI Devices to Expand the Fabric

PSI devices can be connected to scale out the Plexxi fabric. Three 24-fiber MTP cables are used to connect to a PSI device to the next (East) PSI device, and an additional three cables are used to connect to the previous (West) PSI device.

## PSI Network Example

The following illustration shows a network topology that includes four Plexxi 3eq (or 2e switches) connected through a Plexxi PSI. In this case, we assume that the network is planned to grow beyond 7 switches, therefore advising the use of a PSI device. If a network will not exceed 7 switches, you can use direct connect.

As shown, all unused PSI ports are looped back using loopback cables.



**Note:** The QSFP ports in the diagram include a label indicating direction: W1 through W3 and E1 through E3. These labels are informational and are not found on the Plexxi Switch chassis.



## 4 Running px-setup

`px-setup` is a Plexxi utility that simplifies Plexxi switch setup by eliminating the need to edit configuration files on the Plexxi Switch. The utility queries administrators for information, then configures the IP or hostname of the Plexxi Control software, time zone, network address, default gateway, SNMP management, and several network services, including NTP and DNS.

The `px-setup` commands require root/sudo privilege to modify core services. To set up all switches and all network characteristics for a new install, use `px-setup` without arguments:

```
$ sudo px-setup
```

**Note:** `px-setup` recommends UTC as default for Time Zone and Plexxi recommends that you use UTC as Time Zone for Plexxi Switch and Plexxi Control.

**IMPORTANT:** Plexxi strongly recommends that Plexxi Connect, Plexxi Control and Plexxi Switches all be connected to a reliable NTP service.

Help is also available through the man page:

```
$ man px-setup
```

## 5 Deploying a Plexxi Control VM using OVA

Plexxi Control can be installed from an OVA file designed for deployment on virtual hosts. In this section, you will use OVA from a VMware vSphere Web Client to deploy a new VMware VM to host the Plexxi Control software.

### Supported

- Hypervisors: VMware ESXi or Nutanix AHV
- Operating system: The installation deploys a Linux CentOS VM

### VM Requirements

The Plexxi Control virtual machine (VM) must meet the following minimum requirements:

- 4 CPUs
- 8 GB RAM
- 200 GB disk space

### Downloading the OVA File

1. Determine the version of Plexxi Control software to install.

**IMPORTANT:** Refer to the *Plexxi Compatibility Matrix* for information on compatibility between Plexxi Control and Plexxi Switch software.

2. Download the OVA file, **plexxicontrol-version-date.ova**, from <https://software.plexxi.com> in Control > releases > *version*.

### Deploying the Plexxi Control VM

Deploy the Plexxi Control VM using OVA as follows:

1. Save the downloaded OVA file in a location for the OVA deployment.
2. Open the VMware vSphere Web Client.
3. If you are logging into vSphere 6.0 or older, you may be prompted to install the Client Integration Plug-in in your web browser. If prompted, you must install the Client Integration Plug-in to enable OVA deployment from your web browser.
4. Select a VCenter server or a specific hypervisor.
5. Select **Deploy OVF Template** from the **Actions** menu or by right-clicking the hypervisor and selecting **Deploy OVF Template**.
6. In **Select source**, browse for the **plexxicontrol-version-date.ova** file either locally or remotely as saved above. Click **Next**.
7. Verify the Plexxi Control OVF template details. Click **Next**.
8. Read the end user license agreement and click **Accept** to accept the license agreement. Click **Next**.
9. Enter a name and select a folder for the Plexxi Control VM. Click **Next**.
10. In **Select storage**, select the virtual disk format, VM Storage Policy (Datastore Default) and select the datastore for the VM. Click **Next**.
11. In **Setup Networks**, select the source network (vSwitch or port group). Click **Next**.

12. In **Customize template**, enter a VM hostname and set up either static IP or DHCP.

In **A) Network – General Settings**, configure:

- The **Hostname** for the Plexxi Control VM host; for example, plexxi-control.
- The **Domain Name** on the Plexxi Control VM resides. This should be a valid DNS domain name, or if the network/deployment environment does not have a domain, you can use "localdomain" as the domain name.
- **Time Servers (NTP)**: IP addresses or hostnames of the primary and secondary Network Time Servers (NTP) that Plexxi Control will use to synchronize its internal clock. It is **STRONGLY** recommended to use NTP servers to ensure that all elements of the Plexxi system have the most accurate time and date settings. Note that when using DHCP, the NTP server information will not need to be provided. You should confirm that your DHCP server is properly configured to provide NTP server(s) when fulfilling DHCP requests.

In **B) Network – Static IP Settings**, configure:

- For static IP, enter the IP Address, Network Mask, and Default Gateway as needed for your environment.
- **DNS Servers**: For static IP, provide the IP address of the primary and secondary DNS servers that Plexxi Control will use to resolve hostnames. When using DHCP, DNS server information is not needed.
- For DHCP, select the DHCP check box and leave the IP address as 0.0.0.0.

**IMPORTANT:** If you use DHCP, you must reserve an IP address on the DHCP server.

In **C) Network – DHCP Settings**, configure:

- **Use DHCP**: Check this option if DHCP is used.

13. When finished, click **Next**.

14. In **Ready to complete**, verify the entered configuration settings. Click **Finish**.

15. You can monitor the OVA Install progress in the **Recent Tasks** window.

16. When finished, in vSphere, locate and **Power On** the new VM.

17. **Verify the installation**. In a Web browser, enter the Plexxi Control URL. The URL format is:

`https://<hostname>:8443/PlexxiUI/`

**IMPORTANT:** When connecting to Plexxi Control on port 8443, you must use the server's FQDN (Fully Qualified Domain Name).

Log into Plexxi Control as administrator using the default credentials:

Username: **admin**

Password: **plexxi**

Verify that the Plexxi Control UI opens successfully.

18. Plexxi recommends that, while logged into the Plexxi Control UI as administrator, you change the Plexxi Control password to a secure password.

19. Plexxi recommends that you connect to the new VM and change the default Linux passwords for the **root** and **plexxi** user accounts.

20. Optionally, type Ctrl+d to logout from the Linux session.

The Plexxi Control installation is complete.

## 6 Deploying a Plexxi Connect VM using OVA

Plexxi Connect can be installed from an OVA file designed for deployment on virtual hosts. In this section, you will use OVA from a VMware vSphere Web Client to deploy a new VMware VM to host the Plexxi Connect software.

### Supported

- Hypervisors: VMware ESXi or Nutanix AHV
- Operating system: The installation deploys a Linux CentOS VM

### VM Requirements

The Plexxi Connect virtual machine (VM) must meet the following minimum requirements:

- 2 CPUs
- 8 GB RAM
- 50 GB disk space

### Downloading the OVA File

1. Determine the version of Plexxi Connect software to install.  
**IMPORTANT:** You can refer to the Plexxi Compatibility Matrix for software compatibility.
2. Download the OVA installer file, **PlexxiConnect-version-###.ova**, from <https://software.plexxi.com> in Connect > releases > version.

### Deploying the Plexxi Connect VM

Deploy a Plexxi Connect VM using OVA as follows:

1. Connect and log into the VMware vSphere Web Client.
2. Select a vSphere server or a specific ESX host.
3. Select **Deploy OVF Template** from the **Actions** menu or by right-clicking the hypervisor and selecting **Deploy OVF Template**. The OVF window opens.
4. In **Select source**, browse for the **PlexxiConnect-version-###.ova** file to download. Click **Next**.
5. In **Review details**, verify the Plexxi Connect OVF template details. Click **Next**.
6. Read the license agreement and click **Accept** to accept the agreement. Click **Next**.
7. In **Select name and folder**, enter a name and location for the Plexxi Connect VM folder. Click **Next**.
8. In **Select storage**, select the virtual disk format, VM Storage Policy (Datastore Default) and select the datastore for the VM. Click **Next**.
9. In **Setup networks**, select the source and destination networks. Click **Next**.
21. In Customize template, enter a VM hostname and set up either static IP or DHCP.  
In **A) Network – General Settings**, configure:
  - The **Hostname** for the Plexxi Control VM host; for example, plexxi-control.
  - The **Domain Name** on the Plexxi Control VM resides. This should be a valid DNS domain name, or if the network/deployment environment does not have a domain, you can use "localdomain" as the domain name.

- Time Servers (**NTP**): IP addresses or hostnames of the primary and secondary Network Time Servers (NTP) that Plexxi Control will use to synchronize its internal clock. It is **STRONGLY** recommended to use NTP servers to ensure that all elements of the Plexxi system have the most accurate time and date settings. Note that when using DHCP, the NTP server information will not need to be provided. You should confirm that your DHCP server is properly configured to provide NTP server(s) when fulfilling DHCP requests.

In **B) Network – Static IP Settings**, configure:

- For static IP, enter the IP Address, Network Mask, and Default Gateway as needed for your environment.
- **DNS Servers:** For static IP, provide the IP address of the primary and secondary DNS servers that Plexxi Control will use to resolve hostnames. When using DHCP, DNS server information is not needed.
- For DHCP, select the DHCP check box and leave the IP address as 0.0.0.0.

**IMPORTANT:** If you use DHCP, you must reserve an IP address on the DHCP server.

In **C) Network – DHCP Settings**, configure:

- **Use DHCP:** Check this option if DHCP is used.

10. When finished, click **Next**.

11. In **Ready to complete**, verify the entered configuration settings. Click **Finish**.

12. You can monitor the OVA Install progress in the **Recent Tasks** window:

13. When finished, in vSphere, locate and **Power On** the new VM.

14. **Verify the installation.** In a Web browser, enter the URL and log into the UI. The URL format is:

Plexxi Connect UI:

`http://<IP>`

`http://<hostname>`

Plexxi Prism UI:

`http://<IP>/prism`

`http://<hostname>/prism`

Log in as administrator using the default credentials:

Username: **admin**

Password: **plexxi**

Verify that the UI opens successfully.

15. Plexxi recommends that you change the Plexxi Connect admin user password to a secure password as described in the Plexxi Connect UI online help.

16. While logged into the Plexxi Connect UI as administrator, you must create (add):

- One Plexxi Control pack configuration.
- VMware vSphere and/or Nutanix Prism pack configurations as needed for your environment.

While in the Plexxi Connect UI, refer to the Plexxi Connect Help for information on adding pack configurations.

17. Plexxi recommends that you connect to the new VM and change the default Linux password for the **admin** user account.

18. Optionally, type Ctrl+d to logout from the Linux session.

The Plexxi Connect installation is complete.

## 7 Creating Pack Configurations in Plexxi Connect

Refer to the following documentation for further information:

- *Plexxi Connect User Guide*
- *Plexxi Connect Online Help* is available while logged into the Plexxi Connect UI

### Configuring the Plexxi Control Configuration

Configure Plexxi Connect access to Plexxi Control by adding a single Plexxi Control configuration instance as follows:

1. Open and log into the Plexxi Connect UI.
2. In Plexxi Connect, select Configuration > Packs > Plexxi Control, then click **Add**. The Plexxi Control Configuration window opens.
  1. In the Plexxi Control configuration window, configure the parameters as needed.
  2. (Recommended) Click **Validate** to validate the configuration and its connections. A **Validation Successful** popup should be returned.
  3. Click **Apply** to save the configuration or **Cancel** to exit without saving.

### Configuring VMware vSphere Configurations

Configure Plexxi Connect access to VMware vSphere by adding one or more VMware vSphere configurations using the Plexxi Connect UI as follows:

1. Open and log into the Plexxi Connect UI.
2. In Plexxi Connect, select Configuration > Packs > VMware vSphere, then click **Add**.
3. In the VMware vSphere configuration window, configure the parameters as needed.
4. (Recommended) Click **Validate** to validate the configuration and its connections. A **Validation Successful** popup should be returned.
5. Click **Apply** to save the configuration or **Cancel** to exit without saving.
6. Repeat the steps above to add additional VMware vSphere configurations. As many as ten vSphere configurations can be added.

### Registering the vSphere Plugin with VMware

Before you can use the vSphere Plugin, in the Plexxi Connect UI, you must create one vSphere configuration as described above, then register the vSphere Plugin with VMware.

**Note:** When the Plexxi vSphere plugin is registered, bi-directional communication must be available between Plexxi Connect and VMware vSphere (i.e., Plexxi Connect must be able to reach vSphere, and vSphere must be able to reach Plexxi Connect). If this communication is not available, the plugin registration will fail. However, it will be reported as successfully registered.

To register the vSphere Plugin with VMware:

1. In Plexxi Connect, select Configuration > Packs > VMware vSphere.
2. Under Actions on the line for the configuration, click the Register vSphere icon.
3. At the following prompt, click **OK** to register the plugin with VMware or **Cancel** to exit.

When the registration completes, a success notification appears.





## Configuring Nutanix Prism Configurations

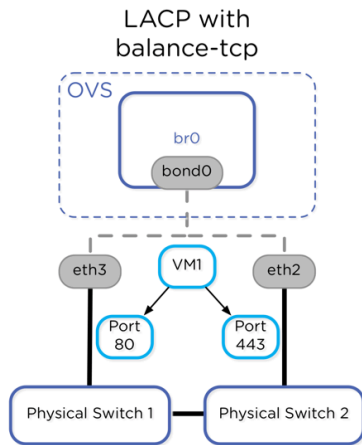
If needed for Nutanix Prism, configure Plexxi Connect access to Nutanix Prism by adding one or more Prism configurations using the Plexxi Connect UI as follows:

1. Open the Plexxi Connect UI.
2. In Plexxi Connect, select **Configuration > Packs > Nutanix Prism**, then click **Add**.
3. In the Nutanix Prism configuration window, configure the parameters as needed.
4. (Recommended) Click **Validate** to validate the configuration and its connections. A **Validation Successful** popup should be returned.
5. Click **Apply** to save the configuration or **Cancel** to exit without saving.
6. Repeat the steps above to add additional Nutanix Prism configurations. As many as ten Nutanix Prism configurations can be added.

# 8 Configuring 3<sup>rd</sup>-Party MLAG/LAG Uplinks to Plexxi Switches

## Nutanix MLAG/LAG

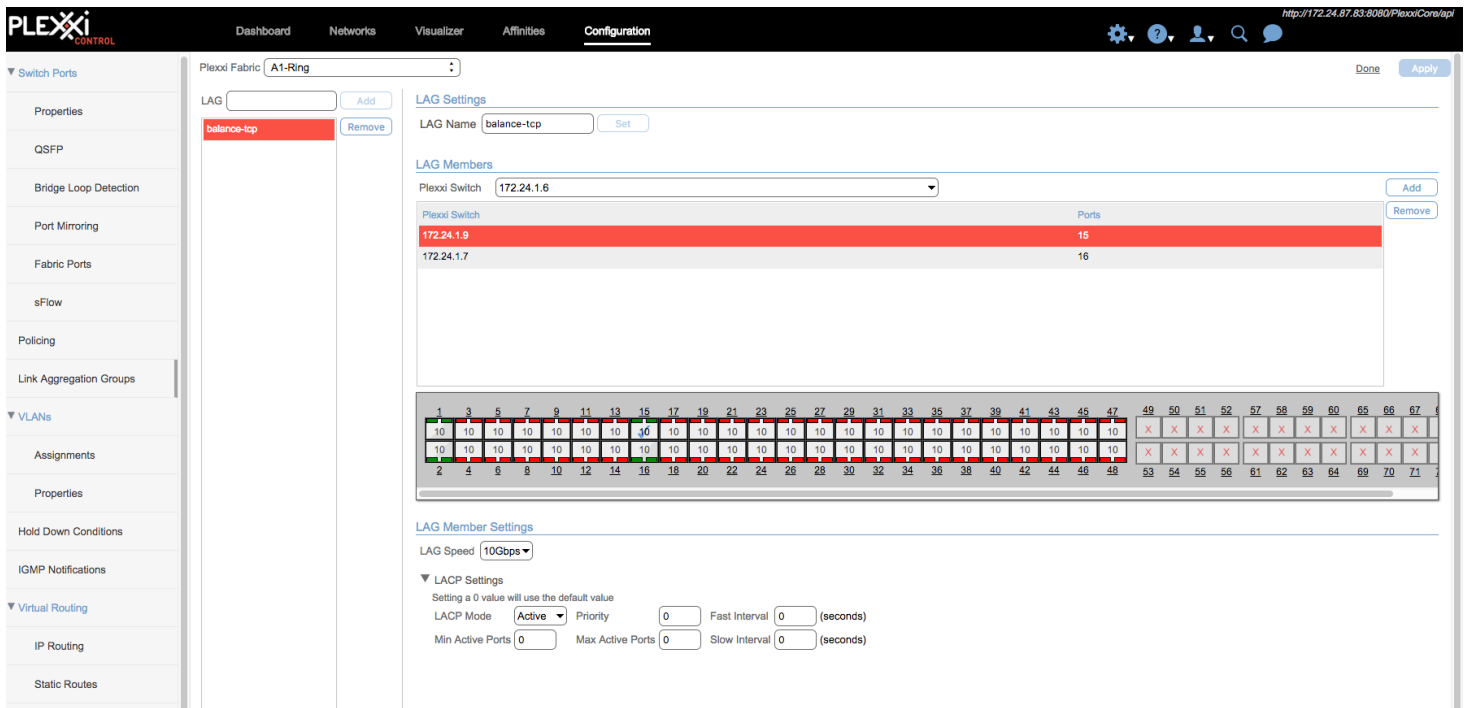
For Nutanix AHV environments, the following example illustration shows a two-port LAG between an Open vSwitch (OVS) and two Plexxi switches.



The following sets up OVS port br0:

```
ovs-vsctl set port br0-up lacp=active
ovs-vsctl set port br0-up other_config:lacp-time=fast
ovs-vsctl set port br0-up bond_mode=balance-tcp
```

In the Plexxi Control UI, create an MLAG on the Plexxi switch. The following Plexxi Control screenshot shows Plexxi Switch 3eq ports 15 and 16 configured to connect to the OVS eth2 and eth3 ports.



The following command shows OVS port br0 port bond status:

```
[root@NTNX-17SM6C010138-A ~]# ovs-appctl bond/show br0-up
---- br0-up ----
bond_mode: balance-tcp
bond may use recirculation: yes, Recirc-ID : 1
bond-hash-basis: 0
updelay: 0 ms
downdelay: 0 ms
next rebalance: 905 ms
lacp_status: negotiated
active slave mac: 00:e0:ed:57:40:cb(eth3)
slave eth0: disabled
    may_enable: false
slave eth1: disabled
    may_enable: false
slave eth2: enabled
    may_enable: true
slave eth3: enabled
    active slave
    may_enable: true
slave eth4: disabled
    may_enable: false
slave eth5: disabled
    may_enable: false
[root@NTNX-17SM6C010138-A ~]#
```

The following commands show the LACP status and configuration information for the two sample Plexxi switches:

```
switch-a1-4# show lacp
Interface xp15 is up
Part of LAG lag1025 (balance-tcp)
LAG ID: [ (8000, e0-39-d7-4a-f0-5a, 1, E, 0), (FFFE, c-c4-7a-9c-a6-fe, 1, 2, FFFF) ]
LACP Info          Local (Actor)          Neighbor (Partner)
-----
LACP Status:       forwarding           forwarding
System Priority:    32768                65534
MAC Address:        e0-39-d7-4a-f0-5a    c-c4-7a-9c-a6-fe
System Identifier:  0x8000,e0-39-d7-4a-f0-5a  0xFFFFE,c-c4-7a-9c-a6-fe
Operational Key:    1                      1
Port Priority:      0                      65535
Port Identifier:    0x0,0xE               0xFFFF,0x2
LACP_Activity:     active                 active
```



## Hewlett Packard Enterprise

```
LACP_Timeout:      fast interval      fast interval
Synchronization:  IN_SYNC           IN_SYNC
Collecting:       true             true
Distributing:    true             true
Actor Oper State: (Ac-1:To-1:Ag-1:Sy-1:Co-1:Di-1:De-0:Ex-0)
Partner Oper State: (Ac-1:To-1:Ag-1:Sy-1:Co-1:Di-1:De-0:Ex-0)
switch-a1-4#
```

switch-a1-2# **show lacp**

```
Interface xp16 is up
Part of LAG lag1025 (balance-tcp)
LAG ID: [ (8000, e0-39-d7-4a-f0-5a, 1, F, 0), (FFFE, c-c4-7a-9c-a6-fe, 1, 1, FFFF) ]
LACP Info          Local (Actor)          Neighbor (Partner)
-----
LACP Status:      forwarding          forwarding
System Priority:   32768              65534
MAC Address:      e0-39-d7-4a-f0-5a   c-c4-7a-9c-a6-fe
System Identifier: 0x8000,e0-39-d7-4a-f0-5a 0xFFFE,c-c4-7a-9c-a6-fe
Operational Key:  1                  1
Port Priority:    0                  65535
Port Identifier:  0x0,0xF           0xFFFF,0x1
LACP_Activity:   active            active
LACP_Timeout:    fast interval      fast interval
Synchronization: IN_SYNC           IN_SYNC
Collecting:      true             true
Distributing:    true             true
Actor Oper State: (Ac-1:To-1:Ag-1:Sy-1:Co-1:Di-1:De-0:Ex-0)
Partner Oper State: (Ac-1:To-1:Ag-1:Sy-1:Co-1:Di-1:De-0:Ex-0)
switch-a1-2#
```

## MLAG/LAG with Cisco

The following is a sample configuration showing how to configure a vPC (virtual port channel) between two Cisco Nexus 5000 series connected to two Plexxi Switches through an MLAG.

Enable LACP and vPC on both Cisco switches:

For Cisco-5k-01

```
feature lacp
feature vpc
```

For Cisco-5k-02

```
feature lacp
feature vpc
```

Configure a vPC domain on both Cisco switches:

For Cisco-5k-01

```
vpc domain 1
```

For Cisco-5k-02

```
vpc domain 1
```

Configure the peer keep-alive IP addresses:

For Cisco-5k-01

```
peer-keepalive destination 172.20.22.2
```

For Cisco-5k-02

```
peer-keepalive destination 172.20.22.1
```

Create a port channel for the vPC between the two Cisco 5000 series switches.

For Cisco-5k-01

```
interface port-channel1
  switchport mode trunk
  switchport trunk allowed vlan 1,21
  spanning-tree port type network
  speed 10000
  vpc peer-link
```

For Cisco-5k-02

```
interface port-channel1
  switchport mode trunk
  switchport trunk allowed vlan 1,21
  spanning-tree port type network
  speed 10000
  vpc peer-link
```

Configure interfaces to be members of the vPC:

For Cisco-5k-01

```
interface Ethernet1/19
  switchport mode trunk
  switchport trunk allowed vlan 1,21
```

```
channel-group 1 mode active

interface Ethernet1/20
  switchport mode trunk
  switchport trunk allowed vlan 1,21
  channel-group 1 mode active
```

#### For Cisco-5k-02

```
interface Ethernet1/19
  switchport mode trunk
  switchport trunk allowed vlan 1,21
  channel-group 1 mode active
interface Ethernet1/20
  switchport mode trunk
  switchport trunk allowed vlan 1,21
  channel-group 1 mode active
```

Create a port channel for the port channel to connect to Plexxi.

#### For Cisco-5k-01

```
interface port-channel2
  switchport mode trunk
  switchport trunk allowed vlan 1,21
  speed 10000
  vpc 2
```

#### For Cisco-5k-02

```
interface port-channel2
  switchport mode trunk
  switchport trunk allowed vlan 1,21
  speed 10000
  vpc 2
```

Configure ports to be members of the channel group used for the connection to Plexxi:

#### For Cisco-5k-01

```
interface Ethernet1/1
  switchport mode trunk
  switchport trunk allowed vlan 1,21
  channel-group 2 mode active
```

#### For Cisco-5k-02

```
interface Ethernet1/2
  switchport mode trunk
  switchport trunk allowed vlan 1,21
  channel-group 2 mode active
```

In the Plexxi Control UI, create an MLAG on the Plexxi switch. The following Plexxi Control screenshot shows Plexxi Switch 3eq ports 77 and 78 connected to the Cisco eth1/1 and eth1/2 ports on a Cisco 5200.

LAG    
CORE\_CISCO\_MLAG

**LAG Settings**  
 LAG Name CORE\_CISCO\_MLAG

**LAG Members**  
 Plexxi Switch s3eq5200

Plexxi Switch	Ports
s3eq5800	77-78
s3eq5200	77-78

**LAG Member Settings**  
 LAG Speed 10Gbps

▼ **LACP Settings**  
 Setting a 0 value will use the default value  
 LACP Mode Active Priority  Fast Interval  (seconds)  
 Min Active Ports  Max Active Ports  Slow Interval  (seconds)

The following Plexxi Control screenshot shows Plexxi Switch 3eq ports 77 and 78 connected to the

LAG    
CORE\_CISCO\_MLAG

**LAG Settings**  
 LAG Name CORE\_CISCO\_MLAG

**LAG Members**  
 Plexxi Switch s3eq5200

Plexxi Switch	Ports
s3eq5800	77-78
s3eq5200	77-78

**LAG Member Settings**  
 LAG Speed 10Gbps

▼ **LACP Settings**  
 Setting a 0 value will use the default value  
 LACP Mode Active Priority  Fast Interval  (seconds)  
 Min Active Ports  Max Active Ports  Slow Interval  (seconds)

Cisco eth1/1 and eth1/2 ports on a Cisco 5800.

## MLAG/LAG with Arista

This example shows a four port MLAG between two Arista 7050s and two Plexxi Switch 3eqs with fast LACP.

The following sample Plexxi Control screenshot shows Plexxi Switch 3eq QSFP port 33 connected to Arista.

The screenshot shows the Plexxi Control Configuration page for a Layer3\_LAB\_Ring fabric. The LAG is named PLX-ARISTA. The LAG Members table lists the following members:

Plexxi Switch	Ports
L3LAB18-00:7F:00	33
L3LAB16-00:7D:00	33
L3LAB17-00:7E:00	33
L3LAB19-00:75:80	33

The LAG Member Settings section shows the LAG Speed set to 40Gbps and LACP Settings set to Active. The LACP Settings include Priority (0), Fast Interval (0), Min Active Ports (0), Max Active Ports (0), and Slow Interval (0).

Configure a port channel on AR-7050s-1A:

```
interface Port-Channel20
    switchport trunk allowed vlan 20
    switchport mode trunk
    mlag 20
```

Two interfaces with fast LACP are members of the port channel:

```
interface Ethernet49/1
    description sw-s1532s1x-p33
    speed forced 40gfull
    switchport mode trunk
    channel-group 20 mode active
```



```
lacp rate fast
interface Ethernet50/1
  description sw-s1533s1x-p33
  speed forced 40gfull
  switchport mode trunk
  channel-group 20 mode active
  lacp rate fast
```

A port channel is configured on AR-7050s-2:

```
interface Port-Channel20
  switchport trunk allowed vlan 20
  switchport mode trunk
  mlag 20
```

Two interfaces are members of the port channel. Both have fast LACP enabled.

```
interface Ethernet49/1
  description sw-s1532s1x-p33
  speed forced 40gfull
  switchport mode trunk
  channel-group 20 mode active
  lacp rate fast
interface Ethernet50/1
  description sw-s1533s1x-p33
  speed forced 40gfull
  switchport mode trunk
  channel-group 20 mode active
  lacp rate fast
```

A peer group is created between both Arista switches on AR-7050s-1:

```
interface Port-Channel1
  description ar7050s-2
  switchport mode trunk
  switchport trunk group mlagpeer
interface Ethernet51/1
  speed forced 40gfull
  channel-group 1 mode active
interface Ethernet52/1
  speed forced 40gfull
  channel-group 1 mode active
```

A peer group is created between both Arista switches on AR-7050s-2:

```
interface Port-Channel1
  description ar7050s-1
  switchport mode trunk
  switchport trunk group mlagpeer
```



**Hewlett Packard**  
Enterprise

```
interface Ethernet51/1
    speed forced 40gfull
    channel-group 1 mode active
interface Ethernet52/1
    speed forced 40gfull
    channel-group 1 mode active
```