

Cloud Campus Fabric with BGP EVPN VXLAN CVD

Solution Design and Deployment Guide

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Introduction

With digitization, software applications are evolving from simply supporting business processes to becoming, in some cases, the primary source of business revenue and competitive differentiation. Organizations are now constantly challenged by the need to scale their network capacity to react quickly to application demands and growth. Another important aspect is security; since the campus network is used by people with different levels of access (e.g. employees, contractors, third parties, guests, etc.) and their BYOD devices to access these applications, the wired and wireless LAN capabilities should be enhanced to support those changing needs and ensure security compliance at the same time.

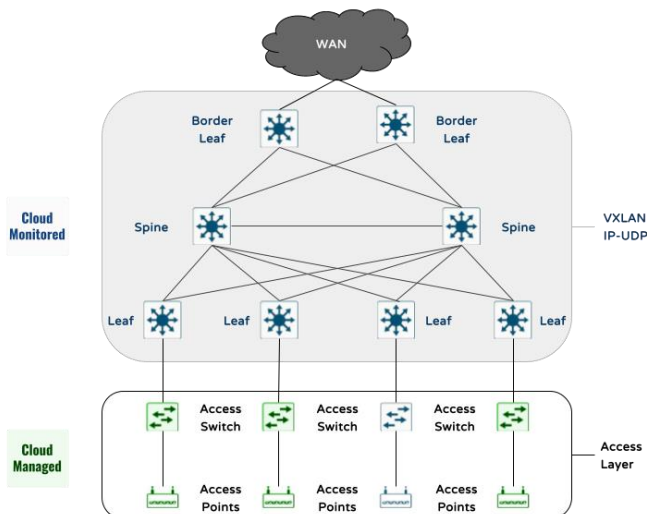
One of these enhancements is Fabric technology, which provides wired and wireless campus networks with programmable overlays and easy-to-deploy network virtualization, permitting a physical network to host one or more logical networks to meet the design intent. In addition to network virtualization, fabric technology in the campus network enhances control of communications, providing software-defined segmentation and policy enforcement based on user identity and group membership. Software-defined segmentation is seamlessly integrated using Cisco TrustSec® and Adaptive Policy technology, providing micro-segmentation for groups within a virtual network using Scalable Group Tags (SGTs).

On the other hand, managing the Campus network in the cloud offers great benefits such as reducing the operational complexity which in turn improves efficiencies and achieves business outcomes with end-to-end security and high scalability.

This document is intended to provide a solution design and deployment guide for organizations that are transitioning to the cloud, either partially or fully and desire a Cloud-first operating model for their campus fabric while leveraging Cisco Catalyst hardware and programmable Fabric as the building blocks for their campus network.

The proposed campus network solution in this document leverages the Cisco Programmable Fabric VXLAN with BGP EVPN technology and the Cloud Management and Monitoring for Catalyst aspects of the Meraki Dashboard as illustrated in the following conceptual diagram.

Figure 1. Cloud Campus Fabric with BGP EVPN VXLAN Concept Diagram



Outcomes and Requirements

The proposed Cloud Campus Fabric is expected to deliver on the following outcomes:

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- Control communications
 - Segmentation
 - Compliance
 - Performance
 - Cloud-first operating model

The following are the key requirements driving the evolution of existing campus networks.

Flexible campus for growth and scale (Test #1)

- Simplified deployment and automation (Wireless and Wired)—with single-pane of glass and provisioning APIs.
- Increased bandwidth needs—bandwidth aggregates using 10 Gbps Ethernet to 40 Gbps to 100 Gbps capacities over time.
- Increased capacity of wireless access points—WIFI 6 and WIFI 6E.
- Additional power requirements from Ethernet devices—The access layer design should have the ability to support Power over Ethernet (PoE) with 60W per port, offered with Cisco Universal Power Over Ethernet (UPOE), and as power demands continue to increase with new endpoints, IEEE 802.3bt and Cisco UPOE-Plus (UPOE+) can provide power up to 90W per port.

Integration Services and Security (unchanged)

- Consistent wired and wireless security capabilities—Security capabilities should be consistent whether a user is connecting to a wired Ethernet port or connecting over the wireless LAN.
- Network assurance and analytics—The deployment should proactively predict network-related and security-related risks by using telemetry to improve the performance of the network, devices, and applications.
- Identity services—Identifying users and devices connecting to the network provides the contextual information required to implement security policies for access control, network segmentation by using scalable group membership.
- Network virtualization—The capability to share a common infrastructure while supporting multiple VNs with isolated data and control planes enables different sets of users and applications to be isolated securely.
- Group-based policies—Creating access and application policies based on user group information provides a much easier and scalable way to deploy and manage security policies. Traditional access control lists (ACLs) can be difficult to implement, manage, and scale because they rely on network constructs such as IP addresses and subnets rather than group membership. Group membership is an IP-agnostic approach to policy creation which provides ease of operation for the network operator and a more scalable approach to ACLs.
- Software-defined segmentation—Scalable Group Tags assigned from group-based policies can be used to segment a network to achieve data plane isolation within physical and virtual networks.

Cisco Cloud Campus Fabric with BGP EVPN VXLAN Solution Components

The Cloud Campus Fabric solution is provided through a combination of Meraki Dashboard, the Cisco Identity Services Engine (ISE), and Catalyst wired platforms which have fabric functionality. As described later in this document, the **Catalyst 9500** and **9300** platforms are utilized to create the elements of the Campus Fabric whilst the **Catalyst 9300** and **9100** are utilized to create the elements of the Access Layer.

Meraki Dashboard

Cisco Meraki offers a comprehensive portfolio of cloud-managed IT solutions designed to work together to help deliver a modern network that is powerful, reliable, and easy to manage. This unique approach to IT aims to simplify powerful technology by reducing the overhead and costs associated with maintaining disparate solutions.

The Meraki cloud solution is a centralized management service that allows users to manage all their network devices via a single, simple and secure platform. Users can deploy, monitor, and configure their Meraki devices via the Meraki dashboard web interface or via APIs. The Meraki cloud is the backbone of the Meraki management solution. This "cloud" is a collection of highly reliable multi-tenant servers strategically distributed around the world at Meraki data centers. The servers at these data centers are powerful hosting computers comprised of many separate user accounts. They are called multi-tenant servers because the accounts share (equal) computing resources on their host (the server). Meraki ensures that customer information is kept secure by restricting organization access based on account authentication, as well as hashing authentication information such as user passwords or API keys.

The Meraki dashboard is a modern web browser-based tool used to configure Meraki devices and services. It is the visual alternative to the traditional command line, which is used to manage many routers, switches, security devices, and more. In addition to simplifying device management, the dashboard is also a platform for viewing network analytics, applying network permissions, and keeping track of users.

Here are some of the benefits of Meraki's Cloud Managed IT:

Simplified network management

- Initial Configuration & Deployment allowing IT to benefit from a zero-touch deployment model.
- Management of the enterprise campus providing detailed insight into the health and performance of the network through a variety of unique features, tools, and proactive alerting.
- Support & Maintenance with logging, alerting, and debugging tools that are all built directly into each product, and are easily accessible via the Dashboard, or a variety of other services such as notifications or network summary reports including things such as anomalies.

End to end visibility

- Visibility and insight into the health of the services being delivered.
- Network trends and anomalies.
- Network Topology.

Streamline network operations

- Built-in operational tools for incident and problem management.
- Network sync and other configuration management tools such as templates.
- Native integrations with other Cisco platforms such as SSE, XDR, ISE, etc.

Enhanced security

- Meraki leverages technology such as secure boot, firmware image signing, and hardware trust anchors as part of the Cisco Secure Development lifecycle to maintain hardware and software integrity.
- Encrypted data between devices and the Cloud.
- Two factor authentication and Single Sign On, login history and change log.

Improved network reliability

- An expansive set of monitoring and logging tools, built directly into the Dashboard.
- Management data storage such as application usage, configuration changes, and event logs within the backend system.
- High Availability architecture in several ways to ensure serviceability with high bandwidth resilient connects, data center backups and resilient management servers.

Note: For additional information about the Meraki Cloud Architecture please refer to this [article](#). Test #4

Identity Services Engine

Cisco Identity Services Engine (ISE) is a secure network access platform enabling increased management awareness, control, and consistency for users and devices accessing an organization's network. ISE is an integral and mandatory component of campus for implementing network access control policy. ISE performs policy implementation, enabling dynamic mapping of users and devices to scalable groups, and simplifying end-to-end security policy enforcement. Within ISE, users and devices are shown in a simple and flexible interface. ISE integrates with the Meraki Dashboard by using ISE connector which is based on REST APIs (Representational State Transfer Application Programming Interfaces) for synchronization and automation of policy configurations.

The Cloud Campus Fabric solution integrates Cisco TrustSec and Adaptive Policy by supporting end-to-end group-based policy with Scalable Group Tags (SGTs). Scalable Group Tags are a metadata value that is transmitted in the header of fabric- encapsulated packets. While SGTs are administered by Cisco ISE through the tightly integrated REST APIs, Meraki Dashboard is used as the pane of glass to manage and create SGTs and define their policies. Policy management with identity services is enabled in Cloud Campus Fabric network using ISE integrated with Meraki Dashboard for dynamic mapping of users and devices to scalable groups. This simplifies end-to-end security policy management and enforcement at a greater scale than traditional network policy implementations relying on IP access-lists.

Note: For additional information about the ISE, please refer to the following [ISE 3.2 documentation](#).

Cisco Catalyst 9k Platforms

Catalyst 9200

Cisco® Catalyst® 9200 Series switches extend the power of intent-based networking and Catalyst 9000 hardware and software innovation to a broader set of deployments. Catalyst 9200 Series switches provide security features that protect the integrity of the hardware as well as the software and all data that flows through the switch. It provides resiliency that keeps business up and running seamlessly. Combine that with open APIs of Cisco IOS XE® and programmability of the UADP ASIC technology, Catalyst 9200 Series ensures investment protection on future innovations.

With full PoE+ capability, power and fan redundancy, stacking bandwidth up to 160 Gbps, modular uplinks, Layer 3 feature support, and cold patching, Catalyst 9200 Series switches are the industry's unparalleled solution with differentiated resiliency and progressive architecture for cost-effective branch-office access.

Catalyst 9200 Series switches also provide operational choice of CLI, Cisco® Catalyst® Center (formerly Cisco DNA Center) on-premises management, or cloud monitoring for Catalyst on Meraki dashboard.

Catalyst 9300

Cisco® Catalyst® 9300 Series switches are Cisco's lead stackable enterprise access switching platform and as part of the Catalyst 9000 family, are built to transform your network to handle a hybrid world where the workplace is anywhere, endpoints could be anything, and applications are hosted all over the place.

The Catalyst 9300 Series, including the new Catalyst 9300X models, continues to shape the future with continued innovation that helps you reimagine connections, reinforce security and redefine the experience for your hybrid workforce big and small. With Catalyst 9300 switches, you choose how you want to manage your network – on-premises, virtual or from the cloud.

Note: Catalyst 9300-M models are identical to 9300 series in hardware specifications. However, it ships with the Meraki persona (i.e. Meraki feature-set) preloaded for zero touch provisioning with the Meraki Dashboard. Please refer to [documentation](#) for further feature and software details. Test #1 wrapping

Catalyst 9500

The Cisco® Catalyst® 9500 Series switches including the Catalyst 9500X models, continues to shape the future with continued innovation that helps you reimagine connections, reinforce security and redefine the experience for your hybrid workforce big and small. Cisco® Catalyst® 9500 Series switches based on Cisco Unified Access Data Plane (UADP) Application-Specific Integrated Circuit (ASIC) are Cisco's lead fixed enterprise core and aggregation switching platform and as part of the Catalyst 9000 family, are built to transform your network to handle a hybrid world where the workplace is anywhere, endpoints could be anything, and applications are hosted all over the place.

Cisco® Catalyst® 9500X switch based on Cisco Silicon One Q200 ASIC is purpose built for the next generation core with a programmable pipeline (P4) and is the first network silicon to offer switching capacity up to 12.8 Tbps full duplex in the enterprise. The Q200 ASIC offers high-performance along with full routing and switching capabilities without external memories. This is enabled by internal architecture that includes an on-chip High Bandwidth Memory (HBM). The Catalyst 9500X switch leverages a high-performance multiple core x86 CPU and is Cisco's leading purpose-built fixed core and edge services enterprise switching platform, built for security, IoT, and cloud.

Cisco® Catalyst® 9500X switch is the industry's first purpose-built fixed 10, 25, 50, 40, 100, 200 and 400 Gigabit Ethernet switch targeted for the enterprise campus. Catalyst 9500 Series switches provide operational choice of Cisco Catalyst Center, or Meraki cloud monitoring.

Catalyst Wireless 9100

Cisco® Catalyst® 9166/64/62 Wi-Fi 6E access points enable operation in the 6GHz band to produce a network that is more reliable and secure, with higher throughput, more capacity, and less device interference. Operational management is flexible because customers can change their network management whenever they want. If a network with Cisco Catalyst 9100 Series Access Points was originally an on-premises deployment, it can be changed to cloud-based management without the need to purchase and redistribute additional hardware, saving you money as you network your way.

With the industry's leading on-premises network platform (Catalyst) joining the industry's leading cloud IT platform (Meraki), these access points provide an unparalleled network experience. For organizations that

need a wireless solution to deliver a reliable, flexible, and superior experience for your users, the Cisco® Catalyst® 9100 Series Access Points are the best choice.

Note: Catalyst 9100-M models are identical to 9100 series in hardware specifications. However, it ships with the Meraki persona (i.e. Meraki feature-set) preloaded for zero touch provisioning with the Meraki Dashboard. Please refer to [documentation](#) for further feature and software details.

Catalyst Wireless 9800

Cisco® Catalyst® 9800 Series Wireless Controllers are based on an open, programmable architecture with built-in security, streaming telemetry, and rich analytics. The controllers are always on, are secure, and can be deployed anywhere—three pillars of network excellence that strengthen the network by providing the best wireless experience without compromise, while saving time and money.

Always on

- High availability and seamless software updates, enabled by hot patching, keep your clients and services always on in planned and unplanned events.
- Bug fixes, access point deployment at multiple sites, network updates, and more can be handled without rebooting the controller or impacting the operation of the networks.

Secure

- Wireless infrastructure becomes the strongest first line of defense with Encrypted Traffic Analytics and Cisco Software-Defined Access.
- The controllers come with built-in security to secure the controller and the network: Secure Boot, runtime defenses, image signing, integrity verification, and hardware authenticity.

Flexible deployment

- Whether your deployment choice is an on-premises solution or a cloud deployment solution, the Cisco Catalyst 9800 Series Wireless Controllers allow for management and deployment of the controller anywhere

Whether your deployment choice is an on-premises solution or a cloud deployment solution, the Cisco Catalyst 9800 Series Wireless Controllers allow for management and deployment of the controller anywhere. The Cisco Catalyst 9800 Series Wireless Controllers support open and programmable APIs that enable flexible management and automation of your day-0 to day-N network operations. Model-driven streaming telemetry provides deep insights into your network and client health.

And when you manage your network with Cisco Catalyst Center, you can begin to take advantage of some truly cutting-edge Artificial Intelligence/Machine Learning features. Unfolding AI/ML over your wireless deployment, Cisco Catalyst Center provides your next step in terms of increased performance, better efficiency and greater cost savings. This allows for considerable network improvements in visibility, including troubleshooting and security. AI/ML turns data into intuition, resulting in time savings and greater efficiency.

Note: For additional information about Cisco Catalyst 9K series switches, please refer to the following datasheets: [Catalyst 9200](#), [Catalyst 9300](#), [Catalyst 9300-M](#), [Catalyst 9500](#), [Catalyst Wireless 9162](#), [9164](#), [9166](#), [Catalyst Wireless 9162-M](#), [9164-M](#), [9166-M](#) and [Catalyst Wireless 9800](#).

BGP EVPN VXLAN Fabric Architecture

For many years now, VLANs have been the de-facto method for providing network segmentation in campus networks. Standardized as IEEE 802.1Q, VLANs leverage traditional loop prevention techniques such as Spanning Tree Protocol which not only imposes restrictions on network design and resiliency, but it also results in an inefficient use of available network links due to the blocking of redundant paths, required to ensure a loop free network topology.

At its core, VXLAN provides benefits of elastic workload placement, higher scalability of Layer 2 segmentation, and connectivity extension across the Layer 3 network boundary. Multi-Protocol Border Gateway Protocol (MP-BGP) introduced new Network Layer Reachability Information (NLRI) to carry both Layer 2 MAC and Layer 3 IP information at the same time. By having the combined set of MAC and IP information available for forwarding decisions, optimized routing and switching within a network becomes feasible. The extension that allows BGP to transport Layer 2 MAC and Layer 3 IP information is called EVPN – Ethernet Virtual Private Network.

The advantages provided by BGP EVPN VXLAN are as follows:

Standard based

- Standard-based Overlay (VXLAN) with standard-based control plane (BGP)

Optimized Forwarding

- Layer 2 MAC and Layer 3 IP information distribution by control plane (BGP)
- Forwarding decision based on scalable control plane (minimizes flooding)
- Integrated Routing/Bridging (IRB) for Optimized Forwarding in the Overlay

Efficient Bandwidth Utilization

- Leverages Layer 3 ECMP – all links forwarding – in the underlay

Scalability

- Significantly larger namespace in the overlay (16M segments)

Roles and Terminology

A CLOS (a type of nonblocking, multistage switching network used today in large-scale switching fabrics) based Spine-Leaf architecture is used in the Programmable Fabric solution. The various components and their roles are described below:

Spine switch

- IP transport forwarder between Leaf switches (East-West).
- Potentially hosting Rendezvous-Point (RP) for the underlay.
- Potentially hosting BGP Route-Reflector (RR) for EVPN.
- Does not require the VTEP functionality.
- Interconnects leaf switches and border leaf switches.

Leaf switch (aka ToR or VTEP)

- VXLAN edge device to which end hosts are attached. The end hosts include virtual and physical/bare metal servers, FEX devices, 3rd party switches, UCS FI, controllers, and blade switches.

- Routes or bridges Classic Ethernet frames and encapsulates them into VXLAN.
- Requires the VTEP functionality.

Border Leaf/Spine switch

- VXLAN edge device for external connectivity.
- Routes and bridges Classical Ethernet frames from an outside network and encapsulate them into VXLAN (North-South).
- Decapsulate MPLS PE/LISP traffic from an outside network and re-encapsulates it into VXLAN (North-South).
- Speaks IGP/EGP routing protocols with the outside network (North-South).
- Requires the VTEP functionality.
- Interface options are physical routed ports, sub interfaces, and VLAN SVIs over trunk ports.
- IPv4/IPv6 route exchange with external neighbors.

Border Spine switch (additional functions unique to border spine)

- IP transport forwarder between Leaf switches (East-West).
- Potentially hosting Rendezvous-Point (RP) for the underlay.
- Potentially hosting BGP Route-Reflector (RR) for EVPN.

Note: Another role could potentially exist which is the Services Leaf switch – (This option does not need a dedicated pair of leaf switches and could be any combination of a leaf switch VTEP and a next-hop router) on which you can run the following services: Firewalls, Load balancers, Proxy services or IPS services.

IP Fabric Overlays (VXLAN)

An overlay network is a virtual network that is built over an existing Layer 2 or Layer 3 network by forming a static or dynamic tunnel that runs on top of the physical network infrastructure. The existing Layer 2 or Layer 3 network is what forms the underlay and is covered further below in this document.

When a data packet is sent through an overlay, the original packet or frame is packaged or encapsulated at a source edge device with an outer header and dispatched toward an appropriate destination edge device. The intermediate network devices forward the packet based on the outer header but are not aware of the data in the original packet. At the destination edge device, the packet is decapsulated by stripping off the overlay header and then forwarded based on the actual data within.

In the context of BGP EVPN VXLAN, VXLAN is used as the overlay technology to encapsulate the data packets and tunnel the traffic over a Layer 3 network. VXLAN creates a Layer 2 overlay network by using a MAC-in-UDP encapsulation. A VXLAN header is added to the original Layer 2 frame, and it is then placed within a UDP-IP packet. A VXLAN overlay network is also called as a VXLAN segment. Only host devices within the same VXLAN segment can communicate with each other.

Note: Each VXLAN segment is identified through a 24-bit segment ID, termed the VXLAN network identifier. This ensures that up to 16 million VXLAN segments can be present within the same administrative domain.

VXLAN is a MAC in IP/UDP overlay that allows layer 2 segments to be stretched across an IP core. All the benefits of layer 3 topologies are thereby available with VXLAN including the popular layer-3 ECMP feature for efficient traffic spread across multiple available paths. The encapsulation and decapsulation of VXLAN headers is handled by a functionality embedded in VXLAN Tunnel End Points (VTEPs).

VXLAN natively operates on a flood-n-learn mechanism where BU (Broadcast, Unknown Unicast) traffic in a given VXLAN network is sent over the IP core to every VTEP that has membership in that network. There are two ways to send such traffic: (1) Using IP multicast (2) Using Ingress Replication or Head-end Replication (HER). The receiving VTEPs will decapsulate the packet and based on the inner frame perform layer-2 MAC learning. The inner SMAC is learnt against the outer Source IP Address (SIP) corresponding to the source VTEP. In this way, reverse traffic can be unicasted toward the previously learnt end host. However, this poses a huge limitation since the broadcast domain spans a much larger boundary across an IP core where floods are translated to IP multicast (or HER). Consequently, the flood-n-learn based scheme presents serious scale challenges especially as the number of end hosts go up. This is addressed via learning using a control-plane for distribution of end host addresses. The control plane of choice is MP-BGP EVPN. Specifically, within BGP, the EVPN address family is employed to carry MAC and IP address information of the end hosts along with other information such as the network and tenant (aka VRF) to which they belong. This allows optimal forwarding of both layer-2 and layer-3 traffic within the fabric.

Fabric Control Plane (MP-BGP EVPN)

In a VXLAN-EVPN based fabric, MAC learning occurs via the control plane (MP-BGP) instead of the data plane. When a new end host is attached to a VTEP, the VTEP advertises the MAC and IP address of the end host to a route reflector which in turn advertises it to the other VTEPs through MP-BGP. Since MP-BGP enables isolation of groups of interacting agents, hosts that belong to the same tenant are logically isolated from other tenants.

There are many reasons and benefits for using MP-BGP EVPN as the control plane:

Reduce flooding

- Since the number of end hosts attached to VTEPs is huge, a mechanism is required to reduce flooding for discovery of end host location and resolution information. This is achieved via MAC/IP binding information distribution.
- MAC address distribution eliminates (or reduces) unknown unicast flooding because MAC addresses are prepopulated.
- MAC to IP binding information helps in local ARP suppression.

Distributed Anycast Gateway (DAG)

- For a given subnet, the same default gateway with the same IP and MAC address is realized simultaneously thereby ensuring the default gateway for the end hosts is always at its closest point aka its directly attached switch (in this case the leaf switch)
- This ensures that routed traffic is also optimally forwarded within the fabric without going through any hair-pinning.

Mobility support

- The control plane supports transparent mobility within and across BGP EVPN VXLAN fabrics, and quickly updates reachability information to avoid hair-pinning of east-west traffic.
- The distributed anycast gateway also aids in supporting transparent mobility since post its move, the ARP cache entry for the default gateway is still valid.

Secure VTEPs

- In a VXLAN-EVPN fabric, traffic is only accepted from VTEPs whose information is learnt via the BGP-EVPN control plane. Any VXLAN encapsulated traffic received from a VTEP that is not known via the control plane will be dropped. In this way, this presents a secure fabric where traffic will only be forwarded between VTEPs validated by the control plane. This is a major security hole in data-plane based VXLAN flood-n-learn environments where a rogue VTEP has the potential of bringing down the overlay network.

Note: An EVPN Instance (EVI) represents a Virtual Private Network (VPN) on a VTEP. It is the equivalent of IP VRF in Layer 3 VPN and is also known as a MAC VRF.

On the other hand, the benefits of using BGP as the routing protocol:

Increased flexibility

- EVPN address family carries both Layer-2 and Layer-3 reachability information. So, you can build bridged overlays or routed overlays. While bridged overlays are simpler to deploy, routed overlays are easier to scale out.

Increased security

- BGP authentication and security constructs provide more secure multi-tenancy.

Increased convergence time

- BGP being a hard-state protocol is inherently non-chatty and only provides updates when there is a change. This greatly improves convergence time when network failures occur.

BGP policies

- Rich BGP policy constructs provide policy-based export and import of reachability information. It is possible to constrain route updates where they are not needed thereby realizing a more scalable fabric.

Route reflectors

- Increases scalability and reduces the need for a full mesh (coverage) of BGP sessions.
- A route reflector in an MP-BGP EVPN control plane acts as a central point for BGP sessions between VTEPs. Instead of each VTEP peering with every other VTEP, the VTEPs peer with a spine device designated as a route reflector.
- For redundancy purposes, an additional route reflector is designated.

Unicast Underlay

The primary purpose of the underlay in the VXLAN EVPN fabric is to advertise the reachability of Virtual Tunnel End Points (VTEPs) and BGP peering addresses. The primary criterion for choosing an underlay protocol is fast convergence in the event of node failures.

From an underlay/overlay perspective, the packet flow from a host to another over the Virtual Extensible LAN (VXLAN) fabric comprises of these steps:

1) Host sends traffic to source VXLAN tunnel endpoint (VTEP)

Tech tip: Please note the difference between bridged and routed traffic; 1a) For bridged traffic in the same broadcast domain, the VTEP will have received the frame on the ingress port and look up the destination MAC. If the destination MAC is local to the VTEP, it will locally switch the frame as usual. If the destination MAC is connected to another VTEP,

it derives the nexthop IP of that VTEP and the L2 VNI number. The far-end VTEP will use the L2 VNI number to determine which VLAN to bridge the frame in. 1b) For routed traffic sent to the default gateway, the VTEP will perform the routing lookup. If the destination host is local to the VTEP, it will route the frame as usual. If the destination host is connected to another VTEP, it derives the nexthop IP of that VTEP and the L3 VNI. The far end VTEP will use the L3 VNI number to determine which routing table to lookup the destination host in. (Far-end VRF) Test #1

2) The VTEP encapsulates the traffic (frames) into VXLAN packets (overlay function) and signals the underlay IP network

3) Based on the underlay routing protocol, the packet is sent from the source VTEP to destination VTEP through the IP network (underlay function)

4) The destination VTEP removes the VXLAN encapsulation (overlay function) and sends traffic to the intended destination.

The VTEPs are a part of the underlay network as well since VTEPs need to be reachable to each other to send VXLAN encapsulated traffic across the IP underlay network.

OSPF Underlay IP Network

An underlay network is the physical network over which the virtual overlay network is established. Once the overlay network is defined along with the data-plane encapsulation, a method of transport is required to move the data across the physical network underneath. This method of transport is typically an underlay transport network, or simply the underlay.

In BGP EVPN VXLAN, the underlay Layer 3 network transports the VXLAN-encapsulated packets between the source and destination VTEPs and provides reachability between them. The VXLAN overlay and the underlying IP network between the VTEPs are independent of each other.

There are several options for the Unicast routing and IP addressing options on the underlay network (e.g. OSPF, IS-IS, eBGP, etc.) OSPF is one of the most common options due to its simplicity and common use across different devices.

Planning and Preparation for Deployment

It is important to ensure proper network connectivity for all required services in this design (e.g. Meraki Management Tunnel) which might require attention to the configuration on the upstream and/or network edge devices. Micro-segmentation is achieved in this design by leveraging address-families in the MP-BGP protocol, ensuring that tenants in different segments are isolated in separate routing instances.

However, it is recommended to configure Scalable Group Tags (SGTs) and Security Group Tag Access lists (SGACLs) to manage the end-to-end network segmentation leveraging Cisco Identity Services Engine (ISE) and Adaptive Policy.

The following section explores the other main considerations for when planning for deployment.

Meraki Cloud Administration and Management

- If you don't have an account on the Meraki Dashboard, create one following these [steps](#).
- An API Key will be required for onboarding Catalyst devices to your dashboard account. If you don't have an API Key already, create one following these [steps](#).

Note: API key must have full read/write access for the organization to which switches will be onboarded. Note indent Test #1

- [Claim](#) your order(s) or serial number(s) into your Meraki Dashboard account.
- Add your devices to existing networks or [create new networks](#) as required.
- Configure [firmware upgrades](#) for your network(s) with latest Stable or RC releases for each device type (Please check the firmware changelog for platform-specific details).
- Configure your network(s) with the correct time-zone from **Network-wide > Configure > General** (This is key for reporting and firmware upgrades).
- Configure your network(s) with the desired [upgrade](#) date and time.
- Ensure that only current administrators are added with the correct [permissions](#) on the Meraki dashboard (unless [SAML](#) is configured for Single Sign-on).
- If using [Single sign-on](#) integration with Meraki dashboard, please ensure that login to dashboard is scoped such that administrators have the correct level of access where applicable (e.g. Per network, Per switch port, etc.). For more information about dashboard access roles, please refer to the following [article](#).
- In case of SAML SSO, it is still required to have one valid administrator account with full rights configured on the Meraki dashboard. However, it's recommended to have at least two accounts to avoid being locked out from dashboard.
- Where applicable, ensure that the designated [Management VLAN](#) has access to DHCP (at least during initial bootup before assigning a static IP address) and also to the internet.
- Please ensure you have the required licenses (e.g. Advanced/Advantage for Adaptive Policy). For more information about license requirements, please refer to the following [article](#).

Meraki Cloud Access

- Ensure that your Campus LAN has access to the internet for management purposes.
- Ensure that Meraki Cloud is accessible and that all [required ports](#) are opened where applicable (information can also be found in Dashboard under firewall info section).
- Ensure that there is sufficient bandwidth for firmware upgrades as they tend to be large in size.

Dashboard Administration for Wireless

- Ensure that your Campus LAN has access to the internet for management purposes.
- Configure the Wireless [upgrade behavior](#) as desired.
- By default, all management traffic is sourced by the Management IP address (Cloud, Radius/ISE, SNMP, Syslog) assigned to the access point. If there is a desire to configure an alternate Management Interfaces, please refer to this [article](#) and in this case ensure that this is reflected in your design (e.g. Cisco ISE).

Note: For further information about Dashboard administration for wireless, please refer to this [MR – Wireless LAN](#) section on [Meraki Documentation](#).

Dashboard Administration for Switches

- Please note that all switches within the same network will use the same Management VLAN unless changed statically on a per switch bases.
- Ensure that the configured Management VLAN is applicable to all switches within the same dashboard network, otherwise change it per switch following these [steps](#).
- By default, all management traffic is sourced by the Management IP address (Cloud, Radius, SNMP, Syslog) assigned to the switch. If there is a desire to configure an alternate Management Interfaces, please refer to this [article](#) and in this case ensure that this is reflected in your design (e.g. Cisco ISE).

Note: For further information about Dashboard administration for switches, please refer to this [MS – Switches](#) section on [Meraki Documentation](#).

Cloud Monitoring for Catalyst Switches

- Please ensure that your Catalyst switch(es) is one of the [supported platforms](#).
- Catalyst switch(es) must be running IOS XE **17.3 - 17.10.1** (Software can be downloaded from [here](#), and please refer to this [article](#) for IOS XE image upgrade).
- All switches must be running a valid Cisco DNA Software subscription.

Note: Dashboard Client traffic analytics powered IOS XE AVC is available only with a Cisco DNA Advantage license. For more information about DNA Software license upgrade, please refer to this [FAQ](#) article.

- The management interface is **not** supported for onboarding Catalyst switches.
- At least **one** SVI needs to be configured with access to the internet on **TCP port 443**.
- A valid **DNS server** must be configured on your switch(es), and DNS lookup must be **enabled**.
- **NTP** must be enabled on your switch(es).
- AAA must be configured with **aaa new-model**
- **SSH** access must be enabled for the onboarding process. The account used must have privilege-15 level.
- **Telnet** is required for connectivity pre-checks.
- The switch(es) must have 4 unused consecutive **VTY** slots.
- If you are using the [onboarding app](#), then please ensure that the environment used to run the app has access to the internet on **TCP port 443**.

- Make sure you **backup** your switch(es) configuration before onboarding them to Cloud Monitoring.

Note: For further information about onboarding Catalyst Switches for Cloud Monitoring, please refer to this [article](#).

Cloud Monitoring for Catalyst Wireless

- Please ensure that Catalyst Wireless LAN Controller and Access Point(s) is one of the [supported platforms](#).
- It is recommended to run IOS XE **17.15.1 or higher** on the Wireless LAN Controller.
- AAA must be configured with **aaa new-model**
- The Wireless LAN Controller account used in Dashboard must have **privilege-15** level.
- The Wireless LAN Controller must have 4 unused consecutive **VTY** slots.
- One of the supported **SSH** algorithms must be configured on the Wireless LAN Controller
- Access points require a Cisco DNA Essentials or Advantage license.
- Please pay attention to the restrictions for onboarding Catalyst Wireless (e.g. Mixing MR and un-managed CW access points in the same Dashboard network is not supported).
- Catalyst 9800 wireless controllers license level add-on enabled for DNA Essentials or Advantage. Dashboard Client traffic analytics powered IOS XE AVC is available only with a Cisco DNA Advantage license.

Note: Dashboard Client traffic analytics powered IOS XE AVC is available only with a Cisco DNA Advantage license. For more information about DNA Software license upgrade, please refer to this [FAQ](#) article.

Note: Claiming Wireless LAN Controllers in Dashboard organizations running Per-Device licensing is **not** supported.

- Please ensure that Wireless LAN Controller is running up to the [maximum number](#) of supported access points for Cloud Monitoring.
- Please ensure that the Wireless LAN Controller has access to the Cloud. Please refer to this [article](#) for further information.
- It is recommended for Meraki Tunnel traffic to be exempt from TLS/SSL traffic inspection in order to avoid potential connectivity issues.

Note: For further information about onboarding Catalyst Wireless for Cloud Monitoring, please refer to this [article](#).

Cloud Management for Catalyst Switches

- Several Catalyst 9300 platforms can be migrated to Meraki management mode.
- When migrating Catalyst 9300 platforms to Meraki management mode, please ensure you take a backup of all device files as they will be wiped during the migration process.

Note: Catalyst 9300-M, 9300L-M and 9300X-M platforms do not need to be migrated as they are pre-shipped with Meraki management mode.

Note: For further information about migrating Catalyst 9300 platforms for Cloud Management, please refer to this [article](#).

Cisco Identity Services Engine (ISE)

- Cisco ISE and cloud-based Cisco Meraki are TrustSec-enabled systems that are policy administration points for TrustSec policies. If you use both Cisco and Meraki network devices, you can connect one or more Cisco Meraki dashboards to Cisco ISE to replicate TrustSec policies and elements from Cisco ISE to the Cisco Meraki networks belonging to each organization.
- The TrustSec Integration for Cisco Meraki is an on-premises service that runs on the primary PAN. If a failover occurs, the integration service continues to function on the newly promoted primary PAN.
- You can only choose the TrustSec policies that conform to the supported formats for [Meraki Adaptive Policies](#).
- The TrustSec Integration for Cisco Meraki does not delete any policies or policy elements in Cisco Meraki. When you delete a policy or policy element in Cisco ISE, you must delete them in Cisco Meraki as well.
- If using an external Radius server (e.g. Cisco ISE), then ensure that the network segment where ISE is hosted can access the Management VLAN configured on your network devices (or the Alternate Management Interface on switches and/or access points if configured and where applicable).
- Ensure that all required ports are opened where applicable (e.g. 1812, 1813, etc.).

Note: For further information about deploying ISE, please refer to this [Performance and Scalability guide](#), [Installation guide](#) and [Deployment guide](#).

Note: When you connect Cisco ISE and a Cisco Meraki dashboard, if the two systems have different TrustSec policies that are configured for the same source and destination, the Cisco ISE TrustSec policy replaces the TrustSec policy in Cisco Meraki. Also please note that Cisco Meraki Policies can't be transferred to Cisco ISE.

Note: For syncing policies from Cisco ISE to Dashboard, please ensure that you have the Cisco ISE Advantage license.

Underlay

- Running IGP (e.g. OSPF) for Unicast Routing between the VTEPs.
- Use interface type point-to-point with OSPF.

- When deploying Multicast, ensure that the protocol is consistent across all switches (PIM-SM vs PIM-Bidir).
- Spine switches can potentially host **RP** (Rendezvous Point) for the underlay with MSDP.
- To improve the convergence experience in the RP failure scenario, the recommendation is to deploy Anycast RP, which consists of using a common IP address on different devices to identify the RP.
- Simple static RP mapping configuration is then applied to each node in the Fabric to associate multicast groups to the RP, so that each source or receiver can then utilize the local RP that is the closest from a topological point of view.
- Configuring ARP suppression can remove the need to flood ARP requests across the Fabric, which usually represents the large majority of L2 broadcast traffic.

Overlay

- Spine switches should be stacked where applicable.
- Spine switches can potentially host **RR** (Route Reflector) for the EVPN.
- Rationalize the number of VRFs by collapsing them where applicable for easier troubleshooting.
- Each Leaf switch should be multi-homed (i.e. connected to each Spine switch).
- Border Leaf switches running EGP routing protocol (e.g. eBGP).
- For IP Transport devices, their OS software needs to support MP-BGP EVPN.
- For VTEP devices, the switch needs to support both the control-plane and data-plane functions.

Access Layer

- Stacking Cloud Managed Access Switches (where applicable) could be beneficial in many situations. Please ensure you follow the correct steps for bringing the stack online. Further details can be found [here](#).
- In case of stacking Cloud Managed Access Switches, please ensure that **same** management IP address is configured on all stack members. This can be done in [Dashboard](#) or via the [local status page](#).

Tech tip: If required, IP addressing can be changed to different settings (e.g. Static IP address or a different management VLAN) on all stack members after the stack has been properly configured and is showing online on dashboard. Again, it is recommended to configure the same IP address on all switches to ensure that traffic uses the same IP during failover scenarios. For best practices on changing Cloud Managed switches IP addresses, please refer to this article. Test #1 and #4

- Cloud Managed devices (e.g. Switches, Access Points) will by default search for a DHCP server in **VLAN 1** unless changed.

Tech tip: Even if it is undesirable to use Native VLAN 1, it is recommended to use it for provisioning the switches for ZTP purposes. Once the switches/stacks are online on dashboard and running steady, you can then change the Management VLAN as required. Remember to change port settings downstream first to avoid losing access to switches. For more information about best practices, please refer to this [article](#).

- In case of a layer-2 Access Layer, please ensure STP interoperability across all switches and STP domain.

Note: For further information about STP interoperability across Cisco switches (e.g. Cloud Managed and Cloud Monitored), please refer to the STP in Cloud Campus section in this [article](#). It is recommended to run MST (802.1s) instance 0 / region 1 / revision 1 between Cloud Managed and Cloud Monitored Switches. Test #1 and #4

- All Cloud Managed Switch ports have the following default configuration: Trunk (802.1Q encapsulation, Native VLAN 1, MST enabled and will send management traffic to the cloud in VLAN 1 untagged)

Downlinks to Access Switches

- Leaf switch downlinks to access switches should be configured as **Trunk**.
- Allowing all VLANs on the Trunk port can simplify the design and will also simplify adding new services (e.g. VLANs) in the future. It is worth noting that sometimes it is required to prune un-used VLANs and only allow specific ranges on Trunk ports as this can be considered more secure. However, deploying Adaptive Policy eliminates this risk. Nonetheless, pruning VLANs on Trunk ports can also help reduce broadcast propagation.
- Configure a **native VLAN** where Cloud Managed devices (e.g. Switches, Access Points) can find a DHCP server.
- Please note that Cloud Managed devices (e.g. Switches, Access Points) will by default search for a DHCP server in **VLAN 1** for zero touch provisioning purposes unless changed.
- For Cloud Managed Switches; If using an [Alternate Management Interface](#), please ensure that this VLAN is enabled as well on the Trunk port.
- In a STP domain, downlinks to Access Switches must be configured with STP **Root Guard**.
- Where applicable, configure EtherChannels between Leaf switch and the access switch. Please ensure that the encapsulation is matched on both sides.

Note: Cloud Managed switches support LACP standard. For more information, please refer to this [article](#).

Tech tip: In a Cloud Campus Fabric deployment, micro-segmentation is maintained using TrustSec and Adaptive Policy. As such, it eliminates the requirement to prune VLANs on the downlinks for security purposes. Allowing all VLANs (unless reserved) could facilitate adding new services in the future (e.g. new SSIDs)

Downlinks to Access Points

- Leaf switch downlinks to access points should be configured as Trunk.
- Access switch downlinks to access point should also be configured as Trunk.
- Allowing all VLANs on the Trunk port can simplify the design and will also simplify adding new services (e.g. SSIDs) in the future. It is worth noting that sometimes it is required to prune un-used VLANs and only allow specific ranges on Trunk ports as this can be considered more secure. However, deploying Adaptive Policy eliminates this risk. Nonetheless, pruning VLANs on Trunk ports can also help reduce broadcast propagation.
- For Cloud Managed Access Points; If using an Alternate Management Interface, please ensure that this VLAN is enabled as well on the Trunk port.
- Configure a native VLAN where Cloud Managed devices (e.g. Switches, Access Points) can find a DHCP server.

-
- Please note that Cloud Managed devices (e.g. Switches, Access Points) will by default search for a DHCP server in VLAN 1 for zero touch provisioning purposes.

Tech tip: Even if it is undesirable to use Native VLAN 1, it is recommended to use it for provisioning the switches for ZTP purposes. Once the switches/stacks are online on dashboard and running steady, you can then change the Management VLAN as required. Remember to change port settings downstream first to avoid losing access to switches. For more information about best practices, please refer to this [article](#).

Cloud Campus Fabric with BGP EVPN VXLAN Design

Managing the enterprise campus in the Cloud offers several benefits to organizations that are looking for operational efficiency and speed of deployment. It helps organizations to streamline their network operations, improve the speed of deploying new services and enhance the network performance leveraging AI/ML in a scalable cloud-based platform. The proposed design and solution in this document is based on the Cloud Management and Monitoring for Catalyst aspects for Wired and Wireless LAN.

Note: For more information about Cloud Management and Monitoring for Catalyst, please refer to this [article](#) and this [FAQ](#) document.

The following sections highlights details related to the topology, hardware, software, and design selections that were made as part of the Cloud Campus Fabric with BGP EVPN VXLAN.

Use Cases

The proposed solution enables customers to run their Campus Fabric in the cloud in Management and monitoring modes. The access layer hanging off the leaf switches provides wired connectivity for the end users as well as connectivity to the wireless access points. To simplify the ongoing management of the fabric, the downlinks to the access layer will be configured as Trunk with all VLANs allowed. This will facilitate future expansions such as adding new SSIDs and/or VLANs. For the purposes of this document, the following use cases have been suggested. Please note that for illustration purposes, each floor is mapped to a unique use case.

Table 1. Network Segments and Design Use Cases

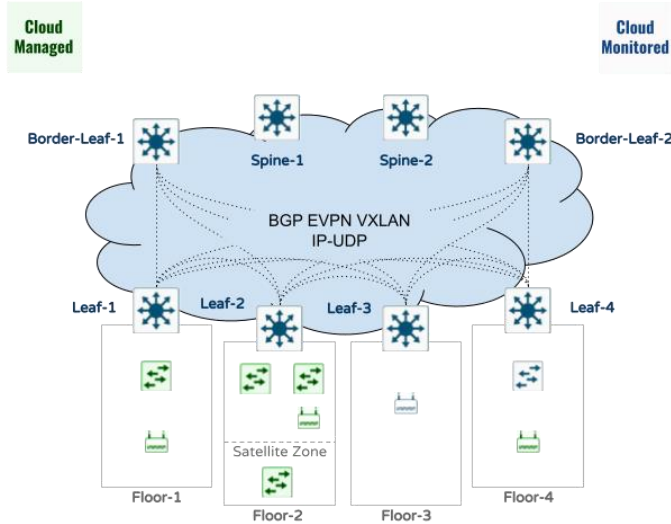
Segment	Requirements	Use Case	Management
Floor-1	• High performance wireless access • Wired connectivity for user workstations • Adequate PoE for WiFi6/6E applications • Cloud Management	Cloud Managed Access	Meraki Dashboard (Full Management)
Floor-2	• High performance wireless access • Wired connectivity for user workstations • Adequate PoE for WiFi6/6E and IoT applications • Extension to remote services (e.g. IoT) - (1) See Note below	Cloud Managed Access with a remote/satellite zone (e.g. IoT applications)	Meraki Dashboard (Full Management)
Floor-3	• High performance wireless access • Direct attach to Fabric • Cloud Monitoring	Cloud Monitored Access with Wireless LAN Controller(s)	Meraki Dashboard (Monitor only)
Floor-4	• High performance wireless access • Wired connectivity for user workstations • Adequate PoE for WiFi6/6E applications	Cloud Managed Access	Meraki Dashboard (Full Management)

Segment	Requirements	Use Case	Management
	Cloud Management		

Note: (1) Shown as “Satellite Zone” in the below diagram

Please refer to the below for the VXLAN overlay and the design use cases.

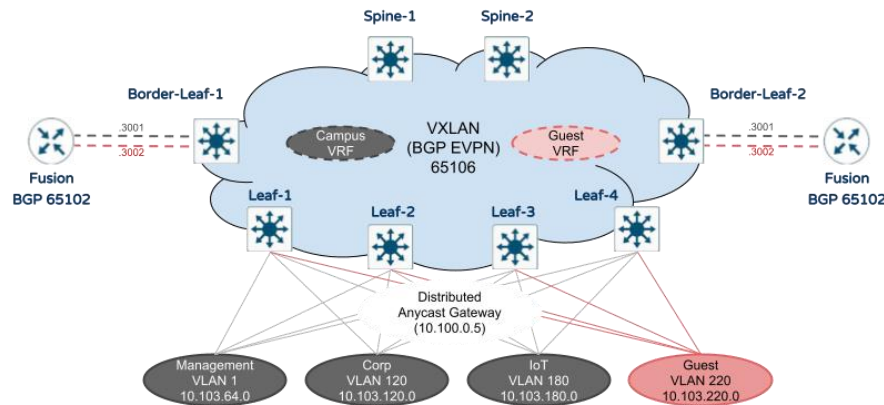
Figure 2. Cloud Campus Fabric Use Cases Diagram



Overlay and IP segments

The following diagram illustrates the mapping between IP segments and VRFs in the Overlay.

Figure 3. VXLAN Overlay Segmentation and Handoffs



Note: In the above diagram, Overlay Handoffs are using BGP address-family IPv4 VRF to external routers (Fusion Routers) to maintain the segmentation between Campus and Guest. This is not necessarily part of the Campus Fabric design. Please design your Overlay Handoffs based on your own requirements.

Note: The Distributed Anycast Gateway shown in the above diagram will be created on the leaf switches on a per VLAN bases which is not shown in the above diagram.

The following table summarizes the VLANs and their VXLAN mappings used in this design.

Table 2. VLANs and L2/L3 VNI Mappings

VLAN ID	Name	Subnet	Default Anycast Gateway	L2 VNI Mapping	L3 VNI Mapping	VRF
1	Management	10.103.64.0/24	MAC address = 0000.0000.0001 IP address = 10.103.64.1 Helper address = 10.100.0.5	200001	303001	Campus
120	Corporate	10.103.120.0/24	MAC address = 0000.0000.0120 IP address = 10.103.120.1 Helper address = 10.100.0.5	200120	303001	Campus
180	IoT	10.103.180.0/24	MAC address = 0000.0000.0180 IP address = 10.103.180.1 Helper address = 10.100.0.5	200180	303001	Campus
220	Guest	10.103.220.0/24	MAC address = 0000.0000.0220 IP address = 10.103.220.1 Helper address = 10.100.0.5	200220	303002	Guest

Note: The Default Anycast Gateway (DAG) will be configured on leaf switches for the above mentioned VLANs with a helper address of 10.100.0.5 and option 82.

Schema and Numbering Conventions

It is vital to have consistency when configuring the Campus Fabric and avoid overlapping where possible. This will help simplify the implementation and improve the operational efficiency since troubleshooting can be much easier. The following table outlines the proposed scheme and numbering conventions for the designs proposed within this document.

Table 3. Schema and Numbering Conventions for Cloud Campus Fabric

Item	Structure	Notes
LoopBack0	10.103.255.x	.1 & .2 reserved for Spine Switches .3 & .4 reserved for Border Leaf Switches .11 onwards reserved for Leaf Switches
Underlay	10.103.224.x	/30 subnet for each interconnect
Sub-interfaces	.x	.10 for trunks .x for overlay

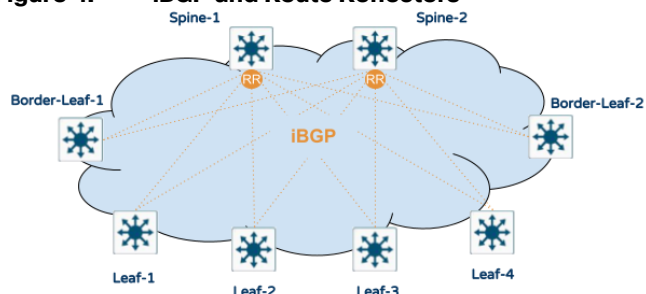
Item	Structure	Notes
L2VNI	20XXXX	XXXX = VLAN Identifier
L3VNI	30XXXX	XXXX = VLAN Identifier
Route Distinguisher (RD)	XXXXX:YY OR XXXXX:2YY	XXXXX = BGP AS# YY = Last octet of Loopback0 (e.g. 65106:11 for Campus on Leaf-01) XXXXX = BGP AS# YY = Last octet of Loopback0 (e.g. 65106:212 for Guest on Leaf-02)
Route Targets (RT)	XXXX:Y	XXXXX = BGP AS# Y = 1 for Campus, 2 for Guest
Hard Coded MAC address	0000.0000.XXXX	XXXX = VLAN Identifier

Note: The schema and numbering conventions mentioned in the above table are for illustration purposes only and to ensure consistency. Please plan your schemas according to your own requirements.

EVPN Control Plane

iBGP is the most common routing protocol deployed for the EVPN control plane in VXLAN Fabrics. With iBGP, there is a requirement to have a full mesh between all iBGP speakers. To help scale and simplify the iBGP configuration, it is recommended to implement iBGP Route Reflectors (RR). The placement of the iBGP route reflectors is recommended to be implemented on the spines as they are central to all leaf switches. In this case, two of the spines will have BGP route reflector configured, and all leaf switches will be configured as the BGP route reflector clients. The route reflector will reflect EVPN routes for the VTEP leaf switches. Please refer to the following diagram for iBGP peering.

Figure 4. iBGP and Route Reflectors



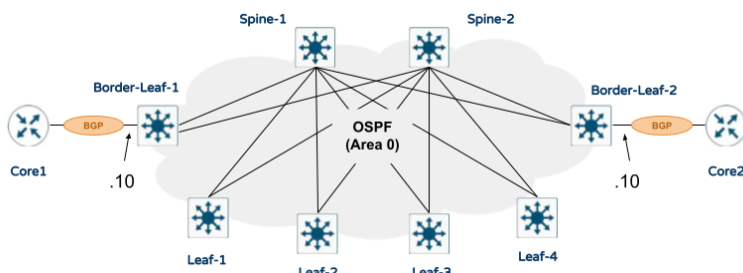
Note: Spines do not peer with each other.

Underlay

There are several options for the Unicast routing and IP addressing options on the underlay network (e.g. OSPF, IS-IS, eBGP, etc.) however for the purposes for this document, it will be referred to OSPF as the routing protocol on the underlay.

OSPF is a link-state routing protocol commonly used in enterprise environments. The OSPF default interface type used for Ethernet interfaces is “Broadcast,” which inherently results in a Designated Router (DR) and/or Backup Designated Router (BDR) election thus reducing routing update traffic. While this is fine in a Multi-Access network (such as a shared Ethernet segment), it is unnecessary in a point-to-point network. In a point-to-point network, the “Broadcast” interface type of OSPF adds a DR/BDR election process and an additional Type 2 Link State Advertisement (LSA). This results in unnecessary additional overhead, which can be avoided by changing the interface type to “point-to-point”. In this way, the DR/BDR election process can be avoided, reducing the amount of time to bring up the OSPF adjacency between the leaf and spine switches. In addition, with the point-to-point interface mode, the need for Type-2 LSAs is removed with only Type-1 LSA needed since there is no Multi-Access (or Broadcast) segment present. As a result, the OSPF LSA database remains lean.

Figure 5. VXLAN Underlay Handoffs



Note: In the above diagram, Underlay Handoffs are using BGP address-family ipv4 to external routers (Core Routers). This is not necessarily part of the Campus Fabric design. Please design your Underlay Handoffs based on your own requirements.

Topology and Design

The proposed topology and design incorporate the previously mentioned use cases and design concepts. As a reference to the below diagram (Cloud Campus with BGP EVPN VXLAN Topology) please refer to the following:

- Device list: [Table 4](#)
- Interface mapping: [Table 5](#)
- Device Interface and IP addressing: [Table 6](#)

Figure 6. Cloud Campus with BGP EVPN VXLAN Topology

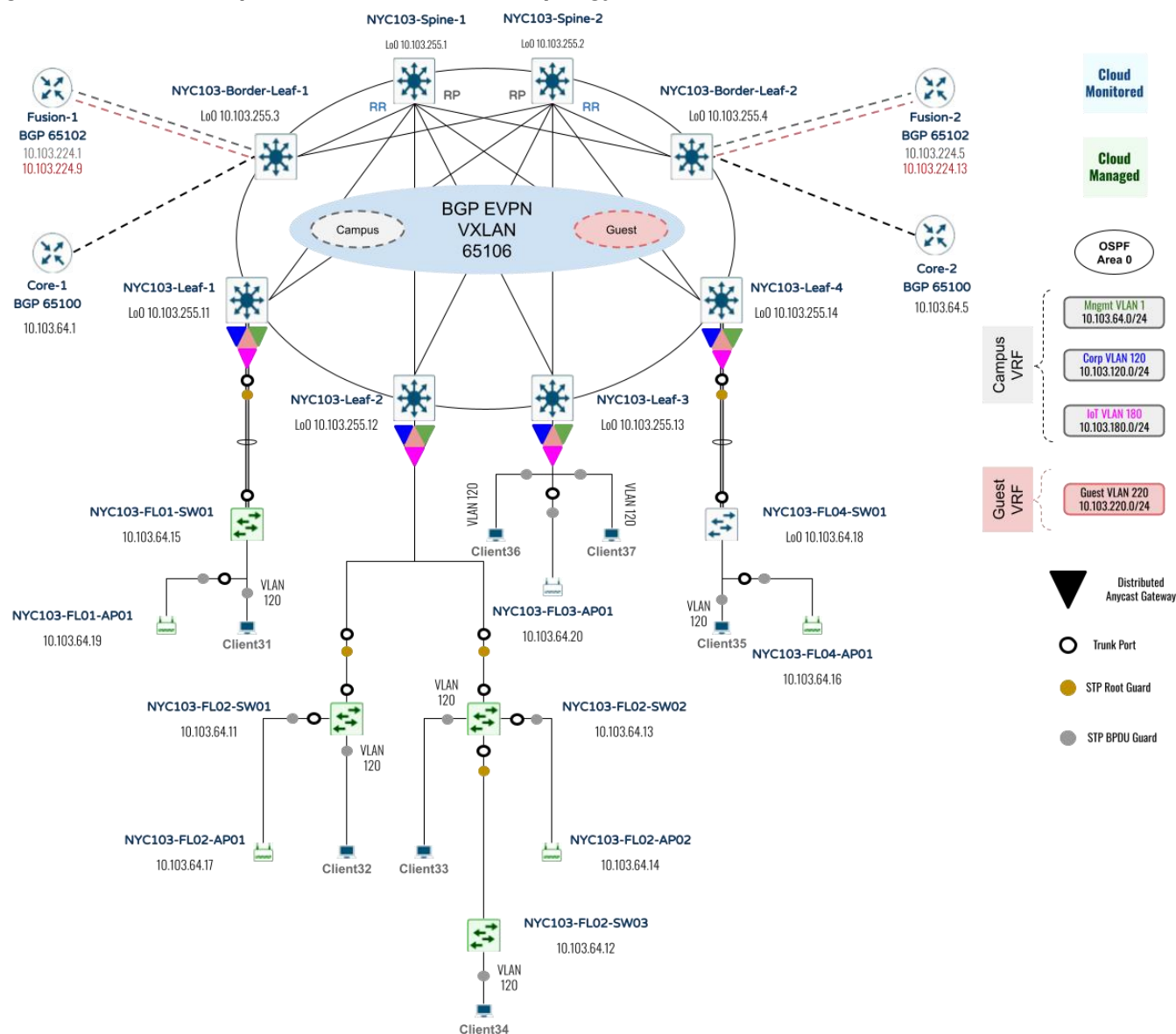


Table 4. List of Devices and Roles

Role	Requirements	Hardware Platforms	Management
Spine	• Redundancy (Hardware, uplinks, downlinks) • High-capacity connections (uplinks, downlinks) • High-performance switching and processing power • IP transport forwarder between Leaf switches (East-West) • BGP Route-Reflector for the underlay • Interconnects leaf switches and border leaf switches	C9500-24Y4C	Meraki Dashboard (Monitor only)
Border Leaf	• Redundancy (Hardware, uplinks, downlinks)	9300-48P	Meraki Dashboard

Role	Requirements	Hardware Platforms	Management
	- High-capacity connections (uplinks, downlinks) - Scalable tunnel endpoints - Routing and bridging between external network and VXLAN (North-South) - IGP/EGP with external network - VXLAN tunnel endpoint (VTEP) functionality		(Monitor only)
Leaf	- Develop UPS strategy considering the desired runtime for the various IT and OT PoE powered endpoints versus the cost, size, and weight of the battery backup solution - VXLAN edge to access layer - Routing or bridging between access layer and VXLAN - VXLAN tunnel endpoint (VTEP) functionality	9300-48P	Meraki Dashboard (Monitor only)
Access (Wired)	- Physical stacking (desirable) - High-capacity uplinks - mGig access ports - Adequate power over ethernet (PoE+, UPoE, UPoE+) - Cloud management	9300-24P-M 9300-24UX-M	Meraki Dashboard (Full Management)
Access (Wireless - 1)	- High performance wireless (6, 6E) - mGig uplink(s) - Cloud management	9162-M 9164-M 9166-M	Meraki Dashboard (Full Management)
Access (Wireless - 2)	- High performance wireless (6, 6E) - mGig uplink(s) - Cloud monitoring	9166	Meraki Dashboard (Monitor only)
Other/Optional	Cascaded access switch	9300-24P-M	Meraki Dashboard (Full Management)
	Wireless LAN Controller (3) (Optional)	C9800-L-C-K9	Meraki Dashboard (Monitor only)

Note: (1) Cloud Managed Catalyst Wireless (2) Cloud Monitored Catalyst Wireless (3) WLC is not shown on the above topology

And please refer to the following table for the physical connectivity as a reference for this design.

Table 5. Device Interface Mapping

Device	Interface	Remote Device	Remove Interface
NYC103-Spine-1	Hu1/0/25	NYC103-Border-Leaf-1	Fo1/1/1
	Hu1/0/26	NYC103-Border-Leaf-2	Fo1/1/1

Device	Interface	Remote Device	Remove Interface
	Tw1/0/1	NYC103-Leaf-1	Tw1/1/1
	Tw1/0/2	NYC103-Leaf-2	G1/0/1
	Tw1/0/3	NYC103-Leaf-3	G1/0/1
	Tw1/0/4	NYC103-Leaf-4	Tw1/1/1
	Hu1/0/28	NYC103-Spine-2	Hu1/0/28
NYC103-Spine-2	Hu1/0/25	NYC103-Border-Leaf-1	Fo1/1/2
	Hu1/0/26	NYC103-Border-Leaf-2	Fo1/1/2
	Tw1/0/1	NYC103-Leaf-1	Tw1/1/2
	Tw1/0/2	NYC103-Leaf-2	G1/0/2
	Tw1/0/3	NYC103-Leaf-3	G1/0/2
	Tw1/0/4	NYC103-Leaf-4	Tw1/1/2
	Hu1/0/28	NYC103-Spine-2	Hu1/0/28
NYC103-Border-Leaf-1	Fo1/1/1	NYC103-Spine-1	Hu1/0/25
	Fo1/1/2	NYC103-Spine-2	Hu1/0/25
	G1/0/1	Core-01	Te1/0/14
	G1/0/2	Fusion-01	Te1/0/4
NYC103-Border-Leaf-2	Fo1/1/1	NYC103-Spine-1	Hu1/0/26
	Fo1/1/2	NYC103-Spine-2	Hu1/0/26
	G1/0/1	Core-02	Te1/0/14
	G1/0/2	Fusion-02	Te1/0/4
NYC103-Leaf-1	Tw1/1/1	NYC103-Spine-1	Tw1/0/1
	Tw1/1/2	NYC103-Spine-2	Tw1/0/1
	G1/0/47 & 48 (EtherChannel)	NYC103-FL01-SW01	G1/0/23 & 24 (EtherChannel)
NYC103-Leaf-2	G1/0/1	NYC103-Spine-1	Tw1/0/2
	G1/0/2	NYC103-Spine-2	Tw1/0/2
	G1/0/48	NYC103-FL02-SW01	G1/0/24
	G1/0/47	NYC103-FL02-SW02	G1/0/24
NYC103-Leaf-3	G1/0/1	NYC103-Spine-1	Tw1/0/3
	G1/0/2	NYC103-Spine-2	Tw1/0/3
	G1/0/48	NYC103-FL03-AP01	Uplink
	G1/0/12	Client36	
	G1/0/13	Client37	
NYC103-Leaf-4	Tw1/1/1	NYC103-Spine-1	Tw1/0/4

Device	Interface	Remote Device	Remove Interface
	Tw1/1/2 G1/0/47 & 48 (EtherChannel)	NYC103-Spine-2 NYC103-FL04-SW01	Tw1/0/4 G1/0/23 & 24 (EtherChannel)
NYC103-FL01-SW01	1 12 23 & 24 (EtherChannel)	NYC103-FL02-AP01 Client31 NYC103-Leaf-1	Uplink G1/0/47 & 48 (EtherChannel)
NYC103-FL02-SW01	1 12 24	NYC103-FL02-AP01 Client32 NYC103-Leaf-2	Uplink G1/0/48
NYC103-FL02-SW02	1 12 23 24	NYC103-FL02-AP02 Client33 NYC103-Leaf-2 NYC103-FL02-SW03	Uplink G1/0/47 24
NYC103-FL02-SW03	12 24	Client34 NYC103-FL02-SW02	24
NYC103-FL04-SW01	1 12 23 & 24 (EtherChannel)	NYC103-FL04-AP01 Client35 NYC103-Leaf-4	Uplink G1/0/47 & 48 (EtherChannel)

Note: The above physical connectivity and interface mapping is for illustration purposes only. Please design your physical layout and connectivity based on your requirements and use case(s).

And please refer to the following table for a list of IP addresses assigned to the devices.

Table 6. Device Interface and IP Addressing

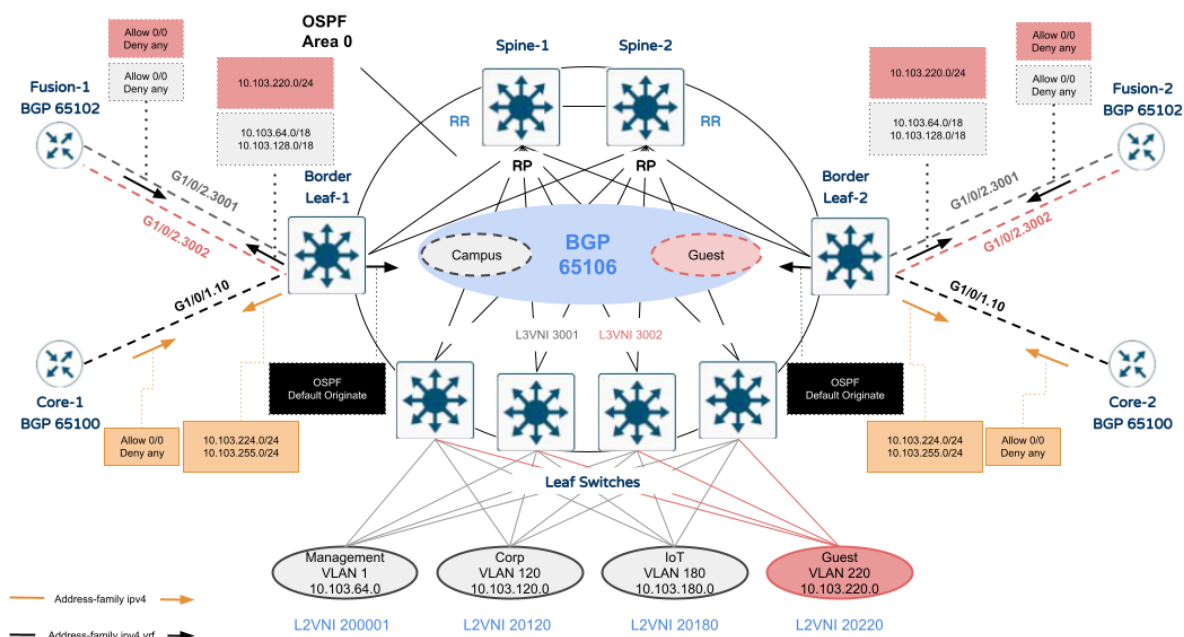
Device	Interface	IP Address	Subnet Mask
NYC103-Spine-1	Loopback0	10.103.255.1	255.255.255.255
	Loopback1	10.103.254.1	255.255.255.255
	Loopback2	10.103.255.255	255.255.255.255
	Hu1/0/25	10.103.224.9	255.255.255.252
	Hu1/0/26	10.103.224.21	255.255.255.252
	Tw1/0/1	10.103.224.29	255.255.255.252
	Tw1/0/2	10.103.224.37	255.255.255.252
	Tw1/0/3	10.103.224.45	255.255.255.252
	Tw1/0/4	10.103.224.53	255.255.255.252

Device	Interface	IP Address	Subnet Mask
	Hu1/0/28	10.103.224.17	255.255.255.252
NYC103-Spine-2	Loopback0	10.103.255.2	255.255.255.255
	Loopback1	10.103.254.2	255.255.255.255
	Loopback2	10.103.255.255	255.255.255.255
	Hu1/0/25	10.103.224.25	255.255.255.252
	Hu1/0/26	10.103.224.13	255.255.255.252
	Tw1/0/1	10.103.224.33	255.255.255.252
	Tw1/0/2	10.103.224.41	255.255.255.252
	Tw1/0/3	10.103.224.49	255.255.255.252
	Tw1/0/4	10.103.224.57	255.255.255.252
	Hu1/0/28	10.103.224.18	255.255.255.252
NY103-Leaf-1	LoopBack0	10.103.255.11	255.255.255.255
	Tw1/1/1	10.103.224.30	255.255.255.252
	Tw1/1/2	10.103.224.34	255.255.255.252
NYC103-Leaf2	LoopBack0	10.103.255.12	255.255.255.255
	G1/0/1	10.103.224.38	255.255.255.252
	G1/0/2	10.103.224.42	255.255.255.252
NYC103-Leaf3	LoopBack0	10.103.255.13	255.255.255.255
	G1/0/1	10.103.224.46	255.255.255.252
	G1/0/2	10.103.224.50	255.255.255.252
NYC103-Leaf4	LoopBack0	10.103.255.14	255.255.255.255
	Tw1/1/1	10.103.224.54	255.255.255.252
	Tw1/1/2	10.103.224.58	255.255.255.252
NYC103-Border-Leaf-1	LoopBack0	10.103.255.3	255.255.255.255
	Fo1/1/1	10.103.224.10	255.255.255.252
	Fo1/1/2	10.103.224.26	255.255.255.252
	G1/0/1.10	10.103.224.2	255.255.255.252
	G1/0/2.3001	10.103.64.2	255.255.255.252
	G1/0/2.3002	10.103.64.10	255.255.255.252
NYC103-Border-Leaf-2	LoopBack0	10.103.255.4	255.255.255.255
	Fo1/1/1	10.103.224.22	255.255.255.252
	Fo1/1/2	10.103.224.14	255.255.255.252
	G1/0/1.10	10.103.224.6	255.255.255.252
	G1/0/2.3001	10.103.64.6	255.255.255.252

Device	Interface	IP Address	Subnet Mask
	G1/0/2.3002	10.103.64.14	255.255.255.252
NYC103-FL01-SW01	Port 23 & Port 24	10.103.64.15	255.255.255.0
NYC103-FL02-SW01	Port 24	10.103.64.11	255.255.255.0
NYC103-FL02-SW02	Port 23	10.103.64.13	255.255.255.0
NYC103-FL02-SW03	Port 24	10.103.64.12	255.255.255.0
Core-1	Te1/0/4.10	10.103.64.1	255.255.255.255
Core-2	Te1/0/4.10	10.103.64.5	255.255.255.255
Fusion-1	Te1/0/14.3001	10.103.224.1	255.255.255.252
	Te1/0/14.3002	10.103.224.9	255.255.255.252
Fusion-2	Te1/0/14.3001	10.103.224.5	255.255.255.252
	Te1/0/14.3001	10.103.224.13	255.255.255.252

From a routing perspective, please refer to the following diagram for further details on the different routing domains on the underlay and overlay.

Figure 7. Underlay and Overlay Routing Domains



Note: In many situations, the external network roles (e.g. Fusion, Core) would be collapsed into a single device and in some occasions this could be handed over using static/default routes rather than BGP. Please design your Overlay/Underlay handoffs based on your own requirements.

Special considerations

- Border Leaf switches will only advertise a BGP aggregate for all interconnects (10.103.224.0/24) and Loopback0 (10.103.255.0/24) to external Core BGP neighbors.
- Border Leaf switches will only advertise a BGP aggregate for all Campus ranges (10.103.64.0/24, 10.103.120.0/24) and Guest ranges (10.103.220.0/24) to external Fusion BGP neighbors in separate IPv4 VRF address-families.
- Boarder Leaf switches will only receive a default route from external Fusion BGP neighbors received in separate IPv4 VRF address-families.
- Border Leaf switches will only inject a default route into OSPF which is redistributed from BGP 65100 (received in IPv4 address-family).
- All underlay interconnects are in OSPF area 0.
- All OSPF interfaces are configured as point-to-point.

Deploying Cloud Campus Fabric with BGP EVPN VXLAN

Prerequisites

It is important to ensure proper network connectivity for all required services in this design (e.g. Meraki Management Tunnel) which might require attention to the configuration on the upstream and/or network edge devices. Micro-segmentation is achieved in this design by leveraging address-families in the MP-BGP protocol, ensuring that tenants in different segments are isolated in separate routing instances.

Please ensure the following has been completed before proceeding with the deployment of Cloud Campus Fabric with BGP EVPN VXLAN:

- Meraki Dashboard Account and API Access (Full org access is required).

Note: Please ensure that the Dashboard Organization has API access before generating an API key for your profile in Dashboard.

- Network access for Meraki Cloud (Ensure these [ports](#) are open for all Cloud Managed devices).
- For Cloud Monitored Switches, please ensure connectivity to one of the [TLS gateways](#) on port **TCP 443**
- For Cloud Monitored Wireless, please ensure connectivity to one of the [TLS gateways](#) on **port TCP 443**.
- For Cloud Monitored Switches, please ensure you're running IOS XE **17.3.1 - 17.9.4**.
- For Cloud Monitored Wireless LAN Controllers, please ensure you're running IOS XE **17.12.3 or 17.15.1 and later**.
- Verify that Cloud Monitored Switches are a [supported platform](#).
- Verify that Cloud Monitored Wireless devices are a [supported platform](#).

Implementation Sequence

Please note that there are several options such as manual CLI, [CLI-macros](#), [Ansible playbooks](#), Catalyst Center and other options for Fabric provisioning. However, only one option is outlined within this document which is manual CLI configuration. This does not exclude any of the other options as a viable option for Fabric provisioning. Please use the option that is suitable for your environment and requirements.

The following is an implementation sequence for this solution to simplify the deployment and troubleshooting process:

- Step 1.** Verify Logins to Meraki Dashboard
- Step 2.** Verify Meraki API Access (e.g. Using a tool such as Postman)
- Step 3.** Create Dashboard Networks as required (Please create a Combined type network)
- Step 4.** Configure Dashboard Network settings as desired (e.g. Firmware, Time-zone, etc.)
- Step 5.** Claim Managed Catalyst devices in Dashboard Inventory (e.g. 9300-M, 91XX-M, etc.)
- Step 6.** Add Managed Catalyst devices to a Dashboard Network

Note: It is recommended to have all Fabric switches (Monitor mode) and Access layer devices (Managed mode) in one Dashboard network to have a single topology view of the entire network.

Note: Please ensure that you have sufficient licenses in your Dashboard account otherwise your network(s) could go out of license compliance which may disrupt your network operations

Step 7. Configure Cloud Managed Access Switches and Access Points in Dashboard (Do not connect switch uplinks yet) Test #1

Step 8. Configure Adaptive Policy in Dashboard by creating Groups

Note: Adaptive Policy leverages SGTs for endpoint classification, identity propagation, and policy enforcement. Even though Adaptive Policy's actual policy lives and breathes in the dashboard, Cisco ISE can be utilized to dynamically assign SGTs to clients based on several conditions, such as device profile, posture, user, machine, and more. This is all done using RADIUS and the AV pair for security group tags. For further details, please refer to this [article](#).

Step 9. Configure Cisco ISE for end user authentication, posturing and authorization.

Note: Configuring Cisco ISE is out of scope for this document. Please refer to [Cisco ISE documentation](#) for details. Also please note that Cisco ISE [Meraki Connector](#) is available with release 3.2 or higher.

Step 10. Configure your Spine Switch(es)

- (1) Base configuration (including Loopback0 and main settings)
- (2) Underlay links (excluding OSPF and Multicast)
- (3) OSPF on Underlay links and Loopback0
- (4) BGP address family for L2VPN EVPN
- (5) Multicast; IP PIM Sparse mode with static RP and MSDP

Step 11. Configure your Border Leaf Switch(es)

- (1) Base configuration (including Loopback0 and main settings)
- (2) Underlay links (excluding OSPF and Multicast)
- (3) OSPF on Underlay links and Loopback0
- (4) BGP address family for L2VPN EVPN
- (5) Multicast; IP PIM Sparse mode with static RP and MSDP
- (6) OSPF to Core (Underlay)
- (7) BGP to Core (Underlay)
- (8) Add Campus VRF
- (9) Add Campus Handoff to Core (Overlay)
- (10) Add Campus BGP to Core (Overlay)
- (11) L3 VNIs (Campus Routing on the Underlay)
- (12) Add Guest VRF
- (13) Add Guest Handoff to Core (Overlay)
- (14) Add Guest BGP to Core (Overlay)

(15) VNIs (Guest Routing on the Underlay)

Step 12. Configure your Leaf Switch(es)

- (1) Base configuration (including Loopback0 and main settings)
- (2) Underlay links (excluding OSPF and Multicast)
- (3) OSPF on Underlay links and Loopback0
- (4) BGP address family for L2VPN EVPN
- (5) Multicast; IP PIM Sparse mode with static RP and MSDP
- (6) Add Campus VRF
- (7) BGP for Campus IPv4 VRF
- (8) Enable Management L2VPN EVPN and VXLAN Mapping
- (9) Add NVE1 and VNI mapping for Management
- (10) DAG and DHCP for Management VLAN
- (11) Enable Corp L2VPN EVPN and VXLAN Mapping
- (12) NVE1 to VNI mapping for Corp
- (13) DAG and DHCP for Corp VLAN
- (14) Enable IoT L2VPN EVPN and VXLAN Mapping
- (15) NVE1 to VNI mapping for IoT
- (16) DAG and DHCP for IoT VLAN
- (17) L3 VNIs (Campus Routing on the Underlay)
- (18) Add Guest VRF
- (19) BGP for Guest IPv4 VRF
- (20) Enable Guest L2VPN EVPN and VXLAN Mapping
- (21) NVE1 to VNI mapping for Guest
- (22) DAG and DHCP for Guest VLAN
- (23) L3 VNIs (Guest Routing on the Underlay)
- (24) Downlinks to Access Layer
- (25) Inline Tagging
- (26) Spanning Tree Protocol

Step 13. Onboard Fabric Switches for Cloud Monitoring (Spines, Border Leaf, Leaf)

Step 14. Onboard Access Switches for Cloud Monitoring (Where applicable)

Step 15. Onboard Wireless LAN Controllers for Cloud Monitoring (Where applicable)

Note: Onboarding Catalyst devices (Switches, APs, WLCs) is out of scope for this document. Please refer to [documentation](#) for steps required to [onboard](#) your devices.

Step 16. Connect Cloud Managed Access Switch Uplinks

Step 17. Wait for the Access Switch(es) and Access Points to come online and upgrade their firmware

Note: This will cause the Access Switches and Access Points to reboot several times. Please wait till they are online in dashboard and steady before proceeding.

Step 18. Configure EtherChannels on Leaf Switch(es) (Where applicable)

Step 19. Configure Cisco ISE for end user authentication, posturing and authorization

Step 20. Configure Adaptive Policy in Dashboard

Step 21. Testing and Verification

Deployment and Configuration Guide

Meraki Dashboard

Please use the following template to set your Meraki Dashboard account.

Note: Only the items mentioned in the below table need to be changed. All other items are the default settings which will remain unchanged unless required. Please set your Meraki Dashboard account based on your own requirements and use the below template for guidance.

Table 7. Meraki Dashboard Settings

Item	Configuration Details
Organization Name	A name of your choice (e.g. Cloud Campus Fabric with BGP EVPN)
Network Name	A name of your choice (e.g. SiteName-CityName-Country)
Network time zone	Please choose the time zone for your city/region as this is going to reflect on all Dashboard reports (e.g. Traffic analytics, alerts, etc.)
Administration	Please ensure that at least one user has full read-write access to the Dashboard organization, even if you have configured SAML for SSO

Cloud Managed Access Switches

Please use the following template to configure your Cloud Managed Access Switches in Meraki Dashboard.

Note: Only the items mentioned in the below table need to be changed. All other items are the default settings which will remain unchanged unless required. Please setup the Meraki Dashboard based on your own requirements and use the below template for guidance.

Table 8. Cloud Managed Access Switches Configuration Template

Item	Configuration Details
Switch Settings	• Management VLAN = 1 • Enable STP • Bridge Priority = 32768
Switch Name	• Name (1) = SiteID-FLXX-SWXX
Switch Tag	• Tag (1) = Managed
Access Policy (802.1x)	• Name = Wired-802.1x • Authentication method = my RADIUS server • Radius Server: Host / Port / Secret • Radius Attribute Specifying Group Policy Name = Filter-Id • Host mode = Single-Host

Item	Configuration Details
	• 802.1X Control Direction = both • Failed Auth VLAN = 220 (Guest VLAN)
Access Switch Uplinks to Leaf switch	• Name (1) = To Leaf-XX Port XX • Tag (1) = Uplink • Trunk • Native VLAN = 1 • Allowed VLANs (2) = 1-1000 • Peer SGT Capable = Enable • Adaptive Policy Group = 2: Infrastructure
Access Switch Downlinks to Access Points	• Name (1) = To AP-XX Port XX • Tag (1) = Wireless-AP • Trunk • Native VLAN = 1 • Allowed VLANs (2) = 1-1000 • Peer SGT Capable = Enable • Adaptive Policy Group = 2: Infrastructure
Access Switch Downlinks to Wired Clients	• Name (1) = To ClientXX • Tag (1) = Client • Access • Access Policy (3) = Wired-802.1x • VLAN = 220 (4)
EtherChannels for Access Switch Uplinks to Leaf Switch	• Where applicable

Note: (1) Suggested. Please amend based on your requirements (2) Please note that -M switches support a maximum of 1000 VLANs (3) Access Policy must be configured first before assigning it to a switch port (4) Guest VLAN (VLAN 220) has been configured as ISE will be leveraged to return a VLAN identifier based on authentication and posture

The following section shows the configuration steps for Cloud Managed Access Switches based on the above template.

Switch Settings

In Dashboard, navigate to **Switching > Switch Settings** then change the settings accordingly. Click **Save** when you're done.

Switch settings View old version

VLAN configuration

Management VLAN ⓘ

1

STP configuration

☒ Enable Rapid Spanning Tree (RSTP) ⓘ

STP bridge priority ⓘ

Switches/Stacks

Bridge priority

Default

32768

Actions

+ Set the bridge priority for another switch or stack

Quality of service ⓘ

#

VLAN

Protocol

Source port ⓘ

Destination port ⓘ

Trust incoming DSCP

Set DSCP to

Actions

No Data

+ Add a QoS Rule for this network

Edit DSCP to CoS map

Multicast settings

Switches/Stacks

IGMP snooping ⓘ

Flood unknown multicast traffic

Actions

Default

☒

☒

+ Set multicast settings for another switch or stack

MTU configuration

Switches

MTU size ⓘ

Actions

Default

9198

+ Set the MTU size for another set of switches

Storm control ⓘ

Traffic types

% of available port bandwidth

Actions

Broadcast

100%

Multicast

100%

Unknown unicast

100%

Switch Name

In Dashboard, navigate to **Switching** > **Switches** then click on the desired switch which takes you to the Switch details page. Next, click on the edit button next to the switch name to specify the name then click on **Save**.



NYC103-FL01-SW01

Save

Switch Tag

In Dashboard, navigate to **Switching** > **Switches** then select the desired switches and click on Tag. Then, choose the tags that you want to add or delete. Click **Save** when you're done.

Switches

Last day

1 Offline

2 Alerting

10 Online

0 Dormant

Search

Status

Tags

Device type

13 results

Download

Items selected Select all 13 items

Cancel Tag Move Remove Close

	Status	Name	MAC address	Connectivity (UTC-4)	Serial number	Local IP
☒	●	NYC103-Spine-02	24:05:e4:1d:07:00		Q2Z2-FL5N-FVK9	10.103.224.13
☒	●	NYC103-Spine-01	24:05:e4:1d:06:c0		Q2Z2-N755-ECAL	10.103.224.9
☐	●	NYC103-Leaf-04	24:2a:04:90:e7:00		Q5TE-WK7Q-QPY2	10.103.224.54
☐	●	NYC103-Leaf-03	24:6c:84:2e:b2:00		Q5TE-DVCH-V8E8	10.103.224.46
☐	●	NYC103-Leaf-02	64:		Q5TE-KB49-9ER4	10.103.224.38
☐	●	NYC103-Leaf-01			Q5TE-3AE2-S6UF	10.103.224.30
☐	●	NYC103-FL04-SW01	94:		Q2Z2-CQH4-XRTF	10.103.64.21
☐	●	NYC103-FL01-SW01	a0:		Q5KA-JCJQ-K7S3	10.103.64.11
☐	●	NYC103-FL01-SW01	8c:		Q5KD-ASEJ-HZVP	10.103.64.15
☐	●	NYC103-FL02-SW01	34:		Q5TE-EZ7C-SSVF	10.103.224.6
☐	●	NYC103-FL02-SW03	24:		Q5TE-J733-R656	10.103.224.2
☐	●	NYC103-FL02-SW03	a0:		Q5KA-F555-KFYQ	10.103.64.12
☐	●	NYC103-FL02-SW02	a0:		Q5KA-BEW4-MEMT	10.103.64.13

Tags

Manage tags for these 2 devices

Add tags to these devices

☐ Managed
 ☒ Monitored
 ☐ recently-added

Cancel Save

Access Policy

In Dashboard, navigate to **Switching > Access policies** then click on Add an [access policy](#). Then choose the name and Authentication method as my RADIUS server. Then add the Radius server(s) with Host / Port / Secret. Enable Radius [CoA](#) and choose Filter-Id as the Radius Attribute. Choose the [policy type](#), [Host mode](#) and 802.1X control direction and the Failed Auth VLAN. Click Save once you're done.

Access policies
Access Policy Detail
4 switch ports

Name
Wired-802.1x

Authentication method
RADIUS server

RADIUS servers

☒ RADIUS Server testing ⓘ
☒ RADIUS CoA support ⓘ
☒ Enable RADIUS accounting servers

#	Name	Host	Secret	Auth	Port	Accounting	Port	Actions
1		10.100.0.10	*****	☒	1812	☐		
2		10.100.0.10	*****	☐		☒	1813	

Select RADIUS
+ Add a server

RADIUS attribute specifying group policy name
Filter-Id

Connection

Policy Type
802.1X
Host mode ⓘ
Single-Host
802.1X control direction
Both
Re-authentication interval ⓘ

Options

☒ Voice auth
☐ Suspend port bounce ⓘ

Critical Auth VLAN Beta ⓘ

Data ⓘ
Voice ⓘ

Guest VLAN

Failed Auth VLAN
220

URL redirect walled garden
☐

RADIUS caching ⓘ
☐

Caching timeout ⓘ
24

Cisco Identity Services Engine

The access policy configured in the previous section is set with Radius server as the authentication method. This is pointing to Cisco ISE as the Radius Server which in addition to authentication and authorization will also be configured to push VLANs, SGTs and TrustSec policies to Dashboard using the [Meraki Connector](#) which is available with Cisco ISE 3.2 and higher.

Note: Please note that the configuration of Cisco Identity Services Engine is out of scope for this document. The following sections will only illustrate the specific items related to adding Cloud Managed devices to Cisco ISE as well as the Cisco ISE integration with Dashboard for TrustSec integration.

The first step is to add the Cloud Managed devices as a network device in Cisco ISE. In Cisco ISE, navigate to **Administration > Network devices** then click on **Add** to create a new list for Cloud Managed devices (e.g. Switches, Access Points) that will be using Cisco ISE as a Radius server.

Network Devices

Name NYC103-Meraki-Infra

Description Meraki Mgt VLAN 1 on EVPN Fabric

IP Address * IP : 10.103.64.0 / 24

Note: Please note that you need to use the Management IP of the Cloud Managed devices (e.g. 10.103.64.0/24 in this design) as the IP address when adding to Cisco ISE.

Device Profile  Cisco

Model Name

Software Version

Network Device Group

Location NYC103 Set To Default

IPSEC No Set To Default

Device Type All Device Types Set To Default

DNAC DNAC Devices Set To Default

RADIUS Authentication Settings

RADIUS UDP Settings

Protocol RADIUS

Shared Secret Show

☐ Use Second Shared Secret

Second Shared Secret Show

CoA Port 1700 Set To Default

Note: Please note that the shared secret must match that configured on Dashboard (for both Cloud Managed switches and Cloud Managed access points).

RADIUS DTLS Settings

☐ DTLS Required

Shared Secret radius/dtls

CoA Port 2083 Set To Default

Issuer CA of ISE Certificates for CoA Select if required (optional)

DNS Name

The second step is to integrate Cisco ISE with Dashboard. Navigate to **Work Centers > Integrations** then click on **Connect Meraki** and follow the steps on your screen. Remember that having a Dashboard API key is required for this step. Also remember that your Dashboard API key must have full access to the Dashboard organization you want connected with Cisco ISE. Next, select the sync interval settings (a value

between 5 and 30mins, default value is 12). Then select the egress policies you want to sync with Dashboard by selected the corresponding check boxes. Finally, select SGACLs and SGTs that you want to sync with Dashboard.

☒	DC_Web_Services_Employe	Employees	Web_Only
☒	Employees	HR_users	Block_ICMP
☒	Employees	DC_Web_Services_Employe	Web_Only
☒	Guests	Guests	Permit IP

☒	Block_ICMP	block ICMP only	IPv4
☐	DenyRemoteServices	Sample contract to block Remote Access and telnet services	Agnostic

☒	Web_Only	only 80 and 443	IPv4

☒	Employees	4	Employee Security Group
☐	Extranet	17	Extranet Security Group
☒	Guests	6	Guest Security Group
☒	HR_users	16	Human Resources
☐	IoT	5	MAB only devices
☐	PCI_Servers	14	PCI Servers Security Group
☐	Point_of_Sale_Systems	10	Point of Sale Security Group
☐	Production_Servers	11	Production Servers Security Group
☐	Production_Users	7	Production User Security Group
☐	Quarantined_Systems	255	Quarantine Security Group
☒	test	3	test
☐	Test_Servers	13	Test Servers Security Group
☒	TrustSec_Devices	2	TrustSec Devices Security Group
☒	Unknown	0	Unknown Security Group

Note: The above Cisco ISE configuration is for illustration purposes only. Please configure your Cisco ISE settings according to your actual requirements.

Uplinks (Access-To-Leaf)

In Dashboard, navigate to **Switching > Switch ports** then select the uplink port(s) (You can also filter for them by port number for example) as shown below.

Switch Ports for the last day ▾

Edit Aggregate Split Mirror Unmirror Tags ▾ port:23-24 ▾

Switch / Port ▲

- ☒ NYC013-FL02-SW02 / 23 - uplink details
- ☒ NYC013-FL02-SW02 / 24 details
- ☒ NYC013-FL02-SW03 / 23 details

Then click on edit to **edit** all ports at once. Specify the tags then choose the port type **Trunk**. Specify the **native VLAN** and the **allowed VLANs**. Then ensure that peer SGT capable is **enabled** and then choose the **Adaptive Policy Group** for your uplinks. Please note that **2: Infrastructure** is one of the default Adaptive Policy Groups in Dashboard. Click **Update** when you're done.

Name

Port status Disabled

Link negotiation

Port schedule

Tags +

Type Access

Native VLAN

Allowed VLANs

RSTP Disabled

STP guard

Port isolation

Trusted DAI

UDLD Enforce

Alerts will be generated if UDLD detects an error, but the port will not be shut down.

PoE Disabled

Peer SGT capable

Adaptive policy group

Note: Cloud Managed Switches (-M models) support a maximum of 1000 VLANs on a trunk port. It is recommended to configure the switch ports with the specific VLANs (or ranges) to stay within the 1000 VLAN count (e.g. 1-20, 100-300, 350, 900-1000, 1050-1250). Also, please note that the following VLAN

ranges are reserved on -M models: 1002-1005, 4093-4094 and cannot be assigned or used on any port configuration.

Note: To modify each port's name in Dashboard to a unique value, you will have to modify each port individually. As an alternative, you can edit all uplink ports and specify the common parameters (e.g. Trunk, Native VLAN, etc.) and then modify them individually to assign the unique values (e.g. Name)

The following figure shows the uplink ports after they have been setup for this topology and design:

Switch Ports for the last day ▾

Edit Aggregate Split Mirror Unmirror Tags ▾ uplink [help](#) 4 of 682 switch ports

☐	Switch / Port ▲	Tags	Name	Type	VLAN	Peer SGT Capable	Adaptive Policy Group
☐	NYC013-FL02-SW02 / 23 - uplink details	Fabric Trunk Uplink	NYC103-Leaf-02 (G1/0/47)	trunk	native 1	Enabled	2: Infrastructure
☐	NYC013-FL02-SW03 / 24 - uplink details	Trunk Uplink	NYC103-FL02-SW02 (Port24)	trunk	native 1	Enabled	2: Infrastructure
☐	NYC103-FL01-SW01 / AGGR/0 - uplink details	Fabric Trunk Uplink	Agg to To NYC103-Leaf-01 (G1/0/47-48) Po1	trunk	native 1	Enabled	2: Infrastructure
☐	NYC103-FL02-SW01 / 24 - uplink details	Fabric Trunk Uplink	NYC103-Leaf-02 (G1/0/48)	trunk	native 1	Enabled	2: Infrastructure

Tech tip: This view can be changed in Dashboard by clicking on the wrench sign. You can then customize the view by selecting or unselecting the table headers. You can also reorder the headers by dragging them to the desired location (e.g. Tags, Name, Type, VLAN, ... instead of Tags, Sent Bytes, Received Bytes, ...)

Downlinks (Switch-To-Access Point)

In Dashboard, navigate to **Switching > Switch ports** then select the downlink port(s) to Access Points (You can also filter for them by port number for example) then click on **edit** to edit all ports at once. Specify the **tags** then choose the port type Trunk. Specify the **native VLAN** and the **allowed VLANs**. Then ensure that peer SGT capable is **enabled** and then choose the **Adaptive Policy Group** for your downlinks. Please note that **2: Infrastructure** is one of the default Adaptive Policy Groups in Dashboard. Click **Update** when you're done.

Port status

Enabled

Disabled

Link negotiation

Auto negotiate

Port schedule

Unscheduled

Tags

Wireless-AP x

Type

Trunk

Access

Native VLAN

1

Allowed VLANs

1-1000

RSTP

Enabled

Disabled

STP guard

Disabled

Port isolation

Enabled

Disabled

Trusted DAI

Enabled

Disabled

UDLD

Alert only

Enforce

Alerts will be generated if UDLD detects an error, but the port will not be shut down.

PoE

Enabled

Disabled

Peer SGT capable

Enabled

Disabled

Adaptive policy group

2: Infrastructure

Cancel

Update

Similar to the previous step, you can change the port names individually. The following figure shows the downlink ports to Access Points after they have been setup for this topology and design:

Switch Ports for the last day

EditAggregateSplitMirrorUnmirrorTags

AP

help7 of 682 switch ports

☐ Switch / Port ▲	Tags	Name	Type	VLAN	Peer SGT Capable	Adaptive Policy Group
☐ NYC103-FL02-SW02 / 1 details	Wireless-AP	NYC103-FL02-AP02	trunk	native 1	Enabled	2: Infrastructure
☐ NYC103-FL01-SW01 / 1 details	Wireless-AP	NYC103-FL01-AP01	trunk	native 1	Enabled	2: Infrastructure
☐ NYC103-FL02-SW01 / 1 details	Wireless-AP	NYC103-FL02-AP01	trunk	native 1	Enabled	2: Infrastructure

Downlinks (Switch-To-Clients)

In Dashboard, navigate to **Switching > Switch ports** then select the downlink port(s) to Client devices (You can also filter for them by port number for example) then click on **edit** to edit all ports at once. Specify the **tags** then choose the port type Access. Specify the **Data VLAN**. Then assign the **Access Policy**. Click **Update** when you're done.

Port status

Enabled

Disabled

Link negotiation

Auto negotiate

Port schedule

Unscheduled

Tags

Client

x

+

Type

Trunk

Access

Access policy ⓘ

Wired-802.1x

VLAN

220

Voice VLAN

RSTP

Enabled

Disabled

STP guard

Disabled

Port isolation

Enabled

Disabled

UDLD

Alert only

Enforce

Alerts will be generated if UDLD detects an error, but the port will not be shut down.

PoE

Enabled

Disabled

Adaptive policy group ⓘ

Select...

Cancel

Update

Similar to the previous step, you can change the port names individually. The following figure shows the downlink ports to Access Points after they have been setup for this topology and design:

Switch Ports for the last day ▾

Edit

Aggregate

Split

Mirror

Unmirror

Tags ▾

client

help 7 of 682 switch ports

☐ Switch / Port ▲	Tags	Name	Type	VLAN	Access policy
☐ NYC013-FL02-SW02 / 12 details	Client	NYC103-Client33	access	220	Wired-802.1x
☐ NYC013-FL02-SW03 / 12 details	Client	NYC103-Client34	access	220	Wired-802.1x
☐ NYC103-FL01-SW01 / 12 details	Client	NYC103-Client31	access	220	Wired-802.1x
☐ NYC103-FL02-SW01 / 12 details	Client	NYC013-Client32	access	220	Wired-802.1x

EtherChannels (Where Applicable)

In Dashboard, navigate to Switching > Switch ports then select the Uplink port(s) to Leaf Switches that need to be [aggregated](#) (You can also filter for them by port number for example) then click **Aggregate**.

Switch Ports for the last day ▾

Edit

Aggregate

Split

Mirror

Unmirror

Tags ▾

Once aggregated, the two ports will be bundled together in the Switch ports view as shown below.

Switch Ports for the last day ▾

[Edit](#) [Aggregate](#) [Split](#) [Mirror](#) [Unmirror](#) [Tags ▾](#) [AGG ▾](#) [help](#) 4 of 682 switch ports, 1 selected [\(deselect all\)](#)

Switch / Port ▲	Tags	Name
☒ NYC103-FL01-SW01 / AGGR/0 - uplink details	Fabric Trunk Uplink	Agg to To NYC103-Leaf-01 (G1/0/47-48) Po1

Note: You can specify the name of the Aggregate port after you have bonded the ports together by selecting the aggregate port and clicking on Edit.

Cloud Managed Access Points

Please use the following template to configure your Cloud Managed Access Points in Meraki Dashboard.

Note: Only the items mentioned in the below table need to be changed. All other items are the default settings which will remain unchanged unless required. Please configure the Meraki Dashboard based on your own requirements and use the below template for guidance.

Table 9. Cloud Managed Access Points Configuration Template

Item	Configuration Details
Access Point Name	• Name (1) = SiteID-FLXX-APXX
Access Point Tag	• Tag (1) = Managed
SSID1	• Name (1) = Campus • Security = Enterprise with my RADIUS server • Splash Page = None • Radius Server: Host / Port / Secret • Radius CoA Support = Enabled • Client IP and LAN = Bridged • Radius Override = Override VLAN tag • VLAN Tagging = VLAN ID = 2202 • Adaptive Group Policy = 0: Unknown
SSID2	• Name (1) = Guest • Security = Password (xxxx) • Splash Page = None • Client IP and LAN = Bridged • VLAN Tagging = VLAN ID = 220 (2) • Adaptive Group Policy = 0: Unknown

Note: (1) Suggested. Please amend based on your requirements (2) Guest VLAN (VLAN 220) has been configured as ISE will be leveraged to return a VLAN identifier based on authentication and posture

The following section explains the configuration steps for Cloud Managed Access Points based on the above template.

Note: Other Access Point settings in Dashboard (e.g. Radio Profiles, SSID Availability, etc.) are out of this document’s scope. Please refer to Meraki Documentation for guidance on how to setup and operate your wireless network.

Access Point Name

In Dashboard, navigate to **Wireless > Access points** then click on the desired access point which takes you to the AP details page. Next, click on the **edit** button next to the AP name to specify the name then click on **Save**.



NYC103-FL01-AP01

Save

Access Point Tag

In Dashboard, navigate to **Wireless > Access points** then select the desired access points and click on **Tag**. Then, choose the **tags** that you want to add or delete. Click **Save** when you’re done.

Access Points

OverviewListHealthMapConnection logTimeline

1 Offline0 Alerting3 Online0 Repeaters

SearchStatusTagsDevice TypeGatewayRepeaters4 resultsDownload

Items selectedSelect all 4 items

Status	Name	MAC address	Connectivity (UTC-4)	Serial number	Local IP
☒	NYC103-FL01-AP01	c4:14:a2:82:89:a8		Q5AA-YVZZ-28CD	10.183.64.19
☒	NYC103-FL02-AP01	c4:06:66:4f:55:08		Q5AL-RR9M-3T8P	10.183.64.17
☒	NYC103-FL02-AP02	c4:06:66:6d:2e:18		Q5AM-9FSQ-V3PM	10.183.64.14
☐	NYC103-FL04-AP01	c4:06:66:6d:8f:08		Q5AM-HAUS-XMY6	10.183.64.22

Tags

Manage tags for these 3 devices

Add tags to these devices

Managed

Tags

CancelSave

SSID Configuration (Campus)

In Dashboard, navigate to **Wireless > SSIDs** then click on rename then **Save**.

Configuration overview

SSIDs Showing 4 of 15 SSIDs. [Show all my SSIDs.](#)

NYC013-Campus	
Enabled	enabled
Name	rename
Access control	edit settings
Encryption	802.1X with custom RADIUS
Sign-on method	None
Bandwidth limit	unlimited
Client IP assignment	Local LAN
Clients blocked from using LAN	no
Wired clients are part of Wi-Fi network	no
VLAN tag ⓘ	220
VPN	Disabled
Splash page	
Splash page enabled	no
Splash theme	n/a

Next, click on **edit settings** and set this SSID as required. Finally, click on **Save** once you’re down. The following shows the configuration for the **Campus SSID**.

Access control

SSID

NYC013-Campus

Basic info

SSID (name)

NYC013-Campus

SSID status

Enabled

Disabled

☐ Hide SSID

Security

WPA2 Enterprise with 1 RADIUS server and 1 accounting server

ⓘ This SSID will not broadcast on the 6 GHz band. Use WPA3 to enable this band.

☐ Open (no encryption)

Any user can associate

☐ Opportunistic Wireless Encryption (OWE)

Any user can associate with data encryption

☐ Password

Users must enter a passphrase to associate ⓘ

☐ MAC-based access control (no encryption)

RADIUS server is queried at association time

☒ Enterprise with

my RADIUS server

User credentials are validated with 802.1X at association time

☐ Identity PSK with RADIUS

RADIUS server is queried at association time to obtain a passphrase for a device based on its MAC address

☐ Identity PSK without RADIUS

Devices are assigned a group policy based on its passphrase

Wi-Fi Personal Network (WPN) ⓘ

Enabled

Disabled

WPA encryption ⓘ

WPA2 only

ⓘ 802.11r is disabled due to RADIUS CoA being enabled

802.11r ⓘ

☐ Enabled

☐ Adaptive

☒ Disabled

802.11w ⓘ

☐ Enabled (allow unsupported clients)

☐ Required (reject unsupported clients)

☒ Disabled (never use)

Splash page None

ⓘ Not all splash authentication methods are compatible with WPA2-Enterprise authentication

☒ None (direct access)

Users can access the network as soon as they associate

☐ Click-through

Users must view and acknowledge your splash page before being allowed on the network

☐ Sponsored guest login

Guests must enter a valid sponsor and own email address before being allowed on the network

☐ Sign-on with

Meraki Cloud Authentication ▾

Users must enter a username and password before being allowed on the network

☐ Sign-on with SMS Authentication

Users enter a mobile phone number and receive an authorization code via SMS.

After a trial period of 25 texts, you will need to connect with your Twilio account on the [Network-wide settings](#) page.

☐ Cisco Identity Services Engine (ISE) Authentication ⓘ

Users are redirected to the Cisco ISE web portal for device posturing and guest access

☐ Billing (paid access) ⓘ

Users choose from various pay-for-access options, or an optional free tier. Only one enabled SSID may be configured to 'Billing'

Advanced splash settings

(Captive portal strength, walled garden, controller disconnection behavior)

Customize the look and feel of your splash page from [Splash page settings](#).

RADIUS 1 RADIUS server, 1 accounting server - Testing enabled, CoA supported

RADIUS servers

#	Host IP or FQDN	Auth port	Secret	RadSec ⓘ	Test	Actions
1	10.100.0.10	1812	*****	☐	<button>Test</button>	⋮

[Add server](#) 3 max.

RADIUS accounting servers

#	Host IP or FQDN	Acct port	Secret	RadSec ⓘ	Actions
1	10.100.0.10	1813	*****	☐	⋮

[Add server](#) 3 max.

Accounting interim interval minutes

ⓘ Enabling RADIUS CoA disables the fast roaming features PMKsa caching, OKC, and 802.11r

☒ RADIUS testing ⓘ

☒ RADIUS CoA support ⓘ

RADIUS attribute specifying group policy name ⓘ

Filter-ID ▾

Advanced RADIUS settings

(NAS ID, Called-station-ID, DAS clients, RADIUS timeout, retry count, fallback, EAP timers)

Client IP and VLAN Bridge mode

☐ Meraki AP assigned (NAT mode)
Clients receive IP addresses in an isolated 10.0.0.0/8 network. Clients cannot communicate with each other, but they may communicate with devices on the wired LAN if the [SSID firewall settings](#) permit.

☒ External DHCP server assigned
Meraki devices operate transparently (do not perform NAT or DHCP). Wireless clients will receive DHCP leases from a server on the LAN or use static IPs. Use this for wireless clients requiring seamless roaming, shared printers, and wireless cameras.

Bridged

Tunneled

☐ Layer 3 roaming

RADIUS override ⓘ

Override VLAN tag

Ignore VLAN attribute

RADIUS guest VLAN ⓘ

Disabled

Bonjour forwarding
Bridge mode and layer 3 roaming only

Enabled

Disabled

VLAN tagging ⓘ

VLAN ID

#	Access point tags	VLAN ID
	Default	220

+ Add VLAN ID

Assign group policies by device type

Enabled

Disabled

Adaptive policy group
Bridge mode and NAT mode only

0: Unknown

Looking for Wireless options? Per-SSID band and bitrate settings have moved to the Radio Settings page. [Go to Radio Settings](#)

SSID Configuration (Guest)

In Dashboard, navigate to **Wireless > SSIDs** then click on **rename** then **Save**.

Configuration overview

SSIDs Showing 4 of 15 SSIDs. [Show all my SSIDs.](#)

	NYC013-Campus	NYC103-Guest
Enabled	enabled	enabled
Name	rename	rename
Access control	edit settings	edit settings
Encryption	802.1X with custom RADIUS	PSK (WPA2)
Sign-on method	None	None
Bandwidth limit	unlimited	unlimited
Client IP assignment	Local LAN	Local LAN
Clients blocked from using LAN	no	no
Wired clients are part of Wi-Fi network	no	no
VLAN tag ⓘ	220	220
VPN	Disabled	Disabled
Splash page		
Splash page enabled	no	no
Splash theme	n/a	n/a

Next, click on **edit settings** and set this SSID as required. Finally, click on **Save** once you're down. The following shows the configuration for the **Guest SSID**.

Access control

SSID

NYC103-Guest

Basic info

SSID (name)

NYC103-Guest

SSID status

Enabled

Disabled

☐ Hide SSID

Security

WPA2 PSK configured

This SSID will not broadcast on the 6 GHz band. Use WPA3 to enable this band.

☐

Open (no encryption)

Any user can associate

☐

Opportunistic Wireless Encryption (OWE)

Any user can associate with data encryption

☒

Password

Users must enter this key to associate.

☐

MAC-based access control (no encryption)

RADIUS server is queried at association time

☐

Enterprise with

Meraki Cloud Authentication

User credentials are validated with 802.1X at association time

☐

Identity PSK with RADIUS

RADIUS server is queried at association time to obtain a passphrase for a device based on its MAC address

☐

Identity PSK without RADIUS

Devices are assigned a group policy based on its passphrase

WPA encryption

WPA2 only

802.11r

☐ Enabled

☐ Adaptive

☒ Disabled

802.11w

☐ Enabled (allow unsupported clients)

☐ Required (reject unsupported clients)

☒ Disabled (never use)

Mandatory DHCP

Enabled

Disabled

Splash page

None

Not all splash authentication methods are compatible with WEP/WPA authentication

☒

None (direct access)

Users can access the network as soon as they associate

☐

Click-through

Users must view and acknowledge your splash page before being allowed on the network

☐

Sponsored guest login

Guests must enter a valid sponsor and own email address before being allowed on the network

☐

Sign-on with

Meraki Cloud Authentication

Users must enter a username and password before being allowed on the network

☐

Sign-on with SMS Authentication

Users enter a mobile phone number and receive an authorization code via SMS. After a trial period of 25 texts, you will need to connect with your Twilio account on the Network-wide settings page.

☐

Cisco Identity Services Engine (ISE) Authentication

Users are redirected to the Cisco ISE web portal for device posturing and guest access

☐

Billing (paid access)

Users choose from various pay-for-access options, or an optional free tier. Only one enabled SSID may be configured to 'Billing'

Advanced splash settings

(Captive portal strength, waiter garden, controller disconnection behavior)

Customize the look and feel of your splash page from [Splash page settings](#).

RADIUS

Client IP and VLAN

Bridge mode

Meraki AP assigned (NAT mode)

Clients receive IP addresses in an isolated 10.0.0.0/8 network. Clients cannot communicate with each other, but they may communicate with devices on the wired LAN if the [SSID firewall settings](#) permit.

External DHCP server assigned

Meraki devices operate transparently (do not perform NAT or DHCP). Wireless clients will receive DHCP leases from a server on the LAN or use static IPs. Use this for wireless clients requiring seamless roaming, shared printers, and wireless cameras.

☒ Bridged ☐ Tunnelled

☐ Layer 3 roaming

RADIUS guest VLAN @

Disabled

Bonjour forwarding

Bridge mode and layer 3 roaming only

Enabled ☒ Disabled

VLAN tagging @

VLAN ID

#	Access point tags	VLAN ID
	Default	220
+ Add VLAN ID		

Assign group policies by device type

Enabled ☒ Disabled

Adaptive policy group

Bridge mode and NAT mode only

0: Unknown

Adaptive Policy in Dashboard

Adaptive Policy Groups can either be created in Dashboard or in Cisco ISE which then can be synchronized. Policies can also be synchronized between Cisco ISE and Dashboard using [Cisco ISE Meraki Connector](#) which is available with Cisco ISE 3.2 or higher.

Note: The monitoring logs (meraki-connector.log and meraki-sync-service.log) for syncing TrustSec policies in Cisco ISE with Cisco Meraki Dashboards can be found in the debug logs maintained in the Meraki connector.

Creating Adaptive Policy Groups in Dashboard

If you are creating Adaptive Policy Groups in Dashboard, please navigate to **Organization > Adaptive policy** then click on **Groups** then click **Add group**. Once you're done, click on **Review changes** then click on **Submit**. Please see the example provided below:

Add adaptive policy group

Name

SGT Value

Description

Policy Object Binding

[Review changes](#)

Note: Please make sure that Adaptive policy is enabled for your Dashboard network. Please refer to this [article](#) for the steps required.

You will need to create a group for each SGT value required. Please refer to the following figure for the Adaptive Policy Groups created for this solution:

☐ Name	SGT Value	Description
☐ Unknown	0	Created by Meraki, the Unknown group applies when a policy is specified for unsuccessful group classification
☐ Infrastructure	2	Created by Meraki, the Infrastructure group is used by Meraki devices for internal and dashboard communication
☐ test	3	test
☐ Employees	4	Employee Security Group
☐ IoT	5	MAB only devices
☐ Guests	6	Guest Security Group
☐ HR_users	16	Human Resources
☐ DC_Web_Services_Employe	18	

Note: If you are using Cisco ISE and wish to centralize your TrustSec configuration (Policies, SGACLs, SGTs) you do not need to create policies in Dashboard as these will be synched with the configuration on Cisco ISE. For further information, please refer to this [article](#). The above configuration is provided as an example only.

Note: Please note that Cisco ISE will dynamically assign VLANs and SGTs to users that will be handed back to Dashboard in a Radius attribute.

Note: For more information on configuring Adaptive Policy with Cloud Managed Devices, please refer to [Adaptive Policy for Cloud Managed Access Points](#) and [Adaptive Policy for Cloud Managed Switches](#).

Note: Please note that Adaptive Policy requires the Advanced/Advantage license on Cloud Managed Switches and Access Points. For more information about licensing requirements, please refer to the following [article](#).

Spine Switches

Please use the following template to configure your Fabric Spine Switch(es)

Spine 1

Base Configuration for Spine 1

```
!  
service timestamps debug datetime msec localtime show-timezone  
service timestamps log datetime msec localtime show-timezone  
!  
hostname NYC103-Spine-01
```

```
!
clock timezone EST -5 0
clock summer-time EDT recurring
!
ip routing
!
ip name-server 10.100.0.5 10.200.0.5
ip domain name ciscovalidated.com
!
license boot level network-advantage addon dna-advantage
!
system mtu 9198
!
errdisable recovery cause bpduguard
errdisable recovery interval 60
!
enable secret **masked**
!
username admin privilege 15 secret **masked**
!
no ip http server
no ip http secure-server
!
line con 0
  exec-timeout 60 0
  privilege level 15
  logging synchronous
  login local
!
line vty 0 31
  exec-timeout 60 0
  privilege level 15
  logging synchronous
  login local
  transport input telnet ssh
!
aaa new-model
!
interface Loopback0
  description Primary loopback
  ip address 10.103.255.1 255.255.255.255
!
ntp source Loopback0
ntp server 10.100.0.5 prefer
!
```

Underlay Links (excluding OSPF and Multicast)

```
! Spine to Spine
!
interface HundredGigE1/0/28
  description To NYC-Spine-02 HundredGigE1/0/28
  no switchport
  ip address 10.103.224.17 255.255.255.252
!
! Spine to Leaf
!
interface TwentyFiveGigE1/0/1
  description To NYC013-Leaf-01 TwentyFiveGigE1/1/1
  no switchport
  ip address 10.103.224.29 255.255.255.252
!
interface TwentyFiveGigE1/0/2
  description To NYC103-Leaf-02 GigabitEthernet1/0/1
  no switchport
  ip address 10.103.224.37 255.255.255.252
!
interface TwentyFiveGigE1/0/3
  description To NYC103-Leaf-03 GigabitEthernet1/0/1
  no switchport
  ip address 10.103.224.45 255.255.255.252
!
interface TwentyFiveGigE1/0/4
  description To NYC103-Leaf-04 TwentyFiveGigE1/1/1
  no switchport
  ip address 10.103.224.53 255.255.255.252
!
! Spine to Border
!
interface HundredGigE1/0/25
  description To NYC103-Border-01 FortyGigabitEthernet1/1/1
  no switchport
  ip address 10.103.224.9 255.255.255.252
  speed nonegotiate
  speed 40000
!
interface HundredGigE1/0/26
  description To NYC103-Border-02 FortyGigabitEthernet1/1/1
  no switchport
  ip address 10.103.224.21 255.255.255.252
  speed nonegotiate
  speed 40000
!
```

OSPF on Underlay links and Loopback0

```
!  
router ospf 1  
  router-id 10.103.255.1  
  auto-cost reference-bandwidth 100000  
  default-information originate metric 1000 metric-type 1  
  bfd all-interfaces  
!  
interface Loopback0  
  ip ospf 1 area 0  
!  
interface HundredGigE1/0/28  
  ip ospf network point-to-point  
  ip ospf 1 area 0  
  bfd interval 100 min_rx 100 multiplier 3  
!  
interface TwentyFiveGigE1/0/1  
  ip ospf network point-to-point  
  ip ospf 1 area 0  
  bfd interval 100 min_rx 100 multiplier 3  
!  
interface TwentyFiveGigE1/0/2  
  ip ospf network point-to-point  
  ip ospf 1 area 0  
  bfd interval 100 min_rx 100 multiplier 3  
!  
interface TwentyFiveGigE1/0/3  
  ip ospf network point-to-point  
  ip ospf 1 area 0  
  bfd interval 100 min_rx 100 multiplier 3  
!  
interface TwentyFiveGigE1/0/4  
  ip ospf network point-to-point  
  ip ospf 1 area 0  
  bfd interval 100 min_rx 100 multiplier 3  
!  
interface HundredGigE1/0/25  
  ip ospf network point-to-point  
  ip ospf 1 area 0  
  bfd interval 100 min_rx 100 multiplier 3  
!  
interface HundredGigE1/0/26  
  ip ospf network point-to-point  
  ip ospf 1 area 0  
  bfd interval 100 min_rx 100 multiplier 3  
!
```

BGP and Address Family for L2VPN EVPN

```
!  
router bgp 65106  
!  
  bgp router-id 10.103.255.1  
  bgp log-neighbor-changes  
  no bgp default ipv4-unicast  
  !  
  template peer-session leaf-ps  
    remote-as 65106  
    update-source Loopback0  
    fall-over bfd  
  exit-peer-session  
  !  
  neighbor 10.103.255.3 inherit peer-session leaf-ps  
  neighbor 10.103.255.4 inherit peer-session leaf-ps  
  neighbor 10.103.255.11 inherit peer-session leaf-ps  
  neighbor 10.103.255.12 inherit peer-session leaf-ps  
  neighbor 10.103.255.13 inherit peer-session leaf-ps  
  neighbor 10.103.255.14 inherit peer-session leaf-ps  
  !  
  template peer-policy leaf-pp  
    route-reflector-client  
    send-community both  
  exit-peer-policy  
  !  
  address-family l2vpn evpn  
    neighbor 10.103.255.3 activate  
    neighbor 10.103.255.3 inherit peer-policy leaf-pp  
    neighbor 10.103.255.4 activate  
    neighbor 10.103.255.4 inherit peer-policy leaf-pp  
    neighbor 10.103.255.11 activate  
    neighbor 10.103.255.11 inherit peer-policy leaf-pp  
    neighbor 10.103.255.12 activate  
    neighbor 10.103.255.12 inherit peer-policy leaf-pp  
    neighbor 10.103.255.13 activate  
    neighbor 10.103.255.13 inherit peer-policy leaf-pp  
    neighbor 10.103.255.14 activate  
    neighbor 10.103.255.14 inherit peer-policy leaf-pp  
  exit-address-family  
  !
```

Multicast; IP PIM Sparse Mode with Static RP and MSDP

```
!  
ip multicast-routing  
!  
interface Loopback1
```

```

description MSDP specific loopback
ip address 10.103.254.1 255.255.255.255
ip pim sparse-mode
ip ospf 1 area 0
!
interface Loopback2
description PIM RP Anycast specific loopback
ip address 10.103.255.255 255.255.255.255
ip pim sparse-mode
ip ospf 1 area 0
!
ip msdp peer 10.103.254.2 connect-source Loopback1
ip msdp cache-sa-state
!
interface HundredGigE1/0/28
ip pim sparse-mode
!
interface TwentyFiveGigE1/0/1
ip pim sparse-mode
!
interface TwentyFiveGigE1/0/2
ip pim sparse-mode
!
interface TwentyFiveGigE1/0/3
ip pim sparse-mode
!
interface TwentyFiveGigE1/0/4
ip pim sparse-mode
!
interface HundredGigE1/0/25
ip pim sparse-mode
!
interface HundredGigE1/0/26
ip pim sparse-mode
!
ip pim rp-address 10.103.255.255
!

```

Spine 2

Base Configuration

```

!
service timestamps debug datetime msec localtime show-timezone
service timestamps log datetime msec localtime show-timezone
!
hostname NYC103-Spine-02
!
clock timezone EST -5 0

```

```
clock summer-time EDT recurring
!
ip routing
!
ip name-server 10.100.0.5 10.200.0.5
ip domain name ciscovalidated.com
!
license boot level network-advantage addon dna-advantage
!
system mtu 9198
!
errdisable recovery cause bpduguard
errdisable recovery interval 60
!
enable secret **masked**
!
username admin privilege 15 secret **masked**
!
no ip http server
no ip http secure-server
!
line con 0
  exec-timeout 60 0
  privilege level 15
  logging synchronous
  login local
!
line vty 0 31
  exec-timeout 60 0
  privilege level 15
  logging synchronous
  login local
  transport input telnet ssh
!
aaa new-model
!
interface Loopback0
  description Primary loopback
  ip address 10.103.255.2 255.255.255.255
!
ntp source Loopback0
ntp server 10.100.0.5 prefer
!
```

Underlay Links (excluding OSPF and Multicast)

```
!
! Spine to Spine
```

```
!  
interface HundredGigE1/0/28  
  description To NYC-Spine-01 HundredGigE1/0/28  
  no switchport  
  ip address 10.103.224.18 255.255.255.252  
!  
! Spine to Leaf  
!  
interface TwentyFiveGigE1/0/1  
  description To NYC013-Leaf-01 TwentyFiveGigE1/1/2  
  no switchport  
  ip address 10.103.224.33 255.255.255.252  
!  
interface TwentyFiveGigE1/0/2  
  description To NYC103-Leaf-02 GigabitEthernet1/0/2  
  no switchport  
  ip address 10.103.224.41 255.255.255.252  
!  
interface TwentyFiveGigE1/0/3  
  description To NYC103-Leaf-03 GigabitEthernet1/0/2  
  no switchport  
  ip address 10.103.224.49 255.255.255.252  
!  
interface TwentyFiveGigE1/0/4  
  description To NYC103-Leaf-04 TwentyFiveGigE1/1/2  
  no switchport  
  ip address 10.103.224.57 255.255.255.252  
!  
! Spine to Border  
!  
interface HundredGigE1/0/25  
  description To NYC103-Border-01 FortyGigabitEthernet1/1/2  
  no switchport  
  ip address 10.103.224.25 255.255.255.252  
  speed nonegotiate  
  speed 40000  
!  
interface HundredGigE1/0/26  
  description To NYC103-Border-02 FortyGigabitEthernet1/1/2  
  no switchport  
  ip address 10.103.224.13 255.255.255.252  
  speed nonegotiate  
  speed 40000  
!
```

OSPF on Underlay links and Loopback0

```
!
```

```

router ospf 1
  router-id 10.103.255.2
  auto-cost reference-bandwidth 100000
  default-information originate metric 1000 metric-type 1
  bfd all-interfaces
!
interface Loopback0
  ip ospf 1 area 0
!
interface HundredGigE1/0/28
  ip ospf network point-to-point
  ip ospf 1 area 0
  bfd interval 100 min_rx 100 multiplier 3
!
interface TwentyFiveGigE1/0/1
  ip ospf network point-to-point
  ip ospf 1 area 0
  bfd interval 100 min_rx 100 multiplier 3
!
interface TwentyFiveGigE1/0/2
  ip ospf network point-to-point
  ip ospf 1 area 0
  bfd interval 100 min_rx 100 multiplier 3
!
interface TwentyFiveGigE1/0/3
  ip ospf network point-to-point
  ip ospf 1 area 0
  bfd interval 100 min_rx 100 multiplier 3
!
interface TwentyFiveGigE1/0/4
  ip ospf network point-to-point
  ip ospf 1 area 0
  bfd interval 100 min_rx 100 multiplier 3
!
interface HundredGigE1/0/25
  ip ospf network point-to-point
  ip ospf 1 area 0
  bfd interval 100 min_rx 100 multiplier 3
!
interface HundredGigE1/0/26
  ip ospf network point-to-point
  ip ospf 1 area 0
  bfd interval 100 min_rx 100 multiplier 3
!

```

BGP and Address Family for L2VPN EVPN

```
!
```

```

router bgp 65106
!
bgp router-id 10.103.255.2
bgp log-neighbor-changes
no bgp default ipv4-unicast
!
template peer-session leaf-ps
  remote-as 65106
  update-source Loopback0
  fall-over bfd
exit-peer-session
!
neighbor 10.103.255.3 inherit peer-session leaf-ps
neighbor 10.103.255.4 inherit peer-session leaf-ps
neighbor 10.103.255.11 inherit peer-session leaf-ps
neighbor 10.103.255.12 inherit peer-session leaf-ps
neighbor 10.103.255.13 inherit peer-session leaf-ps
neighbor 10.103.255.14 inherit peer-session leaf-ps
!
template peer-policy leaf-pp
  route-reflector-client
  send-community both
exit-peer-policy
!
address-family l2vpn evpn
  neighbor 10.103.255.3 activate
  neighbor 10.103.255.3 inherit peer-policy leaf-pp
  neighbor 10.103.255.4 activate
  neighbor 10.103.255.4 inherit peer-policy leaf-pp
  neighbor 10.103.255.11 activate
  neighbor 10.103.255.11 inherit peer-policy leaf-pp
  neighbor 10.103.255.12 activate
  neighbor 10.103.255.12 inherit peer-policy leaf-pp
  neighbor 10.103.255.13 activate
  neighbor 10.103.255.13 inherit peer-policy leaf-pp
  neighbor 10.103.255.14 activate
  neighbor 10.103.255.14 inherit peer-policy leaf-pp
exit-address-family
!

```

Multicast; IP PIM Sparse Mode with Static RP and MSDP

```

!
ip multicast-routing
!
interface Loopback1
  description MSDP specific loopback
  ip address 10.103.254.2 255.255.255.255

```



```

ip pim sparse-mode
ip ospf 1 area 0
!
interface Loopback2
description PIM RP Anycast specific loopback
ip address 10.103.255.255 255.255.255.255
ip pim sparse-mode
ip ospf 1 area 0
!
ip msdp peer 10.103.254.1 connect-source Loopback1
ip msdp cache-sa-state
!
interface HundredGigE1/0/28
ip pim sparse-mode
!
interface TwentyFiveGigE1/0/1
ip pim sparse-mode
!
interface TwentyFiveGigE1/0/2
ip pim sparse-mode
!
interface TwentyFiveGigE1/0/3
ip pim sparse-mode
!
interface TwentyFiveGigE1/0/4
ip pim sparse-mode
!
interface HundredGigE1/0/25
ip pim sparse-mode
!
interface HundredGigE1/0/26
ip pim sparse-mode
!
ip pim rp-address 10.103.255.255
!

```

Border Switches

Please use the following template to configure your Fabric Spine Switch(es)

Border Leaf 1

Base Configuration

```

!
service timestamps debug datetime msec localtime show-timezone
service timestamps log datetime msec localtime show-timezone
!
hostname NYC103-Border-01
!

```

```
clock timezone EST -5 0
clock summer-time EDT recurring
!
ip routing
!
ip name-server 10.100.0.5 10.200.0.5
ip domain name ciscovalidated.com
!
license boot level network-advantage addon dna-advantage
!
system mtu 9198
!
errdisable recovery cause bpduguard
errdisable recovery interval 60
!
enable secret **masked**
!
username admin privilege 15 secret **masked**
!
no ip http server
no ip http secure-server
!
line con 0
  exec-timeout 60 0
  privilege level 15
  logging synchronous
  login local
!
line vty 0 31
  exec-timeout 60 0
  privilege level 15
  logging synchronous
  login local
  transport input telnet ssh
!
aaa new-model
!
interface Loopback0
  description Primary loopback
  ip address 10.103.255.3 255.255.255.255
!
ntp source Loopback0
ntp server 10.100.0.5 prefer
!
```

Underlay Links (excluding OSPF and Multicast)

```
!
```

```
! Border to Spine
!
interface FortyGigabitEthernet1/1/1
  description To NYC103-Spine-01 HundredGigE1/0/25
  no switchport
  ip address 10.103.224.10 255.255.255.252
  speed nonegotiate
  speed 40000
!
interface FortyGigabitEthernet1/1/2
  description To NYC103-Spine-02 HundredGigE1/0/25
  no switchport
  ip address 10.103.224.26 255.255.255.252
  speed nonegotiate
  speed 40000
!
```

OSPF on Underlay links and Loopback0

```
!
router ospf 1
  router-id 10.103.255.3
  auto-cost reference-bandwidth 100000
  default-information originate metric 1000 metric-type 1
  bfd all-interfaces
!
interface Loopback0
  ip ospf 1 area 0
!
interface FortyGigabitEthernet1/1/1
  ip ospf network point-to-point
  ip ospf 1 area 0
  bfd interval 100 min_rx 100 multiplier 3
!
interface FortyGigabitEthernet1/1/2
  ip ospf network point-to-point
  ip ospf 1 area 0
  bfd interval 100 min_rx 100 multiplier 3
!
```

BGP and Address Family for L2VPN EVPN

```
!
router bgp 65106
!
  bgp router-id 10.103.255.3
  bgp log-neighbor-changes
  no bgp default ipv4-unicast
!
  template peer-session spine-ps
```

```

remote-as 65106
update-source Loopback0
fall-over bfd
exit-peer-session
!
neighbor 10.103.255.1 inherit peer-session spine-ps
neighbor 10.103.255.2 inherit peer-session spine-ps
!
address-family l2vpn evpn
neighbor 10.103.255.1 activate
neighbor 10.103.255.1 send-community both
neighbor 10.103.255.2 activate
neighbor 10.103.255.2 send-community both
exit-address-family
!

```

Multicast; IP PIM Sparse Mode with Static RP and MSDP on Spine(s)

```

!
ip multicast-routing
!
interface FortyGigabitEthernet1/1/1
ip pim sparse-mode
!
interface FortyGigabitEthernet1/1/2
ip pim sparse-mode
!
ip pim rp-address 10.103.255.255
!

```

OSPF to Core (Underlay)

```

!
interface GigabitEthernet1/0/1
description Trunk to NYC-Core1 TenGigabitEthernet1/0/14
no switchport
no ip address
cts manual
policy static sgt 2 trusted
!
interface GigabitEthernet1/0/1.10
description To NYC-Core1 TenGigabitEthernet1/0/14.10 Underlay Handoff
encapsulation dot1q 10
ip address 10.103.224.2 255.255.255.252
ip ospf 1 area 0
bfd interval 100 min_rx 100 multiplier 3
!

```

BGP to Core (Underlay)

```

!

```

```

bfd interval 100 min_rx 100 multiplier 3
!
! BGP for Underlay to Core
!
router bgp 65106
!
neighbor 10.103.224.1 remote-as 65100
neighbor 10.103.224.1 fall-over bfd
!
address-family ipv4
network 10.103.255.3 mask 255.255.255.255
network 10.103.224.3 mask 255.255.255.252
aggregate-address 10.103.255.0 255.255.255.0 summary-only
aggregate-address 10.103.224.0 255.255.255.0 summary-only
!
neighbor 10.103.224.1 activate
neighbor 10.103.224.1 route-map bgp-underlay-in-from-core in
neighbor 10.103.224.1 route-map bgp-underlay-out-to-core out
!
ip prefix-list bgp-underlay-in-from-core seq 5 permit 0.0.0.0/0
!
ip prefix-list bgp-underlay-out-to-core seq 5 permit 10.103.255.0/24
ip prefix-list bgp-underlay-out-to-core seq 10 permit 10.103.224.0/24
!
route-map bgp-underlay-out-to-core permit 10
match ip address prefix-list bgp-underlay-out-to-core
!
route-map bgp-underlay-in-from-core permit 10
match ip address prefix-list bgp-underlay-in-from-core
!

```

Note: In the above Border configuration, a prefix-list has been added to filter routes exchanged between the underlay and the core (external) network. Only a default route is allowed to the underlay from the core, and summary routes are allowed to the core from the underlay. Please adjust this based on your actual requirements if needed.

Add Campus VRF

```

!
vrf definition campus
rd 65106:3
!
address-family ipv4
route-target export 65106:1
route-target import 65106:1
route-target export 65106:1 stitching
route-target import 65106:1 stitching
exit-address-family

```

!

Add Campus Handoff to Core (Overlay)

!

```
interface GigabitEthernet1/0/2
  description Trunk to NYC-DC-Handoff tel/0/4 for Overlays
  no switchport
  mtu 9000
  no ip address
  cts manual
  policy static sgt 2 trusted
  bfd interval 100 min_rx 100 multiplier 3
```

!

```
interface GigabitEthernet1/0/2.3001
  description Campus Overlay Handoff
  encapsulation dot1Q 3001
  vrf forwarding campus
  ip address 10.103.64.2 255.255.255.252
  bfd interval 100 min_rx 100 multiplier 3
```

!

Add Campus BGP to Core (Overlay)

!

```
router bgp 65106
  neighbor 10.103.64.1 remote-as 65102
  neighbor 10.103.64.1 fall-over bfd
  !
address-family ipv4 vrf campus
  advertise l2vpn evpn
  network 10.103.64.0 mask 255.255.255.252
  aggregate-address 10.103.64.0 255.255.192.0 summary-only
  aggregate-address 10.103.128.0 255.255.192.0 summary-only
  !
  neighbor 10.103.64.1 remote-as 65102
  neighbor 10.103.64.1 fall-over bfd
  neighbor 10.103.64.1 activate
  neighbor 10.103.64.1 route-map bgp-campus-in-from-core in
  neighbor 10.103.64.1 route-map bgp-campus-out-to-core out
  !
ip prefix-list bgp-campus-in-from-core seq 5 permit 0.0.0.0/0
  !
ip prefix-list bgp-campus-out-to-core seq 5 permit 10.103.64.0/18
ip prefix-list bgp-campus-out-to-core seq 10 permit 10.103.128.0/18
  !
route-map bgp-campus-in-from-fusion permit 10
  match ip address prefix-list bgp-campus-in-from-core
  !
route-map bgp-campus-out-to-fusion permit 10
```

```
match ip address prefix-list bgp-campus-out-to-core
```

```
!
```

Setup L3 VNIs to allow Campus routing across the Underlay

```
!
```

```
! note vlan is needed as it will be come the next hop in the active VRF
```

```
! routing table for L3 routes across the underlay
```

```
!
```

```
VLAN 3001
```

```
name Campus-VRF-L3VNI
```

```
!
```

```
interface Vlan3001
```

```
vrf forwarding campus
```

```
ip unnumbered Loopback0
```

```
no autostate
```

```
!
```

```
vlan configuration 3001
```

```
member vni 303001
```

```
!
```

```
interface nve1
```

```
description Network Virtualization Endpoint for encap-decap
```

```
no ip address
```

```
source-interface Loopback0
```

```
host-reachability protocol bgp
```

```
member vni 303001 vrf campus
```

```
!
```

Add Guest VRF

```
!
```

```
vrf definition guest
```

```
rd 65106:23
```

```
!
```

```
address-family ipv4
```

```
route-target export 65106:2
```

```
route-target import 65106:2
```

```
route-target export 65106:2 stitching
```

```
route-target import 65106:2 stitching
```

```
exit-address-family
```

```
!
```

Add Guest Handoff to Core (Overlay)

```
!
```

```
interface GigabitEthernet1/0/2.3002
```

```
description Guest Overlay Handoff
```

```
encapsulation dot1Q 3002
```

```
vrf forwarding guest
```

```
ip address 10.103.64.10 255.255.255.252
```

```
bfd interval 100 min_rx 100 multiplier 3
```

!

Add Guest BGP to Core (Overlay)

!

```
router bgp 65106
  neighbor 10.103.64.9 remote-as 65102
  neighbor 10.103.64.9 fall-over bfd
!
address-family ipv4 vrf guest
  advertise l2vpn evpn
  network 10.103.64.8 mask 255.255.255.252
!
  neighbor 10.103.64.9 remote-as 65102
  neighbor 10.103.64.9 fall-over bfd
  neighbor 10.103.64.9 activate
  neighbor 10.103.64.9 route-map bgp-campus-in-from-core in
  neighbor 10.103.64.9 route-map bgp-campus-out-to-core out
!
ip prefix-list bgp-campus-in-from-core seq 5 permit 0.0.0.0/0
!
ip prefix-list bgp-campus-out-to-core seq 5 permit 10.103.220.0/24
!
route-map bgp-campus-in-from-core permit 10
  match ip address prefix-list bgp-campus-in-from-core
!
route-map bgp-campus-out-to-core permit 10
  match ip address prefix-list bgp-campus-out-to-core
!
```

Setup L3 VNIs to allow routing across the Underlay

!

```
! note vlan is needed as it will be come the next hop in the active VRF
! routing table for L3 routes across the underlay
!
VLAN 3002
  name Guest-VRF-L3VNI
!
interface Vlan3002
  vrf forwarding guest
  ip unnumbered Loopback0
  no autostate
!
vlan configuration 3002
  member vni 303002
!
!
interface nve1
  member vni 303002 vrf guest
```

!

Border Leaf 2

Base Configuration

!

```
service timestamps debug datetime msec localtime show-timezone
```

```
service timestamps log datetime msec localtime show-timezone
```

!

```
hostname NYC103-Border-02
```

!

```
clock timezone EST -5 0
```

```
clock summer-time EDT recurring
```

!

```
ip routing
```

!

```
ip name-server 10.100.0.5 10.200.0.5
```

```
ip domain name ciscovalidated.com
```

!

```
license boot level network-advantage addon dna-advantage
```

!

```
system mtu 9198
```

!

```
errdisable recovery cause bpduguard
```

```
errdisable recovery interval 60
```

!

```
enable secret **masked**
```

!

```
username admin privilege 15 secret **masked**
```

!

```
no ip http server
```

```
no ip http secure-server
```

!

```
line con 0
```

```
  exec-timeout 60 0
```

```
  privilege level 15
```

```
  logging synchronous
```

```
  login local
```

!

```
line vty 0 31
```

```
  exec-timeout 60 0
```

```
  privilege level 15
```

```
  logging synchronous
```

```
  login local
```

```
  transport input telnet ssh
```

!

```
aaa new-model
```

!

```
interface Loopback0
  description Primary loopback
  ip address 10.103.255.4 255.255.255.255
!
ntp source Loopback0
ntp server 10.100.0.5 prefer
!
```

Underlay Links (excluding OSPF and Multicast)

```
!
! Border to Spine
!
interface FortyGigabitEthernet1/1/1
  description To NYC103-Spine-01 HundredGigE1/0/26
  no switchport
  ip address 10.103.224.22 255.255.255.252
  speed nonegotiate
  speed 40000
!
interface FortyGigabitEthernet1/1/2
  description To NYC103-Spine-02 HundredGigE1/0/26
  no switchport
  ip address 10.103.224.14 255.255.255.252
  speed nonegotiate
  speed 40000
!
```

OSPF on Underlay links and Loopback0

```
!
router ospf 1
  router-id 10.103.255.4
  auto-cost reference-bandwidth 100000
  default-information originate metric 1000 metric-type 1
  bfd all-interfaces
!
interface Loopback0
  ip ospf 1 area 0
!
interface FortyGigabitEthernet1/1/1
  ip ospf network point-to-point
  ip ospf 1 area 0
  bfd interval 100 min_rx 100 multiplier 3
!
interface FortyGigabitEthernet1/1/2
  ip ospf network point-to-point
  ip ospf 1 area 0
  bfd interval 100 min_rx 100 multiplier 3
!
```

BGP and Address Family for L2VPN EVPN

```
!  
router bgp 65106  
!  
  bgp router-id 10.103.255.4  
  bgp log-neighbor-changes  
  no bgp default ipv4-unicast  
  !  
  template peer-session spine-ps  
    remote-as 65106  
    update-source Loopback0  
    fall-over bfd  
  exit-peer-session  
  !  
  neighbor 10.103.255.1 inherit peer-session spine-ps  
  neighbor 10.103.255.2 inherit peer-session spine-ps  
  !  
  address-family l2vpn evpn  
    neighbor 10.103.255.1 activate  
    neighbor 10.103.255.1 send-community both  
    neighbor 10.103.255.2 activate  
    neighbor 10.103.255.2 send-community both  
  exit-address-family  
  !
```

Multicast; IP PIM Sparse Mode with Static RP and MSDP on Spine(s)

```
!  
ip multicast-routing  
!  
interface FortyGigabitEthernet1/1/1  
ip pim sparse-mode  
!  
interface FortyGigabitEthernet1/1/2  
ip pim sparse-mode  
!  
ip pim rp-address 10.103.255.255  
!
```

OSPF to Core (Underlay)

```
!  
interface GigabitEthernet1/0/1  
  description Trunk to NYC-Core2 TenGigabitEthernet1/0/14  
  no switchport  
  no ip address  
  cts manual  
  policy static sgt 2 trusted  
  !
```

```
interface GigabitEthernet1/0/1.10
  description To NYC-Core2 TenGigabitEthernet1/0/14.10 Underlay Handoff
  encapsulation dot1Q 10
  ip address 10.103.224.6 255.255.255.252
  ip ospf 1 area 0
  bfd interval 100 min_rx 100 multiplier 3
!
```

BGP to Core (Underlay)

```
!
bfd interval 100 min_rx 100 multiplier 3
!
! BGP for Underlay to Core
!
router bgp 65106
!
  neighbor 10.103.224.5 remote-as 65100
  neighbor 10.103.224.5 fall-over bfd
!
address-family ipv4
  network 10.103.255.4 mask 255.255.255.255
  network 10.103.224.4 mask 255.255.255.252
  aggregate-address 10.103.255.0 255.255.255.0 summary-only
  aggregate-address 10.103.224.0 255.255.255.0 summary-only
!
  neighbor 10.103.224.5 activate
  neighbor 10.103.224.5 route-map bgp-underlay-in-from-core in
  neighbor 10.103.224.5 route-map bgp-underlay-out-to-core out
!
ip prefix-list bgp-underlay-in-from-core seq 5 permit 0.0.0.0/0
!
ip prefix-list bgp-underlay-out-to-core seq 5 permit 10.103.255.0/24
ip prefix-list bgp-underlay-out-to-core seq 10 permit 10.103.224.0/24
!
route-map bgp-underlay-out-to-core permit 10
  match ip address prefix-list bgp-underlay-out-to-core
!
route-map bgp-underlay-in-from-core permit 10
  match ip address prefix-list bgp-underlay-in-from-core
!
```

Note: In the above Border configuration, a prefix-list has been added to filter routes exchanged between the underlay and the core (external) network. Only a default route is allowed to the underlay from the core, and summary routes are allowed to the core from the underlay. Please adjust this based on your actual requirements if needed.

Add Campus VRF

```
!
```

```
vrf definition campus
  rd 65106:4
!
address-family ipv4
  route-target export 65106:1
  route-target import 65106:1
  route-target export 65106:1 stitching
  route-target import 65106:1 stitching
exit-address-family
!
```

Add Campus Handoff to Core (Overlay)

```
!
interface GigabitEthernet1/0/2
  description Trunk to NYC-DC-Handoff tel/0/5 for Overlays
  no switchport
  mtu 9000
  no ip address
  cts manual
  policy static sgt 2 trusted
  bfd interval 100 min_rx 100 multiplier 3
!
interface GigabitEthernet1/0/2.3001
  description Campus Overlay Handoff
  encapsulation dot1Q 3001
  vrf forwarding campus
  ip address 10.103.64.6 255.255.255.252
  bfd interval 100 min_rx 100 multiplier 3
!
```

Add Campus BGP to Core (Overlay)

```
!
router bgp 65106
  neighbor 10.103.64.5 remote-as 65102
  neighbor 10.103.64.5 fall-over bfd
!
address-family ipv4 vrf campus
  advertise l2vpn evpn
  network 10.103.64.4 mask 255.255.255.252
  aggregate-address 10.103.64.0 255.255.192.0 summary-only
  aggregate-address 10.103.128.0 255.255.192.0 summary-only
!
  neighbor 10.103.64.5 remote-as 65102
  neighbor 10.103.64.5 fall-over bfd
  neighbor 10.103.64.5 activate
  neighbor 10.103.64.5 route-map bgp-campus-in-from-core in
  neighbor 10.103.64.5 route-map bgp-campus-out-to-core out
!
```

```

ip prefix-list bgp-campus-in-from-core seq 5 permit 0.0.0.0/0
!
ip prefix-list bgp-campus-out-to-core seq 5 permit 10.103.64.0/18
ip prefix-list bgp-campus-out-to-core seq 10 permit 10.103.128.0/18
!
route-map bgp-campus-in-from-fusion permit 10
  match ip address prefix-list bgp-campus-in-from-core
!
route-map bgp-campus-out-to-fusion permit 10
  match ip address prefix-list bgp-campus-out-to-core
!

```

Setup L3 VNIs to allow Campus routing across the Underlay

```

!
! note vlan is needed as it will be come the next hop in the active VRF
! routing table for L3 routes across the underlay
!
VLAN 3001
  name Campus-VRF-L3VNI
!
interface Vlan3001
  vrf forwarding campus
  ip unnumbered Loopback0
  no autostate
!
vlan configuration 3001
  member vni 303001
!
interface nve1
  description Network Virtualization Endpoint for encap-decap
  no ip address
  source-interface Loopback0
  host-reachability protocol bgp
  member vni 303001 vrf campus
!

```

Add Guest VRF

```

!
vrf definition guest
  rd 65106:24
!
address-family ipv4
  route-target export 65106:2
  route-target import 65106:2
  route-target export 65106:2 stitching
  route-target import 65106:2 stitching
exit-address-family
!

```

Add Guest Handoff to Core (Overlay)

```
!  
interface GigabitEthernet1/0/2.3002  
  description Guest Overlay Handoff  
  encapsulation dot1Q 3002  
  vrf forwarding guest  
  ip address 10.103.64.14 255.255.255.252  
  bfd interval 100 min_rx 100 multiplier 3  
!
```

Add Guest BGP to Core (Overlay)

```
!  
router bgp 65106  
  neighbor 10.103.64.13 remote-as 65102  
  neighbor 10.103.64.13 fall-over bfd  
!  
address-family ipv4 vrf guest  
  advertise l2vpn evpn  
  network 10.103.64.12 mask 255.255.255.252  
!  
  neighbor 10.103.64.13 remote-as 65102  
  neighbor 10.103.64.13 fall-over bfd  
  neighbor 10.103.64.13 activate  
  neighbor 10.103.64.13 route-map bgp-campus-in-from-core in  
  neighbor 10.103.64.13 route-map bgp-campus-out-to-core out  
!  
ip prefix-list bgp-campus-in-from-core seq 5 permit 0.0.0.0/0  
!  
ip prefix-list bgp-campus-out-to-core seq 5 permit 10.103.220.0/24  
!  
route-map bgp-campus-in-from-core permit 10  
  match ip address prefix-list bgp-campus-in-from-core  
!  
route-map bgp-campus-out-to-core permit 10  
  match ip address prefix-list bgp-campus-out-to-core  
!
```

Setup L3 VNIs to allow Guest routing across the Underlay

```
!  
! note vlan is needed as it will be come the next hop in the active VRF  
! routing table for L3 routes across the underlay  
!  
VLAN 3002  
  name Guest-VRF-L3VNI  
!  
interface Vlan3002  
  vrf forwarding guest
```

```
ip unnumbered Loopback0
no autostate
!
vlan configuration 3002
member vni 303002
!
interface nve1
member vni 303002 vrf guest
!
```

Leaf Switches

Please use the following template to configure your Fabric Leaf Switch(es)

Leaf 1

Base Configuration

```
!
service timestamps debug datetime msec localtime show-timezone
service timestamps log datetime msec localtime show-timezone
!
hostname NYC103-Leaf-01
!
clock timezone EST -5 0
clock summer-time EDT recurring
!
ip routing
!
ip name-server 10.100.0.5 10.200.0.5
ip domain name ciscovalidated.com
!
license boot level network-advantage addon dna-advantage
!
system mtu 9198
!
errdisable recovery cause bpduguard
errdisable recovery interval 60
!
enable secret **masked**
!
username admin privilege 15 secret **masked**
!
no ip http server
no ip http secure-server
!
line con 0
exec-timeout 60 0
privilege level 15
logging synchronous
```



```
login local
!
line vty 0 31
  exec-timeout 60 0
  privilege level 15
  logging synchronous
  login local
  transport input telnet ssh
!
aaa new-model
!
interface Loopback0
  description Primary loopback
  ip address 10.103.255.11 255.255.255.255
!
ntp source Loopback0
ntp server 10.100.0.5 prefer
!
lldp run
!
```

Underlay Links (excluding OSPF and Multicast)

```
! Leaf to Spine
!
interface TwentyFiveGigE1/1/1
  description To NYC-Spine-01 TwentyFiveGigE1/0/1
  no switchport
  ip address 10.103.224.30 255.255.255.252
!
interface TwentyFiveGigE1/1/2
  description To NYC-Spine-02 TwentyFiveGigE1/0/1
  no switchport
  ip address 10.103.224.34 255.255.255.252
!
```

OSPF on Underlay links and Loopback0

```
!
router ospf 1
  router-id 10.103.255.11
  auto-cost reference-bandwidth 100000
  bfd all-interfaces
!
interface Loopback0
  ip ospf 1 area 0
!
interface TwentyFiveGigE1/1/1
  ip ospf network point-to-point
  ip ospf 1 area 0
```

```
bfd interval 100 min_rx 100 multiplier 3
!
interface TwentyFiveGigE1/1/2
 ip ospf network point-to-point
 ip ospf 1 area 0
 bfd interval 100 min_rx 100 multiplier 3
!
```

BGP and Address Family for L2VPN EVPN

```
!
router bgp 65106
!
 bgp router-id 10.103.255.11
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
!
 template peer-session spine-ps
  remote-as 65106
  update-source Loopback0
  fall-over bfd
 exit-peer-session
!
 neighbor 10.103.255.1 inherit peer-session spine-ps
 neighbor 10.103.255.2 inherit peer-session spine-ps
!
 address-family l2vpn evpn
  neighbor 10.103.255.1 activate
  neighbor 10.103.255.1 send-community both
  neighbor 10.103.255.2 activate
  neighbor 10.103.255.2 send-community both
 exit-address-family
!
```

Multicast; IP PIM Sparse Mode with Static RP and MSDP

```
!
ip multicast-routing
!
interface TwentyFiveGigE1/1/1
 ip pim sparse-mode
!
interface TwentyFiveGigE1/1/2
 ip pim sparse-mode
!
ip pim rp-address 10.103.255.255
!
```

Add Campus VRF

```
!
```

```
vrf definition campus
  rd 65106:11
!
  address-family ipv4
    route-target export 65106:1
    route-target import 65106:1
    route-target export 65106:1 stitching
    route-target import 65106:1 stitching
  exit-address-family
!
```

BGP for Campus IPV4 VRF

```
!
router bgp 65106
!
  address-family ipv4 vrf campus
    advertise l2vpn evpn
    redistribute connected
  exit-address-family
!
```

Enable Management L2VPN EVPN and VXLAN mapping

```
!
l2vpn evpn
  replication-type static
  router-id Loopback0
!
vlan 1
  name Management
!
l2vpn evpn instance 1 vlan-based
  encapsulation vxlan
!
vlan configuration 1
  member evpn-instance 1 vni 200001
!
```

Add NVE1 and VNI Mapping for Management

```
!
interface nve1
  description Network Virtualization Endpoint for encap-decap
  no ip address
  source-interface Loopback0
  host-reachability protocol bgp
  member vni 200001 mcast-group 225.0.0.1
!
```

DAG and DHCP settings via Underlay with Option 82 for Management

```
!  
l2vpn evpn instance 1 vlan-based  
  encapsulation vxlan  
!  
vlan configuration 1  
member evpn-instance 1 vni 200001  
!  
interface Vlan1  
  description Meraki Mgt Distributed Anycast Gateway  
  mac-address 0000.0000.0001  
  vrf forwarding campus  
  ip address 10.103.64.1 255.255.255.0  
  ip dhcp relay source-interface Loopback0  
  ip helper-address global 10.100.0.5  
  no autostate  
!
```

Enable Corp L2VPN EVPN and VXLAN mapping

```
!  
l2vpn evpn  
  replication-type static  
  router-id Loopback0  
!  
vlan 120  
  name Employee  
!  
l2vpn evpn instance 120 vlan-based  
  encapsulation vxlan  
!  
vlan configuration 120  
  member evpn-instance 120 vni 200120  
!
```

NVE1 to VNI mapping for Corp

```
!  
interface nve1  
  member vni 200120 mcast-group 225.0.0.120  
!
```

DAG and DHCP settings via Underlay with Option 82 for Corp VLAN

```
!  
interface Vlan120  
  description Employee Distributed Anycast Gateway  
  mac-address 0000.0000.0120  
  vrf forwarding campus  
  ip address 10.103.120.1 255.255.255.0  
!
```

```
ip dhcp relay source-interface Loopback0
ip helper-address global 10.100.0.5
no autostate
!
ip dhcp relay information option
ip dhcp relay information option vpn
!
```

Note: Please note that both ip dhcp relay information option and ip dhcp relay information option vpn are needed with IOS XE prior to 17.9.x. This is however not required with later IOS XE releases.

Enable IoT L2VPN EVPN and VXLAN mapping

```
!
vlan 180
  name IoT
!
l2vpn evpn instance 180 vlan-based
  encapsulation vxlan
!
vlan configuration 180
  member evpn-instance 180 vni 200180
!
```

NVE1 to VNI mapping for IoT

```
!
interface nve1
member vni 200180 mcast-group 225.0.0.120
!
```

DAG and DHCP settings via Underlay with Option 82 for IoT VLAN

```
!
interface Vlan180
  description IoT Distributed Anycast Gateway
  mac-address 0000.0000.0180
  vrf forwarding campus
  ip address 10.103.180.1 255.255.255.0
!
ip dhcp relay source-interface Loopback0
ip helper-address global 10.100.0.5
no autostate
!
ip dhcp relay information option
ip dhcp relay information option vpn
!
```

Note: Please note that both ip dhcp relay information option and ip dhcp relay information option vpn are needed with IOS XE prior to 17.9.x. This is however not required with later IOS XE releases.

Setup L3 VNIs to allow routing across the Underlay for Campus

```
!  
!  note vlan is needed as it will be come the next hop in the active VRF  
!  routing table for L3 routes across the underlay  
!  
!  
VLAN 3001  
  name Campus-VRF-L3VNI  
!  
interface Vlan3001  
  vrf forwarding campus  
  ip unnumbered Loopback0  
  no autostate  
!  
vlan configuration 3001  
  member vni 303001  
!  
interface nve1  
  member vni 303001 vrf campus  
!
```

Add Guest VRF

```
!  
vrf definition guest  
  rd 65106:211  
!  
  address-family ipv4  
    route-target export 65106:2  
    route-target import 65106:2  
    route-target export 65106:2 stitching  
    route-target import 65106:2 stitching  
  exit-address-family  
!
```

BGP for Guest IPV4 VRF

```
!  
router bgp 65106  
!  
  address-family ipv4 vrf guest  
    advertise l2vpn evpn  
    redistribute connected  
  exit-address-family  
!
```

Enable Guest L2VPN EVPN and VXLAN mapping

```
!  
vlan 220  
  name Guest
```

```
!  
l2vpn evpn instance 220 vlan-based  
    encapsulation vxlan  
!  
vlan configuration 220  
    member evpn-instance 220 vni 200220  
!
```

NVE1 to VNI mapping for Guest

```
!  
interface nve1  
member vni 200220 mcast-group 225.0.0.120  
!
```

DAG and DHCP settings via Underlay with Option 82 for Guest VLAN

```
!  
interface Vlan220  
    description Guest Distributed Anycast Gateway  
    mac-address 0000.0000.0220  
    vrf forwarding guest  
    ip address 10.103.220.1 255.255.255.0  
!  
    ip dhcp relay source-interface Loopback0  
    ip helper-address global 10.100.0.5  
    no autostate  
!  
ip dhcp relay information option  
ip dhcp relay information option vpn  
!
```

Note: Please note that both ip dhcp relay information option and ip dhcp relay information option vpn are needed with IOS XE prior to 17.9.x. This is however not required with later IOS XE releases.

Setup L3 VNIs to allow routing across the Underlay for Guest

```
!  
! note vlan is needed as it will be come the next hop in the active VRF  
! routing table for L3 routes across the underlay  
!  
!  
VLAN 3002  
    name Guest-VRF-L3VNI  
!  
interface Vlan3002  
    vrf forwarding guest  
    ip unnumbered Loopback0  
    no autostate  
!  
vlan configuration 3002
```

```
member vni 303002
!  
interface nve1  
member vni 303002 vrf guest  
!
```

Downlinks to Access Layer

```
!  
interface GigabitEthernet1/0/47  
description Trunk to NYC103-FL01-SW01 port 23  
switchport trunk allowed vlan 1-3000,3003-4096  
switchport mode trunk  
switchport nonegotiate  
!  
interface GigabitEthernet1/0/48  
description Trunk to NYC103-FL01-SW01 port 24  
switchport trunk allowed vlan 1-3000,3003-4096  
switchport mode trunk  
switchport nonegotiate  
!
```

Tech tip: The above configuration for the Leaf downlinks to Access layer suggests allowing all supported VLANs to facilitate adding new services (e.g. new SSIDs) in the future. However, it is also possible to prune un-used VLANs if that's a requirement.

Note: Cloud Managed Switches (-M models) supports a maximum of 1000 VLANs. The above downlink configuration has all non-reserved VLANs allowed on the Downlink Trunks such that if a new service is created (e.g. new SSID, new VLAN) on the downstream network it then needs to be added to the Cloud Managed Switch Uplink(s) without the need to adjust the Leaf switch.

Enable Inline Tagging

```
!  
interface GigabitEthernet1/0/47  
cts manual  
policy static sgt 2 trusted  
!  
interface GigabitEthernet1/0/48  
cts manual  
policy static sgt 2 trusted  
!
```

Enable Spanning-Tree with Bridge Priority and enable Root Guard

```
!  
spanning-tree mst configuration  
name region1
```



```
revision 1
exit
!
spanning-tree mst 0 priority 4096
!
interface GigabitEthernet1/0/47
  spanning-tree guard root
!
interface GigabitEthernet1/0/48
  spanning-tree guard root
!
```

Note: At this stage, you can plug the Access Switches and Access Points to Leaf 1 and wait for them to come online in Dashboard. Connect uplinks on the Access Points to Access switch and connect uplinks on Access switch to Leaf switch. Power on all devices and wait for them to come online in Dashboard.

Note: Please note that it might take a few minutes for the switches to download their configuration and firmware and reboot before they come steady online in Dashboard.

Configure Ether Channel for Access Switch (where applicable)

```
!
interface GigabitEthernet1/0/47
  description Trunk to NYC103-FL01-SW01 port 23 in LACP Channel Group 1
  channel-group 1 mode active
!
interface GigabitEthernet1/0/48
  description Trunk to NYC103-FL01-SW01 port 24 in LACP Channel Group 1
  channel-group 1 mode active
!
interface port-channel 1
  description LACP Channel Group to NYC103-FL01-SW01 on ports 47-48
!
```

Leaf 2

Base Configuration

```
!
service timestamps debug datetime msec localtime show-timezone
service timestamps log datetime msec localtime show-timezone
!
hostname NYC103-Leaf-02
!
clock timezone EST -5 0
clock summer-time EDT recurring
!
ip routing
```

```
!  
ip name-server 10.100.0.5 10.200.0.5  
ip domain name ciscovalidated.com  
!  
license boot level network-advantage addon dna-advantage  
!  
system mtu 9198  
!  
errdisable recovery cause bpduguard  
errdisable recovery interval 60  
!  
enable secret **masked**  
!  
username admin privilege 15 secret **masked**  
!  
no ip http server  
no ip http secure-server  
!  
line con 0  
  exec-timeout 60 0  
  privilege level 15  
  logging synchronous  
  login local  
  
line vty 0 31  
  exec-timeout 60 0  
  privilege level 15  
  logging synchronous  
  login local  
  transport input telnet ssh  
!  
aaa new-model  
!  
interface Loopback0  
  description Primary loopback  
  ip address 10.103.255.12 255.255.255.255  
!  
ntp source Loopback0  
ntp server 10.100.0.5 prefer  
!  
lldp run  
!
```

Underlay Links (excluding OSPF and Multicast)

```
! Leaf to Spine  
!  
interface GigabitEthernet1/0/1
```

```
description To NYC103-Spine-01 TwentyFiveGigE1/0/2
no switchport
ip address 10.103.224.38 255.255.255.252
!
interface GigabitEthernet1/0/2
description To NYC103-Spine-02 TwentyFiveGigE1/0/2
no switchport
ip address 10.103.224.42 255.255.255.252
!
```

OSPF on Underlay links and Loopback0

```
!
router ospf 1
router-id 10.103.255.12
auto-cost reference-bandwidth 100000
bfd all-interfaces
!
interface Loopback0
ip ospf 1 area 0
!
interface GigabitEthernet1/0/1
ip ospf network point-to-point
ip ospf 1 area 0
bfd interval 100 min_rx 100 multiplier 3
!
interface GigabitEthernet1/0/2
ip ospf network point-to-point
ip ospf 1 area 0
bfd interval 100 min_rx 100 multiplier 3
!
```

BGP and Address Family for L2VPN EVPN

```
!
router bgp 65106
!
bgp router-id 10.103.255.12
bgp log-neighbor-changes
no bgp default ipv4-unicast
!
template peer-session spine-ps
remote-as 65106
update-source Loopback0
fall-over bfd
exit-peer-session
!
neighbor 10.103.255.1 inherit peer-session spine-ps
neighbor 10.103.255.2 inherit peer-session spine-ps
!
```

```
address-family l2vpn evpn
  neighbor 10.103.255.1 activate
  neighbor 10.103.255.1 send-community both
  neighbor 10.103.255.2 activate
  neighbor 10.103.255.2 send-community both
exit-address-family
!
```

Multicast; IP PIM Sparse Mode with Static RP and MSDP

```
!
ip multicast-routing
!
interface GigabitEthernet1/0/1
  ip pim sparse-mode
!
interface GigabitEthernet1/0/2
  ip pim sparse-mode
!
ip pim rp-address 10.103.255.255
!
```

Add Campus VRF

```
!
vrf definition campus
  rd 65106:12
!
address-family ipv4
  route-target export 65106:1
  route-target import 65106:1
  route-target export 65106:1 stitching
  route-target import 65106:1 stitching
exit-address-family
!
```

BGP for Campus IPV4 VRF

```
!
router bgp 65106
!
address-family ipv4 vrf campus
  advertise l2vpn evpn
  redistribute connected
exit-address-family
!
```

Enable Management L2VPN EVPN and VXLAN mapping

```
!
l2vpn evpn
  replication-type static
```

```
router-id Loopback0
!
vlan 1
 name Management
!
l2vpn evpn instance 1 vlan-based
 encapsulation vxlan
!
vlan configuration 1
 member evpn-instance 1 vni 200001
!
```

Add NVE1 and VNI Mapping for Management

```
!
interface nve1
 description Network Virtualization Endpoint for encap-decap
 no ip address
 source-interface Loopback0
 host-reachability protocol bgp
 member vni 200001 mcast-group 225.0.0.1
!
```

DAG and DHCP settings via Underlay with Option 82 for Management

```
!
l2vpn evpn instance 1 vlan-based
 encapsulation vxlan
!
vlan configuration 1
 member evpn-instance 1 vni 200001
!
interface Vlan1
 description Meraki Mgt Distributed Anycast Gateway
 mac-address 0000.0000.0001
 vrf forwarding campus
 ip address 10.103.64.1 255.255.255.0
 ip dhcp relay source-interface Loopback0
 ip helper-address global 10.100.0.5
 no autostate
!
```

Enable Corp L2VPN EVPN and VXLAN mapping

```
!
l2vpn evpn
 replication-type static
 router-id Loopback0
!
vlan 120
 name Employee
```

```
!  
l2vpn evpn instance 120 vlan-based  
  encapsulation vxlan  
!  
vlan configuration 120  
  member evpn-instance 120 vni 200120  
!
```

NVE1 to VNI mapping for Corp

```
!  
interface nve1  
  member vni 200120 mcast-group 225.0.0.120  
!
```

DAG and DHCP settings via Underlay with Option 82 for Corp VLAN

```
!  
interface Vlan120  
  description Employee Distributed Anycast Gateway  
  mac-address 0000.0000.0120  
  vrf forwarding campus  
  ip address 10.103.120.1 255.255.255.0  
!  
  ip dhcp relay source-interface Loopback0  
  ip helper-address global 10.100.0.5  
  no autostate  
!  
ip dhcp relay information option  
ip dhcp relay information option vpn  
!
```

Enable IoT L2VPN EVPN and VXLAN mapping

```
!  
vlan 180  
  name IoT  
!  
l2vpn evpn instance 180 vlan-based  
  encapsulation vxlan  
!  
vlan configuration 180  
  member evpn-instance 180 vni 200180  
!
```

NVE1 to VNI mapping for IoT

```
!  
interface nve1  
  member vni 200180 mcast-group 225.0.0.120  
!
```

DAG and DHCP settings via Underlay with Option 82 for IoT VLAN

```
!  
interface Vlan180  
  description IoT Distributed Anycast Gateway  
  mac-address 0000.0000.0180  
  vrf forwarding campus  
  ip address 10.103.180.1 255.255.255.0  
!  
ip dhcp relay source-interface Loopback0  
ip helper-address global 10.100.0.5  
no autostate  
!  
ip dhcp relay information option  
ip dhcp relay information option vpn  
!
```

Setup L3 VNIs to allow routing across the Underlay for Campus

```
!  
! note vlan is needed as it will be come the next hop in the active VRF  
! routing table for L3 routes across the underlay  
!  
!  
VLAN 3001  
  name Campus-VRF-L3VNI  
!  
interface Vlan3001  
  vrf forwarding campus  
  ip unnumbered Loopback0  
  no autostate  
!  
!  
vlan configuration 3001  
  member vni 303001  
!  
!  
interface nve1  
  member vni 303001 vrf campus  
!
```

Add Guest VRF

```
!  
vrf definition guest  
  rd 65106:212  
!  
  address-family ipv4  
    route-target export 65106:2  
    route-target import 65106:2
```

```
route-target export 65106:2 stitching
route-target import 65106:2 stitching
exit-address-family
!
```

BGP for Guest IPV4 VRF

```
!
router bgp 65106
!
address-family ipv4 vrf guest
advertise l2vpn evpn
redistribute connected
exit-address-family
!
```

Enable Guest L2VPN EVPN and VXLAN mapping

```
!
vlan 220
name Guest
!
l2vpn evpn instance 220 vlan-based
encapsulation vxlan
!
vlan configuration 220
member evpn-instance 220 vni 200220
!
```

NVE1 to VNI mapping for Guest

```
!
interface nve1
member vni 200220 mcast-group 225.0.0.120
!
```

DAG and DHCP settings via Underlay with Option 82 for Guest VLAN

```
!
interface Vlan220
description Guest Distributed Anycast Gateway
mac-address 0000.0000.0220
vrf forwarding guest
ip address 10.103.220.1 255.255.255.0
!
ip dhcp relay source-interface Loopback0
ip helper-address global 10.100.0.5
no autostate
!
ip dhcp relay information option
ip dhcp relay information option vpn
!
```

Setup L3 VNIs to allow routing across the Underlay for Guest

```
!  
!  note vlan is needed as it will be come the next hop in the active VRF  
!  routing table for L3 routes across the underlay  
!  
!  
VLAN 3002  
  name Guest-VRF-L3VNI  
!  
interface Vlan3002  
  vrf forwarding guest  
  ip unnumbered Loopback0  
  no autostate  
!  
vlan configuration 3002  
  member vni 303002  
!  
interface nve1  
  member vni 303002 vrf guest  
!
```

Downlinks to Access Layer

```
!  
interface GigabitEthernet1/0/47  
  description Trunk to NYC103-FL02-SW02 port 23  
  switchport trunk allowed vlan 1-3000,3003-4096  
  switchport mode trunk  
  switchport nonegotiate  
!  
interface GigabitEthernet1/0/48  
  description Trunk to NYC103-FL02-SW01 port 24  
  switchport trunk allowed vlan 1-3000,3003-4096  
switchport mode trunk  
  switchport nonegotiate  
!
```

Enable Inline Tagging

```
!  
interface GigabitEthernet1/0/47  
  cts manual  
  policy static sgt 2 trusted  
!  
interface GigabitEthernet1/0/48  
  cts manual  
  policy static sgt 2 trusted  
!
```

Enable Spanning-Tree with Bridge Priority and enable Root Guard

```
!  
spanning-tree mst configuration  
  name region1  
  revision 1  
  exit  
!  
spanning-tree mst 0 priority 4096  
!  
interface GigabitEthernet1/0/47  
  spanning-tree guard root  
!  
interface GigabitEthernet1/0/48  
  spanning-tree guard root  
!
```

Note: At this stage, you can plug the Access Switches and Access Points to Leaf 2 and wait for them to come online in Dashboard. Connect uplinks on the Access Points to Access switch and connect uplinks on Access switch to Leaf switch. Power on all devices and wait for them to come online in Dashboard.

Note: Please note that it might take a few minutes for the switches to download their configuration and firmware and reboot before they come steady online in Dashboard.

Leaf 3

Base Configuration

```
!  
service timestamps debug datetime msec localtime show-timezone  
service timestamps log datetime msec localtime show-timezone  
!  
hostname NYC103-Leaf-03  
!  
clock timezone EST -5 0  
clock summer-time EDT recurring  
!  
ip routing  
!  
ip name-server 10.100.0.5 10.200.0.5  
ip domain name ciscovalidated.com  
!  
license boot level network-advantage addon dna-advantage  
!  
system mtu 9198  
!  
errdisable recovery cause bpduguard
```

```
errdisable recovery interval 60
!
enable secret **masked**
!
username admin privilege 15 secret **masked**
!
no ip http server
no ip http secure-server
!
line con 0
  exec-timeout 60 0
  privilege level 15
  logging synchronous
  login local
!
line vty 0 31
  exec-timeout 60 0
  privilege level 15
  logging synchronous
  login local
  transport input telnet ssh
!
aaa new-model
!
interface Loopback0
  description Primary loopback
  ip address 10.103.255.13 255.255.255.255
!
ntp source Loopback0
ntp server 10.100.0.5 prefer
!
lldp run
!
```

Underlay Links (excluding OSPF and Multicast)

```
! Leaf to Spine
!
interface GigabitEthernet1/0/1
  description To NYC103-Spine-01 TwentyFiveGigE1/0/3
  no switchport
  ip address 10.103.224.46 255.255.255.252
!
interface GigabitEthernet1/0/2
  description To NYC103-Spine-02 TwentyFiveGigE1/0/3
  no switchport
  ip address 10.103.224.50 255.255.255.252
!
```

OSPF on Underlay links and Loopback0

```
!  
router ospf 1  
  router-id 10.103.255.13  
  auto-cost reference-bandwidth 100000  
  bfd all-interfaces  
!  
interface Loopback0  
  ip ospf 1 area 0  
!  
interface GigabitEthernet1/0/1  
  ip ospf network point-to-point  
  ip ospf 1 area 0  
  bfd interval 100 min_rx 100 multiplier 3  
!  
interface GigabitEthernet1/0/2  
  ip ospf network point-to-point  
  ip ospf 1 area 0  
  bfd interval 100 min_rx 100 multiplier 3  
!
```

BGP and Address Family for L2VPN EVPN

```
!  
router bgp 65106  
!  
  bgp router-id 10.103.255.13  
  bgp log-neighbor-changes  
  no bgp default ipv4-unicast  
!  
  template peer-session spine-ps  
    remote-as 65106  
    update-source Loopback0  
    fall-over bfd  
  exit-peer-session  
!  
  neighbor 10.103.255.1 inherit peer-session spine-ps  
  neighbor 10.103.255.2 inherit peer-session spine-ps  
!  
address-family l2vpn evpn  
  neighbor 10.103.255.1 activate  
  neighbor 10.103.255.1 send-community both  
  neighbor 10.103.255.2 activate  
  neighbor 10.103.255.2 send-community both  
exit-address-family  
!
```

Multicast; IP PIM Sparse Mode with Static RP and MSDP

```
!  
ip multicast-routing  
!  
interface GigabitEthernet1/0/1  
  ip pim sparse-mode  
!  
interface GigabitEthernet1/0/2  
  ip pim sparse-mode  
!  
ip pim rp-address 10.103.255.255  
!
```

Add Campus VRF

```
!  
vrf definition campus  
  rd 65106:13  
!  
address-family ipv4  
  route-target export 65106:1  
  route-target import 65106:1  
  route-target export 65106:1 stitching  
  route-target import 65106:1 stitching  
exit-address-family  
!
```

BGP for Campus IPV4 VRF

```
!  
router bgp 65106  
!  
address-family ipv4 vrf campus  
  advertise l2vpn evpn  
  redistribute connected  
exit-address-family  
!
```

Enable Management L2VPN EVPN and VXLAN mapping

```
!  
l2vpn evpn  
  replication-type static  
  router-id Loopback0  
!  
vlan 1  
  name Management  
!  
l2vpn evpn instance 1 vlan-based  
  encapsulation vxlan  
!
```

```
vlan configuration 1
  member evpn-instance 1 vni 200001
!
```

Add NVE1 and VNI Mapping for Management

```
!
interface nve1
  description Network Virtualization Endpoint for encap-decap
  no ip address
  source-interface Loopback0
  host-reachability protocol bgp
  member vni 200001 mcast-group 225.0.0.1
!
```

DAG and DHCP settings via Underlay with Option 82 for Management

```
!
l2vpn evpn instance 1 vlan-based
  encapsulation vxlan
!
vlan configuration 1
member evpn-instance 1 vni 200001
!
interface Vlan1
  description Meraki Mgt Distributed Anycast Gateway
  mac-address 0000.0000.0001
  vrf forwarding campus
  ip address 10.103.64.1 255.255.255.0
  ip dhcp relay source-interface Loopback0
  ip helper-address global 10.100.0.5
  no autostate
!
```

Enable Corp L2VPN EVPN and VXLAN mapping

```
!
l2vpn evpn
  replication-type static
  router-id Loopback0
!
vlan 120
  name Employee
!
l2vpn evpn instance 120 vlan-based
  encapsulation vxlan
!
vlan configuration 120
  member evpn-instance 120 vni 200120
!
```

NVE1 to VNI mapping for Corp

```
!  
interface nve1  
  member vni 200120 mcast-group 225.0.0.120  
!
```

DAG and DHCP settings via Underlay with Option 82 for Corp VLAN

```
!  
interface Vlan120  
  description Employee Distributed Anycast Gateway  
  mac-address 0000.0000.0120  
  vrf forwarding campus  
  ip address 10.103.120.1 255.255.255.0  
!  
  ip dhcp relay source-interface Loopback0  
  ip helper-address global 10.100.0.5  
  no autostate  
!  
ip dhcp relay information option  
ip dhcp relay information option vpn  
!
```

Enable IoT L2VPN EVPN and VXLAN mapping

```
!  
vlan 180  
  name IoT  
!  
l2vpn evpn instance 180 vlan-based  
  encapsulation vxlan  
!  
vlan configuration 180  
  member evpn-instance 180 vni 200180  
!
```

NVE1 to VNI mapping for IoT

```
!  
interface nve1  
  member vni 200180 mcast-group 225.0.0.120  
!
```

DAG and DHCP settings via Underlay with Option 82 for IoT VLAN

```
!  
interface Vlan180  
  description IoT Distributed Anycast Gateway  
  mac-address 0000.0000.0180  
  vrf forwarding campus  
  ip address 10.103.180.1 255.255.255.0  
!
```

```
ip dhcp relay source-interface Loopback0
ip helper-address global 10.100.0.5
no autostate
!
ip dhcp relay information option
ip dhcp relay information option vpn
!
```

Setup L3 VNIs to allow routing across the Underlay for Campus

```
!
! note vlan is needed as it will be come the next hop in the active VRF
! routing table for L3 routes across the underlay
!
!
VLAN 3001
  name Campus-VRF-L3VNI
!
interface Vlan3001
  vrf forwarding campus
  ip unnumbered Loopback0
  no autostate
!
!
vlan configuration 3001
  member vni 303001
!
!
interface nve1
  member vni 303001 vrf campus
!
```

Add Guest VRF

```
!
vrf definition guest
  rd 65106:213
!
address-family ipv4
  route-target export 65106:2
  route-target import 65106:2
  route-target export 65106:2 stitching
  route-target import 65106:2 stitching
exit-address-family
!
```

BGP for Guest IPV4 VRF

```
!
router bgp 65106
!
```

```
address-family ipv4 vrf guest
  advertise l2vpn evpn
  redistribute connected
exit-address-family
!
```

Enable Guest L2VPN EVPN and VXLAN mapping

```
!
vlan 220
  name Guest
!
l2vpn evpn instance 220 vlan-based
  encapsulation vxlan
!
vlan configuration 220
  member evpn-instance 220 vni 200220
!
```

NVE1 to VNI mapping for Guest

```
!
interface nve1
member vni 200220 mcast-group 225.0.0.120
!
```

DAG and DHCP settings via Underlay with Option 82 for Guest VLAN

```
!
interface Vlan220
  description Guest Distributed Anycast Gateway
  mac-address 0000.0000.0220
  vrf forwarding guest
  ip address 10.103.220.1 255.255.255.0
!
ip dhcp relay source-interface Loopback0
ip helper-address global 10.100.0.5
no autostate
!
ip dhcp relay information option
ip dhcp relay information option vpn
!
```

Setup L3 VNIs to allow routing across the Underlay for Guest

```
!
! note vlan is needed as it will be come the next hop in the active VRF
! routing table for L3 routes across the underlay
!
!
VLAN 3002
  name Guest-VRF-L3VNI
```

```
!  
interface Vlan3002  
  vrf forwarding guest  
  ip unnumbered Loopback0  
  no autostate  
!  
vlan configuration 3002  
  member vni 303002  
!  
interface nve1  
  member vni 303002 vrf guest  
!
```

Downlinks to Access Layer

```
!  
interface GigabitEthernet1/0/12  
  description To NYC103-Client36 Dot1x Capable  
  switchport access vlan 120  
  switchport mode access  
  switchport nonegotiate  
  spanning-tree portfast  
  spanning-tree bpduguard enable  
!  
interface GigabitEthernet1/0/13  
  description To NYC103-Client37 Dot1x Capable  
  switchport access vlan 120  
  switchport mode access  
  switchport nonegotiate  
  spanning-tree portfast  
  spanning-tree bpduguard enable  
!  
interface GigabitEthernet1/0/48  
  description Trunk to NYC103-FL03-AP01  
  switchport trunk allowed vlan 1-3000,3003-4096  
  switchport mode trunk  
  switchport nonegotiate  
!
```

Enable Inline Tagging

```
!  
interface GigabitEthernet1/0/48  
  cts manual  
  policy static sgt 2 trusted  
!
```

Enable Spanning-Tree with Bridge Priority and enable Root Guard

```
!  
spanning-tree mst configuration
```

```
name region1
revision 1
exit
!
spanning-tree mst 0 priority 4096
!
interface GigabitEthernet1/0/47
spanning-tree guard root
!
interface GigabitEthernet1/0/48
spanning-tree guard root
!
```

Note: At this stage, you can plug the Access Switches and Access Points to Leaf 3 and wait for them to come online in Dashboard. Connect uplinks on the Access Points to Access switch and connect uplinks on Access switch to Leaf switch. Power on all devices and wait for them to come online in Dashboard.

Note: Please note that it might take a few minutes for the switches to download their configuration and firmware and reboot before they come steady online in Dashboard.

Leaf 4

Base Configuration

```
!
service timestamps debug datetime msec localtime show-timezone
service timestamps log datetime msec localtime show-timezone
!
hostname NYC103-Leaf-03
!
clock timezone EST -5 0
clock summer-time EDT recurring
!
ip routing
!
ip name-server 10.100.0.5 10.200.0.5
ip domain name ciscovalidated.com
!
license boot level network-advantage addon dna-advantage
!
system mtu 9198
!
errdisable recovery cause bpduguard
errdisable recovery interval 60
!
enable secret **masked**
```

```
!  
username admin privilege 15 secret **masked**  
!  
no ip http server  
no ip http secure-server  
!  
line con 0  
  exec-timeout 60 0  
  privilege level 15  
  logging synchronous  
  login local  
!  
line vty 0 31  
  exec-timeout 60 0  
  privilege level 15  
  logging synchronous  
  login local  
  transport input telnet ssh  
!  
aaa new-model  
!  
interface Loopback0  
  description Primary loopback  
  ip address 10.103.255.14 255.255.255.255  
!  
ntp source Loopback0  
ntp server 10.100.0.5 prefer  
!  
lldp run  
!
```

Underlay Links (excluding OSPF and Multicast)

```
! Leaf to Spine  
!  
interface TwentyFiveGigE1/1/1  
  description To NYC103-Spine-01 TwentyFiveGigE1/0/4  
  no switchport  
  ip address 10.103.224.54 255.255.255.252  
!  
interface TwentyFiveGigE1/1/2  
  description To NYC103-Spine-02 TwentyFiveGigE1/0/4  
  no switchport  
  ip address 10.103.224.58 255.255.255.252  
!
```

OSPF on Underlay links and Loopback0

```
!  
router ospf 1
```

```
router-id 10.103.255.14
auto-cost reference-bandwidth 100000
bfd all-interfaces
!
interface Loopback0
 ip ospf 1 area 0
!
interface TwentyFiveGigE1/1/1
 ip ospf network point-to-point
 ip ospf 1 area 0
 bfd interval 100 min_rx 100 multiplier 3
!
interface TwentyFiveGigE1/1/2
 ip ospf network point-to-point
 ip ospf 1 area 0
 bfd interval 100 min_rx 100 multiplier 3
!
```

BGP and Address Family for L2VPN EVPN

```
!
router bgp 65106
!
 bgp router-id 10.103.255.14
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
!
template peer-session spine-ps
 remote-as 65106
 update-source Loopback0
 fall-over bfd
exit-peer-session
!
neighbor 10.103.255.1 inherit peer-session spine-ps
neighbor 10.103.255.2 inherit peer-session spine-ps
!
address-family l2vpn evpn
 neighbor 10.103.255.1 activate
 neighbor 10.103.255.1 send-community both
 neighbor 10.103.255.2 activate
 neighbor 10.103.255.2 send-community both
exit-address-family
!
```

Multicast; IP PIM Sparse Mode with Static RP and MSDP

```
!
ip multicast-routing
!
interface TwentyFiveGigE1/1/1
```

```
ip pim sparse-mode
!
interface TwentyFiveGigE1/1/2
ip pim sparse-mode
!
ip pim rp-address 10.103.255.255
!
```

Add Campus VRF

```
!
vrf definition campus
rd 65106:14
!
address-family ipv4
route-target export 65106:1
route-target import 65106:1
route-target export 65106:1 stitching
route-target import 65106:1 stitching
exit-address-family
!
```

BGP for Campus IPV4 VRF

```
!
router bgp 65106
!
address-family ipv4 vrf campus
advertise l2vpn evpn
redistribute connected
exit-address-family
!
```

Enable Management L2VPN EVPN and VXLAN mapping

```
!
l2vpn evpn
replication-type static
router-id Loopback0
!
vlan 1
name Management
!
l2vpn evpn instance 1 vlan-based
encapsulation vxlan
!
vlan configuration 1
member evpn-instance 1 vni 200001
!
```

Add NVE1 and VNI Mapping for Management

```
!  
interface nve1  
  description Network Virtualization Endpoint for encap-decap  
  no ip address  
  source-interface Loopback0  
  host-reachability protocol bgp  
  member vni 200001 mcast-group 225.0.0.1  
!
```

DAG and DHCP settings via Underlay with Option 82 for Management

```
!  
l2vpn evpn instance 1 vlan-based  
  encapsulation vxlan  
!  
vlan configuration 1  
member evpn-instance 1 vni 200001  
!  
interface Vlan1  
  description Meraki Mgt Distributed Anycast Gateway  
  mac-address 0000.0000.0001  
  vrf forwarding campus  
  ip address 10.103.64.1 255.255.255.0  
  ip dhcp relay source-interface Loopback0  
  ip helper-address global 10.100.0.5  
  no autostate  
!
```

Enable Corp L2VPN EVPN and VXLAN mapping

```
!  
l2vpn evpn  
  replication-type static  
  router-id Loopback0  
!  
vlan 120  
  name Employee  
!  
l2vpn evpn instance 120 vlan-based  
  encapsulation vxlan  
!  
vlan configuration 120  
  member evpn-instance 120 vni 200120  
!
```

NVE1 to VNI mapping for Corp

```
!  
interface nve1  
  member vni 200120 mcast-group 225.0.0.120
```

!

DAG and DHCP settings via Underlay with Option 82 for Corp VLAN

!

```
interface Vlan120
  description Employee Distributed Anycast Gateway
  mac-address 0000.0000.0120
  vrf forwarding campus
  ip address 10.103.120.1 255.255.255.0
!
  ip dhcp relay source-interface Loopback0
  ip helper-address global 10.100.0.5
  no autostate
!
ip dhcp relay information option
ip dhcp relay information option vpn
!
```

Enable IoT L2VPN EVPN and VXLAN mapping

!

```
vlan 180
  name IoT
!
l2vpn evpn instance 180 vlan-based
  encapsulation vxlan
!
vlan configuration 180
  member evpn-instance 180 vni 200180
!
```

NVE1 to VNI mapping for IoT

!

```
interface nve1
member vni 200180 mcast-group 225.0.0.120
!
```

DAG and DHCP settings via Underlay with Option 82 for IoT VLAN

!

```
interface Vlan180
  description IoT Distributed Anycast Gateway
  mac-address 0000.0000.0180
  vrf forwarding campus
  ip address 10.103.180.1 255.255.255.0
!
  ip dhcp relay source-interface Loopback0
  ip helper-address global 10.100.0.5
  no autostate
!
```

```
ip dhcp relay information option
ip dhcp relay information option vpn
!
```

Setup L3 VNIs to allow routing across the Underlay for Campus

```
!
! note vlan is needed as it will be come the next hop in the active VRF
! routing table for L3 routes across the underlay
!
!
VLAN 3001
  name Campus-VRF-L3VNI
!
interface Vlan3001
  vrf forwarding campus
  ip unnumbered Loopback0
  no autostate
!
!
vlan configuration 3001
  member vni 303001
!
!
interface nve1
  member vni 303001 vrf campus
!
```

Add Guest VRF

```
!
vrf definition guest
  rd 65106:213
!
  address-family ipv4
    route-target export 65106:2
    route-target import 65106:2
    route-target export 65106:2 stitching
    route-target import 65106:2 stitching
  exit-address-family
!
```

BGP for Guest IPV4 VRF

```
!
router bgp 65106
!
  address-family ipv4 vrf guest
    advertise l2vpn evpn
    redistribute connected
  exit-address-family
```

!

Enable Guest L2VPN EVPN and VXLAN mapping

!

```
vlan 220
  name Guest
!
l2vpn evpn instance 220 vlan-based
  encapsulation vxlan
!
vlan configuration 220
  member evpn-instance 220 vni 200220
!
```

NVE1 to VNI mapping for Guest

!

```
interface nve1
member vni 200220 mcast-group 225.0.0.120
!
```

DAG and DHCP settings via Underlay with Option 82 for Guest VLAN

!

```
interface Vlan220
  description Guest Distributed Anycast Gateway
  mac-address 0000.0000.0220
  vrf forwarding guest
  ip address 10.103.220.1 255.255.255.0
!
  ip dhcp relay source-interface Loopback0
  ip helper-address global 10.100.0.5
  no autostate
!
ip dhcp relay information option
ip dhcp relay information option vpn
!
```

Setup L3 VNIs to allow routing across the Underlay for Guest

!

```
! note vlan is needed as it will be come the next hop in the active VRF
! routing table for L3 routes across the underlay
```

!

!

```
VLAN 3002
  name Guest-VRF-L3VNI
!
interface Vlan3002
  vrf forwarding guest
  ip unnumbered Loopback0
```

```
no autostate
!
vlan configuration 3002
  member vni 303002
!
interface nve1
  member vni 303002 vrf guest
!
```

Downlinks to Access Layer

```
!
interface GigabitEthernet1/0/47
  description Trunk to NYC103-FL04-SW01 port 23
  switchport Trunk allowed vlan 1-3000,3003-4096
  switchport mode trunk
  switchport nonegotiate
!
interface GigabitEthernet1/0/48
  description To Trunk to NYC103-FL04-SW03 port 24
  switchport Trunk allowed vlan 1-3000,3003-4096
  switchport mode trunk
  switchport nonegotiate
!
```

Enable Inline Tagging

```
!
interface GigabitEthernet1/0/47
  cts manual
  policy static sgt 2 trusted
!
interface GigabitEthernet1/0/48
  cts manual
  policy static sgt 2 trusted
!
```

Enable Spanning-Tree with Bridge Priority and enable Root Guard

```
!
spanning-tree mst configuration
  name region1
  revision 1
  exit
!
spanning-tree mst 0 priority 4096
!
interface GigabitEthernet1/0/47
  spanning-tree guard root
!
interface GigabitEthernet1/0/48
```

```
spanning-tree guard root
```

```
!
```

Note: At this stage, you can plug the Access Switches and Access Points to Leaf 4 and wait for them to come online in Dashboard. Connect uplinks on the Access Points to Access switch and connect uplinks on Access switch to Leaf switch. Power on all devices and wait for them to come online in Dashboard.

Note: Please note that it might take a few minutes for the switches to download their configuration and firmware and reboot before they come steady online in Dashboard.

Configure Ether Channel for Access Switch (where applicable)

```
!
```

```
interface GigabitEthernet1/0/47
```

```
channel-group 1 mode active
```

```
!
```

```
interface GigabitEthernet1/0/48
```

```
channel-group 1 mode active
```

```
!
```

```
interface port-channel 1
```

```
description LACP Channel Group to NYC103-FL04-SW01 on ports 47-48
```

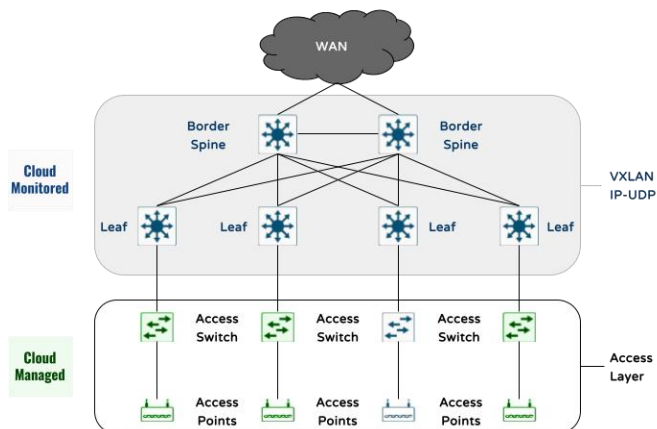
```
!
```

Note: The EtherChannel needs to be configured on the downstream 9200 switch first in passive mode.

Border Spine Switches

Please note that Border Spines are not part of the design outlined in this document as it consists of standalone Spine and Border Leaf switches. However, this is being provided for guidance in case the spine and border roles are being collapsed for a certain deployment (Please refer to below figure). The Border Spine template is provided below.

Figure 8. Border-Spine design concept diagram



Please use the following template to configure your Fabric Border Spine Switch(es)

Border Spine Sample Configuration

Variables used in this template:

Variable	Value (Replace with your own values)
<hostname>	
<TZ>	
<UTC-offset-h>	
<UTC-offset-m>	
<DTZ>	
<name-server-1>	
<name-server-1>	
<domain-name>	
<enable-secret>	
<admin-secret>	
<Border-Spine-Loopback0-desc>	
<Border-Spine-Loopback0-IP@>	
<ntp-server>	
<Border-Spine-underlay>	
<Border-Spine-underlay-desc>	
<<Border-Spine-underlay-IP@>>	
<BGP-ASN>	
<Leaf-Loopback0-IP@>	
<msdp-IP@>	
<rp-address>	
<Border-Spine-underlay-to-core>	
<Border-Spine-underlay-	

Variable	Value (Replace with your own values)
to-core-IP@>	
<Core-IP@>	
<underlay-network-to-core>	
<underlay-network-to-core-mask>	
<agg-underlay-network-to-core>	
<agg-underlay-network-to-core-mask>	
<from-core-to-underlay>	
<to-core-from-underlay>	
<agg-from-core-to-underlay>	
<agg-to-core-to-underlay>	
<VRF-name>	
<RD>	
<RT>	
<overlay-network-to-core-VRF>	
<overlay-network-to-core-VRF-mask>	
<agg-overlay-network-to-core-VRF>	
<agg-overlay-network-to-core-VRF-mask>	
<overlay-to-core-VRF>	
<overlay-from-core-VRF>	
<overlay-to-core-VRF-network-mask>	
<overlay-from-core-VRF-network-mask>	

Variable	Value (Replace with your own values)
<L3-VLAN-id>	
<L3-VLAN-name>	
<L3-VLAN-int-id>	
<L3-VNI-id>	

Base Configuration

```

!
service timestamps debug datetime msec localtime show-timezone
service timestamps log datetime msec localtime show-timezone
!
hostname <hostname>
!
clock timezone zone <UTC-offset-h> <UTC-offset-m>
!
clock summer-time <DTZ> recurring
!
ip routing
!
ip name-server <name-server-1> <name-server-2>
ip domain name <domain-name>
!
license boot level network-advantage addon dna-advantage
!
system mtu 9198
!
errdisable recovery cause bpduguard
errdisable recovery interval 60
!
enable secret <enable-secret>
!
username username privilege 15 secret <admin-secret>
!
no ip http server
no ip http secure-server
!
line con 0
  exec-timeout 60 0
  privilege level 15
  logging synchronous
  login local
!

```

```
line vty 0 31
  exec-timeout 60 0
  privilege level 15
  logging synchronous
  login local
  transport input telnet ssh
!
aaa new-model
!
interface Loopback0
  description Primary loopback
  ip address <Border-Spine-Loopback0-IP@> 255.255.255.255
!
ntp source Loopback0
ntp server <ntp-server> prefer
!
```

Underlay Links (excluding OSPF and Multicast)

```
!
! Spine to Leaf
!
interface <Border-Spine-underlay>
  description To <Border-Spine-underlay-desc>
  no switchport
  ip address <Border-Spine-underlay-IP@> 255.255.255.252
  speed nonegotiate
  speed 40000
!
! Please repeat above step for all Underlay links to Leaf Switches
!
```

OSPF on Underlay links and Loopback0

```
!
router ospf 1
  router-id loopback0-ip-address
  auto-cost reference-bandwidth 100000
  default-information originate metric 1000 metric-type 1
  bfd all-interfaces
!
interface Loopback0
  ip ospf 1 area 0
!
interface <Border-Spine-underlay>
  ip ospf network point-to-point
  ip ospf 1 area 0
  bfd interval 100 min_rx 100 multiplier 3
!
! Please repeat above step for all Underlay links to Leaf Switches
```



```

!
BGP and Address Family for L2VPN EVPN
!
router bgp <BGP-ASN>
!
  bgp router-id Loopback0-ip-address
  bgp log-neighbor-changes
  no bgp default ipv4-unicast
!
  template peer-session leaf-ps
    remote-as <BGP-ASN>
    update-source Loopback0
    fall-over bfd
  exit-peer-session
!
  neighbor <Leaf-Loopback0-IP@> inherit peer-session leaf-ps
!
! Please repeat neighbor inherit statement for all Leaf neighbors
!
address-family l2vpn evpn
  neighbor <Leaf-Loopback0-IP@> activate
  neighbor <Leaf-Loopback0-IP@> send-community both
exit-address-family
!
! Please repeat neighbor activate and send-community statements for all Leaf neighbors
!

```

Multicast; IP PIM Sparse Mode with Static RP and MSDP on Spine(s)

```

!
ip multicast-routing
!
!
interface Loopback1
  description MSDP specific loopback
  ip address MSDP-ip-address <msdp-IP@>
  ip pim sparse-mode
  ip ospf 1 area 0
!
interface Loopback2
  description PIM RP Anycast specific loopback
  ip address <rp-address> 255.255.255.255
  ip pim sparse-mode
  ip ospf 1 area 0
!
!
interface <Border-Spine-underlay>
  ip pim sparse-mode

```

```
!  
! Please repeat last interface statement for all underlay links  
!  
ip msdp peer msdp-peer-ip-address connect-source Loopback1  
ip msdp cache-sa-state  
!  
ip pim rp-address Loopback2-ip-address  
!
```

OSPF to Core (Underlay)

```
!  
interface <Border-Spine-underlay-to-core>  
  description interface-to-external-core  
  no switchport  
  no ip address  
  cts manual  
  policy static sgt 2 trusted  
!  
<Border-Spine-underlay-to-core>.10  
!  
! .10 is a suggestion. Use a sub-interface number that is suitable for your deployment and make  
! sure it matches the encapsulation configuration below  
!  
  description underlay handoff  
  encapsulation dot1Q 10  
  ip address <Border-Spine-underlay-to-core-IP@> 255.255.255.252  
  ip ospf 1 area 0  
  bfd interval 100 min_rx 100 multiplier 3  
!
```

BGP to Core (Underlay)

```
!  
bfd interval 100 min_rx 100 multiplier 3  
!  
! BGP for Underlay to Core  
!  
router bgp <BGP-ASN>  
!  
  neighbor <Core-IP@> remote-as as-number  
  neighbor <Core-IP@> fall-over bfd  
!  
! please repeat neighbor statements for all external neighbors  
!  
address-family ipv4  
  network <Underlay-network-to-core> mask <Underlay-network-to-core-mask>  
!  
! PLEASE REPEAT FOR ALL ADVERTISED NETWORKS (E.G. UNDERLAY)  
!
```

```

aggregate-address <agg-Underlay-network-to-core> <Underlay-network-to-core-mask> summary-only
!
! PLEASE REPEAT FOR ALL AGGREGATED ADVERTISED NETWORKS
!
neighbor <Core-IP@> activate
neighbor <Core-IP@> route-map <from-core> in
neighbor <Core-IP@> route-map <to-core> out
!
! Repeat last neighbor statements for all external BGP neighbors
!
ip prefix-list <from-core-to-underlay> seq 5 permit <agg-from-core-to-underlay>
! ADD MORE ENTRIES AS REQUIRED
!
ip prefix-list <to-core-from-underlay> seq 5 permit <agg-to-core-from-underlay>
!
! ADD MORE ENTRIES AS REQUIRED
!
route-map <to-core-from-underlay> permit 10
  match ip address prefix-list <to-core>
!
route-map <from-core-to-underlay> permit 10
  match ip address prefix-list <from-core>
!

```

Add VRF

```

!
vrf definition <vrf-name>
  rd <RD>
!
address-family ipv4
  route-target export <RT>
  route-target import <RT>
  route-target export <RT> stitching
  route-target import <RT> stitching
exit-address-family
!
! Please repeat the above section to add all VRFs in your design
!

```

Add VRF Handoff to Core (Overlay)

```

!
interface <Border-Spine-underlay-to-core>
!
description <Border-Spine-underlay-to-core-desc>
  no switchport
  mtu 9000
  no ip address
  cts manual

```

```

    policy static sgt 2 trusted
bfd interval 100 min_rx 100 multiplier 3
!
interface interface-id.3001
! .3001 is just an identifier. Please make sure it is consistent with dot1Q enc
description handoff-to-core
encapsulation dot1Q 3001
! PLEASE MATCH WITH SUBINTERFACE FOR CONSISTENCY
vrf forwarding <vrf-name>
ip address <Border-Spine-vrf-handoff-IP> 255.255.255.252
bfd interval 100 min_rx 100 multiplier 3
!
! Please repeat last section creating sub-interfaces for each VRF you have configured
!

```

Add VRF BGP to Core (Overlay)

```

!
! ASSUMING SAME CORE FOR OVERLAY & UNDERLAY HANDOFFS
! OTHERWISE REPLACE CORE WITH FUSION
!
router bgp <BGP-ASN>
  neighbor <Core-IP> remote-as as-number
  neighbor <Core-IP> fall-over bfd
!
! Please repeat above neighbor statements for all External BGP neighbors
!
address-family ipv4 vrf <vrf-name>
  advertise l2vpn evpn
  network <Overlay-network-to-core-VRF> mask <Overlay-network-to-core-VRF-mask>
!
! REPEAT FOR OVERLAY NETWORKS ADVERTISED IN THIS VRF
!
  aggregate-address <agg-overlay-network-to-core-VRF> <agg-overlay-network-to-core-VRF-mask>
summary-only
!
! ASSUMING SAME CORE FOR OVERLAY & UNDERLAY HANDOFFS
! OTHERWISE REPLACE CORE WITH FUSION
!
  neighbor <Core-IP> remote-as as-number
  neighbor <Core-IP> fall-over bfd
  neighbor <Core-IP> activate
  neighbor <Core-IP> route-map <overlay-from-core-VRF> in
  neighbor <Core-IP> route-map <overlay-to-core-VRF> out
!
! Repeat above neighbor statements for each external BGP neighbor
!
ip prefix-list <Overlay-from-core-VRF> seq 5 permit <Overlay-from-core-VRF-network-mask>
!

```

```

ip prefix-list <Overlay-to-core-VRF> seq 5 permit <Overlay-to-core-VRF-network-mask>
!
!
route-map <Overlay-from-core-VRF> permit 10
  match ip address prefix-list <Overlay-from-core-VRF>
!
route-map <Overlay-to-core-VRF> permit 10
  match ip address prefix-list <Overlay-to-core-VRF>
!
! Please repeat this section for all VRFs configured that needs to be routed externally
!

```

Setup L3 VNIs to allow routing across the Underlay

```

!
! note vlan is needed as it will be come the next hop in the active VRF
! routing table for L3 routes across the underlay
!
VLAN <L3-vlan-id>
  name <L3-vlan-name>
!
! REPEAT FOR ALL LAYER 3 VLANS
!
interface <L3-VLAN-int-id>
  vrf forwarding <vrf-name>
  ip unnumbered Loopback0
  no autostate
!
! REPEAT FOR ALL LAYER 3 VLANS
!
vlan configuration <L3-VLAN-id>
  member vni <L3-VNI-id>
!
! REPEAT FOR ALL LAYER 3 VNIS
!
interface nve1
  member vni <L3-VNI-id> vrf <vrf-name>
!
! REPEAT FOR ALL LAYER 3 VNI MEMBERS
!

```

Note: Please note that Leaf switch configurations are identical to that if the Border and Spine roles were not collapsed. Please refer to the previous section for guidance on Leaf switch configurations.

Fabric Expansions and Additions

This section provides guidance for expanding your fabric (e.g. Scaling up) or for simply adding new services such as a new SSID or VLAN on the Access layer.

The following templates can be used for each of the following use case:

Template for Adding VRFs

Note: Please also remember to adjust configuration on your border switches as required.

Note: The following configurations are required on ALL Leaf switches that require those new VRFs.

Variables used in this template:

Variable	Value (Replace with your own values)
<VRF-name>	campus
<RD>	65100:1
<RT>	65100:100
<L2-vlan-id>	1
<L2-vlan-name>	management
<L2-VNI-id>	20001
<mcast-group>	255.0.0.1
<L2-vlan-int-id>	Vlan1
<L3-vlan-id>	3001
<L3-vlan-name>	Campus-L3-VLAN
<L3-vlan-int-id>	Vlan3001
<L3-VNI-id>	30001

Add VRFs

```
!  
vrf definition <VRF-name>  
  rd <RD>  
  !  
  address-family ipv4  
    route-target export <RT1>  
    route-target import <RT1>  
    route-target export <RT1> stitching  
    route-target import <RT1> stitching  
  exit-address-family  
!  
! REPEAT FOR ALL VRFs
```

!

BGP for IPV4 VRF

!

```
router bgp <BGP-ASN>
```

!

```
address-family ipv4 vrf <VRF-name>
```

```
advertise l2vpn evpn
```

```
redistribute connected
```

```
exit-address-family
```

!

```
! REPEAT FOR ALL NEW VRFS
```

!

L2VPN EVPN and VXLAN mapping

!

```
l2vpn evpn
```

```
replication-type static
```

```
router-id Loopback0
```

!

```
vlan <L2-vlan-id>
```

```
name <L2-vlan-name>
```

!

```
! REPEAT FOR ALL LAYER 2 VLANS PART OF THE NEW VRFS
```

!

```
l2vpn evpn instance 1 vlan-based
```

```
encapsulation vxlan
```

!

```
vlan configuration <L2-vlan-id>
```

```
member evpn-instance 1 vni <L2-VNI-id>
```

!

```
! REPEAT FOR ALL LAYER 2 VLANS PART OF THE NEW VRFS
```

!

Add NVE1 and VNI Mapping

!

```
interface nve1
```

```
description Network Virtualization Endpoint for encap-decap
```

```
no ip address
```

```
source-interface Loopback0
```

```
host-reachability protocol bgp
```

```
member vni <L2-VNI-id> mcast-group <mcast-group>
```

!

```
! ADD MEMBERS FOR ALL LAYER 2 VLANS PART OF THE NEW VRFS
```

```
! ALL MEMBERS MUST BE PART OF NVE1
```

!

Setup L3 VNIs to allow routing across the Underlay

```
!  
!  note vlan is needed as it will become the next hop in the active VRF  
!  routing table for L3 routes across the underlay  
!  
!  
VLAN <L3-vlan-id>  
  name <L3-vlan-name>  
!  
! REPEAT FOR ALL L3 VLANS PART OF THE NEW VRFS  
!  
interface <L3-vlan-int-id>  
  vrf forwarding <VRF-name>  
  ip unnumbered Loopback0  
  no autostate  
!  
! REPEAT FOR ALL LAYER 3 VLANS PART OF THE NEW VRFS  
!  
vlan configuration <L3-vlan-id>  
  member vni <L3-VNI-id>  
!  
! REPEAT FOR ALL LAYER 3 VLANS PART OF THE NEW VRFS  
!  
interface nve1  
  member vni <L3-VNI-id> vrf <VRF-name>  
!  
! ADD MEMBERS FOR ALL LAYER 3 VLANS PART OF THE NEW VRFS  
!
```

Template for Adding VLANs

Note: The following configurations are required on ALL Leaf switches that require those new VLANs.

Variables used in this template:

Variable	Value (Replace with your own values)
<L2-vlan-id>	1
<L2-vlan-name>	management
<L2-VNI-id>	20001
<mcast-group>	255.0.0.1
<L2-vlan-int-id>	Vlan1

Variable	Value (Replace with your own values)
<DAG-desc>	
<DAG-mac>	0000.0000.0001
<DAG-gw-IP@>	10.103.64.1
<DAG-sub-mask>	255.255.255.0
<DHCP-server>	10.100.0.1

L2VPN EVPN and VXLAN mapping

```

!
l2vpn evpn
  replication-type static
  router-id Loopback0
!
vlan <L2-vlan-id>
  name <L2-vlan-name>
!
! REPEAT FOR ALL NEW LAYER 2 VLANS
!
l2vpn evpn instance 1 vlan-based
  encapsulation vxlan
!
vlan configuration <L2-vlan-id>
  member evpn-instance 1 vni <L2-VNI-id>
!
! REPEAT FOR ALL NEW LAYER 2 VLANS
!

```

Add NVE1 and VNI Mapping

```

!
interface nve1
  description Network Virtualization Endpoint for encap-decap
  no ip address
  source-interface Loopback0
  host-reachability protocol bgp
  member vni <L2-VNI-id> mcast-group <mcast-group>
!
! ADD MEMBERS FOR ALL NEW LAYER 2 VLANs
!

```

DAG and DHCP settings via Underlay with Option 82 (If required)

```

!
l2vpn evpn instance 1 vlan-based

```

```

encapsulation vxlan
!
vlan configuration <L2-vlan-id>
member evpn-instance 1 vni <L2-VNI-id>
!
! REPEAT FOR ALL LAYER 2 VLANs
!
interface <L2-vlan-int-id>
description <DAG-desc>
mac-address <DAG-mac>
vrf forwarding <VRF-name>
ip address <DAG-gw-IP@> <DAG-sub-mask>
ip dhcp relay source-interface Loopback0
ip helper-address global <DHCP-server>
no autostate
!
! REPEAT FOR ALL DAGs ON ALL NEW LAYER 2 VLANs
!

```

Template for Adding SSIDs

Adding new SSIDs should be similar to adding VLANs assuming that a new broadcast domain is required for it. Please follow the same steps and template for adding VLANs in this case.

Template for Adding Leaf Switches

Variables used in this template:

Variable	Value (Replace with your own values)
<TZ>	EST
<UTC-offset-h>	-5
<UTC-offset-m>	0
<DTZ>	EDT
<name-server-1>	1.1.1.1
<name-server-1>	1.1.1.2
<domain-name>	Customer.com
<hostname>	Leaf-05
<enable-secret>	
<admin-secret>	
<Leaf-Loopback0-desc>	Loopback0 for Leaf

Variable	Value (Replace with your own values)
<Leaf-Loopback0-IP@>	10.103.255.11
<ntp-server>	1.1.1.3
<Leaf-underlay>	Te1/1/1
<Leaf-underlay-desc>	Underlay to Spine
<<Leaf-underlay-IP@>>	10.103.224.7
<BGP-ASN>	65100
<Spine-Loopback0-IP@>	10.10.3.255.1
<rp-address>	10.103.255.255
<VRF-name>	campus
<RD>	65100:1
<RT>	65100:100
<L2-vlan-id>	1
<L2-vlan-name>	management
<L2-VNI-id>	20001
<mcast-group>	255.0.0.1
<L2-vlan-int-id>	Vlan1
<DAG-desc>	
<DAG-mac>	0000.0000.0001
<DAG-gw-IP@>	10.103.64.1
<DAG-sub-mask>	255.255.255.0
<DHCP-server>	10.100.0.1
<L3-vlan-id>	3001
<L3-vlan-name>	Campus-L3-VLAN
<L3-vlan-int-id>	Vlan3001
<L3-VNI-id>	30001

Variable	Value (Replace with your own values)
<Leaf-downlink>	Te1/1/2
<Leaf-downlink-desc>	
<vlan-range>	1-1000
<sgt-id>	2
<Leaf-downlink1-etherchannel>	Te1/1/2
<Leaf-downlink2-etherchannel>	Te1/1/3
<Leaf-etherchannel-desc>	
<Spine-underlay>	Te1/1/1
<Spine-underlay-desc>	Underlay to Spine
<<Spine-underlay-IP@>>	10.103.224.8

Base Configuration

```

!
service timestamps debug datetime msec localtime show-timezone
service timestamps log datetime msec localtime show-timezone
!
hostname <hostname>
!
clock timezone <TZ> <UTC-offset-h> <UTC-offset-m>
clock summer-time <DTZ> recurring
!
ip routing
!
ip name-server <name-server-1> <name-server-2>
ip domain name <domain-name>
!
license boot level network-advantage addon dna-advantage
!
system mtu 9198
!
errdisable recovery cause bpduguard
errdisable recovery interval 60
!
enable secret <enable-secret>
!
username admin privilege 15 secret <admin-secret>

```

```
!  
no ip http server  
no ip http secure-server  
!  
line con 0  
  exec-timeout 60 0  
  privilege level 15  
  logging synchronous  
  login local  
!  
line vty 0 31  
  exec-timeout 60 0  
  privilege level 15  
  logging synchronous  
  login local  
  transport input telnet ssh  
!  
aaa new-model  
!  
interface Loopback0  
  description <Leaf-Loopback0-desc>  
  ip address <Leaf-Loopback0-IP@> 255.255.255.255  
!  
ntp source Loopback0  
ntp server <ntp-server> prefer  
!  
lldp run  
!
```

Underlay Links (excluding OSPF and Multicast)

```
! Leaf to Spine  
!  
interface <Leaf-underlay>  
  description <Leaf-underlay-desc>  
  no switchport  
  ip address <Leaf-underlay-IP@> 255.255.255.252  
!  
! REPEAT FOR ALL UNDERLAY INTERFACES ON LEAF  
!
```

OSPF on Underlay links and Loopback0

```
!  
router ospf 1  
  router-id <Leaf-Loopback0-IP@>  
  auto-cost reference-bandwidth 100000  
  bfd all-interfaces  
!  
interface Loopback0
```

```

ip ospf 1 area 0
!
interface <Leaf-underlay>
ip ospf network point-to-point
ip ospf 1 area 0
bfd interval 100 min_rx 100 multiplier 3
!
! REPEAT FOR ALL LEAF UNDERLAY INTERFACES
!

```

BGP and Address Family for L2VPN EVPN

```

!
router bgp <BGP-ASN>
!
bgp router-id <Loopback0-IP@>
bgp log-neighbor-changes
no bgp default ipv4-unicast
!
template peer-session spine-ps
remote-as <BGP-ASN>
update-source Loopback0
fall-over bfd
exit-peer-session
!
neighbor <Spine-Loopback0-IP@> inherit peer-session spine-ps
!
! REPEAT FOR ALL SPINE NEIGHBORS
!
address-family l2vpn evpn
neighbor <Spine-Loopback0-IP@> activate
neighbor <Spine-Loopback0-IP@> send-community both
!
! REPEAT FOR ALL SPINE NEIGHBORS
!
exit-address-family
!

```

Multicast; IP PIM Sparse Mode with Static RP and MSDP

```

!
ip multicast-routing
!
interface <Leaf-underlay>
ip pim sparse-mode
!
! REPEAT FOR ALL LEAF UNDERLAY INTERFACES
!
ip pim rp-address <rp-address>
!

```

Add VRFs

```
!  
vrf definition <VRF-name>  
  rd <RD>  
!  
  address-family ipv4  
    route-target export <RT>  
    route-target import <RT>  
    route-target export <RT> stitching  
    route-target import <RT> stitching  
  exit-address-family  
!  
! REPEAT FOR ALL VRFs  
!
```

BGP for IPV4 VRF

```
!  
router bgp <BGP-ASN>  
!  
  address-family ipv4 vrf <VRF-name>  
    advertise l2vpn evpn  
    redistribute connected  
  exit-address-family  
!  
! REPEAT FOR ALL VRFs  
!
```

L2VPN EVPN and VXLAN mapping

```
!  
l2vpn evpn  
  replication-type static  
  router-id Loopback0  
!  
vlan <L2-vlan-id>  
  name <L2-vlan-name>  
!  
! REPEAT FOR ALL LAYER 2 VLANS  
!  
l2vpn evpn instance 1 vlan-based  
  encapsulation vxlan  
!  
vlan configuration <L2-vlan-id>  
  member evpn-instance 1 vni <L2-VNI-id>  
!  
! REPEAT FOR ALL LAYER 2 VLANS  
!
```

Add NVE1 and VNI Mapping

```
!  
interface nve1  
  description Network Virtualization Endpoint for encap-decap  
  no ip address  
  source-interface Loopback0  
  host-reachability protocol bgp  
  member vni <L2-VNI-id> mcast-group <mcast-group>  
!  
! ADD MEMBERS FOR ALL LAYER 2 VLANs  
!
```

DAG and DHCP settings via Underlay with Option 82

```
!  
l2vpn evpn instance 1 vlan-based  
  encapsulation vxlan  
!  
vlan configuration <L2-vlan-id>  
member evpn-instance 1 vni <L2-VNI-id>  
!  
! REPEAT FOR ALL LAYER 2 VLANs  
!  
interface <L2-vlan-int-id>  
  description <DAG-desc>  
  mac-address <DAG-mac>  
  vrf forwarding <VRF-name>  
  ip address <DAG-gw-IP> <DAG-sub-mask>  
  ip dhcp relay source-interface Loopback0  
  ip helper-address global <DHCP-server>  
  no autostate  
!  
! REPEAT FOR ALL DAGs  
!
```

Setup L3 VNIs to allow routing across the Underlay

```
!  
! note vlan is needed as it will become the next hop in the active VRF  
! routing table for L3 routes across the underlay  
!  
!  
VLAN <L3-vlan-id>  
  name <L3-vlan-name>  
!  
! REPEAT FOR ALL L3 VLANs  
!  
interface <L3-vlan-int-id>  
  vrf forwarding <VRF-name>
```

```
ip unnumbered Loopback0
no autostate
!
! REPEAT FOR ALL LAYER 3 VLANS
!
vlan configuration <L3-vlan-id>
  member vni <L3-VNI-id>
!
! REPEAT FOR ALL LAYER 3 VLANS
!
interface nve1
  member vni <L3-VNI-id> vrf <VRF-name>
!
! ADD MEMBERS FOR ALL LAYER 3 VLANS
!
```

Downlinks to Access Layer

```
!
interface <Leaf-downlink>
  description <Leaf-downlink-desc>
  switchport Trunk allowed vlan <vlan-range>
  switchport mode trunk
  switchport nonegotiate
!
! REPEAT FOR ALL LEAF DOWNLINKS
!
```

Enable Inline Tagging

```
!
interface <Leaf-downlink>
  cts manual
  policy static sgt <sgt-id> trusted
!
! REPEAT FOR ALL LEAF DOWNLINKS
!
```

Enable Spanning-Tree with Bridge Priority and enable Root Guard

```
!
spanning-tree mst configuration
  name region1
  revision 1
  exit
!
spanning-tree mst 0 priority 4096
!
interface <Leaf-downlink>
  spanning-tree guard root
!
```

```
! REPEAT FOR ALL LEAF DOWNLINKS
```

```
!
```

Configure Ether Channel for Access Switch (where applicable)

```
!
```

```
interface <Leaf-downlink1-etherchannel>  
  channel-group 1 mode active
```

```
!
```

```
interface <Leaf-downlink2-etherchannel>  
  channel-group 1 mode active
```

```
!
```

```
interface port-channel 1  
  description <Leaf-etherchannel-desc>
```

```
!
```

Spine Configuration

```
! REPEAT ON ALL SPINE SWITCHES
```

```
! Spine to Leaf
```

```
!
```

```
interface <Spine-underlay>  
  description To <Spine-underlay-desc>  
  no switchport  
  ip address <Spine-underlay-IP@> 255.255.255.252
```

```
!
```

```
! REPEAT FOR ALL SPINE UNDERLAY INTERFACES
```

```
!
```

```
interface <Spine-underlay>  
  ip ospf network point-to-point  
  ip ospf 1 area 0  
  bfd interval 100 min_rx 100 multiplier 3
```

```
!
```

```
! REPEAT FOR ALL SPINE UNDERLAY INTERFACES
```

```
!
```

```
router bgp 65106
```

```
!
```

```
  neighbor <Leaf-Loopback0-IP@> inherit peer-session leaf-ps
```

```
!
```

```
! REPEAT FOR ALL NEW LEAF SWITCHES
```

```
!
```

```
  address-family l2vpn evpn  
    neighbor <Leaf-Loopback0-IP@> activate  
    neighbor <Leaf-Loopback0-IP@> inherit peer-policy leaf-pp  
exit-address-family
```

```
!
```

```
interface <Spine-underlay>  
  ip pim sparse-mode
```

```
!
```

```
! REPEAT FOR ALL SPINE UNDERLAY INTERFACES
```



!

Testing and Verification

The following table lists the summary of testing and verification steps.

Table 10. Summary of Testing and Verification for Cloud Campus Fabric with BGP EVPN VXLAN

Item	Device	Verification	Expected Behavior
Underlay interfaces	All Fabric Switches	show ip interface brief show run interface loopback0 show cdp neighbors show lldp neighbors Port Summary (UI)	Interfaces up/up Interface in ospf 1 Discoverable switches Discoverable switches Ports showing connected and passing traffic
OSPF	All Fabric Switches	show ip ospf neighbor show ip ospf interface show ip ospf 1 show ip route ospf show ip ospf database	Neighbors in FULL state Interfaces participating and up Router ID, Area 0 Underlay and Loopback routes Router link states
Loopback0	All Fabric Switches	ping <ip-address> source loopback0	Success, 0% loss
BGP L2VPN EVPN	All Fabric Switches	show ip bgp l2vpn evpn summary show ip bgp l2vpn evpn nei <ip-address> advertised-routes show ip bgp l2vpn evpn nei <ip-address> routes show ip bgp l2vpn evpn show ip bgp l2vpn evpn route-type 2 show ip bgp l2vpn evpn route-type 5 show ip bgp l2vpn evpn <mac-address> show ip bgp l2vpn evpn <network/mask>	Verify peers and route count Verify advertised routes to a specific peer Verify received routes from a specific peer Verify full BGP RIB Verify all MAC/MAC-IP routes Verify all network routes Verify MAC routes Verify a network route
Multicast	All Fabric Switches	show ip pim interface show ip pim neighbor show ip pim rp show ip mroute	Underlay interface(s) and mode (S/P) Neighbor status RP for multicast groups Multicast routes and RP assigned
Multicast	Spine Switches	Show ip interface brief show ip msdp summary show ip msdp peer	Loopback1/2 up/up MSDP neighbor and state Detailed MSPD peer state
VLANs	Leaf Switches	show vlan	VLAN config and L2/L3 mapping

VRFs	Leaf Switches	show vrf	Configured VRFs and RD/RT
Virtual interfaces	Leaf Switches	show ip interface brief	One per DAG, one per L3 VNI
NVE	Leaf Switches	show run interface nve1 show ip interface brief	Verify L2/L3 VNIs Verify NVE1 up/up
Access Ports	Leaf Switches	show interface status show interface trunk show interface port1	Verify connected interfaces Verify allowed VLANs on Trunks Verify port channel
L2 Forwarding	Leaf Switches	show mac address-table dynamic show l2route evpn mac ip	L2 forwarding table L2VPN = local, BGP = remote
L3 Routing	Leaf Switches	show ip bgp vpv4 vrf <name> show ip bgp vpv4 vrf <name> <network/mask> show ip route vrf <name>	Verify EVPN address-family routes Verify L3 VNI, VTEPs, Encapsulation, L3 VNI Verify routes injected from BGP EPVN
VLANs	Border Switches	show vlan	VLAN config and L2/L3 mapping
VRFs	Border Switches	show vrf	Configured VRFs and RD/RT
L3 Routing	Border Switches	show ip bgp l2vpn evpn	Verify routes injected from BGP EVPN
BGP	Border Switches	show ip bgp summary show ip bgp neighbors show ip bgp neighbor <ip-address> advertised-routes show ip bgp neighbor <ip-address> routes show ip bgp show ip route bgp	Verify BGP status Verify peers and route count Verify advertised routes to a specific peer Verify received routes from a peer Verify full BGP RIB Verify BGP routes in RIB
BGP VPNV4	Border Switches	show ip bgp vpv4 vrf <name> show ip bgp vpv4 vrf <name> neighbor <ip-address> advertised-routes show ip bgp vpv4 vrf <name> neighbor <ip-address> routes show ip bgp vpv4 vrf <name> show ip route vrf <name>	Verify BGP injected routes Verify advertised routes to a specific peer (e.g. Fusion) Verify received routes from a specific peer (e.g. Fusion) Verify VRF BGP RIB for VRF Verify RIB for VRF
Cloud Monitoring	All Cloud Monitored Switches	Navigate to Switching > Switches, then check the status of all cloud monitored switches	Online (i.e. Green)
Cloud	All Cloud Monitored	Navigate to Wireless > Access Points, then check the status of all cloud monitored	Online (i.e. Green)

Monitoring	Access Points	access points	
Cloud Management	All Cloud Managed Switches	Navigate to Switching > Switches, then check the status of all cloud managed switches	Online (i.e. Green)
Cloud Management	All Cloud Managed Access Points	Navigate to Wireless > Access Points, then check the status of all cloud managed access points	Online (i.e. Green)
Micro-segmentation	All Cloud Managed Devices	Navigate to Network-wide > Clients, then check the adaptive policy group and VLAN assigned to clients. You can also check Adaptive Policies in Dashboard by navigating to Organization > Adaptive policy then Policies.	Dynamic VLAN and Adaptive Policy assignment based on device posture Policies in Dashboard in sync with Policies in Cisco ISE (Meraki Connector)

The following sections explain the testing and verification steps for a Cloud Campus Fabric with BGP EVPN VXLAN solution.

Note: To access switch terminal in dashboard, navigate to Switching > Switches then click on the desired switch. Then click on Launch Terminal. Please note that the Cloud Monitored switches need to be onboarded and online to be able to access their Terminal in Dashboard.

NYC103-Spine-01
C9500-24Y4C 24-05-04 10:00:00
Monitor Only

ADDRESS
1 Pennsylvania Plaza, New York, NY 10119

LAN IP
10.103.224.9 (statically assigned)

PHYSICAL IP
192.133.243.244

GATEWAY
10.103.224.10

VLAN
10.100.0.5
10.200.0.5

LAN IPV6
Not configured

TERMINAL
Launch Terminal

SERIAL NUMBER
F00274908DJ (Catalyst)
G22Z-N795-EGAL (Meraki)

TAGS
Recently added: Monitored

NOTES

FIRMWARE
Current version: IOS XE 17.9.4

VLAN PROFILE
Default Profile

TOPOLOGY
Show

Summary Ports Location **Tools** Config history

Ping Ping

Terminal
Opens a troubleshooting console to this device, similar to an IOS-XE CLI window.
Close Terminal Detach

This terminal allows limited access to read-only IOS-XE commands, such as `show`.

```

Welcome to Meraki Troubleshooting Console...

Note: You can enter "show ?" anytime to get the list of currently supported commands and shortcuts

NYC103-Spine-01>

```

Cycle port Warning: PoE powered devices will be temporarily powered down.
Ports (se. 1-5,7,1,20-23) Cycle ports

MAC forwarding table Run

Note: You can use Dashboard Terminal for show commands (e.g. show ip route vrf campus). Configuration is not allowed as well as ping and traceroute.

Underlay (All Fabric Switches and Access Switches)

Tech tip: You can use the Dashboard Terminal and the following commands: show ip interface brief.

NYC103-Spine-01

```
NYC103-Spine-01#sh ip int br
```

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	unassigned	YES	NVRAM	up	down
GigabitEthernet0/0	unassigned	YES	NVRAM	administratively down	down
TwentyFiveGigE1/0/1	10.103.224.29	YES	NVRAM	up	up
TwentyFiveGigE1/0/2	10.103.224.37	YES	NVRAM	up	up
TwentyFiveGigE1/0/3	10.103.224.45	YES	NVRAM	up	up
TwentyFiveGigE1/0/4	10.103.224.53	YES	NVRAM	up	up
TwentyFiveGigE1/0/5	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/6	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/7	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/8	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/9	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/10	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/11	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/12	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/13	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/14	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/15	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/16	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/17	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/18	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/19	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/20	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/21	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/22	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/23	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/24	unassigned	YES	unset	down	down
HundredGigE1/0/25	10.103.224.9	YES	NVRAM	up	up
HundredGigE1/0/26	10.103.224.21	YES	NVRAM	up	up
HundredGigE1/0/27	unassigned	YES	unset	down	down
HundredGigE1/0/28	10.103.224.17	YES	NVRAM	up	up
TLS-VIF0	20.0.122.247	YES	TFTP	up	up
Loopback0	10.103.255.1	YES	NVRAM	up	up
Loopback1	10.103.254.1	YES	NVRAM	up	up
Loopback2	10.103.255.255	YES	NVRAM	up	up
Loopback1000	20.0.122.247	YES	manual	up	up
Tunnel0	10.103.255.255	YES	unset	up	up
Tunnel1	10.103.255.255	YES	unset	up	up

NYC103-Spine-02

NYC103-Spine-02#sh ip int br

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	unassigned	YES	NVRAM	up	down
GigabitEthernet0/0	unassigned	YES	NVRAM	administratively down	down
TwentyFiveGigE1/0/1	10.103.224.33	YES	NVRAM	up	up
TwentyFiveGigE1/0/2	10.103.224.41	YES	NVRAM	up	up
TwentyFiveGigE1/0/3	10.103.224.49	YES	NVRAM	up	up
TwentyFiveGigE1/0/4	10.103.224.57	YES	NVRAM	up	up
TwentyFiveGigE1/0/5	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/6	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/7	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/8	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/9	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/10	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/11	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/12	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/13	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/14	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/15	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/16	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/17	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/18	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/19	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/20	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/21	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/22	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/23	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/24	unassigned	YES	unset	down	down
HundredGigE1/0/25	10.103.224.25	YES	NVRAM	up	up
HundredGigE1/0/26	10.103.224.13	YES	NVRAM	up	up
HundredGigE1/0/27	unassigned	YES	unset	down	down
HundredGigE1/0/28	10.103.224.18	YES	NVRAM	up	up
TLS-VIF0	20.0.105.23	YES	TFTP	up	up
Loopback0	10.103.255.2	YES	NVRAM	up	up
Loopback1	10.103.254.2	YES	NVRAM	up	up
Loopback2	10.103.255.255	YES	NVRAM	up	up
Loopback1000	20.0.105.23	YES	manual	up	up
Tunnel0	10.103.255.255	YES	unset	up	up
Tunnel1	10.103.255.255	YES	unset	up	up

NYC103-Border-01

NYC103-Border-01#sh ip int br

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	unassigned	YES	NVRAM	up	up
Vlan3001	10.103.255.3	YES	unset	up	up
Vlan3002	10.103.255.3	YES	unset	up	up

GigabitEthernet0/0	unassigned	YES NVRAM	administratively down	down
GigabitEthernet1/0/1	unassigned	YES unset	up	up
Gil/0/1.10	10.103.224.2	YES NVRAM	up	up
GigabitEthernet1/0/2	unassigned	YES unset	up	up
Gil/0/2.3001	10.103.64.2	YES NVRAM	up	up
Gil/0/2.3002	10.103.64.10	YES NVRAM	up	up
GigabitEthernet1/0/3	unassigned	YES unset	down	down
GigabitEthernet1/0/4	unassigned	YES unset	down	down
GigabitEthernet1/0/5	unassigned	YES unset	down	down
GigabitEthernet1/0/6	unassigned	YES unset	down	down
GigabitEthernet1/0/7	unassigned	YES unset	down	down
GigabitEthernet1/0/8	unassigned	YES unset	down	down
GigabitEthernet1/0/9	unassigned	YES unset	down	down
GigabitEthernet1/0/10	unassigned	YES unset	down	down
GigabitEthernet1/0/11	unassigned	YES unset	down	down
GigabitEthernet1/0/12	unassigned	YES unset	down	down
GigabitEthernet1/0/13	unassigned	YES unset	down	down
GigabitEthernet1/0/14	unassigned	YES unset	down	down
GigabitEthernet1/0/15	unassigned	YES unset	down	down
GigabitEthernet1/0/16	unassigned	YES unset	down	down
GigabitEthernet1/0/17	unassigned	YES unset	down	down
GigabitEthernet1/0/18	unassigned	YES unset	down	down
GigabitEthernet1/0/19	unassigned	YES unset	down	down
GigabitEthernet1/0/20	unassigned	YES unset	down	down
GigabitEthernet1/0/21	unassigned	YES unset	down	down
GigabitEthernet1/0/22	unassigned	YES unset	down	down
GigabitEthernet1/0/23	unassigned	YES unset	down	down
GigabitEthernet1/0/24	unassigned	YES unset	down	down
GigabitEthernet1/0/25	unassigned	YES unset	down	down
GigabitEthernet1/0/26	unassigned	YES unset	down	down
GigabitEthernet1/0/27	unassigned	YES unset	down	down
GigabitEthernet1/0/28	unassigned	YES unset	down	down
GigabitEthernet1/0/29	unassigned	YES unset	down	down
GigabitEthernet1/0/30	unassigned	YES unset	down	down
GigabitEthernet1/0/31	unassigned	YES unset	down	down
GigabitEthernet1/0/32	unassigned	YES unset	down	down
GigabitEthernet1/0/33	unassigned	YES unset	down	down
GigabitEthernet1/0/34	unassigned	YES unset	down	down
GigabitEthernet1/0/35	unassigned	YES unset	down	down
GigabitEthernet1/0/36	unassigned	YES unset	down	down
GigabitEthernet1/0/37	unassigned	YES unset	down	down
GigabitEthernet1/0/38	unassigned	YES unset	down	down
GigabitEthernet1/0/39	unassigned	YES unset	down	down
GigabitEthernet1/0/40	unassigned	YES unset	down	down
GigabitEthernet1/0/41	unassigned	YES unset	down	down
GigabitEthernet1/0/42	unassigned	YES unset	down	down
GigabitEthernet1/0/43	unassigned	YES unset	down	down

GigabitEthernet1/0/44	unassigned	YES	unset	down	down
GigabitEthernet1/0/45	unassigned	YES	unset	down	down
GigabitEthernet1/0/46	unassigned	YES	unset	down	down
GigabitEthernet1/0/47	unassigned	YES	unset	down	down
GigabitEthernet1/0/48	unassigned	YES	unset	down	down
GigabitEthernet1/1/1	unassigned	YES	unset	down	down
GigabitEthernet1/1/2	unassigned	YES	unset	down	down
GigabitEthernet1/1/3	unassigned	YES	unset	down	down
GigabitEthernet1/1/4	unassigned	YES	unset	down	down
Te1/1/1	unassigned	YES	unset	down	down
Te1/1/2	unassigned	YES	unset	down	down
Te1/1/3	unassigned	YES	unset	down	down
Te1/1/4	unassigned	YES	unset	down	down
Te1/1/5	unassigned	YES	unset	down	down
Te1/1/6	unassigned	YES	unset	down	down
Te1/1/7	unassigned	YES	unset	down	down
Te1/1/8	unassigned	YES	unset	down	down
Fo1/1/1	10.103.224.10	YES	NVRAM	up	up
Fo1/1/2	10.103.224.26	YES	NVRAM	up	up
TwentyFiveGigE1/1/1	unassigned	YES	unset	down	down
TwentyFiveGigE1/1/2	unassigned	YES	unset	down	down
Ap1/0/1	unassigned	YES	unset	up	up
nve1	unassigned	YES	unset	up	up
Loopback0	10.103.255.3	YES	NVRAM	up	up
Loopback1000	20.0.88.125	YES	manual	up	up
TLS-VIF0	20.0.88.125	YES	TFTP	up	up
Tunnel0	10.103.255.3	YES	unset	up	up
Tunnel1	10.103.224.26	YES	unset	up	up

NYC103-Border-02

NYC103-Border-02#sh ip int br

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	unassigned	YES	NVRAM	up	up
Vlan3001	10.103.255.4	YES	unset	up	up
Vlan3002	10.103.255.4	YES	unset	up	up
GigabitEthernet0/0	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet1/0/1	unassigned	YES	unset	up	up
Gi1/0/1.10	10.103.224.6	YES	NVRAM	up	up
GigabitEthernet1/0/2	unassigned	YES	unset	up	up
Gi1/0/2.3001	10.103.64.6	YES	NVRAM	up	up
Gi1/0/2.3002	10.103.64.14	YES	NVRAM	up	up
GigabitEthernet1/0/3	unassigned	YES	unset	down	down
GigabitEthernet1/0/4	unassigned	YES	unset	down	down
GigabitEthernet1/0/5	unassigned	YES	unset	down	down
GigabitEthernet1/0/6	unassigned	YES	unset	down	down
GigabitEthernet1/0/7	unassigned	YES	unset	down	down
GigabitEthernet1/0/8	unassigned	YES	unset	down	down

GigabitEthernet1/0/9	unassigned	YES	unset	down	down
GigabitEthernet1/0/10	unassigned	YES	unset	down	down
GigabitEthernet1/0/11	unassigned	YES	unset	down	down
GigabitEthernet1/0/12	unassigned	YES	unset	down	down
GigabitEthernet1/0/13	unassigned	YES	unset	down	down
GigabitEthernet1/0/14	unassigned	YES	unset	down	down
GigabitEthernet1/0/15	unassigned	YES	unset	down	down
GigabitEthernet1/0/16	unassigned	YES	unset	down	down
GigabitEthernet1/0/17	unassigned	YES	unset	down	down
GigabitEthernet1/0/18	unassigned	YES	unset	down	down
GigabitEthernet1/0/19	unassigned	YES	unset	down	down
GigabitEthernet1/0/20	unassigned	YES	unset	down	down
GigabitEthernet1/0/21	unassigned	YES	unset	down	down
GigabitEthernet1/0/22	unassigned	YES	unset	down	down
GigabitEthernet1/0/23	unassigned	YES	unset	down	down
GigabitEthernet1/0/24	unassigned	YES	unset	down	down
GigabitEthernet1/0/25	unassigned	YES	unset	down	down
GigabitEthernet1/0/26	unassigned	YES	unset	down	down
GigabitEthernet1/0/27	unassigned	YES	unset	down	down
GigabitEthernet1/0/28	unassigned	YES	unset	down	down
GigabitEthernet1/0/29	unassigned	YES	unset	down	down
GigabitEthernet1/0/30	unassigned	YES	unset	down	down
GigabitEthernet1/0/31	unassigned	YES	unset	down	down
GigabitEthernet1/0/32	unassigned	YES	unset	down	down
GigabitEthernet1/0/33	unassigned	YES	unset	down	down
GigabitEthernet1/0/34	unassigned	YES	unset	down	down
GigabitEthernet1/0/35	unassigned	YES	unset	down	down
GigabitEthernet1/0/36	unassigned	YES	unset	down	down
GigabitEthernet1/0/37	unassigned	YES	unset	down	down
GigabitEthernet1/0/38	unassigned	YES	unset	down	down
GigabitEthernet1/0/39	unassigned	YES	unset	down	down
GigabitEthernet1/0/40	unassigned	YES	unset	down	down
GigabitEthernet1/0/41	unassigned	YES	unset	down	down
GigabitEthernet1/0/42	unassigned	YES	unset	down	down
GigabitEthernet1/0/43	unassigned	YES	unset	down	down
GigabitEthernet1/0/44	unassigned	YES	unset	down	down
GigabitEthernet1/0/45	unassigned	YES	unset	down	down
GigabitEthernet1/0/46	unassigned	YES	unset	down	down
GigabitEthernet1/0/47	unassigned	YES	unset	down	down
GigabitEthernet1/0/48	unassigned	YES	unset	down	down
GigabitEthernet1/1/1	unassigned	YES	unset	down	down
GigabitEthernet1/1/2	unassigned	YES	unset	down	down
GigabitEthernet1/1/3	unassigned	YES	unset	down	down
GigabitEthernet1/1/4	unassigned	YES	unset	down	down
Te1/1/1	unassigned	YES	unset	down	down
Te1/1/2	unassigned	YES	unset	down	down
Te1/1/3	unassigned	YES	unset	down	down

Tel1/1/4	unassigned	YES	unset	down	down
Tel1/1/5	unassigned	YES	unset	down	down
Tel1/1/6	unassigned	YES	unset	down	down
Tel1/1/7	unassigned	YES	unset	down	down
Tel1/1/8	unassigned	YES	unset	down	down
Fo1/1/1	10.103.224.22	YES	NVRAM	up	up
Fo1/1/2	10.103.224.14	YES	NVRAM	up	up
TwentyFiveGigE1/1/1	unassigned	YES	unset	down	down
TwentyFiveGigE1/1/2	unassigned	YES	unset	down	down
Ap1/0/1	unassigned	YES	unset	up	up
nve1	unassigned	YES	unset	up	up
Loopback0	10.103.255.4	YES	NVRAM	up	up
Loopback1000	20.0.105.219	YES	manual	up	up
TLS-VIF0	20.0.105.219	YES	TFTP	up	up
Tunnel0	10.103.255.4	YES	unset	up	up
Tunnel1	10.103.224.22	YES	unset	up	up

NYC103-Leaf-01

NYC103-Leaf-01#sh ip int br

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	10.103.64.1	YES	NVRAM	up	up
Vlan120	10.103.120.1	YES	NVRAM	up	up
Vlan180	10.103.180.1	YES	NVRAM	up	up
Vlan220	10.103.220.1	YES	NVRAM	up	up
Vlan3001	10.103.255.11	YES	unset	up	up
Vlan3002	10.103.255.11	YES	unset	up	up
GigabitEthernet0/0	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet1/0/1	unassigned	YES	unset	down	down
GigabitEthernet1/0/2	unassigned	YES	unset	down	down
GigabitEthernet1/0/3	unassigned	YES	unset	down	down
GigabitEthernet1/0/4	unassigned	YES	unset	down	down
GigabitEthernet1/0/5	unassigned	YES	unset	down	down
GigabitEthernet1/0/6	unassigned	YES	unset	down	down
GigabitEthernet1/0/7	unassigned	YES	unset	down	down
GigabitEthernet1/0/8	unassigned	YES	unset	down	down
GigabitEthernet1/0/9	unassigned	YES	unset	down	down
GigabitEthernet1/0/10	unassigned	YES	unset	down	down
GigabitEthernet1/0/11	unassigned	YES	unset	down	down
GigabitEthernet1/0/12	unassigned	YES	unset	down	down
GigabitEthernet1/0/13	unassigned	YES	unset	down	down
GigabitEthernet1/0/14	unassigned	YES	unset	down	down
GigabitEthernet1/0/15	unassigned	YES	unset	down	down
GigabitEthernet1/0/16	unassigned	YES	unset	down	down
GigabitEthernet1/0/17	unassigned	YES	unset	down	down
GigabitEthernet1/0/18	unassigned	YES	unset	down	down
GigabitEthernet1/0/19	unassigned	YES	unset	down	down
GigabitEthernet1/0/20	unassigned	YES	unset	down	down

GigabitEthernet1/0/21	unassigned	YES	unset	down	down
GigabitEthernet1/0/22	unassigned	YES	unset	down	down
GigabitEthernet1/0/23	unassigned	YES	unset	down	down
GigabitEthernet1/0/24	unassigned	YES	unset	down	down
GigabitEthernet1/0/25	unassigned	YES	unset	down	down
GigabitEthernet1/0/26	unassigned	YES	unset	down	down
GigabitEthernet1/0/27	unassigned	YES	unset	down	down
GigabitEthernet1/0/28	unassigned	YES	unset	down	down
GigabitEthernet1/0/29	unassigned	YES	unset	down	down
GigabitEthernet1/0/30	unassigned	YES	unset	down	down
GigabitEthernet1/0/31	unassigned	YES	unset	down	down
GigabitEthernet1/0/32	unassigned	YES	unset	down	down
GigabitEthernet1/0/33	unassigned	YES	unset	down	down
GigabitEthernet1/0/34	unassigned	YES	unset	down	down
GigabitEthernet1/0/35	unassigned	YES	unset	down	down
GigabitEthernet1/0/36	unassigned	YES	unset	down	down
GigabitEthernet1/0/37	unassigned	YES	unset	down	down
GigabitEthernet1/0/38	unassigned	YES	unset	down	down
GigabitEthernet1/0/39	unassigned	YES	unset	down	down
GigabitEthernet1/0/40	unassigned	YES	unset	down	down
GigabitEthernet1/0/41	unassigned	YES	unset	down	down
GigabitEthernet1/0/42	unassigned	YES	unset	down	down
GigabitEthernet1/0/43	unassigned	YES	unset	down	down
GigabitEthernet1/0/44	unassigned	YES	unset	down	down
GigabitEthernet1/0/45	unassigned	YES	unset	down	down
GigabitEthernet1/0/46	unassigned	YES	unset	down	down
GigabitEthernet1/0/47	unassigned	YES	unset	up	up
GigabitEthernet1/0/48	unassigned	YES	unset	up	up
GigabitEthernet1/1/1	unassigned	YES	unset	down	down
GigabitEthernet1/1/2	unassigned	YES	unset	down	down
GigabitEthernet1/1/3	unassigned	YES	unset	down	down
GigabitEthernet1/1/4	unassigned	YES	unset	down	down
Tel1/1/1	unassigned	YES	unset	down	down
Tel1/1/2	unassigned	YES	unset	down	down
Tel1/1/3	unassigned	YES	unset	down	down
Tel1/1/4	unassigned	YES	unset	down	down
Tel1/1/5	unassigned	YES	unset	down	down
Tel1/1/6	unassigned	YES	unset	down	down
Tel1/1/7	unassigned	YES	unset	down	down
Tel1/1/8	unassigned	YES	unset	down	down
Fo1/1/1	unassigned	YES	unset	down	down
Fo1/1/2	unassigned	YES	unset	down	down
TwentyFiveGigE1/1/1	10.103.224.30	YES	NVRAM	up	up
TwentyFiveGigE1/1/2	10.103.224.34	YES	NVRAM	up	up
Ap1/0/1	unassigned	YES	unset	up	up
Port-channel1	unassigned	YES	unset	up	up
TLS-VIF0	20.0.88.201	YES	TFTP	up	up

nve1	unassigned	YES	unset	up	up
Loopback0	10.103.255.11	YES	NVRAM	up	up
Loopback1000	20.0.88.201	YES	manual	up	up
Tunnel0	10.103.255.11	YES	unset	up	up
Tunnel1	10.103.224.30	YES	unset	up	up

NYC103-Leaf-02

NYC103-Leaf-02#sh ip int br

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	10.103.64.1	YES	NVRAM	up	up
Vlan120	10.103.120.1	YES	NVRAM	up	up
Vlan180	10.103.180.1	YES	NVRAM	up	up
Vlan220	10.103.220.1	YES	NVRAM	up	up
Vlan3001	10.103.255.12	YES	unset	up	up
Vlan3002	10.103.255.12	YES	unset	up	up
GigabitEthernet0/0	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet1/0/1	10.103.224.38	YES	NVRAM	up	up
GigabitEthernet1/0/2	10.103.224.42	YES	NVRAM	up	up
GigabitEthernet1/0/3	unassigned	YES	unset	down	down
GigabitEthernet1/0/4	unassigned	YES	unset	down	down
GigabitEthernet1/0/5	unassigned	YES	unset	down	down
GigabitEthernet1/0/6	unassigned	YES	unset	down	down
GigabitEthernet1/0/7	unassigned	YES	unset	down	down
GigabitEthernet1/0/8	unassigned	YES	unset	down	down
GigabitEthernet1/0/9	unassigned	YES	unset	down	down
GigabitEthernet1/0/10	unassigned	YES	unset	down	down
GigabitEthernet1/0/11	unassigned	YES	unset	down	down
GigabitEthernet1/0/12	unassigned	YES	unset	down	down
GigabitEthernet1/0/13	unassigned	YES	unset	down	down
GigabitEthernet1/0/14	unassigned	YES	unset	down	down
GigabitEthernet1/0/15	unassigned	YES	unset	down	down
GigabitEthernet1/0/16	unassigned	YES	unset	down	down
GigabitEthernet1/0/17	unassigned	YES	unset	down	down
GigabitEthernet1/0/18	unassigned	YES	unset	down	down
GigabitEthernet1/0/19	unassigned	YES	unset	down	down
GigabitEthernet1/0/20	unassigned	YES	unset	down	down
GigabitEthernet1/0/21	unassigned	YES	unset	down	down
GigabitEthernet1/0/22	unassigned	YES	unset	down	down
GigabitEthernet1/0/23	unassigned	YES	unset	down	down
GigabitEthernet1/0/24	unassigned	YES	unset	down	down
GigabitEthernet1/0/25	unassigned	YES	unset	down	down
GigabitEthernet1/0/26	unassigned	YES	unset	down	down
GigabitEthernet1/0/27	unassigned	YES	unset	down	down
GigabitEthernet1/0/28	unassigned	YES	unset	down	down
GigabitEthernet1/0/29	unassigned	YES	unset	down	down
GigabitEthernet1/0/30	unassigned	YES	unset	down	down
GigabitEthernet1/0/31	unassigned	YES	unset	down	down

GigabitEthernet1/0/32	unassigned	YES	unset	down	down
GigabitEthernet1/0/33	unassigned	YES	unset	down	down
GigabitEthernet1/0/34	unassigned	YES	unset	down	down
GigabitEthernet1/0/35	unassigned	YES	unset	down	down
GigabitEthernet1/0/36	unassigned	YES	unset	down	down
GigabitEthernet1/0/37	unassigned	YES	unset	down	down
GigabitEthernet1/0/38	unassigned	YES	unset	down	down
GigabitEthernet1/0/39	unassigned	YES	unset	down	down
GigabitEthernet1/0/40	unassigned	YES	unset	down	down
GigabitEthernet1/0/41	unassigned	YES	unset	down	down
GigabitEthernet1/0/42	unassigned	YES	unset	down	down
GigabitEthernet1/0/43	unassigned	YES	unset	down	down
GigabitEthernet1/0/44	unassigned	YES	unset	down	down
GigabitEthernet1/0/45	unassigned	YES	unset	down	down
GigabitEthernet1/0/46	unassigned	YES	unset	down	down
GigabitEthernet1/0/47	unassigned	YES	unset	up	up
GigabitEthernet1/0/48	unassigned	YES	unset	up	up
GigabitEthernet1/1/1	unassigned	YES	unset	down	down
GigabitEthernet1/1/2	unassigned	YES	unset	down	down
GigabitEthernet1/1/3	unassigned	YES	unset	down	down
GigabitEthernet1/1/4	unassigned	YES	unset	down	down
Tel1/1/1	unassigned	YES	unset	down	down
Tel1/1/2	unassigned	YES	unset	down	down
Tel1/1/3	unassigned	YES	unset	down	down
Tel1/1/4	unassigned	YES	unset	down	down
Tel1/1/5	unassigned	YES	unset	down	down
Tel1/1/6	unassigned	YES	unset	down	down
Tel1/1/7	unassigned	YES	unset	down	down
Tel1/1/8	unassigned	YES	unset	down	down
Fo1/1/1	unassigned	YES	unset	down	down
Fo1/1/2	unassigned	YES	unset	down	down
TwentyFiveGigE1/1/1	unassigned	YES	unset	down	down
TwentyFiveGigE1/1/2	unassigned	YES	unset	down	down
Ap1/0/1	unassigned	YES	unset	up	up
TLS-VIF0	20.0.66.11	YES	TFTP	up	up
nve1	unassigned	YES	unset	up	up
Loopback0	10.103.255.12	YES	NVRAM	up	up
Loopback1000	20.0.66.11	YES	manual	up	up
Tunnel0	10.103.255.12	YES	unset	up	up
Tunnel1	10.103.224.42	YES	unset	up	up

NYC103-Leaf-03

NYC103-Leaf-03#sh ip int br

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	10.103.64.1	YES	NVRAM	up	up
Vlan120	10.103.120.1	YES	NVRAM	up	up
Vlan180	10.103.180.1	YES	NVRAM	up	up

Vlan220	10.103.220.1	YES	NVRAM	up	up
Vlan3001	10.103.255.13	YES	unset	up	up
Vlan3002	10.103.255.13	YES	unset	up	up
GigabitEthernet0/0	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet1/0/1	10.103.224.46	YES	NVRAM	up	up
GigabitEthernet1/0/2	10.103.224.50	YES	NVRAM	up	up
GigabitEthernet1/0/3	unassigned	YES	unset	down	down
GigabitEthernet1/0/4	unassigned	YES	unset	down	down
GigabitEthernet1/0/5	unassigned	YES	unset	down	down
GigabitEthernet1/0/6	unassigned	YES	unset	down	down
GigabitEthernet1/0/7	unassigned	YES	unset	down	down
GigabitEthernet1/0/8	unassigned	YES	unset	down	down
GigabitEthernet1/0/9	unassigned	YES	unset	down	down
GigabitEthernet1/0/10	unassigned	YES	unset	down	down
GigabitEthernet1/0/11	unassigned	YES	unset	down	down
GigabitEthernet1/0/12	unassigned	YES	unset	up	up
GigabitEthernet1/0/13	unassigned	YES	unset	up	up
GigabitEthernet1/0/14	unassigned	YES	unset	down	down
GigabitEthernet1/0/15	unassigned	YES	unset	down	down
GigabitEthernet1/0/16	unassigned	YES	unset	down	down
GigabitEthernet1/0/17	unassigned	YES	unset	down	down
GigabitEthernet1/0/18	unassigned	YES	unset	down	down
GigabitEthernet1/0/19	unassigned	YES	unset	down	down
GigabitEthernet1/0/20	unassigned	YES	unset	down	down
GigabitEthernet1/0/21	unassigned	YES	unset	down	down
GigabitEthernet1/0/22	unassigned	YES	unset	down	down
GigabitEthernet1/0/23	unassigned	YES	unset	down	down
GigabitEthernet1/0/24	unassigned	YES	unset	down	down
GigabitEthernet1/0/25	unassigned	YES	unset	down	down
GigabitEthernet1/0/26	unassigned	YES	unset	down	down
GigabitEthernet1/0/27	unassigned	YES	unset	down	down
GigabitEthernet1/0/28	unassigned	YES	unset	down	down
GigabitEthernet1/0/29	unassigned	YES	unset	down	down
GigabitEthernet1/0/30	unassigned	YES	unset	down	down
GigabitEthernet1/0/31	unassigned	YES	unset	down	down
GigabitEthernet1/0/32	unassigned	YES	unset	down	down
GigabitEthernet1/0/33	unassigned	YES	unset	down	down
GigabitEthernet1/0/34	unassigned	YES	unset	down	down
GigabitEthernet1/0/35	unassigned	YES	unset	down	down
GigabitEthernet1/0/36	unassigned	YES	unset	down	down
GigabitEthernet1/0/37	unassigned	YES	unset	down	down
GigabitEthernet1/0/38	unassigned	YES	unset	down	down
GigabitEthernet1/0/39	unassigned	YES	unset	down	down
GigabitEthernet1/0/40	unassigned	YES	unset	down	down
GigabitEthernet1/0/41	unassigned	YES	unset	down	down
GigabitEthernet1/0/42	unassigned	YES	unset	down	down
GigabitEthernet1/0/43	unassigned	YES	unset	down	down

GigabitEthernet1/0/44	unassigned	YES	unset	down	down
GigabitEthernet1/0/45	unassigned	YES	unset	down	down
GigabitEthernet1/0/46	unassigned	YES	unset	down	down
GigabitEthernet1/0/47	unassigned	YES	unset	down	down
GigabitEthernet1/0/48	unassigned	YES	unset	up	up
GigabitEthernet1/1/1	unassigned	YES	unset	down	down
GigabitEthernet1/1/2	unassigned	YES	unset	down	down
GigabitEthernet1/1/3	unassigned	YES	unset	down	down
GigabitEthernet1/1/4	unassigned	YES	unset	down	down
Te1/1/1	unassigned	YES	unset	down	down
Te1/1/2	unassigned	YES	unset	down	down
Te1/1/3	unassigned	YES	unset	down	down
Te1/1/4	unassigned	YES	unset	down	down
Te1/1/5	unassigned	YES	unset	down	down
Te1/1/6	unassigned	YES	unset	down	down
Te1/1/7	unassigned	YES	unset	down	down
Te1/1/8	unassigned	YES	unset	down	down
Fo1/1/1	unassigned	YES	unset	down	down
Fo1/1/2	unassigned	YES	unset	down	down
TwentyFiveGigE1/1/1	unassigned	YES	unset	down	down
TwentyFiveGigE1/1/2	unassigned	YES	unset	down	down
Ap1/0/1	unassigned	YES	unset	up	up
TLS-VIF0	20.0.66.252	YES	TFTP	up	up
nve1	unassigned	YES	unset	up	up
Loopback0	10.103.255.13	YES	NVRAM	up	up
Loopback1000	20.0.66.252	YES	manual	up	up
Tunnel0	10.103.255.13	YES	unset	up	up
Tunnel1	10.103.224.50	YES	unset	up	up

NYC103-Leaf-04

NYC103-Leaf-04#sh ip int br

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	10.103.64.1	YES	NVRAM	up	up
Vlan120	10.103.120.1	YES	NVRAM	up	up
Vlan180	10.103.180.1	YES	NVRAM	up	up
Vlan220	10.103.220.1	YES	NVRAM	up	up
Vlan3001	10.103.255.14	YES	unset	up	up
Vlan3002	10.103.255.14	YES	unset	up	up
GigabitEthernet0/0	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet1/0/1	unassigned	YES	unset	down	down
GigabitEthernet1/0/2	unassigned	YES	unset	down	down
GigabitEthernet1/0/3	unassigned	YES	unset	down	down
GigabitEthernet1/0/4	unassigned	YES	unset	down	down
GigabitEthernet1/0/5	unassigned	YES	unset	down	down
GigabitEthernet1/0/6	unassigned	YES	unset	down	down
GigabitEthernet1/0/7	unassigned	YES	unset	down	down
GigabitEthernet1/0/8	unassigned	YES	unset	down	down

GigabitEthernet1/0/9	unassigned	YES	unset	down	down
GigabitEthernet1/0/10	unassigned	YES	unset	down	down
GigabitEthernet1/0/11	unassigned	YES	unset	down	down
GigabitEthernet1/0/12	unassigned	YES	unset	down	down
GigabitEthernet1/0/13	unassigned	YES	unset	down	down
GigabitEthernet1/0/14	unassigned	YES	unset	down	down
GigabitEthernet1/0/15	unassigned	YES	unset	down	down
GigabitEthernet1/0/16	unassigned	YES	unset	down	down
GigabitEthernet1/0/17	unassigned	YES	unset	down	down
GigabitEthernet1/0/18	unassigned	YES	unset	down	down
GigabitEthernet1/0/19	unassigned	YES	unset	down	down
GigabitEthernet1/0/20	unassigned	YES	unset	down	down
GigabitEthernet1/0/21	unassigned	YES	unset	down	down
GigabitEthernet1/0/22	unassigned	YES	unset	down	down
GigabitEthernet1/0/23	unassigned	YES	unset	down	down
GigabitEthernet1/0/24	unassigned	YES	unset	down	down
GigabitEthernet1/0/25	unassigned	YES	unset	down	down
GigabitEthernet1/0/26	unassigned	YES	unset	down	down
GigabitEthernet1/0/27	unassigned	YES	unset	down	down
GigabitEthernet1/0/28	unassigned	YES	unset	down	down
GigabitEthernet1/0/29	unassigned	YES	unset	down	down
GigabitEthernet1/0/30	unassigned	YES	unset	down	down
GigabitEthernet1/0/31	unassigned	YES	unset	down	down
GigabitEthernet1/0/32	unassigned	YES	unset	down	down
GigabitEthernet1/0/33	unassigned	YES	unset	down	down
GigabitEthernet1/0/34	unassigned	YES	unset	down	down
GigabitEthernet1/0/35	unassigned	YES	unset	down	down
GigabitEthernet1/0/36	unassigned	YES	unset	down	down
GigabitEthernet1/0/37	unassigned	YES	unset	down	down
GigabitEthernet1/0/38	unassigned	YES	unset	down	down
GigabitEthernet1/0/39	unassigned	YES	unset	down	down
GigabitEthernet1/0/40	unassigned	YES	unset	down	down
GigabitEthernet1/0/41	unassigned	YES	unset	down	down
GigabitEthernet1/0/42	unassigned	YES	unset	down	down
GigabitEthernet1/0/43	unassigned	YES	unset	down	down
GigabitEthernet1/0/44	unassigned	YES	unset	down	down
GigabitEthernet1/0/45	unassigned	YES	unset	down	down
GigabitEthernet1/0/46	unassigned	YES	unset	down	down
GigabitEthernet1/0/47	unassigned	YES	unset	up	up
GigabitEthernet1/0/48	unassigned	YES	unset	up	up
GigabitEthernet1/1/1	unassigned	YES	unset	down	down
GigabitEthernet1/1/2	unassigned	YES	unset	down	down
GigabitEthernet1/1/3	unassigned	YES	unset	down	down
GigabitEthernet1/1/4	unassigned	YES	unset	down	down
Te1/1/1	unassigned	YES	unset	down	down
Te1/1/2	unassigned	YES	unset	down	down
Te1/1/3	unassigned	YES	unset	down	down

Tel1/1/4	unassigned	YES	unset	down	down
Tel1/1/5	unassigned	YES	unset	down	down
Tel1/1/6	unassigned	YES	unset	down	down
Tel1/1/7	unassigned	YES	unset	down	down
Tel1/1/8	unassigned	YES	unset	down	down
Fo1/1/1	unassigned	YES	unset	down	down
Fo1/1/2	unassigned	YES	unset	down	down
TwentyFiveGigE1/1/1	10.103.224.54	YES	NVRAM	up	up
TwentyFiveGigE1/1/2	10.103.224.58	YES	NVRAM	up	up
Ap1/0/1	unassigned	YES	unset	up	up
Port-channel1	unassigned	YES	unset	up	up
TLS-VIF0	20.0.82.26	YES	TFTP	up	up
nve1	unassigned	YES	unset	up	up
Loopback0	10.103.255.14	YES	NVRAM	up	up
Loopback1000	20.0.82.26	YES	manual	up	up
Tunnel0	10.103.255.14	YES	unset	up	up
Tunnel1	10.103.224.54	YES	unset	up	up

NYC103-FL01-SW01

No module connected

NYC103-FL02-SW01

No module connected

NYC103-FL02-SW02

No module connected

NYC103-FL02-SW03

No module connected

NYC103-FL04-SW01

No module connected

OSPF (All Fabric Switches)

Tech tip: You can use the Dashboard Terminal and the following commands: show ip ospf neighbors and show ip route ospf

NYC103-Spine-01

NYC103-Spine-01#show ip ospf neighbor

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.103.255.2	0	FULL/ -	00:00:30	10.103.224.18	HundredGigE1/0/28
10.103.255.4	0	FULL/ -	00:00:31	10.103.224.22	HundredGigE1/0/26
10.103.255.3	0	FULL/ -	00:00:34	10.103.224.10	HundredGigE1/0/25
10.103.255.14	0	FULL/ -	00:00:39	10.103.224.54	TwentyFiveGigE1/0/4
10.103.255.13	0	FULL/ -	00:00:31	10.103.224.46	TwentyFiveGigE1/0/3
10.103.255.12	0	FULL/ -	00:00:37	10.103.224.38	TwentyFiveGigE1/0/2
10.103.255.11	0	FULL/ -	00:00:37	10.103.224.30	TwentyFiveGigE1/0/1

NYC103-Spine-01#show ip ospf interface

Loopback0 is up, line protocol is up

Internet Address 10.103.255.1/32, Interface ID 39, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.1, Network Type LOOPBACK, Cost: 1

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	1	no	no	Base

Enabled by interface config, including secondary ip addresses

Loopback interface is treated as a stub Host

Loopback1 is up, line protocol is up

Internet Address 10.103.254.1/32, Interface ID 40, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.1, Network Type LOOPBACK, Cost: 1

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	1	no	no	Base

Enabled by interface config, including secondary ip addresses

Loopback interface is treated as a stub Host

Loopback2 is up, line protocol is up

Internet Address 10.103.255.255/32, Interface ID 41, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.1, Network Type LOOPBACK, Cost: 1

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	1	no	no	Base

Enabled by interface config, including secondary ip addresses

Loopback interface is treated as a stub Host

HundredGigE1/0/28 is up, line protocol is up (connected)

Internet Address 10.103.224.17/30, Interface ID 48, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.1, Network Type POINT_TO_POINT, Cost: 2

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	2	no	no	Base

Enabled by interface config, including secondary ip addresses

Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

oob-resync timeout 40

Hello due in 00:00:03

```

Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Can be protected by per-prefix Loop-Free FastReroute
Can be used for per-prefix Loop-Free FastReroute repair paths
Not Protected by per-prefix TI-LFA
Index 1/10/10, flood queue length 0
Next 0x0(0)/0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 2
Last flood scan time is 0 msec, maximum is 1 msec
Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 10.103.255.2
Suppress hello for 0 neighbor(s)
HundredGigE1/0/26 is up, line protocol is up (connected)
    Internet Address 10.103.224.21/30, Interface ID 47, Area 0
Attached via Interface Enable
Process ID 1, Router ID 10.103.255.1, Network Type POINT_TO_POINT, Cost: 2
Topology-MTID      Cost      Disabled      Shutdown      Topology Name
          0          2          no           no           Base
Enabled by interface config, including secondary ip addresses
Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    oob-resync timeout 40
    Hello due in 00:00:02
Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Can be protected by per-prefix Loop-Free FastReroute
Can be used for per-prefix Loop-Free FastReroute repair paths
Not Protected by per-prefix TI-LFA
Index 1/9/9, flood queue length 0
Next 0x0(0)/0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 2
Last flood scan time is 0 msec, maximum is 1 msec
Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 10.103.255.4
Suppress hello for 0 neighbor(s)
HundredGigE1/0/25 is up, line protocol is up (connected)

NYC103-Spine-01#
NYC103-Spine-01#show ip ospf 1
Routing Process "ospf 1" with ID 10.103.255.1
Start time: 00:01:35.477, Time elapsed: 1w2d
Supports only single TOS(TOS0) routes
Supports opaque LSA
Supports Link-local Signaling (LLS)
Supports area transit capability

```

```
Supports NSSA (compatible with RFC 3101)
Supports Database Exchange Summary List Optimization (RFC 5243)
Event-log enabled, Maximum number of events: 1000, Mode: cyclic
It is an autonomous system boundary router
Redistributing External Routes from,
Router is not originating router-LSAs with maximum metric
Initial SPF schedule delay 50 msec
Minimum hold time between two consecutive SPF's 200 msec
Maximum wait time between two consecutive SPF's 5000 msec
Incremental-SPF disabled
Initial LSA throttle delay 50 msec
Minimum hold time for LSA throttle 200 msec
Maximum wait time for LSA throttle 5000 msec
Minimum LSA arrival 100 msec
LSA group pacing timer 240 sec
Interface flood pacing timer 33 msec
Retransmission pacing timer 66 msec
EXCHANGE/LOADING adjacency limit: initial 300, process maximum 300
Number of external LSA 2. Checksum Sum 0x00F1EF
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Number of areas transit capable is 0
External flood list length 0
IETF NSF helper support enabled
Cisco NSF helper support enabled
BFD is enabled
Reference bandwidth unit is 100000 mbps
  Area BACKBONE(0)
    Number of interfaces in this area is 10 (3 loopback)
    Area has no authentication
    SPF algorithm last executed 1w2d ago
    SPF algorithm executed 32 times
    Area ranges are
    Number of LSA 8. Checksum Sum 0x03DBF7
    Number of opaque link LSA 0. Checksum Sum 0x000000
    Number of DCbitless LSA 0
    Number of indication LSA 0
    Number of DoNotAge LSA 0
    Flood list length 0
Maintenance Mode ID:      139668902607264
Maintenance Mode:        disabled
Maintenance Mode Timer:   stopped (0)
Graceful Reload FSU Global status : Not Supported (global: Not Supported)
```

```
NYC103-Spine-01#show ip route ospf
```

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from Pfr
& - replicated local route overrides by connected

Gateway of last resort is 10.103.224.22 to network 0.0.0.0

O*E1 0.0.0.0/0 [110/1102] via 10.103.224.22, 1w2d, HundredGigE1/0/26
[110/1102] via 10.103.224.10, 1w2d, HundredGigE1/0/25
10.0.0.0/8 is variably subnetted, 33 subnets, 2 masks
O 10.103.224.0/30 [110/102] via 10.103.224.10, 1w2d, HundredGigE1/0/25
O 10.103.224.4/30 [110/102] via 10.103.224.22, 1w2d, HundredGigE1/0/26
O 10.103.224.12/30 [110/4] via 10.103.224.22, 1w2d, HundredGigE1/0/26
[110/4] via 10.103.224.18, 1w2d, HundredGigE1/0/28
O 10.103.224.24/30 [110/4] via 10.103.224.18, 1w2d, HundredGigE1/0/28
[110/4] via 10.103.224.10, 1w2d, HundredGigE1/0/25
O 10.103.224.32/30 [110/12] via 10.103.224.18, 1w2d, HundredGigE1/0/28
O 10.103.224.40/30 [110/102] via 10.103.224.18, 1w2d, HundredGigE1/0/28
O 10.103.224.48/30 [110/102] via 10.103.224.18, 1w2d, HundredGigE1/0/28
O 10.103.224.56/30 [110/6] via 10.103.224.18, 1w2d, HundredGigE1/0/28
O 10.103.254.2/32 [110/3] via 10.103.224.18, 1w2d, HundredGigE1/0/28
O 10.103.255.2/32 [110/3] via 10.103.224.18, 1w2d, HundredGigE1/0/28
O 10.103.255.3/32 [110/3] via 10.103.224.10, 1w2d, HundredGigE1/0/25
O 10.103.255.4/32 [110/3] via 10.103.224.22, 1w2d, HundredGigE1/0/26
O 10.103.255.11/32
[110/11] via 10.103.224.30, 1w2d, TwentyFiveGigE1/0/1
O 10.103.255.12/32
[110/101] via 10.103.224.38, 1w2d, TwentyFiveGigE1/0/2
O 10.103.255.13/32
[110/101] via 10.103.224.46, 1w2d, TwentyFiveGigE1/0/3
O 10.103.255.14/32 [110/5] via 10.103.224.54, 1w2d, TwentyFiveGigE1/0/4
NYC103-Spine-01#show ip ospf database

OSPF Router with ID (10.103.255.1) (Process ID 1)

Router Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum	Link count
10.103.255.1	10.103.255.1	1916	0x8000019E	0x00A79F	17

10.103.255.2	10.103.255.2	934	0x800001A2 0x00808E 17
10.103.255.3	10.103.255.3	595	0x80000195 0x0021A6 6
10.103.255.4	10.103.255.4	1858	0x80000194 0x007849 6
10.103.255.11	10.103.255.11	433	0x80000192 0x00E43B 5
10.103.255.12	10.103.255.12	602	0x80000191 0x00E9AA 5
10.103.255.13	10.103.255.13	1441	0x80000190 0x002B47 5
10.103.255.14	10.103.255.14	311	0x80000191 0x0020AF 5

Type-5 AS External Link States

Link ID	ADV Router	Age	Seq#	Checksum Tag
0.0.0.0	10.103.255.3	595	0x8000018D	0x00DE14 1
0.0.0.0	10.103.255.4	1858	0x8000018C	0x0013DB 1

NYC103-Spine-02

NYC103-Spine-02#show ip ospf neighbor

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.103.255.4	0	FULL/ -	00:00:36	10.103.224.14	HundredGigE1/0/26
10.103.255.1	0	FULL/ -	00:00:38	10.103.224.17	HundredGigE1/0/28
10.103.255.3	0	FULL/ -	00:00:34	10.103.224.26	HundredGigE1/0/25
10.103.255.14	0	FULL/ -	00:00:31	10.103.224.58	TwentyFiveGigE1/0/4
10.103.255.13	0	FULL/ -	00:00:37	10.103.224.50	TwentyFiveGigE1/0/3
10.103.255.12	0	FULL/ -	00:00:30	10.103.224.42	TwentyFiveGigE1/0/2
10.103.255.11	0	FULL/ -	00:00:31	10.103.224.34	TwentyFiveGigE1/0/1

NYC103-Spine-02#show ip ospf interface

Loopback0 is up, line protocol is up

Internet Address 10.103.255.2/32, Interface ID 39, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.2, Network Type LOOPBACK, Cost: 1

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	1	no	no	Base

Enabled by interface config, including secondary ip addresses

Loopback interface is treated as a stub Host

Loopback1 is up, line protocol is up

Internet Address 10.103.254.2/32, Interface ID 40, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.2, Network Type LOOPBACK, Cost: 1

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	1	no	no	Base

Enabled by interface config, including secondary ip addresses

Loopback interface is treated as a stub Host

Loopback2 is up, line protocol is up

Internet Address 10.103.255.255/32, Interface ID 41, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.2, Network Type LOOPBACK, Cost: 1

Topology-MTID	Cost	Disabled	Shutdown	Topology Name


```

0          1          no          no          Base
Enabled by interface config, including secondary ip addresses
Loopback interface is treated as a stub Host
HundredGigE1/0/26 is up, line protocol is up (connected)
Internet Address 10.103.224.13/30, Interface ID 47, Area 0
Attached via Interface Enable
Process ID 1, Router ID 10.103.255.2, Network Type POINT_TO_POINT, Cost: 2
Topology-MTID    Cost    Disabled    Shutdown    Topology Name
0                2        no         no         Base
Enabled by interface config, including secondary ip addresses
Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  oob-resync timeout 40
  Hello due in 00:00:03
Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Can be protected by per-prefix Loop-Free FastReroute
Can be used for per-prefix Loop-Free FastReroute repair paths
Not Protected by per-prefix TI-LFA
Index 1/10/10, flood queue length 0
Next 0x0(0)/0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 2
Last flood scan time is 0 msec, maximum is 1 msec
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 10.103.255.4
Suppress hello for 0 neighbor(s)
HundredGigE1/0/28 is up, line protocol is up (connected)
Internet Address 10.103.224.18/30, Interface ID 48, Area 0
Attached via Interface Enable
Process ID 1, Router ID 10.103.255.2, Network Type POINT_TO_POINT, Cost: 2
Topology-MTID    Cost    Disabled    Shutdown    Topology Name
0                2        no         no         Base
Enabled by interface config, including secondary ip addresses
Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  oob-resync timeout 40
  Hello due in 00:00:04
Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Can be protected by per-prefix Loop-Free FastReroute
Can be used for per-prefix Loop-Free FastReroute repair paths
Not Protected by per-prefix TI-LFA
Index 1/9/9, flood queue length 0
Next 0x0(0)/0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 2

```

```
Last flood scan time is 0 msec, maximum is 1 msec
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 10.103.255.1
  Suppress hello for 0 neighbor(s)
HundredGigE1/0/25 is up, line protocol is up (connected)
```

```
NYC103-Spine-02#
```

```
NYC103-Spine-02#show ip ospf 1
```

```
Routing Process "ospf 1" with ID 10.103.255.2
Start time: 00:01:35.706, Time elapsed: 1w2d
Supports only single TOS(TOS0) routes
Supports opaque LSA
Supports Link-local Signaling (LLS)
Supports area transit capability
Supports NSSA (compatible with RFC 3101)
Supports Database Exchange Summary List Optimization (RFC 5243)
Event-log enabled, Maximum number of events: 1000, Mode: cyclic
It is an autonomous system boundary router
Redistributing External Routes from,
Router is not originating router-LSAs with maximum metric
Initial SPF schedule delay 50 msec
Minimum hold time between two consecutive SPF's 200 msec
Maximum wait time between two consecutive SPF's 5000 msec
Incremental-SPF disabled
Initial LSA throttle delay 50 msec
Minimum hold time for LSA throttle 200 msec
Maximum wait time for LSA throttle 5000 msec
Minimum LSA arrival 100 msec
LSA group pacing timer 240 secs
Interface flood pacing timer 33 msec
Retransmission pacing timer 66 msec
EXCHANGE/LOADING adjacency limit: initial 300, process maximum 300
Number of external LSA 2. Checksum Sum 0x00F1EF
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Number of areas transit capable is 0
External flood list length 0
IETF NSF helper support enabled
Cisco NSF helper support enabled
BFD is enabled
Reference bandwidth unit is 100000 mbps
  Area BACKBONE(0)
    Number of interfaces in this area is 10 (3 loopback)
    Area has no authentication
    SPF algorithm last executed 1w2d ago
```

```

SPF algorithm executed 27 times
Area ranges are
Number of LSA 8. Checksum Sum 0x03DBF7
Number of opaque link LSA 0. Checksum Sum 0x000000
Number of DCbitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0
Maintenance Mode ID:      140219356546768
Maintenance Mode:         disabled
Maintenance Mode Timer:    stopped (0)
Graceful Reload FSU Global status : Not Supported (global: Not Supported)

NYC103-Spine-02#show ip route ospf
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
       & - replicated local route overrides by connected

Gateway of last resort is 10.103.224.26 to network 0.0.0.0

O*E1  0.0.0.0/0 [110/1102] via 10.103.224.26, 1w2d, HundredGigE1/0/25
        [110/1102] via 10.103.224.14, 1w2d, HundredGigE1/0/26
10.0.0.0/8 is variably subnetted, 33 subnets, 2 masks
O      10.103.224.0/30 [110/102] via 10.103.224.26, 1w2d, HundredGigE1/0/25
O      10.103.224.4/30 [110/102] via 10.103.224.14, 1w2d, HundredGigE1/0/26
O      10.103.224.8/30 [110/4] via 10.103.224.26, 1w2d, HundredGigE1/0/25
        [110/4] via 10.103.224.17, 1w2d, HundredGigE1/0/28
O      10.103.224.20/30 [110/4] via 10.103.224.17, 1w2d, HundredGigE1/0/28
        [110/4] via 10.103.224.14, 1w2d, HundredGigE1/0/26
O      10.103.224.28/30 [110/12] via 10.103.224.17, 1w2d, HundredGigE1/0/28
O      10.103.224.36/30 [110/102] via 10.103.224.17, 1w2d, HundredGigE1/0/28
O      10.103.224.44/30 [110/102] via 10.103.224.17, 1w2d, HundredGigE1/0/28
O      10.103.224.52/30 [110/6] via 10.103.224.17, 1w2d, HundredGigE1/0/28
O      10.103.254.1/32 [110/3] via 10.103.224.17, 1w2d, HundredGigE1/0/28
O      10.103.255.1/32 [110/3] via 10.103.224.17, 1w2d, HundredGigE1/0/28
O      10.103.255.3/32 [110/3] via 10.103.224.26, 1w2d, HundredGigE1/0/25
O      10.103.255.4/32 [110/3] via 10.103.224.14, 1w2d, HundredGigE1/0/26
O      10.103.255.11/32

```

```
[110/11] via 10.103.224.34, 1w2d, TwentyFiveGigE1/0/1
O      10.103.255.12/32
      [110/101] via 10.103.224.42, 1w2d, TwentyFiveGigE1/0/2
O      10.103.255.13/32
      [110/101] via 10.103.224.50, 1w2d, TwentyFiveGigE1/0/3
O      10.103.255.14/32 [110/5] via 10.103.224.58, 1w2d, TwentyFiveGigE1/0/4
NYC103-Spine-02#show ip ospf database
```

OSPF Router with ID (10.103.255.2) (Process ID 1)

Router Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum	Link count
10.103.255.1	10.103.255.1	1922	0x8000019E	0x00A79F	17
10.103.255.2	10.103.255.2	937	0x800001A2	0x00808E	17
10.103.255.3	10.103.255.3	600	0x80000195	0x0021A6	6
10.103.255.4	10.103.255.4	1863	0x80000194	0x007849	6
10.103.255.11	10.103.255.11	438	0x80000192	0x00E43B	5
10.103.255.12	10.103.255.12	607	0x80000191	0x00E9AA	5
10.103.255.13	10.103.255.13	1446	0x80000190	0x002B47	5
10.103.255.14	10.103.255.14	316	0x80000191	0x0020AF	5

Type-5 AS External Link States

Link ID	ADV Router	Age	Seq#	Checksum	Tag
0.0.0.0	10.103.255.3	600	0x8000018D	0x00DE14	1
0.0.0.0	10.103.255.4	1863	0x8000018C	0x0013DB	1

NYC103-Border-01

```
NYC103-Border-01#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.103.255.2	0	FULL/ -	00:00:35	10.103.224.25	FortyGigabitEthernet1/1/2
10.103.255.1	0	FULL/ -	00:00:37	10.103.224.9	FortyGigabitEthernet1/1/1

```
NYC103-Border-01#show ip ospf interface
```

Loopback0 is up, line protocol is up

Internet Address 10.103.255.3/32, Interface ID 77, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.3, Network Type LOOPBACK, Cost: 1

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	1	no	no	Base

Enabled by interface config, including secondary ip addresses

Loopback interface is treated as a stub Host

FortyGigabitEthernet1/1/2 is up, line protocol is up (connected)

Internet Address 10.103.224.26/30, Interface ID 84, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.3, Network Type POINT_TO_POINT, Cost: 2

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	2	no	no	Base

Enabled by interface config, including secondary ip addresses
 Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled
 Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
 oob-resync timeout 40
 Hello due in 00:00:09
 Supports Link-local Signaling (LLS)
 Cisco NSF helper support enabled
 IETF NSF helper support enabled
 Can be protected by per-prefix Loop-Free FastReroute
 Can be used for per-prefix Loop-Free FastReroute repair paths
 Not Protected by per-prefix TI-LFA
 Index 1/4/4, flood queue length 0
 Next 0x0(0)/0x0(0)/0x0(0)
 Last flood scan length is 2, maximum is 2
 Last flood scan time is 0 msec, maximum is 1 msec
 Neighbor Count is 1, Adjacent neighbor count is 1
 Adjacent with neighbor 10.103.255.2
 Suppress hello for 0 neighbor(s)

FortyGigabitEthernet1/1/1 is up, line protocol is up (connected)

Internet Address 10.103.224.10/30, Interface ID 83, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.3, Network Type POINT_TO_POINT, Cost: 2

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	2	no	no	Base

Enabled by interface config, including secondary ip addresses
 Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled
 Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
 oob-resync timeout 40
 Hello due in 00:00:05
 Supports Link-local Signaling (LLS)
 Cisco NSF helper support enabled
 IETF NSF helper support enabled
 Can be protected by per-prefix Loop-Free FastReroute
 Can be used for per-prefix Loop-Free FastReroute repair paths
 Not Protected by per-prefix TI-LFA
 Index 1/3/3, flood queue length 0
 Next 0x0(0)/0x0(0)/0x0(0)
 Last flood scan length is 1, maximum is 2
 Last flood scan time is 0 msec, maximum is 1 msec
 Neighbor Count is 1, Adjacent neighbor count is 1
 Adjacent with neighbor 10.103.255.1
 Suppress hello for 0 neighbor(s)

GigabitEthernet1/0/1.10 is up, line protocol is up (connected)

Internet Address 10.103.224.2/30, Interface ID 79, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.3, Network Type BROADCAST, Cost: 100

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	100	no	no	Base

Enabled by interface config, including secondary ip addresses

Transmit Delay is 1 sec, State DR, Priority 1, BFD enabled

Designated Router (ID) 10.103.255.3, Interface address 10.103.224.2

No backup designated router on this network

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
oob-resync timeout 40

Hello due in 00:00:08

Supports Link-local Signaling (LLS)

Cisco NSF helper support enabled

IETF NSF helper support enabled

Can be protected by per-prefix Loop-Free FastReroute

NYC103-Border-01#

NYC103-Border-01#show ip ospf 1

Routing Process "ospf 1" with ID 10.103.255.3

Start time: 00:02:35.752, Time elapsed: 1w2d

Supports only single TOS(TOS0) routes

Supports opaque LSA

Supports Link-local Signaling (LLS)

Supports area transit capability

Supports NSSA (compatible with RFC 3101)

Supports Database Exchange Summary List Optimization (RFC 5243)

Event-log enabled, Maximum number of events: 1000, Mode: cyclic

It is an autonomous system boundary router

Redistributing External Routes from,

Router is not originating router-LSAs with maximum metric

Initial SPF schedule delay 50 msec

Minimum hold time between two consecutive SPF's 200 msec

Maximum wait time between two consecutive SPF's 5000 msec

Incremental-SPF disabled

Initial LSA throttle delay 50 msec

Minimum hold time for LSA throttle 200 msec

Maximum wait time for LSA throttle 5000 msec

Minimum LSA arrival 100 msec

LSA group pacing timer 240 sec

Interface flood pacing timer 33 msec

Retransmission pacing timer 66 msec

EXCHANGE/LOADING adjacency limit: initial 300, process maximum 300

Number of external LSA 2. Checksum Sum 0x00F1EF

Number of opaque AS LSA 0. Checksum Sum 0x000000

Number of DCbitless external and opaque AS LSA 0

Number of DoNotAge external and opaque AS LSA 0

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Number of areas transit capable is 0

```

External flood list length 0
IETF NSF helper support enabled
Cisco NSF helper support enabled
BFD is enabled
Reference bandwidth unit is 100000 mbps
Area BACKBONE(0)
    Number of interfaces in this area is 4 (1 loopback)
Area has no authentication
SPF algorithm last executed 1w2d ago
SPF algorithm executed 16 times
Area ranges are
Number of LSA 8. Checksum Sum 0x03DBF7
Number of opaque link LSA 0. Checksum Sum 0x000000
Number of DCbitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0
Maintenance Mode ID:      140453915606304
Maintenance Mode:         disabled
Maintenance Mode Timer:   stopped (0)
Graceful Reload FSU Global status : None (global: None)

```

NYC103-Border-01#show ip route ospf

```

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
       & - replicated local route overrides by connected

```

Gateway of last resort is 10.103.224.1 to network 0.0.0.0

```

10.0.0.0/8 is variably subnetted, 31 subnets, 3 masks
O      10.103.224.4/30
        [110/104] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
        [110/104] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.224.12/30
        [110/4] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
O      10.103.224.16/30
        [110/4] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
        [110/4] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1

```

```

O      10.103.224.20/30
      [110/4] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.224.28/30
      [110/12] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.224.32/30
      [110/12] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
O      10.103.224.36/30
      [110/102] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.224.40/30
      [110/102] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
O      10.103.224.44/30
      [110/102] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.224.48/30
      [110/102] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
O      10.103.224.52/30
      [110/6] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.224.56/30
      [110/6] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
O      10.103.254.1/32
      [110/3] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.254.2/32
      [110/3] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
O      10.103.255.1/32
      [110/3] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.255.2/32
      [110/3] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
O      10.103.255.4/32
      [110/5] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
      [110/5] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.255.11/32
      [110/13] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
      [110/13] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.255.12/32
      [110/103] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
      [110/103] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.255.13/32
      [110/103] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
      [110/103] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.255.14/32
      [110/7] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
      [110/7] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.255.255/32
      [110/3] via 10.103.224.25, 1w2d, FortyGigabitEthernet1/1/2
      [110/3] via 10.103.224.9, 1w2d, FortyGigabitEthernet1/1/1

```

NYC103-Border-01#show ip ospf database

OSPF Router with ID (10.103.255.3) (Process ID 1)

Router Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum	Link count
10.103.255.1	10.103.255.1	1925	0x8000019E	0x00A79F	17
10.103.255.2	10.103.255.2	942	0x800001A2	0x00808E	17
10.103.255.3	10.103.255.3	602	0x80000195	0x0021A6	6
10.103.255.4	10.103.255.4	1868	0x80000194	0x007849	6
10.103.255.11	10.103.255.11	443	0x80000192	0x00E43B	5
10.103.255.12	10.103.255.12	612	0x80000191	0x00E9AA	5
10.103.255.13	10.103.255.13	1451	0x80000190	0x002B47	5
10.103.255.14	10.103.255.14	320	0x80000191	0x0020AF	5

Type-5 AS External Link States

Link ID	ADV Router	Age	Seq#	Checksum	Tag
0.0.0.0	10.103.255.3	602	0x8000018D	0x00DE14	1
0.0.0.0	10.103.255.4	1868	0x8000018C	0x0013DB	1

NYC103-Border-02

NYC103-Border-02#show ip ospf neighbor

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.103.255.2	0	FULL/ -	00:00:36	10.103.224.13	FortyGigabitEthernet1/1/2
10.103.255.1	0	FULL/ -	00:00:39	10.103.224.21	FortyGigabitEthernet1/1/1

NYC103-Border-02#show ip ospf interface

Loopback0 is up, line protocol is up

Internet Address 10.103.255.4/32, Interface ID 77, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.4, Network Type LOOPBACK, Cost: 1

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	1	no	no	Base

Enabled by interface config, including secondary ip addresses

Loopback interface is treated as a stub Host

FortyGigabitEthernet1/1/2 is up, line protocol is up (connected)

Internet Address 10.103.224.14/30, Interface ID 84, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.4, Network Type POINT_TO_POINT, Cost: 2

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	2	no	no	Base

Enabled by interface config, including secondary ip addresses

Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

oob-resync timeout 40

Hello due in 00:00:07

Supports Link-local Signaling (LLS)

Cisco NSF helper support enabled

```

IETF NSF helper support enabled
Can be protected by per-prefix Loop-Free FastReroute
Can be used for per-prefix Loop-Free FastReroute repair paths
Not Protected by per-prefix TI-LFA
Index 1/4/4, flood queue length 0
Next 0x0(0)/0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 2
Last flood scan time is 0 msec, maximum is 1 msec
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 10.103.255.2
Suppress hello for 0 neighbor(s)
FortyGigabitEthernet1/1/1 is up, line protocol is up (connected)
  Internet Address 10.103.224.22/30, Interface ID 83, Area 0
  Attached via Interface Enable
  Process ID 1, Router ID 10.103.255.4, Network Type POINT_TO_POINT, Cost: 2
  Topology-MTID      Cost      Disabled      Shutdown      Topology Name
        0            2          no           no           Base
  Enabled by interface config, including secondary ip addresses
  Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    oob-resync timeout 40
    Hello due in 00:00:08
  Supports Link-local Signaling (LLS)
  Cisco NSF helper support enabled
  IETF NSF helper support enabled
  Can be protected by per-prefix Loop-Free FastReroute
  Can be used for per-prefix Loop-Free FastReroute repair paths
  Not Protected by per-prefix TI-LFA
  Index 1/3/3, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 2
  Last flood scan time is 0 msec, maximum is 1 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 10.103.255.1
  Suppress hello for 0 neighbor(s)
GigabitEthernet1/0/1.10 is up, line protocol is up (connected)
  Internet Address 10.103.224.6/30, Interface ID 79, Area 0
  Attached via Interface Enable
  Process ID 1, Router ID 10.103.255.4, Network Type BROADCAST, Cost: 100
  Topology-MTID      Cost      Disabled      Shutdown      Topology Name
        0           100          no           no           Base
  Enabled by interface config, including secondary ip addresses
  Transmit Delay is 1 sec, State DR, Priority 1, BFD enabled
  Designated Router (ID) 10.103.255.4, Interface address 10.103.224.6
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    oob-resync timeout 40

```

```
Hello due in 00:00:00
Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Can be protected by per-prefix Loop-Free FastReroute
```

NYC103-Border-02#

NYC103-Border-02#show ip ospf 1

```
Routing Process "ospf 1" with ID 10.103.255.4
Start time: 00:02:34.537, Time elapsed: 1w2d
Supports only single TOS(TOS0) routes
Supports opaque LSA
Supports Link-local Signaling (LLS)
Supports area transit capability
Supports NSSA (compatible with RFC 3101)
Supports Database Exchange Summary List Optimization (RFC 5243)
Event-log enabled, Maximum number of events: 1000, Mode: cyclic
It is an autonomous system boundary router
Redistributing External Routes from,
Router is not originating router-LSAs with maximum metric
Initial SPF schedule delay 50 msec
Minimum hold time between two consecutive SPF's 200 msec
Maximum wait time between two consecutive SPF's 5000 msec
Incremental-SPF disabled
Initial LSA throttle delay 50 msec
Minimum hold time for LSA throttle 200 msec
Maximum wait time for LSA throttle 5000 msec
Minimum LSA arrival 100 msec
LSA group pacing timer 240 secs
Interface flood pacing timer 33 msec
Retransmission pacing timer 66 msec
EXCHANGE/LOADING adjacency limit: initial 300, process maximum 300
Number of external LSA 2. Checksum Sum 0x00F1EF
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Number of areas transit capable is 0
External flood list length 0
IETF NSF helper support enabled
Cisco NSF helper support enabled
BFD is enabled
Reference bandwidth unit is 100000 mbps
Area BACKBONE(0)
    Number of interfaces in this area is 4 (1 loopback)
    Area has no authentication
    SPF algorithm last executed 1w2d ago
```

```
SPF algorithm executed 15 times
Area ranges are
Number of LSA 8. Checksum Sum 0x03DBF7
Number of opaque link LSA 0. Checksum Sum 0x000000
Number of DCbitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0
Maintenance Mode ID:      140105562550480
Maintenance Mode:         disabled
Maintenance Mode Timer:   stopped (0)
Graceful Reload FSU Global status : None (global: None)
```

NYC103-Border-02#show ip route ospf

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PfR
& - replicated local route overrides by connected

Gateway of last resort is 10.103.224.5 to network 0.0.0.0

```
10.0.0.0/8 is variably subnetted, 31 subnets, 3 masks
O      10.103.224.0/30
        [110/104] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
        [110/104] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O      10.103.224.8/30
        [110/4] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.224.16/30
        [110/4] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
        [110/4] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O      10.103.224.24/30
        [110/4] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O      10.103.224.28/30
        [110/12] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.224.32/30
        [110/12] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O      10.103.224.36/30
        [110/102] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
O      10.103.224.40/30
```

```

    [110/102] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O    10.103.224.44/30
    [110/102] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
O    10.103.224.48/30
    [110/102] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O    10.103.224.52/30
    [110/6] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
O    10.103.224.56/30
    [110/6] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O    10.103.254.1/32
    [110/3] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
O    10.103.254.2/32
    [110/3] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O    10.103.255.1/32
    [110/3] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
O    10.103.255.2/32
    [110/3] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O    10.103.255.3/32
    [110/5] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
    [110/5] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O    10.103.255.11/32
    [110/13] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
    [110/13] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O    10.103.255.12/32
    [110/103] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
    [110/103] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O    10.103.255.13/32
    [110/103] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
    [110/103] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O    10.103.255.14/32
    [110/7] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
    [110/7] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2
O    10.103.255.255/32
    [110/3] via 10.103.224.21, 1w2d, FortyGigabitEthernet1/1/1
    [110/3] via 10.103.224.13, 1w2d, FortyGigabitEthernet1/1/2

```

NYC103-Border-02#show ip ospf database

OSPF Router with ID (10.103.255.4) (Process ID 1)

Router Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum	Link count
10.103.255.1	10.103.255.1	1929	0x8000019E	0x00A79F	17
10.103.255.2	10.103.255.2	945	0x800001A2	0x00808E	17
10.103.255.3	10.103.255.3	608	0x80000195	0x0021A6	6
10.103.255.4	10.103.255.4	1869	0x80000194	0x007849	6
10.103.255.11	10.103.255.11	446	0x80000192	0x00E43B	5

10.103.255.12	10.103.255.12	615	0x80000191 0x00E9AA 5
10.103.255.13	10.103.255.13	1454	0x80000190 0x002B47 5
10.103.255.14	10.103.255.14	324	0x80000191 0x0020AF 5

Type-5 AS External Link States

Link ID	ADV Router	Age	Seq#	Checksum Tag
0.0.0.0	10.103.255.3	608	0x8000018D 0x00DE14 1	
0.0.0.0	10.103.255.4	1869	0x8000018C 0x0013DB 1	

NYC103-Leaf-01

NYC103-Leaf-01#show ip ospf neighbor

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.103.255.2	0	FULL/ -	00:00:36	10.103.224.33	TwentyFiveGigE1/1/2
10.103.255.1	0	FULL/ -	00:00:33	10.103.224.29	TwentyFiveGigE1/1/1

NYC103-Leaf-01#show ip ospf interface

Loopback0 is up, line protocol is up

Internet Address 10.103.255.11/32, Interface ID 76, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.11, Network Type LOOPBACK, Cost: 1

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	1	no	no	Base

Enabled by interface config, including secondary ip addresses

Loopback interface is treated as a stub Host

TwentyFiveGigE1/1/2 is up, line protocol is up (connected)

Internet Address 10.103.224.34/30, Interface ID 80, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.11, Network Type POINT_TO_POINT, Cost: 10

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	10	no	no	Base

Enabled by interface config, including secondary ip addresses

Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

oob-resync timeout 40

Hello due in 00:00:00

Supports Link-local Signaling (LLS)

Cisco NSF helper support enabled

IETF NSF helper support enabled

Can be protected by per-prefix Loop-Free FastReroute

Can be used for per-prefix Loop-Free FastReroute repair paths

Not Protected by per-prefix TI-LFA

Index 1/3/3, flood queue length 0

Next 0x0(0)/0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 2

Last flood scan time is 0 msec, maximum is 1 msec

Neighbor Count is 1, Adjacent neighbor count is 1

```

    Adjacent with neighbor 10.103.255.2
    Suppress hello for 0 neighbor(s)
TwentyFiveGigE1/1/1 is up, line protocol is up (connected)
    Internet Address 10.103.224.30/30, Interface ID 79, Area 0
    Attached via Interface Enable
    Process ID 1, Router ID 10.103.255.11, Network Type POINT_TO_POINT, Cost: 10
Topology-MTID      Cost      Disabled      Shutdown      Topology Name
    0            10          no            no            Base
Enabled by interface config, including secondary ip addresses
Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    oob-resync timeout 40
    Hello due in 00:00:00
Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Can be protected by per-prefix Loop-Free FastReroute
Can be used for per-prefix Loop-Free FastReroute repair paths
Not Protected by per-prefix TI-LFA
Index 1/2/2, flood queue length 0
Next 0x0(0)/0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 2
Last flood scan time is 0 msec, maximum is 1 msec
Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 10.103.255.1
    Suppress hello for 0 neighbor(s)
NYC103-Leaf-01#show ip ospf 1
Routing Process "ospf 1" with ID 10.103.255.11
Start time: 00:02:34.689, Time elapsed: 1w2d
Supports only single TOS(TOS0) routes
Supports opaque LSA
Supports Link-local Signaling (LLS)
Supports area transit capability
Supports NSSA (compatible with RFC 3101)
Supports Database Exchange Summary List Optimization (RFC 5243)
Event-log enabled, Maximum number of events: 1000, Mode: cyclic
Router is not originating router-LSAs with maximum metric
Initial SPF schedule delay 50 msec
Minimum hold time between two consecutive SPF's 200 msec
Maximum wait time between two consecutive SPF's 5000 msec
Incremental-SPF disabled
Initial LSA throttle delay 50 msec
Minimum hold time for LSA throttle 200 msec
Maximum wait time for LSA throttle 5000 msec
Minimum LSA arrival 100 msec
LSA group pacing timer 240 secs
Interface flood pacing timer 33 msec

```

```
Retransmission pacing timer 66 msec
EXCHANGE/LOADING adjacency limit: initial 300, process maximum 300
Number of external LSA 2. Checksum Sum 0x00F1EF
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Number of areas transit capable is 0
External flood list length 0
IETF NSF helper support enabled
Cisco NSF helper support enabled
BFD is enabled
Reference bandwidth unit is 100000 mbps
```

Area BACKBONE(0)

```
Number of interfaces in this area is 3 (1 loopback)
Area has no authentication
SPF algorithm last executed 1w2d ago
SPF algorithm executed 10 times
Area ranges are
Number of LSA 8. Checksum Sum 0x03DBF7
Number of opaque link LSA 0. Checksum Sum 0x000000
Number of DCbitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0
```

```
Maintenance Mode ID: 139818590787088
Maintenance Mode: disabled
Maintenance Mode Timer: stopped (0)
Graceful Reload FSU Global status : None (global: None)
```

NYC103-Leaf-01#show ip route ospf

```
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from Pfr
& - replicated local route overrides by connected
```

Gateway of last resort is 10.103.224.33 to network 0.0.0.0

O*E1 0.0.0.0/0 [110/1112] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2


```

    [110/1112] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
10.0.0.0/8 is variably subnetted, 28 subnets, 2 masks
O    10.103.224.0/30
    [110/112] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
    [110/112] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.4/30
    [110/112] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
    [110/112] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.8/30 [110/12] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.12/30
    [110/12] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
O    10.103.224.16/30
    [110/12] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
    [110/12] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.20/30
    [110/12] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.24/30
    [110/12] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
O    10.103.224.36/30
    [110/110] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.40/30
    [110/110] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
O    10.103.224.44/30
    [110/110] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.48/30
    [110/110] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
O    10.103.224.52/30
    [110/14] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.56/30
    [110/14] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
O    10.103.254.1/32 [110/11] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.254.2/32 [110/11] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
O    10.103.255.1/32 [110/11] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.255.2/32 [110/11] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
O    10.103.255.3/32 [110/13] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
    [110/13] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.255.4/32 [110/13] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
    [110/13] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.255.12/32
    [110/111] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
    [110/111] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.255.13/32
    [110/111] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
    [110/111] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
O    10.103.255.14/32
    [110/15] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
    [110/15] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1

```

```
O      10.103.255.255/32
      [110/11] via 10.103.224.33, 1w2d, TwentyFiveGigE1/1/2
      [110/11] via 10.103.224.29, 1w2d, TwentyFiveGigE1/1/1
NYC103-Leaf-01#show ip ospf database
```

OSPF Router with ID (10.103.255.11) (Process ID 1)

Router Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum	Link count
10.103.255.1	10.103.255.1	1932	0x8000019E	0x00A79F	17
10.103.255.2	10.103.255.2	949	0x800001A2	0x00808E	17
10.103.255.3	10.103.255.3	611	0x80000195	0x0021A6	6
10.103.255.4	10.103.255.4	1875	0x80000194	0x007849	6
10.103.255.11	10.103.255.11	448	0x80000192	0x00E43B	5
10.103.255.12	10.103.255.12	619	0x80000191	0x00E9AA	5
10.103.255.13	10.103.255.13	1458	0x80000190	0x002B47	5
10.103.255.14	10.103.255.14	328	0x80000191	0x0020AF	5

Type-5 AS External Link States

Link ID	ADV Router	Age	Seq#	Checksum	Tag
0.0.0.0	10.103.255.3	611	0x8000018D	0x00DE14	1
0.0.0.0	10.103.255.4	1875	0x8000018C	0x0013DB	1

NYC103-Leaf-02

```
NYC103-Leaf-02#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.103.255.2	0	FULL/ -	00:00:34	10.103.224.41	GigabitEthernet1/0/2
10.103.255.1	0	FULL/ -	00:00:32	10.103.224.37	GigabitEthernet1/0/1

```
NYC103-Leaf-02#show ip ospf interface
```

```
Loopback0 is up, line protocol is up
  Internet Address 10.103.255.12/32, Interface ID 76, Area 0
  Attached via Interface Enable
  Process ID 1, Router ID 10.103.255.12, Network Type LOOPBACK, Cost: 1
  Topology-MTID      Cost      Disabled      Shutdown      Topology Name
      0              1         no           no           Base
  Enabled by interface config, including secondary ip addresses
  Loopback interface is treated as a stub Host
GigabitEthernet1/0/2 is up, line protocol is up (connected)
  Internet Address 10.103.224.42/30, Interface ID 79, Area 0
  Attached via Interface Enable
  Process ID 1, Router ID 10.103.255.12, Network Type POINT_TO_POINT, Cost: 100
  Topology-MTID      Cost      Disabled      Shutdown      Topology Name
      0          100         no           no           Base
  Enabled by interface config, including secondary ip addresses
```

```

Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  oob-resync timeout 40
  Hello due in 00:00:05
Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Can be protected by per-prefix Loop-Free FastReroute
Can be used for per-prefix Loop-Free FastReroute repair paths
Not Protected by per-prefix TI-LFA
Index 1/3/3, flood queue length 0
Next 0x0(0)/0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 2
Last flood scan time is 0 msec, maximum is 1 msec
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 10.103.255.2
Suppress hello for 0 neighbor(s)
GigabitEthernet1/0/1 is up, line protocol is up (connected)
  Internet Address 10.103.224.38/30, Interface ID 78, Area 0
Attached via Interface Enable
Process ID 1, Router ID 10.103.255.12, Network Type POINT_TO_POINT, Cost: 100
Topology-MTID      Cost      Disabled      Shutdown      Topology Name
      0          100         no           no           Base
Enabled by interface config, including secondary ip addresses
Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  oob-resync timeout 40
  Hello due in 00:00:07
Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Can be protected by per-prefix Loop-Free FastReroute
Can be used for per-prefix Loop-Free FastReroute repair paths
Not Protected by per-prefix TI-LFA
Index 1/2/2, flood queue length 0
Next 0x0(0)/0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 2
Last flood scan time is 0 msec, maximum is 1 msec
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 10.103.255.1
Suppress hello for 0 neighbor(s)
NYC103-Leaf-02#show ip ospf 1
Routing Process "ospf 1" with ID 10.103.255.12
Start time: 00:02:42.437, Time elapsed: 1w2d
Supports only single TOS(TOS0) routes
Supports opaque LSA
Supports Link-local Signaling (LLS)

```

```
Supports area transit capability
Supports NSSA (compatible with RFC 3101)
Supports Database Exchange Summary List Optimization (RFC 5243)
Event-log enabled, Maximum number of events: 1000, Mode: cyclic
Router is not originating router-LSAs with maximum metric
Initial SPF schedule delay 50 msec
Minimum hold time between two consecutive SPF 200 msec
Maximum wait time between two consecutive SPF 5000 msec
Incremental-SPF disabled
Initial LSA throttle delay 50 msec
Minimum hold time for LSA throttle 200 msec
Maximum wait time for LSA throttle 5000 msec
Minimum LSA arrival 100 msec
LSA group pacing timer 240 sec
Interface flood pacing timer 33 msec
Retransmission pacing timer 66 msec
EXCHANGE/LOADING adjacency limit: initial 300, process maximum 300
Number of external LSA 2. Checksum Sum 0x00F1EF
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Number of areas transit capable is 0
External flood list length 0
IETF NSF helper support enabled
Cisco NSF helper support enabled
BFD is enabled
Reference bandwidth unit is 100000 mbps
  Area BACKBONE(0)
    Number of interfaces in this area is 3 (1 loopback)
    Area has no authentication
    SPF algorithm last executed 1w2d ago
    SPF algorithm executed 22 times
    Area ranges are
    Number of LSA 8. Checksum Sum 0x03DBF7
    Number of opaque link LSA 0. Checksum Sum 0x000000
    Number of DCbitless LSA 0
    Number of indication LSA 0
    Number of DoNotAge LSA 0
    Flood list length 0
Maintenance Mode ID:      139742029727248
Maintenance Mode:        disabled
Maintenance Mode Timer:   stopped (0)
Graceful Reload FSU Global status : None (global: None)
```

```
NYC103-Leaf-02#show ip route ospf
```

```
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
```

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PfR
& - replicated local route overrides by connected

Gateway of last resort is 10.103.224.41 to network 0.0.0.0

```
O*E1 0.0.0.0/0 [110/1202] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
      [110/1202] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
10.0.0.0/8 is variably subnetted, 28 subnets, 2 masks
O      10.103.224.0/30
      [110/202] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
      [110/202] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
O      10.103.224.4/30
      [110/202] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
      [110/202] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
O      10.103.224.8/30
      [110/102] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
O      10.103.224.12/30
      [110/102] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
O      10.103.224.16/30
      [110/102] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
      [110/102] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
O      10.103.224.20/30
      [110/102] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
O      10.103.224.24/30
      [110/102] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
O      10.103.224.28/30
      [110/110] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
O      10.103.224.32/30
      [110/110] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
O      10.103.224.44/30
      [110/200] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
O      10.103.224.48/30
      [110/200] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
O      10.103.224.52/30
      [110/104] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
O      10.103.224.56/30
      [110/104] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
O      10.103.254.1/32
```

```

O      [110/101] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
10.103.254.2/32
O      [110/101] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
10.103.255.1/32
O      [110/101] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
10.103.255.2/32
O      [110/101] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
10.103.255.3/32
O      [110/103] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
[110/103] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
10.103.255.4/32
O      [110/103] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
[110/103] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
10.103.255.11/32
O      [110/111] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
[110/111] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
10.103.255.13/32
O      [110/201] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
[110/201] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
10.103.255.14/32
O      [110/105] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
[110/105] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1
10.103.255.255/32
O      [110/101] via 10.103.224.41, 1w2d, GigabitEthernet1/0/2
[110/101] via 10.103.224.37, 1w2d, GigabitEthernet1/0/1

```

NYC103-Leaf-02#show ip ospf database

OSPF Router with ID (10.103.255.12) (Process ID 1)

Router Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum	Link count
10.103.255.1	10.103.255.1	1935	0x8000019E	0x00A79F	17
10.103.255.2	10.103.255.2	952	0x800001A2	0x00808E	17
10.103.255.3	10.103.255.3	614	0x80000195	0x0021A6	6
10.103.255.4	10.103.255.4	1878	0x80000194	0x007849	6
10.103.255.11	10.103.255.11	453	0x80000192	0x00E43B	5
10.103.255.12	10.103.255.12	620	0x80000191	0x00E9AA	5
10.103.255.13	10.103.255.13	1461	0x80000190	0x002B47	5
10.103.255.14	10.103.255.14	331	0x80000191	0x0020AF	5

Type-5 AS External Link States

Link ID	ADV Router	Age	Seq#	Checksum	Tag
0.0.0.0	10.103.255.3	614	0x8000018D	0x00DE14	1
0.0.0.0	10.103.255.4	1878	0x8000018C	0x0013DB	1

NYC103-Leaf-03

NYC103-Leaf-03#show ip ospf neighbor

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.103.255.2	0	FULL/ -	00:00:33	10.103.224.49	GigabitEthernet1/0/2
10.103.255.1	0	FULL/ -	00:00:36	10.103.224.45	GigabitEthernet1/0/1

NYC103-Leaf-03#show ip ospf interface

Loopback0 is up, line protocol is up

Internet Address 10.103.255.13/32, Interface ID 76, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.13, Network Type LOOPBACK, Cost: 1

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	1	no	no	Base

Enabled by interface config, including secondary ip addresses

Loopback interface is treated as a stub Host

GigabitEthernet1/0/2 is up, line protocol is up (connected)

Internet Address 10.103.224.50/30, Interface ID 79, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.13, Network Type POINT_TO_POINT, Cost: 100

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	100	no	no	Base

Enabled by interface config, including secondary ip addresses

Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

oob-resync timeout 40

Hello due in 00:00:00

Supports Link-local Signaling (LLS)

Cisco NSF helper support enabled

IETF NSF helper support enabled

Can be protected by per-prefix Loop-Free FastReroute

Can be used for per-prefix Loop-Free FastReroute repair paths

Not Protected by per-prefix TI-LFA

Index 1/3/3, flood queue length 0

Next 0x0(0)/0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 2

Last flood scan time is 0 msec, maximum is 1 msec

Neighbor Count is 1, Adjacent neighbor count is 1

Adjacent with neighbor 10.103.255.2

Suppress hello for 0 neighbor(s)

GigabitEthernet1/0/1 is up, line protocol is up (connected)

Internet Address 10.103.224.46/30, Interface ID 78, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.13, Network Type POINT_TO_POINT, Cost: 100

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	100	no	no	Base

Enabled by interface config, including secondary ip addresses

Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled

```
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  oob-resync timeout 40
  Hello due in 00:00:07
Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Can be protected by per-prefix Loop-Free FastReroute
Can be used for per-prefix Loop-Free FastReroute repair paths
Not Protected by per-prefix TI-LFA
Index 1/2/2, flood queue length 0
Next 0x0(0)/0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 2
Last flood scan time is 0 msec, maximum is 1 msec
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 10.103.255.1
  Suppress hello for 0 neighbor(s)
NYC103-Leaf-03#show ip ospf 1
Routing Process "ospf 1" with ID 10.103.255.13
Start time: 00:02:35.483, Time elapsed: 1w2d
Supports only single TOS(TOS0) routes
Supports opaque LSA
Supports Link-local Signaling (LLS)
Supports area transit capability
Supports NSSA (compatible with RFC 3101)
Supports Database Exchange Summary List Optimization (RFC 5243)
Event-log enabled, Maximum number of events: 1000, Mode: cyclic
Router is not originating router-LSAs with maximum metric
Initial SPF schedule delay 50 msec
Minimum hold time between two consecutive SPFs 200 msec
Maximum wait time between two consecutive SPFs 5000 msec
Incremental-SPF disabled
Initial LSA throttle delay 50 msec
Minimum hold time for LSA throttle 200 msec
Maximum wait time for LSA throttle 5000 msec
Minimum LSA arrival 100 msec
LSA group pacing timer 240 secs
Interface flood pacing timer 33 msec
Retransmission pacing timer 66 msec
EXCHANGE/LOADING adjacency limit: initial 300, process maximum 300
Number of external LSA 2. Checksum Sum 0x00F1EF
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Number of areas transit capable is 0
External flood list length 0
IETF NSF helper support enabled
```



```
Cisco NSF helper support enabled
BFD is enabled
Reference bandwidth unit is 100000 mbps
Area BACKBONE(0)
    Number of interfaces in this area is 3 (1 loopback)
Area has no authentication
SPF algorithm last executed 1w2d ago
SPF algorithm executed 25 times
Area ranges are
Number of LSA 8. Checksum Sum 0x03DBF7
Number of opaque link LSA 0. Checksum Sum 0x000000
Number of DCbitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0
Maintenance Mode ID:      140269749040656
Maintenance Mode:         disabled
Maintenance Mode Timer:   stopped (0)
Graceful Reload FSU Global status : None (global: None)
```

```
NYC103-Leaf-03#show ip route ospf
```

```
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
       & - replicated local route overrides by connected
```

```
Gateway of last resort is 10.103.224.49 to network 0.0.0.0
```

```
O*E1  0.0.0.0/0 [110/1202] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2
        [110/1202] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1
10.0.0.0/8 is variably subnetted, 28 subnets, 2 masks
O      10.103.224.0/30
        [110/202] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2
        [110/202] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1
O      10.103.224.4/30
        [110/202] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2
        [110/202] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1
O      10.103.224.8/30
        [110/102] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1
```

O 10.103.224.12/30
[110/102] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2

O 10.103.224.16/30
[110/102] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2
[110/102] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1

O 10.103.224.20/30
[110/102] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1

O 10.103.224.24/30
[110/102] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2

O 10.103.224.28/30
[110/110] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1

O 10.103.224.32/30
[110/110] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2

O 10.103.224.36/30
[110/200] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1

O 10.103.224.40/30
[110/200] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2

O 10.103.224.52/30
[110/104] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1

O 10.103.224.56/30
[110/104] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2

O 10.103.254.1/32
[110/101] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1

O 10.103.254.2/32
[110/101] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2

O 10.103.255.1/32
[110/101] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1

O 10.103.255.2/32
[110/101] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2

O 10.103.255.3/32
[110/103] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2
[110/103] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1

O 10.103.255.4/32
[110/103] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2
[110/103] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1

O 10.103.255.11/32
[110/111] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2
[110/111] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1

O 10.103.255.12/32
[110/201] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2
[110/201] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1

O 10.103.255.14/32
[110/105] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2
[110/105] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1

O 10.103.255.255/32
[110/101] via 10.103.224.49, 1w2d, GigabitEthernet1/0/2
[110/101] via 10.103.224.45, 1w2d, GigabitEthernet1/0/1



NYC103-Leaf-03#show ip ospf database

OSPF Router with ID (10.103.255.13) (Process ID 1)

Router Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum	Link count
10.103.255.1	10.103.255.1	1938	0x8000019E	0x00A79F	17
10.103.255.2	10.103.255.2	955	0x800001A2	0x00808E	17
10.103.255.3	10.103.255.3	617	0x80000195	0x0021A6	6
10.103.255.4	10.103.255.4	1881	0x80000194	0x007849	6
10.103.255.11	10.103.255.11	456	0x80000192	0x00E43B	5
10.103.255.12	10.103.255.12	625	0x80000191	0x00E9AA	5
10.103.255.13	10.103.255.13	1462	0x80000190	0x002B47	5
10.103.255.14	10.103.255.14	334	0x80000191	0x0020AF	5

Type-5 AS External Link States

Link ID	ADV Router	Age	Seq#	Checksum	Tag
0.0.0.0	10.103.255.3	617	0x8000018D	0x00DE14	1
0.0.0.0	10.103.255.4	1881	0x8000018C	0x0013DB	1

NYC103-Leaf-04

NYC103-Leaf-04#show ip ospf neighbor

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.103.255.2	0	FULL/ -	00:00:35	10.103.224.57	TwentyFiveGigE1/1/2
10.103.255.1	0	FULL/ -	00:00:37	10.103.224.53	TwentyFiveGigE1/1/1

NYC103-Leaf-04#show ip ospf interface

Loopback0 is up, line protocol is up

Internet Address 10.103.255.14/32, Interface ID 76, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.14, Network Type LOOPBACK, Cost: 1

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	1	no	no	Base

Enabled by interface config, including secondary ip addresses

Loopback interface is treated as a stub Host

TwentyFiveGigE1/1/2 is up, line protocol is up (connected)

Internet Address 10.103.224.58/30, Interface ID 80, Area 0

Attached via Interface Enable

Process ID 1, Router ID 10.103.255.14, Network Type POINT_TO_POINT, Cost: 4

Topology-MTID	Cost	Disabled	Shutdown	Topology Name
0	4	no	no	Base

Enabled by interface config, including secondary ip addresses

Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

oob-resync timeout 40

```

Hello due in 00:00:08
Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Can be protected by per-prefix Loop-Free FastReroute
Can be used for per-prefix Loop-Free FastReroute repair paths
Not Protected by per-prefix TI-LFA
Index 1/3/3, flood queue length 0
Next 0x0(0)/0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 2
Last flood scan time is 0 msec, maximum is 1 msec
Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 10.103.255.2
Suppress hello for 0 neighbor(s)
TwentyFiveGigE1/1/1 is up, line protocol is up (connected)
Internet Address 10.103.224.54/30, Interface ID 79, Area 0
Attached via Interface Enable
Process ID 1, Router ID 10.103.255.14, Network Type POINT_TO_POINT, Cost: 4
Topology-MTID      Cost      Disabled      Shutdown      Topology Name
      0           4          no           no           Base
Enabled by interface config, including secondary ip addresses
Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    oob-resync timeout 40
    Hello due in 00:00:02
Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Can be protected by per-prefix Loop-Free FastReroute
Can be used for per-prefix Loop-Free FastReroute repair paths
Not Protected by per-prefix TI-LFA
Index 1/2/2, flood queue length 0
Next 0x0(0)/0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 2
Last flood scan time is 0 msec, maximum is 1 msec
Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 10.103.255.1
Suppress hello for 0 neighbor(s)
NYC103-Leaf-04#show ip ospf 1
Routing Process "ospf 1" with ID 10.103.255.14
Start time: 00:02:35.024, Time elapsed: 1w2d
Supports only single TOS(TOS0) routes
Supports opaque LSA
Supports Link-local Signaling (LLS)
Supports area transit capability
Supports NSSA (compatible with RFC 3101)
Supports Database Exchange Summary List Optimization (RFC 5243)

```

```
Event-log enabled, Maximum number of events: 1000, Mode: cyclic
Router is not originating router-LSAs with maximum metric
Initial SPF schedule delay 50 msec
Minimum hold time between two consecutive SPF's 200 msec
Maximum wait time between two consecutive SPF's 5000 msec
Incremental-SPF disabled
Initial LSA throttle delay 50 msec
Minimum hold time for LSA throttle 200 msec
Maximum wait time for LSA throttle 5000 msec
Minimum LSA arrival 100 msec
LSA group pacing timer 240 secs
Interface flood pacing timer 33 msec
Retransmission pacing timer 66 msec
EXCHANGE/LOADING adjacency limit: initial 300, process maximum 300
Number of external LSA 2. Checksum Sum 0x00F1EF
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Number of areas transit capable is 0
External flood list length 0
IETF NSF helper support enabled
Cisco NSF helper support enabled
BFD is enabled
Reference bandwidth unit is 100000 mbps
  Area BACKBONE(0)
    Number of interfaces in this area is 3 (1 loopback)
    Area has no authentication
    SPF algorithm last executed 1w2d ago
    SPF algorithm executed 12 times
    Area ranges are
    Number of LSA 8. Checksum Sum 0x03DBF7
    Number of opaque link LSA 0. Checksum Sum 0x000000
    Number of DCbitless LSA 0
    Number of indication LSA 0
    Number of DoNotAge LSA 0
    Flood list length 0
Maintenance Mode ID:      139896724862480
Maintenance Mode:        disabled
Maintenance Mode Timer:   stopped (0)
Graceful Reload FSU Global status : None (global: None)
```

```
NYC103-Leaf-04#show ip route ospf
```

```
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
```

n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
 i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
 ia - IS-IS inter area, * - candidate default, U - per-user static route
 H - NHRP, G - NHRP registered, g - NHRP registration summary
 o - ODR, P - periodic downloaded static route, l - LISP
 a - application route
 + - replicated route, % - next hop override, p - overrides from PfR
 & - replicated local route overrides by connected

Gateway of last resort is 10.103.224.57 to network 0.0.0.0

```

O*E1 0.0.0.0/0 [110/1106] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
      [110/1106] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
10.0.0.0/8 is variably subnetted, 28 subnets, 2 masks
O    10.103.224.0/30
      [110/106] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
      [110/106] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.4/30
      [110/106] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
      [110/106] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.8/30 [110/6] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.12/30 [110/6] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
O    10.103.224.16/30 [110/6] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
      [110/6] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.20/30 [110/6] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.24/30 [110/6] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
O    10.103.224.28/30
      [110/14] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.32/30
      [110/14] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
O    10.103.224.36/30
      [110/104] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.40/30
      [110/104] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
O    10.103.224.44/30
      [110/104] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O    10.103.224.48/30
      [110/104] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
O    10.103.254.1/32 [110/5] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O    10.103.254.2/32 [110/5] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
O    10.103.255.1/32 [110/5] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O    10.103.255.2/32 [110/5] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
O    10.103.255.3/32 [110/7] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
      [110/7] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O    10.103.255.4/32 [110/7] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
      [110/7] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O    10.103.255.11/32
  
```

```

[110/15] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
[110/15] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O      10.103.255.12/32
[110/105] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
[110/105] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O      10.103.255.13/32
[110/105] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
[110/105] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1
O      10.103.255.255/32
[110/5] via 10.103.224.57, 1w2d, TwentyFiveGigE1/1/2
[110/5] via 10.103.224.53, 1w2d, TwentyFiveGigE1/1/1

```

NYC103-Leaf-04#show ip ospf database

OSPF Router with ID (10.103.255.14) (Process ID 1)

Router Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum	Link count
10.103.255.1	10.103.255.1	1942	0x8000019E	0x00A79F	17
10.103.255.2	10.103.255.2	958	0x800001A2	0x00808E	17
10.103.255.3	10.103.255.3	621	0x80000195	0x0021A6	6
10.103.255.4	10.103.255.4	1884	0x80000194	0x007849	6
10.103.255.11	10.103.255.11	459	0x80000192	0x00E43B	5
10.103.255.12	10.103.255.12	628	0x80000191	0x00E9AA	5
10.103.255.13	10.103.255.13	1467	0x80000190	0x002B47	5
10.103.255.14	10.103.255.14	335	0x80000191	0x0020AF	5

Type-5 AS External Link States

Link ID	ADV Router	Age	Seq#	Checksum	Tag
0.0.0.0	10.103.255.3	621	0x8000018D	0x00DE14	1
0.0.0.0	10.103.255.4	1884	0x8000018C	0x0013DB	1

Loopback0 to Loopback0 on the Underlay

Note: Please note that extended ping (i.e. source-based ping) is not allowed from the Dashboard Terminal. Ping tests should be done through SSH.

NYC103-Spine-01

```

NYC103-Spine-01#ping 10.103.255.2 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.2, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.1
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-01#ping 10.103.255.3 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.3, timeout is 2 seconds:

```

```
Packet sent with a source address of 10.103.255.1
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-01#ping 10.103.255.4 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.4, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.1
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-01#ping 10.103.255.11 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.11, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.1
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-01#ping 10.103.255.12 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.12, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.1
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-01#ping 10.103.255.13 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.13, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.1
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-01#ping 10.103.255.14 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.14, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.1
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-01#
```

NYC103-Spine-02

```
NYC103-Spine-02#ping 10.103.255.1 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.1, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.2
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-02#ping 10.103.255.3 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.3, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.2
!!!!
```



```
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-02#ping 10.103.255.4 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.4, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.2
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-02#ping 10.103.255.11 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.11, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.2
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-02#ping 10.103.255.12 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.12, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.2
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-02#ping 10.103.255.13 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.13, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.2
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-02#ping 10.103.255.14 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.14, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.2
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Spine-02#
```

NYC103-Border-01

```
NYC103-Border-01#ping 10.103.255.1 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.1, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.3
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-01#ping 10.103.255.2 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.2, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.3
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-01#ping 10.103.255.4 source loopback0
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.4, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.3
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-01#ping 10.103.255.11 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.11, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.3
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-01#ping 10.103.255.12 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.12, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.3
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-01#ping 10.103.255.13 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.13, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.3
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-01#ping 10.103.255.14 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.14, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.3
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-01#
```

NYC103-Border-02

```
NYC103-Border-02#ping 10.103.255.1 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.1, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.4
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-02#ping 10.103.255.2 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.2, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.4
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-02#ping 10.103.255.3 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.3, timeout is 2 seconds:
```

```
Packet sent with a source address of 10.103.255.4
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-02#ping 10.103.255.11 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.11, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.4
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-02#ping 10.103.255.12 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.12, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.4
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-02#ping 10.103.255.13 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.13, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.4
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-02#ping 10.103.255.14 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.14, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.4
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Border-02#
```

NYC103-Leaf-01

```
NYC103-Leaf-01#ping 10.103.255.1 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.1, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.11
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-01#ping 10.103.255.2 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.2, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.11
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-01#ping 10.103.255.3 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.3, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.11
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-01#ping 10.103.255.4 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.4, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.11
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-01#ping 10.103.255.12 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.12, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.11
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-01#ping 10.103.255.13 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.13, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.11
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-01#ping 10.103.255.14 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.14, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.11
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-01#
```

NYC103-Leaf-02

```
NYC103-Leaf-02#ping 10.103.255.1 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.1, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.12
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-02#ping 10.103.255.2 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.2, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.12
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-02#ping 10.103.255.3 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.3, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.12
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-02#ping 10.103.255.4 source loopback0
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.4, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.12
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-02#ping 10.103.255.11 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.11, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.12
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-02#ping 10.103.255.13 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.13, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.12
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-02#ping 10.103.255.14 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.14, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.12
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-02#
```

NYC103-Leaf-03

```
NYC103-Leaf-03#ping 10.103.255.1 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.1, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.13
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-03#ping 10.103.255.2 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.2, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.13
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-03#ping 10.103.255.3 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.3, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.13
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-03#ping 10.103.255.4 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.4, timeout is 2 seconds:
```

```
Packet sent with a source address of 10.103.255.13
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-03#ping 10.103.255.11 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.11, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.13
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-03#ping 10.103.255.12 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.12, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.13
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-03#ping 10.103.255.14 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.14, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.13
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-03#
```

NYC103-Leaf-04

```
NYC103-Leaf-04#ping 10.103.255.1 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.1, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.14
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-04#ping 10.103.255.2 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.2, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.14
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-04#ping 10.103.255.3 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.3, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.14
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-04#ping 10.103.255.4 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.4, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.14
!!!!
```

```

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-04#ping 10.103.255.11 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.11, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.14
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-04#ping 10.103.255.12 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.12, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.14
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-04#ping 10.103.255.13 source loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.103.255.13, timeout is 2 seconds:
Packet sent with a source address of 10.103.255.14
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
NYC103-Leaf-04#

```

BGP L2VPN EVPN (All Fabric Switches)

NYC103-Spine-01

```

NYC103-Spine-01#show ip bgp l2vpn evpn summary
BGP router identifier 10.103.255.1, local AS number 65106
BGP table version is 5476, main routing table version 5476
79 network entries using 30336 bytes of memory
79 path entries using 18328 bytes of memory
24/24 BGP path/bestpath attribute entries using 7104 bytes of memory
2 BGP AS-PATH entries using 80 bytes of memory
20 BGP extended community entries using 880 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 56728 total bytes of memory
BGP activity 2758/2679 prefixes, 2777/2698 paths, scan interval 60 secs
84 networks peaked at 08:54:58 Jul 12 2024 EDT (4d10h ago)

```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.103.255.3	4	65106	14616	18547	5476	0	0	1w2d	5
10.103.255.4	4	65106	14625	18570	5476	0	0	1w2d	5
10.103.255.11	4	65106	14631	18540	5476	0	0	1w2d	15
10.103.255.12	4	65106	18455	18538	5476	0	0	1w2d	32
10.103.255.13	4	65106	14633	18558	5476	0	0	1w2d	10
10.103.255.14	4	65106	14677	18552	5476	0	0	1w2d	12

```

NYC103-Spine-01#show ip bgp l2vpn evpn nei 10.103.255.11 advertised-routes
BGP table version is 5476, local router ID is 10.103.255.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,

```

r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
>i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [0] []/20	10.103.255.11	0	100	0 ?	
*>i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [32] [10.103.64.15]/24	10.103.255.11	0	100	0 ?	
>i [2] [10.103.255.11:1] [0] [48] [8C44A5718317] [0] []/20	10.103.255.11	0	100	0 ?	
>i [2] [10.103.255.11:1] [0] [48] [8C44A5718318] [0] []/20	10.103.255.11	0	100	0 ?	
>i [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [0] []/20	10.103.255.11	0	100	0 ?	
*>i [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [32] [10.103.64.19]/24	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.11:120					
>i [2] [10.103.255.11:120] [0] [48] [8C44A5718318] [0] []/20	10.103.255.11	0	100	0 ?	
>i [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [0] []/20	10.103.255.11	0	100	0 ?	
*>i [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [32] [10.103.120.12]/24	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.11:180					
>i [2] [10.103.255.11:180] [0] [48] [8C44A5718318] [0] []/20	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.11:220					
>i [2] [10.103.255.11:220] [0] [48] [8C44A5718318] [0] []/20	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.12:1					
>i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [0] []/20	10.103.255.12	0	100	0 ?	
*>i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [32] [10.103.64.12]/24	10.103.255.12	0	100	0 ?	
>i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B18] [0] []/20	10.103.255.12	0	100	0 ?	
>i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [0] []/20	10.103.255.12	0	100	0 ?	
*>i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [32] [10.103.64.11]/24	10.103.255.12	0	100	0 ?	
>i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B98] [0] []/20	10.103.255.12	0	100	0 ?	
>i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [0] []/20					


```

10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [32] [10.103.64.13]/24
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F17] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [32] [10.103.64.17]/24
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [32] [10.103.64.14]/24
10.103.255.12          0    100    0 ?
Route Distinguisher: 10.103.255.12:120
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FD67B18] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FE28B98] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FE28F17] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0CEC8FB4687] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0CEC8FB4687] [32] [10.103.120.14]/24
10.103.255.12          0    100    0 ?

```

NYC103-Spine-01#

NYC103-Spine-01#show ip bgp l2vpn evpn nei 10.103.255.11 routes

BGP table version is 5476, local router ID is 10.103.255.1

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
>i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [0] []/20					
10.103.255.11		0	100		0 ?
*>i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [32] [10.103.64.15]/24					
10.103.255.11		0	100		0 ?
>i [2] [10.103.255.11:1] [0] [48] [8C44A5718317] [0] []/20					
10.103.255.11		0	100		0 ?
>i [2] [10.103.255.11:1] [0] [48] [8C44A5718318] [0] []/20					
10.103.255.11		0	100		0 ?
>i [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [0] []/20					
10.103.255.11		0	100		0 ?

```

*>i [2][10.103.255.11:1][0][48][C414A20289A0][32][10.103.64.19]/24
      10.103.255.11          0      100      0 ?
Route Distinguisher: 10.103.255.11:120
*>i [2][10.103.255.11:120][0][48][8C44A5718318][0][*]/20
      10.103.255.11          0      100      0 ?
*>i [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][*]/20
      10.103.255.11          0      100      0 ?
*>i [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24
      10.103.255.11          0      100      0 ?
Route Distinguisher: 10.103.255.11:180
*>i [2][10.103.255.11:180][0][48][8C44A5718318][0][*]/20
      10.103.255.11          0      100      0 ?
Route Distinguisher: 10.103.255.11:220
*>i [2][10.103.255.11:220][0][48][8C44A5718318][0][*]/20
      10.103.255.11          0      100      0 ?
Route Distinguisher: 65106:11
*>i [5][65106:11][0][24][10.103.64.0]/17
      10.103.255.11          0      100      0 ?
*>i [5][65106:11][0][24][10.103.120.0]/17
      10.103.255.11          0      100      0 ?
*>i [5][65106:11][0][24][10.103.180.0]/17
      10.103.255.11          0      100      0 ?
Route Distinguisher: 65106:211
*>i [5][65106:211][0][24][10.103.220.0]/17
      10.103.255.11          0      100      0 ?

```

Total number of prefixes 15

NYC103-Spine-01#show ip bgp l2vpn evpn

BGP table version is 5476, local router ID is 10.103.255.1

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
>i [2][10.103.255.11:1][0][48][8C44A5718300][0][]/20					
10.103.255.11		0	100		0 ?
*>i [2][10.103.255.11:1][0][48][8C44A5718300][32][10.103.64.15]/24					
10.103.255.11		0	100		0 ?
>i [2][10.103.255.11:1][0][48][8C44A5718317][0][]/20					
10.103.255.11		0	100		0 ?
>i [2][10.103.255.11:1][0][48][8C44A5718318][0][]/20					
10.103.255.11		0	100		0 ?
>i [2][10.103.255.11:1][0][48][C414A20289A0][0][]/20					

```

10.103.255.11          0    100    0 ?
*>i  [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [32] [10.103.64.19]/24
10.103.255.11          0    100    0 ?
Route Distinguisher: 10.103.255.11:120
*>i  [2] [10.103.255.11:120] [0] [48] [8C44A5718318] [0] [*]/20
10.103.255.11          0    100    0 ?
*>i  [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [0] [*]/20
10.103.255.11          0    100    0 ?
*>i  [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [32] [10.103.120.12]/24
10.103.255.11          0    100    0 ?
Route Distinguisher: 10.103.255.11:180
*>i  [2] [10.103.255.11:180] [0] [48] [8C44A5718318] [0] [*]/20
10.103.255.11          0    100    0 ?
Route Distinguisher: 10.103.255.11:220
*>i  [2] [10.103.255.11:220] [0] [48] [8C44A5718318] [0] [*]/20
10.103.255.11          0    100    0 ?
Route Distinguisher: 10.103.255.12:1
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [32] [10.103.64.12]/24
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B18] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [32] [10.103.64.11]/24
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B98] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [32] [10.103.64.13]/24
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F17] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [32] [10.103.64.17]/24
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [32] [10.103.64.14]/24
10.103.255.12          0    100    0 ?
Route Distinguisher: 10.103.255.12:120
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FD67B18] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FE28B98] [0] [*]/20

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10.103.255.12          0    100    0 ?
*>i  [2][10.103.255.12:120][0][48][A0BC6FE28F17][0][*]/20
10.103.255.12          0    100    0 ?
*>i  [2][10.103.255.12:120][0][48][A0CEC8FB4687][0][*]/20
10.103.255.12          0    100    0 ?
*>i  [2][10.103.255.12:120][0][48][A0CEC8FB4687][32][10.103.120.14]/24
10.103.255.12          0    100    0 ?

```

```

NYC103-Spine-01#
NYC103-Spine-01#show ip bgp l2vpn evpn route-type 2
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][0][*]/20, version 49
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:08:19 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][32][10.103.64.15]/24,
version 113
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:30:35 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718317][0][*]/20, version 46
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:08:15 EDT

```

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718318][0][*]/20, version 45

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:08:14 EDT

BGP routing table entry for [2][10.103.255.11:1][0][48][C414A20289A0][0][*]/20, version 84

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:10:30 EDT

BGP routing table entry for [2][10.103.255.11:1][0][48][C414A20289A0][32][10.103.64.19]/24, version 118

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001

Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:30:45 EDT

BGP routing table entry for [2][10.103.255.11:120][0][48][8C44A5718318][0][*]/20, version 70

NYC103-Spine-01#

NYC103-Spine-01#show ip bgp l2vpn evpn route-type 5

BGP routing table entry for [5][65106:3][0][0][0.0.0.0]/17, version 100

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

65102 65100 65101, (Received from a RR-client)

```

10.103.255.3 (metric 3) (via default) from 10.103.255.3 (10.103.255.3)
  Origin incomplete, metric 0, localpref 100, valid, internal, best
  EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
  Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.64.0]/17, version 12
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Flag: 0x100
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3), (Received from a RR-client)
    10.103.255.3 (metric 3) (via default) from 10.103.255.3 (10.103.255.3)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.128.0]/17, version 13
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Flag: 0x100
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3), (Received from a RR-client)
    10.103.255.3 (metric 3) (via default) from 10.103.255.3 (10.103.255.3)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:4][0][0][0.0.0.0]/17, version 102
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  65102 65100 65101, (Received from a RR-client)
    10.103.255.4 (metric 3) (via default) from 10.103.255.4 (10.103.255.4)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:18:34 EDT

```

```
BGP routing table entry for [5][65106:4][0][18][10.103.64.0]/17, version 10
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Flag: 0x100
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.4), (Received from a RR-client)
    10.103.255.4 (metric 3) (via default) from 10.103.255.4 (10.103.255.4)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:4][0][18][10.103.128.0]/17, version 11
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Flag: 0x100
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.4), (Received from a RR-client)
    10.103.255.4 (metric 3) (via default) from 10.103.255.4 (10.103.255.4)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0

NYC103-Spine-01#
NYC103-Spine-01#show ip bgp l2vpn evpn 0.0.0.0/0
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][0][*]/20, version 49
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:08:19 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718317][0][*]/20, version 46
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
```

```

    EVPN ESI: 00000000000000000000, Label1 200001
    Extended Community: RT:65106:1 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:08:15 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718318][0][*]/20, version 45
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:08:14 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][C414A20289A0][0][*]/20, version 84
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:10:30 EDT
BGP routing table entry for [2][10.103.255.11:120][0][48][8C44A5718318][0][*]/20, version 70
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200120
      Extended Community: RT:65106:120 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:09:31 EDT
BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][*]/20, version 201
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
```



```

Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200120
Extended Community: RT:65106:120 ENCAP:8
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:43:29 EDT
BGP routing table entry for [2][10.103.255.11:180][0][48][8C44A5718318][0][*]/20, version 71
Paths: (1 available, best #1, table EVPN-BGP-Table)
Advertised to update-groups:
  1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200180
    Extended Community: RT:65106:180 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:09:31 EDT
BGP routing table entry for [2][10.103.255.11:220][0][48][8C44A5718318][0][*]/20, version 72
Paths: (1 available, best #1, table EVPN-BGP-Table)
Advertised to update-groups:
  1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200220
    Extended Community: RT:65106:220 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:09:31 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FD67B00][0][*]/20, version 81
Paths: (1 available, best #1, table EVPN-BGP-Table)
Advertised to update-groups:
  1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200001
    Extended Community: RT:65106:1 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:09:50 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FD67B18][0][*]/20, version 94
Paths: (1 available, best #1, table EVPN-BGP-Table)
Advertised to update-groups:
  1
Refresh Epoch 1
Local, (Received from a RR-client)

```

```
10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
  Origin incomplete, metric 0, localpref 100, valid, internal, best
  EVPN ESI: 00000000000000000000, Label1 200001
  Extended Community: RT:65106:1 ENCAP:8
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 7 2024 14:13:21 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FE28B80][0][*]/20, version 80
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:09:48 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FE28B98][0][*]/20, version 78
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:09:40 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FE28F00][0][*]/20, version 82
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:09:52 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FE28F17][0][*]/20, version 75
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
```

```
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200001
    Extended Community: RT:65106:1 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:09:34 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][C4D6664F55B0][0][*]/20, version 83
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200001
    Extended Community: RT:65106:1 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:09:57 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][C4D6666D2E10][0][*]/20, version 79
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200001
    Extended Community: RT:65106:1 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:09:46 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0BC6FD67B18][0][*]/20, version 87
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200120
    Extended Community: RT:65106:120 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:11:17 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0BC6FE28B98][0][*]/20, version 64
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
```

```
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200120
    Extended Community: RT:65106:120 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:09:17 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0BC6FE28F17][0][*]/20, version 4914
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200120
    Extended Community: RT:65106:120 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 14 2024 16:34:14 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0CEC8FB4687][0][*]/20, version 204
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200120
    Extended Community: RT:65106:120 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 19:43:37 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0CEC8FB47B7][0][*]/20, version 203
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200120
    Extended Community: RT:65106:120 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 19:43:34 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0CEC8FB47DC][0][*]/20, version 202
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
```

```

1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200120
    Extended Community: RT:65106:120 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 19:43:31 EDT
BGP routing table entry for [2][10.103.255.12:180][0][48][A0BC6FD67B18][0][*]/20, version 89
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200180
    Extended Community: RT:65106:180 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:11:17 EDT
BGP routing table entry for [2][10.103.255.12:180][0][48][A0BC6FE28B98][0][*]/20, version 65
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200180
    Extended Community: RT:65106:180 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:09:17 EDT
BGP routing table entry for [2][10.103.255.12:180][0][48][A0BC6FE28F17][0][*]/20, version 4918
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200180
    Extended Community: RT:65106:180 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 14 2024 16:42:34 EDT
BGP routing table entry for [2][10.103.255.12:220][0][48][A0BC6FD67B18][0][*]/20, version 90
Paths: (1 available, best #1, table EVPN-BGP-Table)

```

```

Advertised to update-groups:
  1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200220
    Extended Community: RT:65106:220 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:11:18 EDT
BGP routing table entry for [2][10.103.255.12:220][0][48][A0BC6FE28B98][0][*]/20, version 66
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
    Refresh Epoch 1
    Local, (Received from a RR-client)
      10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
        Origin incomplete, metric 0, localpref 100, valid, internal, best
        EVPN ESI: 00000000000000000000, Label1 200220
        Extended Community: RT:65106:220 ENCAP:8
        rx pathid: 0, tx pathid: 0x0
        Updated on Jul 7 2024 14:09:17 EDT
BGP routing table entry for [2][10.103.255.12:220][0][48][A0BC6FE28F17][0][*]/20, version 5476
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
    Refresh Epoch 1
    Local, (Received from a RR-client)
      10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
        Origin incomplete, metric 0, localpref 100, valid, internal, best
        EVPN ESI: 00000000000000000000, Label1 200220
        Extended Community: RT:65106:220 ENCAP:8
        rx pathid: 0, tx pathid: 0x0
        Updated on Jul 16 2024 11:35:29 EDT
BGP routing table entry for [2][10.103.255.13:1][0][48][C4D666D93140][0][*]/20, version 409
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
    Refresh Epoch 1
    Local, (Received from a RR-client)
      10.103.255.13 (metric 101) (via default) from 10.103.255.13 (10.103.255.13)
        Origin incomplete, metric 0, localpref 100, valid, internal, best
        EVPN ESI: 00000000000000000000, Label1 200001
        Extended Community: RT:65106:1 ENCAP:8
        rx pathid: 0, tx pathid: 0x0
        Updated on Jul 8 2024 10:58:10 EDT
BGP routing table entry for [2][10.103.255.13:120][0][48][A0CEC8FB4689][0][*]/20, version 207

```

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.13 (metric 101) (via default) from 10.103.255.13 (10.103.255.13)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200120

Extended Community: RT:65106:120 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 19:44:02 EDT

BGP routing table entry for [2][10.103.255.13:120][0][48][A0CEC8FB47A7][0][*]/20, version 206

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.13 (metric 101) (via default) from 10.103.255.13 (10.103.255.13)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200120

Extended Community: RT:65106:120 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 19:43:59 EDT

BGP routing table entry for [2][10.103.255.14:1][0][48][9433D8078517][0][*]/20, version 2692

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.14 (metric 5) (via default) from 10.103.255.14 (10.103.255.14)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 12 2024 09:16:15 EDT

BGP routing table entry for [2][10.103.255.14:1][0][48][9433D8078518][0][*]/20, version 2690

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.14 (metric 5) (via default) from 10.103.255.14 (10.103.255.14)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 12 2024 09:16:15 EDT

BGP routing table entry for [2][10.103.255.14:1][0][48][9433D8078547][0][*]/20, version 2698

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.14 (metric 5) (via default) from 10.103.255.14 (10.103.255.14)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 12 2024 09:16:23 EDT

BGP routing table entry for [2][10.103.255.14:1][0][48][C4D6666D0F80][0][*]/20, version 2704

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.14 (metric 5) (via default) from 10.103.255.14 (10.103.255.14)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 12 2024 09:17:36 EDT

BGP routing table entry for [2][10.103.255.14:120][0][48][A0CEC8FB4677][0][*]/20, version 2695

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.14 (metric 5) (via default) from 10.103.255.14 (10.103.255.14)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200120

Extended Community: RT:65106:120 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 12 2024 09:16:15 EDT

BGP routing table entry for [5][65106:3][0][0][0.0.0.0]/17, version 100

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

65102 65100 65101, (Received from a RR-client)

10.103.255.3 (metric 3) (via default) from 10.103.255.3 (10.103.255.3)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label

Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2


```

    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:4][0][0][0.0.0.0]/17, version 102
Paths: (1 available, best #1, table EVPN-BGP-Table)
    Advertised to update-groups:
        1
    Refresh Epoch 1
    65102 65100 65101, (Received from a RR-client)
        10.103.255.4 (metric 3) (via default) from 10.103.255.4 (10.103.255.4)
            Origin incomplete, metric 0, localpref 100, valid, internal, best
            EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
            Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
            rx pathid: 0, tx pathid: 0x0
            Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:23][0][0][0.0.0.0]/17, version 101
Paths: (1 available, best #1, table EVPN-BGP-Table)
    Advertised to update-groups:
        1
    Refresh Epoch 1
    65102 65100 65100 65100 65100, (Received from a RR-client)
        10.103.255.3 (metric 3) (via default) from 10.103.255.3 (10.103.255.3)
            Origin IGP, metric 0, localpref 100, valid, internal, best
            EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303002, MPLS VPN Label
0
            Extended Community: RT:65106:2 ENCAP:8 Router MAC:246C.847E.E0CB
            rx pathid: 0, tx pathid: 0x0
            Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:24][0][0][0.0.0.0]/17, version 103
Paths: (1 available, best #1, table EVPN-BGP-Table)
    Advertised to update-groups:
        1
    Refresh Epoch 1
    65102 65100 65100 65100 65100, (Received from a RR-client)
        10.103.255.4 (metric 3) (via default) from 10.103.255.4 (10.103.255.4)
            Origin IGP, metric 0, localpref 100, valid, internal, best
            EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303002, MPLS VPN Label
0
            Extended Community: RT:65106:2 ENCAP:8 Router MAC:3488.1824.764B
            rx pathid: 0, tx pathid: 0x0
            Updated on Jul 7 2024 14:18:34 EDT
NYC103-Spine-01# show ip bgp l2vpn evpn route-type 5
BGP routing table entry for [5][65106:3][0][0][0.0.0.0]/17, version 100
Paths: (1 available, best #1, table EVPN-BGP-Table)
    Advertised to update-groups:
        1
    Refresh Epoch 1
    65102 65100 65101, (Received from a RR-client)

```

```

10.103.255.3 (metric 3) (via default) from 10.103.255.3 (10.103.255.3)
  Origin incomplete, metric 0, localpref 100, valid, internal, best
  EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
  Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.64.0]/17, version 12
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Flag: 0x100
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3), (Received from a RR-client)
    10.103.255.3 (metric 3) (via default) from 10.103.255.3 (10.103.255.3)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.128.0]/17, version 13
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Flag: 0x100
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3), (Received from a RR-client)
    10.103.255.3 (metric 3) (via default) from 10.103.255.3 (10.103.255.3)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:4][0][0][0.0.0.0]/17, version 102
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  65102 65100 65101, (Received from a RR-client)
    10.103.255.4 (metric 3) (via default) from 10.103.255.4 (10.103.255.4)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:18:34 EDT

```

```
BGP routing table entry for [5][65106:4][0][18][10.103.64.0]/17, version 10
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Flag: 0x100
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.4), (Received from a RR-client)
    10.103.255.4 (metric 3) (via default) from 10.103.255.4 (10.103.255.4)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:24 EDT
```

```
BGP routing table entry for [5][65106:4][0][18][10.103.128.0]/17, version 11
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Flag: 0x100
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.4), (Received from a RR-client)
    10.103.255.4 (metric 3) (via default) from 10.103.255.4 (10.103.255.4)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
```

NYC103-Spine-01#

NYC103-Spine-02

```
NYC103-Spine-02#show ip bgp l2vpn evpn summary
BGP router identifier 10.103.255.2, local AS number 65106
BGP table version is 5476, main routing table version 5476
79 network entries using 30336 bytes of memory
79 path entries using 18328 bytes of memory
24/24 BGP path/bestpath attribute entries using 7104 bytes of memory
2 BGP AS-PATH entries using 80 bytes of memory
20 BGP extended community entries using 880 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 56728 total bytes of memory
BGP activity 2758/2679 prefixes, 2777/2698 paths, scan interval 60 secs
84 networks peaked at 08:54:58 Jul 12 2024 EDT (4d10h ago)
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.103.255.3	4	65106	14608	18577	5476	0	0	1w2d	5
10.103.255.4	4	65106	14618	18552	5476	0	0	1w2d	5
10.103.255.11	4	65106	14636	18563	5476	0	0	1w2d	15
10.103.255.12	4	65106	18452	18545	5476	0	0	1w2d	32

10.103.255.13	4	65106	14646	18564	5476	0	0	1w2d	10
10.103.255.14	4	65106	14673	18554	5476	0	0	1w2d	12

NYC103-Spine-02#show ip bgp l2vpn evpn nei 10.103.255.11 advertised-routes

BGP table version is 5476, local router ID is 10.103.255.2

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
>i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [0] []/20	10.103.255.11	0	100	0	?
*>i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [32] [10.103.64.15]/24	10.103.255.11	0	100	0	?
>i [2] [10.103.255.11:1] [0] [48] [8C44A5718317] [0] []/20	10.103.255.11	0	100	0	?
>i [2] [10.103.255.11:1] [0] [48] [8C44A5718318] [0] []/20	10.103.255.11	0	100	0	?
>i [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [0] []/20	10.103.255.11	0	100	0	?
*>i [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [32] [10.103.64.19]/24	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.11:120					
>i [2] [10.103.255.11:120] [0] [48] [8C44A5718318] [0] []/20	10.103.255.11	0	100	0	?
>i [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [0] []/20	10.103.255.11	0	100	0	?
*>i [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [32] [10.103.120.12]/24	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.11:180					
>i [2] [10.103.255.11:180] [0] [48] [8C44A5718318] [0] []/20	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.11:220					
>i [2] [10.103.255.11:220] [0] [48] [8C44A5718318] [0] []/20	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.12:1					
>i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [0] []/20	10.103.255.12	0	100	0	?
*>i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [32] [10.103.64.12]/24	10.103.255.12	0	100	0	?
>i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B18] [0] []/20	10.103.255.12	0	100	0	?
>i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [0] []/20					

```

10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [32] [10.103.64.11]/24
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B98] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [32] [10.103.64.13]/24
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F17] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [32] [10.103.64.17]/24
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [32] [10.103.64.14]/24
10.103.255.12          0    100    0 ?
Route Distinguisher: 10.103.255.12:120
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FD67B18] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FE28B98] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FE28F17] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0CEC8FB4687] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0CEC8FB4687] [32] [10.103.120.14]/24
10.103.255.12          0    100    0 ?

```

NYC103-Spine-02#

NYC103-Spine-02#show ip bgp l2vpn evpn nei 10.103.255.11 routes

BGP table version is 5476, local router ID is 10.103.255.2

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
>i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [0] []/20					
10.103.255.11		0	100		0 ?
*>i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [32] [10.103.64.15]/24					
10.103.255.11		0	100		0 ?

```

*>i [2][10.103.255.11:1][0][48][8C44A5718317][0][*]/20
      10.103.255.11          0      100      0 ?
*>i [2][10.103.255.11:1][0][48][8C44A5718318][0][*]/20
      10.103.255.11          0      100      0 ?
*>i [2][10.103.255.11:1][0][48][C414A20289A0][0][*]/20
      10.103.255.11          0      100      0 ?
*>i [2][10.103.255.11:1][0][48][C414A20289A0][32][10.103.64.19]/24
      10.103.255.11          0      100      0 ?
Route Distinguisher: 10.103.255.11:120
*>i [2][10.103.255.11:120][0][48][8C44A5718318][0][*]/20
      10.103.255.11          0      100      0 ?
*>i [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][*]/20
      10.103.255.11          0      100      0 ?
*>i [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24
      10.103.255.11          0      100      0 ?
Route Distinguisher: 10.103.255.11:180
*>i [2][10.103.255.11:180][0][48][8C44A5718318][0][*]/20
      10.103.255.11          0      100      0 ?
Route Distinguisher: 10.103.255.11:220
*>i [2][10.103.255.11:220][0][48][8C44A5718318][0][*]/20
      10.103.255.11          0      100      0 ?
Route Distinguisher: 65106:11
*>i [5][65106:11][0][24][10.103.64.0]/17
      10.103.255.11          0      100      0 ?
*>i [5][65106:11][0][24][10.103.120.0]/17
      10.103.255.11          0      100      0 ?
*>i [5][65106:11][0][24][10.103.180.0]/17
      10.103.255.11          0      100      0 ?
Route Distinguisher: 65106:211
*>i [5][65106:211][0][24][10.103.220.0]/17
      10.103.255.11          0      100      0 ?

```

Total number of prefixes 15

NYC103-Spine-02#show ip bgp l2vpn evpn

BGP table version is 5476, local router ID is 10.103.255.2

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
>i [2][10.103.255.11:1][0][48][8C44A5718300][0][]/20					
10.103.255.11		0	100		0 ?
*>i [2][10.103.255.11:1][0][48][8C44A5718300][32][10.103.64.15]/24					

```

10.103.255.11 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [8C44A5718317] [0] [*]/20
10.103.255.11 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [8C44A5718318] [0] [*]/20
10.103.255.11 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [0] [*]/20
10.103.255.11 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [32] [10.103.64.19]/24
10.103.255.11 0 100 0 ?
Route Distinguisher: 10.103.255.11:120
*>i [2] [10.103.255.11:120] [0] [48] [8C44A5718318] [0] [*]/20
10.103.255.11 0 100 0 ?
*>i [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [0] [*]/20
10.103.255.11 0 100 0 ?
*>i [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [32] [10.103.120.12]/24
10.103.255.11 0 100 0 ?
Route Distinguisher: 10.103.255.11:180
*>i [2] [10.103.255.11:180] [0] [48] [8C44A5718318] [0] [*]/20
10.103.255.11 0 100 0 ?
Route Distinguisher: 10.103.255.11:220
*>i [2] [10.103.255.11:220] [0] [48] [8C44A5718318] [0] [*]/20
10.103.255.11 0 100 0 ?
Route Distinguisher: 10.103.255.12:1
*>i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [0] [*]/20
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [32] [10.103.64.12]/24
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B18] [0] [*]/20
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [0] [*]/20
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [32] [10.103.64.11]/24
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B98] [0] [*]/20
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [0] [*]/20
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [32] [10.103.64.13]/24
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F17] [0] [*]/20
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [0] [*]/20
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [32] [10.103.64.17]/24
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [0] [*]/20
10.103.255.12 0 100 0 ?

```

```
*>i [2][10.103.255.12:1][0][48][C4D6666D2E10][32][10.103.64.14]/24
      10.103.255.12          0      100      0 ?
```

Route Distinguisher: 10.103.255.12:120

```
*>i [2][10.103.255.12:120][0][48][A0BC6FD67B18][0][*]/20
      10.103.255.12          0      100      0 ?
```

```
*>i [2][10.103.255.12:120][0][48][A0BC6FE28B98][0][*]/20
      10.103.255.12          0      100      0 ?
```

```
*>i [2][10.103.255.12:120][0][48][A0BC6FE28F17][0][*]/20
      10.103.255.12          0      100      0 ?
```

```
*>i [2][10.103.255.12:120][0][48][A0CEC8FB4687][0][*]/20
      10.103.255.12          0      100      0 ?
```

```
*>i [2][10.103.255.12:120][0][48][A0CEC8FB4687][32][10.103.120.14]/24
      10.103.255.12          0      100      0 ?
```

NYC103-Spine-02#

NYC103-Spine-02#show ip bgp l2vpn evpn route-type 2

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][0][*]/20, version 49

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:08:19 EDT

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][32][10.103.64.15]/24, version 113

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001

Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:30:35 EDT

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718317][0][*]/20, version 46

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)


```
10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
  Origin incomplete, metric 0, localpref 100, valid, internal, best
  EVPN ESI: 00000000000000000000, Label1 200001
  Extended Community: RT:65106:1 ENCAP:8
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 7 2024 14:08:15 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718318][0][*]/20, version 45
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:08:14 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][C414A20289A0][0][*]/20, version 84
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:10:30 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][C414A20289A0][32][10.103.64.19]/24,
version 118
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:30:45 EDT
BGP routing table entry for [2][10.103.255.11:120][0][48][8C44A5718318][0][*]/20, version 70

NYC103-Spine-02#
NYC103-Spine-02#show ip bgp l2vpn evpn route-type 5
```

```

BGP routing table entry for [5][65106:3][0][0][0.0.0.0]/17, version 100
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  65102 65100 65101, (Received from a RR-client)
    10.103.255.3 (metric 3) (via default) from 10.103.255.3 (10.103.255.3)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.64.0]/17, version 12
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Flag: 0x100
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3), (Received from a RR-client)
    10.103.255.3 (metric 3) (via default) from 10.103.255.3 (10.103.255.3)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.128.0]/17, version 13
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Flag: 0x100
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3), (Received from a RR-client)
    10.103.255.3 (metric 3) (via default) from 10.103.255.3 (10.103.255.3)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:4][0][0][0.0.0.0]/17, version 102
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  65102 65100 65101, (Received from a RR-client)
    10.103.255.4 (metric 3) (via default) from 10.103.255.4 (10.103.255.4)

```

```

Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:4][0][18][10.103.64.0]/17, version 10
Paths: (1 available, best #1, table EVPN-BGP-Table)
Flag: 0x100
Advertised to update-groups:
1
Refresh Epoch 1
Local, (aggregated by 65106 10.103.255.4), (Received from a RR-client)
10.103.255.4 (metric 3) (via default) from 10.103.255.4 (10.103.255.4)
Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:4][0][18][10.103.128.0]/17, version 11
Paths: (1 available, best #1, table EVPN-BGP-Table)
Flag: 0x100
Advertised to update-groups:
1
Refresh Epoch 1
Local, (aggregated by 65106 10.103.255.4), (Received from a RR-client)
10.103.255.4 (metric 3) (via default) from 10.103.255.4 (10.103.255.4)
Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0

NYC103-Spine-02#
NYC103-Spine-02#show ip bgp l2vpn evpn 0.0.0.0/0
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][0][*]/20, version 49
Paths: (1 available, best #1, table EVPN-BGP-Table)
Advertised to update-groups:
1
Refresh Epoch 1
Local, (Received from a RR-client)
10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:08:19 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718317][0][*]/20, version 46
Paths: (1 available, best #1, table EVPN-BGP-Table)

```

```
Advertised to update-groups:
  1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200001
    Extended Community: RT:65106:1 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:08:15 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718318][0][*]/20, version 45
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:08:14 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][C414A20289A0][0][*]/20, version 84
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:10:30 EDT
BGP routing table entry for [2][10.103.255.11:120][0][48][8C44A5718318][0][*]/20, version 70
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200120
      Extended Community: RT:65106:120 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:09:31 EDT
BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][*]/20, version 201
```

```

Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200120
      Extended Community: RT:65106:120 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 19:43:29 EDT
BGP routing table entry for [2][10.103.255.11:180][0][48][8C44A5718318][0][*]/20, version 71
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200180
      Extended Community: RT:65106:180 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:09:31 EDT
BGP routing table entry for [2][10.103.255.11:220][0][48][8C44A5718318][0][*]/20, version 72
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200220
      Extended Community: RT:65106:220 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:09:31 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FD67B00][0][*]/20, version 81
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:09:50 EDT

```

BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FD67B18][0][*]/20, version 94

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:13:21 EDT

BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FE28B80][0][*]/20, version 80

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:09:49 EDT

BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FE28B98][0][*]/20, version 78

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:09:40 EDT

BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FE28F00][0][*]/20, version 82

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

rx pathid: 0, tx pathid: 0x0

```

Updated on Jul 7 2024 14:09:52 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FE28F17][0][*]/20, version 75
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:09:34 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][C4D6664F55B0][0][*]/20, version 83
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:09:58 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][C4D6666D2E10][0][*]/20, version 79
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:09:46 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0BC6FD67B18][0][*]/20, version 87
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200120
      Extended Community: RT:65106:120 ENCAP:8

```

```
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:11:17 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0BC6FE28B98][0][*]/20, version 64
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200120
      Extended Community: RT:65106:120 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:09:17 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0BC6FE28F17][0][*]/20, version 4914
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200120
      Extended Community: RT:65106:120 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 14 2024 16:34:14 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0CEC8FB4687][0][*]/20, version 204
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200120
      Extended Community: RT:65106:120 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 19:43:37 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0CEC8FB47B7][0][*]/20, version 203
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200120
```



```
Extended Community: RT:65106:120 ENCAP:8
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:43:34 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0CEC8FB47DC][0][*]/20, version 202
Paths: (1 available, best #1, table EVPN-BGP-Table)
Advertised to update-groups:
  1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200120
    Extended Community: RT:65106:120 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 19:43:31 EDT
BGP routing table entry for [2][10.103.255.12:180][0][48][A0BC6FD67B18][0][*]/20, version 89
Paths: (1 available, best #1, table EVPN-BGP-Table)
Advertised to update-groups:
  1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200180
    Extended Community: RT:65106:180 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:11:17 EDT
BGP routing table entry for [2][10.103.255.12:180][0][48][A0BC6FE28B98][0][*]/20, version 65
Paths: (1 available, best #1, table EVPN-BGP-Table)
Advertised to update-groups:
  1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200180
    Extended Community: RT:65106:180 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:09:17 EDT
BGP routing table entry for [2][10.103.255.12:180][0][48][A0BC6FE28F17][0][*]/20, version 4918
Paths: (1 available, best #1, table EVPN-BGP-Table)
Advertised to update-groups:
  1
Refresh Epoch 1
Local, (Received from a RR-client)
  10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
```

```

    EVPN ESI: 00000000000000000000, Label1 200180
    Extended Community: RT:65106:180 ENCAP:8
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 14 2024 16:42:34 EDT
BGP routing table entry for [2][10.103.255.12:220][0][48][A0BC6FD67B18][0][*]/20, version 90
Paths: (1 available, best #1, table EVPN-BGP-Table)
    Advertised to update-groups:
        1
    Refresh Epoch 1
    Local, (Received from a RR-client)
        10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
            Origin incomplete, metric 0, localpref 100, valid, internal, best
            EVPN ESI: 00000000000000000000, Label1 200220
            Extended Community: RT:65106:220 ENCAP:8
            rx pathid: 0, tx pathid: 0x0
            Updated on Jul 7 2024 14:11:18 EDT
BGP routing table entry for [2][10.103.255.12:220][0][48][A0BC6FE28B98][0][*]/20, version 66
Paths: (1 available, best #1, table EVPN-BGP-Table)
    Advertised to update-groups:
        1
    Refresh Epoch 1
    Local, (Received from a RR-client)
        10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
            Origin incomplete, metric 0, localpref 100, valid, internal, best
            EVPN ESI: 00000000000000000000, Label1 200220
            Extended Community: RT:65106:220 ENCAP:8
            rx pathid: 0, tx pathid: 0x0
            Updated on Jul 7 2024 14:09:17 EDT
BGP routing table entry for [2][10.103.255.12:220][0][48][A0BC6FE28F17][0][*]/20, version 5476
Paths: (1 available, best #1, table EVPN-BGP-Table)
    Advertised to update-groups:
        1
    Refresh Epoch 1
    Local, (Received from a RR-client)
        10.103.255.12 (metric 101) (via default) from 10.103.255.12 (10.103.255.12)
            Origin incomplete, metric 0, localpref 100, valid, internal, best
            EVPN ESI: 00000000000000000000, Label1 200220
            Extended Community: RT:65106:220 ENCAP:8
            rx pathid: 0, tx pathid: 0x0
            Updated on Jul 16 2024 11:35:29 EDT
BGP routing table entry for [2][10.103.255.13:1][0][48][C4D666D93140][0][*]/20, version 409
Paths: (1 available, best #1, table EVPN-BGP-Table)
    Advertised to update-groups:
        1
    Refresh Epoch 1
    Local, (Received from a RR-client)
        10.103.255.13 (metric 101) (via default) from 10.103.255.13 (10.103.255.13)
```

```
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
rx pathid: 0, tx pathid: 0x0
Updated on Jul 8 2024 10:58:10 EDT
BGP routing table entry for [2][10.103.255.13:120][0][48][A0CEC8FB4689][0][*]/20, version 207
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.13 (metric 101) (via default) from 10.103.255.13 (10.103.255.13)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200120
      Extended Community: RT:65106:120 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 19:44:02 EDT
BGP routing table entry for [2][10.103.255.13:120][0][48][A0CEC8FB47A7][0][*]/20, version 206
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.13 (metric 101) (via default) from 10.103.255.13 (10.103.255.13)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200120
      Extended Community: RT:65106:120 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 19:43:59 EDT
BGP routing table entry for [2][10.103.255.14:1][0][48][9433D8078517][0][*]/20, version 2692
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.14 (metric 5) (via default) from 10.103.255.14 (10.103.255.14)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 12 2024 09:16:15 EDT
BGP routing table entry for [2][10.103.255.14:1][0][48][9433D8078518][0][*]/20, version 2690
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
```

```
10.103.255.14 (metric 5) (via default) from 10.103.255.14 (10.103.255.14)
  Origin incomplete, metric 0, localpref 100, valid, internal, best
  EVPN ESI: 00000000000000000000, Label1 200001
  Extended Community: RT:65106:1 ENCAP:8
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 12 2024 09:16:15 EDT
BGP routing table entry for [2][10.103.255.14:1][0][48][9433D8078547][0][*]/20, version 2698
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.14 (metric 5) (via default) from 10.103.255.14 (10.103.255.14)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 12 2024 09:16:23 EDT
BGP routing table entry for [2][10.103.255.14:1][0][48][C4D6666D0F80][0][*]/20, version 2704
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.14 (metric 5) (via default) from 10.103.255.14 (10.103.255.14)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 12 2024 09:17:36 EDT
BGP routing table entry for [2][10.103.255.14:120][0][48][A0CEC8FB4677][0][*]/20, version 2695
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (Received from a RR-client)
    10.103.255.14 (metric 5) (via default) from 10.103.255.14 (10.103.255.14)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200120
      Extended Community: RT:65106:120 ENCAP:8
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 12 2024 09:16:15 EDT
BGP routing table entry for [5][65106:3][0][0][0.0.0.0]/17, version 100
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
```

```
65102 65100 65101, (Received from a RR-client)
  10.103.255.3 (metric 3) (via default) from 10.103.255.3 (10.103.255.3)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
    Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:4][0][0][0.0.0.0]/17, version 102
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
65102 65100 65101, (Received from a RR-client)
  10.103.255.4 (metric 3) (via default) from 10.103.255.4 (10.103.255.4)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
    Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:23][0][0][0.0.0.0]/17, version 101
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
65102 65100 65100 65100 65100, (Received from a RR-client)
  10.103.255.3 (metric 3) (via default) from 10.103.255.3 (10.103.255.3)
    Origin IGP, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303002, MPLS VPN Label
0
    Extended Community: RT:65106:2 ENCAP:8 Router MAC:246C.847E.E0CB
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:24][0][0][0.0.0.0]/17, version 103
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
65102 65100 65100 65100 65100, (Received from a RR-client)
  10.103.255.4 (metric 3) (via default) from 10.103.255.4 (10.103.255.4)
    Origin IGP, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303002, MPLS VPN Label
0
    Extended Community: RT:65106:2 ENCAP:8 Router MAC:3488.1824.764B
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:18:34 EDT
NYC103-Spine-02#sh ip bgp l2vpn evpn a0:ce:c8:fb:46:7f
```

BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][*]/20, version 201

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200120

Extended Community: RT:65106:120 ENCAP:8

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 19:43:29 EDT

BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24, version 208

Paths: (1 available, best #1, table EVPN-BGP-Table)

Advertised to update-groups:

1

Refresh Epoch 1

Local, (Received from a RR-client)

10.103.255.11 (metric 11) (via default) from 10.103.255.11 (10.103.255.11)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001

Extended Community: RT:65106:1 RT:65106:120 ENCAP:8

Router MAC:3488.1828.4B72

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 19:44:05 EDT

NYC103-Spine-02#

NYC103-Border-01

NYC103-Border-01#show ip bgp l2vpn evpn summary

BGP router identifier 10.103.255.3, local AS number 65106

BGP table version is 144, main routing table version 144

43 network entries using 16512 bytes of memory

81 path entries using 18792 bytes of memory

20/20 BGP path/bestpath attribute entries using 5920 bytes of memory

10 BGP rrinfo entries using 400 bytes of memory

3 BGP AS-PATH entries using 104 bytes of memory

18 BGP extended community entries using 768 bytes of memory

0 BGP route-map cache entries using 0 bytes of memory

0 BGP filter-list cache entries using 0 bytes of memory

BGP using 42496 total bytes of memory

BGP activity 138/62 prefixes, 280/150 paths, scan interval 60 secs

46 networks peaked at 08:54:58 Jul 12 2024 EDT (4d10h ago)

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.103.255.1	4	65106	18553	14622	144	0	0	1w2d	38
10.103.255.2	4	65106	18578	14610	144	0	0	1w2d	38

```

NYC103-Border-01#show ip bgp l2vpn evpn
BGP table version is 144, local router ID is 10.103.255.3
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

```

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
* i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [32] [10.103.64.15]/24	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
*>i [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [32] [10.103.64.19]/24	10.103.255.11	0	100	0 ?	
* i	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.11:120					
*>i [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [32] [10.103.120.12]/24	10.103.255.11	0	100	0 ?	
* i	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.12:1					
* i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [32] [10.103.64.12]/24	10.103.255.12	0	100	0 ?	
*>i	10.103.255.12	0	100	0 ?	
* i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [32] [10.103.64.11]/24	10.103.255.12	0	100	0 ?	
*>i	10.103.255.12	0	100	0 ?	
* i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [32] [10.103.64.13]/24	10.103.255.12	0	100	0 ?	
*>i	10.103.255.12	0	100	0 ?	
* i [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [32] [10.103.64.17]/24	10.103.255.12	0	100	0 ?	
*>i	10.103.255.12	0	100	0 ?	
* i [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [32] [10.103.64.14]/24	10.103.255.12	0	100	0 ?	
*>i	10.103.255.12	0	100	0 ?	
Route Distinguisher: 10.103.255.12:120					
*>i [2] [10.103.255.12:120] [0] [48] [A0CEC8FB4687] [32] [10.103.120.14]/24	10.103.255.12	0	100	0 ?	
* i	10.103.255.12	0	100	0 ?	
* i [2] [10.103.255.12:120] [0] [48] [A0CEC8FB47B7] [32] [10.103.120.13]/24	10.103.255.12	0	100	0 ?	
*>i	10.103.255.12	0	100	0 ?	
* i [2] [10.103.255.12:120] [0] [48] [A0CEC8FB47DC] [32] [10.103.120.11]/24	10.103.255.12	0	100	0 ?	
*>i	10.103.255.12	0	100	0 ?	

```

Route Distinguisher: 10.103.255.13:1
* i [2][10.103.255.13:1][0][48][C4D666D93140][32][10.103.64.20]/24
      10.103.255.13 0 100 0 ?
*>i 10.103.255.13 0 100 0 ?
Route Distinguisher: 10.103.255.13:120
* i [2][10.103.255.13:120][0][48][A0CEC8FB4689][32][10.103.120.23]/24
      10.103.255.13 0 100 0 ?
*>i 10.103.255.13 0 100 0 ?
* i [2][10.103.255.13:120][0][48][A0CEC8FB47A7][32][10.103.120.16]/24
      10.103.255.13 0 100 0 ?
*>i 10.103.255.13 0 100 0 ?
Route Distinguisher: 10.103.255.14:1
* i [2][10.103.255.14:1][0][48][9433D8078547][32][10.103.64.26]/24
      10.103.255.14 0 100 0 ?
*>i 10.103.255.14 0 100 0 ?
*>i [2][10.103.255.14:1][0][48][C4D666D0F80][32][10.103.64.28]/24
      10.103.255.14 0 100 0 ?
* i 10.103.255.14 0 100 0 ?
Route Distinguisher: 10.103.255.14:120
* i [2][10.103.255.14:120][0][48][A0CEC8FB4677][32][10.103.120.15]/24
      10.103.255.14 0 100 0 ?
*>i 10.103.255.14 0 100 0 ?
Route Distinguisher: 65106:3 (default for vrf campus)
*> [5][65106:3][0][0][0.0.0.0]/17
      10.103.64.1 0 65102 65100 65101 ?
*> [5][65106:3][0][18][10.103.64.0]/17
      0.0.0.0 32768 i

NYC103-Border-01#
NYC103-Border-01#show ip bgp l2vpn evpn route-type 2
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][32][10.103.64.15]/24,
version 49
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  Local
    10.103.255.11 (metric 13) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
      Originator: 10.103.255.11, Cluster list: 10.103.255.2
      rx pathid: 0, tx pathid: 0
      Updated on Jul 7 2024 14:30:35 EDT
  Refresh Epoch 1
  Local
    10.103.255.11 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)
      Origin incomplete, metric 0, localpref 100, valid, internal, best

```



```

EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:30:35 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][C414A20289A0][32][10.103.64.19]/24,
version 55
Paths: (2 available, best #1, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:30:45 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 13) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:30:45 EDT
BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24,
version 62
Paths: (2 available, best #1, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:44:05 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 13) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
Router MAC:3488.1828.4B72
```

```
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 19:44:05 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FD67B00][32][10.103.64.12]/24,
version 46
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  Local
    10.103.255.12 (metric 103) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001

NYC103-Border-01#
NYC103-Border-01#
NYC103-Border-01#show ip bgp l2vpn evpn route-type 5
BGP routing table entry for [5][65106:3][0][0][0.0.0.0]/17, version 38
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  65102 65100 65101, imported path from base
    10.103.64.1 (via vrf campus) from 10.103.64.1 (10.100.255.3)
      Origin incomplete, localpref 100, valid, external, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, local vtep: 10.103.255.3, VNI
Label 303001, MPLS VPN Label 20
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.64.0]/17, version 10
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3), imported path from base
    0.0.0.0 (via default) from 0.0.0.0 (10.103.255.3)
      Origin IGP, localpref 100, weight 32768, valid, aggregated, local, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, local vtep: 10.103.255.3, VNI
Label 303001, MPLS VPN Label 16
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:23 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.128.0]/17, version 11
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3), imported path from base
```

```
0.0.0.0 (via default) from 0.0.0.0 (10.103.255.3)
  Origin IGP, localpref 100, weight 32768, valid, aggregated, local, atomic-aggregate, best
  EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, local vtep: 10.103.255.3, VNI
Label 303001, MPLS VPN Label 17
  Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 7 2024 14:06:23 EDT
BGP routing table entry for [5][65106:4][0][0][0.0.0.0]/17, version 40
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  65102 65100 65101
    10.103.255.4 (metric 5) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
      Originator: 10.103.255.4, Cluster list: 10.103.255.2
      rx pathid: 0, tx pathid: 0
      Updated on Jul 7 2024 14:18:34 EDT
    Refresh Epoch 1
    65102 65100 65101
      10.103.255.4 (metric 5) (via default) from 10.103.255.1 (10.103.255.1)
        Origin incomplete, metric 0, localpref 100, valid, internal, best
        EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
        Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
        Originator: 10.103.255.4, Cluster list: 10.103.255.1
        rx pathid: 0, tx pathid: 0x0
        Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:4][0][18][10.103.64.0]/17, version 14
Paths: (2 available, best #1, table EVPN-BGP-Table)
  Flag: 0x100
  Not advertised to any peer
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.4)
    10.103.255.4 (metric 5) (via default) from 10.103.255.1 (10.103.255.1)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
      Originator: 10.103.255.4, Cluster list: 10.103.255.1
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:24 EDT
    Refresh Epoch 1
    Local, (aggregated by 65106 10.103.255.4)
      10.103.255.4 (metric 5) (via default) from 10.103.255.2 (10.103.255.2)
```

```
NYC103-Border-01#
NYC103-Border-01#show ip bgp l2vpn evpn 0.0.0.0/0
BGP routing table entry for [5][65106:3][0][0][0.0.0.0]/17, version 38
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  65102 65100 65101, imported path from base
    10.103.64.1 (via vrf campus) from 10.103.64.1 (10.100.255.3)
      Origin incomplete, localpref 100, valid, external, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, local vtep: 10.103.255.3, VNI
Label 303001, MPLS VPN Label 20
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:4][0][0][0.0.0.0]/17, version 40
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  65102 65100 65101
    10.103.255.4 (metric 5) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
      Originator: 10.103.255.4, Cluster list: 10.103.255.2
      rx pathid: 0, tx pathid: 0
      Updated on Jul 7 2024 14:18:34 EDT
  Refresh Epoch 1
  65102 65100 65101
    10.103.255.4 (metric 5) (via default) from 10.103.255.1 (10.103.255.1)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
      Originator: 10.103.255.4, Cluster list: 10.103.255.1
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:23][0][0][0.0.0.0]/17, version 39
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  65102 65100 65100 65100 65100, imported path from base
    10.103.64.9 (via vrf guest) from 10.103.64.9 (10.100.255.3)
      Origin IGP, localpref 100, valid, external, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, local vtep: 10.103.255.3, VNI
Label 303002, MPLS VPN Label 21
```

```

Extended Community: RT:65106:2 ENCAP:8 Router MAC:246C.847E.E0CB
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:24][0][0][0.0.0.0]/17, version 41
Paths: (2 available, best #2, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
65102 65100 65100 65100 65100
10.103.255.4 (metric 5) (via default) from 10.103.255.2 (10.103.255.2)
Origin IGP, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303002, MPLS VPN Label
0
Extended Community: RT:65106:2 ENCAP:8 Router MAC:3488.1824.764B
Originator: 10.103.255.4, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:18:34 EDT
Refresh Epoch 1
65102 65100 65100 65100 65100
10.103.255.4 (metric 5) (via default) from 10.103.255.1 (10.103.255.1)
Origin IGP, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303002, MPLS VPN Label
0
Extended Community: RT:65106:2 ENCAP:8 Router MAC:3488.1824.764B
Originator: 10.103.255.4, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:18:34 EDT
NYC103-Border-01#
NYC103-Border-01#sh ip bgp l2vpn evpn a0:ce:c8:fb:46:7f
BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24,
version 62
Paths: (2 available, best #1, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:44:05 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 13) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8

```

Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 19:44:05 EDT
NYC103-Border-01#

NYC103-Border-02

NYC103-Border-02#show ip bgp l2vpn evpn summary
BGP router identifier 10.103.255.4, local AS number 65106
BGP table version is 141, main routing table version 141
43 network entries using 16512 bytes of memory
81 path entries using 18792 bytes of memory
20/20 BGP path/bestpath attribute entries using 5920 bytes of memory
10 BGP rrinfo entries using 400 bytes of memory
3 BGP AS-PATH entries using 104 bytes of memory
18 BGP extended community entries using 768 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 42496 total bytes of memory
BGP activity 136/60 prefixes, 276/146 paths, scan interval 60 secs
46 networks peaked at 08:54:58 Jul 12 2024 EDT (4d10h ago)

Neighbor	V	AS	MsgRcvd	MsgSent	ThlVer	InQ	OutQ	Up/Down	State/PfxRcd
10.103.255.1	4	65106	18582	14637	141	0	0	1w2d	38
10.103.255.2	4	65106	18560	14626	141	0	0	1w2d	38

NYC103-Border-02#show ip bgp l2vpn evpn
BGP table version is 141, local router ID is 10.103.255.4
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
* i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [32] [10.103.64.15]/24	10.103.255.11	0	100	0	?
*>i 10.103.255.11	10.103.255.11	0	100	0	?
*>i [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [32] [10.103.64.19]/24	10.103.255.11	0	100	0	?
* i 10.103.255.11	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.11:120					
*>i [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [32] [10.103.120.12]/24	10.103.255.11	0	100	0	?
* i 10.103.255.11	10.103.255.11	0	100	0	?

Route Distinguisher: 10.103.255.12:1

```
* i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [32] [10.103.64.12]/24
      10.103.255.12          0    100    0 ?
*>i      10.103.255.12          0    100    0 ?
* i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [32] [10.103.64.11]/24
      10.103.255.12          0    100    0 ?
*>i      10.103.255.12          0    100    0 ?
* i [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [32] [10.103.64.13]/24
      10.103.255.12          0    100    0 ?
*>i      10.103.255.12          0    100    0 ?
* i [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [32] [10.103.64.17]/24
      10.103.255.12          0    100    0 ?
*>i      10.103.255.12          0    100    0 ?
* i [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [32] [10.103.64.14]/24
      10.103.255.12          0    100    0 ?
*>i      10.103.255.12          0    100    0 ?
```

Route Distinguisher: 10.103.255.12:120

```
*>i [2] [10.103.255.12:120] [0] [48] [A0CEC8FB4687] [32] [10.103.120.14]/24
      10.103.255.12          0    100    0 ?
* i      10.103.255.12          0    100    0 ?
* i [2] [10.103.255.12:120] [0] [48] [A0CEC8FB47B7] [32] [10.103.120.13]/24
      10.103.255.12          0    100    0 ?
*>i      10.103.255.12          0    100    0 ?
* i [2] [10.103.255.12:120] [0] [48] [A0CEC8FB47DC] [32] [10.103.120.11]/24
      10.103.255.12          0    100    0 ?
*>i      10.103.255.12          0    100    0 ?
```

Route Distinguisher: 10.103.255.13:1

```
* i [2] [10.103.255.13:1] [0] [48] [C4D666D93140] [32] [10.103.64.20]/24
      10.103.255.13          0    100    0 ?
*>i      10.103.255.13          0    100    0 ?
```

Route Distinguisher: 10.103.255.13:120

```
* i [2] [10.103.255.13:120] [0] [48] [A0CEC8FB4689] [32] [10.103.120.23]/24
      10.103.255.13          0    100    0 ?
*>i      10.103.255.13          0    100    0 ?
* i [2] [10.103.255.13:120] [0] [48] [A0CEC8FB47A7] [32] [10.103.120.16]/24
      10.103.255.13          0    100    0 ?
*>i      10.103.255.13          0    100    0 ?
```

Route Distinguisher: 10.103.255.14:1

```
* i [2] [10.103.255.14:1] [0] [48] [9433D8078547] [32] [10.103.64.26]/24
      10.103.255.14          0    100    0 ?
*>i      10.103.255.14          0    100    0 ?
*>i [2] [10.103.255.14:1] [0] [48] [C4D6666D0F80] [32] [10.103.64.28]/24
      10.103.255.14          0    100    0 ?
* i      10.103.255.14          0    100    0 ?
```

Route Distinguisher: 10.103.255.14:120

```
* i [2] [10.103.255.14:120] [0] [48] [A0CEC8FB4677] [32] [10.103.120.15]/24
      10.103.255.14          0    100    0 ?
```

```

*>i          10.103.255.14          0    100    0 ?
Route Distinguisher: 65106:3
* i   [5][65106:3][0][0][0.0.0.0]/17
          10.103.255.3          0    100    0 65102 65100 65101 ?
*>i          10.103.255.3          0    100    0 65102 65100 65101 ?
*>i   [5][65106:3][0][18][10.103.64.0]/17

NYC103-Border-02#
NYC103-Border-02#show ip bgp l2vpn evpn route-type 2
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][32][10.103.64.15]/24,
version 46
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  Local
    10.103.255.11 (metric 13) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
      Originator: 10.103.255.11, Cluster list: 10.103.255.2
      rx pathid: 0, tx pathid: 0
      Updated on Jul 7 2024 14:30:35 EDT
  Refresh Epoch 1
  Local
    10.103.255.11 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
      Originator: 10.103.255.11, Cluster list: 10.103.255.1
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:30:35 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][C414A20289A0][32][10.103.64.19]/24,
version 52
Paths: (2 available, best #1, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  Local
    10.103.255.11 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
      Originator: 10.103.255.11, Cluster list: 10.103.255.1
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:30:45 EDT
  Refresh Epoch 1
  Local
    10.103.255.11 (metric 13) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal

```



```

EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:30:45 EDT
BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24,
version 59
Paths: (2 available, best #1, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:44:05 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 13) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 19:44:05 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][A0BC6FD67B00][32][10.103.64.12]/24,
version 43
Paths: (2 available, best #2, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.12 (metric 103) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001

NYC103-Border-02#
NYC103-Border-02#show ip bgp l2vpn evpn route-type 5
BGP routing table entry for [5][65106:3][0][0][0.0.0.0]/17, version 37
Paths: (2 available, best #2, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
65102 65100 65101
10.103.255.3 (metric 5) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal

```

```

EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
Originator: 10.103.255.3, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:18:34 EDT
Refresh Epoch 1
65102 65100 65101
10.103.255.3 (metric 5) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
Originator: 10.103.255.3, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.64.0]/17, version 14
Paths: (2 available, best #1, table EVPN-BGP-Table)
Flag: 0x100
Not advertised to any peer
Refresh Epoch 1
Local, (aggregated by 65106 10.103.255.3)
10.103.255.3 (metric 5) (via default) from 10.103.255.1 (10.103.255.1)
Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
Originator: 10.103.255.3, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:06:24 EDT
Refresh Epoch 1
Local, (aggregated by 65106 10.103.255.3)
10.103.255.3 (metric 5) (via default) from 10.103.255.2 (10.103.255.2)
Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate
EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
Originator: 10.103.255.3, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.128.0]/17, version 15
Paths: (2 available, best #1, table EVPN-BGP-Table)
Flag: 0x100
Not advertised to any peer
Refresh Epoch 1
Local, (aggregated by 65106 10.103.255.3)
10.103.255.3 (metric 5) (via default) from 10.103.255.1 (10.103.255.1)
Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best

```

```

EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
Originator: 10.103.255.3, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:06:24 EDT
Refresh Epoch 1
Local, (aggregated by 65106 10.103.255.3)
10.103.255.3 (metric 5) (via default) from 10.103.255.2 (10.103.255.2)
Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate
EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
Originator: 10.103.255.3, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:4][0][0][0.0.0.0]/17, version 35
Paths: (1 available, best #1, table EVPN-BGP-Table)
Advertised to update-groups:
1
Refresh Epoch 1
65102 65100 65101, imported path from base
10.103.64.5 (via vrf campus) from 10.103.64.5 (10.100.255.3)
Origin incomplete, localpref 100, valid, external, best

NYC103-Border-02#
NYC103-Border-02#show ip bgp l2vpn evpn 0.0.0.0/0
BGP routing table entry for [5][65106:3][0][0][0.0.0.0]/17, version 37
Paths: (2 available, best #2, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
65102 65100 65101
10.103.255.3 (metric 5) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
Originator: 10.103.255.3, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:18:34 EDT
Refresh Epoch 1
65102 65100 65101
10.103.255.3 (metric 5) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
Originator: 10.103.255.3, Cluster list: 10.103.255.1

```

```
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:4][0][0][0.0.0.0]/17, version 35
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  65102 65100 65101, imported path from base
    10.103.64.5 (via vrf campus) from 10.103.64.5 (10.100.255.3)
      Origin incomplete, localpref 100, valid, external, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, local vtep: 10.103.255.4, VNI
Label 303001, MPLS VPN Label 20
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:23][0][0][0.0.0.0]/17, version 38
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  65102 65100 65100 65100 65100
    10.103.255.3 (metric 5) (via default) from 10.103.255.2 (10.103.255.2)
      Origin IGP, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303002, MPLS VPN Label
0
      Extended Community: RT:65106:2 ENCAP:8 Router MAC:246C.847E.E0CB
      Originator: 10.103.255.3, Cluster list: 10.103.255.2
      rx pathid: 0, tx pathid: 0
      Updated on Jul 7 2024 14:18:34 EDT
  Refresh Epoch 1
  65102 65100 65100 65100 65100
    10.103.255.3 (metric 5) (via default) from 10.103.255.1 (10.103.255.1)
      Origin IGP, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303002, MPLS VPN Label
0
      Extended Community: RT:65106:2 ENCAP:8 Router MAC:246C.847E.E0CB
      Originator: 10.103.255.3, Cluster list: 10.103.255.1
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:24][0][0][0.0.0.0]/17, version 36
Paths: (1 available, best #1, table EVPN-BGP-Table)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  65102 65100 65100 65100 65100, imported path from base
    10.103.64.13 (via vrf guest) from 10.103.64.13 (10.100.255.3)
      Origin IGP, localpref 100, valid, external, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, local vtep: 10.103.255.4, VNI
Label 303002, MPLS VPN Label 21
```

```
Extended Community: RT:65106:2 ENCAP:8 Router MAC:3488.1824.764B
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:18:34 EDT
NYC103-Border-02#sh ip bgp l2vpn evpn a0:ce:c8:fb:46:7f
BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24,
version 59
Paths: (2 available, best #1, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:44:05 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 13) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 19:44:05 EDT
```

NYC103-Leaf-01

```
NYC103-Leaf-01#show ip bgp l2vpn evpn summary
BGP router identifier 10.103.255.11, local AS number 65106
BGP table version is 16144, main routing table version 16144
127 network entries using 48768 bytes of memory
191 path entries using 44312 bytes of memory
29/29 BGP path/bestpath attribute entries using 8584 bytes of memory
10 BGP rrinfo entries using 400 bytes of memory
2 BGP AS-PATH entries using 80 bytes of memory
22 BGP extended community entries using 928 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 103072 total bytes of memory
BGP activity 5536/5385 prefixes, 10646/10415 paths, scan interval 60 secs
137 networks peaked at 08:54:58 Jul 12 2024 EDT (4d10h ago)
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.103.255.1	4	65106	18556	14647	16144	0	0	1w2d	64
10.103.255.2	4	65106	18574	14647	16144	0	0	1w2d	64

```

NYC103-Leaf-01#show ip bgp l2vpn evpn nei 10.103.255.1 advertised-routes
BGP table version is 16144, local router ID is 10.103.255.11
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

```

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
> [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [0] []/20	0.0.0.0			32768	?
*> [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [32] [10.103.64.15]/24	0.0.0.0			32768	?
> [2] [10.103.255.11:1] [0] [48] [8C44A5718317] [0] []/20	0.0.0.0			32768	?
> [2] [10.103.255.11:1] [0] [48] [8C44A5718318] [0] []/20	0.0.0.0			32768	?
> [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [0] []/20	0.0.0.0			32768	?
*> [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [32] [10.103.64.19]/24	0.0.0.0			32768	?
Route Distinguisher: 10.103.255.11:120					
> [2] [10.103.255.11:120] [0] [48] [8C44A5718318] [0] []/20	0.0.0.0			32768	?
> [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [0] []/20	0.0.0.0			32768	?
*> [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [32] [10.103.120.12]/24	0.0.0.0			32768	?
Route Distinguisher: 10.103.255.11:180					
> [2] [10.103.255.11:180] [0] [48] [8C44A5718318] [0] []/20	0.0.0.0			32768	?
Route Distinguisher: 10.103.255.11:220					
> [2] [10.103.255.11:220] [0] [48] [8C44A5718318] [0] []/20	0.0.0.0			32768	?
Route Distinguisher: 65106:11 (default for vrf campus)					
*> [5] [65106:11] [0] [24] [10.103.64.0]/17	0.0.0.0	0		32768	?
*> [5] [65106:11] [0] [24] [10.103.120.0]/17	0.0.0.0	0		32768	?
*> [5] [65106:11] [0] [24] [10.103.180.0]/17	0.0.0.0	0		32768	?
Route Distinguisher: 65106:211 (default for vrf guest)					
*> [5] [65106:211] [0] [24] [10.103.220.0]/17	0.0.0.0	0		32768	?

Total number of prefixes 15

NYC103-Leaf-01#show ip bgp l2vpn evpn nei 10.103.255.1 routes

BGP table version is 16144, local router ID is 10.103.255.11

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
>i [2] [10.103.255.11:1] [0] [48] [9433D8078517] [0] []/20	10.103.255.14	0	100	0 ?	
>i [2] [10.103.255.11:1] [0] [48] [9433D8078518] [0] []/20	10.103.255.14	0	100	0 ?	
>i [2] [10.103.255.11:1] [0] [48] [9433D8078547] [0] []/20	10.103.255.14	0	100	0 ?	
*>i [2] [10.103.255.11:1] [0] [48] [9433D8078547] [32] [10.103.64.26]/24	10.103.255.14	0	100	0 ?	
>i [2] [10.103.255.11:1] [0] [48] [A0BC6FD67B00] [0] []/20	10.103.255.12	0	100	0 ?	
*>i [2] [10.103.255.11:1] [0] [48] [A0BC6FD67B00] [32] [10.103.64.12]/24	10.103.255.12	0	100	0 ?	
>i [2] [10.103.255.11:1] [0] [48] [A0BC6FD67B18] [0] []/20	10.103.255.12	0	100	0 ?	
>i [2] [10.103.255.11:1] [0] [48] [A0BC6FE28B80] [0] []/20	10.103.255.12	0	100	0 ?	
*>i [2] [10.103.255.11:1] [0] [48] [A0BC6FE28B80] [32] [10.103.64.11]/24	10.103.255.12	0	100	0 ?	
>i [2] [10.103.255.11:1] [0] [48] [A0BC6FE28B98] [0] []/20	10.103.255.12	0	100	0 ?	
>i [2] [10.103.255.11:1] [0] [48] [A0BC6FE28F00] [0] []/20	10.103.255.12	0	100	0 ?	
*>i [2] [10.103.255.11:1] [0] [48] [A0BC6FE28F00] [32] [10.103.64.13]/24	10.103.255.12	0	100	0 ?	
>i [2] [10.103.255.11:1] [0] [48] [A0BC6FE28F17] [0] []/20	10.103.255.12	0	100	0 ?	
*>i [2] [10.103.255.11:1] [0] [48] [A0CEC8FB4677] [32] [10.103.120.15]/24	10.103.255.14	0	100	0 ?	
*>i [2] [10.103.255.11:1] [0] [48] [A0CEC8FB4687] [32] [10.103.120.14]/24	10.103.255.12	0	100	0 ?	
*>i [2] [10.103.255.11:1] [0] [48] [A0CEC8FB4689] [32] [10.103.120.23]/24	10.103.255.13	0	100	0 ?	
*>i [2] [10.103.255.11:1] [0] [48] [A0CEC8FB47A7] [32] [10.103.120.16]/24	10.103.255.13	0	100	0 ?	

```

*>i [2] [10.103.255.11:1] [0] [48] [A0CEC8FB47B7] [32] [10.103.120.13]/24
      10.103.255.12          0      100      0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0CEC8FB47DC] [32] [10.103.120.11]/24
      10.103.255.12          0      100      0 ?
*>i [2] [10.103.255.11:1] [0] [48] [C4D6664F55B0] [0] [*]/20
      10.103.255.12          0      100      0 ?
*>i [2] [10.103.255.11:1] [0] [48] [C4D6664F55B0] [32] [10.103.64.17]/24
      10.103.255.12          0      100      0 ?
*>i [2] [10.103.255.11:1] [0] [48] [C4D666D0F80] [0] [*]/20
      10.103.255.14          0      100      0 ?
*>i [2] [10.103.255.11:1] [0] [48] [C4D666D0F80] [32] [10.103.64.28]/24
      10.103.255.14          0      100      0 ?
*>i [2] [10.103.255.11:1] [0] [48] [C4D666D2E10] [0] [*]/20
      10.103.255.12          0      100      0 ?
*>i [2] [10.103.255.11:1] [0] [48] [C4D666D2E10] [32] [10.103.64.14]/24
      10.103.255.12          0      100      0 ?
*>i [2] [10.103.255.11:1] [0] [48] [C4D666D93140] [0] [*]/20
      10.103.255.13          0      100      0 ?
*>i [2] [10.103.255.11:1] [0] [48] [C4D666D93140] [32] [10.103.64.20]/24
      10.103.255.13          0      100      0 ?
Route Distinguisher: 10.103.255.11:120
*>i [2] [10.103.255.11:120] [0] [48] [A0BC6FD67B18] [0] [*]/20
      10.103.255.12          0      100      0 ?
*>i [2] [10.103.255.11:120] [0] [48] [A0BC6FE28B98] [0] [*]/20
      10.103.255.12          0      100      0 ?
*>i [2] [10.103.255.11:120] [0] [48] [A0BC6FE28F17] [0] [*]/20
      10.103.255.12          0      100      0 ?
*>i [2] [10.103.255.11:120] [0] [48] [A0CEC8FB4677] [0] [*]/20
      10.103.255.14          0      100      0 ?

```

NYC103-Leaf-01#

NYC103-Leaf-01#show ip bgp l2vpn evpn

BGP table version is 16144, local router ID is 10.103.255.11

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
> [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [0] []/20	0.0.0.0			32768	?
*> [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [32] [10.103.64.15]/24	0.0.0.0			32768	?
> [2] [10.103.255.11:1] [0] [48] [8C44A5718317] [0] []/20					


```

0.0.0.0 32768 ?
*> [2] [10.103.255.11:1] [0] [48] [8C44A5718318] [0] [*]/20
0.0.0.0 32768 ?
*>i [2] [10.103.255.11:1] [0] [48] [9433D8078517] [0] [*]/20
10.103.255.14 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [9433D8078518] [0] [*]/20
10.103.255.14 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [9433D8078547] [0] [*]/20
10.103.255.14 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [9433D8078547] [32] [10.103.64.26]/24
10.103.255.14 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0BC6FD67B00] [0] [*]/20
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0BC6FD67B00] [32] [10.103.64.12]/24
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0BC6FD67B18] [0] [*]/20
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0BC6FE28B80] [0] [*]/20
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0BC6FE28B80] [32] [10.103.64.11]/24
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0BC6FE28B98] [0] [*]/20
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0BC6FE28F00] [0] [*]/20
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0BC6FE28F00] [32] [10.103.64.13]/24
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0BC6FE28F17] [0] [*]/20
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0CEC8FB4677] [32] [10.103.120.15]/24
10.103.255.14 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0CEC8FB4687] [32] [10.103.120.14]/24
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0CEC8FB4689] [32] [10.103.120.23]/24
10.103.255.13 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0CEC8FB47A7] [32] [10.103.120.16]/24
10.103.255.13 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0CEC8FB47B7] [32] [10.103.120.13]/24
10.103.255.12 0 100 0 ?
*>i [2] [10.103.255.11:1] [0] [48] [A0CEC8FB47DC] [32] [10.103.120.11]/24
10.103.255.12 0 100 0 ?
*> [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [32] [10.103.64.19]/24
0.0.0.0 32768 ?
*>i [2] [10.103.255.11:1] [0] [48] [C4D6664F55B0] [0] [*]/20
10.103.255.12 0 100 0 ?

```

```

*>i [2][10.103.255.11:1][0][48][C4D6664F55B0][32][10.103.64.17]/24
      10.103.255.12      0      100      0 ?
*>i [2][10.103.255.11:1][0][48][C4D6666D0F80][0][*]/20
      10.103.255.14      0      100      0 ?
*>i [2][10.103.255.11:1][0][48][C4D6666D0F80][32][10.103.64.28]/24
      10.103.255.14      0      100      0 ?
*>i [2][10.103.255.11:1][0][48][C4D6666D2E10][0][*]/20
      10.103.255.12      0      100      0 ?
*>i [2][10.103.255.11:1][0][48][C4D6666D2E10][32][10.103.64.14]/24
      10.103.255.12      0      100      0 ?
*>i [2][10.103.255.11:1][0][48][C4D666D93140][0][*]/20

```

NYC103-Leaf-01#

NYC103-Leaf-01#show ip bgp l2vpn evpn route-type 2

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][0][*]/20, version 91

Paths: (1 available, best #1, table evi_1)

Advertised to update-groups:

1

Refresh Epoch 1

Local

0.0.0.0 (via default) from 0.0.0.0 (10.103.255.11)

Origin incomplete, localpref 100, weight 32768, valid, sourced, local, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

Local irb vxlan vtep:

vrf:campus, l3-vni:303001

local router mac:3488.1828.4B72

core-irb interface:Vlan3001

vtep-ip:10.103.255.11

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:08:19 EDT

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][32][10.103.64.15]/24, version 252

Paths: (1 available, best #1, table evi_1)

Advertised to update-groups:

1

Refresh Epoch 1

Local

0.0.0.0 (via default) from 0.0.0.0 (10.103.255.11)

Origin incomplete, localpref 100, weight 32768, valid, sourced, local, best

EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001

Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72

Local irb vxlan vtep:

vrf:campus, l3-vni:303001

local router mac:3488.1828.4B72

core-irb interface:Vlan3001

vtep-ip:10.103.255.11

```

    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:30:35 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718317][0][*]/20, version 84
Paths: (1 available, best #1, table evi_1)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local
    0.0.0.0 (via default) from 0.0.0.0 (10.103.255.11)
      Origin incomplete, localpref 100, weight 32768, valid, sourced, local, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      Local irb vxlan vtep:
        vrf:campus, l3-vni:303001
        local router mac:3488.1828.4B72
        core-irb interface:Vlan3001
        vtep-ip:10.103.255.11
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:08:15 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718318][0][*]/20, version 83
Paths: (1 available, best #1, table evi_1)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local
    0.0.0.0 (via default) from 0.0.0.0 (10.103.255.11)
      Origin incomplete, localpref 100, weight 32768, valid, sourced, local, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      Local irb vxlan vtep:
        vrf:campus, l3-vni:303001
        local router mac:3488.1828.4B72
        core-irb interface:Vlan3001
        vtep-ip:10.103.255.11
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:08:14 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][9433D8078517][0][*]/20, version 7893
Paths: (1 available, best #1, table evi_1)
  Not advertised to any peer
  Refresh Epoch 1
  Local, imported path from [2][10.103.255.14:1][0][48][9433D8078517][0][*]/20 (global)

NYC103-Leaf-01#
NYC103-Leaf-01#show ip bgp l2vpn evpn route-type 5
BGP routing table entry for [5][65106:3][0][0][0.0.0.0]/17, version 222
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer

```

```

Refresh Epoch 1
65102 65100 65101
  10.103.255.3 (metric 13) (via default) from 10.103.255.2 (10.103.255.2)
    Origin incomplete, metric 0, localpref 100, valid, internal
    EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
    Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
    Originator: 10.103.255.3, Cluster list: 10.103.255.2
    rx pathid: 0, tx pathid: 0
    Updated on Jul 7 2024 14:18:34 EDT
Refresh Epoch 1
65102 65100 65101
  10.103.255.3 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
    Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
    Originator: 10.103.255.3, Cluster list: 10.103.255.1
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:18:34 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.64.0]/17, version 2
Paths: (2 available, best #1, table EVPN-BGP-Table)
  Not advertised to any peer
Refresh Epoch 1
Local, (aggregated by 65106 10.103.255.3)
  10.103.255.3 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)
    Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
    EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
    Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
    Originator: 10.103.255.3, Cluster list: 10.103.255.1
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:06:24 EDT
Refresh Epoch 1
Local, (aggregated by 65106 10.103.255.3)
  10.103.255.3 (metric 13) (via default) from 10.103.255.2 (10.103.255.2)
    Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate
    EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
    Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
    Originator: 10.103.255.3, Cluster list: 10.103.255.2
    rx pathid: 0, tx pathid: 0
    Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.128.0]/17, version 3
Paths: (2 available, best #1, table EVPN-BGP-Table)
  Not advertised to any peer
Refresh Epoch 1
Local, (aggregated by 65106 10.103.255.3)

```

```

10.103.255.3 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)
  Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
  EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
  Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
  Originator: 10.103.255.3, Cluster list: 10.103.255.1
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 7 2024 14:06:24 EDT
Refresh Epoch 1
Local, (aggregated by 65106 10.103.255.3)
  10.103.255.3 (metric 13) (via default) from 10.103.255.2 (10.103.255.2)
    Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate
    EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
    Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
    Originator: 10.103.255.3, Cluster list: 10.103.255.2
    rx pathid: 0, tx pathid: 0
    Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:4][0][0][0.0.0.0]/17, version 224
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  65102 65100 65101
    10.103.255.4 (metric 13) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
      Originator: 10.103.255.4, Cluster list: 10.103.255.2

NYC103-Leaf-01#
NYC103-Leaf-01#show ip bgp l2vpn evpn 0.0.0.0/0
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][0][*]/20, version 91
Paths: (1 available, best #1, table evi_1)
  Advertised to update-groups:
    1
  Refresh Epoch 1
  Local
    0.0.0.0 (via default) from 0.0.0.0 (10.103.255.11)
      Origin incomplete, localpref 100, weight 32768, valid, sourced, local, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      Local irb vxlan vtep:
        vrf:campus, l3-vni:303001
        local router mac:3488.1828.4B72
        core-irb interface:Vlan3001
        vtep-ip:10.103.255.11
      rx pathid: 0, tx pathid: 0x0

```

Updated on Jul 7 2024 14:08:19 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718317][0][*]/20, version 84
Paths: (1 available, best #1, table evi_1)
Advertised to update-groups:

1

Refresh Epoch 1

Local

0.0.0.0 (via default) from 0.0.0.0 (10.103.255.11)
Origin incomplete, localpref 100, weight 32768, valid, sourced, local, best
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Local irb vxlan vtep:
vrf:campus, l3-vni:303001
local router mac:3488.1828.4B72
core-irb interface:Vlan3001
vtep-ip:10.103.255.11
rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:08:15 EDT

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718318][0][*]/20, version 83
Paths: (1 available, best #1, table evi_1)
Advertised to update-groups:

1

Refresh Epoch 1

Local

0.0.0.0 (via default) from 0.0.0.0 (10.103.255.11)
Origin incomplete, localpref 100, weight 32768, valid, sourced, local, best
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Local irb vxlan vtep:
vrf:campus, l3-vni:303001
local router mac:3488.1828.4B72
core-irb interface:Vlan3001
vtep-ip:10.103.255.11
rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:08:14 EDT

BGP routing table entry for [2][10.103.255.11:1][0][48][9433D8078517][0][*]/20, version 7893
Paths: (1 available, best #1, table evi_1)
Not advertised to any peer

Refresh Epoch 1

Local, imported path from [2][10.103.255.14:1][0][48][9433D8078517][0][*]/20 (global)

10.103.255.14 (metric 15) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Originator: 10.103.255.14, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 12 2024 09:16:15 EDT

BGP routing table entry for [2][10.103.255.11:1][0][48][9433D8078518][0][*]/20, version 7885

Paths: (1 available, best #1, table evi_1)

Not advertised to any peer

Refresh Epoch 1

Local, imported path from [2][10.103.255.14:1][0][48][9433D8078518][0][*]/20 (global)

10.103.255.14 (metric 15) (via default) from 10.103.255.1 (10.103.255.1)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

Originator: 10.103.255.14, Cluster list: 10.103.255.1

NYC103-Leaf-01#

NYC103-Leaf-01#sh ip bgp l2vpn evpn a0:ce:c8:fb:46:7f

BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][*]/20, version 498

Paths: (1 available, best #1, table evi_120)

Advertised to update-groups:

1

Refresh Epoch 1

Local

0.0.0.0 (via default) from 0.0.0.0 (10.103.255.11)

Origin incomplete, localpref 100, weight 32768, valid, sourced, local, best

EVPN ESI: 00000000000000000000, Label1 200120

Extended Community: RT:65106:120 ENCAP:8

Local irb vxlan vtep:

vrf:campus, l3-vni:303001

local router mac:3488.1828.4B72

core-irb interface:Vlan3001

vtep-ip:10.103.255.11

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 19:43:29 EDT

BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24, version 517

Paths: (1 available, best #1, table evi_120)

Advertised to update-groups:

1

Refresh Epoch 1

Local

0.0.0.0 (via default) from 0.0.0.0 (10.103.255.11)

Origin incomplete, localpref 100, weight 32768, valid, sourced, local, best

EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001

Extended Community: RT:65106:1 RT:65106:120 ENCAP:8

Router MAC:3488.1828.4B72

Local irb vxlan vtep:

vrf:campus, l3-vni:303001

local router mac:3488.1828.4B72

core-irb interface:Vlan3001

vtep-ip:10.103.255.11

rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:44:05 EDT

NYC103-Leaf-02

```
NYC103-Leaf-02#show ip bgp l2vpn evpn summary
BGP router identifier 10.103.255.12, local AS number 65106
BGP table version is 5790, main routing table version 5790
108 network entries using 41472 bytes of memory
155 path entries using 35960 bytes of memory
29/29 BGP path/bestpath attribute entries using 8584 bytes of memory
10 BGP rrinfo entries using 400 bytes of memory
2 BGP AS-PATH entries using 80 bytes of memory
22 BGP extended community entries using 928 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 87424 total bytes of memory
BGP activity 2891/2764 prefixes, 3169/2979 paths, scan interval 60 secs
118 networks peaked at 08:54:58 Jul 12 2024 EDT (4d10h ago)
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.103.255.1	4	65106	18555	18473	5790	0	0	1w2d	47
10.103.255.2	4	65106	18558	18464	5790	0	0	1w2d	47

```
NYC103-Leaf-02#show ip bgp l2vpn evpn nei 10.103.255.1 advertised-routes
BGP table version is 5790, local router ID is 10.103.255.12
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found
```

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.12:1					
> [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [0] []/20	0.0.0.0			32768	?
*> [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [32] [10.103.64.12]/24	0.0.0.0			32768	?
> [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B18] [0] []/20	0.0.0.0			32768	?
> [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [0] []/20	0.0.0.0			32768	?
*> [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [32] [10.103.64.11]/24	0.0.0.0			32768	?
> [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B98] [0] []/20	0.0.0.0			32768	?
> [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [0] []/20					


```

0.0.0.0 32768 ?
*> [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [32] [10.103.64.13]/24
0.0.0.0 32768 ?
*> [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F17] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [32] [10.103.64.17]/24
0.0.0.0 32768 ?
*> [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [32] [10.103.64.14]/24
0.0.0.0 32768 ?
Route Distinguisher: 10.103.255.12:120
*> [2] [10.103.255.12:120] [0] [48] [A0BC6FD67B18] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.12:120] [0] [48] [A0BC6FE28B98] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.12:120] [0] [48] [A0BC6FE28F17] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.12:120] [0] [48] [A0CEC8FB4687] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.12:120] [0] [48] [A0CEC8FB4687] [32] [10.103.120.14]/24
0.0.0.0 32768 ?
*> [2] [10.103.255.12:120] [0] [48] [A0CEC8FB47B7] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.12:120] [0] [48] [A0CEC8FB47B7] [32] [10.103.120.13]/24
0.0.0.0 32768 ?
*> [2] [10.103.255.12:120] [0] [48] [A0CEC8FB47DC] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.12:120] [0] [48] [A0CEC8FB47DC] [32] [10.103.120.11]/24
0.0.0.0 32768 ?
Route Distinguisher: 10.103.255.12:180
*> [2] [10.103.255.12:180] [0] [48] [A0BC6FD67B18] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.12:180] [0] [48] [A0BC6FE28B98] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.12:180] [0] [48] [A0BC6FE28F17] [0] [*]/20
0.0.0.0 32768 ?
Route Distinguisher: 10.103.255.12:220
*> [2] [10.103.255.12:220] [0] [48] [A0BC6FD67B18] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.12:220] [0] [48] [A0BC6FE28B98] [0] [*]/20
0.0.0.0 32768 ?
*> [2] [10.103.255.12:220] [0] [48] [A0BC6FE28F17] [0] [*]/20
0.0.0.0 32768 ?
Route Distinguisher: 65106:12 (default for vrf campus)

```

```
*> [5][65106:12][0][24][10.103.64.0]/17
0.0.0.0 0 32768 ?
*> [5][65106:12][0][24][10.103.120.0]/17
```

```
NYC103-Leaf-02#
NYC103-Leaf-02#show ip bgp l2vpn evpn nei 10.103.255.1 routes
BGP table version is 5790, local router ID is 10.103.255.12
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found
```

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
>i [2][10.103.255.11:1][0][48][8C44A5718300][0][]/20	10.103.255.11	0	100	0	?
*>i [2][10.103.255.11:1][0][48][8C44A5718300][32][10.103.64.15]/24	10.103.255.11	0	100	0	?
>i [2][10.103.255.11:1][0][48][8C44A5718317][0][]/20	10.103.255.11	0	100	0	?
>i [2][10.103.255.11:1][0][48][8C44A5718318][0][]/20	10.103.255.11	0	100	0	?
>i [2][10.103.255.11:1][0][48][C414A20289A0][0][]/20	10.103.255.11	0	100	0	?
*>i [2][10.103.255.11:1][0][48][C414A20289A0][32][10.103.64.19]/24	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.11:120					
>i [2][10.103.255.11:120][0][48][8C44A5718318][0][]/20	10.103.255.11	0	100	0	?
>i [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][]/20	10.103.255.11	0	100	0	?
*>i [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.11:180					
>i [2][10.103.255.11:180][0][48][8C44A5718318][0][]/20	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.11:220					
>i [2][10.103.255.11:220][0][48][8C44A5718318][0][]/20	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.12:1					
>i [2][10.103.255.12:1][0][48][8C44A5718300][0][]/20	10.103.255.11	0	100	0	?
*>i [2][10.103.255.12:1][0][48][8C44A5718300][32][10.103.64.15]/24	10.103.255.11	0	100	0	?
>i [2][10.103.255.12:1][0][48][8C44A5718317][0][]/20					

```

10.103.255.11          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [8C44A5718318] [0] [*]/20
10.103.255.11          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [9433D8078517] [0] [*]/20
10.103.255.14          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [9433D8078518] [0] [*]/20
10.103.255.14          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [9433D8078547] [0] [*]/20
10.103.255.14          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [9433D8078547] [32] [10.103.64.26]/24
10.103.255.14          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0CEC8FB4677] [32] [10.103.120.15]/24
10.103.255.14          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0CEC8FB467F] [32] [10.103.120.12]/24
10.103.255.11          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0CEC8FB4689] [32] [10.103.120.23]/24
10.103.255.13          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0CEC8FB47A7] [32] [10.103.120.16]/24
10.103.255.13          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C414A20289A0] [0] [*]/20
10.103.255.11          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C414A20289A0] [32] [10.103.64.19]/24
10.103.255.11          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6666D0F80] [0] [*]/20
10.103.255.14          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6666D0F80] [32] [10.103.64.28]/24
10.103.255.14          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D666D93140] [0] [*]/20
10.103.255.13          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D666D93140] [32] [10.103.64.20]/24
10.103.255.13          0    100    0 ?

```

Route Distinguisher: 10.103.255.12:120

NYC103-Leaf-02#

NYC103-Leaf-02#show ip bgp l2vpn evpn

BGP table version is 5790, local router ID is 10.103.255.12

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

```

Network          Next Hop          Metric LocPrf Weight Path
Route Distinguisher: 10.103.255.11:1
* i  [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [0] [*]/20
10.103.255.11          0    100    0 ?

```

```

*>i          10.103.255.11          0    100    0 ?
* i  [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [32] [10.103.64.15]/24
          10.103.255.11          0    100    0 ?
*>i          10.103.255.11          0    100    0 ?
* i  [2] [10.103.255.11:1] [0] [48] [8C44A5718317] [0] [*]/20
          10.103.255.11          0    100    0 ?
*>i          10.103.255.11          0    100    0 ?
* i  [2] [10.103.255.11:1] [0] [48] [8C44A5718318] [0] [*]/20
          10.103.255.11          0    100    0 ?
*>i          10.103.255.11          0    100    0 ?
* i  [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [0] [*]/20
          10.103.255.11          0    100    0 ?
*>i          10.103.255.11          0    100    0 ?
*>i  [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [32] [10.103.64.19]/24
          10.103.255.11          0    100    0 ?
* i          10.103.255.11          0    100    0 ?
Route Distinguisher: 10.103.255.11:120
* i  [2] [10.103.255.11:120] [0] [48] [8C44A5718318] [0] [*]/20
          10.103.255.11          0    100    0 ?
*>i          10.103.255.11          0    100    0 ?
* i  [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [0] [*]/20
          10.103.255.11          0    100    0 ?
*>i          10.103.255.11          0    100    0 ?
* i  [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [32] [10.103.120.12]/24
          10.103.255.11          0    100    0 ?
*>i          10.103.255.11          0    100    0 ?
Route Distinguisher: 10.103.255.11:180
* i  [2] [10.103.255.11:180] [0] [48] [8C44A5718318] [0] [*]/20
          10.103.255.11          0    100    0 ?
*>i          10.103.255.11          0    100    0 ?
Route Distinguisher: 10.103.255.11:220
* i  [2] [10.103.255.11:220] [0] [48] [8C44A5718318] [0] [*]/20
          10.103.255.11          0    100    0 ?
*>i          10.103.255.11          0    100    0 ?
Route Distinguisher: 10.103.255.12:1
*>i  [2] [10.103.255.12:1] [0] [48] [8C44A5718300] [0] [*]/20
          10.103.255.11          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [8C44A5718300] [32] [10.103.64.15]/24
          10.103.255.11          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [8C44A5718317] [0] [*]/20
          10.103.255.11          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [8C44A5718318] [0] [*]/20
          10.103.255.11          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [9433D8078517] [0] [*]/20
          10.103.255.14          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [9433D8078518] [0] [*]/20
          10.103.255.14          0    100    0 ?

```

```

*>i [2][10.103.255.12:1][0][48][9433D8078547][0][*]/20
      10.103.255.14      0      100      0 ?
*>i [2][10.103.255.12:1][0][48][9433D8078547][32][10.103.64.26]/24
      10.103.255.14      0      100      0 ?
*> [2][10.103.255.12:1][0][48][A0BC6FD67B00][0][*]/20
      0.0.0.0      32768 ?
*> [2][10.103.255.12:1][0][48][A0BC6FD67B00][32][10.103.64.12]/24
      0.0.0.0      32768 ?
*> [2][10.103.255.12:1][0][48][A0BC6FD67B18][0][*]/20
      0.0.0.0      32768 ?
*> [2][10.103.255.12:1][0][48][A0BC6FE28B80][0][*]/20
      0.0.0.0      32768 ?
*> [2][10.103.255.12:1][0][48][A0BC6FE28B80][32][10.103.64.11]/24
      0.0.0.0      32768 ?

```

NYC103-Leaf-02#

NYC103-Leaf-02#show ip bgp l2vpn evpn route-type 2

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][0][*]/20, version 70

Paths: (2 available, best #2, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

Local

```

10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
  Origin incomplete, metric 0, localpref 100, valid, internal
  EVPN ESI: 00000000000000000000, Label1 200001
  Extended Community: RT:65106:1 ENCAP:8
  Originator: 10.103.255.11, Cluster list: 10.103.255.2
  rx pathid: 0, tx pathid: 0
  Updated on Jul 7 2024 14:08:18 EDT

```

Refresh Epoch 1

Local

```

10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
  Origin incomplete, metric 0, localpref 100, valid, internal, best
  EVPN ESI: 00000000000000000000, Label1 200001
  Extended Community: RT:65106:1 ENCAP:8
  Originator: 10.103.255.11, Cluster list: 10.103.255.1
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 7 2024 14:08:18 EDT

```

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][32][10.103.64.15]/24, version 158

Paths: (2 available, best #2, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

Local

```

10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
  Origin incomplete, metric 0, localpref 100, valid, internal
  EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001

```

```
Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:30:34 EDT
```

Refresh Epoch 1

Local

```
10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:30:34 EDT
```

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718317][0][*]/20, version 65

Paths: (2 available, best #2, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

Local

```
10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:08:14 EDT
```

Refresh Epoch 1

Local

```
10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:08:14 EDT
```

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718318][0][*]/20, version 62

Paths: (2 available, best #2, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

Local

```
10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.2
```

NYC103-Leaf-02#

NYC103-Leaf-02#show ip bgp l2vpn evpn route-type 5

```
BGP routing table entry for [5][65106:3][0][0][0.0.0.0]/17, version 145
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  65102 65100 65101
    10.103.255.3 (metric 103) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      Originator: 10.103.255.3, Cluster list: 10.103.255.2
      rx pathid: 0, tx pathid: 0
      Updated on Jul 7 2024 14:18:33 EDT
  Refresh Epoch 1
  65102 65100 65101
    10.103.255.3 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      Originator: 10.103.255.3, Cluster list: 10.103.255.1
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:18:33 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.64.0]/17, version 16
Paths: (2 available, best #1, table EVPN-BGP-Table)
  Flag: 0x100
  Not advertised to any peer
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3)
    10.103.255.3 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      Originator: 10.103.255.3, Cluster list: 10.103.255.1
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:23 EDT
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3)
    10.103.255.3 (metric 103) (via default) from 10.103.255.2 (10.103.255.2)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      Originator: 10.103.255.3, Cluster list: 10.103.255.2
      rx pathid: 0, tx pathid: 0
      Updated on Jul 7 2024 14:06:23 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.128.0]/17, version 17
```

```
Paths: (2 available, best #1, table EVPN-BGP-Table)
  Flag: 0x100
  Not advertised to any peer
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3)
    10.103.255.3 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      Originator: 10.103.255.3, Cluster list: 10.103.255.1
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:23 EDT
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3)
    10.103.255.3 (metric 103) (via default) from 10.103.255.2 (10.103.255.2)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      Originator: 10.103.255.3, Cluster list: 10.103.255.2
      rx pathid: 0, tx pathid: 0
      Updated on Jul 7 2024 14:06:23 EDT
BGP routing table entry for [5][65106:4][0][0][0.0.0.0]/17, version 147
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  65102 65100 65101
    10.103.255.4 (metric 103) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0

NYC103-Leaf-02#
NYC103-Leaf-02#show ip bgp l2vpn evpn 0.0.0.0/0
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][0][*]/20, version 70
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  Local
    10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      Originator: 10.103.255.11, Cluster list: 10.103.255.2
      rx pathid: 0, tx pathid: 0
      Updated on Jul 7 2024 14:08:18 EDT
  Refresh Epoch 1
```



```
Local
  10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200001
    Extended Community: RT:65106:1 ENCAP:8
    Originator: 10.103.255.11, Cluster list: 10.103.255.1
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:08:18 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718317][0][*]/20, version 65
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
Local
  10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
    Origin incomplete, metric 0, localpref 100, valid, internal
    EVPN ESI: 00000000000000000000, Label1 200001
    Extended Community: RT:65106:1 ENCAP:8
    Originator: 10.103.255.11, Cluster list: 10.103.255.2
    rx pathid: 0, tx pathid: 0
    Updated on Jul 7 2024 14:08:14 EDT
Refresh Epoch 1
Local
  10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200001
    Extended Community: RT:65106:1 ENCAP:8
    Originator: 10.103.255.11, Cluster list: 10.103.255.1
    rx pathid: 0, tx pathid: 0x0
    Updated on Jul 7 2024 14:08:14 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718318][0][*]/20, version 62
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
Local
  10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
    Origin incomplete, metric 0, localpref 100, valid, internal
    EVPN ESI: 00000000000000000000, Label1 200001
    Extended Community: RT:65106:1 ENCAP:8
    Originator: 10.103.255.11, Cluster list: 10.103.255.2
    rx pathid: 0, tx pathid: 0
    Updated on Jul 7 2024 14:08:13 EDT
Refresh Epoch 1
Local
  10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
    Origin incomplete, metric 0, localpref 100, valid, internal, best
    EVPN ESI: 00000000000000000000, Label1 200001
    Extended Community: RT:65106:1 ENCAP:8
```

```
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:08:13 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][C414A20289A0][0][*]/20, version 119
Paths: (2 available, best #2, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.2

NYC103-Leaf-02#
NYC103-Leaf-02#sh ip bgp l2vpn evpn a0:ce:c8:fb:46:7f
BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][*]/20, version 260
Paths: (2 available, best #2, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200120
Extended Community: RT:65106:120 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 19:43:29 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200120
Extended Community: RT:65106:120 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:43:29 EDT
BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24,
version 275
Paths: (2 available, best #2, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
```

```
Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 19:44:05 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:44:05 EDT
BGP routing table entry for [2][10.103.255.12:1][0][48][A0CEC8FB467F][32][10.103.120.12]/24,
version 279
Paths: (1 available, best #1, table evi_1)
Not advertised to any peer
Refresh Epoch 1
Local, imported path from [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24
(global)
10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:44:05 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0CEC8FB467F][0][*]/20, version 262
Paths: (1 available, best #1, table evi_120)
Not advertised to any peer
Refresh Epoch 1
Local, imported path from [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][*]/20 (global)
10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200120
Extended Community: RT:65106:120 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:43:29 EDT
BGP routing table entry for [2][10.103.255.12:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24,
version 278
Paths: (1 available, best #1, table evi_120)
Not advertised to any peer
Refresh Epoch 1

NYC103-Leaf-02#
```

NYC103-Leaf-03

NYC103-Leaf-03#show ip bgp l2vpn evpn summary

BGP router identifier 10.103.255.13, local AS number 65106

BGP table version is 15981, main routing table version 15981

131 network entries using 50304 bytes of memory

200 path entries using 46400 bytes of memory

27/27 BGP path/bestpath attribute entries using 7992 bytes of memory

10 BGP rrinfo entries using 400 bytes of memory

2 BGP AS-PATH entries using 80 bytes of memory

22 BGP extended community entries using 928 bytes of memory

0 BGP route-map cache entries using 0 bytes of memory

0 BGP filter-list cache entries using 0 bytes of memory

BGP using 106104 total bytes of memory

BGP activity 5542/5387 prefixes, 10504/10264 paths, scan interval 60 secs

141 networks peaked at 08:54:58 Jul 12 2024 EDT (4d10h ago)

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.103.255.1	4	65106	18577	14652	15981	0	0	1w2d	69
10.103.255.2	4	65106	18578	14660	15981	0	0	1w2d	69

NYC103-Leaf-03#show ip bgp l2vpn evpn nei 10.103.255.1 advertised-routes

BGP table version is 15981, local router ID is 10.103.255.13

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.13:1					
> [2] [10.103.255.13:1] [0] [48] [C4D666D93140] [0] []/20	0.0.0.0			32768	?
*> [2] [10.103.255.13:1] [0] [48] [C4D666D93140] [32] [10.103.64.20]/24	0.0.0.0			32768	?
Route Distinguisher: 10.103.255.13:120					
> [2] [10.103.255.13:120] [0] [48] [A0CEC8FB4689] [0] []/20	0.0.0.0			32768	?
*> [2] [10.103.255.13:120] [0] [48] [A0CEC8FB4689] [32] [10.103.120.23]/24	0.0.0.0			32768	?
> [2] [10.103.255.13:120] [0] [48] [A0CEC8FB47A7] [0] []/20	0.0.0.0			32768	?
*> [2] [10.103.255.13:120] [0] [48] [A0CEC8FB47A7] [32] [10.103.120.16]/24	0.0.0.0			32768	?
Route Distinguisher: 65106:13 (default for vrf campus)					
*> [5] [65106:13] [0] [24] [10.103.64.0]/17	0.0.0.0	0		32768	?

```

*> [5][65106:13][0][24][10.103.120.0]/17
      0.0.0.0          0          32768 ?
*> [5][65106:13][0][24][10.103.180.0]/17
      0.0.0.0          0          32768 ?
Route Distinguisher: 65106:213 (default for vrf guest)
*> [5][65106:213][0][24][10.103.220.0]/17
      0.0.0.0          0          32768 ?

```

Total number of prefixes 10

NYC103-Leaf-03#show ip bgp l2vpn evpn nei 10.103.255.1 routes

BGP table version is 15981, local router ID is 10.103.255.13

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
>i [2][10.103.255.11:1][0][48][8C44A5718300][0][]/20	10.103.255.11	0	100	0	?
*>i [2][10.103.255.11:1][0][48][8C44A5718300][32][10.103.64.15]/24	10.103.255.11	0	100	0	?
>i [2][10.103.255.11:1][0][48][8C44A5718317][0][]/20	10.103.255.11	0	100	0	?
>i [2][10.103.255.11:1][0][48][8C44A5718318][0][]/20	10.103.255.11	0	100	0	?
>i [2][10.103.255.11:1][0][48][C414A20289A0][0][]/20	10.103.255.11	0	100	0	?
*>i [2][10.103.255.11:1][0][48][C414A20289A0][32][10.103.64.19]/24	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.11:120					
>i [2][10.103.255.11:120][0][48][8C44A5718318][0][]/20	10.103.255.11	0	100	0	?
>i [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][]/20	10.103.255.11	0	100	0	?
*>i [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.11:180					
>i [2][10.103.255.11:180][0][48][8C44A5718318][0][]/20	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.11:220					
>i [2][10.103.255.11:220][0][48][8C44A5718318][0][]/20	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.12:1					
>i [2][10.103.255.12:1][0][48][A0BC6FD67B00][0][]/20					

```

10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [32] [10.103.64.12]/24
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B18] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [32] [10.103.64.11]/24
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B98] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [32] [10.103.64.13]/24
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F17] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [32] [10.103.64.17]/24
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [32] [10.103.64.14]/24
10.103.255.12          0    100    0 ?
Route Distinguisher: 10.103.255.12:120
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FD67B18] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FE28B98] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FE28F17] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0CEC8FB4687] [0] [*]/20
10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0CEC8FB4687] [32] [10.103.120.14]/24
10.103.255.12          0    100    0 ?

```

NYC103-Leaf-03#

NYC103-Leaf-03#show ip bgp l2vpn evpn

BGP table version is 15981, local router ID is 10.103.255.13

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
* i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
* i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [32] [10.103.64.15]/24	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
* i [2] [10.103.255.11:1] [0] [48] [8C44A5718317] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
* i [2] [10.103.255.11:1] [0] [48] [8C44A5718318] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
* i [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
*>i [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [32] [10.103.64.19]/24	10.103.255.11	0	100	0 ?	
* i	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.11:120					
* i [2] [10.103.255.11:120] [0] [48] [8C44A5718318] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
* i [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
*>i [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [32] [10.103.120.12]/24	10.103.255.11	0	100	0 ?	
* i	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.11:180					
* i [2] [10.103.255.11:180] [0] [48] [8C44A5718318] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.11:220					
* i [2] [10.103.255.11:220] [0] [48] [8C44A5718318] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.12:1					
* i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [0] [*]/20	10.103.255.12	0	100	0 ?	
*>i	10.103.255.12	0	100	0 ?	
* i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [32] [10.103.64.12]/24	10.103.255.12	0	100	0 ?	
*>i	10.103.255.12	0	100	0 ?	
* i [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B18] [0] [*]/20	10.103.255.12	0	100	0 ?	

```

*>i          10.103.255.12          0    100    0 ?
* i  [2][10.103.255.12:1][0][48][A0BC6FE28B80][0][*]/20
          10.103.255.12          0    100    0 ?
*>i          10.103.255.12          0    100    0 ?
* i  [2][10.103.255.12:1][0][48][A0BC6FE28B80][32][10.103.64.11]/24
          10.103.255.12          0    100    0 ?
*>i          10.103.255.12          0    100    0 ?
* i  [2][10.103.255.12:1][0][48][A0BC6FE28B98][0][*]/20
          10.103.255.12          0    100    0 ?
*>i          10.103.255.12          0    100    0 ?
* i  [2][10.103.255.12:1][0][48][A0BC6FE28F00][0][*]/20
          10.103.255.12          0    100    0 ?
*>i          10.103.255.12          0    100    0 ?
* i  [2][10.103.255.12:1][0][48][A0BC6FE28F00][32][10.103.64.13]/24
          10.103.255.12          0    100    0 ?
*>i          10.103.255.12          0    100    0 ?
* i  [2][10.103.255.12:1][0][48][A0BC6FE28F17][0][*]/20
          10.103.255.12          0    100    0 ?

```

```

NYC103-Leaf-03#
NYC103-Leaf-03#show ip bgp l2vpn evpn route-type 2
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][0][*]/20, version 99
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  Local
    10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      Originator: 10.103.255.11, Cluster list: 10.103.255.2
      rx pathid: 0, tx pathid: 0
      Updated on Jul 7 2024 14:08:18 EDT
  Refresh Epoch 1
  Local
    10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      Originator: 10.103.255.11, Cluster list: 10.103.255.1
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:08:18 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][32][10.103.64.15]/24,
version 276
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1

```


Local

10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:30:35 EDT

Refresh Epoch 1

Local

10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:30:35 EDT

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718317][0][*]/20, version 90

Paths: (2 available, best #2, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

Local

10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:08:15 EDT

Refresh Epoch 1

Local

10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:08:15 EDT

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718318][0][*]/20, version 87

Paths: (2 available, best #2, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

Local

10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8

Originator: 10.103.255.11, Cluster list: 10.103.255.2

NYC103-Leaf-03#

NYC103-Leaf-03#show ip bgp l2vpn evpn route-type 5

BGP routing table entry for [5][65106:3][0][0][0.0.0.0]/17, version 246

Paths: (2 available, best #2, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

65102 65100 65101

10.103.255.3 (metric 103) (via default) from 10.103.255.2 (10.103.255.2)

Origin incomplete, metric 0, localpref 100, valid, internal

0 EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label

Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2

Originator: 10.103.255.3, Cluster list: 10.103.255.2

rx pathid: 0, tx pathid: 0

Updated on Jul 7 2024 14:18:34 EDT

Refresh Epoch 1

65102 65100 65101

10.103.255.3 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)

Origin incomplete, metric 0, localpref 100, valid, internal, best

0 EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label

Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2

Originator: 10.103.255.3, Cluster list: 10.103.255.1

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:18:34 EDT

BGP routing table entry for [5][65106:3][0][18][10.103.64.0]/17, version 16

Paths: (2 available, best #1, table EVPN-BGP-Table)

Flag: 0x100

Not advertised to any peer

Refresh Epoch 1

Local, (aggregated by 65106 10.103.255.3)

10.103.255.3 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)

Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best

0 EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label

Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2

Originator: 10.103.255.3, Cluster list: 10.103.255.1

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:06:23 EDT

Refresh Epoch 1

Local, (aggregated by 65106 10.103.255.3)

10.103.255.3 (metric 103) (via default) from 10.103.255.2 (10.103.255.2)

Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate

0 EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label

Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2

```

    Originator: 10.103.255.3, Cluster list: 10.103.255.2
    rx pathid: 0, tx pathid: 0
    Updated on Jul 7 2024 14:06:23 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.128.0]/17, version 17
Paths: (2 available, best #1, table EVPN-BGP-Table)
    Flag: 0x100
    Not advertised to any peer
    Refresh Epoch 1
    Local, (aggregated by 65106 10.103.255.3)
      10.103.255.3 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)
        Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
        EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      Originator: 10.103.255.3, Cluster list: 10.103.255.1
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:23 EDT
    Refresh Epoch 1
    Local, (aggregated by 65106 10.103.255.3)
      10.103.255.3 (metric 103) (via default) from 10.103.255.2 (10.103.255.2)
        Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate
        EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      Originator: 10.103.255.3, Cluster list: 10.103.255.2
      rx pathid: 0, tx pathid: 0
      Updated on Jul 7 2024 14:06:23 EDT
BGP routing table entry for [5][65106:4][0][0][0.0.0.0]/17, version 248
Paths: (2 available, best #2, table EVPN-BGP-Table)
    Not advertised to any peer
    Refresh Epoch 1
    65102 65100 65101
      10.103.255.4 (metric 103) (via default) from 10.103.255.2 (10.103.255.2)
        Origin incomplete, metric 0, localpref 100, valid, internal
        EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0

NYC103-Leaf-03#
NYC103-Leaf-03#show ip bgp l2vpn evpn 0.0.0.0/0
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][0][*]/20, version 99
Paths: (2 available, best #2, table EVPN-BGP-Table)
    Not advertised to any peer
    Refresh Epoch 1
    Local
      10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
        Origin incomplete, metric 0, localpref 100, valid, internal
        EVPN ESI: 00000000000000000000, Label11 200001
        Extended Community: RT:65106:1 ENCAP:8

```

```
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:08:18 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:08:18 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718317][0][*]/20, version 90
Paths: (2 available, best #2, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:08:15 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:08:15 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718318][0][*]/20, version 87
Paths: (2 available, best #2, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:08:13 EDT
Refresh Epoch 1
Local
```

```
10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
  Origin incomplete, metric 0, localpref 100, valid, internal, best
  EVPN ESI: 00000000000000000000, Label1 200001
  Extended Community: RT:65106:1 ENCAP:8
  Originator: 10.103.255.11, Cluster list: 10.103.255.1
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 7 2024 14:08:13 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][C414A20289A0][0][*]/20, version 206
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  Local
    10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Label1 200001
      Extended Community: RT:65106:1 ENCAP:8
      Originator: 10.103.255.11, Cluster list: 10.103.255.2

NYC103-Leaf-03#
NYC103-Leaf-03#sh ip bgp l2vpn evpn a0:ce:c8:fb:46:7f
BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][*]/20, version 529
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  Local
    10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Label1 200120
      Extended Community: RT:65106:120 ENCAP:8
      Originator: 10.103.255.11, Cluster list: 10.103.255.2
      rx pathid: 0, tx pathid: 0
      Updated on Jul 7 2024 19:43:29 EDT
  Refresh Epoch 1
  Local
    10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
      Origin incomplete, metric 0, localpref 100, valid, internal, best
      EVPN ESI: 00000000000000000000, Label1 200120
      Extended Community: RT:65106:120 ENCAP:8
      Originator: 10.103.255.11, Cluster list: 10.103.255.1
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 19:43:29 EDT
BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24,
version 547
Paths: (2 available, best #1, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  Local
```

```

10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
  Origin incomplete, metric 0, localpref 100, valid, internal, best
  EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
  Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
  Router MAC:3488.1828.4B72
  Originator: 10.103.255.11, Cluster list: 10.103.255.1
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 7 2024 19:44:05 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 111) (via default) from 10.103.255.2 (10.103.255.2)
  Origin incomplete, metric 0, localpref 100, valid, internal
  EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
  Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
  Router MAC:3488.1828.4B72
  Originator: 10.103.255.11, Cluster list: 10.103.255.2
  rx pathid: 0, tx pathid: 0
  Updated on Jul 7 2024 19:44:05 EDT
BGP routing table entry for [2][10.103.255.13:1][0][48][A0CEC8FB467F][32][10.103.120.12]/24,
version 549
Paths: (1 available, best #1, table evi_1)
  Not advertised to any peer
  Refresh Epoch 1
  Local, imported path from [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24
(global)
10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
  Origin incomplete, metric 0, localpref 100, valid, internal, best
  EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
  Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
  Router MAC:3488.1828.4B72
  Originator: 10.103.255.11, Cluster list: 10.103.255.1
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 7 2024 19:44:05 EDT
BGP routing table entry for [2][10.103.255.13:120][0][48][A0CEC8FB467F][0][*]/20, version 531
Paths: (1 available, best #1, table evi_120)
  Not advertised to any peer
  Refresh Epoch 1
  Local, imported path from [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][*]/20 (global)
10.103.255.11 (metric 111) (via default) from 10.103.255.1 (10.103.255.1)
  Origin incomplete, metric 0, localpref 100, valid, internal, best
  EVPN ESI: 00000000000000000000, Label1 200120
  Extended Community: RT:65106:120 ENCAP:8
  Originator: 10.103.255.11, Cluster list: 10.103.255.1
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 7 2024 19:43:29 EDT
BGP routing table entry for [2][10.103.255.13:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24,
version 548
Paths: (1 available, best #1, table evi_120)

```

Not advertised to any peer
Refresh Epoch 1

NYC103-Leaf-03#

NYC103-Leaf-04

```
NYC103-Leaf-04#show ip bgp l2vpn evpn summary
BGP router identifier 10.103.255.14, local AS number 65106
BGP table version is 15737, main routing table version 15737
130 network entries using 49920 bytes of memory
197 path entries using 45704 bytes of memory
27/27 BGP path/bestpath attribute entries using 7992 bytes of memory
10 BGP rrinfo entries using 400 bytes of memory
2 BGP AS-PATH entries using 80 bytes of memory
22 BGP extended community entries using 928 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 105024 total bytes of memory
BGP activity 5466/5312 prefixes, 10312/10075 paths, scan interval 60 secs
135 networks peaked at 08:54:58 Jul 12 2024 EDT (4d10h ago)
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.103.255.1	4	65106	18571	14697	15737	0	0	1w2d	67
10.103.255.2	4	65106	18569	14688	15737	0	0	1w2d	67

NYC103-Leaf-04#show ip bgp l2vpn evpn nei 10.103.255.1 advertised-routes

BGP table version is 15737, local router ID is 10.103.255.14

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.14:1					
> [2] [10.103.255.14:1] [0] [48] [9433D8078517] [0] []/20	0.0.0.0			32768	?
> [2] [10.103.255.14:1] [0] [48] [9433D8078518] [0] []/20	0.0.0.0			32768	?
> [2] [10.103.255.14:1] [0] [48] [9433D8078547] [0] []/20	0.0.0.0			32768	?
*> [2] [10.103.255.14:1] [0] [48] [9433D8078547] [32] [10.103.64.26]/24	0.0.0.0			32768	?
> [2] [10.103.255.14:1] [0] [48] [C4D6666D0F80] [0] []/20	0.0.0.0			32768	?
*> [2] [10.103.255.14:1] [0] [48] [C4D6666D0F80] [32] [10.103.64.28]/24	0.0.0.0			32768	?

Route Distinguisher: 10.103.255.14:120

```
*> [2][10.103.255.14:120][0][48][A0CEC8FB4677][0][*]/20
      0.0.0.0                                32768 ?
*> [2][10.103.255.14:120][0][48][A0CEC8FB4677][32][10.103.120.15]/24
      0.0.0.0                                32768 ?
```

Route Distinguisher: 65106:14 (default for vrf campus)

```
*> [5][65106:14][0][24][10.103.64.0]/17
      0.0.0.0                                0          32768 ?
*> [5][65106:14][0][24][10.103.120.0]/17
      0.0.0.0                                0          32768 ?
*> [5][65106:14][0][24][10.103.180.0]/17
      0.0.0.0                                0          32768 ?
```

Route Distinguisher: 65106:214 (default for vrf guest)

```
*> [5][65106:214][0][24][10.103.220.0]/17
      0.0.0.0                                0          32768 ?
```

Total number of prefixes 12

NYC103-Leaf-04#show ip bgp l2vpn evpn nei 10.103.255.1 routes

BGP table version is 15737, local router ID is 10.103.255.14

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
>i [2][10.103.255.11:1][0][48][8C44A5718300][0][]/20	10.103.255.11	0	100	0	?
*>i [2][10.103.255.11:1][0][48][8C44A5718300][32][10.103.64.15]/24	10.103.255.11	0	100	0	?
>i [2][10.103.255.11:1][0][48][8C44A5718317][0][]/20	10.103.255.11	0	100	0	?
>i [2][10.103.255.11:1][0][48][8C44A5718318][0][]/20	10.103.255.11	0	100	0	?
>i [2][10.103.255.11:1][0][48][C414A20289A0][0][]/20	10.103.255.11	0	100	0	?
*>i [2][10.103.255.11:1][0][48][C414A20289A0][32][10.103.64.19]/24	10.103.255.11	0	100	0	?
Route Distinguisher: 10.103.255.11:120					
>i [2][10.103.255.11:120][0][48][8C44A5718318][0][]/20	10.103.255.11	0	100	0	?
>i [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][]/20	10.103.255.11	0	100	0	?
*>i [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24	10.103.255.11	0	100	0	?

Route Distinguisher: 10.103.255.11:180

```
*>i  [2] [10.103.255.11:180] [0] [48] [8C44A5718318] [0] [*]/20
      10.103.255.11          0    100    0 ?
```

Route Distinguisher: 10.103.255.11:220

```
*>i  [2] [10.103.255.11:220] [0] [48] [8C44A5718318] [0] [*]/20
      10.103.255.11          0    100    0 ?
```

Route Distinguisher: 10.103.255.12:1

```
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [0] [*]/20
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B00] [32] [10.103.64.12]/24
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FD67B18] [0] [*]/20
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [0] [*]/20
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B80] [32] [10.103.64.11]/24
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28B98] [0] [*]/20
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [0] [*]/20
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F00] [32] [10.103.64.13]/24
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [A0BC6FE28F17] [0] [*]/20
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [0] [*]/20
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6664F55B0] [32] [10.103.64.17]/24
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [0] [*]/20
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:1] [0] [48] [C4D6666D2E10] [32] [10.103.64.14]/24
      10.103.255.12          0    100    0 ?
Route Distinguisher: 10.103.255.12:120
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FD67B18] [0] [*]/20
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FE28B98] [0] [*]/20
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0BC6FE28F17] [0] [*]/20
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0CEC8FB4687] [0] [*]/20
      10.103.255.12          0    100    0 ?
*>i  [2] [10.103.255.12:120] [0] [48] [A0CEC8FB4687] [32] [10.103.120.14]/24
      10.103.255.12          0    100    0 ?
```

NYC103-Leaf-04#

NYC103-Leaf-04#show ip bgp l2vpn evpn

BGP table version is 15737, local router ID is 10.103.255.14

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 10.103.255.11:1					
* i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
* i [2] [10.103.255.11:1] [0] [48] [8C44A5718300] [32] [10.103.64.15]/24	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
* i [2] [10.103.255.11:1] [0] [48] [8C44A5718317] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
* i [2] [10.103.255.11:1] [0] [48] [8C44A5718318] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
* i [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
*>i [2] [10.103.255.11:1] [0] [48] [C414A20289A0] [32] [10.103.64.19]/24	10.103.255.11	0	100	0 ?	
* i	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.11:120					
* i [2] [10.103.255.11:120] [0] [48] [8C44A5718318] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
* i [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
*>i [2] [10.103.255.11:120] [0] [48] [A0CEC8FB467F] [32] [10.103.120.12]/24	10.103.255.11	0	100	0 ?	
* i	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.11:180					
* i [2] [10.103.255.11:180] [0] [48] [8C44A5718318] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.11:220					
* i [2] [10.103.255.11:220] [0] [48] [8C44A5718318] [0] [*]/20	10.103.255.11	0	100	0 ?	
*>i	10.103.255.11	0	100	0 ?	
Route Distinguisher: 10.103.255.12:1					

```

* i [2][10.103.255.12:1][0][48][A0BC6FD67B00][0][*]/20
      10.103.255.12      0      100      0 ?
*>i      10.103.255.12      0      100      0 ?
* i [2][10.103.255.12:1][0][48][A0BC6FD67B00][32][10.103.64.12]/24
      10.103.255.12      0      100      0 ?
*>i      10.103.255.12      0      100      0 ?
* i [2][10.103.255.12:1][0][48][A0BC6FD67B18][0][*]/20
      10.103.255.12      0      100      0 ?
*>i      10.103.255.12      0      100      0 ?
* i [2][10.103.255.12:1][0][48][A0BC6FE28B80][0][*]/20
      10.103.255.12      0      100      0 ?
*>i      10.103.255.12      0      100      0 ?
* i [2][10.103.255.12:1][0][48][A0BC6FE28B80][32][10.103.64.11]/24
      10.103.255.12      0      100      0 ?
*>i      10.103.255.12      0      100      0 ?
* i [2][10.103.255.12:1][0][48][A0BC6FE28B98][0][*]/20
      10.103.255.12      0      100      0 ?
*>i      10.103.255.12      0      100      0 ?
* i [2][10.103.255.12:1][0][48][A0BC6FE28F00][0][*]/20
      10.103.255.12      0      100      0 ?
*>i      10.103.255.12      0      100      0 ?
* i [2][10.103.255.12:1][0][48][A0BC6FE28F00][32][10.103.64.13]/24
      10.103.255.12      0      100      0 ?
*>i      10.103.255.12      0      100      0 ?
* i [2][10.103.255.12:1][0][48][A0BC6FE28F17][0][*]/20
      10.103.255.12      0      100      0 ?

```

NYC103-Leaf-04#

NYC103-Leaf-04#show ip bgp l2vpn evpn route-type 2

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][0][*]/20, version 83

Paths: (2 available, best #2, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

Local

10.103.255.11 (metric 15) (via default) from 10.103.255.2 (10.103.255.2)

Origin incomplete, metric 0, localpref 100, valid, internal

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

Originator: 10.103.255.11, Cluster list: 10.103.255.2

rx pathid: 0, tx pathid: 0

Updated on Jul 7 2024 14:08:19 EDT

Refresh Epoch 1

Local

10.103.255.11 (metric 15) (via default) from 10.103.255.1 (10.103.255.1)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

```
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:08:19 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][32][10.103.64.15]/24,
version 256
Paths: (2 available, best #2, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 15) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:30:35 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 15) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200001, Label2 303001
Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:30:35 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718317][0][*]/20, version 74
Paths: (2 available, best #2, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 15) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:08:15 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 15) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200001
Extended Community: RT:65106:1 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:08:15 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718318][0][*]/20, version 71
```

Paths: (2 available, best #2, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

Local

10.103.255.11 (metric 15) (via default) from 10.103.255.2 (10.103.255.2)

Origin incomplete, metric 0, localpref 100, valid, internal

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

Originator: 10.103.255.11, Cluster list: 10.103.255.2

NYC103-Leaf-04#

NYC103-Leaf-04#

NYC103-Leaf-04#show ip bgp l2vpn evpn route-type 5

BGP routing table entry for [5][65106:3][0][0][0.0.0.0]/17, version 226

Paths: (2 available, best #2, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

65102 65100 65101

10.103.255.3 (metric 7) (via default) from 10.103.255.2 (10.103.255.2)

Origin incomplete, metric 0, localpref 100, valid, internal

EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label

Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2

Originator: 10.103.255.3, Cluster list: 10.103.255.2

rx pathid: 0, tx pathid: 0

Updated on Jul 7 2024 14:18:34 EDT

Refresh Epoch 1

65102 65100 65101

10.103.255.3 (metric 7) (via default) from 10.103.255.1 (10.103.255.1)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label

Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2

Originator: 10.103.255.3, Cluster list: 10.103.255.1

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:18:34 EDT

BGP routing table entry for [5][65106:3][0][18][10.103.64.0]/17, version 8

Paths: (2 available, best #1, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

Local, (aggregated by 65106 10.103.255.3)

10.103.255.3 (metric 7) (via default) from 10.103.255.1 (10.103.255.1)

Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best

EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label

Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2

Originator: 10.103.255.3, Cluster list: 10.103.255.1

rx pathid: 0, tx pathid: 0x0

```
Updated on Jul 7 2024 14:06:24 EDT
Refresh Epoch 1
Local, (aggregated by 65106 10.103.255.3)
  10.103.255.3 (metric 7) (via default) from 10.103.255.2 (10.103.255.2)
    Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate
    EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
    Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
    Originator: 10.103.255.3, Cluster list: 10.103.255.2
    rx pathid: 0, tx pathid: 0
    Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:3][0][18][10.103.128.0]/17, version 9
Paths: (2 available, best #1, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3)
    10.103.255.3 (metric 7) (via default) from 10.103.255.1 (10.103.255.1)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate, best
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      Originator: 10.103.255.3, Cluster list: 10.103.255.1
      rx pathid: 0, tx pathid: 0x0
      Updated on Jul 7 2024 14:06:24 EDT
  Refresh Epoch 1
  Local, (aggregated by 65106 10.103.255.3)
    10.103.255.3 (metric 7) (via default) from 10.103.255.2 (10.103.255.2)
      Origin IGP, metric 0, localpref 100, valid, internal, atomic-aggregate
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
      Originator: 10.103.255.3, Cluster list: 10.103.255.2
      rx pathid: 0, tx pathid: 0
      Updated on Jul 7 2024 14:06:24 EDT
BGP routing table entry for [5][65106:4][0][0][0.0.0.0]/17, version 228
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
  Refresh Epoch 1
  65102 65100 65101
    10.103.255.4 (metric 7) (via default) from 10.103.255.2 (10.103.255.2)
      Origin incomplete, metric 0, localpref 100, valid, internal
      EVPN ESI: 00000000000000000000, Gateway Address: 0.0.0.0, VNI Label 303001, MPLS VPN Label
0
      Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
      Originator: 10.103.255.4, Cluster list: 10.103.255.2

NYC103-Leaf-04#
NYC103-Leaf-04#show ip bgp l2vpn evpn 0.0.0.0/0
```

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718300][0][*]/20, version 83

Paths: (2 available, best #2, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

Local

10.103.255.11 (metric 15) (via default) from 10.103.255.2 (10.103.255.2)

Origin incomplete, metric 0, localpref 100, valid, internal

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

Originator: 10.103.255.11, Cluster list: 10.103.255.2

rx pathid: 0, tx pathid: 0

Updated on Jul 7 2024 14:08:19 EDT

Refresh Epoch 1

Local

10.103.255.11 (metric 15) (via default) from 10.103.255.1 (10.103.255.1)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

Originator: 10.103.255.11, Cluster list: 10.103.255.1

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:08:19 EDT

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718317][0][*]/20, version 74

Paths: (2 available, best #2, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

Local

10.103.255.11 (metric 15) (via default) from 10.103.255.2 (10.103.255.2)

Origin incomplete, metric 0, localpref 100, valid, internal

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

Originator: 10.103.255.11, Cluster list: 10.103.255.2

rx pathid: 0, tx pathid: 0

Updated on Jul 7 2024 14:08:15 EDT

Refresh Epoch 1

Local

10.103.255.11 (metric 15) (via default) from 10.103.255.1 (10.103.255.1)

Origin incomplete, metric 0, localpref 100, valid, internal, best

EVPN ESI: 00000000000000000000, Label1 200001

Extended Community: RT:65106:1 ENCAP:8

Originator: 10.103.255.11, Cluster list: 10.103.255.1

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:08:15 EDT

BGP routing table entry for [2][10.103.255.11:1][0][48][8C44A5718318][0][*]/20, version 71

Paths: (2 available, best #2, table EVPN-BGP-Table)

Not advertised to any peer

Refresh Epoch 1

Local

```

10.103.255.11 (metric 15) (via default) from 10.103.255.2 (10.103.255.2)
  Origin incomplete, metric 0, localpref 100, valid, internal
  EVPN ESI: 00000000000000000000, Label1 200001
  Extended Community: RT:65106:1 ENCAP:8
  Originator: 10.103.255.11, Cluster list: 10.103.255.2
  rx pathid: 0, tx pathid: 0
  Updated on Jul 7 2024 14:08:14 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 15) (via default) from 10.103.255.1 (10.103.255.1)
  Origin incomplete, metric 0, localpref 100, valid, internal, best
  EVPN ESI: 00000000000000000000, Label1 200001
  Extended Community: RT:65106:1 ENCAP:8
  Originator: 10.103.255.11, Cluster list: 10.103.255.1
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 7 2024 14:08:14 EDT
BGP routing table entry for [2][10.103.255.11:1][0][48][C414A20289A0][0][*]/20, version 190
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 15) (via default) from 10.103.255.2 (10.103.255.2)
  Origin incomplete, metric 0, localpref 100, valid, internal
  EVPN ESI: 00000000000000000000, Label1 200001
  Extended Community: RT:65106:1 ENCAP:8
  Originator: 10.103.255.11, Cluster list: 10.103.255.2

NYC103-Leaf-04#
NYC103-Leaf-04#sh ip bgp l2vpn evpn a0:ce:c8:fb:46:7f
BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][*]/20, version 505
Paths: (2 available, best #2, table EVPN-BGP-Table)
  Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 15) (via default) from 10.103.255.2 (10.103.255.2)
  Origin incomplete, metric 0, localpref 100, valid, internal
  EVPN ESI: 00000000000000000000, Label1 200120
  Extended Community: RT:65106:120 ENCAP:8
  Originator: 10.103.255.11, Cluster list: 10.103.255.2
  rx pathid: 0, tx pathid: 0
  Updated on Jul 7 2024 19:43:29 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 15) (via default) from 10.103.255.1 (10.103.255.1)
  Origin incomplete, metric 0, localpref 100, valid, internal, best
  EVPN ESI: 00000000000000000000, Label1 200120
  Extended Community: RT:65106:120 ENCAP:8

```



```
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:43:29 EDT
BGP routing table entry for [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24,
version 525
Paths: (2 available, best #1, table EVPN-BGP-Table)
Not advertised to any peer
Refresh Epoch 1
Local
10.103.255.11 (metric 15) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:44:05 EDT
Refresh Epoch 1
Local
10.103.255.11 (metric 15) (via default) from 10.103.255.2 (10.103.255.2)
Origin incomplete, metric 0, localpref 100, valid, internal
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.2
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 19:44:05 EDT
BGP routing table entry for [2][10.103.255.14:1][0][48][A0CEC8FB467F][32][10.103.120.12]/24,
version 527
Paths: (1 available, best #1, table evi_1)
Not advertised to any peer
Refresh Epoch 1
Local, imported path from [2][10.103.255.11:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24
(global)
10.103.255.11 (metric 15) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200120, Label2 303001
Extended Community: RT:65106:1 RT:65106:120 ENCAP:8
Router MAC:3488.1828.4B72
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:44:05 EDT
BGP routing table entry for [2][10.103.255.14:120][0][48][A0CEC8FB467F][0][*]/20, version 507
Paths: (1 available, best #1, table evi_120)
Not advertised to any peer
Refresh Epoch 1
Local, imported path from [2][10.103.255.11:120][0][48][A0CEC8FB467F][0][*]/20 (global)
10.103.255.11 (metric 15) (via default) from 10.103.255.1 (10.103.255.1)
```

```
Origin incomplete, metric 0, localpref 100, valid, internal, best
EVPN ESI: 00000000000000000000, Label1 200120
Extended Community: RT:65106:120 ENCAP:8
Originator: 10.103.255.11, Cluster list: 10.103.255.1
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 19:43:29 EDT
```

BGP routing table entry for [2][10.103.255.14:120][0][48][A0CEC8FB467F][32][10.103.120.12]/24, version 526

Paths: (1 available, best #1, table evi_120)

Not advertised to any peer

Refresh Epoch 1

NYC103-Leaf-04#

Multicast

NYC103-Spine-01

NYC103-Spine-01#show ip pim interface

Address	Interface	Ver/ Mode	Nbr Count	Query Intvl	DR Prior	DR
10.103.254.1	Loopback1	v2/S	0	30	1	10.103.254.1
10.103.255.255	Loopback2	v2/S	0	30	1	10.103.255.255
10.103.224.29	TwentyFiveGigE1/0/1	v2/S	1	30	1	10.103.224.30
10.103.224.37	TwentyFiveGigE1/0/2	v2/S	1	30	1	10.103.224.38
10.103.224.45	TwentyFiveGigE1/0/3	v2/S	1	30	1	10.103.224.46
10.103.224.53	TwentyFiveGigE1/0/4	v2/S	1	30	1	10.103.224.54
10.103.224.9	HundredGigE1/0/25	v2/S	1	30	1	10.103.224.10
10.103.224.21	HundredGigE1/0/26	v2/S	1	30	1	10.103.224.22
10.103.224.17	HundredGigE1/0/28	v2/S	1	30	1	10.103.224.18

NYC103-Spine-01#show ip pim neighbor

PIM Neighbor Table

Mode: B - Bidir Capable, DR - Designated Router, N - Default DR Priority,

P - Proxy Capable, S - State Refresh Capable, G - GenID Capable,

L - DR Load-balancing Capable

Neighbor Address	Interface	Uptime/Expires	Ver	DR Prio/Mode
10.103.224.30	TwentyFiveGigE1/0/1	1w2d/00:01:25	v2	1 / DR S P G
10.103.224.38	TwentyFiveGigE1/0/2	1w2d/00:01:42	v2	1 / DR S P G
10.103.224.46	TwentyFiveGigE1/0/3	1w2d/00:01:38	v2	1 / DR S P G
10.103.224.54	TwentyFiveGigE1/0/4	1w2d/00:01:19	v2	1 / DR S P G
10.103.224.10	HundredGigE1/0/25	1w2d/00:01:16	v2	1 / DR S P G
10.103.224.22	HundredGigE1/0/26	1w2d/00:01:34	v2	1 / DR S P G
10.103.224.18	HundredGigE1/0/28	1w2d/00:01:43	v2	1 / DR S P G

NYC103-Spine-01#show ip pim rp

Group: 224.0.1.40, RP: 10.103.255.255

NYC103-Spine-01#show ip mroute

IP Multicast Routing Table

Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
 L - Local, P - Pruned, R - RP-bit set, F - Register flag,
 T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
 X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
 U - URD, I - Received Source Specific Host Report,
 Z - Multicast Tunnel, z - MDT-data group sender,
 Y - Joined MDT-data group, y - Sending to MDT-data group,
 G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
 N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
 Q - Received BGP S-A Route, q - Sent BGP S-A Route,
 V - RD & Vector, v - Vector, p - PIM Joins on route,
 x - VxLAN group, c - PFP-SA cache created entry,
 * - determined by Assert, # - iif-starg configured on rpf intf,
 e - encap-helper tunnel flag, l - LISP decap ref count contributor

Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
 t - LISP transit group

Timers: Uptime/Expires

Interface state: Interface, Next-Hop or VCD, State/Mode

(* , 224.0.1.40), 1w2d/00:03:27, RP 10.103.255.255, flags: SJCL

Incoming interface: Null, RPF nbr 0.0.0.0

Outgoing interface list:

Loopback1, Forward/Sparse, 1w2d/00:02:02, flags:

HundredGigE1/0/26, Forward/Sparse, 1w2d/00:03:27, flags:

NYC103-Spine-01#Show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	unassigned	YES	NVRAM	up	down
GigabitEthernet0/0	unassigned	YES	NVRAM	administratively down	down
TwentyFiveGigE1/0/1	10.103.224.29	YES	NVRAM	up	up
TwentyFiveGigE1/0/2	10.103.224.37	YES	NVRAM	up	up
TwentyFiveGigE1/0/3	10.103.224.45	YES	NVRAM	up	up
TwentyFiveGigE1/0/4	10.103.224.53	YES	NVRAM	up	up
TwentyFiveGigE1/0/5	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/6	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/7	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/8	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/9	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/10	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/11	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/12	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/13	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/14	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/15	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/16	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/17	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/18	unassigned	YES	unset	down	down

```

TwentyFiveGigE1/0/19    unassigned    YES unset    down          down
TwentyFiveGigE1/0/20    unassigned    YES unset    down          down
TwentyFiveGigE1/0/21    unassigned    YES unset    down          down
TwentyFiveGigE1/0/22    unassigned    YES unset    down          down
TwentyFiveGigE1/0/23    unassigned    YES unset    down          down
TwentyFiveGigE1/0/24    unassigned    YES unset    down          down
HundredGigE1/0/25       10.103.224.9  YES NVRAM    up            up
HundredGigE1/0/26       10.103.224.21 YES NVRAM    up            up
HundredGigE1/0/27       unassigned    YES unset    down          down
HundredGigE1/0/28       10.103.224.17 YES NVRAM    up            up
TLS-VIF0                 20.0.122.247 YES TFTP     up            up
Loopback0                10.103.255.1  YES NVRAM    up            up
Loopback1                10.103.254.1  YES NVRAM    up            up
Loopback2                10.103.255.255 YES NVRAM    up            up
Loopback1000             20.0.122.247  YES manual   up            up
Tunnel0                  10.103.255.255 YES unset    up            up
Tunnell                  10.103.255.255 YES unset    up            up

```

NYC103-Spine-01#show ip msdp summary

MSDP Peer Status Summary

Peer Address	AS	State	Uptime/ Downtime	Reset Count	SA Count	Peer Name
10.103.254.2	?	Up	1w2d	0	0	?

NYC103-Spine-01#show ip msdp peer

MSDP Peer 10.103.254.2 (?), AS ?

Connection status:

State: Up, Resets: 0, Connection source: Loopback1 (10.103.254.1)

Uptime(Downtime): 1w2d, Messages sent/received: 13296/13296

Output messages discarded: 0

Connection and counters cleared 1w2d ago

SA Filtering:

Input (S,G) filter: none, route-map: none

Input RP filter: none, route-map: none

Output (S,G) filter: none, route-map: none

Output RP filter: none, route-map: none

SA-Requests:

Input filter: none

Peer ttl threshold: 0

SAs learned from this peer: 0

Number of connection transitions to Established state: 1

Input queue size: 0, Output queue size: 0

MD5 signature protection on MSDP TCP connection: not enabled

Message counters:

RPF Failure count: 0

SA Messages in/out: 0/0

SA Requests in: 0

SA Responses out: 0

Data Packets in/out: 0/0

```
NYC103-Spine-01#show ip interface loopback1
Loopback1 is up, line protocol is up
  Internet address is 10.103.254.1/32
  Broadcast address is 255.255.255.255
  Address determined by non-volatile memory
  MTU is 9212 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Multicast reserved groups joined: 224.0.0.1 224.0.0.2 224.0.0.22 224.0.0.13
    224.0.0.5
  Outgoing Common access list is not set
  Outgoing access list is not set
  Inbound Common access list is not set
  Inbound access list is not set
  Proxy ARP is enabled
  Local Proxy ARP is disabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachable are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
  IP Flow switching is disabled
  IP CEF switching is enabled
  IP CEF switching turbo vector
  IP Null turbo vector
  Associated unicast routing topologies:
    Topology "base", operation state is UP
  Associated multicast routing topologies:
    Topology "base", operation state is UP
  IP multicast fast switching is enabled
  IP multicast distributed fast switching is disabled
  IP route-cache flags are Fast, CEF
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  RTP/IP header compression is disabled
  Probe proxy name replies are disabled
  Policy routing is disabled
  Network address translation is disabled
  BGP Policy Mapping is disabled
  Input features: MCI Check
  IPv4 WCCP Redirect outbound is disabled
  IPv4 WCCP Redirect inbound is disabled
  IPv4 WCCP Redirect exclude is disabled
  IP Clear Dont Fragment is disabled
```

```
NYC103-Spine-01#show ip interface loopback2
Loopback2 is up, line protocol is up
  Internet address is 10.103.255.255/32
  Broadcast address is 255.255.255.255
  Address determined by non-volatile memory
  MTU is 9212 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Multicast reserved groups joined: 224.0.0.1 224.0.0.2 224.0.0.22 224.0.0.13
    224.0.0.5
  Outgoing Common access list is not set
  Outgoing access list is not set
  Inbound Common access list is not set
  Inbound access list is not set
  Proxy ARP is enabled
  Local Proxy ARP is disabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachable are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
  IP Flow switching is disabled
  IP CEF switching is enabled
  IP CEF switching turbo vector
  IP Null turbo vector
  Associated unicast routing topologies:
    Topology "base", operation state is UP
  Associated multicast routing topologies:
    Topology "base", operation state is UP
  IP multicast fast switching is enabled
  IP multicast distributed fast switching is disabled
  IP route-cache flags are Fast, CEF
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  RTP/IP header compression is disabled
  Probe proxy name replies are disabled
  Policy routing is disabled
  Network address translation is disabled
  BGP Policy Mapping is disabled
  Input features: MCI Check
  IPv4 WCCP Redirect outbound is disabled
  IPv4 WCCP Redirect inbound is disabled
  IPv4 WCCP Redirect exclude is disabled
  IP Clear Dont Fragment is disabled
```

NYC103-Spine-01#

NYC103-Spine-02

NYC103-Spine-02#show ip pim interface

Address	Interface	Ver/ Mode	Nbr Count	Query Intvl	DR Prior	DR
10.103.254.2	Loopback1	v2/S	0	30	1	10.103.254.2
10.103.255.255	Loopback2	v2/S	0	30	1	10.103.255.255
10.103.224.33	TwentyFiveGigE1/0/1	v2/S	1	30	1	10.103.224.34
10.103.224.41	TwentyFiveGigE1/0/2	v2/S	1	30	1	10.103.224.42
10.103.224.49	TwentyFiveGigE1/0/3	v2/S	1	30	1	10.103.224.50
10.103.224.57	TwentyFiveGigE1/0/4	v2/S	1	30	1	10.103.224.58
10.103.224.25	HundredGigE1/0/25	v2/S	1	30	1	10.103.224.26
10.103.224.13	HundredGigE1/0/26	v2/S	1	30	1	10.103.224.14
10.103.224.18	HundredGigE1/0/28	v2/S	1	30	1	10.103.224.18

NYC103-Spine-02#show ip pim neighbor

PIM Neighbor Table

Mode: B - Bidir Capable, DR - Designated Router, N - Default DR Priority,
P - Proxy Capable, S - State Refresh Capable, G - GenID Capable,
L - DR Load-balancing Capable

Neighbor Address	Interface	Uptime/Expires	Ver	DR Prio/Mode
10.103.224.34	TwentyFiveGigE1/0/1	1w2d/00:01:24	v2	1 / DR S P G
10.103.224.42	TwentyFiveGigE1/0/2	1w2d/00:01:16	v2	1 / DR S P G
10.103.224.50	TwentyFiveGigE1/0/3	1w2d/00:01:32	v2	1 / DR S P G
10.103.224.58	TwentyFiveGigE1/0/4	1w2d/00:01:27	v2	1 / DR S P G
10.103.224.26	HundredGigE1/0/25	1w2d/00:01:38	v2	1 / DR S P G
10.103.224.14	HundredGigE1/0/26	1w2d/00:01:30	v2	1 / DR S P G
10.103.224.17	HundredGigE1/0/28	1w2d/00:01:37	v2	1 / S P G

NYC103-Spine-02#show ip pim rp

Group: 225.0.0.1, RP: 10.103.255.255
Group: 224.0.1.40, RP: 10.103.255.255
Group: 225.0.0.120, RP: 10.103.255.255
Group: 225.0.0.180, RP: 10.103.255.255
Group: 225.0.0.220, RP: 10.103.255.255

NYC103-Spine-02#show ip mroute

IP Multicast Routing Table

Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
L - Local, P - Pruned, R - RP-bit set, F - Register flag,
T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
U - URD, I - Received Source Specific Host Report,
Z - Multicast Tunnel, z - MDT-data group sender,
Y - Joined MDT-data group, y - Sending to MDT-data group,
G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,

Q - Received BGP S-A Route, q - Sent BGP S-A Route,
V - RD & Vector, v - Vector, p - PIM Joins on route,
x - VxLAN group, c - PFP-SA cache created entry,
* - determined by Assert, # - iif-starg configured on rpf intf,
e - encap-helper tunnel flag, l - LISP decap ref count contributor
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
t - LISP transit group
Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode

(*, 225.0.0.1), 1w2d/00:03:26, RP 10.103.255.255, flags: S
Incoming interface: Null, RPF nbr 0.0.0.0
Outgoing interface list:
TwentyFiveGigE1/0/3, Forward/Sparse, 1w2d/00:02:59, flags:
TwentyFiveGigE1/0/2, Forward/Sparse, 1w2d/00:03:26, flags:
TwentyFiveGigE1/0/4, Forward/Sparse, 1w2d/00:03:02, flags:
TwentyFiveGigE1/0/1, Forward/Sparse, 1w2d/00:02:33, flags:

(*, 224.0.1.40), 1w2d/00:03:29, RP 10.103.255.255, flags: SJCL
Incoming interface: Null, RPF nbr 0.0.0.0
Outgoing interface list:
Loopback1, Forward/Sparse, 1w2d/00:02:00, flags:
TwentyFiveGigE1/0/3, Forward/Sparse, 1w2d/00:03:29, flags:
TwentyFiveGigE1/0/2, Forward/Sparse, 1w2d/00:03:00, flags:
HundredGigE1/0/25, Forward/Sparse, 1w2d/00:03:25, flags:
TwentyFiveGigE1/0/4, Forward/Sparse, 1w2d/00:03:25, flags:
TwentyFiveGigE1/0/1, Forward/Sparse, 1w2d/00:03:29, flags:

(*, 225.0.0.120), 1w2d/00:03:22, RP 10.103.255.255, flags: S
Incoming interface: Null, RPF nbr 0.0.0.0
Outgoing interface list:
TwentyFiveGigE1/0/3, Forward/Sparse, 1w2d/00:03:22, flags:
TwentyFiveGigE1/0/2, Forward/Sparse, 1w2d/00:03:12, flags:
TwentyFiveGigE1/0/4, Forward/Sparse, 1w2d/00:03:18, flags:
TwentyFiveGigE1/0/1, Forward/Sparse, 1w2d/00:03:10, flags:

(*, 225.0.0.180), 1w2d/00:03:24, RP 10.103.255.255, flags: S
Incoming interface: Null, RPF nbr 0.0.0.0
Outgoing interface list:
TwentyFiveGigE1/0/3, Forward/Sparse, 1w2d/00:02:53, flags:
TwentyFiveGigE1/0/2, Forward/Sparse, 1w2d/00:03:12, flags:
TwentyFiveGigE1/0/4, Forward/Sparse, 1w2d/00:03:24, flags:
TwentyFiveGigE1/0/1, Forward/Sparse, 1w2d/00:02:53, flags:

(*, 225.0.0.220), 1w2d/00:03:27, RP 10.103.255.255, flags: S
Incoming interface: Null, RPF nbr 0.0.0.0
Outgoing interface list:

TwentyFiveGigE1/0/3, Forward/Sparse, 1w2d/00:03:27, flags:
 TwentyFiveGigE1/0/2, Forward/Sparse, 1w2d/00:03:00, flags:
 TwentyFiveGigE1/0/4, Forward/Sparse, 1w2d/00:02:43, flags:
 TwentyFiveGigE1/0/1, Forward/Sparse, 1w2d/00:02:42, flags:

NYC103-Spine-02#Show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	unassigned	YES	NVRAM	up	down
GigabitEthernet0/0	unassigned	YES	NVRAM	administratively down	down
TwentyFiveGigE1/0/1	10.103.224.33	YES	NVRAM	up	up
TwentyFiveGigE1/0/2	10.103.224.41	YES	NVRAM	up	up
TwentyFiveGigE1/0/3	10.103.224.49	YES	NVRAM	up	up
TwentyFiveGigE1/0/4	10.103.224.57	YES	NVRAM	up	up
TwentyFiveGigE1/0/5	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/6	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/7	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/8	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/9	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/10	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/11	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/12	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/13	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/14	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/15	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/16	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/17	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/18	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/19	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/20	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/21	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/22	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/23	unassigned	YES	unset	down	down
TwentyFiveGigE1/0/24	unassigned	YES	unset	down	down
HundredGigE1/0/25	10.103.224.25	YES	NVRAM	up	up
HundredGigE1/0/26	10.103.224.13	YES	NVRAM	up	up
HundredGigE1/0/27	unassigned	YES	unset	down	down
HundredGigE1/0/28	10.103.224.18	YES	NVRAM	up	up
TLS-VIF0	20.0.105.23	YES	TFTP	up	up
Loopback0	10.103.255.2	YES	NVRAM	up	up
Loopback1	10.103.254.2	YES	NVRAM	up	up
Loopback2	10.103.255.255	YES	NVRAM	up	up
Loopback1000	20.0.105.23	YES	manual	up	up
Tunnel0	10.103.255.255	YES	unset	up	up
Tunnel1	10.103.255.255	YES	unset	up	up

NYC103-Spine-02#show ip msdp summary

MSDP Peer Status Summary

Peer Address	AS	State	Uptime/	Reset SA	Peer Name

```

                                Downtime Count Count
10.103.254.1      ?      Up      1w2d      0      0      ?
NYC103-Spine-02#show ip msdp peer
MSDP Peer 10.103.254.1 (?), AS ?
  Connection status:
    State: Up, Resets: 0, Connection source: Loopback1 (10.103.254.2)
    Uptime(Downtime): 1w2d, Messages sent/received: 13294/13294
    Output messages discarded: 0
    Connection and counters cleared 1w2d ago
  SA Filtering:
    Input (S,G) filter: none, route-map: none
    Input RP filter: none, route-map: none
    Output (S,G) filter: none, route-map: none
    Output RP filter: none, route-map: none
  SA-Requests:
    Input filter: none
  Peer ttl threshold: 0
  SAs learned from this peer: 0
  Number of connection transitions to Established state: 1
    Input queue size: 0, Output queue size: 0
  MD5 signature protection on MSDP TCP connection: not enabled
  Message counters:
    RPF Failure count: 0
    SA Messages in/out: 0/0
    SA Requests in: 0
    SA Responses out: 0
    Data Packets in/out: 0/0
NYC103-Spine-02#
NYC103-Spine-02#sh ip int loopback1
Loopback1 is up, line protocol is up
  Internet address is 10.103.254.2/32
  Broadcast address is 255.255.255.255
  Address determined by non-volatile memory
  MTU is 9212 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Multicast reserved groups joined: 224.0.0.1 224.0.0.2 224.0.0.22 224.0.0.13
    224.0.0.5
  Outgoing Common access list is not set
  Outgoing access list is not set
  Inbound Common access list is not set
  Inbound access list is not set
  Proxy ARP is enabled
  Local Proxy ARP is disabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent

```

```
ICMP unreachable are always sent
ICMP mask replies are never sent
IP fast switching is enabled
IP Flow switching is disabled
IP CEF switching is enabled
IP CEF switching turbo vector
IP Null turbo vector
Associated unicast routing topologies:
    Topology "base", operation state is UP
Associated multicast routing topologies:
    Topology "base", operation state is UP
IP multicast fast switching is enabled
IP multicast distributed fast switching is disabled
IP route-cache flags are Fast, CEF
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
BGP Policy Mapping is disabled
Input features: MCI Check
IPv4 WCCP Redirect outbound is disabled
IPv4 WCCP Redirect inbound is disabled
IPv4 WCCP Redirect exclude is disabled
IP Clear Dont Fragment is disabled
NYC103-Spine-02#sh ip int loopback2
Loopback2 is up, line protocol is up
    Internet address is 10.103.255.255/32
    Broadcast address is 255.255.255.255
    Address determined by non-volatile memory
    MTU is 9212 bytes
    Helper address is not set
    Directed broadcast forwarding is disabled
    Multicast reserved groups joined: 224.0.0.1 224.0.0.2 224.0.0.22 224.0.0.13
        224.0.0.5
    Outgoing Common access list is not set
    Outgoing access list is not set
    Inbound Common access list is not set
    Inbound access list is not set
    Proxy ARP is enabled
    Local Proxy ARP is disabled
    Security level is default
    Split horizon is enabled
    ICMP redirects are always sent
```

```

ICMP unreachable are always sent
ICMP mask replies are never sent
IP fast switching is enabled
IP Flow switching is disabled
IP CEF switching is enabled
IP CEF switching turbo vector
IP Null turbo vector
Associated unicast routing topologies:
    Topology "base", operation state is UP
Associated multicast routing topologies:
    Topology "base", operation state is UP
IP multicast fast switching is enabled
IP multicast distributed fast switching is disabled
IP route-cache flags are Fast, CEF
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
BGP Policy Mapping is disabled
Input features: MCI Check
IPv4 WCCP Redirect outbound is disabled
IPv4 WCCP Redirect inbound is disabled
IPv4 WCCP Redirect exclude is disabled
IP Clear Dont Fragment is disabled
NYC103-Spine-02#

```

NYC103-Border-01

```
NYC103-Border-01#show ip pim interface
```

Address	Interface	Ver/ Mode	Nbr Count	Query Intvl	DR Prior	DR
10.103.224.10	Fo1/1/1	v2/S	1	30	1	10.103.224.10
10.103.224.26	Fo1/1/2	v2/S	1	30	1	10.103.224.26

```
NYC103-Border-01#show ip pim neighbor
```

PIM Neighbor Table

Mode: B - Bidir Capable, DR - Designated Router, N - Default DR Priority,
P - Proxy Capable, S - State Refresh Capable, G - GenID Capable,
L - DR Load-balancing Capable

Neighbor Address	Interface	Uptime/Expires	Ver	DR Prio/Mode
10.103.224.9	Fo1/1/1	1w2d/00:01:19	v2	1 / S P G
10.103.224.25	Fo1/1/2	1w2d/00:01:20	v2	1 / S P G

```
NYC103-Border-01#show ip pim rp
```

```
Group: 224.0.1.40, RP: 10.103.255.255, uptime 1w2d, expires never
NYC103-Border-01#show ip mroute
IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
      L - Local, P - Pruned, R - RP-bit set, F - Register flag,
      T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
      X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
      U - URD, I - Received Source Specific Host Report,
      Z - Multicast Tunnel, z - MDT-data group sender,
      Y - Joined MDT-data group, y - Sending to MDT-data group,
      G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
      N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
      Q - Received BGP S-A Route, q - Sent BGP S-A Route,
      V - RD & Vector, v - Vector, p - PIM Joins on route,
      x - VxLAN group, c - PFP-SA cache created entry,
      * - determined by Assert, # - iif-starg configured on rpf intf,
      e - encap-helper tunnel flag, l - LISP decap ref count contributor
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
                        t - LISP transit group

Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode

(*, 224.0.1.40), 1w2d/00:02:56, RP 10.103.255.255, flags: SJCL
  Incoming interface: Fo1/1/2, RPF nbr 10.103.224.25
  Outgoing interface list:
    Fo1/1/1, Forward/Sparse, 1w2d/00:02:56, flags:
```

NYC103-Border-01#

NYC103-Border-02

```
NYC103-Border-02#show ip pim interface
```

Address	Interface	Ver/ Mode	Nbr Count	Query Intvl	DR Prior	DR
10.103.224.22	Fo1/1/1	v2/S	1	30	1	10.103.224.22
10.103.224.14	Fo1/1/2	v2/S	1	30	1	10.103.224.14

```
NYC103-Border-02#show ip pim neighbor
```

PIM Neighbor Table

Mode: B - Bidir Capable, DR - Designated Router, N - Default DR Priority,
 P - Proxy Capable, S - State Refresh Capable, G - GenID Capable,
 L - DR Load-balancing Capable

Neighbor Address	Interface	Uptime/Expires	Ver	DR Prio/Mode
10.103.224.21	Fo1/1/1	1w2d/00:01:37	v2	1 / S P G
10.103.224.13	Fo1/1/2	1w2d/00:01:20	v2	1 / S P G

```
NYC103-Border-02#show ip pim rp
```

Group: 224.0.1.40, RP: 10.103.255.255, uptime 1w2d, expires never

```
NYC103-Border-02#show ip mroute
IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
      L - Local, P - Pruned, R - RP-bit set, F - Register flag,
      T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
      X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
      U - URD, I - Received Source Specific Host Report,
      Z - Multicast Tunnel, z - MDT-data group sender,
      Y - Joined MDT-data group, y - Sending to MDT-data group,
      G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
      N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
      Q - Received BGP S-A Route, q - Sent BGP S-A Route,
      V - RD & Vector, v - Vector, p - PIM Joins on route,
      x - VxLAN group, c - PFP-SA cache created entry,
      * - determined by Assert, # - iif-starg configured on rpf intf,
      e - encap-helper tunnel flag, l - LISP decap ref count contributor
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
                        t - LISP transit group

Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode

(*, 224.0.1.40), 1w2d/00:02:52, RP 10.103.255.255, flags: SJPCL
  Incoming interface: Fo1/1/1, RPF nbr 10.103.224.21
  Outgoing interface list: Null
```

NYC103-Border-02#

NYC103-Leaf-01

```
NYC103-Leaf-01#show ip pim interface
```

Address	Interface	Ver/ Mode	Nbr Count	Query Intvl	DR Prior	DR
10.103.224.30	TwentyFiveGigE1/1/1	v2/S	1	30	1	10.103.224.30
10.103.224.34	TwentyFiveGigE1/1/2	v2/S	1	30	1	10.103.224.34
10.103.255.11	Tunnel0	v2/P	0	30	1	10.103.255.11

```
NYC103-Leaf-01#show ip pim neighbor
```

PIM Neighbor Table

Mode: B - Bidir Capable, DR - Designated Router, N - Default DR Priority,
 P - Proxy Capable, S - State Refresh Capable, G - GenID Capable,
 L - DR Load-balancing Capable

Neighbor Address	Interface	Uptime/Expires	Ver	DR Prio/Mode
10.103.224.29	TwentyFiveGigE1/1/1	1w2d/00:01:22	v2	1 / S P G
10.103.224.33	TwentyFiveGigE1/1/2	1w2d/00:01:44	v2	1 / S P G

```
NYC103-Leaf-01#show ip pim rp
```

Group: 225.0.0.1, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 224.0.1.40, RP: 10.103.255.255, uptime 1w2d, expires never

```

Group: 225.0.0.120, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 225.0.0.180, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 225.0.0.220, RP: 10.103.255.255, uptime 1w2d, expires never
NYC103-Leaf-01#show ip mroute
IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
      L - Local, P - Pruned, R - RP-bit set, F - Register flag,
      T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
      X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
      U - URD, I - Received Source Specific Host Report,
      Z - Multicast Tunnel, z - MDT-data group sender,
      Y - Joined MDT-data group, y - Sending to MDT-data group,
      G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
      N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
      Q - Received BGP S-A Route, q - Sent BGP S-A Route,
      V - RD & Vector, v - Vector, p - PIM Joins on route,
      x - VxLAN group, c - PFP-SA cache created entry,
      * - determined by Assert, # - iif-starg configured on rpf intf,
      e - encap-helper tunnel flag, l - LISP decap ref count contributor
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
                        t - LISP transit group

Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode

(*, 225.0.0.1), 1w2d/stopped, RP 10.103.255.255, flags: SJCx
  Incoming interface: TwentyFiveGigE1/1/2, RPF nbr 10.103.224.33
  Outgoing interface list:
    Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:

(10.103.255.11, 225.0.0.1), 00:02:53/00:00:06, flags: PTx
  Incoming interface: Null, RPF nbr 0.0.0.0
  Outgoing interface list: Null

(*, 224.0.1.40), 1w2d/00:02:10, RP 10.103.255.255, flags: SJCL
  Incoming interface: TwentyFiveGigE1/1/2, RPF nbr 10.103.224.33
  Outgoing interface list:
    TwentyFiveGigE1/1/1, Forward/Sparse, 1w2d/00:02:10, flags:

(*, 225.0.0.120), 1w2d/stopped, RP 10.103.255.255, flags: SJCx
  Incoming interface: TwentyFiveGigE1/1/2, RPF nbr 10.103.224.33
  Outgoing interface list:
    Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:

(*, 225.0.0.180), 1w2d/stopped, RP 10.103.255.255, flags: SJCx
  Incoming interface: TwentyFiveGigE1/1/2, RPF nbr 10.103.224.33
  Outgoing interface list:
    Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:

```

```
(* , 225.0.0.220), 1w2d/stopped, RP 10.103.255.255, flags: SJCx
Incoming interface: TwentyFiveGigE1/1/2, RPF nbr 10.103.224.33
Outgoing interface list:
Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:
```

NYC103-Leaf-01#

NYC103-Leaf-02

NYC103-Leaf-02#show ip pim interface

Address	Interface	Ver/ Mode	Nbr Count	Query Intvl	DR Prior	DR
10.103.224.38	GigabitEthernet1/0/1	v2/S	1	30	1	10.103.224.38
10.103.224.42	GigabitEthernet1/0/2	v2/S	1	30	1	10.103.224.42
10.103.255.12	Tunnel0	v2/P	0	30	1	10.103.255.12

NYC103-Leaf-02#show ip pim neighbor

PIM Neighbor Table

Mode: B - Bidir Capable, DR - Designated Router, N - Default DR Priority,
P - Proxy Capable, S - State Refresh Capable, G - GenID Capable,
L - DR Load-balancing Capable

Neighbor Address	Interface	Uptime/Expires	Ver	DR Prio/Mode
10.103.224.37	GigabitEthernet1/0/1	1w2d/00:01:28	v2	1 / S P G
10.103.224.41	GigabitEthernet1/0/2	1w2d/00:01:35	v2	1 / S P G

NYC103-Leaf-02#show ip pim rp

Group: 225.0.0.1, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 224.0.1.40, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 225.0.0.120, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 225.0.0.180, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 225.0.0.220, RP: 10.103.255.255, uptime 1w2d, expires never

NYC103-Leaf-02#show ip mroute

IP Multicast Routing Table

Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
L - Local, P - Pruned, R - RP-bit set, F - Register flag,
T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
U - URD, I - Received Source Specific Host Report,
Z - Multicast Tunnel, z - MDT-data group sender,
Y - Joined MDT-data group, y - Sending to MDT-data group,
G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
Q - Received BGP S-A Route, q - Sent BGP S-A Route,
V - RD & Vector, v - Vector, p - PIM Joins on route,
x - VxLAN group, c - PFP-SA cache created entry,
* - determined by Assert, # - iif-starg configured on rpf intf,
e - encaps-helper tunnel flag, l - LISP decap ref count contributor

Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
t - LISP transit group

Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode

(*, 225.0.0.1), 1w2d/00:02:44, RP 10.103.255.255, flags: SJCx
Incoming interface: GigabitEthernet1/0/2, RPF nbr 10.103.224.41
Outgoing interface list:
Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:

(*, 224.0.1.40), 1w2d/00:02:18, RP 10.103.255.255, flags: SJCL
Incoming interface: GigabitEthernet1/0/2, RPF nbr 10.103.224.41
Outgoing interface list:
GigabitEthernet1/0/1, Forward/Sparse, 1w2d/00:02:18, flags:

(*, 225.0.0.120), 1w2d/stopped, RP 10.103.255.255, flags: SJCx
Incoming interface: GigabitEthernet1/0/2, RPF nbr 10.103.224.41
Outgoing interface list:
Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:

(*, 225.0.0.180), 1w2d/stopped, RP 10.103.255.255, flags: SJCx
Incoming interface: GigabitEthernet1/0/2, RPF nbr 10.103.224.41
Outgoing interface list:
Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:

(*, 225.0.0.220), 1w2d/stopped, RP 10.103.255.255, flags: SJCx
Incoming interface: GigabitEthernet1/0/2, RPF nbr 10.103.224.41
Outgoing interface list:
Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:

NYC103-Leaf-02#

NYC103-Leaf-03

NYC103-Leaf-03#show ip pim interface

Address	Interface	Ver/ Mode	Nbr Count	Query Intvl	DR Prior	DR
10.103.224.46	GigabitEthernet1/0/1	v2/S	1	30	1	10.103.224.46
10.103.224.50	GigabitEthernet1/0/2	v2/S	1	30	1	10.103.224.50
10.103.255.13	Tunnel0	v2/P	0	30	1	10.103.255.13

NYC103-Leaf-03#show ip pim neighbor

PIM Neighbor Table

Mode: B - Bidir Capable, DR - Designated Router, N - Default DR Priority,
P - Proxy Capable, S - State Refresh Capable, G - GenID Capable,
L - DR Load-balancing Capable

Neighbor Address	Interface	Uptime/Expires	Ver	DR Prio/Mode

```
10.103.224.45      GigabitEthernet1/0/1      1w2d/00:01:39      v2      1 / S P G
10.103.224.49      GigabitEthernet1/0/2      1w2d/00:01:36      v2      1 / S P G
```

```
NYC103-Leaf-03#show ip pim rp
```

```
Group: 225.0.0.1, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 224.0.1.40, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 225.0.0.120, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 225.0.0.180, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 225.0.0.220, RP: 10.103.255.255, uptime 1w2d, expires never
```

```
NYC103-Leaf-03#show ip mroute
```

```
IP Multicast Routing Table
```

```
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
       L - Local, P - Pruned, R - RP-bit set, F - Register flag,
       T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
       X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
       U - URD, I - Received Source Specific Host Report,
       Z - Multicast Tunnel, z - MDT-data group sender,
       Y - Joined MDT-data group, y - Sending to MDT-data group,
       G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
       N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
       Q - Received BGP S-A Route, q - Sent BGP S-A Route,
       V - RD & Vector, v - Vector, p - PIM Joins on route,
       x - VxLAN group, c - PFP-SA cache created entry,
       * - determined by Assert, # - iif-starg configured on rpf intf,
       e - encap-helper tunnel flag, l - LISP decap ref count contributor
```

```
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
                          t - LISP transit group
```

```
Timers: Uptime/Expires
```

```
Interface state: Interface, Next-Hop or VCD, State/Mode
```

```
(*, 225.0.0.1), 1w2d/00:02:31, RP 10.103.255.255, flags: SJCx
  Incoming interface: GigabitEthernet1/0/2, RPF nbr 10.103.224.49
  Outgoing interface list:
    Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:
```

```
(*, 224.0.1.40), 1w2d/00:02:11, RP 10.103.255.255, flags: SJCL
  Incoming interface: GigabitEthernet1/0/2, RPF nbr 10.103.224.49
  Outgoing interface list:
    GigabitEthernet1/0/1, Forward/Sparse, 1w2d/00:02:11, flags:
```

```
(*, 225.0.0.120), 1w2d/stopped, RP 10.103.255.255, flags: SJCx
  Incoming interface: GigabitEthernet1/0/2, RPF nbr 10.103.224.49
  Outgoing interface list:
    Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:
```

```
(*, 225.0.0.180), 1w2d/stopped, RP 10.103.255.255, flags: SJCx
  Incoming interface: GigabitEthernet1/0/2, RPF nbr 10.103.224.49
  Outgoing interface list:
```

Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:

(*, 225.0.0.220), 1w2d/stopped, RP 10.103.255.255, flags: SJCx
Incoming interface: GigabitEthernet1/0/2, RPF nbr 10.103.224.49
Outgoing interface list:
Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:

NYC103-Leaf-03#

NYC103-Leaf-04

NYC103-Leaf-04#show ip pim interface

Address	Interface	Ver/ Mode	Nbr Count	Query Intvl	DR Prior	DR
10.103.224.54	TwentyFiveGigE1/1/1	v2/S	1	30	1	10.103.224.54
10.103.224.58	TwentyFiveGigE1/1/2	v2/S	1	30	1	10.103.224.58
10.103.255.14	Tunnel0	v2/P	0	30	1	10.103.255.14

NYC103-Leaf-04#show ip pim neighbor

PIM Neighbor Table

Mode: B - Bidir Capable, DR - Designated Router, N - Default DR Priority,
P - Proxy Capable, S - State Refresh Capable, G - GenID Capable,
L - DR Load-balancing Capable

Neighbor Address	Interface	Uptime/Expires	Ver	DR Prio/Mode
10.103.224.53	TwentyFiveGigE1/1/1	1w2d/00:01:18	v2	1 / S P G
10.103.224.57	TwentyFiveGigE1/1/2	1w2d/00:01:15	v2	1 / S P G

NYC103-Leaf-04#show ip pim rp

Group: 225.0.0.1, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 224.0.1.40, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 225.0.0.120, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 225.0.0.180, RP: 10.103.255.255, uptime 1w2d, expires never
Group: 225.0.0.220, RP: 10.103.255.255, uptime 1w2d, expires never

NYC103-Leaf-04#show ip mroute

IP Multicast Routing Table

Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
L - Local, P - Pruned, R - RP-bit set, F - Register flag,
T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
U - URD, I - Received Source Specific Host Report,
Z - Multicast Tunnel, z - MDT-data group sender,
Y - Joined MDT-data group, y - Sending to MDT-data group,
G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
Q - Received BGP S-A Route, q - Sent BGP S-A Route,
V - RD & Vector, v - Vector, p - PIM Joins on route,
x - VxLAN group, c - PFP-SA cache created entry,
* - determined by Assert, # - iif-starg configured on rpf intf,

e - encaps-helper tunnel flag, l - LISP decap ref count contributor

Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join

t - LISP transit group

Timers: Uptime/Expires

Interface state: Interface, Next-Hop or VCD, State/Mode

(*, 225.0.0.1), 1w2d/stopped, RP 10.103.255.255, flags: SJCx

Incoming interface: TwentyFiveGigE1/1/2, RPF nbr 10.103.224.57

Outgoing interface list:

Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:

(*, 224.0.1.40), 1w2d/00:02:43, RP 10.103.255.255, flags: SJCL

Incoming interface: TwentyFiveGigE1/1/2, RPF nbr 10.103.224.57

Outgoing interface list:

TwentyFiveGigE1/1/1, Forward/Sparse, 1w2d/00:02:43, flags:

(*, 225.0.0.120), 1w2d/stopped, RP 10.103.255.255, flags: SJCx

Incoming interface: TwentyFiveGigE1/1/2, RPF nbr 10.103.224.57

Outgoing interface list:

Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:

(*, 225.0.0.180), 1w2d/stopped, RP 10.103.255.255, flags: SJCx

Incoming interface: TwentyFiveGigE1/1/2, RPF nbr 10.103.224.57

Outgoing interface list:

Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:

(*, 225.0.0.220), 1w2d/stopped, RP 10.103.255.255, flags: SJCx

Incoming interface: TwentyFiveGigE1/1/2, RPF nbr 10.103.224.57

Outgoing interface list:

Tunnel0, Forward/Sparse-Dense, 1w2d/stopped, flags:

NYC103-Leaf-04#

Leaf Switches (VLANs, VRFs, Virtual Interfaces, Access Ports)

NYC103-Leaf-01

NYC103-Leaf-01#sh vlan

VLAN Name	Status	Ports
1 default	active	Gi1/0/1, Gi1/0/2, Gi1/0/3, Gi1/0/4, Gi1/0/5, Gi1/0/6, Gi1/0/7, Gi1/0/8, Gi1/0/9, Gi1/0/10, Gi1/0/11, Gi1/0/12, Gi1/0/13, Gi1/0/14, Gi1/0/15, Gi1/0/16, Gi1/0/17, Gi1/0/18, Gi1/0/19, Gi1/0/20, Gi1/0/21, Gi1/0/22, Gi1/0/23, Gi1/0/24, Gi1/0/25, Gi1/0/26, Gi1/0/27, Gi1/0/28, Gi1/0/29, Gi1/0/30, Gi1/0/31, Gi1/0/32, Gi1/0/33, Gi1/0/34, Gi1/0/35, Gi1/0/36, Gi1/0/37, Gi1/0/38, Gi1/0/39, Gi1/0/40, Gi1/0/41, Gi1/0/42, Gi1/0/43, Gi1/0/44, Gi1/0/45, Gi1/0/46, Ap1/0/1
120 Employee	active	
121 VLAN0121	active	

180	IoT	active
220	Guest	active
1002	fddi-default	act/unsup
1003	token-ring-default	act/unsup
1004	fddinet-default	act/unsup
1005	trnet-default	act/unsup
3001	Campus-VRF-L3VNI	active
3002	Guest-VRF-L3VNI	active

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----
1	enet	100001	1500	-	-	-	-	-	0	0
120	enet	100120	1500	-	-	-	-	-	0	0
121	enet	100121	1500	-	-	-	-	-	0	0
180	enet	100180	1500	-	-	-	-	-	0	0
220	enet	100220	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0
3001	enet	103001	1500	-	-	-	-	-	0	0
3002	enet	103002	1500	-	-	-	-	-	0	0

Remote SPAN VLANs

Primary	Secondary	Type	Ports
-----	-----	-----	-----

NYC103-Leaf-01#sh vrf

Name	Default RD	Protocols	Interfaces
Mgmt-vrf	<not set>	ipv4,ipv6	Gi0/0
campus	65106:11	ipv4	Vl1
			Vl120
			Vl180
			Vl3001
guest	65106:211	ipv4	Vl220
			Vl3002

NYC103-Leaf-01#sh run int nve1

Building configuration...

Current configuration : 387 bytes

!

```
interface nve1
  description Network Virtualization Endpoint for encap-decap
  no ip address
```

```

source-interface Loopback0
host-reachability protocol bgp
member vni 200120 mcast-group 225.0.0.120
member vni 200180 mcast-group 225.0.0.180
member vni 303001 vrf campus
member vni 200001 mcast-group 225.0.0.1
member vni 200220 mcast-group 225.0.0.220
member vni 303002 vrf guest
end

```

NYC103-Leaf-01#sh ip int br

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	10.103.64.1	YES	NVRAM	up	up
Vlan120	10.103.120.1	YES	NVRAM	up	up
Vlan180	10.103.180.1	YES	NVRAM	up	up
Vlan220	10.103.220.1	YES	NVRAM	up	up
Vlan3001	10.103.255.11	YES	unset	up	up
Vlan3002	10.103.255.11	YES	unset	up	up
GigabitEthernet0/0	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet1/0/1	unassigned	YES	unset	down	down
GigabitEthernet1/0/2	unassigned	YES	unset	down	down
GigabitEthernet1/0/3	unassigned	YES	unset	down	down
GigabitEthernet1/0/4	unassigned	YES	unset	down	down
GigabitEthernet1/0/5	unassigned	YES	unset	down	down
GigabitEthernet1/0/6	unassigned	YES	unset	down	down
GigabitEthernet1/0/7	unassigned	YES	unset	down	down
GigabitEthernet1/0/8	unassigned	YES	unset	down	down
GigabitEthernet1/0/9	unassigned	YES	unset	down	down
GigabitEthernet1/0/10	unassigned	YES	unset	down	down
GigabitEthernet1/0/11	unassigned	YES	unset	down	down
GigabitEthernet1/0/12	unassigned	YES	unset	down	down
GigabitEthernet1/0/13	unassigned	YES	unset	down	down
GigabitEthernet1/0/14	unassigned	YES	unset	down	down
GigabitEthernet1/0/15	unassigned	YES	unset	down	down
GigabitEthernet1/0/16	unassigned	YES	unset	down	down
GigabitEthernet1/0/17	unassigned	YES	unset	down	down
GigabitEthernet1/0/18	unassigned	YES	unset	down	down
GigabitEthernet1/0/19	unassigned	YES	unset	down	down
GigabitEthernet1/0/20	unassigned	YES	unset	down	down
GigabitEthernet1/0/21	unassigned	YES	unset	down	down
GigabitEthernet1/0/22	unassigned	YES	unset	down	down
GigabitEthernet1/0/23	unassigned	YES	unset	down	down
GigabitEthernet1/0/24	unassigned	YES	unset	down	down
GigabitEthernet1/0/25	unassigned	YES	unset	down	down
GigabitEthernet1/0/26	unassigned	YES	unset	down	down
GigabitEthernet1/0/27	unassigned	YES	unset	down	down
GigabitEthernet1/0/28	unassigned	YES	unset	down	down

GigabitEthernet1/0/29	unassigned	YES	unset	down	down
GigabitEthernet1/0/30	unassigned	YES	unset	down	down
GigabitEthernet1/0/31	unassigned	YES	unset	down	down
GigabitEthernet1/0/32	unassigned	YES	unset	down	down
GigabitEthernet1/0/33	unassigned	YES	unset	down	down
GigabitEthernet1/0/34	unassigned	YES	unset	down	down
GigabitEthernet1/0/35	unassigned	YES	unset	down	down
GigabitEthernet1/0/36	unassigned	YES	unset	down	down
GigabitEthernet1/0/37	unassigned	YES	unset	down	down
GigabitEthernet1/0/38	unassigned	YES	unset	down	down
GigabitEthernet1/0/39	unassigned	YES	unset	down	down
GigabitEthernet1/0/40	unassigned	YES	unset	down	down
GigabitEthernet1/0/41	unassigned	YES	unset	down	down
GigabitEthernet1/0/42	unassigned	YES	unset	down	down
GigabitEthernet1/0/43	unassigned	YES	unset	down	down
GigabitEthernet1/0/44	unassigned	YES	unset	down	down
GigabitEthernet1/0/45	unassigned	YES	unset	down	down
GigabitEthernet1/0/46	unassigned	YES	unset	down	down
GigabitEthernet1/0/47	unassigned	YES	unset	up	up
GigabitEthernet1/0/48	unassigned	YES	unset	up	up
GigabitEthernet1/1/1	unassigned	YES	unset	down	down
GigabitEthernet1/1/2	unassigned	YES	unset	down	down
GigabitEthernet1/1/3	unassigned	YES	unset	down	down
GigabitEthernet1/1/4	unassigned	YES	unset	down	down
Tel1/1/1	unassigned	YES	unset	down	down
Tel1/1/2	unassigned	YES	unset	down	down
Tel1/1/3	unassigned	YES	unset	down	down
Tel1/1/4	unassigned	YES	unset	down	down
Tel1/1/5	unassigned	YES	unset	down	down
Tel1/1/6	unassigned	YES	unset	down	down
Tel1/1/7	unassigned	YES	unset	down	down
Tel1/1/8	unassigned	YES	unset	down	down
Fo1/1/1	unassigned	YES	unset	down	down
Fo1/1/2	unassigned	YES	unset	down	down
TwentyFiveGigE1/1/1	10.103.224.30	YES	NVRAM	up	up
TwentyFiveGigE1/1/2	10.103.224.34	YES	NVRAM	up	up
Ap1/0/1	unassigned	YES	unset	up	up
Port-channel1	unassigned	YES	unset	up	up
TLS-VIF0	20.0.88.201	YES	TFTP	up	up
nve1	unassigned	YES	unset	up	up
Loopback0	10.103.255.11	YES	NVRAM	up	up
Loopback1000	20.0.88.201	YES	manual	up	up
Tunnel0	10.103.255.11	YES	unset	up	up
Tunnel1	10.103.224.30	YES	unset	up	up
NYC103-Leaf-01#					
NYC103-Leaf-01#show interface status					

Port	Name	Status	Vlan	Duplex	Speed	Type
Gi1/0/1		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/2		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/3		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/4		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/5		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/6		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/7		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/8		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/9		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/10		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/11		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/12		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/13		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/14		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/15		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/16		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/17		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/18		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/19		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/20		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/21		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/22		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/23		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/24		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/25		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/26		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/27		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/28		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/29		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/30		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/31		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/32		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/33		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/34		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/35		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/36		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/37		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/38		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/39		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/40		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/41		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/42		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/43		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/44		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/45		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/46		notconnect	1	auto	auto	10/100/1000BaseTX


```

Gi1/0/47      Trunk to NYC103-FL connected      trunk      a-full a-1000 10/100/1000BaseTX
Gi1/0/48      Trunk to NYC103-FL connected      trunk      a-full a-1000 10/100/1000BaseTX
Twe1/1/1      To NYC103-Spine-01 connected      routed      full      10G SFP-10GBase-CX1
Twe1/1/2      To NYC103-Spine-02 connected      routed      full      10G SFP-10GBase-CX1
Ap1/0/1              connected      1          a-full a-1000 App-hosting port
Po1           LACP Channel Group connected      trunk      a-full a-1000 N/A

```

NYC103-Leaf-01#show interface trunk

Port	Mode	Encapsulation	Status	Native vlan
Po1	on	802.1q	trunking	1

Port Vlans allowed on trunk

Po1 1-3000,3003-4094

Port Vlans allowed and active in management domain

Po1 1,120-121,180,220

Port Vlans in spanning tree forwarding state and not pruned

Po1 1,120-121,180,220

NYC103-Leaf-01#show interface port1

Port-channel1 is up, line protocol is up (connected)

Hardware is EtherChannel, address is 3488.1828.4b30 (bia 3488.1828.4b30)

Description: LACP Channel Group to NYC103-FL01-SW01 on ports 47-48

MTU 9198 bytes, BW 2000000 Kbit/sec, DLY 10 usec,

reliability 255/255, txload 1/255, rxload 1/255

Encapsulation ARPA, loopback not set

Keepalive set (10 sec)

Full-duplex, 1000Mb/s, link type is auto, media type is N/A

input flow-control is on, output flow-control is unsupported

Members in this channel: Gi1/0/47 Gi1/0/48

ARP type: ARPA, ARP Timeout 04:00:00

Last input 00:00:02, output 00:00:00, output hang never

Last clearing of "show interface" counters never

Input queue: 0/2000/0/0 (size/max/drops/flushes); Total output drops: 0

Queueing strategy: fifo

Output queue: 0/40 (size/max)

5 minute input rate 20000 bits/sec, 9 packets/sec

5 minute output rate 18000 bits/sec, 10 packets/sec

9915642 packets input, 1328993168 bytes, 0 no buffer

Received 6788282 broadcasts (6760395 multicasts)

0 runts, 0 giants, 0 throttles

0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored

0 watchdog, 6760395 multicast, 0 pause input

0 input packets with dribble condition detected

6341428 packets output, 1053055823 bytes, 0 underruns

Output 8 broadcasts (2534674 multicasts)

0 output errors, 0 collisions, 1 interface resets

0 unknown protocol drops
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier, 0 pause output
0 output buffer failures, 0 output buffers swapped out

NYC103-Leaf-01#

NYC103-Leaf-02

NYC103-Leaf-02#sh vlan

VLAN Name	Status	Ports

1 default	active	Gi1/0/3, Gi1/0/4, Gi1/0/5, Gi1/0/6, Gi1/0/7, Gi1/0/8, Gi1/0/9, Gi1/0/10, Gi1/0/11, Gi1/0/12, Gi1/0/13, Gi1/0/14, Gi1/0/15, Gi1/0/16, Gi1/0/17, Gi1/0/18, Gi1/0/19, Gi1/0/20, Gi1/0/21, Gi1/0/22, Gi1/0/23, Gi1/0/24, Gi1/0/25, Gi1/0/26, Gi1/0/27, Gi1/0/28, Gi1/0/29, Gi1/0/30, Gi1/0/31, Gi1/0/32, Gi1/0/33, Gi1/0/34, Gi1/0/35, Gi1/0/36, Gi1/0/37, Gi1/0/38, Gi1/0/39, Gi1/0/40, Gi1/0/41, Gi1/0/42, Gi1/0/43, Gi1/0/44, Gi1/0/45, Gi1/0/46, Ap1/0/1
120 Employee	active	
121 VLAN0121	active	
180 IoT	active	
220 Guest	active	
1002 fddi-default	act/unsup	
1003 token-ring-default	act/unsup	
1004 fddinet-default	act/unsup	
1005 trnet-default	act/unsup	
3001 Campus-VRF-L3VNI	active	
3002 Guest-VRF-L3VNI	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2

1	enet	100001	1500	-	-	-	-	-	0	0
120	enet	100120	1500	-	-	-	-	-	0	0
121	enet	100121	1500	-	-	-	-	-	0	0
180	enet	100180	1500	-	-	-	-	-	0	0
220	enet	100220	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0
3001	enet	103001	1500	-	-	-	-	-	0	0
3002	enet	103002	1500	-	-	-	-	-	0	0

Remote SPAN VLANs

Primary	Secondary	Type	Ports

```
NYC103-Leaf-02#sh vrf
```

Name	Default RD	Protocols	Interfaces
Mgmt-vrf	<not set>	ipv4,ipv6	Gi0/0
campus	65106:12	ipv4	Vl1 Vl120 Vl180 Vl3001
guest	65106:212	ipv4	Vl220 Vl3002

```
NYC103-Leaf-02#sh run int nve1
```

```
Building configuration...
```

```
Current configuration : 387 bytes
```

```
!
```

```
interface nve1
  description Network Virtualization Endpoint for encap-decap
  no ip address
  source-interface Loopback0
  host-reachability protocol bgp
  member vni 200120 mcast-group 225.0.0.120
  member vni 200180 mcast-group 225.0.0.180
  member vni 303001 vrf campus
  member vni 200001 mcast-group 225.0.0.1
  member vni 200220 mcast-group 225.0.0.220
  member vni 303002 vrf guest
end
```

```
NYC103-Leaf-02#sh ip int br
```

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	10.103.64.1	YES	NVRAM	up	up
Vlan120	10.103.120.1	YES	NVRAM	up	up
Vlan180	10.103.180.1	YES	NVRAM	up	up
Vlan220	10.103.220.1	YES	NVRAM	up	up
Vlan3001	10.103.255.12	YES	unset	up	up
Vlan3002	10.103.255.12	YES	unset	up	up
GigabitEthernet0/0	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet1/0/1	10.103.224.38	YES	NVRAM	up	up
GigabitEthernet1/0/2	10.103.224.42	YES	NVRAM	up	up
GigabitEthernet1/0/3	unassigned	YES	unset	down	down
GigabitEthernet1/0/4	unassigned	YES	unset	down	down
GigabitEthernet1/0/5	unassigned	YES	unset	down	down
GigabitEthernet1/0/6	unassigned	YES	unset	down	down
GigabitEthernet1/0/7	unassigned	YES	unset	down	down
GigabitEthernet1/0/8	unassigned	YES	unset	down	down
GigabitEthernet1/0/9	unassigned	YES	unset	down	down
GigabitEthernet1/0/10	unassigned	YES	unset	down	down
GigabitEthernet1/0/11	unassigned	YES	unset	down	down

GigabitEthernet1/0/12	unassigned	YES	unset	down	down
GigabitEthernet1/0/13	unassigned	YES	unset	down	down
GigabitEthernet1/0/14	unassigned	YES	unset	down	down
GigabitEthernet1/0/15	unassigned	YES	unset	down	down
GigabitEthernet1/0/16	unassigned	YES	unset	down	down
GigabitEthernet1/0/17	unassigned	YES	unset	down	down
GigabitEthernet1/0/18	unassigned	YES	unset	down	down
GigabitEthernet1/0/19	unassigned	YES	unset	down	down
GigabitEthernet1/0/20	unassigned	YES	unset	down	down
GigabitEthernet1/0/21	unassigned	YES	unset	down	down
GigabitEthernet1/0/22	unassigned	YES	unset	down	down
GigabitEthernet1/0/23	unassigned	YES	unset	down	down
GigabitEthernet1/0/24	unassigned	YES	unset	down	down
GigabitEthernet1/0/25	unassigned	YES	unset	down	down
GigabitEthernet1/0/26	unassigned	YES	unset	down	down
GigabitEthernet1/0/27	unassigned	YES	unset	down	down
GigabitEthernet1/0/28	unassigned	YES	unset	down	down
GigabitEthernet1/0/29	unassigned	YES	unset	down	down
GigabitEthernet1/0/30	unassigned	YES	unset	down	down
GigabitEthernet1/0/31	unassigned	YES	unset	down	down
GigabitEthernet1/0/32	unassigned	YES	unset	down	down
GigabitEthernet1/0/33	unassigned	YES	unset	down	down
GigabitEthernet1/0/34	unassigned	YES	unset	down	down
GigabitEthernet1/0/35	unassigned	YES	unset	down	down
GigabitEthernet1/0/36	unassigned	YES	unset	down	down
GigabitEthernet1/0/37	unassigned	YES	unset	down	down
GigabitEthernet1/0/38	unassigned	YES	unset	down	down
GigabitEthernet1/0/39	unassigned	YES	unset	down	down
GigabitEthernet1/0/40	unassigned	YES	unset	down	down
GigabitEthernet1/0/41	unassigned	YES	unset	down	down
GigabitEthernet1/0/42	unassigned	YES	unset	down	down
GigabitEthernet1/0/43	unassigned	YES	unset	down	down
GigabitEthernet1/0/44	unassigned	YES	unset	down	down
GigabitEthernet1/0/45	unassigned	YES	unset	down	down
GigabitEthernet1/0/46	unassigned	YES	unset	down	down
GigabitEthernet1/0/47	unassigned	YES	unset	up	up
GigabitEthernet1/0/48	unassigned	YES	unset	up	up
GigabitEthernet1/1/1	unassigned	YES	unset	down	down
GigabitEthernet1/1/2	unassigned	YES	unset	down	down
GigabitEthernet1/1/3	unassigned	YES	unset	down	down
GigabitEthernet1/1/4	unassigned	YES	unset	down	down
Te1/1/1	unassigned	YES	unset	down	down
Te1/1/2	unassigned	YES	unset	down	down
Te1/1/3	unassigned	YES	unset	down	down
Te1/1/4	unassigned	YES	unset	down	down
Te1/1/5	unassigned	YES	unset	down	down
Te1/1/6	unassigned	YES	unset	down	down

Tel1/1/7	unassigned	YES	unset	down	down
Tel1/1/8	unassigned	YES	unset	down	down
Fo1/1/1	unassigned	YES	unset	down	down
Fo1/1/2	unassigned	YES	unset	down	down
TwentyFiveGigE1/1/1	unassigned	YES	unset	down	down
TwentyFiveGigE1/1/2	unassigned	YES	unset	down	down
Ap1/0/1	unassigned	YES	unset	up	up
TLS-VIF0	20.0.66.11	YES	TFTP	up	up
nve1	unassigned	YES	unset	up	up
Loopback0	10.103.255.12	YES	NVRAM	up	up
Loopback1000	20.0.66.11	YES	manual	up	up
Tunnel0	10.103.255.12	YES	unset	up	up
Tunnel1	10.103.224.42	YES	unset	up	up

NYC103-Leaf-02#

NYC103-Leaf-02#show interface status

Port	Name	Status	Vlan	Duplex	Speed	Type
Gi1/0/1	To NYC103-Spine-01	connected	routed	a-full	a-1000	10/100/1000BaseTX
Gi1/0/2	To NYC103-Spine-02	connected	routed	a-full	a-1000	10/100/1000BaseTX
Gi1/0/3		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/4		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/5		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/6		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/7		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/8		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/9		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/10		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/11		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/12		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/13		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/14		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/15		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/16		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/17		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/18		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/19		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/20		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/21		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/22		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/23		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/24		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/25		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/26		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/27		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/28		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/29		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/30		notconnect	1	auto	auto	10/100/1000BaseTX

```

Gi1/0/31                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/32                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/33                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/34                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/35                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/36                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/37                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/38                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/39                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/40                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/41                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/42                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/43                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/44                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/45                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/46                notconnect 1          auto    auto 10/100/1000BaseTX
Gi1/0/47      Trunk to NYC103-FL connected trunk    a-full a-1000 10/100/1000BaseTX
Gi1/0/48      Trunk to NYC103-FL connected trunk    a-full a-1000 10/100/1000BaseTX
Ap1/0/1                connected 1          a-full a-1000 App-hosting port
NYC103-Leaf-02#show interface trunk

```

Port	Mode	Encapsulation	Status	Native vlan
Gi1/0/47	on	802.1q	trunking	1
Gi1/0/48	on	802.1q	trunking	1

Port	Vlans allowed on trunk
Gi1/0/47	1-3000,3003-4094
Gi1/0/48	1-3000,3003-4094

Port	Vlans allowed and active in management domain
Gi1/0/47	1,120-121,180,220
Gi1/0/48	1,120-121,180,220

Port	Vlans in spanning tree forwarding state and not pruned
Gi1/0/47	1,120-121,180,220
Gi1/0/48	1,120-121,180,220

NYC103-Leaf-02#

NYC103-Leaf-03

NYC103-Leaf-03#sh vlan

VLAN Name	Status	Ports
1 default	active	Gi1/0/3, Gi1/0/4, Gi1/0/5, Gi1/0/6, Gi1/0/7, Gi1/0/8, Gi1/0/9, Gi1/0/10, Gi1/0/11, Gi1/0/14, Gi1/0/15, Gi1/0/16, Gi1/0/17, Gi1/0/18, Gi1/0/19, Gi1/0/20, Gi1/0/21, Gi1/0/22, Gi1/0/23, Gi1/0/24, Gi1/0/25, Gi1/0/26, Gi1/0/27, Gi1/0/28, Gi1/0/29, Gi1/0/30, Gi1/0/31, Gi1/0/32, Gi1/0/33, Gi1/0/34, Gi1/0/35, Gi1/0/36, Gi1/0/37, Gi1/0/38, Gi1/0/39, Gi1/0/40, Gi1/0/41, Gi1/0/42, Gi1/0/43, Gi1/0/44, Gi1/0/45, Gi1/0/46, Gi1/0/47, Ap1/0/1

120	Employee	active	Gi1/0/12, Gi1/0/13
121	VLAN0121	active	
180	IoT	active	
220	Guest	active	
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	
3001	Campus-VRF-L3VNI	active	
3002	Guest-VRF-L3VNI	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0
120	enet	100120	1500	-	-	-	-	-	0	0
121	enet	100121	1500	-	-	-	-	-	0	0
180	enet	100180	1500	-	-	-	-	-	0	0
220	enet	100220	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0
3001	enet	103001	1500	-	-	-	-	-	0	0
3002	enet	103002	1500	-	-	-	-	-	0	0

Remote SPAN VLANs

Primary Secondary Type Ports

NYC103-Leaf-03#sh vrf

Name	Default RD	Protocols	Interfaces
Mgmt-vrf	<not set>	ipv4,ipv6	Gi0/0
campus	65106:13	ipv4	Vl1 Vl120 Vl180 Vl3001
guest	65106:213	ipv4	Vl220 Vl3002

NYC103-Leaf-03#

NYC103-Leaf-03#sh run int nve1

Building configuration...

Current configuration : 387 bytes

!

```

interface nve1
  description Network Virtualization Endpoint for encap-decap
  no ip address
  source-interface Loopback0
  host-reachability protocol bgp
  member vni 200120 mcast-group 225.0.0.120
  member vni 200180 mcast-group 225.0.0.180
  member vni 303001 vrf campus
  member vni 200001 mcast-group 225.0.0.1
  member vni 200220 mcast-group 225.0.0.220
  member vni 303002 vrf guest
end

```

NYC103-Leaf-03#

NYC103-Leaf-03#

NYC103-Leaf-03#

NYC103-Leaf-03#sh ip int br

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	10.103.64.1	YES	NVRAM	up	up
Vlan120	10.103.120.1	YES	NVRAM	up	up
Vlan180	10.103.180.1	YES	NVRAM	up	up
Vlan220	10.103.220.1	YES	NVRAM	up	up
Vlan3001	10.103.255.13	YES	unset	up	up
Vlan3002	10.103.255.13	YES	unset	up	up
GigabitEthernet0/0	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet1/0/1	10.103.224.46	YES	NVRAM	up	up
GigabitEthernet1/0/2	10.103.224.50	YES	NVRAM	up	up
GigabitEthernet1/0/3	unassigned	YES	unset	down	down
GigabitEthernet1/0/4	unassigned	YES	unset	down	down
GigabitEthernet1/0/5	unassigned	YES	unset	down	down
GigabitEthernet1/0/6	unassigned	YES	unset	down	down
GigabitEthernet1/0/7	unassigned	YES	unset	down	down
GigabitEthernet1/0/8	unassigned	YES	unset	down	down
GigabitEthernet1/0/9	unassigned	YES	unset	down	down
GigabitEthernet1/0/10	unassigned	YES	unset	down	down
GigabitEthernet1/0/11	unassigned	YES	unset	down	down
GigabitEthernet1/0/12	unassigned	YES	unset	up	up
GigabitEthernet1/0/13	unassigned	YES	unset	up	up
GigabitEthernet1/0/14	unassigned	YES	unset	down	down
GigabitEthernet1/0/15	unassigned	YES	unset	down	down
GigabitEthernet1/0/16	unassigned	YES	unset	down	down
GigabitEthernet1/0/17	unassigned	YES	unset	down	down
GigabitEthernet1/0/18	unassigned	YES	unset	down	down
GigabitEthernet1/0/19	unassigned	YES	unset	down	down
GigabitEthernet1/0/20	unassigned	YES	unset	down	down
GigabitEthernet1/0/21	unassigned	YES	unset	down	down
GigabitEthernet1/0/22	unassigned	YES	unset	down	down

GigabitEthernet1/0/23	unassigned	YES	unset	down	down
GigabitEthernet1/0/24	unassigned	YES	unset	down	down
GigabitEthernet1/0/25	unassigned	YES	unset	down	down
GigabitEthernet1/0/26	unassigned	YES	unset	down	down
GigabitEthernet1/0/27	unassigned	YES	unset	down	down
GigabitEthernet1/0/28	unassigned	YES	unset	down	down
GigabitEthernet1/0/29	unassigned	YES	unset	down	down
GigabitEthernet1/0/30	unassigned	YES	unset	down	down
GigabitEthernet1/0/31	unassigned	YES	unset	down	down
GigabitEthernet1/0/32	unassigned	YES	unset	down	down
GigabitEthernet1/0/33	unassigned	YES	unset	down	down
GigabitEthernet1/0/34	unassigned	YES	unset	down	down
GigabitEthernet1/0/35	unassigned	YES	unset	down	down
GigabitEthernet1/0/36	unassigned	YES	unset	down	down
GigabitEthernet1/0/37	unassigned	YES	unset	down	down
GigabitEthernet1/0/38	unassigned	YES	unset	down	down
GigabitEthernet1/0/39	unassigned	YES	unset	down	down
GigabitEthernet1/0/40	unassigned	YES	unset	down	down
GigabitEthernet1/0/41	unassigned	YES	unset	down	down
GigabitEthernet1/0/42	unassigned	YES	unset	down	down
GigabitEthernet1/0/43	unassigned	YES	unset	down	down
GigabitEthernet1/0/44	unassigned	YES	unset	down	down
GigabitEthernet1/0/45	unassigned	YES	unset	down	down
GigabitEthernet1/0/46	unassigned	YES	unset	down	down
GigabitEthernet1/0/47	unassigned	YES	unset	down	down
GigabitEthernet1/0/48	unassigned	YES	unset	up	up
GigabitEthernet1/1/1	unassigned	YES	unset	down	down
GigabitEthernet1/1/2	unassigned	YES	unset	down	down
GigabitEthernet1/1/3	unassigned	YES	unset	down	down
GigabitEthernet1/1/4	unassigned	YES	unset	down	down
Tel1/1/1	unassigned	YES	unset	down	down
Tel1/1/2	unassigned	YES	unset	down	down
Tel1/1/3	unassigned	YES	unset	down	down
Tel1/1/4	unassigned	YES	unset	down	down
Tel1/1/5	unassigned	YES	unset	down	down
Tel1/1/6	unassigned	YES	unset	down	down
Tel1/1/7	unassigned	YES	unset	down	down
Tel1/1/8	unassigned	YES	unset	down	down
Fo1/1/1	unassigned	YES	unset	down	down
Fo1/1/2	unassigned	YES	unset	down	down
TwentyFiveGigE1/1/1	unassigned	YES	unset	down	down
TwentyFiveGigE1/1/2	unassigned	YES	unset	down	down
Ap1/0/1	unassigned	YES	unset	up	up
TLS-VIF0	20.0.66.252	YES	TFTP	up	up
nve1	unassigned	YES	unset	up	up
Loopback0	10.103.255.13	YES	NVRAM	up	up
Loopback1000	20.0.66.252	YES	manual	up	up

```
Tunnel0          10.103.255.13  YES unset  up
Tunnel1          10.103.224.50  YES unset  up
```

NYC103-Leaf-03#

NYC103-Leaf-03#show interface status

Port	Name	Status	Vlan	Duplex	Speed	Type
Gi1/0/1	To NYC103-Spine-01	connected	routed	a-full	a-1000	10/100/1000BaseTX
Gi1/0/2	To NYC103-Spine-02	connected	routed	a-full	a-1000	10/100/1000BaseTX
Gi1/0/3		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/4		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/5		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/6		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/7		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/8		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/9		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/10		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/11		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/12	To NYC103-Client36	connected	120	a-full	a-100	10/100/1000BaseTX
Gi1/0/13	To NYC103-Client37	connected	120	a-full	a-100	10/100/1000BaseTX
Gi1/0/14		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/15		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/16		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/17		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/18		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/19		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/20		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/21		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/22		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/23		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/24		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/25		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/26		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/27		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/28		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/29		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/30		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/31		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/32		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/33		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/34		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/35		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/36		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/37		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/38		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/39		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/40		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/41		notconnect	1	auto	auto	10/100/1000BaseTX

```

Gi1/0/42          notconnect  1          auto    auto  10/100/1000BaseTX
Gi1/0/43          notconnect  1          auto    auto  10/100/1000BaseTX
Gi1/0/44          notconnect  1          auto    auto  10/100/1000BaseTX
Gi1/0/45          notconnect  1          auto    auto  10/100/1000BaseTX
Gi1/0/46          notconnect  1          auto    auto  10/100/1000BaseTX
Gi1/0/47          notconnect  1          auto    auto  10/100/1000BaseTX
Gi1/0/48          Trunk to NYC103-FL connected  trunk    a-full  a-1000 10/100/1000BaseTX
Ap1/0/1           connected   1          a-full  a-1000 App-hosting port
NYC103-Leaf-03#show interface trunk

```

Port	Mode	Encapsulation	Status	Native vlan
Gi1/0/48	on	802.1q	trunking	1

Port	Vlans allowed on trunk
Gi1/0/48	1-3000,3003-4094

Port	Vlans allowed and active in management domain
Gi1/0/48	1,120-121,180,220

Port	Vlans in spanning tree forwarding state and not pruned
Gi1/0/48	1,120-121,180,220

NYC103-Leaf-03#

NYC103-Leaf-04

NYC103-Leaf-04#sh vlan

VLAN	Name	Status	Ports
1	default	active	Gi1/0/1, Gi1/0/2, Gi1/0/3, Gi1/0/4, Gi1/0/5, Gi1/0/6, Gi1/0/7, Gi1/0/8, Gi1/0/9, Gi1/0/10, Gi1/0/11, Gi1/0/12, Gi1/0/13, Gi1/0/14, Gi1/0/15, Gi1/0/16, Gi1/0/17, Gi1/0/18, Gi1/0/19, Gi1/0/20, Gi1/0/21, Gi1/0/22, Gi1/0/23, Gi1/0/24, Gi1/0/25, Gi1/0/26, Gi1/0/27, Gi1/0/28, Gi1/0/29, Gi1/0/30, Gi1/0/31, Gi1/0/32, Gi1/0/33, Gi1/0/34, Gi1/0/35, Gi1/0/36, Gi1/0/37, Gi1/0/38, Gi1/0/39, Gi1/0/40, Gi1/0/41, Gi1/0/42, Gi1/0/43, Gi1/0/44, Gi1/0/45, Gi1/0/46, Ap1/0/1
120	Employee	active	
121	VLAN0121	active	
180	IoT	active	
220	Guest	active	
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	
3001	Campus-VRF-L3VNI	active	
3002	Guest-VRF-L3VNI	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0

120	enet	100120	1500	-	-	-	-	-	0	0
121	enet	100121	1500	-	-	-	-	-	0	0
180	enet	100180	1500	-	-	-	-	-	0	0
220	enet	100220	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0
3001	enet	103001	1500	-	-	-	-	-	0	0
3002	enet	103002	1500	-	-	-	-	-	0	0

Remote SPAN VLANs

Primary	Secondary	Type	Ports

NYC103-Leaf-04#sh vrf

Name	Default RD	Protocols	Interfaces
Mgmt-vrf	<not set>	ipv4,ipv6	Gi0/0
campus	65106:14	ipv4	Vl1 Vl120 Vl180 Vl3001
guest	65106:214	ipv4	Vl220 Vl3002

NYC103-Leaf-04#

NYC103-Leaf-04#sh run int nve1

Building configuration...

Current configuration : 387 bytes

!

interface nve1

description Network Virtualization Endpoint for encap-decap

no ip address

source-interface Loopback0

host-reachability protocol bgp

member vni 200120 mcast-group 225.0.0.120

member vni 200180 mcast-group 225.0.0.180

member vni 303001 vrf campus

member vni 200001 mcast-group 225.0.0.1

member vni 200220 mcast-group 225.0.0.220

member vni 303002 vrf guest

end

NYC103-Leaf-04#sh ip int br

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	10.103.64.1	YES	NVRAM	up	up
Vlan120	10.103.120.1	YES	NVRAM	up	up
Vlan180	10.103.180.1	YES	NVRAM	up	up
Vlan220	10.103.220.1	YES	NVRAM	up	up
Vlan3001	10.103.255.14	YES	unset	up	up
Vlan3002	10.103.255.14	YES	unset	up	up
GigabitEthernet0/0	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet1/0/1	unassigned	YES	unset	down	down
GigabitEthernet1/0/2	unassigned	YES	unset	down	down
GigabitEthernet1/0/3	unassigned	YES	unset	down	down
GigabitEthernet1/0/4	unassigned	YES	unset	down	down
GigabitEthernet1/0/5	unassigned	YES	unset	down	down
GigabitEthernet1/0/6	unassigned	YES	unset	down	down
GigabitEthernet1/0/7	unassigned	YES	unset	down	down
GigabitEthernet1/0/8	unassigned	YES	unset	down	down
GigabitEthernet1/0/9	unassigned	YES	unset	down	down
GigabitEthernet1/0/10	unassigned	YES	unset	down	down
GigabitEthernet1/0/11	unassigned	YES	unset	down	down
GigabitEthernet1/0/12	unassigned	YES	unset	down	down
GigabitEthernet1/0/13	unassigned	YES	unset	down	down
GigabitEthernet1/0/14	unassigned	YES	unset	down	down
GigabitEthernet1/0/15	unassigned	YES	unset	down	down
GigabitEthernet1/0/16	unassigned	YES	unset	down	down
GigabitEthernet1/0/17	unassigned	YES	unset	down	down
GigabitEthernet1/0/18	unassigned	YES	unset	down	down
GigabitEthernet1/0/19	unassigned	YES	unset	down	down
GigabitEthernet1/0/20	unassigned	YES	unset	down	down
GigabitEthernet1/0/21	unassigned	YES	unset	down	down
GigabitEthernet1/0/22	unassigned	YES	unset	down	down
GigabitEthernet1/0/23	unassigned	YES	unset	down	down
GigabitEthernet1/0/24	unassigned	YES	unset	down	down
GigabitEthernet1/0/25	unassigned	YES	unset	down	down
GigabitEthernet1/0/26	unassigned	YES	unset	down	down
GigabitEthernet1/0/27	unassigned	YES	unset	down	down
GigabitEthernet1/0/28	unassigned	YES	unset	down	down
GigabitEthernet1/0/29	unassigned	YES	unset	down	down
GigabitEthernet1/0/30	unassigned	YES	unset	down	down
GigabitEthernet1/0/31	unassigned	YES	unset	down	down
GigabitEthernet1/0/32	unassigned	YES	unset	down	down
GigabitEthernet1/0/33	unassigned	YES	unset	down	down
GigabitEthernet1/0/34	unassigned	YES	unset	down	down
GigabitEthernet1/0/35	unassigned	YES	unset	down	down
GigabitEthernet1/0/36	unassigned	YES	unset	down	down
GigabitEthernet1/0/37	unassigned	YES	unset	down	down
GigabitEthernet1/0/38	unassigned	YES	unset	down	down
GigabitEthernet1/0/39	unassigned	YES	unset	down	down

```

GigabitEthernet1/0/40  unassigned      YES unset  down
GigabitEthernet1/0/41  unassigned      YES unset  down
GigabitEthernet1/0/42  unassigned      YES unset  down
GigabitEthernet1/0/43  unassigned      YES unset  down
GigabitEthernet1/0/44  unassigned      YES unset  down
GigabitEthernet1/0/45  unassigned      YES unset  down
GigabitEthernet1/0/46  unassigned      YES unset  down
GigabitEthernet1/0/47  unassigned      YES unset  up
GigabitEthernet1/0/48  unassigned      YES unset  up
GigabitEthernet1/1/1   unassigned      YES unset  down
GigabitEthernet1/1/2   unassigned      YES unset  down
GigabitEthernet1/1/3   unassigned      YES unset  down
GigabitEthernet1/1/4   unassigned      YES unset  down
Tel1/1/1               unassigned      YES unset  down
Tel1/1/2               unassigned      YES unset  down
Tel1/1/3               unassigned      YES unset  down
Tel1/1/4               unassigned      YES unset  down
Tel1/1/5               unassigned      YES unset  down
Tel1/1/6               unassigned      YES unset  down
Tel1/1/7               unassigned      YES unset  down
Tel1/1/8               unassigned      YES unset  down
Fol1/1/1               unassigned      YES unset  down
Fol1/1/2               unassigned      YES unset  down
TwentyFiveGigE1/1/1    10.103.224.54  YES NVRAM  up
TwentyFiveGigE1/1/2    10.103.224.58  YES NVRAM  up
Ap1/0/1                unassigned      YES unset  up
Port-channel1          unassigned      YES unset  up
TLS-VIF0               20.0.82.26     YES TFTP   up
nve1                   unassigned      YES unset  up
Loopback0              10.103.255.14  YES NVRAM  up
Loopback1000           20.0.82.26     YES manual up
Tunnel0                 10.103.255.14  YES unset  up
Tunnel1                 10.103.224.54  YES unset  up

```

NYC103-Leaf-04#

NYC103-Leaf-04#show interface status

Port	Name	Status	Vlan	Duplex	Speed	Type
Gi1/0/1		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/2		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/3		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/4		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/5		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/6		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/7		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/8		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/9		notconnect	1	auto	auto	10/100/1000BaseTX
Gi1/0/10		notconnect	1	auto	auto	10/100/1000BaseTX

```

Gi1/0/11          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/12          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/13          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/14          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/15          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/16          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/17          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/18          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/19          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/20          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/21          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/22          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/23          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/24          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/25          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/26          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/27          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/28          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/29          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/30          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/31          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/32          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/33          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/34          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/35          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/36          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/37          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/38          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/39          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/40          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/41          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/42          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/43          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/44          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/45          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/46          notconnect 1          auto  auto 10/100/1000BaseTX
Gi1/0/47          Trunk to NYC103-FL connected trunk  a-full a-1000 10/100/1000BaseTX
Gi1/0/48          Trunk to NYC103-FL connected trunk  a-full a-1000 10/100/1000BaseTX
Twe1/1/1          To NYC103-Spine-01 connected routed   full   25G SFP-H25GBase-CU1M
Twe1/1/2          To NYC103-Spine-02 connected routed   full   25G SFP-H25GBase-CU1M
Ap1/0/1           connected 1          a-full a-1000 App-hosting port
Po1              LACP Channel Group connected trunk  a-full a-1000 N/A
NYC103-Leaf-04#show interface trunk

```

Port	Mode	Encapsulation	Status	Native vlan
Po1	on	802.1q	trunking	1

```
Port          Vlans allowed on trunk
Po1           1-3000,3003-4094

Port          Vlans allowed and active in management domain
Po1           1,120-121,180,220

Port          Vlans in spanning tree forwarding state and not pruned
Po1           1,120-121,180,220
NYC103-Leaf-04#show interface port1
Port-channel1 is up, line protocol is up (connected)
  Hardware is EtherChannel, address is 242a.0490.e730 (bia 242a.0490.e730)
  Description: LACP Channel Group to NYC103-FL01-SW01 on ports 47-48
  MTU 9198 bytes, BW 2000000 Kbit/sec, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s, link type is auto, media type is N/A
  input flow-control is on, output flow-control is unsupported
  Members in this channel: Gi1/0/47 Gi1/0/48
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:04, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/2000/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 124000 bits/sec, 46 packets/sec
  5 minute output rate 44000 bits/sec, 36 packets/sec
    3709342 packets input, 1205288620 bytes, 0 no buffer
    Received 121836 broadcasts (101654 multicasts)
    0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
    0 watchdog, 101654 multicast, 0 pause input
    0 input packets with dribble condition detected
  6221127 packets output, 2667521581 bytes, 0 underruns
  Output 153 broadcasts (1782529 multicasts)
    0 output errors, 0 collisions, 1 interface resets
    0 unknown protocol drops
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier, 0 pause output
    0 output buffer failures, 0 output buffers swapped out
NYC103-Leaf-04#
```

Leaf Switches (L2 Forwarding, L3 Routing)

NYC103-Leaf-01

```
NYC103-Leaf-01#show mac address-table dynamic
      Mac Address Table
-----
```


Vlan	Mac Address	Type	Ports
----	-----	-----	-----
1	8c44.a571.8300	DYNAMIC	Po1
1	8c44.a571.8317	DYNAMIC	Po1
1	8c44.a571.8318	DYNAMIC	Po1
1	c414.a202.89a0	DYNAMIC	Po1
120	8c44.a571.8318	DYNAMIC	Po1
120	a0ce.c8fb.467f	DYNAMIC	Po1
180	8c44.a571.8318	DYNAMIC	Po1
220	8c44.a571.8318	DYNAMIC	Po1
121	8c44.a571.8318	DYNAMIC	Po1

Total Mac Addresses for this criterion: 9

NYC103-Leaf-01#show l2route evpn mac ip

EVI	ETag	Prod	Mac Address	Host IP
Next Hop(s)				
-----	-----	-----	-----	-----
1	0	L2VPN	8c44.a571.8300	10.103.64.15
Po1:1				
1	0	BGP	9433.d807.8547	10.103.64.26
V:200001	10.103.255.14			
1	0	BGP	a0bc.6fd6.7b00	10.103.64.12
V:200001	10.103.255.12			
1	0	BGP	a0bc.6fe2.8b80	10.103.64.11
V:200001	10.103.255.12			
1	0	BGP	a0bc.6fe2.8f00	10.103.64.13
V:200001	10.103.255.12			
1	0	BGP	a0ce.c8fb.4677	10.103.120.15
V:200120	10.103.255.14			
1	0	BGP	a0ce.c8fb.4687	10.103.120.14
V:200120	10.103.255.12			
1	0	BGP	a0ce.c8fb.4689	10.103.120.23
V:200120	10.103.255.13			
1	0	BGP	a0ce.c8fb.47a7	10.103.120.16
V:200120	10.103.255.13			
1	0	BGP	a0ce.c8fb.47b7	10.103.120.13
V:200120	10.103.255.12			
1	0	BGP	a0ce.c8fb.47dc	10.103.120.11
V:200120	10.103.255.12			
1	0	L2VPN	c414.a202.89a0	10.103.64.19
Po1:1				
1	0	BGP	c4d6.664f.55b0	10.103.64.17
V:200001	10.103.255.12			
1	0	BGP	c4d6.666d.0f80	10.103.64.28
V:200001	10.103.255.14			
1	0	BGP	c4d6.666d.2e10	10.103.64.14
V:200001	10.103.255.12			
1	0	BGP	c4d6.66d9.3140	10.103.64.20
V:200001	10.103.255.13			
120	0	BGP	a0ce.c8fb.4677	10.103.120.15
V:200120	10.103.255.14			

```

120          0 L2VPN a0ce.c8fb.467f          10.103.120.12
Po1:120
120          0 BGP a0ce.c8fb.4687          10.103.120.14
V:200120 10.103.255.12
120          0 BGP a0ce.c8fb.4689          10.103.120.23
V:200120 10.103.255.13
120          0 BGP a0ce.c8fb.47a7          10.103.120.16
V:200120 10.103.255.13
120          0 BGP a0ce.c8fb.47b7          10.103.120.13
V:200120 10.103.255.12
120          0 BGP a0ce.c8fb.47dc          10.103.120.11
V:200120 10.103.255.12

```

NYC103-Leaf-01#show ip bgp vpnv4 vrf campus

BGP table version is 131, local router ID is 10.103.255.11

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, l long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 65106:11 (default for vrf campus)					
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 3/1000					
Ow ip					
*>i	10.103.255.3	0	100	0	65102 65100 65101 ?
* i 10.103.64.0/24	10.103.255.14	0	100	0	?
* i	10.103.255.13	0	100	0	?
* i	10.103.255.12	0	100	0	?
*>	0.0.0.0	0		32768	?
* i 10.103.64.0/18	10.103.255.4	0	100	0	i
*>i	10.103.255.3	0	100	0	i
*>i 10.103.64.11/32	10.103.255.12	0	100	0	?
*>i 10.103.64.12/32	10.103.255.12	0	100	0	?
*>i 10.103.64.13/32	10.103.255.12	0	100	0	?
*>i 10.103.64.14/32	10.103.255.12	0	100	0	?
*>i 10.103.64.17/32	10.103.255.12	0	100	0	?
*>i 10.103.64.20/32	10.103.255.13	0	100	0	?
*>i 10.103.64.26/32	10.103.255.14	0	100	0	?
*>i 10.103.64.28/32	10.103.255.14	0	100	0	?
* i 10.103.120.0/24	10.103.255.14	0	100	0	?
* i	10.103.255.13	0	100	0	?
* i	10.103.255.12	0	100	0	?
*>	0.0.0.0	0		32768	?
*>i 10.103.120.11/32	10.103.255.12	0	100	0	?
*>i 10.103.120.13/32	10.103.255.12	0	100	0	?
*>i 10.103.120.14/32	10.103.255.12	0	100	0	?
*>i 10.103.120.15/32	10.103.255.14	0	100	0	?

```

*>i 10.103.120.16/32 10.103.255.13      0    100    0 ?
*>i 10.103.120.23/32 10.103.255.13      0    100    0 ?
* i 10.103.128.0/18 10.103.255.4        0    100    0 i
*>i                10.103.255.3        0    100    0 i
* i 10.103.180.0/24 10.103.255.14      0    100    0 ?
* i                10.103.255.13      0    100    0 ?
* i                10.103.255.12      0    100    0 ?
*>                0.0.0.0              0          32768 ?

```

NYC103-Leaf-01#show ip bgp vpnv4 vrf campus 0.0.0.0/0

BGP routing table entry for 65106:11:0.0.0.0/0, version 25

Paths: (2 available, best #2, table campus)

Not advertised to any peer

Refresh Epoch 1

65102 65100 65101, imported path from [5][65106:4][0][0][0.0.0.0]/17 (global)

10.103.255.4 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)

Origin incomplete, metric 0, localpref 100, valid, internal

Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672

Originator: 10.103.255.4, Cluster list: 10.103.255.1

Local vxlan vtep:

vrf:campus, vni:303001

local router mac:3488.1828.4B72

encap:1

vtep-ip:10.103.255.11

bdi:Vlan3001

Remote VxLAN:

Topoid 0x2(vrf campus)

Remote Router MAC:3488.1824.7672

Encap 8

Egress VNI 303001

RTEP 10.103.255.4

rx pathid: 0, tx pathid: 0

Updated on Jul 7 2024 14:18:34 EDT

Refresh Epoch 1

65102 65100 65101, imported path from [5][65106:3][0][0][0.0.0.0]/17 (global)

10.103.255.3 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)

Origin incomplete, metric 0, localpref 100, valid, internal, best

Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2

Originator: 10.103.255.3, Cluster list: 10.103.255.1

Local vxlan vtep:

vrf:campus, vni:303001

local router mac:3488.1828.4B72

encap:1

vtep-ip:10.103.255.11

bdi:Vlan3001

Remote VxLAN:

Topoid 0x2(vrf campus)

Remote Router MAC:246C.847E.E0F2

```
Encap 8
Egress VNI 303001
RTEP 10.103.255.3
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:18:34 EDT
```

NYC103-Leaf-01#show ip route vrf campus

Routing Table: campus

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PFR
& - replicated local route overrides by connected

Gateway of last resort is 10.103.255.3 to network 0.0.0.0

```
B* 0.0.0.0/0 [200/0] via 10.103.255.3, 1w2d, Vlan3001
    10.0.0.0/8 is variably subnetted, 25 subnets, 3 masks
B   10.103.64.0/18 [200/0] via 10.103.255.3, 1w2d, Vlan3001
C   10.103.64.0/24 is directly connected, Vlan1
L   10.103.64.1/32 is directly connected, Vlan1
B   10.103.64.11/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.64.12/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.64.13/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.64.14/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
S   10.103.64.15/32 is directly connected, Vlan1
B   10.103.64.17/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
S   10.103.64.19/32 is directly connected, Vlan1
B   10.103.64.20/32 [200/0] via 10.103.255.13, 1w1d, Vlan3001
B   10.103.64.26/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
B   10.103.64.28/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
C   10.103.120.0/24 is directly connected, Vlan120
L   10.103.120.1/32 is directly connected, Vlan120
B   10.103.120.11/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
S   10.103.120.12/32 is directly connected, Vlan120
B   10.103.120.13/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.120.14/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.120.15/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
B   10.103.120.16/32 [200/0] via 10.103.255.13, 1w2d, Vlan3001
B   10.103.120.23/32 [200/0] via 10.103.255.13, 1w2d, Vlan3001
```

B 10.103.128.0/18 [200/0] via 10.103.255.3, 1w2d, Vlan3001
C 10.103.180.0/24 is directly connected, Vlan180
L 10.103.180.1/32 is directly connected, Vlan180
NYC103-Leaf-01#show ip bgp vpnv4 vrf guest
BGP table version is 131, local router ID is 10.103.255.11
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 65106:211 (default for vrf guest)					
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 1/1000					
* i 0.0.0.0	10.103.255.4	0	100	0	65102 65100 65100 65100 65100 i
*>i	10.103.255.3	0	100	0	65102 65100 65100 65100 65100 i
*>i 10.103.64.8/30	10.103.255.3	0	100	0	i
*>i 10.103.64.12/30	10.103.255.4	0	100	0	i
* i 10.103.220.0/24	10.103.255.14	0	100	0	?
* i	10.103.255.13	0	100	0	?
* i	10.103.255.12	0	100	0	?
*>	0.0.0.0	0		32768	?

NYC103-Leaf-01#show ip bgp vpnv4 vrf guest 0.0.0.0/0
BGP routing table entry for 65106:211:0.0.0.0/0, version 27
Paths: (2 available, best #2, table guest)
Not advertised to any peer
Refresh Epoch 1
65102 65100 65100 65100 65100, imported path from [5][65106:24][0][0][0.0.0.0]/17 (global)
10.103.255.4 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)
Origin IGP, metric 0, localpref 100, valid, internal
Extended Community: RT:65106:2 ENCAP:8 Router MAC:3488.1824.764B
Originator: 10.103.255.4, Cluster list: 10.103.255.1
Local vxlan vtep:
vrf:guest, vni:303002
local router mac:3488.1828.4B4B
encap:1
vtep-ip:10.103.255.11
bdi:Vlan3002
Remote VxLAN:
Topoid 0x3(vrf guest)
Remote Router MAC:3488.1824.764B
Encap 8
Egress VNI 303002
RTEP 10.103.255.4
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:18:34 EDT

Refresh Epoch 1

65102 65100 65100 65100 65100, imported path from [5][65106:23][0][0][0.0.0.0]/17 (global)
10.103.255.3 (metric 13) (via default) from 10.103.255.1 (10.103.255.1)

Origin IGP, metric 0, localpref 100, valid, internal, best

Extended Community: RT:65106:2 ENCAP:8 Router MAC:246C.847E.E0CB

Originator: 10.103.255.3, Cluster list: 10.103.255.1

Local vxlan vtep:

vrf:guest, vni:303002

local router mac:3488.1828.4B4B

encap:1

vtep-ip:10.103.255.11

bdi:Vlan3002

Remote VxLAN:

Topoid 0x3(vrf guest)

Remote Router MAC:246C.847E.E0CB

Encap 8

Egress VNI 303002

RTEP 10.103.255.3

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:18:34 EDT

NYC103-Leaf-01#show ip route vrf guest

Routing Table: guest

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP

n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA

i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2

ia - IS-IS inter area, * - candidate default, U - per-user static route

H - NHRP, G - NHRP registered, g - NHRP registration summary

o - ODR, P - periodic downloaded static route, l - LISP

a - application route

+ - replicated route, % - next hop override, p - overrides from PfR

& - replicated local route overrides by connected

Gateway of last resort is 10.103.255.3 to network 0.0.0.0

B* 0.0.0.0/0 [200/0] via 10.103.255.3, 1w2d, Vlan3002

10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks

B 10.103.64.8/30 [200/0] via 10.103.255.3, 1w2d, Vlan3002

B 10.103.64.12/30 [200/0] via 10.103.255.4, 1w2d, Vlan3002

C 10.103.220.0/24 is directly connected, Vlan220

L 10.103.220.1/32 is directly connected, Vlan220

NYC103-Leaf-01#

NYC103-Leaf-02

NYC103-Leaf-02#show mac address-table dynamic

Mac Address Table

Vlan	Mac Address	Type	Ports
1	a0bc.6fd6.7b00	DYNAMIC	Gi1/0/47
1	a0bc.6fd6.7b18	DYNAMIC	Gi1/0/47
1	a0bc.6fe2.8b80	DYNAMIC	Gi1/0/48
1	a0bc.6fe2.8b98	DYNAMIC	Gi1/0/48
1	a0bc.6fe2.8f00	DYNAMIC	Gi1/0/47
1	a0bc.6fe2.8f17	DYNAMIC	Gi1/0/47
1	c4d6.664f.55b0	DYNAMIC	Gi1/0/48
1	c4d6.666d.2e10	DYNAMIC	Gi1/0/47
120	a0bc.6fd6.7b18	DYNAMIC	Gi1/0/47
120	a0bc.6fe2.8b98	DYNAMIC	Gi1/0/48
120	a0bc.6fe2.8f17	DYNAMIC	Gi1/0/47
120	a0ce.c8fb.4687	DYNAMIC	Gi1/0/47
120	a0ce.c8fb.47b7	DYNAMIC	Gi1/0/47
120	a0ce.c8fb.47dc	DYNAMIC	Gi1/0/48
180	a0bc.6fd6.7b18	DYNAMIC	Gi1/0/47
180	a0bc.6fe2.8b98	DYNAMIC	Gi1/0/48
180	a0bc.6fe2.8f17	DYNAMIC	Gi1/0/47
220	a0bc.6fd6.7b18	DYNAMIC	Gi1/0/47
220	a0bc.6fe2.8b98	DYNAMIC	Gi1/0/48
220	a0bc.6fe2.8f17	DYNAMIC	Gi1/0/47
121	a0bc.6fd6.7b18	DYNAMIC	Gi1/0/47
121	a0bc.6fe2.8b98	DYNAMIC	Gi1/0/48
121	a0bc.6fe2.8f17	DYNAMIC	Gi1/0/47

Total Mac Addresses for this criterion: 23

NYC103-Leaf-02#show l2route evpn mac ip

Next Hop(s)	Host IP
1 0 BGP 8c44.a571.8300	10.103.64.15
V:200001 10.103.255.11	
1 0 BGP 9433.d807.8547	10.103.64.26
V:200001 10.103.255.14	
1 0 L2VPN a0bc.6fd6.7b00	10.103.64.12
Gi1/0/47:1	
1 0 L2VPN a0bc.6fe2.8b80	10.103.64.11
Gi1/0/48:1	
1 0 L2VPN a0bc.6fe2.8f00	10.103.64.13
Gi1/0/47:1	
1 0 BGP a0ce.c8fb.4677	10.103.120.15
V:200120 10.103.255.14	
1 0 BGP a0ce.c8fb.467f	10.103.120.12
V:200120 10.103.255.11	

```

1          0    BGP a0ce.c8fb.4689          10.103.120.23
V:200120 10.103.255.13
1          0    BGP a0ce.c8fb.47a7          10.103.120.16
V:200120 10.103.255.13
1          0    BGP c414.a202.89a0          10.103.64.19
V:200001 10.103.255.11
1          0 L2VPN c4d6.664f.55b0          10.103.64.17
Gi1/0/48:1
1          0    BGP c4d6.666d.0f80          10.103.64.28
V:200001 10.103.255.14
1          0 L2VPN c4d6.666d.2e10          10.103.64.14
Gi1/0/47:1
1          0    BGP c4d6.66d9.3140          10.103.64.20
V:200001 10.103.255.13
120        0    BGP a0ce.c8fb.4677          10.103.120.15
V:200120 10.103.255.14
120        0    BGP a0ce.c8fb.467f          10.103.120.12
V:200120 10.103.255.11
120        0 L2VPN a0ce.c8fb.4687          10.103.120.14
Gi1/0/47:120
120        0    BGP a0ce.c8fb.4689          10.103.120.23
V:200120 10.103.255.13
120        0    BGP a0ce.c8fb.47a7          10.103.120.16
V:200120 10.103.255.13
120        0 L2VPN a0ce.c8fb.47b7          10.103.120.13
Gi1/0/47:120
120        0 L2VPN a0ce.c8fb.47dc          10.103.120.11
Gi1/0/48:120

```

NYC103-Leaf-02#show ip bgp vpnv4 vrf campus

BGP table version is 114, local router ID is 10.103.255.12

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 65106:12 (default for vrf campus)					
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 3/1000					
* i 0.0.0.0	10.103.255.4	0	100	0	65102 65100 65101 ?
*>i	10.103.255.3	0	100	0	65102 65100 65101 ?
* i 10.103.64.0/24	10.103.255.14	0	100	0	?
* i	10.103.255.11	0	100	0	?
* i	10.103.255.13	0	100	0	?
*>	0.0.0.0	0		32768	?
*>i 10.103.64.0/18	10.103.255.3	0	100	0	i
* i	10.103.255.4	0	100	0	i
*>i 10.103.64.15/32	10.103.255.11	0	100	0	?
*>i 10.103.64.19/32	10.103.255.11	0	100	0	?


```

*>i 10.103.64.20/32 10.103.255.13 0 100 0 ?
*>i 10.103.64.26/32 10.103.255.14 0 100 0 ?
*>i 10.103.64.28/32 10.103.255.14 0 100 0 ?
* i 10.103.120.0/24 10.103.255.14 0 100 0 ?
* i 10.103.255.11 0 100 0 ?
* i 10.103.255.13 0 100 0 ?
*> 0.0.0.0 0 32768 ?
*>i 10.103.120.12/32 10.103.255.11 0 100 0 ?
*>i 10.103.120.15/32 10.103.255.14 0 100 0 ?
*>i 10.103.120.16/32 10.103.255.13 0 100 0 ?
*>i 10.103.120.23/32 10.103.255.13 0 100 0 ?
*>i 10.103.128.0/18 10.103.255.3 0 100 0 i
* i 10.103.255.4 0 100 0 i
* i 10.103.180.0/24 10.103.255.14 0 100 0 ?
* i 10.103.255.11 0 100 0 ?
* i 10.103.255.13 0 100 0 ?
*> 0.0.0.0 0 32768 ?

```

NYC103-Leaf-02#show ip bgp vpnv4 vrf campus 0.0.0.0/0

BGP routing table entry for 65106:12:0.0.0.0/0, version 25

Paths: (2 available, best #2, table campus)

Not advertised to any peer

Refresh Epoch 1

65102 65100 65101, imported path from [5][65106:4][0][0][0.0.0.0]/17 (global)

10.103.255.4 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)

Origin incomplete, metric 0, localpref 100, valid, internal

Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672

Originator: 10.103.255.4, Cluster list: 10.103.255.1

Local vxlan vtep:

vrf:campus, vni:303001

local router mac:648F.3E3F.1472

encap:1

vtep-ip:10.103.255.12

bdi:Vlan3001

Remote VxLAN:

Topoid 0x2(vrf campus)

Remote Router MAC:3488.1824.7672

Encap 8

Egress VNI 303001

RTEP 10.103.255.4

rx pathid: 0, tx pathid: 0

Updated on Jul 7 2024 14:18:33 EDT

Refresh Epoch 1

65102 65100 65101, imported path from [5][65106:3][0][0][0.0.0.0]/17 (global)

10.103.255.3 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)

Origin incomplete, metric 0, localpref 100, valid, internal, best

Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2

Originator: 10.103.255.3, Cluster list: 10.103.255.1

Local vxlan vtep:

vrf:campus, vni:303001
local router mac:648F.3E3F.1472
encap:1
vtep-ip:10.103.255.12
bdi:Vlan3001

Remote VxLAN:

Topoid 0x2(vrf campus)
Remote Router MAC:246C.847E.E0F2
Encap 8
Egress VNI 303001
RTEP 10.103.255.3

rx pathid: 0, tx pathid: 0x0

Updated on Jul 7 2024 14:18:33 EDT

NYC103-Leaf-02#show ip route vrf campus

Routing Table: campus

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PfR
& - replicated local route overrides by connected

Gateway of last resort is 10.103.255.3 to network 0.0.0.0

B* 0.0.0.0/0 [200/0] via 10.103.255.3, 1w2d, Vlan3001
10.0.0.0/8 is variably subnetted, 25 subnets, 3 masks
B 10.103.64.0/18 [200/0] via 10.103.255.3, 1w2d, Vlan3001
C 10.103.64.0/24 is directly connected, Vlan1
L 10.103.64.1/32 is directly connected, Vlan1
S 10.103.64.11/32 is directly connected, Vlan1
S 10.103.64.12/32 is directly connected, Vlan1
S 10.103.64.13/32 is directly connected, Vlan1
S 10.103.64.14/32 is directly connected, Vlan1
B 10.103.64.15/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
S 10.103.64.17/32 is directly connected, Vlan1
B 10.103.64.19/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
B 10.103.64.20/32 [200/0] via 10.103.255.13, 1w1d, Vlan3001
B 10.103.64.26/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
B 10.103.64.28/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001

```
C      10.103.120.0/24 is directly connected, Vlan120
L      10.103.120.1/32 is directly connected, Vlan120
S      10.103.120.11/32 is directly connected, Vlan120
B      10.103.120.12/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
S      10.103.120.13/32 is directly connected, Vlan120
S      10.103.120.14/32 is directly connected, Vlan120
B      10.103.120.15/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
B      10.103.120.16/32 [200/0] via 10.103.255.13, 1w2d, Vlan3001
B      10.103.120.23/32 [200/0] via 10.103.255.13, 1w2d, Vlan3001
B      10.103.128.0/18 [200/0] via 10.103.255.3, 1w2d, Vlan3001
C      10.103.180.0/24 is directly connected, Vlan180
L      10.103.180.1/32 is directly connected, Vlan180
NYC103-Leaf-02#show ip bgp vpnv4 vrf guest
BGP table version is 114, local router ID is 10.103.255.12
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

      Network          Next Hop          Metric LocPrf Weight Path
Route Distinguisher: 65106:212 (default for vrf guest)
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 1/1000
* i  0.0.0.0           10.103.255.4           0    100      0 65102 65100 65100 65100 65100 i
*>i           10.103.255.3           0    100      0 65102 65100 65100 65100 65100 i
*>i 10.103.64.8/30     10.103.255.3           0    100      0 i
*>i 10.103.64.12/30    10.103.255.4           0    100      0 i
* i  10.103.220.0/24   10.103.255.14          0    100      0 ?
* i           10.103.255.11          0    100      0 ?
* i           10.103.255.13          0    100      0 ?
*>           0.0.0.0           0          32768 ?
NYC103-Leaf-02#show ip bgp vpnv4 vrf guest 0.0.0.0/0
BGP routing table entry for 65106:212:0.0.0.0/0, version 27
Paths: (2 available, best #2, table guest)
Not advertised to any peer
Refresh Epoch 1
65102 65100 65100 65100 65100, imported path from [5][65106:24][0][0][0.0.0.0]/17 (global)
10.103.255.4 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)
Origin IGP, metric 0, localpref 100, valid, internal
Extended Community: RT:65106:2 ENCAP:8 Router MAC:3488.1824.764B
Originator: 10.103.255.4, Cluster list: 10.103.255.1
Local vxlan vtep:
  vrf:guest, vni:303002
  local router mac:648F.3E3F.144B
  encap:1
  vtep-ip:10.103.255.12
```

```

bdi:Vlan3002
Remote VxLAN:
  Topoid 0x3(vrf guest)
  Remote Router MAC:3488.1824.764B
  Encap 8
  Egress VNI 303002
  RTEP 10.103.255.4
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:18:33 EDT
Refresh Epoch 1
65102 65100 65100 65100 65100, imported path from [5][65106:23][0][0][0.0.0.0]/17 (global)
10.103.255.3 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)
  Origin IGP, metric 0, localpref 100, valid, internal, best
  Extended Community: RT:65106:2 ENCAP:8 Router MAC:246C.847E.E0CB
  Originator: 10.103.255.3, Cluster list: 10.103.255.1
Local vxlan vtep:
  vrf:guest, vni:303002
  local router mac:648F.3E3F.144B
  encap:1
  vtep-ip:10.103.255.12
  bdi:Vlan3002
Remote VxLAN:
  Topoid 0x3(vrf guest)
  Remote Router MAC:246C.847E.E0CB
  Encap 8
  Egress VNI 303002
  RTEP 10.103.255.3
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:18:33 EDT
NYC103-Leaf-02#show ip route vrf guest

Routing Table: guest
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
       & - replicated local route overrides by connected

Gateway of last resort is 10.103.255.3 to network 0.0.0.0

```

```
B* 0.0.0.0/0 [200/0] via 10.103.255.3, 1w2d, Vlan3002
    10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
B   10.103.64.8/30 [200/0] via 10.103.255.3, 1w2d, Vlan3002
B   10.103.64.12/30 [200/0] via 10.103.255.4, 1w2d, Vlan3002
C   10.103.220.0/24 is directly connected, Vlan220
L   10.103.220.1/32 is directly connected, Vlan220
NYC103-Leaf-02#
```

NYC103-Leaf-03

```
NYC103-Leaf-03#show mac address-table dynamic
      Mac Address Table
```

Vlan	Mac Address	Type	Ports
----	-----	-----	-----
1	c4d6.66d9.3140	DYNAMIC	Gi1/0/48
120	a0ce.c8fb.4689	DYNAMIC	Gi1/0/13
120	a0ce.c8fb.47a7	DYNAMIC	Gi1/0/12

Total Mac Addresses for this criterion: 3

```
NYC103-Leaf-03#show l2route evpn mac ip
```

EVI	ETag	Prod	Mac Address	Host IP
Next Hop(s)				
-----	-----	-----	-----	-----
1	0	BGP	8c44.a571.8300	10.103.64.15
V:200001 10.103.255.11				
1	0	BGP	9433.d807.8547	10.103.64.26
V:200001 10.103.255.14				
1	0	BGP	a0bc.6fd6.7b00	10.103.64.12
V:200001 10.103.255.12				
1	0	BGP	a0bc.6fe2.8b80	10.103.64.11
V:200001 10.103.255.12				
1	0	BGP	a0bc.6fe2.8f00	10.103.64.13
V:200001 10.103.255.12				
1	0	BGP	a0ce.c8fb.4677	10.103.120.15
V:200120 10.103.255.14				
1	0	BGP	a0ce.c8fb.467f	10.103.120.12
V:200120 10.103.255.11				
1	0	BGP	a0ce.c8fb.4687	10.103.120.14
V:200120 10.103.255.12				
1	0	BGP	a0ce.c8fb.47b7	10.103.120.13
V:200120 10.103.255.12				
1	0	BGP	a0ce.c8fb.47dc	10.103.120.11
V:200120 10.103.255.12				
1	0	BGP	c414.a202.89a0	10.103.64.19
V:200001 10.103.255.11				
1	0	BGP	c4d6.664f.55b0	10.103.64.17
V:200001 10.103.255.12				
1	0	BGP	c4d6.666d.0f80	10.103.64.28
V:200001 10.103.255.14				
1	0	BGP	c4d6.666d.2e10	10.103.64.14
V:200001 10.103.255.12				

```

1          0 L2VPN c4d6.66d9.3140          10.103.64.20
Gi1/0/48:1
120        0 BGP a0ce.c8fb.4677          10.103.120.15
V:200120 10.103.255.14
120        0 BGP a0ce.c8fb.467f          10.103.120.12
V:200120 10.103.255.11
120        0 BGP a0ce.c8fb.4687          10.103.120.14
V:200120 10.103.255.12
120        0 L2VPN a0ce.c8fb.4689          10.103.120.23
Gi1/0/13:120
120        0 L2VPN a0ce.c8fb.47a7          10.103.120.16
Gi1/0/12:120
120        0 BGP a0ce.c8fb.47b7          10.103.120.13
V:200120 10.103.255.12
120        0 BGP a0ce.c8fb.47dc          10.103.120.11
V:200120 10.103.255.12

```

```

NYC103-Leaf-03#show ip bgp vpnv4 vrf campus
BGP table version is 124, local router ID is 10.103.255.13
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

```

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 65106:13 (default for vrf campus)					
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 3/1000					
* i 0.0.0.0	10.103.255.4	0	100	0	65102 65100 65101 ?
*>i	10.103.255.3	0	100	0	65102 65100 65101 ?
* i 10.103.64.0/24	10.103.255.14	0	100	0	?
* i	10.103.255.11	0	100	0	?
* i	10.103.255.12	0	100	0	?
*>	0.0.0.0	0		32768	?
*>i 10.103.64.0/18	10.103.255.3	0	100	0	i
* i	10.103.255.4	0	100	0	i
*>i 10.103.64.11/32	10.103.255.12	0	100	0	?
*>i 10.103.64.12/32	10.103.255.12	0	100	0	?
*>i 10.103.64.13/32	10.103.255.12	0	100	0	?
*>i 10.103.64.14/32	10.103.255.12	0	100	0	?
*>i 10.103.64.15/32	10.103.255.11	0	100	0	?
*>i 10.103.64.17/32	10.103.255.12	0	100	0	?
*>i 10.103.64.19/32	10.103.255.11	0	100	0	?
*>i 10.103.64.26/32	10.103.255.14	0	100	0	?
*>i 10.103.64.28/32	10.103.255.14	0	100	0	?
* i 10.103.120.0/24	10.103.255.14	0	100	0	?
* i	10.103.255.11	0	100	0	?
* i	10.103.255.12	0	100	0	?

```

*>                0.0.0.0                0                32768 ?
*>i 10.103.120.11/32 10.103.255.12        0        100        0 ?
*>i 10.103.120.12/32 10.103.255.11        0        100        0 ?
*>i 10.103.120.13/32 10.103.255.12        0        100        0 ?
*>i 10.103.120.14/32 10.103.255.12        0        100        0 ?
*>i 10.103.120.15/32 10.103.255.14        0        100        0 ?
*>i 10.103.128.0/18  10.103.255.3         0        100        0 i
* i                10.103.255.4           0        100        0 i
* i 10.103.180.0/24 10.103.255.14         0        100        0 ?
* i                10.103.255.11          0        100        0 ?
* i                10.103.255.12          0        100        0 ?
*>                0.0.0.0                0                32768 ?

```

NYC103-Leaf-03#show ip bgp vpnv4 vrf campus 0.0.0.0/0

BGP routing table entry for 65106:13:0.0.0.0/0, version 25

Paths: (2 available, best #2, table campus)

Not advertised to any peer

Refresh Epoch 1

65102 65100 65101, imported path from [5][65106:4][0][0][0.0.0.0]/17 (global)

10.103.255.4 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)

Origin incomplete, metric 0, localpref 100, valid, internal

Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672

Originator: 10.103.255.4, Cluster list: 10.103.255.1

Local vxlan vtep:

vrf:campus, vni:303001

local router mac:246C.847E.B272

encap:1

vtep-ip:10.103.255.13

bdi:Vlan3001

Remote VxLAN:

Topoid 0x2(vrf campus)

Remote Router MAC:3488.1824.7672

Encap 8

Egress VNI 303001

RTEP 10.103.255.4

rx pathid: 0, tx pathid: 0

Updated on Jul 7 2024 14:18:34 EDT

Refresh Epoch 1

65102 65100 65101, imported path from [5][65106:3][0][0][0.0.0.0]/17 (global)

10.103.255.3 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)

Origin incomplete, metric 0, localpref 100, valid, internal, best

Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2

Originator: 10.103.255.3, Cluster list: 10.103.255.1

Local vxlan vtep:

vrf:campus, vni:303001

local router mac:246C.847E.B272

encap:1

vtep-ip:10.103.255.13

```
bdi:Vlan3001
Remote VxLAN:
  Topoid 0x2(vrf campus)
  Remote Router MAC:246C.847E.E0F2
  Encap 8
  Egress VNI 303001
  RTEP 10.103.255.3
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:18:34 EDT
NYC103-Leaf-03#show ip route vrf campus
```

Routing Table: campus

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PfR
& - replicated local route overrides by connected

Gateway of last resort is 10.103.255.3 to network 0.0.0.0

```
B* 0.0.0.0/0 [200/0] via 10.103.255.3, 1w2d, Vlan3001
    10.0.0.0/8 is variably subnetted, 25 subnets, 3 masks
B   10.103.64.0/18 [200/0] via 10.103.255.3, 1w2d, Vlan3001
C   10.103.64.0/24 is directly connected, Vlan1
L   10.103.64.1/32 is directly connected, Vlan1
B   10.103.64.11/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.64.12/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.64.13/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.64.14/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.64.15/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
B   10.103.64.17/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.64.19/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
S   10.103.64.20/32 is directly connected, Vlan1
B   10.103.64.26/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
B   10.103.64.28/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
C   10.103.120.0/24 is directly connected, Vlan120
L   10.103.120.1/32 is directly connected, Vlan120
B   10.103.120.11/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.120.12/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
B   10.103.120.13/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
```



```
B      10.103.120.14/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B      10.103.120.15/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
S      10.103.120.16/32 is directly connected, Vlan120
S      10.103.120.23/32 is directly connected, Vlan120
B      10.103.128.0/18 [200/0] via 10.103.255.3, 1w2d, Vlan3001
C      10.103.180.0/24 is directly connected, Vlan180
L      10.103.180.1/32 is directly connected, Vlan180
NYC103-Leaf-03#show ip bgp vpnv4 vrf guest
BGP table version is 124, local router ID is 10.103.255.13
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found
```

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 65106:213 (default for vrf guest)					
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 1/1000					
* i 0.0.0.0	10.103.255.4	0	100	0	65102 65100 65100 65100 65100 i
*>i	10.103.255.3	0	100	0	65102 65100 65100 65100 65100 i
*>i 10.103.64.8/30	10.103.255.3	0	100	0	i
*>i 10.103.64.12/30	10.103.255.4	0	100	0	i
* i 10.103.220.0/24	10.103.255.14	0	100	0	?
* i	10.103.255.11	0	100	0	?
* i	10.103.255.12	0	100	0	?
*>	0.0.0.0	0		32768	?

```
NYC103-Leaf-03#show ip bgp vpnv4 vrf guest 0.0.0.0/0
BGP routing table entry for 65106:213:0.0.0.0/0, version 27
Paths: (2 available, best #2, table guest)
Not advertised to any peer
Refresh Epoch 1
65102 65100 65100 65100 65100, imported path from [5][65106:24][0][0][0.0.0.0]/17 (global)
10.103.255.4 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)
Origin IGP, metric 0, localpref 100, valid, internal
Extended Community: RT:65106:2 ENCAP:8 Router MAC:3488.1824.764B
Originator: 10.103.255.4, Cluster list: 10.103.255.1
Local vxlan vtep:
  vrf:guest, vni:303002
  local router mac:246C.847E.B24B
  encap:1
  vtep-ip:10.103.255.13
  bdi:Vlan3002
Remote VxLAN:
  Topoid 0x3(vrf guest)
  Remote Router MAC:3488.1824.764B
  Encap 8
```

```

Egress VNI 303002
RTEP 10.103.255.4
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:18:34 EDT
Refresh Epoch 1
65102 65100 65100 65100 65100, imported path from [5][65106:23][0][0][0.0.0.0]/17 (global)
10.103.255.3 (metric 103) (via default) from 10.103.255.1 (10.103.255.1)
Origin IGP, metric 0, localpref 100, valid, internal, best
Extended Community: RT:65106:2 ENCAP:8 Router MAC:246C.847E.E0CB
Originator: 10.103.255.3, Cluster list: 10.103.255.1
Local vxlan vtep:
  vrf:guest, vni:303002
  local router mac:246C.847E.B24B
  encap:1
  vtep-ip:10.103.255.13
  bdi:Vlan3002
Remote VxLAN:
  Topoid 0x3(vrf guest)
  Remote Router MAC:246C.847E.E0CB
  Encap 8
  Egress VNI 303002
  RTEP 10.103.255.3
  rx pathid: 0, tx pathid: 0x0
  Updated on Jul 7 2024 14:18:34 EDT
NYC103-Leaf-03#show ip route vrf guest

```

Routing Table: guest

```

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
       & - replicated local route overrides by connected

```

Gateway of last resort is 10.103.255.3 to network 0.0.0.0

```

B*    0.0.0.0/0 [200/0] via 10.103.255.3, 1w2d, Vlan3002
      10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
B      10.103.64.8/30 [200/0] via 10.103.255.3, 1w2d, Vlan3002
B      10.103.64.12/30 [200/0] via 10.103.255.4, 1w2d, Vlan3002
C      10.103.220.0/24 is directly connected, Vlan220

```

L 10.103.220.1/32 is directly connected, Vlan220
NYC103-Leaf-03#

NYC103-Leaf-04

NYC103-Leaf-04#show mac address-table dynamic
Mac Address Table

Vlan	Mac Address	Type	Ports
1	9433.d807.8517	DYNAMIC	Po1
1	9433.d807.8518	DYNAMIC	Po1
1	9433.d807.8547	DYNAMIC	Po1
1	c4d6.666d.0f80	DYNAMIC	Po1
120	a0ce.c8fb.4677	DYNAMIC	Po1

Total Mac Addresses for this criterion: 5

NYC103-Leaf-04#show l2route evpn mac ip

EVI	ETag	Prod	Mac Address	Host IP
Next Hop(s)				
1	0	BGP	8c44.a571.8300	10.103.64.15
V:200001 10.103.255.11				
1	0	L2VPN	9433.d807.8547	10.103.64.26
Po1:1				
1	0	BGP	a0bc.6fd6.7b00	10.103.64.12
V:200001 10.103.255.12				
1	0	BGP	a0bc.6fe2.8b80	10.103.64.11
V:200001 10.103.255.12				
1	0	BGP	a0bc.6fe2.8f00	10.103.64.13
V:200001 10.103.255.12				
1	0	BGP	a0ce.c8fb.467f	10.103.120.12
V:200120 10.103.255.11				
1	0	BGP	a0ce.c8fb.4687	10.103.120.14
V:200120 10.103.255.12				
1	0	BGP	a0ce.c8fb.4689	10.103.120.23
V:200120 10.103.255.13				
1	0	BGP	a0ce.c8fb.47a7	10.103.120.16
V:200120 10.103.255.13				
1	0	BGP	a0ce.c8fb.47b7	10.103.120.13
V:200120 10.103.255.12				
1	0	BGP	a0ce.c8fb.47dc	10.103.120.11
V:200120 10.103.255.12				
1	0	BGP	c414.a202.89a0	10.103.64.19
V:200001 10.103.255.11				
1	0	BGP	c4d6.664f.55b0	10.103.64.17
V:200001 10.103.255.12				
1	0	L2VPN	c4d6.666d.0f80	10.103.64.28
Po1:1				
1	0	BGP	c4d6.666d.2e10	10.103.64.14
V:200001 10.103.255.12				
1	0	BGP	c4d6.66d9.3140	10.103.64.20
V:200001 10.103.255.13				

```

120          0 L2VPN a0ce.c8fb.4677          10.103.120.15
Po1:120
120          0 BGP a0ce.c8fb.467f          10.103.120.12
V:200120 10.103.255.11
120          0 BGP a0ce.c8fb.4687          10.103.120.14
V:200120 10.103.255.12
120          0 BGP a0ce.c8fb.4689          10.103.120.23
V:200120 10.103.255.13
120          0 BGP a0ce.c8fb.47a7          10.103.120.16
V:200120 10.103.255.13
120          0 BGP a0ce.c8fb.47b7          10.103.120.13
V:200120 10.103.255.12
120          0 BGP a0ce.c8fb.47dc          10.103.120.11
V:200120 10.103.255.12

```

NYC103-Leaf-04#show ip bgp vpnv4 vrf campus

BGP table version is 68, local router ID is 10.103.255.14

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 65106:14 (default for vrf campus)					
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 3/1000					
* i 0.0.0.0	10.103.255.4	0	100	0	65102 65100 65101 ?
*>i	10.103.255.3	0	100	0	65102 65100 65101 ?
* i 10.103.64.0/24	10.103.255.13	0	100	0	?
* i	10.103.255.12	0	100	0	?
* i	10.103.255.11	0	100	0	?
*>	0.0.0.0	0		32768	?
* i 10.103.64.0/18	10.103.255.4	0	100	0	i
*>i	10.103.255.3	0	100	0	i
*>i 10.103.64.11/32	10.103.255.12	0	100	0	?
*>i 10.103.64.12/32	10.103.255.12	0	100	0	?
*>i 10.103.64.13/32	10.103.255.12	0	100	0	?
*>i 10.103.64.14/32	10.103.255.12	0	100	0	?
*>i 10.103.64.15/32	10.103.255.11	0	100	0	?
*>i 10.103.64.17/32	10.103.255.12	0	100	0	?
*>i 10.103.64.19/32	10.103.255.11	0	100	0	?
*>i 10.103.64.20/32	10.103.255.13	0	100	0	?
* i 10.103.120.0/24	10.103.255.13	0	100	0	?
* i	10.103.255.12	0	100	0	?
* i	10.103.255.11	0	100	0	?
*>	0.0.0.0	0		32768	?
*>i 10.103.120.11/32	10.103.255.12	0	100	0	?
*>i 10.103.120.12/32	10.103.255.11	0	100	0	?

```

*>i 10.103.120.13/32 10.103.255.12      0    100    0 ?
*>i 10.103.120.14/32 10.103.255.12      0    100    0 ?
*>i 10.103.120.16/32 10.103.255.13      0    100    0 ?
*>i 10.103.120.23/32 10.103.255.13      0    100    0 ?
* i 10.103.128.0/18 10.103.255.4        0    100    0 i
*>i          10.103.255.3                0    100    0 i
* i 10.103.180.0/24 10.103.255.13      0    100    0 ?
* i          10.103.255.12                0    100    0 ?
* i          10.103.255.11                0    100    0 ?
*>          0.0.0.0                      0          32768 ?

```

```

NYC103-Leaf-04#show ip bgp vpnv4 vrf campus 0.0.0.0/0
BGP routing table entry for 65106:14:0.0.0.0/0, version 23
Paths: (2 available, best #2, table campus)

```

```

Not advertised to any peer
Refresh Epoch 1
65102 65100 65101, imported path from [5][65106:4][0][0][0.0.0.0]/17 (global)
10.103.255.4 (metric 7) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal
Extended Community: RT:65106:1 ENCAP:8 Router MAC:3488.1824.7672
Originator: 10.103.255.4, Cluster list: 10.103.255.1
Local vxlan vtep:
vrf:campus, vni:303001
local router mac:242A.0490.E772
encap:1
vtep-ip:10.103.255.14
bdi:Vlan3001
Remote VxLAN:
Topoid 0x2(vrf campus)
Remote Router MAC:3488.1824.7672
Encap 8
Egress VNI 303001
RTEP 10.103.255.4
rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:18:34 EDT

```

```

Refresh Epoch 1
65102 65100 65101, imported path from [5][65106:3][0][0][0.0.0.0]/17 (global)
10.103.255.3 (metric 7) (via default) from 10.103.255.1 (10.103.255.1)
Origin incomplete, metric 0, localpref 100, valid, internal, best
Extended Community: RT:65106:1 ENCAP:8 Router MAC:246C.847E.E0F2
Originator: 10.103.255.3, Cluster list: 10.103.255.1
Local vxlan vtep:
vrf:campus, vni:303001
local router mac:242A.0490.E772
encap:1
vtep-ip:10.103.255.14
bdi:Vlan3001
Remote VxLAN:

```

```
Topoid 0x2(vrf campus)
Remote Router MAC:246C.847E.E0F2
Encap 8
Egress VNI 303001
RTEP 10.103.255.3
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:18:34 EDT
NYC103-Leaf-04#show ip route vrf campus
```

Routing Table: campus

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PfR
& - replicated local route overrides by connected

Gateway of last resort is 10.103.255.3 to network 0.0.0.0

```
B* 0.0.0.0/0 [200/0] via 10.103.255.3, 1w2d, Vlan3001
    10.0.0.0/8 is variably subnetted, 25 subnets, 3 masks
B   10.103.64.0/18 [200/0] via 10.103.255.3, 1w2d, Vlan3001
C   10.103.64.0/24 is directly connected, Vlan1
L   10.103.64.1/32 is directly connected, Vlan1
B   10.103.64.11/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.64.12/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.64.13/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.64.14/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.64.15/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
B   10.103.64.17/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.64.19/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
B   10.103.64.20/32 [200/0] via 10.103.255.13, 1w1d, Vlan3001
S   10.103.64.26/32 is directly connected, Vlan1
S   10.103.64.28/32 is directly connected, Vlan1
C   10.103.120.0/24 is directly connected, Vlan120
L   10.103.120.1/32 is directly connected, Vlan120
B   10.103.120.11/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.120.12/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
B   10.103.120.13/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B   10.103.120.14/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
S   10.103.120.15/32 is directly connected, Vlan120
```

```
B      10.103.120.16/32 [200/0] via 10.103.255.13, 1w2d, Vlan3001
B      10.103.120.23/32 [200/0] via 10.103.255.13, 1w2d, Vlan3001
B      10.103.128.0/18 [200/0] via 10.103.255.3, 1w2d, Vlan3001
C      10.103.180.0/24 is directly connected, Vlan180
L      10.103.180.1/32 is directly connected, Vlan180
NYC103-Leaf-04#show ip bgp vpnv4 vrf guest
BGP table version is 68, local router ID is 10.103.255.14
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

      Network          Next Hop          Metric LocPrf Weight Path
Route Distinguisher: 65106:214 (default for vrf guest)
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 1/1000
* i  0.0.0.0           10.103.255.4           0      100      0 65102 65100 65100 65100 65100 i
*>i           10.103.255.3           0      100      0 65102 65100 65100 65100 65100 i
*>i 10.103.64.8/30     10.103.255.3           0      100      0 i
*>i 10.103.64.12/30    10.103.255.4           0      100      0 i
* i  10.103.220.0/24   10.103.255.13          0      100      0 ?
* i           10.103.255.12          0      100      0 ?
* i           10.103.255.11          0      100      0 ?
*>           0.0.0.0           0           32768 ?
NYC103-Leaf-04#show ip bgp vpnv4 vrf guest 0.0.0.0/0
BGP routing table entry for 65106:214:0.0.0.0/0, version 25
Paths: (2 available, best #2, table guest)
  Not advertised to any peer
  Refresh Epoch 1
  65102 65100 65100 65100 65100, imported path from [5][65106:24][0][0][0.0.0.0]/17 (global)
    10.103.255.4 (metric 7) (via default) from 10.103.255.1 (10.103.255.1)
      Origin IGP, metric 0, localpref 100, valid, internal
      Extended Community: RT:65106:2 ENCAP:8 Router MAC:3488.1824.764B
      Originator: 10.103.255.4, Cluster list: 10.103.255.1
      Local vxlan vtep:
        vrf:guest, vni:303002
        local router mac:242A.0490.E74B
        encap:1
        vtep-ip:10.103.255.14
        bdi:Vlan3002
      Remote VxLAN:
        Topoid 0x3(vrf guest)
        Remote Router MAC:3488.1824.764B
        Encap 8
        Egress VNI 303002
        RTEP 10.103.255.4
```

```

rx pathid: 0, tx pathid: 0
Updated on Jul 7 2024 14:18:34 EDT
Refresh Epoch 1
65102 65100 65100 65100 65100, imported path from [5][65106:23][0][0][0.0.0.0]/17 (global)
10.103.255.3 (metric 7) (via default) from 10.103.255.1 (10.103.255.1)
Origin IGP, metric 0, localpref 100, valid, internal, best
Extended Community: RT:65106:2 ENCAP:8 Router MAC:246C.847E.E0CB
Originator: 10.103.255.3, Cluster list: 10.103.255.1
Local vxlan vtep:
  vrf:guest, vni:303002
  local router mac:242A.0490.E74B
  encap:1
  vtep-ip:10.103.255.14
  bdi:Vlan3002
Remote VxLAN:
  Topoid 0x3(vrf guest)
  Remote Router MAC:246C.847E.E0CB
  Encap 8
  Egress VNI 303002
  RTEP 10.103.255.3
rx pathid: 0, tx pathid: 0x0
Updated on Jul 7 2024 14:18:34 EDT
NYC103-Leaf-04#show ip route vrf guest

```

Routing Table: guest

```

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
       & - replicated local route overrides by connected

```

Gateway of last resort is 10.103.255.3 to network 0.0.0.0

```

B*    0.0.0.0/0 [200/0] via 10.103.255.3, 1w2d, Vlan3002
      10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
B      10.103.64.8/30 [200/0] via 10.103.255.3, 1w2d, Vlan3002
B      10.103.64.12/30 [200/0] via 10.103.255.4, 1w2d, Vlan3002
C      10.103.220.0/24 is directly connected, Vlan220
L      10.103.220.1/32 is directly connected, Vlan220
NYC103-Leaf-04#

```


Border Switches (VLANs, VRFs, NVE1)

NYC103-Border-01

NYC103-Border-01#show vlan

VLAN Name	Status	Ports
1 default	active	Gi1/0/3, Gi1/0/4, Gi1/0/5, Gi1/0/6, Gi1/0/7, Gi1/0/8, Gi1/0/9, Gi1/0/10, Gi1/0/11, Gi1/0/12, Gi1/0/13, Gi1/0/14, Gi1/0/15, Gi1/0/16, Gi1/0/17, Gi1/0/18, Gi1/0/19, Gi1/0/20, Gi1/0/21, Gi1/0/22, Gi1/0/23, Gi1/0/24, Gi1/0/25, Gi1/0/26, Gi1/0/27, Gi1/0/28, Gi1/0/29, Gi1/0/30, Gi1/0/31, Gi1/0/32, Gi1/0/33, Gi1/0/34, Gi1/0/35, Gi1/0/36, Gi1/0/37, Gi1/0/38, Gi1/0/39, Gi1/0/40, Gi1/0/41, Gi1/0/42, Gi1/0/43, Gi1/0/44, Gi1/0/45, Gi1/0/46, Gi1/0/47, Gi1/0/48, Ap1/0/1
1002 fddi-default	act/unsup	
1003 token-ring-default	act/unsup	
1004 fddinet-default	act/unsup	
1005 trnet-default	act/unsup	
3001 Campus-VRF-L3VNI	active	
3002 Guest-VRF-L3VNI	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0
3001	enet	103001	1500	-	-	-	-	-	0	0
3002	enet	103002	1500	-	-	-	-	-	0	0

Remote SPAN VLANs

Primary	Secondary	Type	Ports

NYC103-Border-01#show vrf

Name	Default RD	Protocols	Interfaces
Mgmt-vrf	<not set>	ipv4,ipv6	Gi0/0
campus	65106:3	ipv4	Gi1/0/2.3001 Vl3001
guest	65106:23	ipv4	Gi1/0/2.3002 Vl3002

NYC103-Border-01#

NYC103-Border-01#sh run int nve1

Building configuration...

Current configuration : 217 bytes

```
!  
interface nve1  
  description Network Virtualization Endpoint for encap-decap  
  no ip address  
  source-interface Loopback0  
  host-reachability protocol bgp  
  member vni 303001 vrf campus  
  member vni 303002 vrf guest  
end
```

NYC103-Border-01#

NYC103-Border-02

NYC103-Border-02#show vlan

VLAN Name	Status	Ports
-----	-----	-----
1 default	active	Gi1/0/3, Gi1/0/4, Gi1/0/5, Gi1/0/6, Gi1/0/7, Gi1/0/8, Gi1/0/9, Gi1/0/10, Gi1/0/11, Gi1/0/12, Gi1/0/13, Gi1/0/14, Gi1/0/15, Gi1/0/16, Gi1/0/17, Gi1/0/18, Gi1/0/19, Gi1/0/20, Gi1/0/21, Gi1/0/22, Gi1/0/23, Gi1/0/24, Gi1/0/25, Gi1/0/26, Gi1/0/27, Gi1/0/28, Gi1/0/29, Gi1/0/30, Gi1/0/31, Gi1/0/32, Gi1/0/33, Gi1/0/34, Gi1/0/35, Gi1/0/36, Gi1/0/37, Gi1/0/38, Gi1/0/39, Gi1/0/40, Gi1/0/41, Gi1/0/42, Gi1/0/43, Gi1/0/44, Gi1/0/45, Gi1/0/46, Gi1/0/47, Gi1/0/48, Ap1/0/1
1002 fddi-default	act/unsup	
1003 token-ring-default	act/unsup	
1004 fddinet-default	act/unsup	
1005 trnet-default	act/unsup	
3001 Campus-VRF-L3VNI	active	
3002 Guest-VRF-L3VNI	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1	enet	100001	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0
3001	enet	103001	1500	-	-	-	-	-	0	0
3002	enet	103002	1500	-	-	-	-	-	0	0

Remote SPAN VLANs

Primary	Secondary	Type	Ports
-----	-----	-----	-----

NYC103-Border-02#show vrf

Name	Default RD	Protocols	Interfaces
Mgmt-vrf	<not set>	ipv4,ipv6	Gi0/0
campus	65106:4	ipv4	Gi1/0/2.3001 Vl3001
guest	65106:24	ipv4	Gi1/0/2.3002 Vl3002

NYC103-Border-02#

NYC103-Border-02#sh run int nve1

Building configuration...

Current configuration : 217 bytes

!

```
interface nve1
  description Network Virtualization Endpoint for encap-decap
  no ip address
  source-interface Loopback0
  host-reachability protocol bgp
  member vni 303001 vrf campus
  member vni 303002 vrf guest
end
```

NYC103-Border-02#

Border Switches (BGP GRT, VPNV4)

NYC103-Border-01

NYC103-Border-01#show ip bgp summary

```
BGP router identifier 10.103.255.3, local AS number 65106
BGP table version is 8, main routing table version 8
5 network entries using 1240 bytes of memory
5 path entries using 680 bytes of memory
3/3 BGP path/bestpath attribute entries using 888 bytes of memory
10 BGP rrinfo entries using 400 bytes of memory
3 BGP AS-PATH entries using 104 bytes of memory
18 BGP extended community entries using 768 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 4080 total bytes of memory
BGP activity 138/62 prefixes, 280/150 paths, scan interval 60 secs
5 networks peaked at 14:07:09 Jul 7 2024 EDT (1w2d ago)
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.103.224.1	4	65100	14658	14651	8	0	0	1w2d	1

NYC103-Border-01#show ip bgp neighbors

```
BGP neighbor is 10.103.224.1, remote AS 65100, external link
  Fall over configured for session
```

```

BFD is configured. BFD peer is Up. Using BFD to detect fast fallover (single-hop).
BGP version 4, remote router ID 10.100.255.11
BGP state = Established, up for 1w2d
Last read 00:00:14, last write 00:00:45, hold time is 180, keepalive interval is 60 seconds
Last update received: 1w2d
Neighbor sessions:
  1 active, is not multisession capable (disabled)
Neighbor capabilities:
  Route refresh: advertised and received(new)
  Four-octets ASN Capability: advertised and received
  Address family IPv4 Unicast: advertised and received
  Enhanced Refresh Capability: advertised and received
  Multisession Capability:
  Stateful switchover support enabled: NO for session 1
Message statistics:
  InQ depth is 0
  OutQ depth is 0

      Sent      Rcvd
Opens:          1          1
Notifications:  0          0
Updates:        2          2
Keepalives:    14648      14655
Route Refresh:  0          0
Total:         14651      14658

Do log neighbor state changes (via global configuration)
Default minimum time between advertisement runs is 30 seconds

```

```

For address family: IPv4 Unicast
Session: 10.103.224.1
BGP table version 8, neighbor version 8/0
Output queue size : 0
Index 1, Advertise bit 0
1 update-group member
Inbound path policy configured
Outbound path policy configured
Route map for incoming advertisements is bgp-underlay-in-from-core
Route map for outgoing advertisements is bgp-underlay-out-to-core
Slow-peer detection is disabled
Slow-peer split-update-group dynamic is disabled

```

	Sent	Rcvd
Prefix activity:	----	----
Prefixes Current:	2	1 (Consumes 136 bytes)
Prefixes Total:	2	1
Implicit Withdraw:	0	0
Explicit Withdraw:	0	0
Used as bestpath:	n/a	1

```
Used as multipath:          n/a          0
Used as secondary:          n/a          0
```

	Outbound	Inbound
Local Policy Denied Prefixes:	-----	-----
Suppressed due to dampening:	2	n/a
Other Policies:	1	n/a
Total:	3	0

Number of NLRI's in the update sent: max 2, min 0

Current session network count peaked at 1 entries at 14:07:09 Jul 7 2024 EDT (1w2d ago)

Highest network count observed at 1 entries at 14:07:09 Jul 7 2024 EDT (1w2d ago)

Last detected as dynamic slow peer: never

Dynamic slow peer recovered: never

Refresh Epoch: 1

Last Sent Refresh Start-of-rib: never

Last Sent Refresh End-of-rib: never

Last Received Refresh Start-of-rib: never

Last Received Refresh End-of-rib: never

	Sent	Rcvd
Refresh activity:	----	----
Refresh Start-of-RIB	0	0
Refresh End-of-RIB	0	0

Address tracking is enabled, the RIB does have a route to 10.103.224.1

NYC103-Border-01#

NYC103-Border-01#show ip bgp neighbor 10.103.224.1 advertised-routes

BGP table version is 8, local router ID is 10.103.255.3

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

	Network	Next Hop	Metric	LocPrf	Weight	Path
*>	10.103.224.0/24	0.0.0.0			32768	i
*>	10.103.255.0/24	0.0.0.0			32768	i

Total number of prefixes 2

NYC103-Border-01#show ip bgp neighbor 10.103.224.1 routes

BGP table version is 8, local router ID is 10.103.255.3

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

	Network	Next Hop	Metric	LocPrf	Weight	Path
*>	0.0.0.0	10.103.224.1			0	65100 i

Total number of prefixes 1

NYC103-Border-01#show ip bgp

BGP table version is 8, local router ID is 10.103.255.3

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

	Network	Next Hop	Metric	LocPrf	Weight	Path
*>	0.0.0.0	10.103.224.1			0	65100 i
s>	10.103.224.0/30	0.0.0.0	0		32768	i
*>	10.103.224.0/24	0.0.0.0			32768	i
*>	10.103.255.0/24	0.0.0.0			32768	i
s>	10.103.255.3/32	0.0.0.0	0		32768	i

NYC103-Border-01#show ip route bgp

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PFR
& - replicated local route overrides by connected

Gateway of last resort is 10.103.224.1 to network 0.0.0.0

B* 0.0.0.0/0 [20/0] via 10.103.224.1, 1w2d
10.0.0.0/8 is variably subnetted, 31 subnets, 3 masks
B 10.103.224.0/24 [200/0], 1w2d, Null0
B 10.103.255.0/24 [200/0], 1w2d, Null0

NYC103-Border-01#show ip bgp vpnv4 vrf campus

BGP table version is 195, local router ID is 10.103.255.3

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 65106:3 (default for vrf campus)					
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 3/1000					
* i 0.0.0.0	10.103.255.4	0	100	0	65102 65100 65101 ?
*>	10.103.64.1			0	65102 65100 65101 ?
s> 10.103.64.0/30	0.0.0.0	0		32768	i
s>i 10.103.64.0/24	10.103.255.14	0	100	0	?
s i	10.103.255.11	0	100	0	?
s i	10.103.255.13	0	100	0	?
s i	10.103.255.12	0	100	0	?
* i 10.103.64.0/18	10.103.255.4	0	100	0	i
*>	0.0.0.0			32768	i
s>i 10.103.64.11/32	10.103.255.12	0	100	0	?
s>i 10.103.64.12/32	10.103.255.12	0	100	0	?
s>i 10.103.64.13/32	10.103.255.12	0	100	0	?
s>i 10.103.64.14/32	10.103.255.12	0	100	0	?
s>i 10.103.64.15/32	10.103.255.11	0	100	0	?
s>i 10.103.64.17/32	10.103.255.12	0	100	0	?
s>i 10.103.64.19/32	10.103.255.11	0	100	0	?
s>i 10.103.64.20/32	10.103.255.13	0	100	0	?
s>i 10.103.64.26/32	10.103.255.14	0	100	0	?
s>i 10.103.64.28/32	10.103.255.14	0	100	0	?
s>i 10.103.120.0/24	10.103.255.14	0	100	0	?
s i	10.103.255.11	0	100	0	?
s i	10.103.255.13	0	100	0	?
s i	10.103.255.12	0	100	0	?
s>i 10.103.120.11/32	10.103.255.12	0	100	0	?
s>i 10.103.120.12/32	10.103.255.11	0	100	0	?
s>i 10.103.120.13/32	10.103.255.12	0	100	0	?
s>i 10.103.120.14/32	10.103.255.12	0	100	0	?
s>i 10.103.120.15/32	10.103.255.14	0	100	0	?
s>i 10.103.120.16/32	10.103.255.13	0	100	0	?
s>i 10.103.120.23/32	10.103.255.13	0	100	0	?
* i 10.103.128.0/18	10.103.255.4	0	100	0	i
*>	0.0.0.0			32768	i
s>i 10.103.180.0/24	10.103.255.14	0	100	0	?
s i	10.103.255.11	0	100	0	?
s i	10.103.255.13	0	100	0	?
s i	10.103.255.12	0	100	0	?

NYC103-Border-01#show ip bgp vpnv4 vrf campus

BGP table version is 195, local router ID is 10.103.255.3

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,

t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 65106:3 (default for vrf campus)					
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 3/1000					
* i 0.0.0.0	10.103.255.4	0	100	0	65102 65100 65101 ?
*>	10.103.64.1			0	65102 65100 65101 ?
s> 10.103.64.0/30	0.0.0.0	0		32768	i
s>i 10.103.64.0/24	10.103.255.14	0	100	0	?
s i	10.103.255.11	0	100	0	?
s i	10.103.255.13	0	100	0	?
s i	10.103.255.12	0	100	0	?
* i 10.103.64.0/18	10.103.255.4	0	100	0	i
*>	0.0.0.0			32768	i
s>i 10.103.64.11/32	10.103.255.12	0	100	0	?
s>i 10.103.64.12/32	10.103.255.12	0	100	0	?
s>i 10.103.64.13/32	10.103.255.12	0	100	0	?
s>i 10.103.64.14/32	10.103.255.12	0	100	0	?
s>i 10.103.64.15/32	10.103.255.11	0	100	0	?
s>i 10.103.64.17/32	10.103.255.12	0	100	0	?
s>i 10.103.64.19/32	10.103.255.11	0	100	0	?
s>i 10.103.64.20/32	10.103.255.13	0	100	0	?
s>i 10.103.64.26/32	10.103.255.14	0	100	0	?
s>i 10.103.64.28/32	10.103.255.14	0	100	0	?
s>i 10.103.120.0/24	10.103.255.14	0	100	0	?
s i	10.103.255.11	0	100	0	?
s i	10.103.255.13	0	100	0	?
s i	10.103.255.12	0	100	0	?
s>i 10.103.120.11/32	10.103.255.12	0	100	0	?
s>i 10.103.120.12/32	10.103.255.11	0	100	0	?
s>i 10.103.120.13/32	10.103.255.12	0	100	0	?
s>i 10.103.120.14/32	10.103.255.12	0	100	0	?
s>i 10.103.120.15/32	10.103.255.14	0	100	0	?
s>i 10.103.120.16/32	10.103.255.13	0	100	0	?
s>i 10.103.120.23/32	10.103.255.13	0	100	0	?
* i 10.103.128.0/18	10.103.255.4	0	100	0	i
*>	0.0.0.0			32768	i
s>i 10.103.180.0/24	10.103.255.14	0	100	0	?
s i	10.103.255.11	0	100	0	?
s i	10.103.255.13	0	100	0	?
s i	10.103.255.12	0	100	0	?

NYC103-Border-01#show ip route vrf campus

Routing Table: campus

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PfR
& - replicated local route overrides by connected

Gateway of last resort is 10.103.64.1 to network 0.0.0.0

```
B* 0.0.0.0/0 [20/0] via 10.103.64.1, 1w2d
    10.0.0.0/8 is variably subnetted, 24 subnets, 4 masks
B    10.103.64.0/18 [200/0], 1w2d, Null0
B    10.103.64.0/24 [200/0] via 10.103.255.14, 1w2d, Vlan3001
C    10.103.64.0/30 is directly connected, GigabitEthernet1/0/2.3001
L    10.103.64.2/32 is directly connected, GigabitEthernet1/0/2.3001
B    10.103.64.11/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B    10.103.64.12/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B    10.103.64.13/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B    10.103.64.14/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B    10.103.64.15/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
B    10.103.64.17/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B    10.103.64.19/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
B    10.103.64.20/32 [200/0] via 10.103.255.13, 1w1d, Vlan3001
B    10.103.64.26/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
B    10.103.64.28/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
B    10.103.120.0/24 [200/0] via 10.103.255.14, 1w2d, Vlan3001
B    10.103.120.11/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B    10.103.120.12/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
B    10.103.120.13/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B    10.103.120.14/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B    10.103.120.15/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
B    10.103.120.16/32 [200/0] via 10.103.255.13, 1w2d, Vlan3001
B    10.103.120.23/32 [200/0] via 10.103.255.13, 1w2d, Vlan3001
B    10.103.128.0/18 [200/0], 1w2d, Null0
B    10.103.180.0/24 [200/0] via 10.103.255.14, 1w2d, Vlan3001
NYC103-Border-01#show ip bgp vpnv4 vrf guest
BGP table version is 195, local router ID is 10.103.255.3
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
```

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 65106:23 (default for vrf guest)					
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 2/1000					
* i 0.0.0.0	10.103.255.4	0	100	0	65102 65100 65100 65100 65100 i
*>	10.103.64.9			0	65102 65100 65100 65100 65100 i
*> 10.103.64.8/30	0.0.0.0	0		32768	i
*>i 10.103.64.12/30	10.103.255.4	0	100	0	i
*>i 10.103.220.0/24	10.103.255.14	0	100	0	?
* i	10.103.255.11	0	100	0	?
* i	10.103.255.13	0	100	0	?
* i	10.103.255.12	0	100	0	?

NYC103-Border-01#show ip bgp vpnv4 vrf guest

BGP table version is 195, local router ID is 10.103.255.3

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, l long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 65106:23 (default for vrf guest)					
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 2/1000					
* i 0.0.0.0	10.103.255.4	0	100	0	65102 65100 65100 65100 65100 i
*>	10.103.64.9			0	65102 65100 65100 65100 65100 i
*> 10.103.64.8/30	0.0.0.0	0		32768	i
*>i 10.103.64.12/30	10.103.255.4	0	100	0	i
*>i 10.103.220.0/24	10.103.255.14	0	100	0	?
* i	10.103.255.11	0	100	0	?
* i	10.103.255.13	0	100	0	?
* i	10.103.255.12	0	100	0	?

NYC103-Border-01#show ip route vrf guest

Routing Table: guest

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP

n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA

i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2

ia - IS-IS inter area, * - candidate default, U - per-user static route

H - NHRP, G - NHRP registered, g - NHRP registration summary

o - ODR, P - periodic downloaded static route, l - LISP

a - application route

+ - replicated route, % - next hop override, p - overrides from PFR

& - replicated local route overrides by connected

Gateway of last resort is 10.103.64.9 to network 0.0.0.0

```
B*    0.0.0.0/0 [20/0] via 10.103.64.9, 1w2d
      10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
C      10.103.64.8/30 is directly connected, GigabitEthernet1/0/2.3002
L      10.103.64.10/32 is directly connected, GigabitEthernet1/0/2.3002
B      10.103.64.12/30 [200/0] via 10.103.255.4, 1w2d, Vlan3002
B      10.103.220.0/24 [200/0] via 10.103.255.14, 1w2d, Vlan3002
NYC103-Border-01#
```

NYC103-Border-02

```
NYC103-Border-02#show ip bgp summary
BGP router identifier 10.103.255.4, local AS number 65106
BGP table version is 11, main routing table version 11
5 network entries using 1240 bytes of memory
5 path entries using 680 bytes of memory
3/3 BGP path/bestpath attribute entries using 888 bytes of memory
10 BGP rrinfo entries using 400 bytes of memory
3 BGP AS-PATH entries using 104 bytes of memory
18 BGP extended community entries using 768 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 4080 total bytes of memory
BGP activity 136/60 prefixes, 276/146 paths, scan interval 60 secs
5 networks peaked at 14:06:41 Jul 7 2024 EDT (1w2d ago)
```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.103.224.5	4	65100	14661	14649	11	0	0	1w2d	1

```
NYC103-Border-02#show ip bgp neighbors
BGP neighbor is 10.103.224.5, remote AS 65100, external link
  Fall over configured for session
  BFD is configured. BFD peer is Up. Using BFD to detect fast fallover (single-hop).
  BGP version 4, remote router ID 10.100.255.12
  BGP state = Established, up for 1w2d
  Last read 00:00:51, last write 00:00:00, hold time is 180, keepalive interval is 60 seconds
  Last update received: 1w2d
  Neighbor sessions:
    1 active, is not multiseession capable (disabled)
  Neighbor capabilities:
    Route refresh: advertised and received(new)
    Four-octets ASN Capability: advertised and received
    Address family IPv4 Unicast: advertised and received
    Enhanced Refresh Capability: advertised and received
    Multiseession Capability:
      Stateful switchover support enabled: NO for session 1
```

Message statistics:

InQ depth is 0
OutQ depth is 0

	Sent	Rcvd
Opens:	1	1
Notifications:	0	0
Updates:	2	2
Keepalives:	14646	14658
Route Refresh:	0	0
Total:	14649	14661

Do log neighbor state changes (via global configuration)
Default minimum time between advertisement runs is 30 seconds

For address family: IPv4 Unicast
Session: 10.103.224.5
BGP table version 11, neighbor version 11/0
Output queue size : 0
Index 1, Advertise bit 0
1 update-group member
Inbound path policy configured
Outbound path policy configured
Route map for incoming advertisements is bgp-underlay-in-from-core
Route map for outgoing advertisements is bgp-underlay-out-to-core
Slow-peer detection is disabled
Slow-peer split-update-group dynamic is disabled

	Sent	Rcvd
Prefix activity:	----	----
Prefixes Current:	2	1 (Consumes 136 bytes)
Prefixes Total:	2	1
Implicit Withdraw:	0	0
Explicit Withdraw:	0	0
Used as bestpath:	n/a	1
Used as multipath:	n/a	0
Used as secondary:	n/a	0

	Outbound	Inbound
Local Policy Denied Prefixes:	-----	-----
Suppressed due to dampening:	2	n/a
Other Policies:	1	n/a
Total:	3	0

Number of NLRI's in the update sent: max 2, min 0
Current session network count peaked at 1 entries at 14:06:41 Jul 7 2024 EDT (1w2d ago)
Highest network count observed at 1 entries at 14:06:41 Jul 7 2024 EDT (1w2d ago)
Last detected as dynamic slow peer: never
Dynamic slow peer recovered: never
Refresh Epoch: 1

Last Sent Refresh Start-of-rib: never
Last Sent Refresh End-of-rib: never
Last Received Refresh Start-of-rib: never
Last Received Refresh End-of-rib: never

	Sent	Rcvd
Refresh activity:	----	----
Refresh Start-of-RIB	0	0
Refresh End-of-RIB	0	0

Address tracking is enabled, the RIB does have a route to 10.103.224.5

NYC103-Border-02#

NYC103-Border-02#show ip bgp

BGP table version is 11, local router ID is 10.103.255.4

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,

Origin codes: i - IGP, e - EGP, ? - incomplete

RPKI validation codes: V valid, I invalid, N Not found

	Network	Next Hop	Metric	LocPrf	Weight	Path
*>	0.0.0.0	10.103.224.5			0	65100 i
*>	10.103.224.0/24	0.0.0.0			32768	i
s>	10.103.224.4/30	0.0.0.0	0		32768	i
*>	10.103.255.0/24	0.0.0.0			32768	i
s>	10.103.255.4/32	0.0.0.0	0		32768	i

NYC103-Border-02#show ip route bgp

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from Pfr
& - replicated local route overrides by connected

Gateway of last resort is 10.103.224.5 to network 0.0.0.0

B* 0.0.0.0/0 [20/0] via 10.103.224.5, 1w2d
10.0.0.0/8 is variably subnetted, 31 subnets, 3 masks
B 10.103.224.0/24 [200/0], 1w2d, Null0
B 10.103.255.0/24 [200/0], 1w2d, Null0

```

NYC103-Border-02#show ip bgp vpnv4 vrf campus
BGP table version is 191, local router ID is 10.103.255.4
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

```

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 65106:4 (default for vrf campus)					
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 3/1000					
* i 0.0.0.0	10.103.255.3	0	100	0	65102 65100 65101 ?
*>	10.103.64.5			0	65102 65100 65101 ?
s>i 10.103.64.0/24	10.103.255.14	0	100	0	?
s i	10.103.255.11	0	100	0	?
s i	10.103.255.13	0	100	0	?
s i	10.103.255.12	0	100	0	?
* i 10.103.64.0/18	10.103.255.3	0	100	0	i
*>	0.0.0.0			32768	i
s> 10.103.64.4/30	0.0.0.0	0		32768	i
s>i 10.103.64.11/32	10.103.255.12	0	100	0	?
s>i 10.103.64.12/32	10.103.255.12	0	100	0	?
s>i 10.103.64.13/32	10.103.255.12	0	100	0	?
s>i 10.103.64.14/32	10.103.255.12	0	100	0	?
s>i 10.103.64.15/32	10.103.255.11	0	100	0	?
s>i 10.103.64.17/32	10.103.255.12	0	100	0	?
s>i 10.103.64.19/32	10.103.255.11	0	100	0	?
s>i 10.103.64.20/32	10.103.255.13	0	100	0	?
s>i 10.103.64.26/32	10.103.255.14	0	100	0	?
s>i 10.103.64.28/32	10.103.255.14	0	100	0	?
s>i 10.103.120.0/24	10.103.255.14	0	100	0	?
s i	10.103.255.11	0	100	0	?
s i	10.103.255.13	0	100	0	?
s i	10.103.255.12	0	100	0	?
s>i 10.103.120.11/32	10.103.255.12	0	100	0	?
s>i 10.103.120.12/32	10.103.255.11	0	100	0	?
s>i 10.103.120.13/32	10.103.255.12	0	100	0	?
s>i 10.103.120.14/32	10.103.255.12	0	100	0	?
s>i 10.103.120.15/32	10.103.255.14	0	100	0	?
s>i 10.103.120.16/32	10.103.255.13	0	100	0	?
s>i 10.103.120.23/32	10.103.255.13	0	100	0	?
* i 10.103.128.0/18	10.103.255.3	0	100	0	i
*>	0.0.0.0			32768	i
s>i 10.103.180.0/24	10.103.255.14	0	100	0	?
s i	10.103.255.11	0	100	0	?
s i	10.103.255.13	0	100	0	?

```

s i          10.103.255.12          0    100    0 ?
NYC103-Border-02#show ip bgp vpnv4 vrf campus
BGP table version is 191, local router ID is 10.103.255.4
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

      Network          Next Hop          Metric LocPrf Weight Path
Route Distinguisher: 65106:4 (default for vrf campus)
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 3/1000
* i  0.0.0.0          10.103.255.3          0    100    0 65102 65100 65101 ?
*>          10.103.64.5          0 65102 65100 65101 ?
s>i  10.103.64.0/24   10.103.255.14          0    100    0 ?
s i          10.103.255.11          0    100    0 ?
s i          10.103.255.13          0    100    0 ?
s i          10.103.255.12          0    100    0 ?
* i  10.103.64.0/18   10.103.255.3          0    100    0 i
*>          0.0.0.0          32768 i
s>  10.103.64.4/30    0.0.0.0          0    32768 i
s>i  10.103.64.11/32   10.103.255.12          0    100    0 ?
s>i  10.103.64.12/32   10.103.255.12          0    100    0 ?
s>i  10.103.64.13/32   10.103.255.12          0    100    0 ?
s>i  10.103.64.14/32   10.103.255.12          0    100    0 ?
s>i  10.103.64.15/32   10.103.255.11          0    100    0 ?
s>i  10.103.64.17/32   10.103.255.12          0    100    0 ?
s>i  10.103.64.19/32   10.103.255.11          0    100    0 ?
s>i  10.103.64.20/32   10.103.255.13          0    100    0 ?
s>i  10.103.64.26/32   10.103.255.14          0    100    0 ?
s>i  10.103.64.28/32   10.103.255.14          0    100    0 ?
s>i  10.103.120.0/24   10.103.255.14          0    100    0 ?
s i          10.103.255.11          0    100    0 ?
s i          10.103.255.13          0    100    0 ?
s i          10.103.255.12          0    100    0 ?
s>i  10.103.120.11/32  10.103.255.12          0    100    0 ?
s>i  10.103.120.12/32  10.103.255.11          0    100    0 ?
s>i  10.103.120.13/32  10.103.255.12          0    100    0 ?
s>i  10.103.120.14/32  10.103.255.12          0    100    0 ?
s>i  10.103.120.15/32  10.103.255.14          0    100    0 ?
s>i  10.103.120.16/32  10.103.255.13          0    100    0 ?
s>i  10.103.120.23/32  10.103.255.13          0    100    0 ?
* i  10.103.128.0/18   10.103.255.3          0    100    0 i
*>          0.0.0.0          32768 i
s>i  10.103.180.0/24   10.103.255.14          0    100    0 ?
s i          10.103.255.11          0    100    0 ?

```

```

s i          10.103.255.13          0    100    0 ?
s i          10.103.255.12          0    100    0 ?

```

NYC103-Border-02#show ip route vrf campus

Routing Table: campus

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PFR
& - replicated local route overrides by connected

Gateway of last resort is 10.103.64.5 to network 0.0.0.0

```

B*    0.0.0.0/0 [20/0] via 10.103.64.5, 1w2d
      10.0.0.0/8 is variably subnetted, 24 subnets, 4 masks
B      10.103.64.0/18 [200/0], 1w2d, Null0
B      10.103.64.0/24 [200/0] via 10.103.255.14, 1w2d, Vlan3001
C      10.103.64.4/30 is directly connected, GigabitEthernet1/0/2.3001
L      10.103.64.6/32 is directly connected, GigabitEthernet1/0/2.3001
B      10.103.64.11/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B      10.103.64.12/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B      10.103.64.13/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B      10.103.64.14/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B      10.103.64.15/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
B      10.103.64.17/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B      10.103.64.19/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
B      10.103.64.20/32 [200/0] via 10.103.255.13, 1w1d, Vlan3001
B      10.103.64.26/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
B      10.103.64.28/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
B      10.103.120.0/24 [200/0] via 10.103.255.14, 1w2d, Vlan3001
B      10.103.120.11/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B      10.103.120.12/32 [200/0] via 10.103.255.11, 1w2d, Vlan3001
B      10.103.120.13/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B      10.103.120.14/32 [200/0] via 10.103.255.12, 1w2d, Vlan3001
B      10.103.120.15/32 [200/0] via 10.103.255.14, 4d10h, Vlan3001
B      10.103.120.16/32 [200/0] via 10.103.255.13, 1w2d, Vlan3001
B      10.103.120.23/32 [200/0] via 10.103.255.13, 1w2d, Vlan3001
B      10.103.128.0/18 [200/0], 1w2d, Null0
B      10.103.180.0/24 [200/0] via 10.103.255.14, 1w2d, Vlan3001

```

NYC103-Border-02#show ip bgp vpnv4 vrf guest


```

BGP table version is 191, local router ID is 10.103.255.4
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

```

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 65106:24 (default for vrf guest)					
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 2/1000					
* i 0.0.0.0	10.103.255.3	0	100	0	65102 65100 65100 65100 65100 i
*>	10.103.64.13			0	65102 65100 65100 65100 65100 i
*>i 10.103.64.8/30	10.103.255.3	0	100	0	i
*> 10.103.64.12/30	0.0.0.0	0		32768	i
*>i 10.103.220.0/24	10.103.255.14	0	100	0	?
* i	10.103.255.11	0	100	0	?
* i	10.103.255.13	0	100	0	?
* i	10.103.255.12	0	100	0	?

```

NYC103-Border-02#show ip bgp vpnv4 vrf guest
BGP table version is 191, local router ID is 10.103.255.4
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

```

Network	Next Hop	Metric	LocPrf	Weight	Path
Route Distinguisher: 65106:24 (default for vrf guest)					
AF-Private Import to Address-Family: L2VPN E-VPN, Pfx Count/Limit: 2/1000					
* i 0.0.0.0	10.103.255.3	0	100	0	65102 65100 65100 65100 65100 i
*>	10.103.64.13			0	65102 65100 65100 65100 65100 i
*>i 10.103.64.8/30	10.103.255.3	0	100	0	i
*> 10.103.64.12/30	0.0.0.0	0		32768	i
*>i 10.103.220.0/24	10.103.255.14	0	100	0	?
* i	10.103.255.11	0	100	0	?
* i	10.103.255.13	0	100	0	?
* i	10.103.255.12	0	100	0	?

```

NYC103-Border-02#show ip route vrf guest

```

```

Routing Table: guest
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA

```

i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
 ia - IS-IS inter area, * - candidate default, U - per-user static route
 H - NHRP, G - NHRP registered, g - NHRP registration summary
 o - ODR, P - periodic downloaded static route, l - LISP
 a - application route
 + - replicated route, % - next hop override, p - overrides from PfR
 & - replicated local route overrides by connected

Gateway of last resort is 10.103.64.13 to network 0.0.0.0

B* 0.0.0.0/0 [20/0] via 10.103.64.13, 1w2d
 10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
 B 10.103.64.8/30 [200/0] via 10.103.255.3, 1w2d, Vlan3002
 C 10.103.64.12/30 is directly connected, GigabitEthernet1/0/2.3002
 L 10.103.64.14/32 is directly connected, GigabitEthernet1/0/2.3002
 B 10.103.220.0/24 [200/0] via 10.103.255.14, 1w2d, Vlan3002
 NYC103-Border-02#

Cloud Monitoring for Catalyst Switches

Navigate to **Switching** > **Switches** then check the status of Cloud Campus Fabric switches.

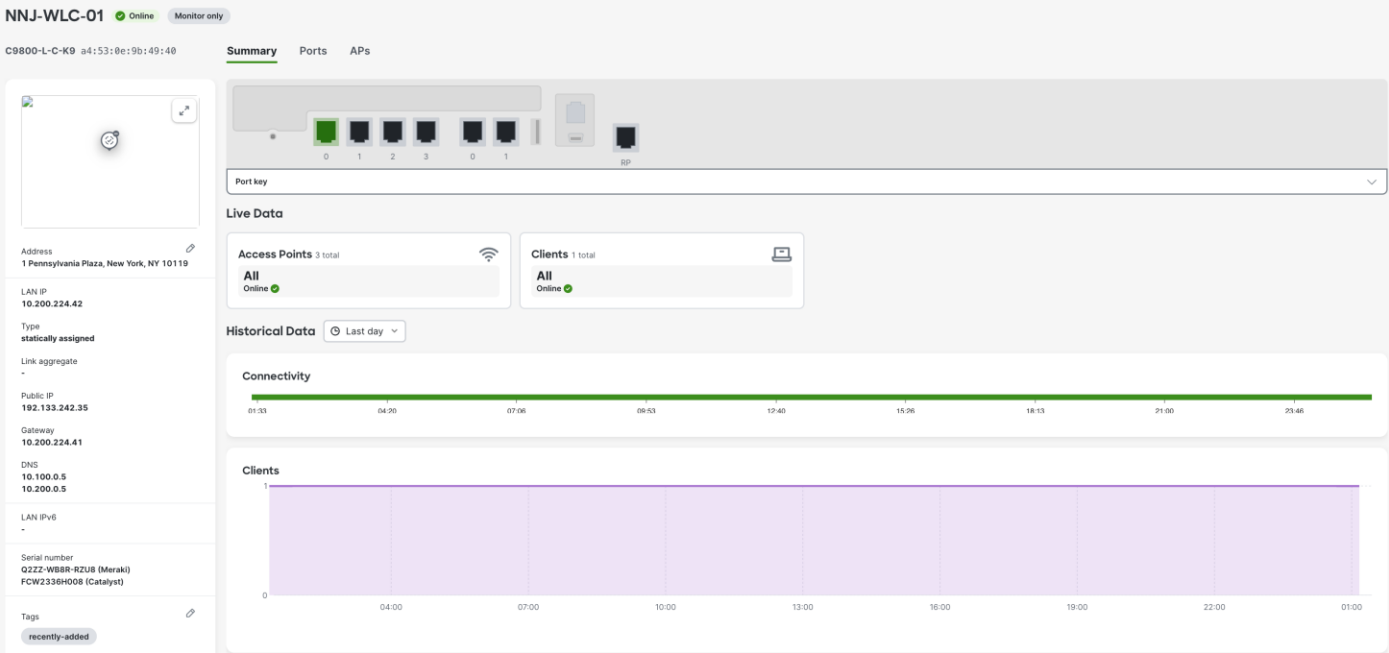
Note: Cloud Monitored Switches will be shown with a Monitor Only identifier.

☐	Status	Name	Connectivity (UTC-4)	Model	Local IP	MAC address	Firmware version	Tags
☐	✓	NYC103-FL02-SW01		C9300-24P	10.103.64.11	a0:bc:6f:e2:8b:80	CS 16.8	Managed
☐	✓	NYC013-FL02-SW03		C9300-24P	10.103.64.12	a0:bc:6f:d6:7b:00	CS 16.8	Managed
☐	✓	NYC013-FL02-SW02		C9300-24P	10.103.64.13	a0:bc:6f:e2:8f:00	CS 16.8	Managed
☐	✓	NYC103-FL01-SW01		C9300-24UX	10.103.64.15	8c:44:a5:71:83:00	CS 16.8	Managed
☐	✓	NYC103-FL04-SW01 Monitor Only		C9200-24P	10.103.64.26	94:33:d8:07:85:00	IOS XE 17.9.4	recently-added Monitored
☐	✓	NYC103-Border-01 Monitor Only		C9300-48P	10.103.224.2	24:6c:84:7e:e0:80	IOS XE 17.9.4	recently-added Monitored
☐	✓	NYC103-Border-02 Monitor Only		C9300-48P	10.103.224.6	34:88:18:24:76:00	IOS XE 17.9.4	recently-added Monitored
☐	✓	NYC103-Spine-01 Monitor Only		C9500-24Y4C	10.103.224.9	24:d5:e4:1d:66:c0	IOS XE 17.9.4	recently-added Monitored
☐	✓	NYC103-Spine-02 Monitor Only		C9500-24Y4C	10.103.224.13	24:d5:e4:1d:67:60	IOS XE 17.9.4	recently-added Monitored
☐	✓	NYC103-Leaf-01 Monitor Only		C9300-48P	10.103.224.30	34:88:18:28:4b:00	IOS XE 17.9.4	recently-added Monitored
☐	✓	NYC103-Leaf-02 Monitor Only		C9300-48P	10.103.224.38	64:8f:3e:3f:14:00	IOS XE 17.9.4	recently-added Monitored
☐	✓	NYC103-Leaf-03 Monitor Only		C9300-48P	10.103.224.46	24:6c:84:7e:b2:00	IOS XE 17.9.4	recently-added Monitored
☐	✓	NYC103-Leaf-04 Monitor Only		C9300-48P	10.103.224.54	24:2a:04:90:e7:00	IOS XE 17.9.4	recently-added Monitored

Cloud Monitoring for Catalyst Wireless Access Points

Navigate to **Wireless** > **Access points** then check the status of Cloud Campus Fabric Access Points and Wireless LAN Controllers from **Wireless** > **Wireless LAN Controllers**.

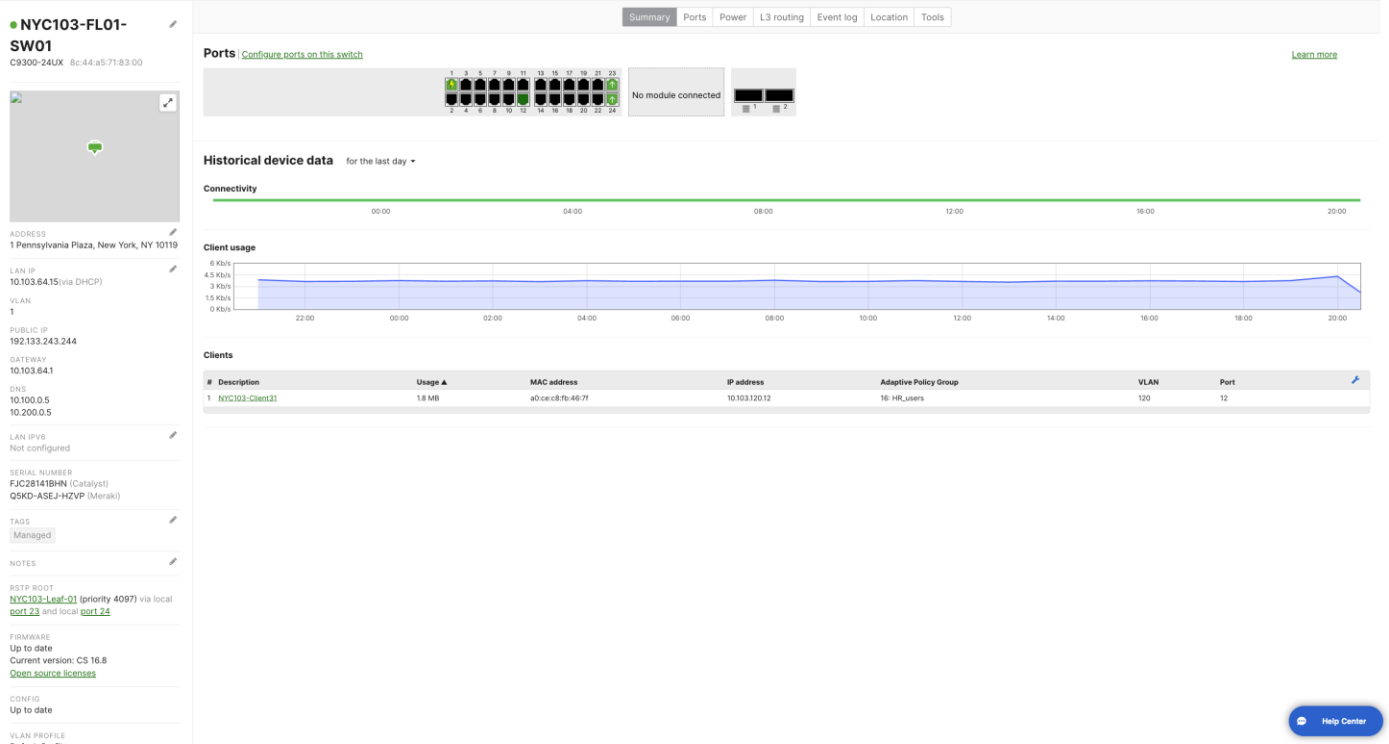
Note: You might need to navigate to a different Dashboard Network in case that monitored Switches and Access Points are not part of the same Dashboard Network.



Cloud Management for Catalyst Switches

Navigate to Switching > Switches then click on the desired switch. Check the status of Cloud Managed Access switches.

NYC103-FL01-SW01



NYC103-FL02-SW01

NYC103-FL02-SW01

C9300-24P a0:bc:f2:8b:80

Map data ©2024 Google

1 Pennsylvania Plaza, New York, NY 10119

10103.64.11 (via DHCP)

1

192.133.243.244

10103.64.1

10.100.0.5

10.200.0.5

Not configured

FJC2807171 (Catalyst)

QSKA-JCJG-K7S3 (Meraki)

Managed

Notes

RSTP ROOT

NYC103-Leaf-02 (priority 4097) via port 24

Up to date

Current version: CS 16.8

Open source licenses

Up to date

VLAN PROFILE

Summary

Ports

Power

L3 routing

Event log

Location

Tools

Ports

Configure ports on this switch

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

No module connected

1 2

[Learn more](#)

Historical device data

for the last day

Connectivity

Client usage

Clients

#	Description	Usage ▲	MAC address	IP address	Adaptive Policy Group	VLAN	Port
1	NYC103-Client32	1.8 MB	a0:ce:c8:fb:47:dc	10.103.120.11		120	12

Help Center

NYC103-FL02-SW02

NYC103-FL02-SW02

C9300-24P a0:bc:f2:8f:00

Map data ©2024 Google

1 Pennsylvania Plaza, New York, NY 10119

10103.64.13 (via DHCP)

1

192.133.243.244

10103.64.1

10.100.0.5

10.200.0.5

Not configured

FJC2807168 (Catalyst)

QSKA-B6W4-MEMT (Meraki)

Managed

Notes

RSTP ROOT

NYC103-Leaf-02 (priority 4097) via port 24

Up to date

Current version: CS 16.8

Open source licenses

Up to date

VLAN PROFILE

Summary

Ports

Power

L3 routing

Event log

Location

Tools

Ports

Configure ports on this switch

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

No module connected

1 2

[Learn more](#)

Historical device data

for the last day

Connectivity

Client usage

Clients

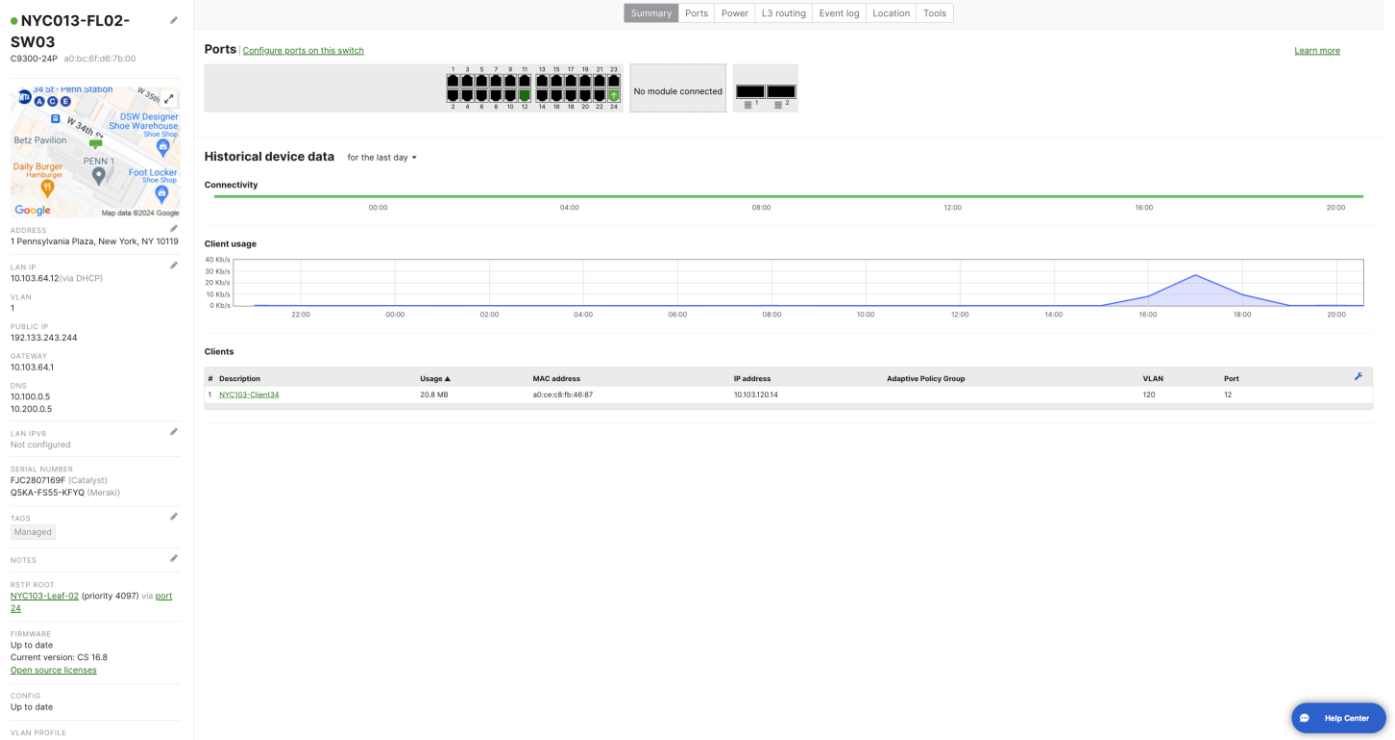
#	Description	Usage ▲	MAC address	IP address	Adaptive Policy Group	VLAN	Port
1	NYC103-Client34	21.6 MB	a0:ce:c8:fb:46:87	10.103.120.14		120	24
2	NYC103-Client33	104.6 MB	a0:ce:c8:fb:47:b7	10.103.120.13		120	12

Help Center

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NYC103-FL02-SW03



NYC103-FL02-AP01

NYC103-FL02-AP01

CW91641 c4:d6:66:4f:55:b0

24 St - Penn station

W 34th St

Betz Pavilion

Daily Burger

Dish Designer Shoe Warehouse

PENN 1

Foot Locker

Map data ©2024 Google

ADDRESS

1 Pennsylvania Plaza, New York, NY 10119

SSIDS

NYC103-Campus

NYC103-Guest

BSSID Details

RADIO SETTINGS

2.4 GHz: 1 (20 MHz; 5 dBm)

5 GHz: 165 (20 MHz; 8 dBm)

RF profile: Basic Indoor Profile

LAN IP

10.103.64.17 (via DHCP)

PUBLIC IP

192.133.243.244

GATEWAY

10.103.64.1

PREFERRED MESH GATEWAY (Default)

DNS

10.100.0.5

10.200.0.5

ETHERNET 1

1000 Mbit, full duplex

NYC103-FL02-SW01 / Port 1

LAN IPV6

Not configured

SERIAL NUMBER

WNT272908KW (Catalyst)

Q5AL-RR9M-3T9P (Meraki)

TAGS

Managed

NOTES

Summary

Ports

Event log

Timeline

Location

Connections

Performance

Tools

LAN

Live data

Ports

AP port profile

use network default (none currently set) (edit)

(see/edit all profiles)

Uplink traffic

136.0 Kbps (106.1 Kbps ↓, 29.9 Kbps ↑)

Current clients

0

There are no currently connected clients.

Radius and VLAN request status

DNS

1 VLAN

ARP

OK

Utilization on current channels

802.11 Traffic

non-802.11 Interference

Channel 1 (2.4 GHz): 12% (Acceptable)

Channel 165 (5 GHz): 4% (Acceptable)

Channel 1 (6 GHz): 0% (Acceptable)

All channel utilization

2.4 GHz

5 GHz

6 GHz

NYC103-FL02-AP02

NYC103-FL02-AP02

CW91661 c4:d6:66:6d:2e:10

24 St - Penn station

W 34th St

Betz Pavilion

Daily Burger

Dish Designer Shoe Warehouse

PENN 1

Foot Locker

Map data ©2024 Google

ADDRESS

1 Pennsylvania Plaza, New York, NY 10119

SSIDS

NYC103-Campus

NYC103-Guest

BSSID Details

RADIO SETTINGS

2.4 GHz: 11 (20 MHz; 5 dBm)

5 GHz: 52 (80 MHz; 8 dBm)

5 GHz: 157 (80 MHz; 8 dBm)

RF profile: Basic Indoor Profile

LAN IP

10.103.64.14 (via DHCP)

PUBLIC IP

192.133.243.244

GATEWAY

10.103.64.1

PREFERRED MESH GATEWAY (Default)

DNS

10.100.0.5

10.200.0.5

ETHERNET 1

1000 Mbit, full duplex

NYC103-FL02-SW02 / Port 1

LAN IPV6

Not configured

SERIAL NUMBER

WNT2734032W (Catalyst)

Q5AL-9P5Q-V3PM (Meraki)

TAGS

Managed

NOTES

Summary

Ports

Event log

Timeline

Location

Connections

Performance

Tools

LAN

Live data

Ports

AP port profile

use network default (none currently set) (edit)

(see/edit all profiles)

Uplink traffic

64.0 Kbps (28.8 Kbps ↓, 35.3 Kbps ↑)

Current clients

0

There are no currently connected clients.

Radius and VLAN request status

DNS

OK

ARP

OK

Utilization on current channels

802.11 Traffic

non-802.11 Interference

Channel 11 (2.4 GHz): 9% (Acceptable)

Channel 52 (5 GHz): 3% (Acceptable)

Channel 157 (5 GHz): 2% (Acceptable)

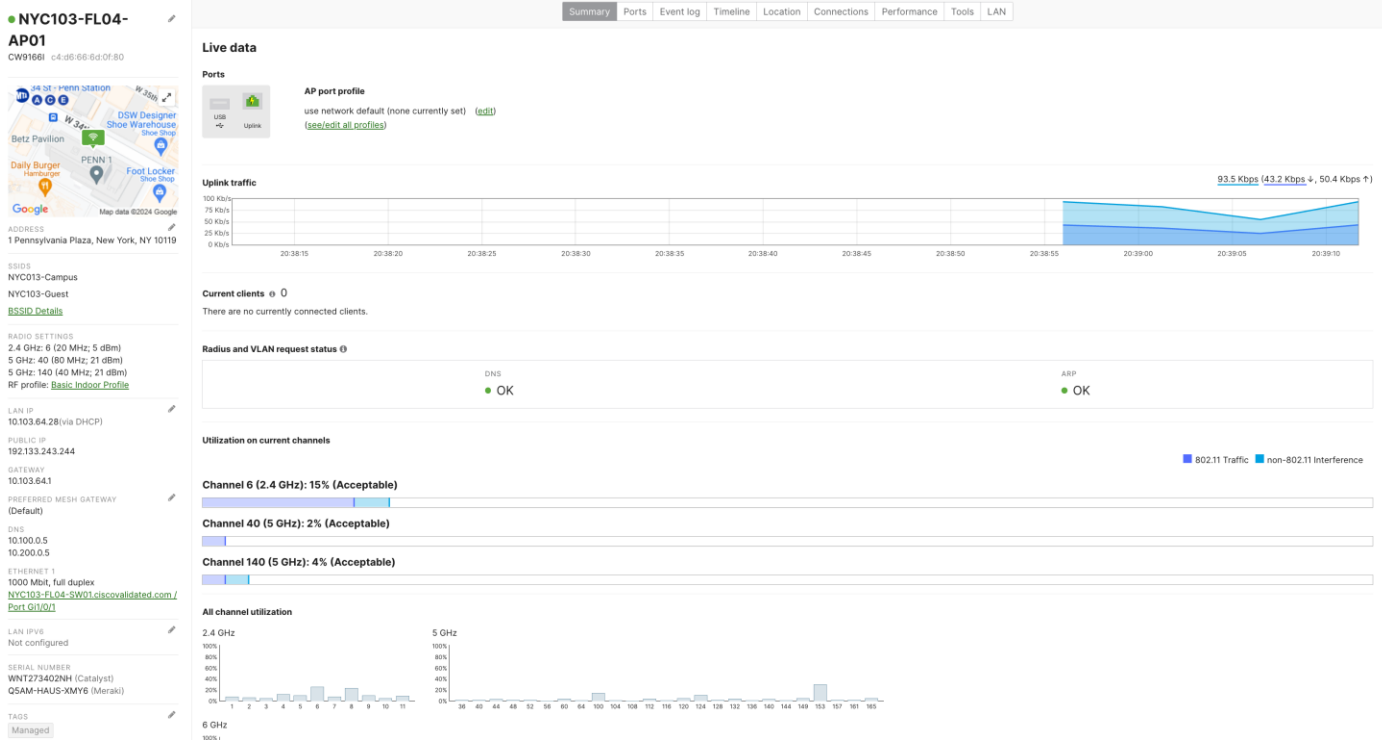
All channel utilization

2.4 GHz

5 GHz

6 GHz

NYC103-FL03-AP04



Note: You can change the view in Dashboard by clicking on the wrench icon on the right-hand side and selecting the columns you want to view. You can also change the order by dragging the columns to the desired position.

P10

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