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# Cisco Nexus Hyperfabric — Multi-Site

## Multi-Site

The Multi-Site functionality of Cisco Nexus Hyperfabric uses virtual extensible LAN (VXLAN) Ethernet virtual private network (EVPN) to interconnect multiple fabrics, allowing them to function as a unified network. Multi-Site provides these benefits:

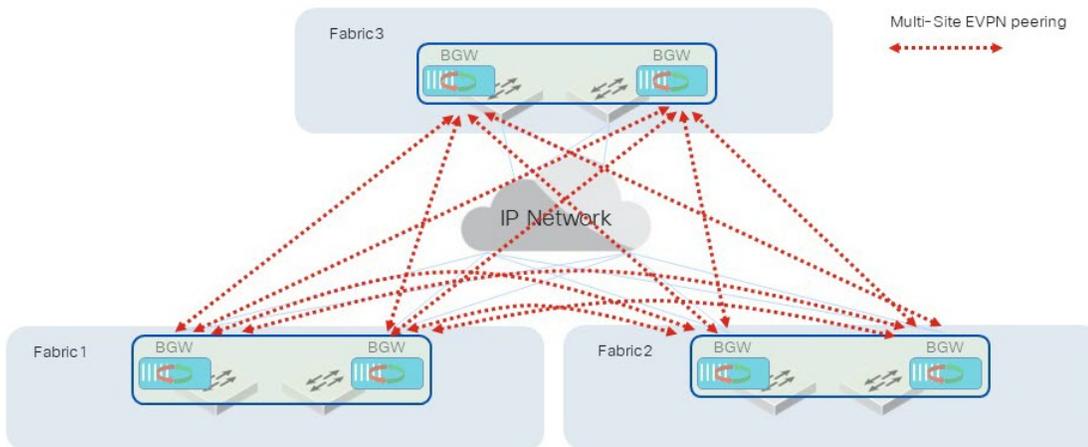
- Centralized management: You can manage all fabrics from a single point.
- Resiliency: If one fabric encounters issues, other fabrics can remain operational.
- Optimized resources: You can distribute applications and services among the fabrics for best performance.

## Design considerations for a Multi-Site interconnect

These design considerations apply for Multi-Site:

- A Multi-Site interconnect can have up to five fabrics.
- A fabric can be part of only one Multi-Site interconnect.
- Fabrics in a Multi-Site interconnect must be in the same [organization](#).
- The fabrics use the full mesh topology. Border gateways will establish Multi-Site interconnect peering with border gateways in other fabrics.
- Multi-Site interconnect provides Layer 2 VNI extension across fabrics.
- A border gateway switch must not have any existing loopback interface, host port, or routed port. If your spine switches do not have these interface and ports, you do not need to have a dedicated border gateway switch.
- Each fabric can have up to two border gateways and each border gateway can have up to two border gateway interfaces.
- Ensure all border gateways are connected to the same IP network (the underlay) that has enough MTU size to carry VXLAN packets. Every border gateway will automatically establish an EVPN peering with every border gateway in all other fabrics as shown in [Figure 1: Design of a Multi-Site interconnect \(full mesh\)](#), on page 2.

Figure 1: Design of a Multi-Site interconnect (full mesh)



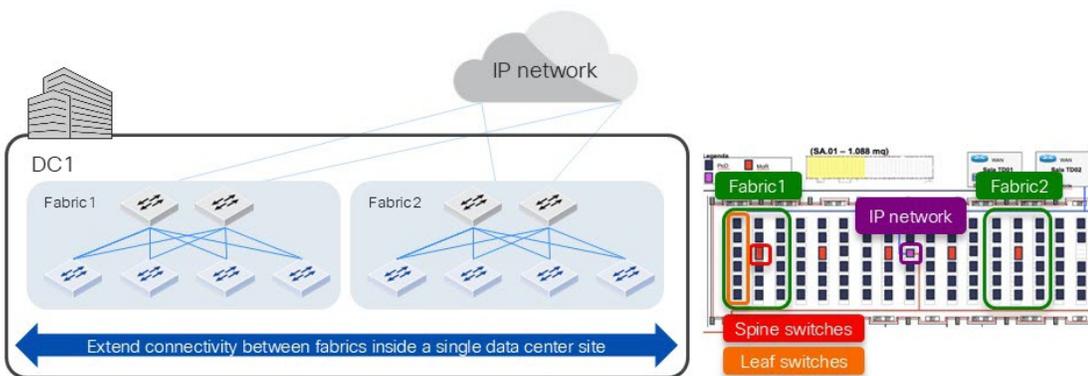
## Multi-Site use cases

These are some Multi-Site use cases.

### Scale and IP mobility

You can use Multi-Site to extend connectivity between active/active fabrics inside a single data center site, which helps with scale and IP mobility.

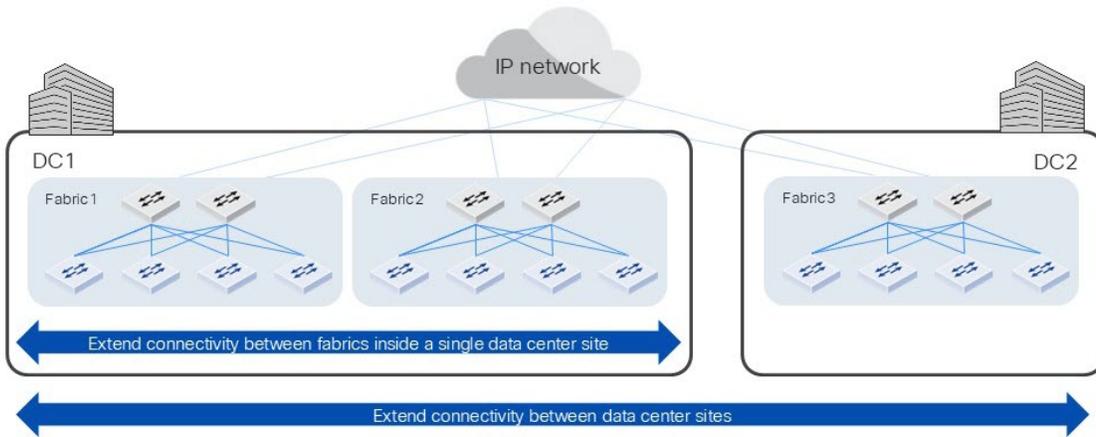
Figure 2: Scale and IP mobility use case example



### Disaster recovery and IP mobility

You can use Multi-Site to extend connectivity between a combination of active/active and active/standby fabrics within multiple data center sites, which helps with disaster recovery and IP mobility.

Figure 3: Disaster recovery and IP mobility use case example

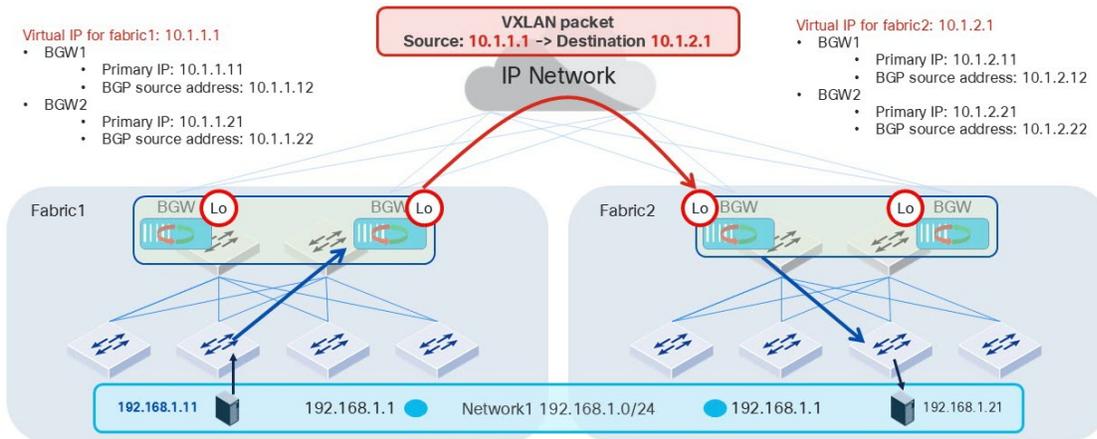


## Required IP addresses for Multi-Site

You must assign various IP addresses to use Multi-Site. The addresses can be all IPv4 or all IPv6, but you cannot mix IPv4 and IPv6 addresses. Multi-Site requires these IP addresses:

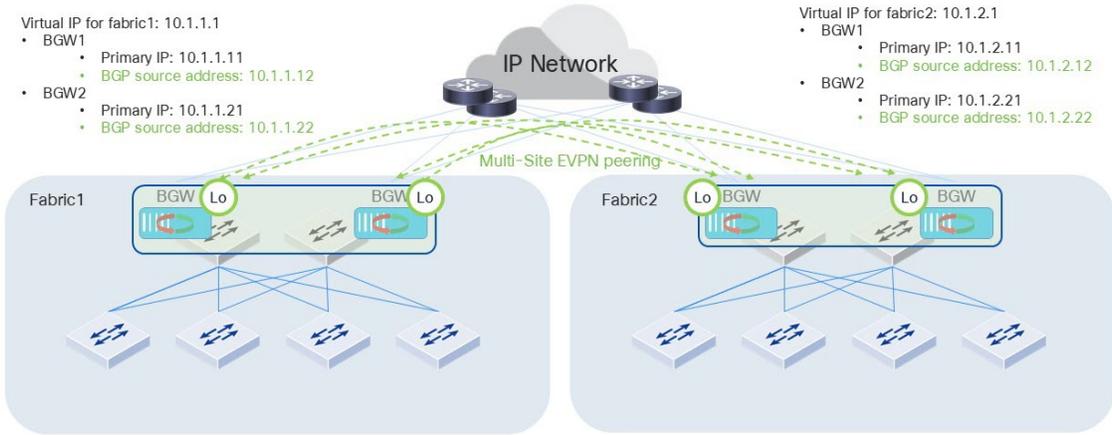
- Each fabric requires one virtual IP address for the data plane. This is for terminating the external VXLAN tunnel between border gateways. Nexus Hyperfabric uses a shared virtual IP address that is deployed as the same loopback address. VXLAN tunneled traffic from a border gateway in a different fabric can land on either one of the border gateways in the local fabric, and will be properly switched to an internal VXLAN tunnel to the destination switch.

Figure 4: One virtual IP address for the data plane per fabric



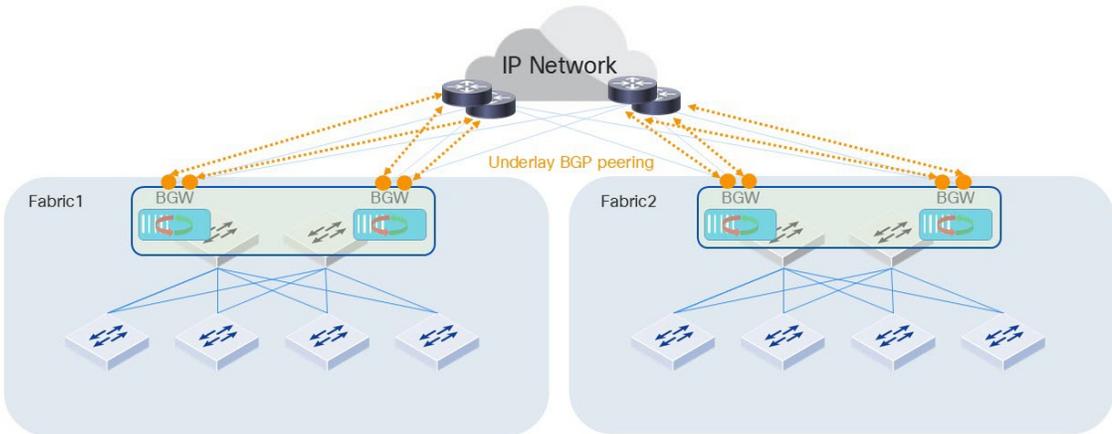
- Each border gateway requires one BGP source IP address for the control plane, which is for Multi-Site Ethernet virtual private network (EVPN) BGP peering between border gateways in different fabrics.

**Figure 5: One BGP source IP address for the control plane per border gateway**



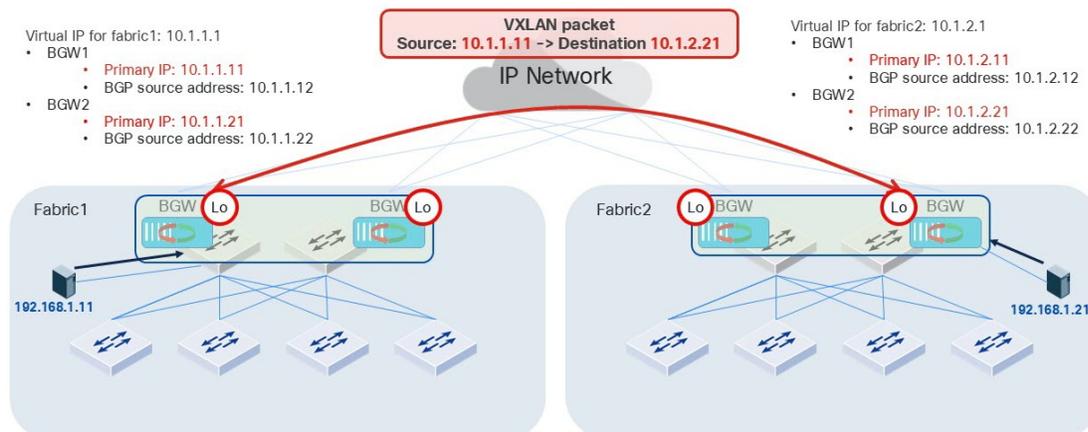
- Underlay BGP peering is between the border gateway interface and external routers to get the required loopback IP addresses above routable between the fabrics. The fabric administrator
  - selects border gateway ports and configures the IP addresses of the ports
  - connects the border gateway ports to the external routers, and
  - configures the underlay BGP peers between the border gateway ports and the external routers.

**Figure 6: Underlay BGP peering**



- Each border gateway requires one primary IP address to support hosts, port channels or routed ports directly attached to the border gateway. This configuration is reserved for a future feature enhancement.

Figure 7: One primary IP address per border gateway



## Create a Multi-Site interconnect

To begin the process of interconnecting multiple fabrics, the network administrator must create a Multi-Site interconnect. This task involves specifying the underlay IP MTU, selecting an authentication method, linking the desired fabrics to the interconnect, and configuring the VNI extensions.

Follow these steps to create a Multi-Site interconnect.

**Step 1** Choose **Multi-Site interconnects**.

**Step 2** Click + **Add new Multi-Site**.

- In the **Create a new Multi-Site** dialog, fill out the fields as necessary.
- For **Underlay IP MTU**, enter the MTU

The value must be between 1500 and 9100.

- For **Authentication method**, select one of the methods.

You will see additional fields depending on which method you selected.

- If you selected **MD5** for **Authentication method**, then for **Create a password** and **Confirm password**, enter a password.

The password must be between 7 and 126 characters in length.

- Click **Create**.

**Step 3** Link fabrics to the interconnect.

- Click the Multi-Site interconnect name.
- In **Fabric interconnects**, click + **Link Fabric**.
- For **Select fabric**, select a fabric.
- For **Virtual IP for fabric**, enter a virtual IP address for the fabric.

The virtual IP address is deployed as a loopback and the subnet is always /32.

- For **Fabric external ASN**, enter the autonomous system number (ASN) for the fabric.
- For **BGP source address**, enter the source IP addresses for each border gateway that you want to configure.

The IP address is deployed as a loopback and the subnet is always /32. You can have up to two border gateways per fabric.

- g) Click **Link**.
- h) Repeat this step for each fabric to link to this Multi-Site interconnect.

**Step 4** Choose **VNI extensions**, then click + **VNI extension (L2)**.

- a) For **L2 VNI extension name**, enter a name.
- b) For **Normalized VNI**, enter the VXLAN network identifier (VNI) to use with this VNI extension.
- c) For **Select fabric(s)**, select up to five fabrics that you linked under **Fabric interconnects**.
- d) Click **Add**.
- e) Repeat this step for each network.

**Step 5** Commit the changes.

See [Finish and commit your changes, on page 7](#).

### What to do next

The fabric administrator must establish the network. See [Establish the network for a Multi-Site interconnect, on page 6](#).

## Establish the network for a Multi-Site interconnect

After the network administrator creates a Multi-Site interconnect, the fabric administrator must establish the network.

Follow these steps to establish the network for a Multi-Site interconnect.

**Step 1** Choose **Fabrics**, then select the fabric for which you want to configure a border gateway.

**Step 2** Select **Multi-Site interconnects**.

**Step 3** Select **Edit**.

**Step 4** Configure a border gateway.

- a) In **Border gateway configuration**, in the area for the first switch, for **Switch**, select the switch that you want to use for the first border gateway.
- b) For the **Port** drop-down lists, select the border gateway ports that are connected to the external IP network that interconnects the other fabrics.

You must select at least one port and can select up to two ports.

- c) For the **IP address** fields, enter the Classless Inter-Domain Routing (CIDR) IP addresses for the border gateway ports.
- d) If you have a second border gateway IP address allocated from the Multi-Site interconnect configuration, repeat these substeps using the drop-down lists and fields in the area for the second switch.

**Step 5** Add one underlay BGP peer per border gateway switch port.

- a) In **Underlay peering configuration**, select + **Add underlay peer**.

Cisco Nexus Hyperfabric supports only TTL=1 for an underlay peer.

- b) For **Peer address & interface**, enter the IP address of the peer.
- c) For **Select a BGP source interface**, select the interface to use for the BGP source.
- d) In **Session**, for **Peer AS**, enter the autonomous system (AS) number of the peer.
- e) In **Security**, for **Authentication method**, select the method.
- f) (Optional) If you selected MD5, for **Create a password** and **Confirm password**, enter a password.

- g) Click **Save**.
- h) Repeat these substeps for each border gateway switch port.

- Step 6** Configure the VNI extensions.
- a) In **VNI extensions**, for **Local logical network**, select the logical networks to use for this Multi-Site interconnect.
  - b) For **Extend network**, leave the values as **Yes**.
  - c) Select **Save**.
- Step 7** Commit the changes.
- See [Finish and commit your changes, on page 7](#).
- Step 8** Repeat [Step 4, on page 6](#) and the successive steps for each fabric in the Multi-Site interconnect.

## Finish and commit your changes

Your changes are not applied to the fabric until you review, commit, and push them.



### Note

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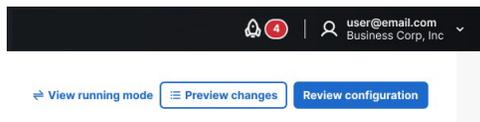
For a more detailed description of this procedure, see "Workflow for making changes to the fabric" in *Cisco Nexus Hyperfabric—Getting Started*.

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Follow these steps to finish and commit your changes.

- Step 1** Click **Review configuration**.

*Figure 8: Review configuration*



- Step 2** Verify your changes in the review list.
- Step 3** Click **Comment and push**.
- Step 4** In the **Comment before pushing configuration** dialog box, enter the reason for the change.
- Step 5** Click **Push configuration**.

## View the status of a Multi-Site interconnect

Follow these steps to view the status of a Multi-Site interconnect.

- Step 1** Choose **Fabrics**, then select the fabric for which you want to view the status of a Multi-Site interconnect.
- Step 2** Select **Multi-Site interconnects**.
- Step 3** In **Configuration**, select **Border gateways**.
- a) In main area, expand the information for the switches.
    - If the **Admin state** and **Link state** are up, then the fabrics have connectivity to one another.

**Step 4** In **Configuration**, select **BGP peering**.

a) In main area, view the **Status** of the peers.

If a peer's status is `Established`, then the peering session between that border gateway and its BGP neighbor has been successfully formed and is operational.

## Frequently asked questions about Multi-Site

These are some frequently asked questions about multisite.

**Q: I created a Multi-Site, but the Multi-Site tab in the fabrics is not populated.**

A: You may not have committed some changes in the organization-wide Multi-Site instance, which behaves like a pseudo-fabric with its own commit process. Try to commit changes in the organization-level Multi-Site mesh and check back in the fabric.

**Q: Why do I need multiple IP addresses for border gateways?**

A: These addresses are used outside the fabric for border gateways (BGWs) to communicate with each other to establish Multi-Site connectivity. For more information, see [Required IP addresses for Multi-Site, on page 3](#).