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Cisco Nexus Hyperfabric — Terminology

Cisco Nexus Hyperfabric

The Cisco Nexus Hyperfabric is a fabric-as-a-service solution that allows you to design and build a physical network that is managed by a cloud-based service. Your network can start as small as a single switch and can grow to multiple locations, each with a fabric of many switches.

This document defines some of the terminology used for Cisco Nexus Hyperfabric.

Cisco Nexus Hyperfabric terminology

assertion

A statement used to test assumptions made by the system. If an assumed condition is true, the system is functioning as intended, which is a green assertion. If the condition evaluates to false, this is a red assertion that triggers an error or exception, alerting the operator to a potential failure or unexpected behavior. Assertions help ensure that the system is functioning as intended.

Assertions can be latched or unlatched, which affects whether an assertion becomes red when the assertion's condition evaluates to false. Generally, an assertion automatically becomes latched after 90 seconds. You can manually unlatch a latched assertion.

Example: Green and red, latched and unlatched assertion

When you bring up your fabric, the default port role is "Unused." Assume that there is no connection on Leaf1 Ethernet1_10. This results in the "Port link down" green assertion because the port role is "Unused." Even if you configure the port role to "Host" or "Routed," the "Port link unexpectedly down" red assertion is not raised because the port has never come up so far and the assertion is unlatched.

If Leaf1 Ethernet1_10 is set to "Routed" and it is UP, you will have the "Port link up" green assertion because the port role is "Host" and the port UP. If you then configure the port role to "Unused," the "Port link unexpectedly up" red assertion is raised because the assertion is latched, the port is UP, and the port's role is "Unused."

Example: Auto-latch assertion

Assume that you configured a BGP neighbor using the leaf switch Ethernet1_6 as the source port. Ethernet1_6 is set to "Routed" and it is UP. Initially, the "External BGP neighbor is up" assertion is unlatched. The assertion automatically becomes latched after 5 minutes. This results in the "External BGP neighbor is up" green assertion being raised if the BGP neighbor is established.

Example: Assertion suppression based on priority

Assume that Spine1 Ethernet1_1 (Fabric port) is UP and has the "Port not connected to expected neighbor" red assertion because of mis-cabling. Then, Spine1 Ethernet1_1 is set to Admin down, which raises the "Port link unexpectedly down" red assertion because the port that is set to "Fabric" is down. The "Port Connected to expected neighbor" assertion becomes "Unknown" because you must first fix the "Port link unexpectedly down" red assertion.

bind a device

The process by which an organization's administrator maps a physical device to a logical position in the fabric's blueprint. When a device is bound, Cisco Nexus Hyperfabric pushes the blueprint-specified configuration to the device.

blueprint

A conceptual design of a network fabric that fully specifies the topology, switch models, port types, connection types, interconnections, and network configuration of each switch. From the blueprint, a bill of materials and a cabling plan are generated.

claim a device

The process by which an organization's administrator proves possession of and registers a physical device to the organization.

exit node

During bring-up of the fabric, the fabric switch that has a working Internet connection to Cisco Nexus Hyperfabric. Other switches in the fabric can contact Cisco Nexus Hyperfabric through this switch.

fabric

A collection of switches specific to one organization, and each switch is specific to a single fabric. A fabric is the configuration and monitoring domain; users configure fabrics, not individual switches. A fabric is also a blueprint to which physical devices are bound and interconnected.

link aggregation control protocol

The link aggregation control protocol (LACP) is defined in the IEEE 802.3ad standard and enables devices to manage Ethernet channels between devices that conform to the standard. LACP facilitates the automatic creation of EtherChannels by exchanging LACP packets between Ethernet ports.

link layer discovery protocol

The link layer discovery protocol (LLDP) is a neighbor discovery protocol that is used for network devices to advertise information about themselves to other devices on the network. This protocol runs over the data-link layer, which allows two systems running different network layer protocols to learn about each other.

non-exit node

A node that does not have a direct connection to the Internet. A non-exit node uses the exit node as a proxy for its connection to the Internet.

organization

The basic unit of administration that may include one or more fabrics.

parking lot

A set of switches that are claimed to the organization but not yet bound to a fabric position. During a binding operation, these switches appear as a list of claimed switches that are available to be bound to a fabric position.

port channel

The port channel is a Layer 2 networking technology used to combine multiple physical Ethernet links into a single logical link. A basic port channel aggregates links from a single switch, while a multi-chassis port channel aggregates multiple physical links across a pair of switches, creating a single logical link.

port group

A port group is a collection of ports on a switch, and these ports have the same speed.

Figure 1: Example of port groups



The numbers in the illustration indicate the port groups, and each group contains two ports. The remaining ports are not part of any port group and you can set their speed independently.

port role

The type of connection provided by a port. These are the supported port roles:

- **Fabric**: Provides connectivity between fabric switches and allows for automatic discovery by peer switches.
- **Host**: Provides a Layer 2 connection to a server or other general network device.
- **Port channel**: Specifies that the port is a member of a port channel.
- **Routed**: Provides a Layer 3 connection to a router or other network device.
- **Unused**: Specifies that the port does not forward nor receive traffic.

rail group

A set of graphics processing units (GPUs). A rail group defines the number of GPUs per server and how the GPUs connect to a switch group. A typical rail group has eight GPUs per server.

server group

A set of servers that have the same role, such as GPU servers or storage servers. A server group defines how the servers are interconnected. A server tier contains one or more server groups.

switch group

A set of switches that have the same role, such as spine switches or leaf switches. Cisco Nexus Hyperfabric uses switch groups to define how the switches are interconnected. A switch tier contains one or more switch groups.

A switch group can contain switches with different fan directions, power supply units (PSUs), or other differences that do not affect cabling.

switch state

The operational status of a switch from delivery to being fully operational in the fabric of an organization. These are the states:

- **unclaimed**: The switch is not registered as being associated with any owner nor organization.
- **claimed**: An organization has proven that it has physical and administrative access to the switch.
- **unbound**: The switch has not been mapped to a logical position in a fabric blueprint.
- **bound**: The switch is mapped to a logical position in a fabric blueprint.

template

A template contains a pre-defined fabric topology, which you can use as the basis for creating a fabric blueprint. After you choose a template, you can customize the fabric as necessary. You can use a template to create a switch fabric or AI cluster.

tier

A fabric has one or more tiers, with more tiers allowing for higher scale deployments. When you create a tier, you specify whether the tier is for servers or switches. A switch tier contains one or more switch groups, while a server tier contains one or more server groups.

For example, a switch fabric with one tier has only leaf switches, while a switch fabric with two tiers has spine switches in one tier and leaf switches in the other tier.

user

A person who has access, either read-only, read-write, or administrator, to an organization and its fabrics. A user may belong to one or more organizations. A user can create an organization only if the user is not a member of any existing organization.