

The background features a vibrant, multi-colored abstract design. On the left, there are horizontal, wavy bands of color in shades of red, orange, yellow, and green. On the right, a bright white light source emits a series of sharp, triangular rays in various shades of blue and cyan, creating a sunburst effect that spreads across the right half of the image.

cisco *Live!*

Let's go

#CiscoLiveAPJC



The bridge to possible

Leveraging Webex Edge for optimal performance

Richard Murphy – Technical Leader, Technical Marketing Engineer
@RichardF_Murphy
BRKCOL-2096

CISCO *Live!*

#CiscoLiveAPJC

Cisco Webex App

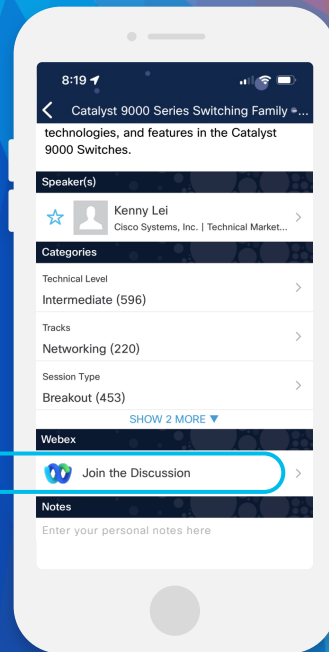
Questions?

Use Cisco Webex App to chat with the speaker after the session

How

- 1 Find this session in the Cisco Live Mobile App
- 2 Click “Join the Discussion”
- 3 Install the Webex App or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until December 22, 2023.

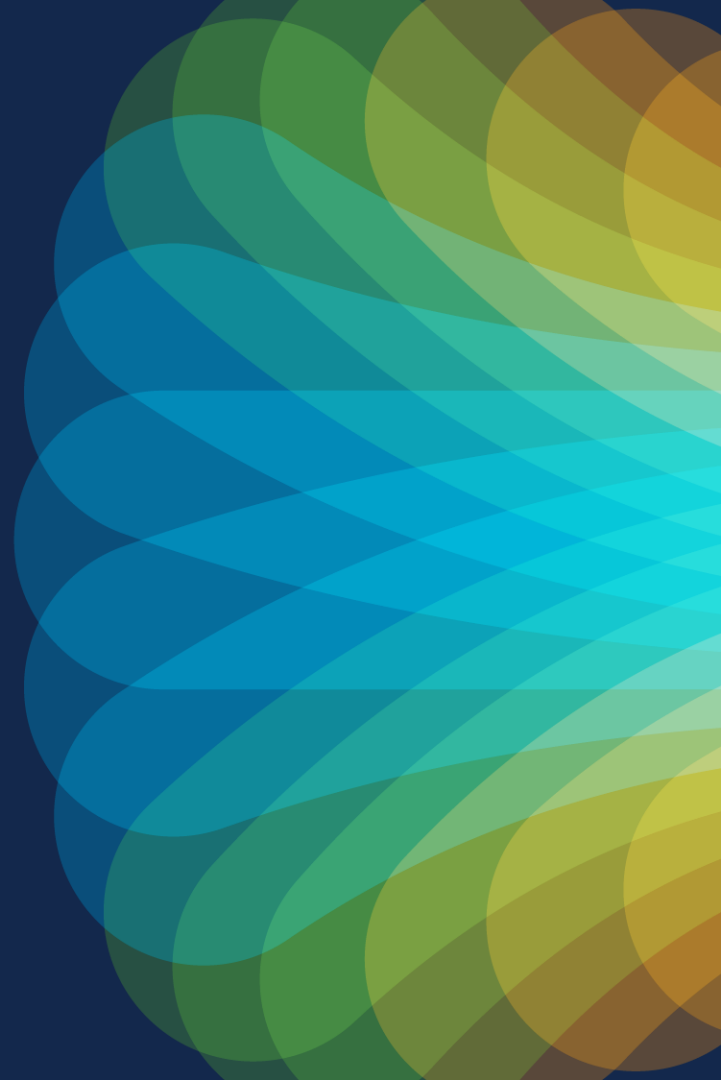


<https://ciscolive.ciscoevents.com/ciscolivebot/#BRKCOL-2096>

Agenda

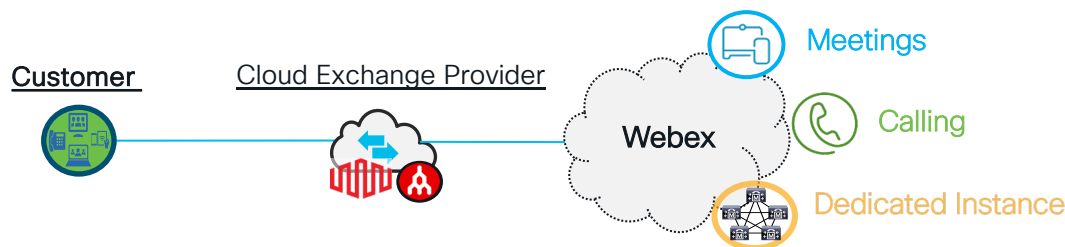
- Edge Connect
 - Introduction
 - Ordering process
 - Meetings and Calling Architecture
 - Webex Suite Architecture
- Video Mesh
 - Overview
 - Webex Suite Meetings Platform
 - Betas
- Reference Links

Edge Connect Overview



What is Webex Edge Connect?

Answer: One or more private network peering connections to Webex



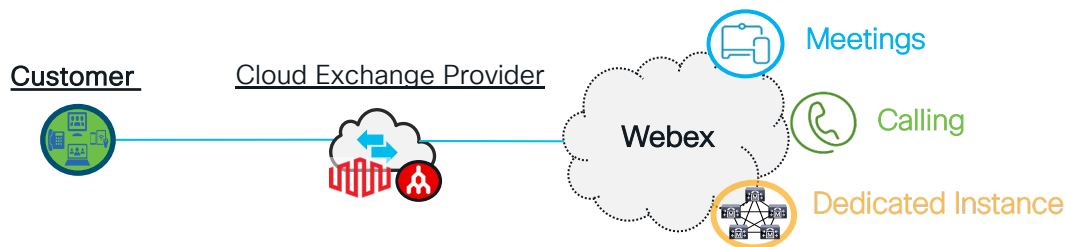
Benefits:

- Direct connection to the Webex backbone for services
- A dedicated, consistent, reliable, high-quality secure meeting and calling experience
- Provides protection from the public Internet and the potential threats and attacks associated with the Internet.

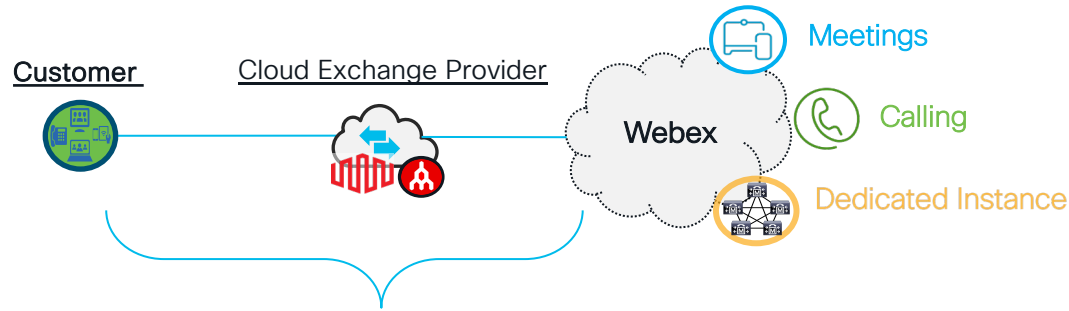
Cloud Exchange Providers for Edge Connect

Connectivity through a cloud exchange provider only.

- [Equinix](#) 
- [Megaport](#) – New and in Early Access (EA) status 
- No direct peering with Cisco from the customer, must use cloud exchange provider fabric connection to Webex.



Edge Connect sizing options

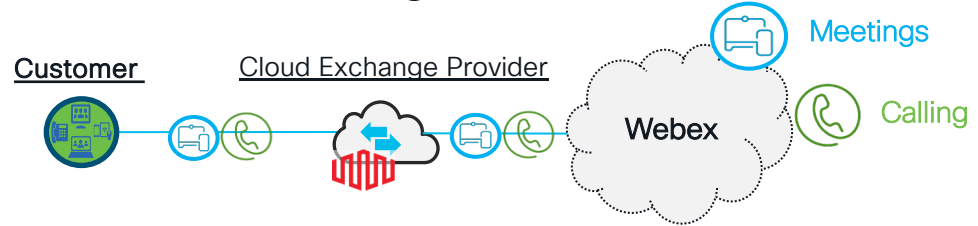


- Options from 200MB to 10 GB connection speed to Webex
- Can purchase a 200M, 500M, 1G, 2G, 5G, 10G connection
- Able to upgrade speed after initial purchase

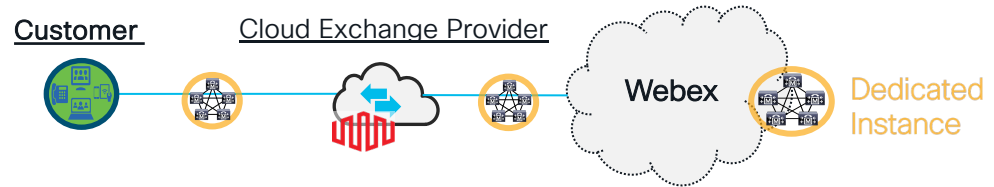
Webex Services over Edge Connect

General Availability Webex services available on a single connection:

- Meetings
- Webex Calling Multi-tenant

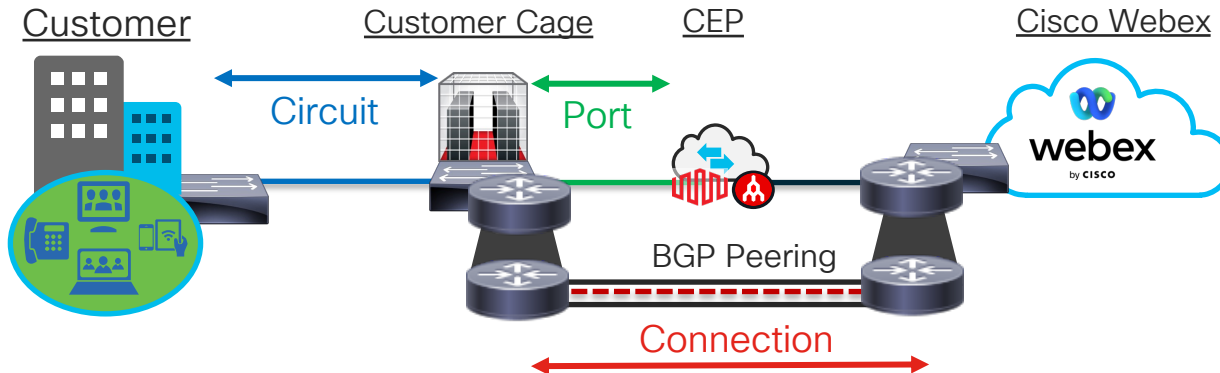


- Single connection for Dedicated Instance traffic only



Nomenclature – Let’s speak the same language!!!

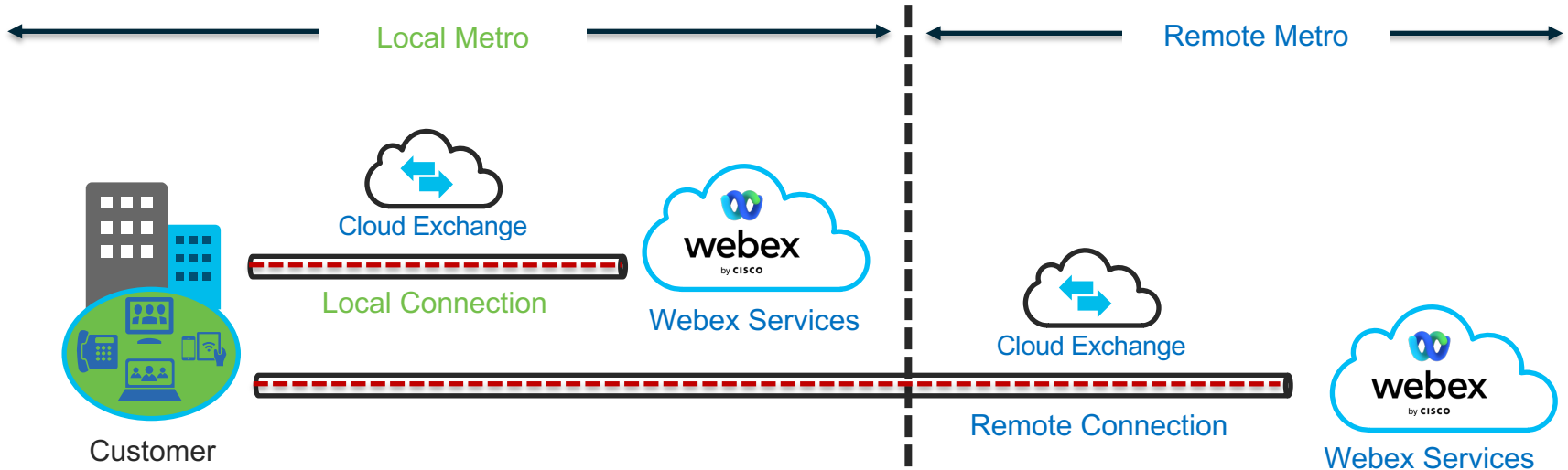
- Cloud Exchange Provider (CEP): Equinix or Megaport
- “**Circuit**”: Network circuit between Customer and the CEP. May have traffic to multiple cloud providers.
- “**Port**” – A port is the physical port that was ordered in the CEP that is connected from the CEP backbone to the customer equipment in the cage (router/switch).
- “**Connection**” – This is where a customer uses the CEP portal to submit a request to connect to a Cloud Provider.



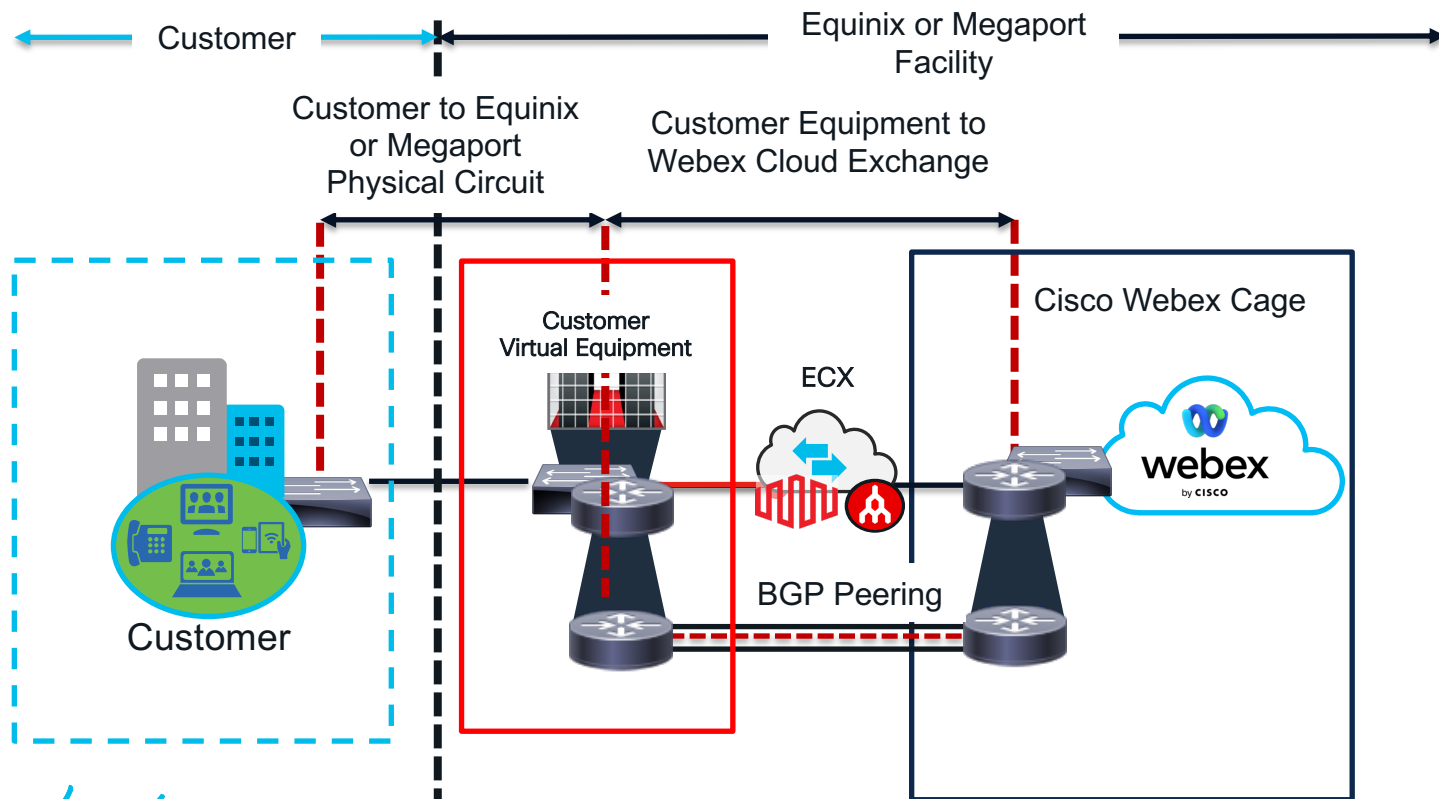
Customer Connections: Local Connection vs Remote Connection

A **Local Connection** is a virtual connection between Webex Services and the customer that is **within the same** Metro location.

A **Remote Connection** is a virtual connection between Webex Services and the customer that is **between different** Metro locations.



Cloud Exchange Virtual Equipment Options



Edge Connect Cloud Exchange Expansion



Goals

- Expand Customer Choice
- Extend reach beyond Equinix Facilities



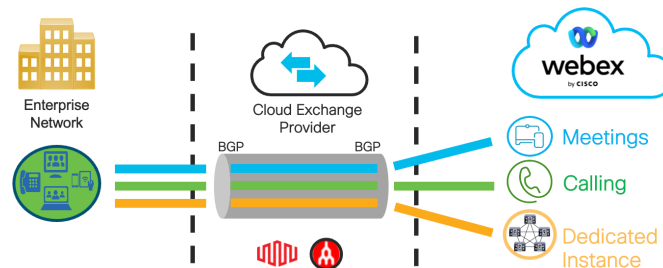
Edge Connect for Webex Suite with Dedicated Instance



Goals

- Packaged Services (Webex Suite)
- Unified Solution

Meetings + Calling + Dedicated Instance

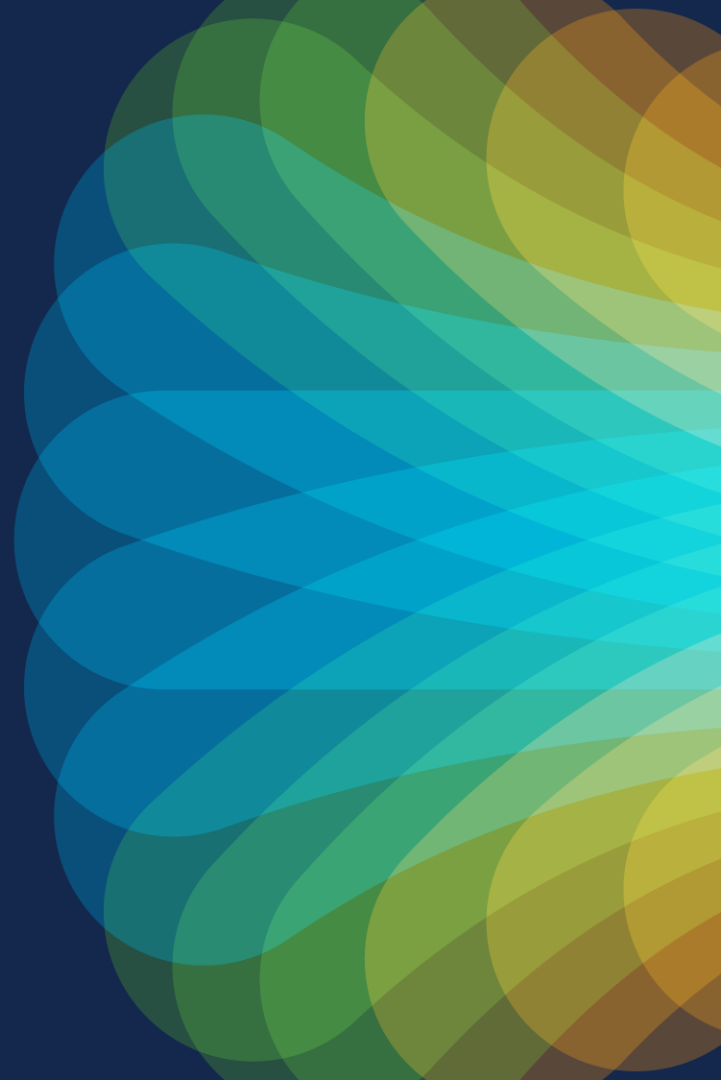


Early Access (EA) Status

Edge Connect 2.0 Early Access New Features

1. Cloud exchange expansion
 - Added Megaport 
2. Single BGP Peering for Webex Suite
 - Meetings, Calling Multi-tenant and Dedicated Instance traffic to traverse
3. Cloud Exchange Peering Location to Dedicated Instance DC Pinning
4. Customer onboarding portal for both Equinix and Megaport for the following services: (In Development right now - Future)
 - Meetings
 - Calling Multi-tenant
 - Calling Dedicated Instance (DI)

Locations



Webex Services Global Locations

- **Webex Meetings and Calling** share the same Webex Backbone
- **Webex Dedicated Instance** does not share all of the same local connectivity options.
 - What this means is that some services might require remote connections from other locations where Webex services exist.

The following are the “local” global locations for each service type:

Cisco Webex Meetings / Calling ONLY

Cisco Webex Dedicated Instance ONLY

Webex Meetings/Calling and Dedicated Instance footprint



Edge Connect in **Equinix**^E and Megaport^M

Webex Cloud Exchange Connectivity

E Equinix

M Megaport

Vancouver, CA **E** **M**
Montreal, CA **E**
Toronto, CA **E**
Chicago, US **E** **M**
New York, US **E** **M**
Ashburn, US **E** **M**
Dallas, US **E** **M**
San Jose, US **E** **M**

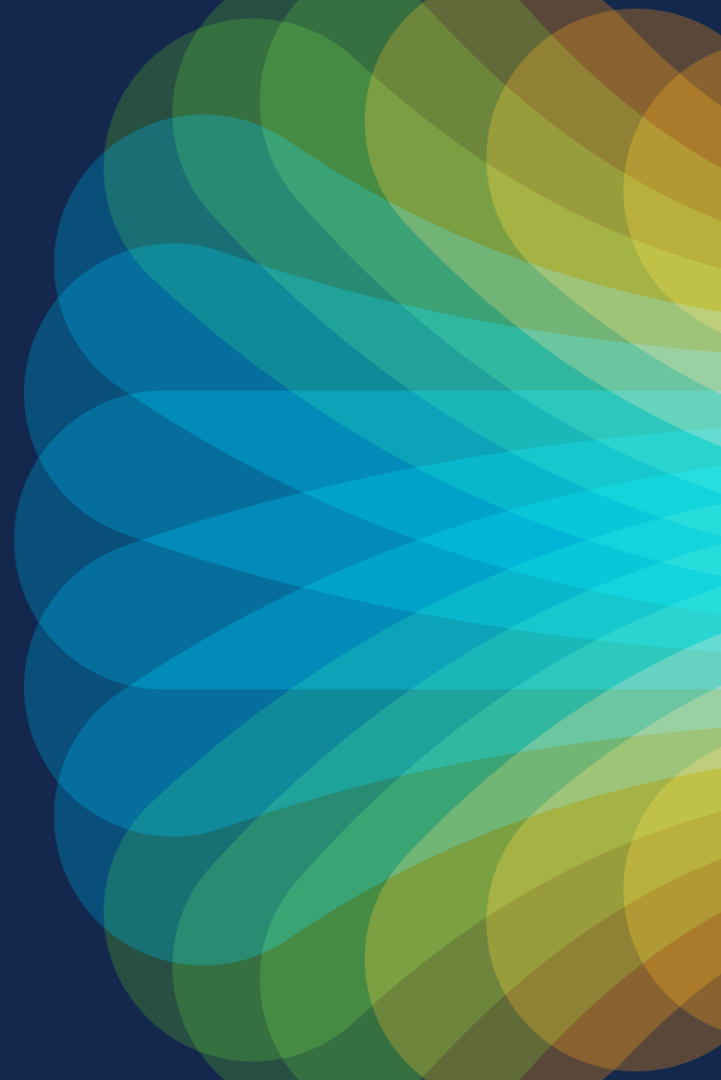
London, UK **E** **M**
Amsterdam, NE **E** **M**
Frankfurt, DE **E** **M**

Tokyo, JP **E** **M**

Singapore, SG **E** **M**

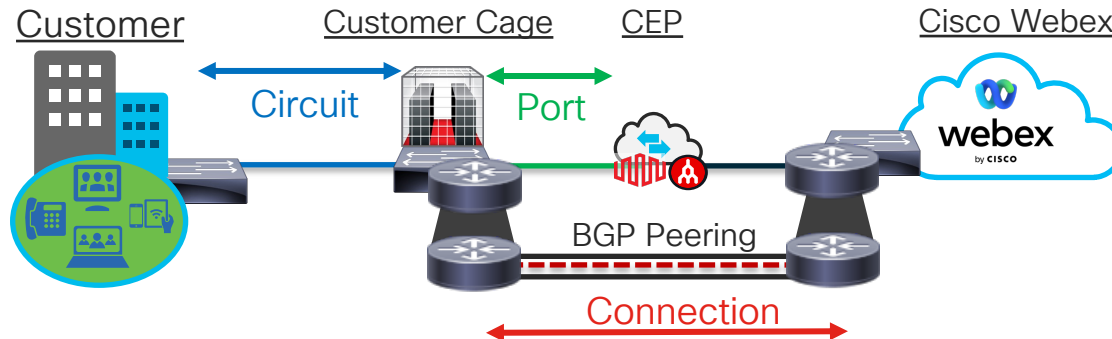
Sydney, AU **E** **M**
*Melbourne, AU **E** **M**

Ordering Edge Connect



Customer Requirements Before Edge Connect “Connection” (Peering) Request

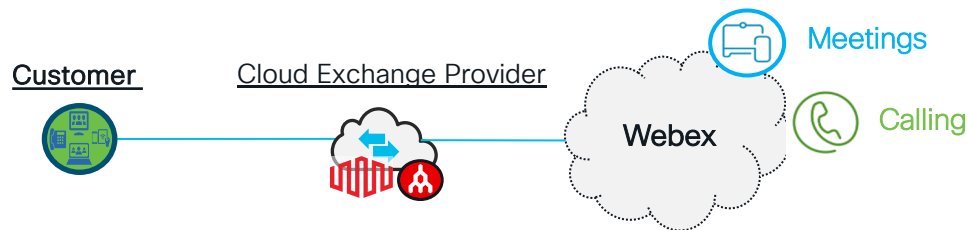
1. Customer must have a **circuit** to Equinix or Megaport (CEP)
2. Customer typically has **equipment** (router / switches) in a cage
3. Customer is required to have a **port** available and to connected to Equinix or Megaport fabric to make the Webex connection request. The port is the physical circuit created from the customer’s cage to the fabric backbone.
4. Cisco PO# of Edge Connect licensing



Customer Requirements – Core

1. Equinix or Megaport account and rackspace in the provider.
2. BGP and Dot1Q tagging capable router with L3 connectivity to the customer's enterprise network.
3. Physical port [1G/10G typical] available for connecting to the fabric
4. Public and Private BGP Autonomous System Number (ASN)
5. An IP space that is public and provider-independent
 - Edge Connect does not accept private IP advertisements like RFC1918 addresses
6. An IT team knowledgeable of BGP and peering principles

Customer Requirements – Meeting and Calling



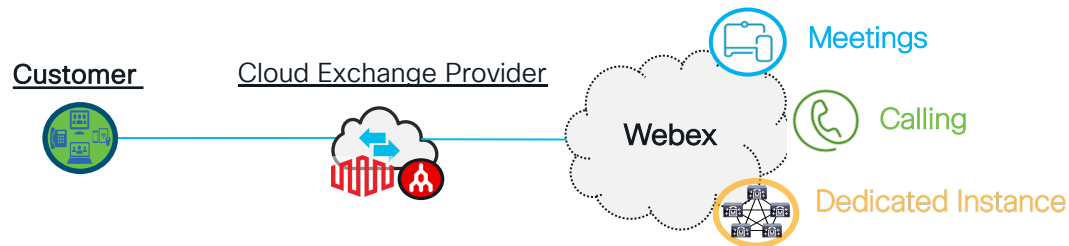
IP Addressing

- Customer owned public IP - /30 or /31 for BGP peering
- Max length prefix that Webex advertises is /24
- The maximum length prefix that Webex accepts is /29
- The maximum number of routes Webex accepts is 100
- Customer router has NAT pool(s) configured

IP Addressing

- Cisco recommends that customers allow 500 routes from Webex on the BGP peering as the number of routes that Webex advertises may change over time. Meeting and Webex Calling Multi-tenant routes are sent to the customer.
- Bidirectional-Forwarding Detection (BFD) is supported and enabled with a default value of 300 ms x 3 on the Webex Edge routers

Customer Requirements – Meeting, Calling, DI



IP Addressing

- Customer owned public IP – /30 or /31 for BGP peering
- Customer advertises default gateway (0.0.0.0) to Webex
- No customer configured NAT pool(s) for service

IP Addressing

- Cisco recommends that customers allow 500 routes from Webex on the BGP peering as the number of routes that Webex advertises may change over time. Meeting, Webex Calling Multi-tenant and DI routes are sent to the customer.
- Bidirectional-Forwarding Detection (BFD) is supported and enabled with a default value of 300 ms x 3 on the Webex Edge routers

Ordering options

Uses the ECX portal page process

1. Equinix – Meetings and Calling

Uses the service key process

2. Equinix – Meetings, Calling, and Dedicated Instance
3. Megaport – Meeting and Calling
4. Megaport – Meetings, Calling, and Dedicated Instance

Equinix Customer Portal Configuration for Meetings and Calling



Origin

Locations with ports or Virtual Devices

AMER 2

Select Location

Ashburn

1 ports | 0 Virtual Devices

Silicon Valley

1 ports | 0 Virtual Devices

Ports in Silicon Valley



TMEValidate_SJC

Primary | Dot1q | 1 Gbps

No Virtual Devices found



Destination

WEBEX COMMUNICATIONS locations you can connect with

AMER 5

EMEA 2

APAC 3

Suggested:

Silicon Valley

Latency (RTT) < 1 ms

Remote:

Chicago

Latency (RTT) 46 ms

New York

Latency (RTT) 65 ms

Dallas

Latency (RTT) 40 ms

Ashburn

Latency (RTT) 60 ms

Connection Information

Webex connection identifier

e.g. CompanyName_DC5_Pri

Outer Tag or S-Tag

Enter a number between 2 and 4092

BGP Peer subnet
and mask –
Customer Provided

Advertised routes – Public facing
addresses used to NAT Webex traffic to
the Cloud

PO# from CCW Order – Used by Cisco
to cross reference the peering
connection authorization

The buyer email address for support notifications.

Technical contact phone number

The buyer phone number for support issues.

Cisco Purchase Order Number

The buyer purchase order number for Cisco Edge Connect.

Purchase Order Number

Optional

The purchase order number will be included in the order confirmation email

e.g. PO1544555

Additional Buyer Options

Webex router IP address

(E.g. 198.51.100.1) The IP address that will be assigned to the Webex router interface.

Your router IP address

The IP address that will be assigned to your router interface.

Subnet mask for point-to-point link

(E.g. /30) The subnet mask or CIDR prefix for the point-to-point link.

Your advertised prefixes

(E.g. 198.51.100.0/28,192.0.2.0/24) A comma separated list of routes you wish to advertise to Webex.

Your BGP ASN

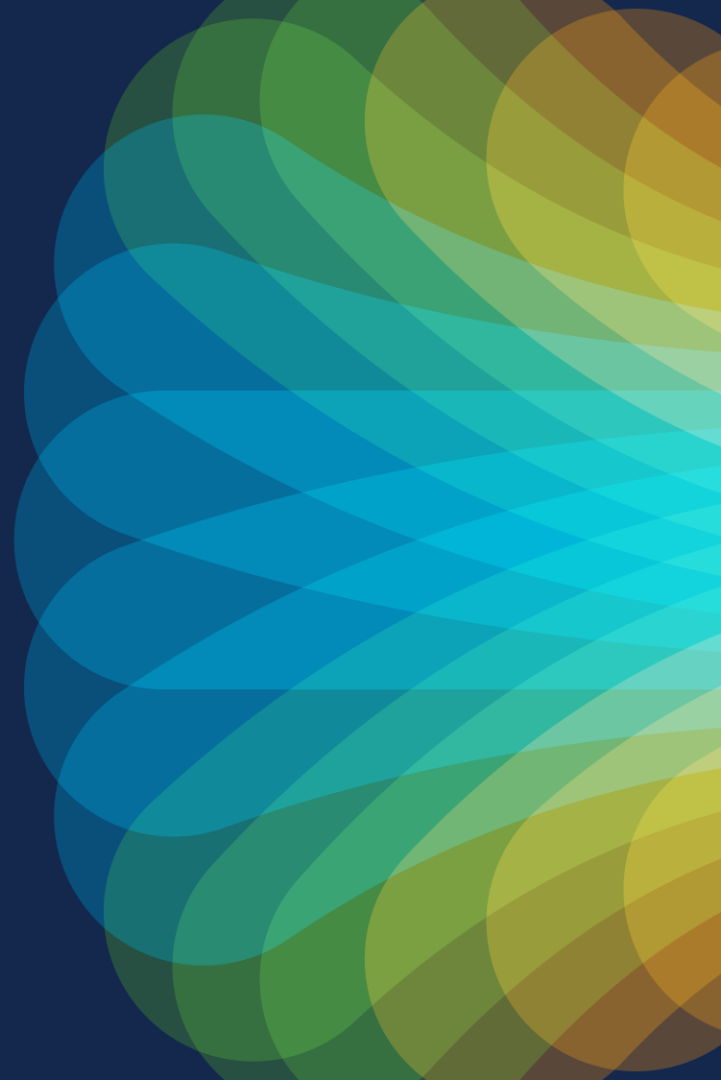
(E.g. 65000) Your BGP autonomous system number.

BGP Password (optional)

The password that is to be assign to the BGP session.

Service Key Ordering process

Note: Part of the Early
Access program



Service Key – What to know

A service key is a code that is given by Webex to connect that customer over the **Equinix** or **Megaport** network. This requires information up front from the customer to configure the Layer 3 BGP peering. Each solution will require a different set of data so there is a slide below on each solution and the required information:

1. Edge Connect for Equinix or Megaport with DI related solutions (**Dedicated Instance Only** or **Webex Suite with DI**)
2. Edge Connect for **Megaport** with Webex Meetings/Calling solution

NOTE: Edge Connect for Equinix for Meetings/Calling follow the traditional method via Equinix portal. (see [Cisco Preferred Architecture for Webex Edge Connect for Webex Meetings and Calling](#))

Megaport Customer Portal Configuration with Service Key

Note: Part of the Early
Access program

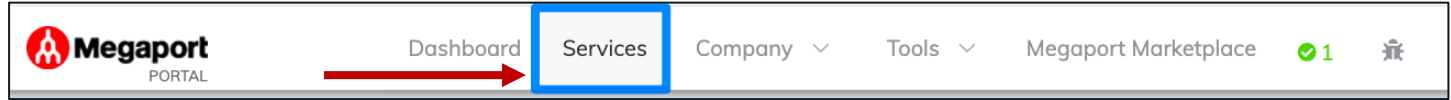
MegaPort – Customer Key Usage

<https://portal.megaPort.com>

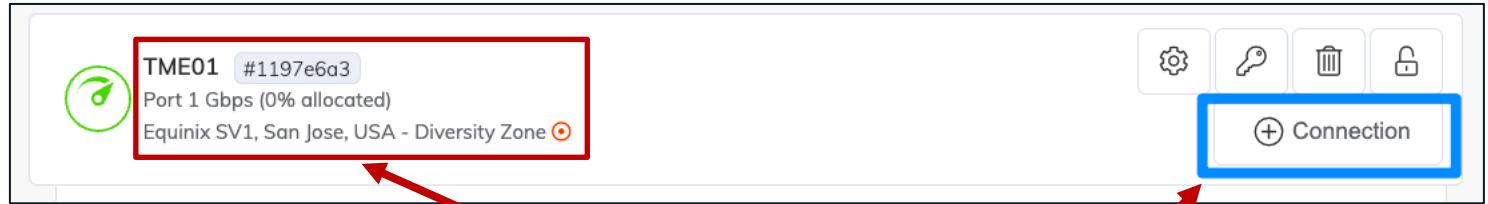
1. Browse to Services
2. Choose the port you want to use for creating the connection
3. Choose service key destination type
4. Enter service key
5. Provide Connection Name, Bandwidth and VLAN
6. Select add VXC (virtual cross connect)

<https://portal.megaport.com> --> Services

Step 1



Step 2



Select Port to be used and Create Connection

Step 3

Choose Destination Type


Cloud


Private VXC


Internet Exchange


Megaport Marketplace


Enter Service Key

Select Enter Service Key

Cancel Next →



Step 4

Enter Service Key
Provided by
Provisioning Team

Service Key

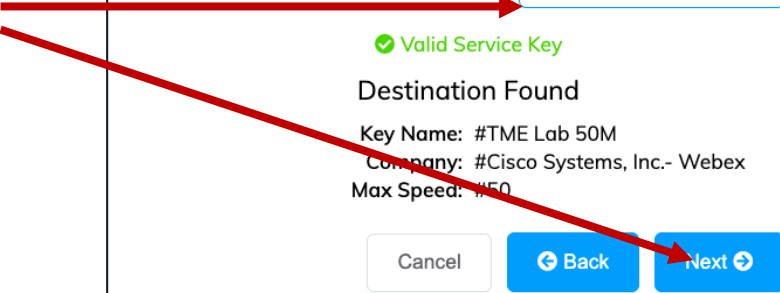
* Megaport Service Key Id

✓ Valid Service Key

Destination Found

Key Name: #TME Lab 50M
Company: #Cisco Systems, Inc.- Webex
Max Speed: #50

Cancel Back Next →



Step 5

Provide Connection Name, Bandwidth and VLAN

This VLAN is the customer side VLAN (A-End).

The Webex B-End VLAN will be pre-populated with the Service Key

**TME01**
1 Gbps
San Jose, USA
Diversity Zone 



**SJC10-WXBB-PE01-BUNDLE10001**
10 Gbps
Equinix SV1, San Jose

Monthly Rate:\$100.00 USD (Price Excludes Tax)

Connection Details

* Connection Name

Demo

Service Level Reference ?

Service Level Reference

* Rate Limit ?

50

MAX: 50 Mbps

Preferred A-End VLAN

Untag ☐

44

VLAN is available

Preferred B-End VLAN

Untag ☐

1029

VLAN is available

Cancel

Back

Next

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Summary

Summary

Connection Name: Demo

Rate Limit: 50 Mbps

Preferred A-End VLAN: 44

Preferred B-End VLAN: 1029

Service Key: f059e72c-c564-4e34-96cf-948213c6016e

Max Rate Limit: 50

Monthly Rate: \$100.00 USD
Price Excludes Tax

Cancel← BackAdd VXC ✓

Expectations for the provisioning process

Equinix Meetings and Calling

- 5 business days, starts the day after the information is put in the Equinix portal
- Dependent on the quality of the technical information provided in the portal

Megaport Meetings and Calling

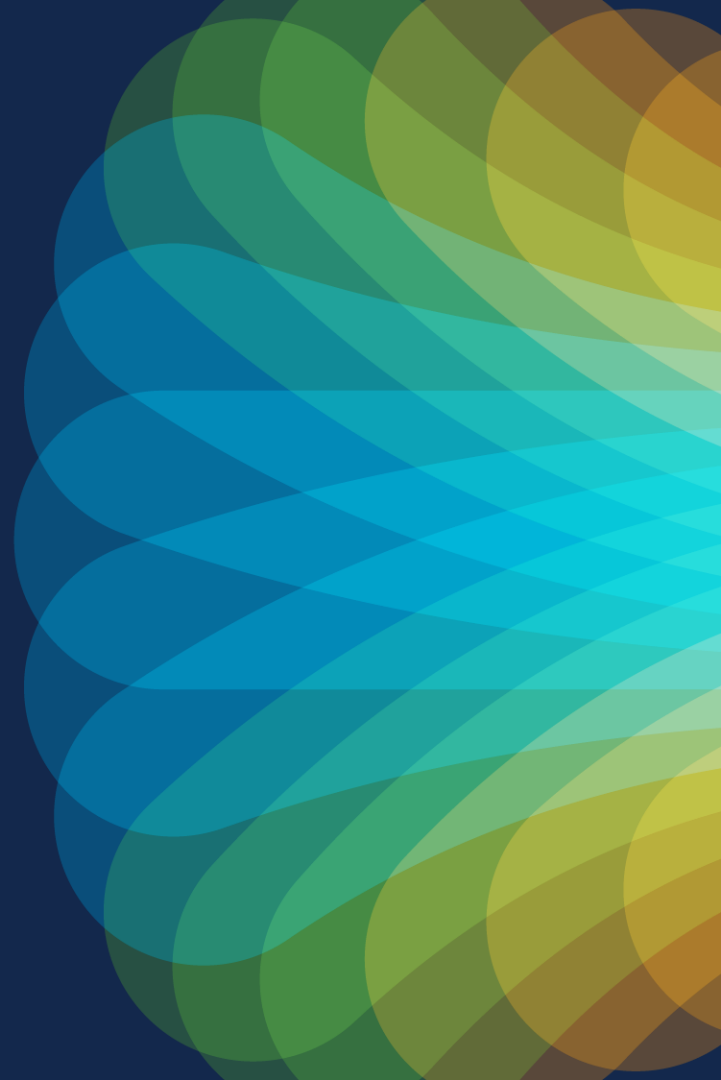
- This process is under Early Access status and is manually configured.
- Plan for up to 3 business weeks turnaround
- Dependent on the quality of the technical information provided to the Webex team.

Equinix and Megaport Webex Suite

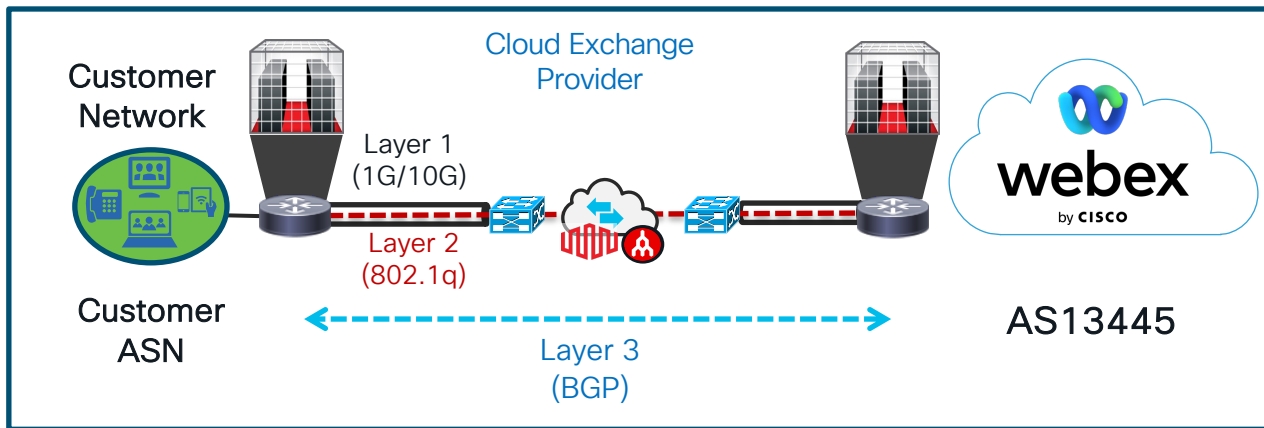
(Meetings, Calling and Dedicated Instance)

- This process is under Early Access status and is manually configured.
- Plan for up to 3 business weeks turnaround
- Dependent on the services required and quality of the technical information provided to the Webex team.

How do I Connect?



Connectivity and Responsibilities



IMPORTANT ROLES AND RESPONSIBILITIES

1. Layer 1 – Physical Connectivity
2. Layer 2 – Ethernet Connectivity

3. Layer 3 – IP connectivity

Cloud Exchange Provider responsibility:

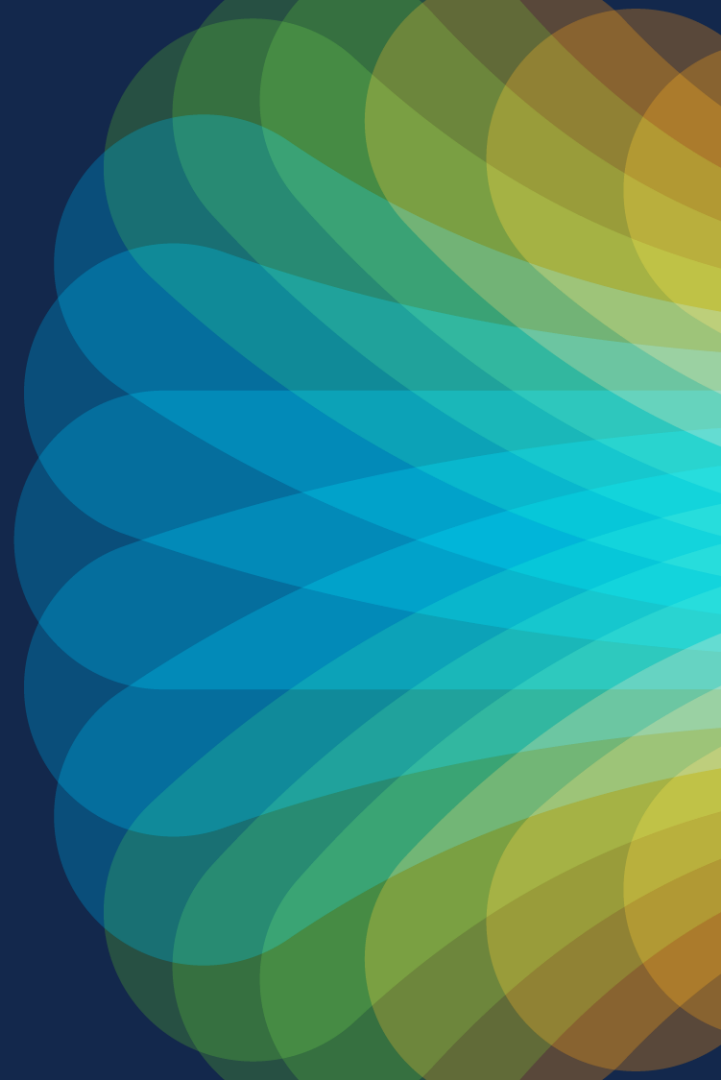
- ✓ Physical link provisioning (cross connects)
- ✓ Virtual circuit monitoring reports & support

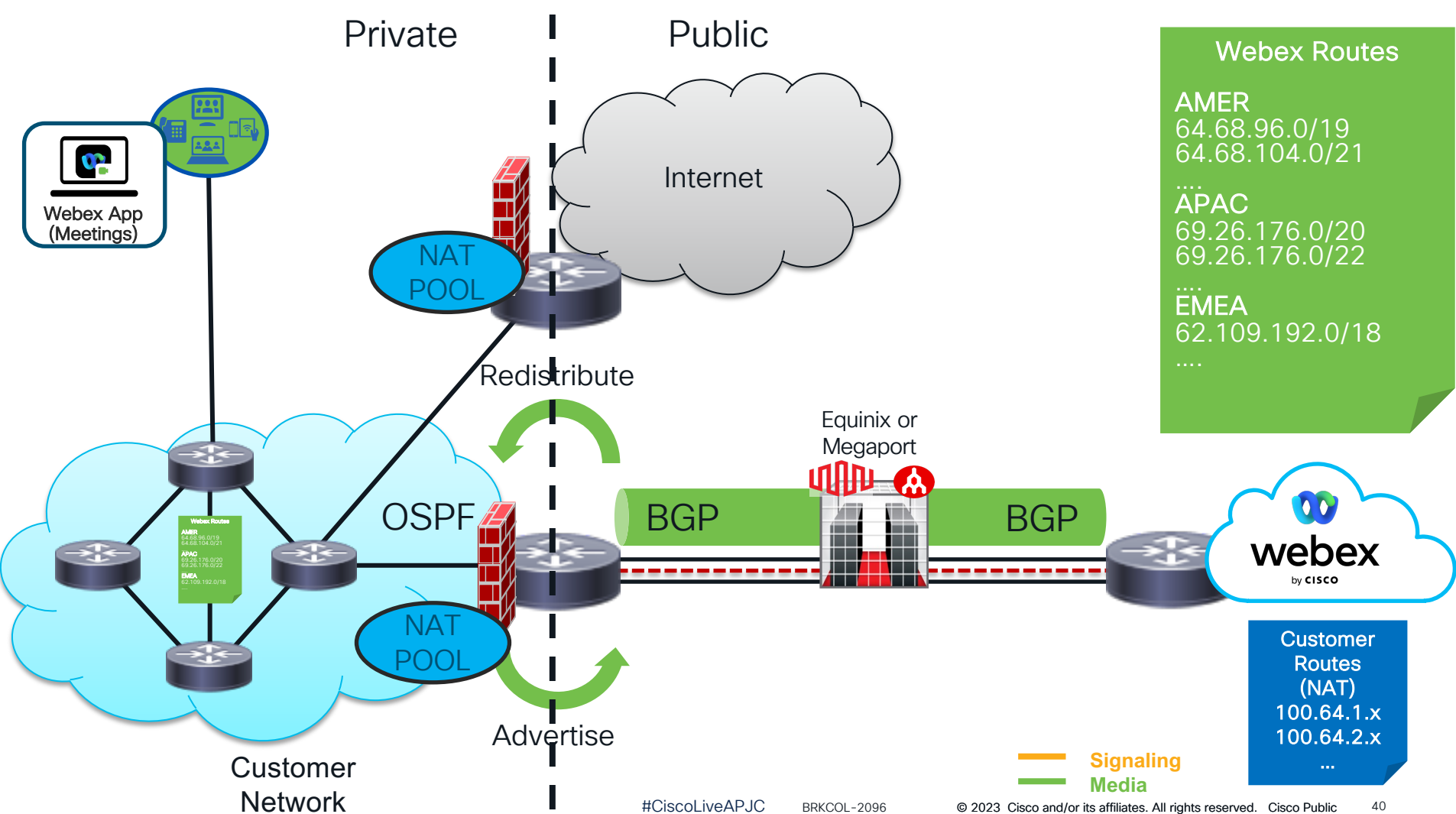
Cisco responsibility

- ✓ peering provisioning and support

How it works?

Meetings and Calling
routing





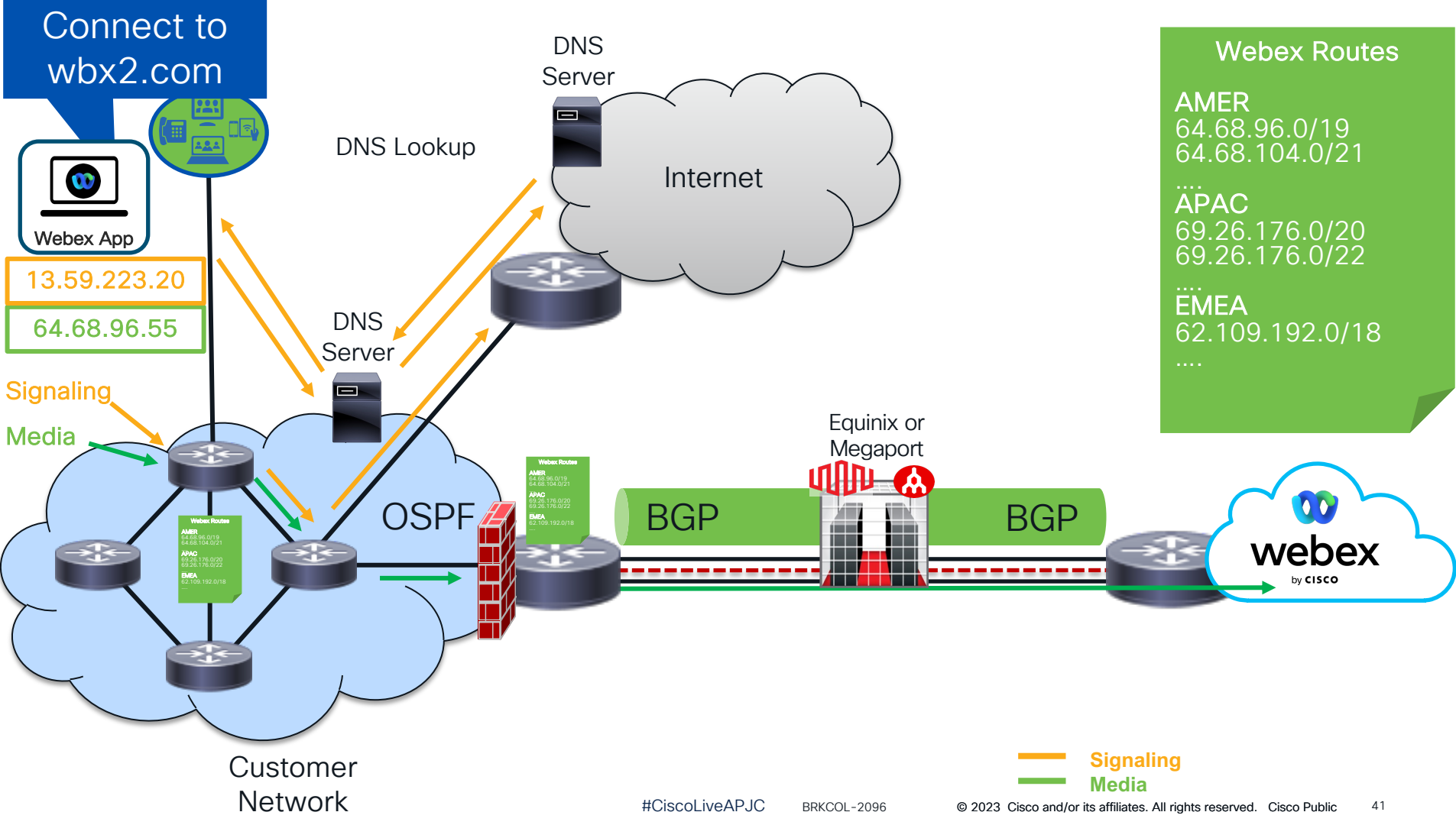
Connect to
wbx2.com



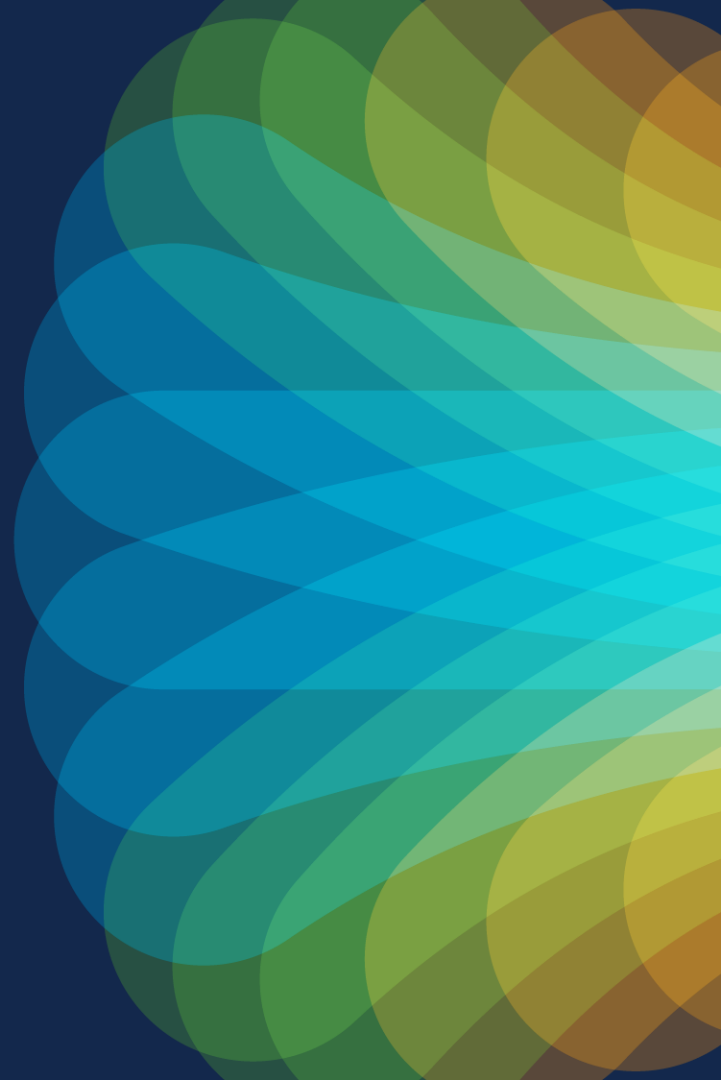
13.59.223.20

64.68.96.55

Signaling
Media



BGP Peering





BGP Traffic Engineering – Customer Controlled

Multiple options to influence traffic flow

Option 1 – BGP Community local preference tagging

- Highest level of control and routing influence
- Advanced customer configuration

Option 2 – AS-Path prepending

- Simple

Option 3 – Unique NAT Pools per peering session

- Simple
- Disruptive Fail-over

Traffic Engineering Communities

Link Priority

- **None** – Default (least desirable path)
- **13445:200** – Local Preference 200
- **13445:300** – Local Preference 300
- **13445:400** – Local Preference 400
- **13445:500** – Local Preference 500
- **13445:600** – Local Preference 600
- **13445:700** – Local Preference 700
- **13445:800** – Local Preference 800
- **13445:900** – Local Preference 900 (Most desirable path)

Webex Prefix BGP Origin communities

- **13445:10000** – AMER • **13445:20000** – Calling AMER
- **13445:10010** – EMEA • **13445:20010** – Calling EMEA
- **13445:10020** – APAC • **13445:20020** – Calling ANZ
- **13445:20060** – Calling APAC

Customer Prefix propagation scoping communities

- **None** – Default permit global reachability
- **13445:677** – Permit local theater reachability



Filtering on Webex Calling Prefixes through Community Strings

```

router bgp 65333
  bgp log-neighbor-changes
  neighbor 100.64.2.2 remote-as 13445
  neighbor 100.64.2.2 fall-over bfd
  !

  address-family ipv4
    network 100.64.200.128 mask 255.255.255.128
    neighbor 100.64.2.2 activate
    neighbor 100.64.2.2 route-map CALL-ONLY in
  exit-address-family

  ip bgp-community new-format
  ip community-list 1 permit 13445:10000
  ip community-list 2 permit 13445:10010
  ip community-list 3 permit 13445:10020
  ip community-list 4 permit 13445:20000
  ip community-list 5 permit 13445:20010
  ip community-list 6 permit 13445:20020
  ip community-list 7 permit 13445:20060
  !

  route-map CALL-ONLY permit 10
    match community 4 5 6 7
  !

  route-map MTG-ONLY permit 10
    match community 1 2 3
  !

```

2

Apply Route-Map to filter on Webex Calling Prefixes ONLY

1

Route-map matching only on permitted community lists with Webex Calling communities



Filtering on Webex Meetings Prefixes through Community Strings

```

router bgp 65333
  bgp log-neighbor-changes
  neighbor 100.64.2.2 remote-as 13445
  neighbor 100.64.2.2 fall-over bfd
  !
  address-family ipv4
    network 100.64.200.128 mask 255.255.255.128
    neighbor 100.64.2.2 activate
    neighbor 100.64.2.2 route-map MTG-ONLY in
  exit-address-family
  ip bgp-community new-format
  ip community-list 1 permit 13445:10000
  ip community-list 2 permit 13445:10010
  ip community-list 3 permit 13445:10020
  ip community-list 4 permit 13445:20000
  ip community-list 5 permit 13445:20010
  ip community-list 6 permit 13445:20020
  ip community-list 7 permit 13445:20060
  !
  route-map CALL-ONLY permit 10
    match community 4 5 6 7
  !
  route-map MTG-ONLY permit 10
    match community 1 2 3
  !

```

2 Apply Route-Map to filter on Webex Meetings Prefixes ONLY

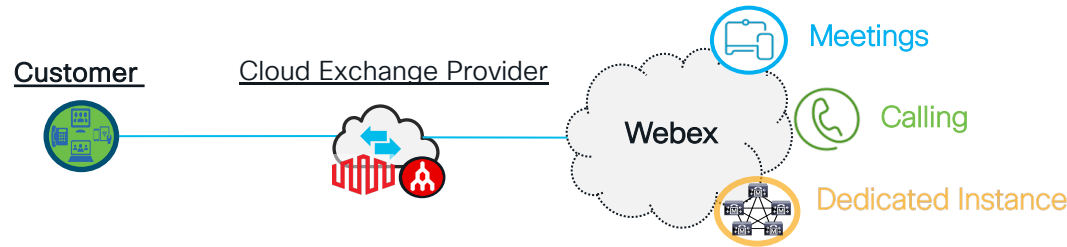
1 Route-map matching only on permitted community lists with Webex Meetings communities

Edge Connect for Webex Suite – Technical Overview

Note: Part of the Early
Access program

What is Edge Connect for the Webex Suite?

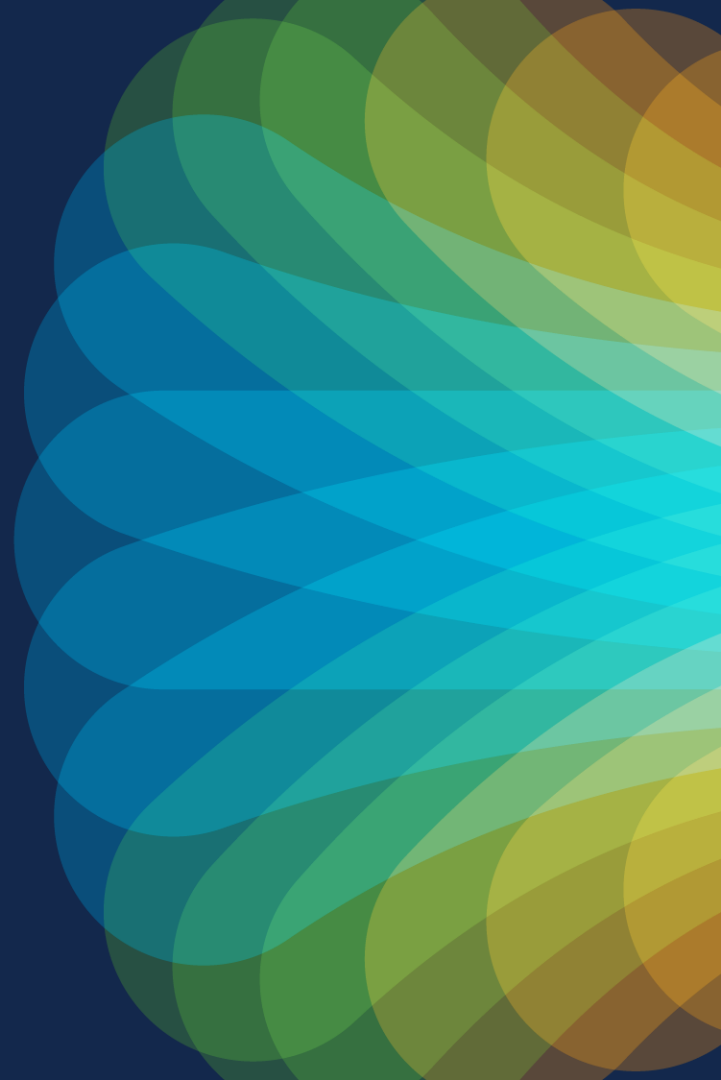
Edge Connect for Webex Suite is for customers who have Webex Suite with Dedicated Instance (**Webex Meetings**, **Webex Calling** and **Webex Dedicated Instance (DI)**) all available over a single Edge Connect Peering.



Prior to this offering customers required separate BGP peerings and virtual connections for **Webex Dedicated Instance (DI)** and **Webex Meetings / Webex Calling**.

	Equinix Webex Suite 	Equinix Meetings and Calling 	Megaport Webex Suite 	Megaport Meetings and Calling 
Cisco Purchase Order (PO) Number (CCW order)	Required	Required	Required	Required
BGP Peering Public IP Range: Customer side IP and Webex side IP required	Public IP Range (/30 or /31)	Public IP Range (/30 or /31)	Public IP Range (/30 or /31)	Public IP Range (/30 or /31)
Advertised Public IP Range: Subnets used for NAT and Advertised to Webex	Cisco implements the NAT	<i>Customer NAT: max /29 max 100 subnets</i>	Cisco implements the NAT	<i>Customer NAT: max /29 max 100 subnets</i>
Public or Private ASN (32 bit supported) BGP Password	ASN required Password optional	ASN required Password optional	ASN required Password optional	ASN required Password optional
Tech contact	admin group alias email + phone number	admin group alias email + phone number	admin group alias email + phone number	admin group alias email + phone number
Number of connections	<i>DI requires 2 connections minimum</i>	1 connection minimum	<i>DI requires 2 connections minimum</i>	1 connection minimum
Link speed 200mb, 500mb, 1gb, 5gb, 10gb	Speed should match PO	Speed should match PO	Speed should match PO	Speed should match PO
Metro Location(s):	Location where the peering terminates to Webex	Location where the peering terminates to Webex	Location where the peering terminates to Webex	Location where the peering terminates to Webex

Meeting and Calling IP architecture (GA)

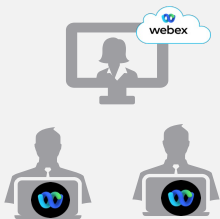


Meetings and Calling

Corporate Network

Using RFC 1918 address

10.0.0.0/8
172.16.0.0/12
192.168.0.0/16



Need to connect to
Webex services

```
interface GigabitEthernet0/1/1.100  
ip address 100.64.2.5 255.255.255.252  
encapsulation dot1q 100
```

```
router bgp 64512  
bgp log-neighbor-changes  
neighbor 100.64.2.6 remote-as 13445  
neighbor 100.64.2.6 password 1Secretpaswd!
```

Edge Connect link

```
interface GigabitEthernet0/0/2.208  
ip address 100.64.2.6 255.255.255.252  
encapsulation dot1q 208
```



REQUIREMENTS: Customer Edge Router IP Config

- **Public IP address** (/30 or /31) provided by customer between CE and PE routers
- Local Vlan and encapsulation
- BGP enabled with Public or Private ASN for peering

Meetings and Calling

Corporate Network

Using RFC 1918 address

10.0.0.0/8
172.16.0.0/12
192.168.0.0/16



Need to connect to
Webex services
10.10.x.x

```
interface GigabitEthernet0/1/1.100
ip address 100.64.2.5 255.255.255.252
encapsulation dot1q 100
ip nat outside
```

```
interface GigabitEthernet0/2/1
ip address 10.10.10.1 255.255.255.0
ip nat inside
```

```
ip nat pool EdgeConnect 100.64.200.145 100.64.200.150 prefix-length 28
ip nat inside source list 1 pool EdgeConnect overload
access-list 1 permit 10.10.0.0 0.0.255.255
```

Edge Connect link

```
interface GigabitEthernet0/0/2.208
ip address 100.64.2.6 255.255.255.252
encapsulation dot1q 208
```



REQUIREMENTS: NAT Pool

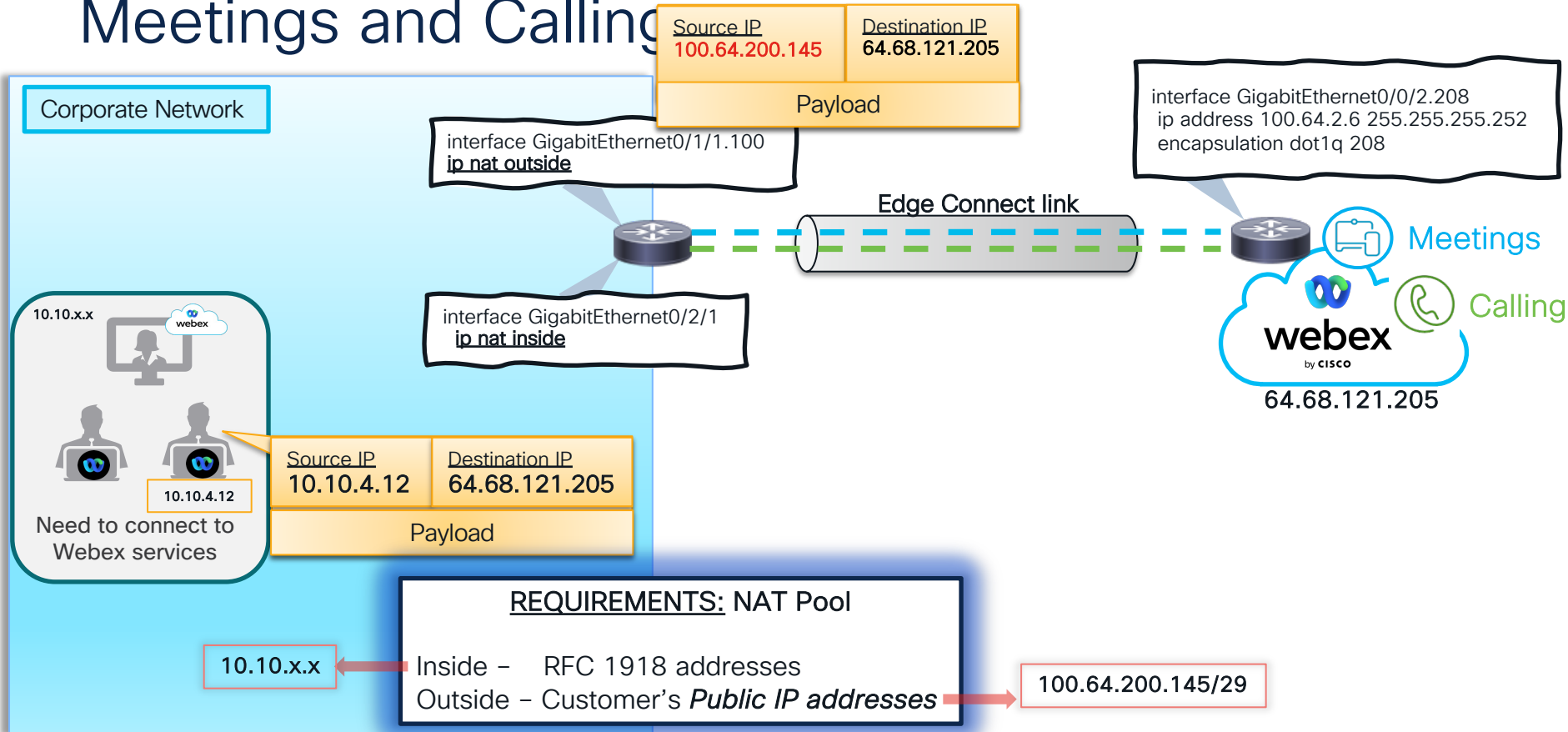
10.10.x.x

Inside – RFC 1918 addresses

Outside – Customer's *Public IP addresses*

100.64.200.145/29

Meetings and Calling



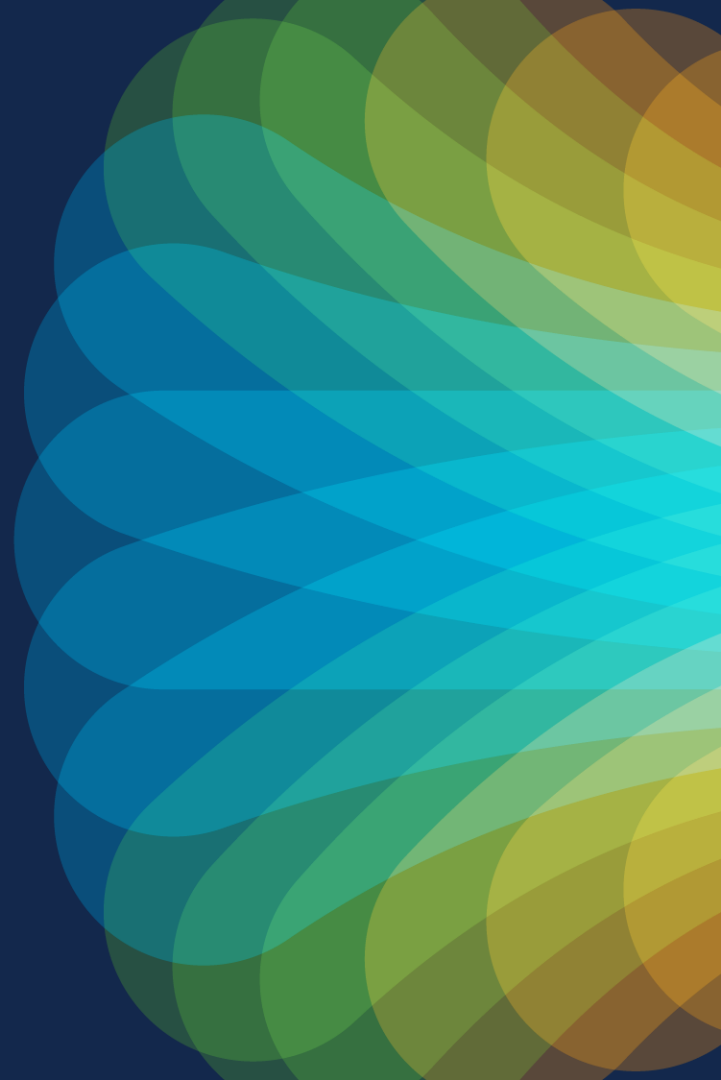


Meetings and Calling – Key points

- Edge Connect link uses Public IP addresses between CE and PE.
- Nat pool is on the customer's router.
- BGP passes customer's Nat'd IP address range to Cisco
- Webex receives public source IP addresses on packets to Meetings and Calling services on the backbone.

Dedicated Instance IP architecture

Note: Part of the Early
Access program



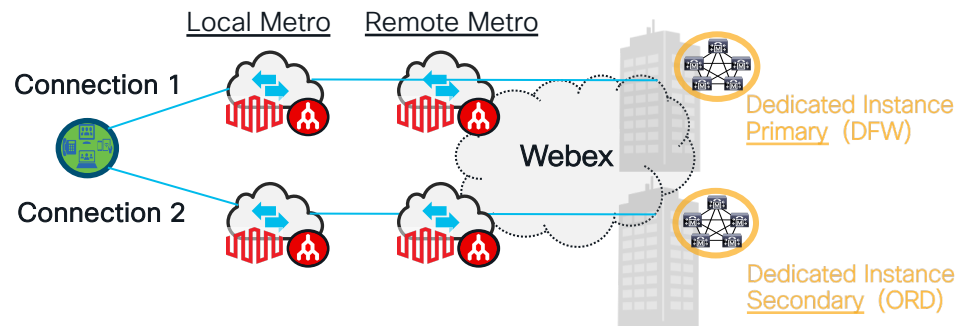
Scenario A

Scenario

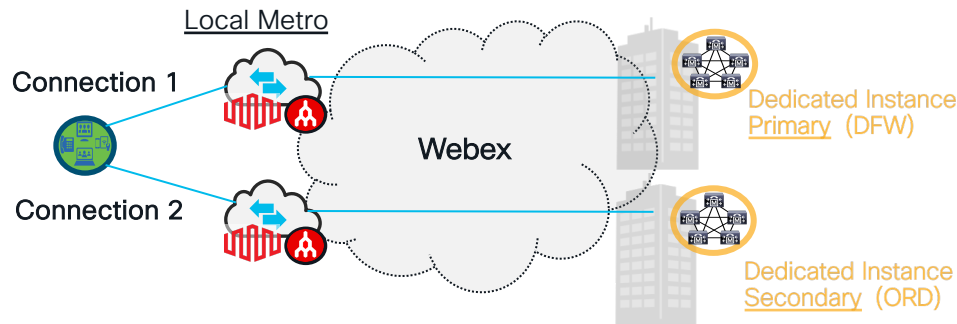
- Customer has purchased Edge Connect links.
- Customer wants to have **Dedicated Instance** traffic on the Edge Connect links.
- What is the network architecture?
- What is the IP routing requirements?

Redundancy Considerations for DI

- Using a virtual circuit provisioned for Dedicated Instance only
 - Requires provisioning 2 circuits
 - Requires 2 cloud exchange provider ports and remote connections to each datacenter
 - Increased cost to the customer



- Edge Connect for the Webex Suite model
 - Requires a 2 Edge Connect circuit to the Webex backbone
 - Requires 2 cloud exchange provider ports
 - Webex routes the traffic to the remote primary and redundant datacenters across the backbone



Note: DI requires redundant links to different datacenters

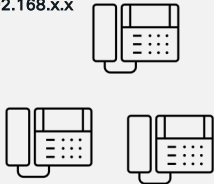
Dedicated Instance Only

Corporate Network

Using RFC 1918 address

10.0.0.0/8
172.16.0.0/12
192.168.0.0/16

192.168.x.x



192.168.1.50

Need to connect to
Webex services

```
interface GigabitEthernet0/0/1.300
description EC - DFW
bandwidth 100000
encapsulation dot1Q 300
ip address 100.64.2.5 255.255.255.252
```

Edge Connect link

```
interface GigabitEthernet0/0/3.209
description EC - DFW
bandwidth 100000
encapsulation dot1Q 209
ip address 100.64.2.6 255.255.255.252
```

Dedicated
Instance



REQUIREMENTS: Customer Edge Router IP Config

- **Public IP address** (/30 or /31) provided by customer between CE and PE routers
- Local Vlan and encapsulation
- BGP enabled with Public or Private ASN for peering
- Uses RFC 1918 addresses from device to call control

Note: DI requires redundant links to different datacenters

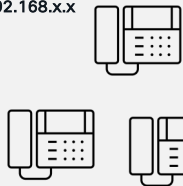
Dedicated Instance Only

Corporate Network

Using RFC 1918 address

10.0.0.0/8
172.16.0.0/12
192.168.0.0/16

192.168.x.x



192.168.1.50

Need to connect to
Webex services

Source IP
192.168.1.50

Destination IP
69.168.17.10

Payload

```
interface GigabitEthernet0/0/1.300
description EC - DFW
bandwidth 100000
encapsulation dot1Q 300
ip address 100.64.2.5 255.255.255.252
```

```
interface GigabitEthernet0/0/3.209
description EC - DFW
bandwidth 100000
encapsulation dot1Q 209
ip address 100.64.2.6 255.255.255.252
```

Edge Connect link

Default
Route
0.0.0.0

DI Routes
69.168.17.0/25
69.168.17.0/24

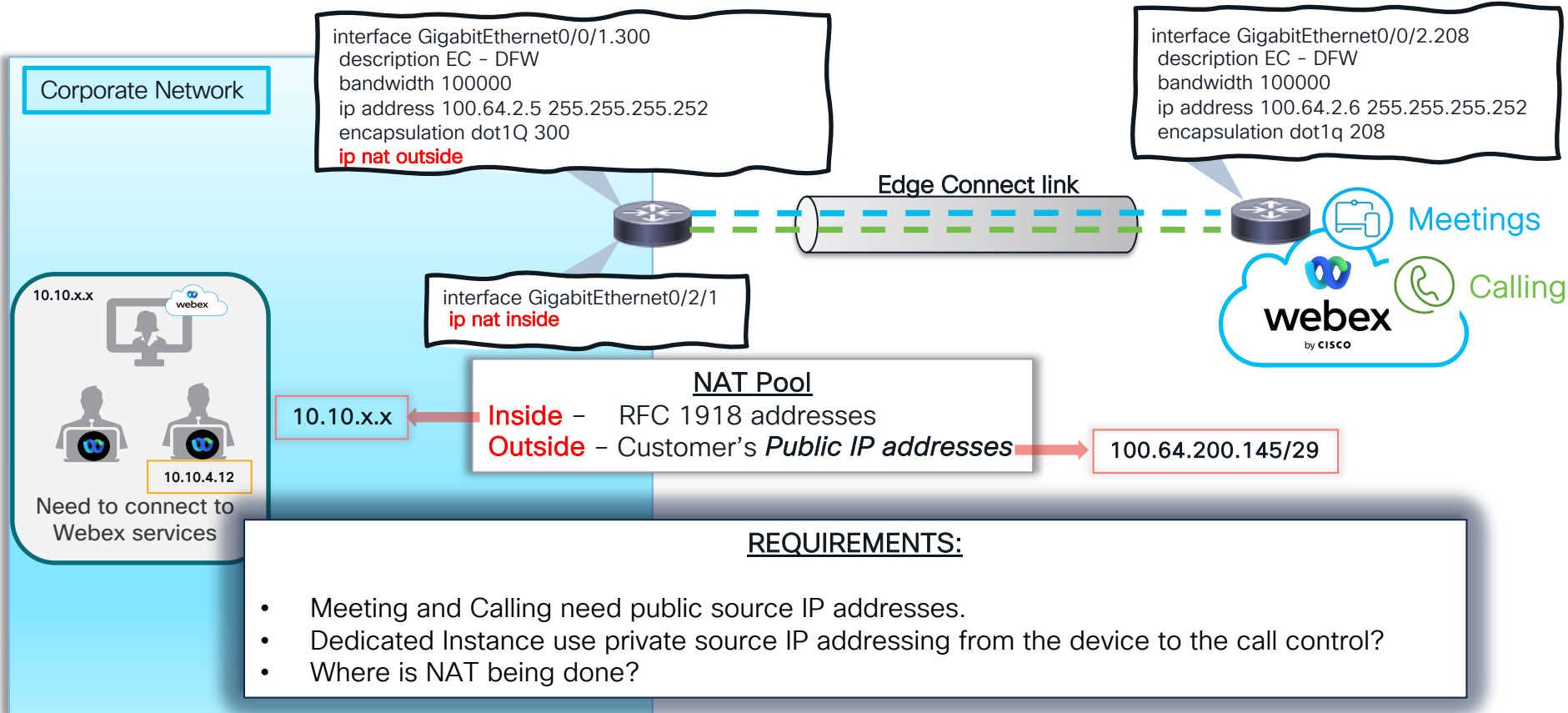
Dedicated
Instance
69.168.17.10

webex
by **CISCO**

REQUIREMENTS: Customer Edge Router IP Config

- Uses RFC 1918 source address from the phone to the call control.
- Public IP address used between CE and PE router for BGP Peering.
- Advertised prefix in BGP peering is the default route (0.0.0.0).

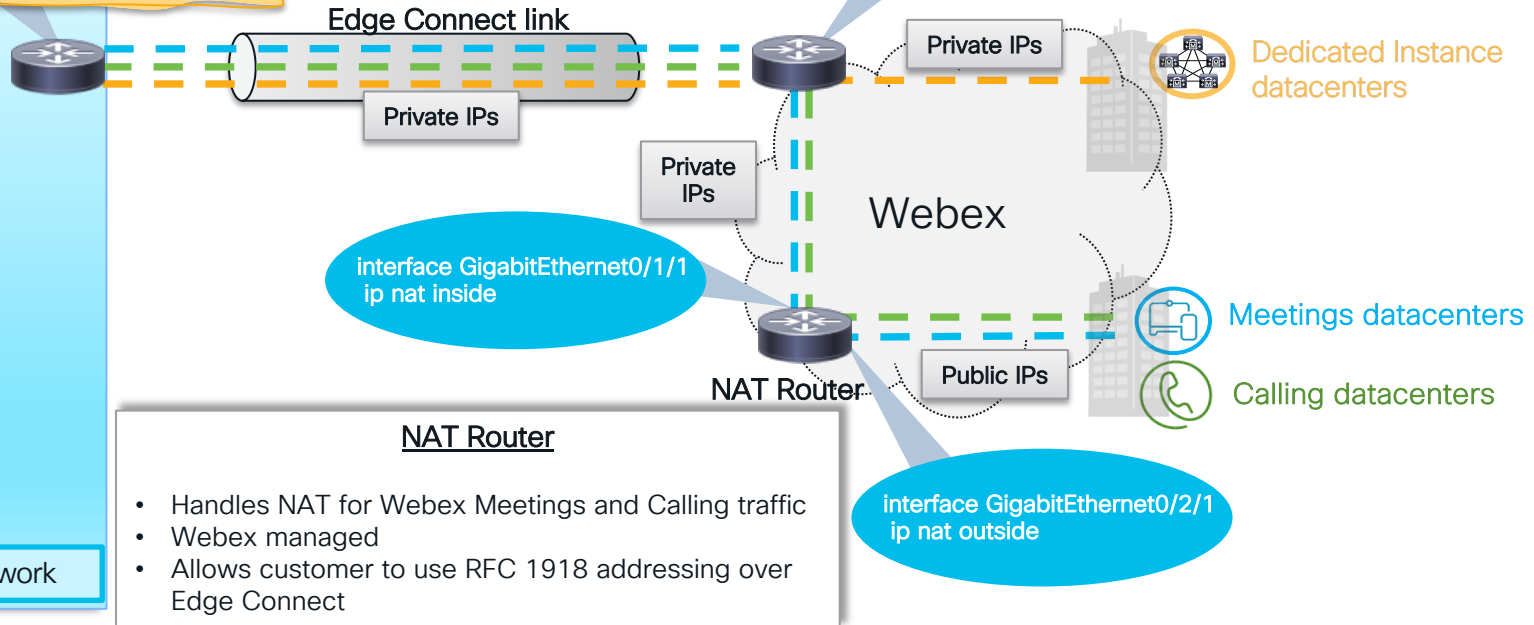
Add Dedicated Instance to a Meetings and Calling Early Access (EA) link?

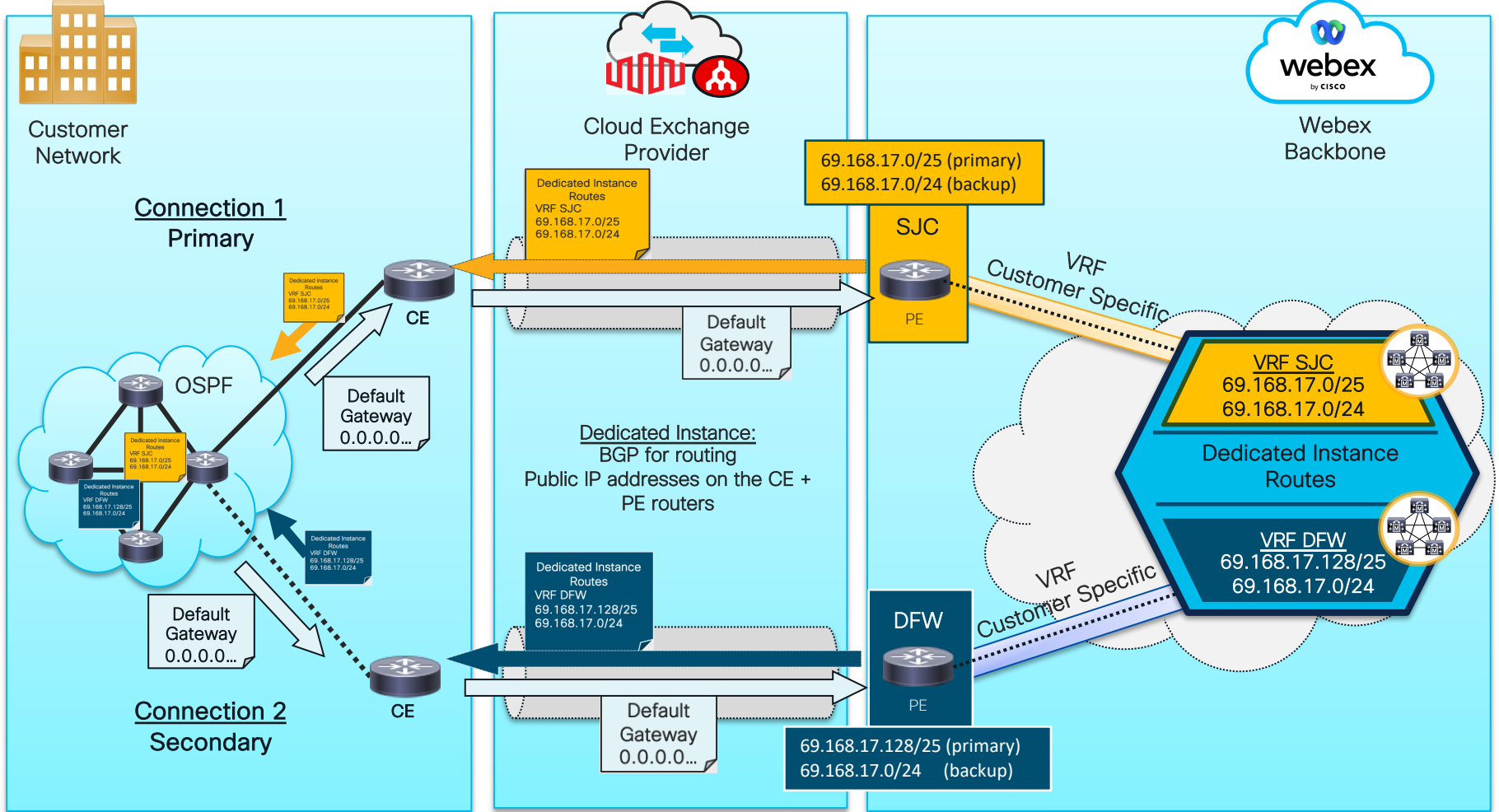


Meetings, Calling and Dedicated Instance

```
interface GigabitEthernet0/0/1.300
description EC - DFW
bandwidth 100000
encapsulation dot1Q 300
ip address 100.64.2.5 255.255.255.252
```

```
interface GigabitEthernet0/0/3.209
description EC - DFW
bandwidth 100000
encapsulation dot1Q 209
ip address 100.64.2.6 255.255.255.252
```





Scenario A Summary

Scenario

- Customer has purchased Edge Connect links.
- Customer wants to have **Dedicated Instance** traffic on the Edge Connect links.
- What is the network architecture?
- What is the IP routing requirements?

Summary

- DI requires dual connections to different DI instances in Webex.
- CE and PE routers need public IP addresses on the interface with BGP enabled. Highest IP address is the PE router interface.
- Each PE passes a /25 and /24 route to the customer. The same IP routes are sent to every customer.
- Customer sends a default route 0.0.0.0 to Webex.

Webex Suite for Edge Connect and all services

Note: Part of the Early
Access program

Scenario B

Scenario

- Customer has purchased Edge Connect links.
- Customer wants to have all Webex services, **Meetings**, **Calling** and **Dedicated Instance** traffic on the Edge Connect links.
- What is the network architecture?
- What is the IP routing requirements?

Scenario B Summary

Scenario

- Customer has purchased Edge Connect peering.
- Customer wants to have all Webex services, **Meetings**, **Calling** and **Dedicated Instance** traffic on the Edge Connect links.
- What is the network architecture?
- What is the IP routing requirements?

Summary

- Meetings and Calling do not support RFC 1918 addressing.
- NAT is moved from the customer network to a Webex provisioned and managed router for Meetings and Calling traffic.
- Meetings and Calling IP routes are passed to the customer's CE router across BGP.
- CE and PE routers need public IP addresses on the interface with BGP enabled. Highest IP address is the PE router interface.

DC Pinning

Note: Part of the Early Access program

Cloud Exchange Peering Location to Dedicated Instance – Remote Connections

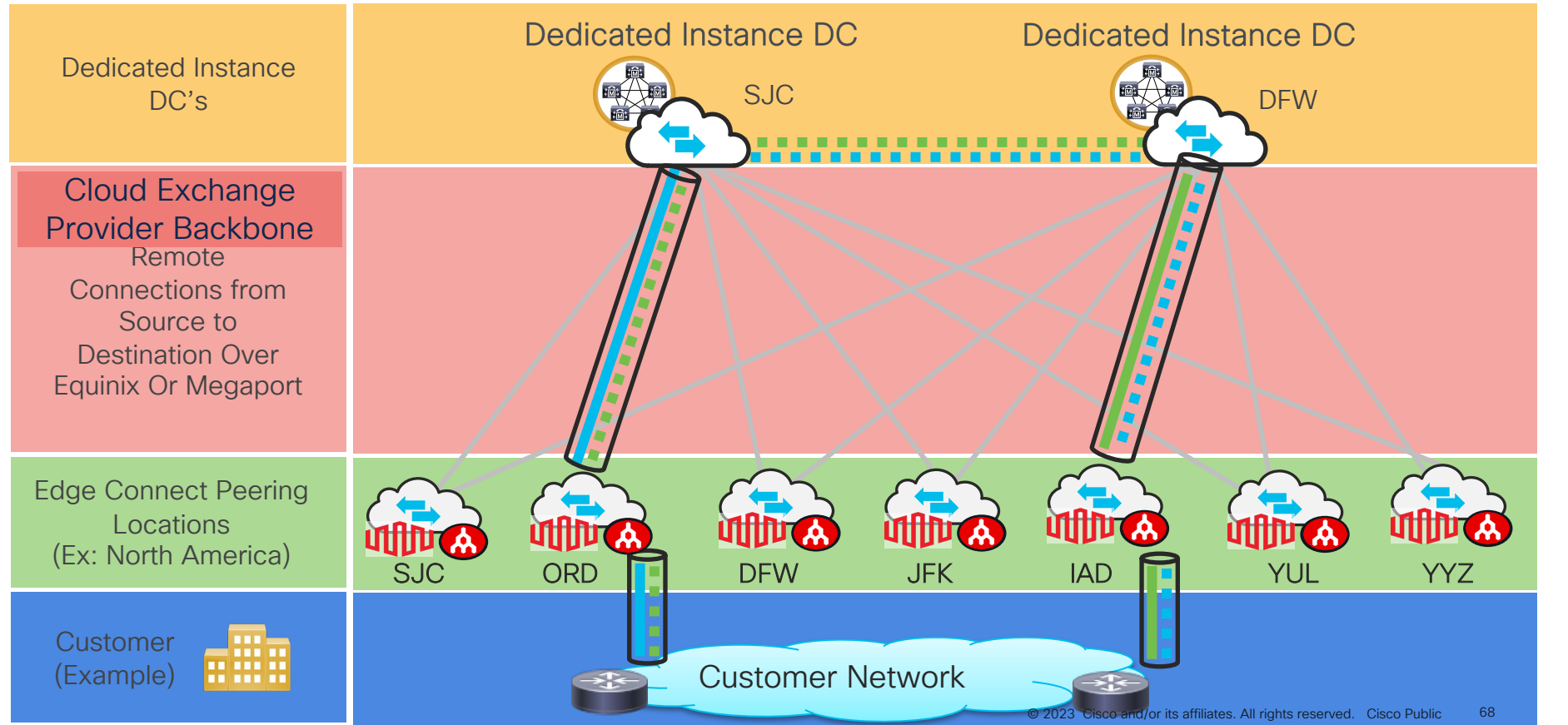
LEGEND

DFW Primary Path

SJC Secondary Path

SJC Primary Path

DFW Secondary Path



Cloud Exchange Peering Location to Dedicated Instance DC Pinning – Local Connections

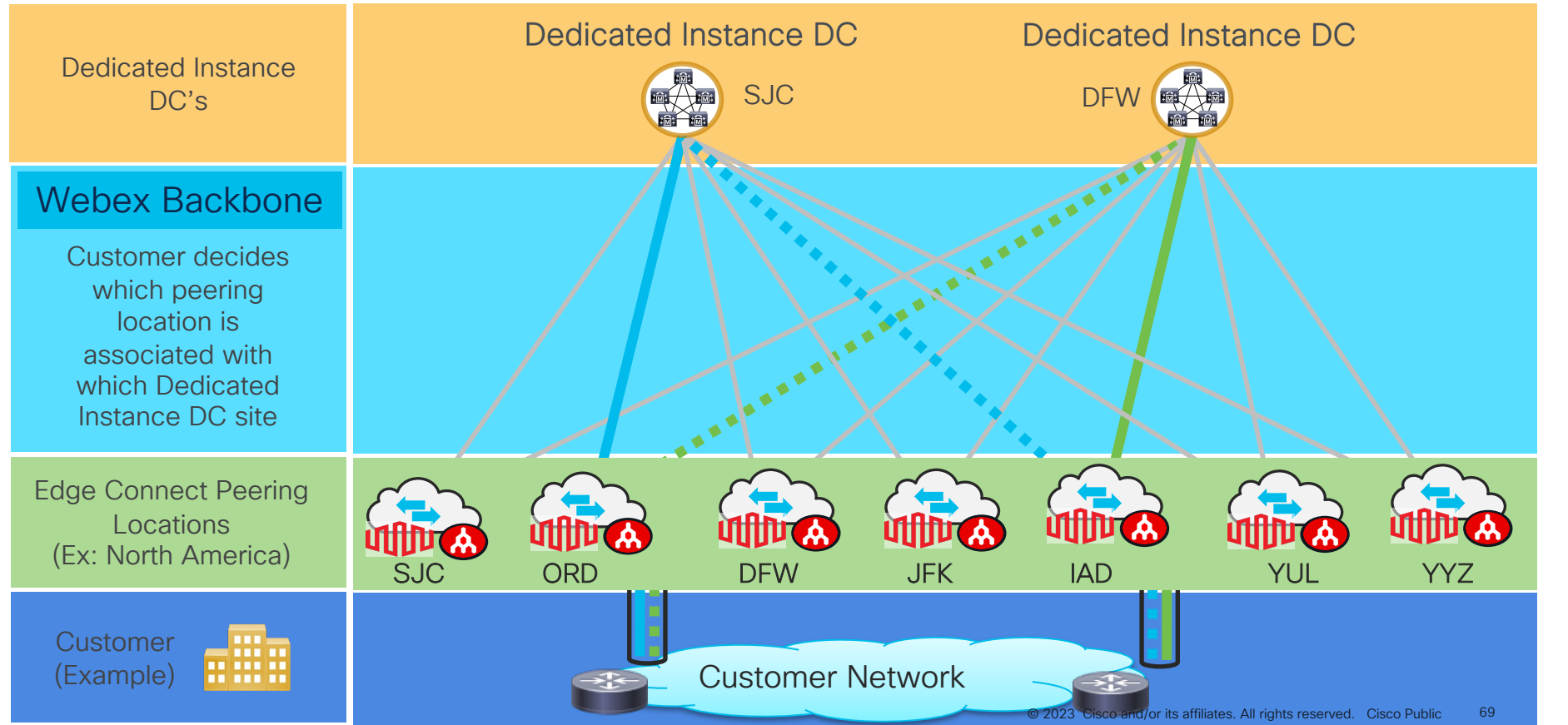
LEGEND

DFW Primary Path

DFW Secondary Path

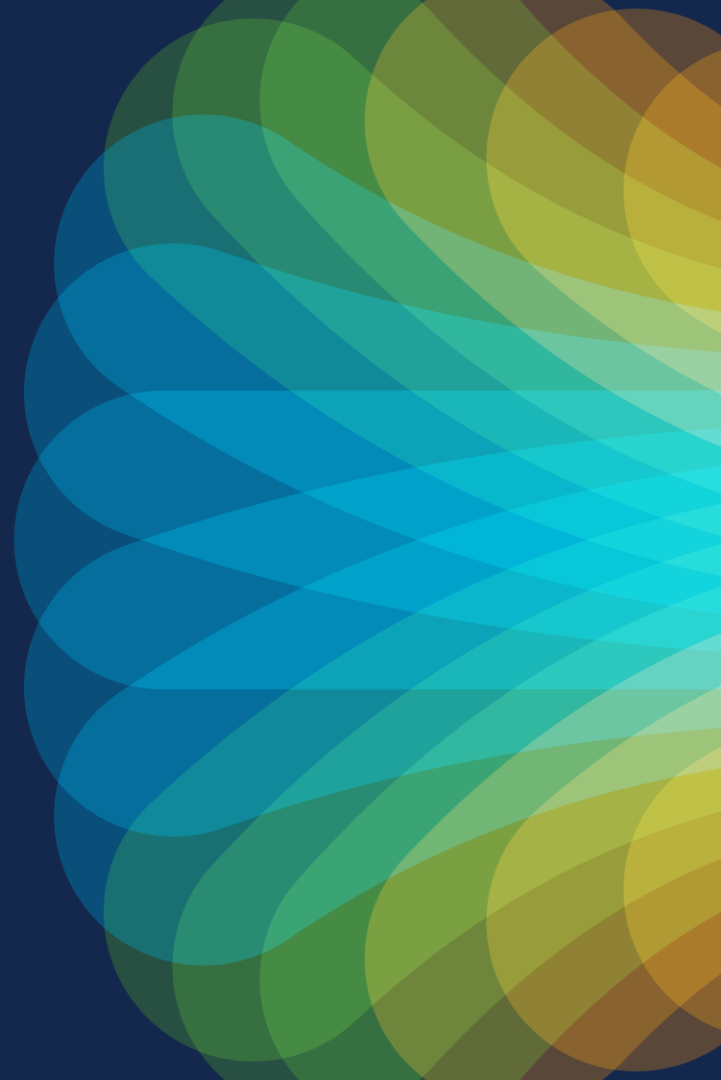
SJC Primary Path

SJC Secondary Path



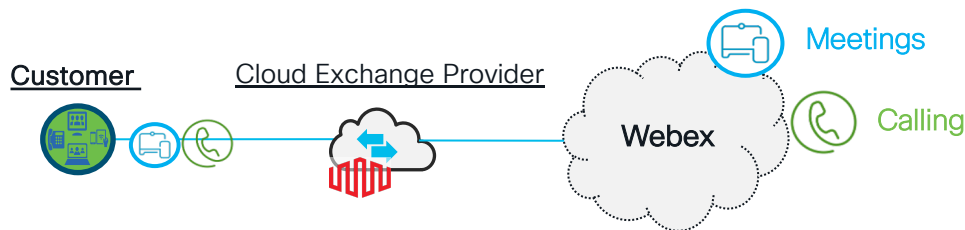
Adding additional Webex Suite services to Edge Connect existing links

Note: Part of the Early
Access program



Scenario C

- Customer has an existing Meetings and Calling Edge Connect link.
- Not a link provisioned for Early Access (EA)



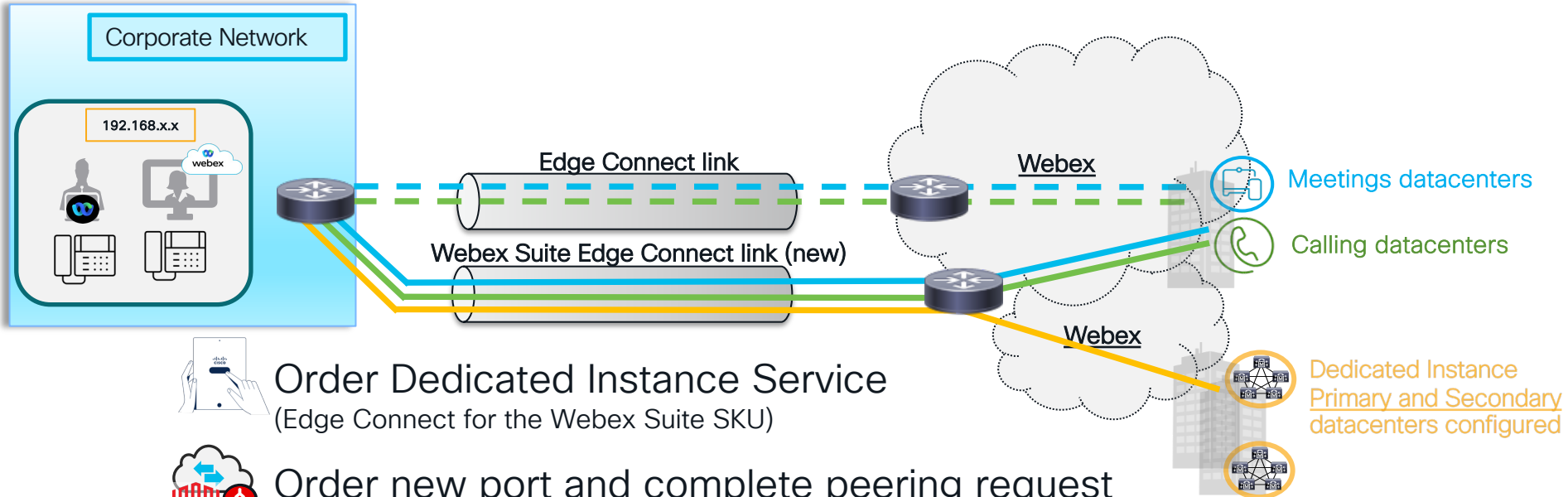
- Now wants to add all the services over a single peering, the Webex Suite offering of Edge Connect.
- How is this be accomplished?



Represents the customer

Note: DI requires redundant links to different datacenters

Adding Dedicated Instance to an existing link



Order Dedicated Instance Service
(Edge Connect for the Webex Suite SKU)



Order new port and complete peering request



Everyone provisions their routers for connectivity



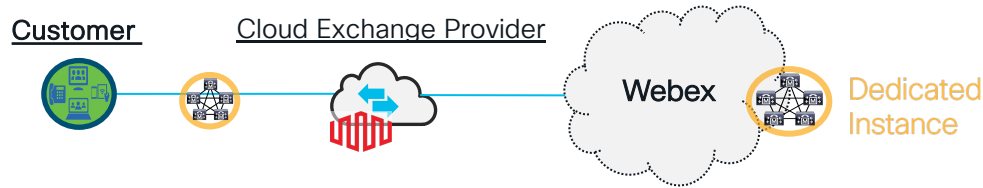
Decommission request for the original Meetings and Calling circuit
(Done within the cloud exchange provider portal)

Adding Dedicated Instance to an existing link

- Can not add new services to the existing DI link due to architecture.
- Must provision a new connection with Equinix or Megaport. May be over the same port if bandwidth is available. Equinix allow for over-provisioning, Megaport does not.
- New public IP addressing (/30 or /31) needed for BGP peering if the old and new links are active at the same time.
- Could use existing IP addresses if traffic is routed to the Internet during the transition.
- Highest number IP address in the subnet must be the Cisco PE router address in the /30 or /31 subnet
- Plan for up to 3 business weeks for the provisioning process as it is part of the Early Access process.

Scenario D

- Customer has an existing Dedicated Instance Edge Connect link.
- Not a link provisioned for Early Access (EA)



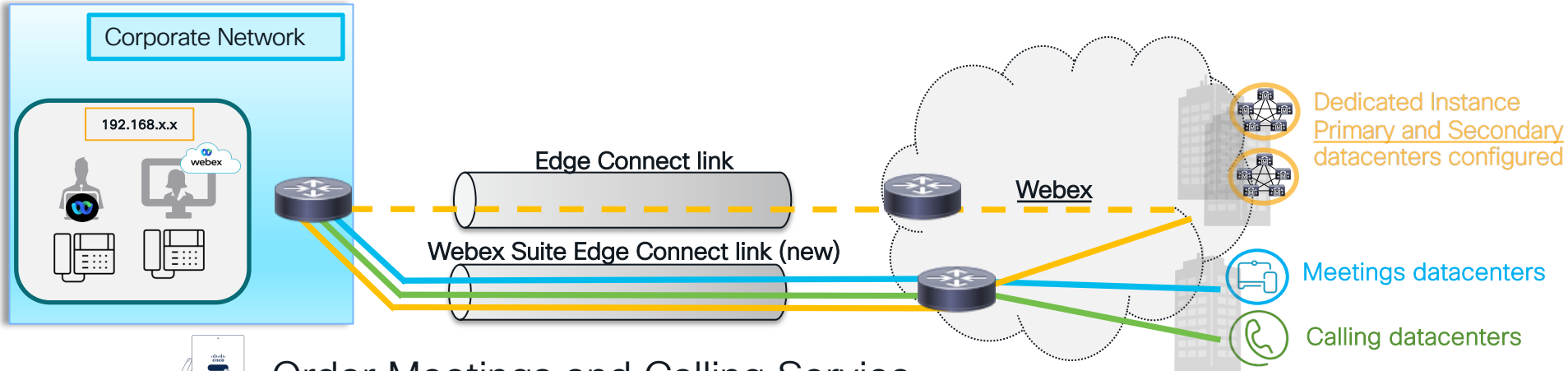
- Now wants to add all the services over a single link, the Webex Suite offering of Edge Connect.
- How is this be accomplished?



Represents the customer

Note: DI requires redundant links to different datacenters

Adding Meeting and Calling to an existing DI link



Order Meetings and Calling Service

(Edge Connect for the Webex Suite SKU, if applicable)



Order new port and complete peering request



Everyone provisions their routers for connectivity



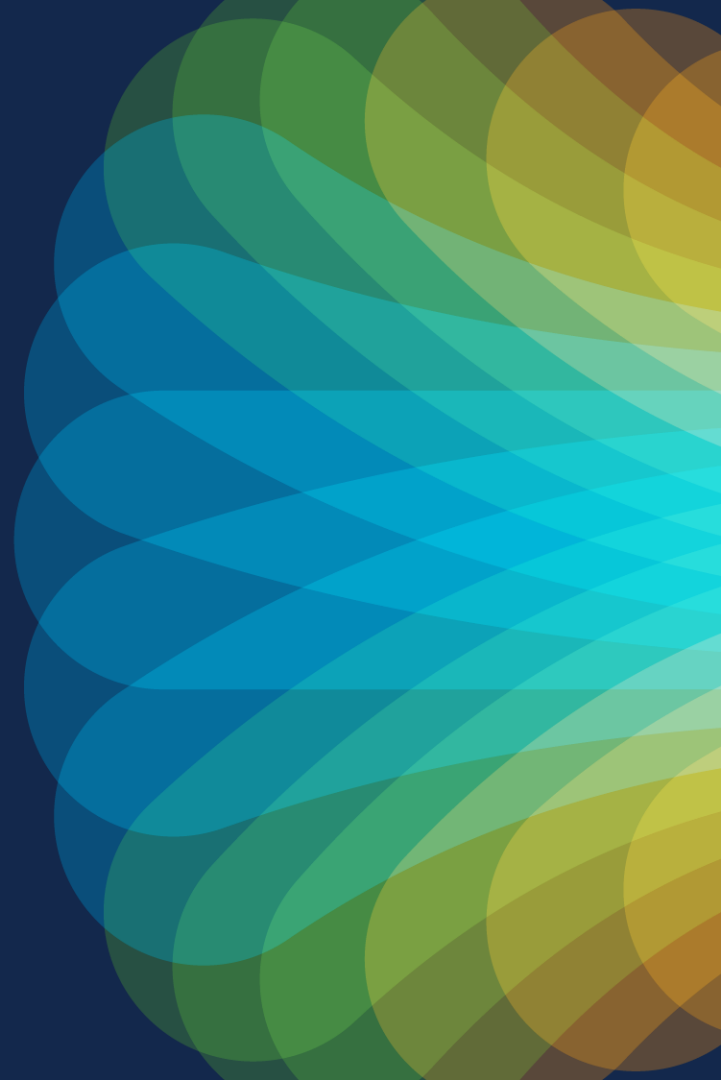
Decommission request for the original Dedicated Instance circuit

(Done within the cloud exchange provider portal)

Adding Meeting and Calling to an existing DI link

- Can not add new services to the existing DI link due to architecture.
- Must provision a new connection with Equinix or Megaport. May be over the same port if bandwidth is available. Equinix allow for over-provisioning, Megaport does not.
- New public IP addressing (/30 or /31) needed for BGP peering if the old and new links are active at the same time.
- Could use existing IP addresses if traffic is routed to the Internet during the transition.
- Highest number IP address in the subnet must be the Cisco PE router address in the /30 or /31 subnet
- Plan for up to 3 business weeks for the provisioning process as it is part of the Early Access process.

Video Mesh



The benefits of Video Mesh



Lower bandwidth costs

Attendees connect automatically to the closest data center, reducing bandwidth usage and latency.



Migrate at your own pace

Enjoy the benefits of the cloud while remaining on-premises and securing your investments.



Enhanced User Experience

An enriched calling and meeting experience while scaling capacity to the cloud as needed.



Simplified management

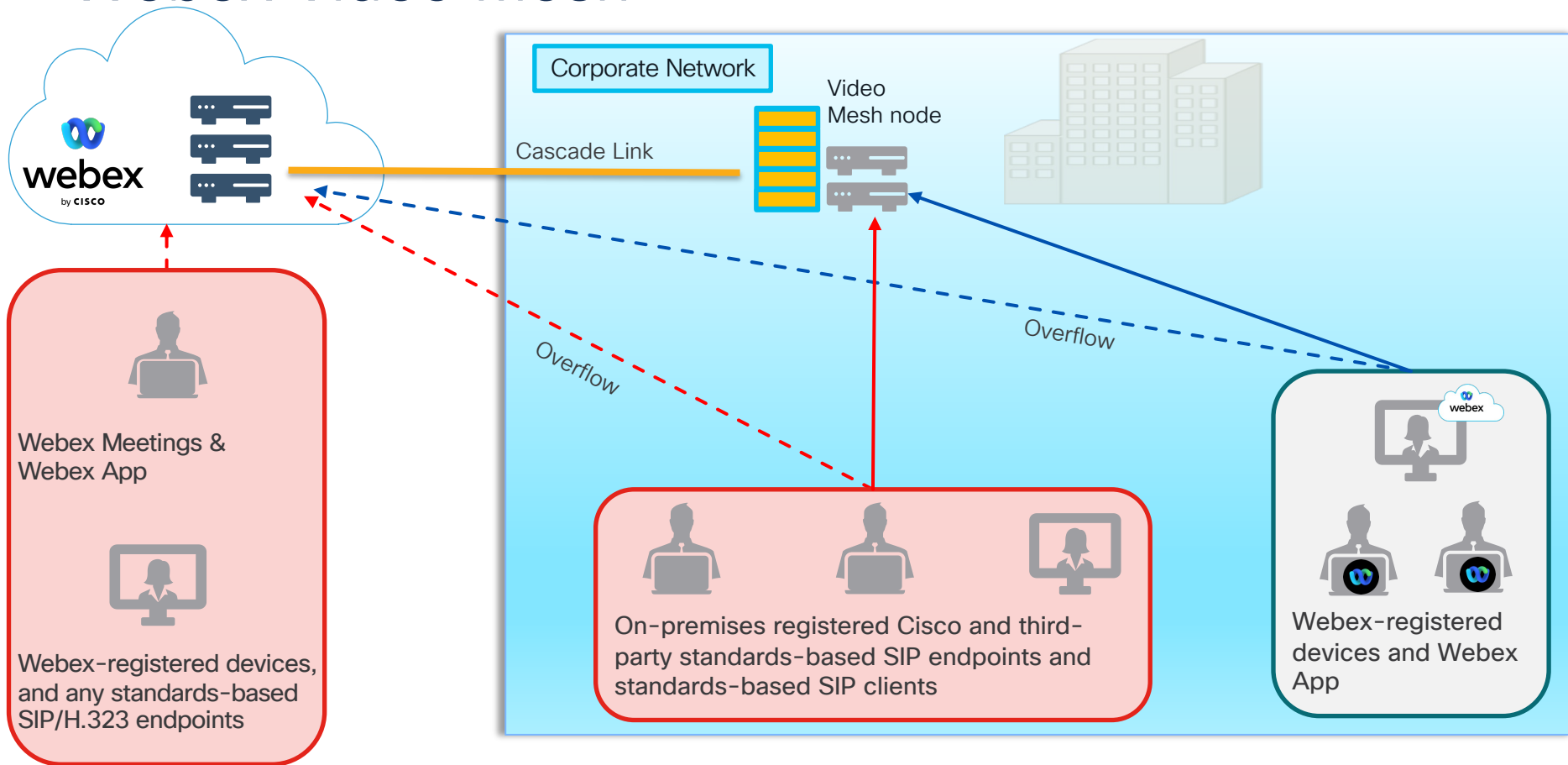
Effortlessly deployed and managed through the cloud with a centralized portal.



What is Video Mesh?

- Dockerized deployment of Webex cloud media services on the customer premises for a high-quality *hybrid meeting experience*.
- Cisco CMS1000, Cisco CMS2000, or customer's hardware can be used to install Video Mesh software, requires VMware also.
- *Management, analytics, and troubleshooting* via the Webex Control Hub.
- *Automatic discovery* of media resources and *placement* of participants in meetings for optimal media utilization.
- *Intelligent overflow* of a participant to the Webex cloud when the Video Mesh Node on the customer premises' capacity is reached to ensure seamless meeting experience.
- *Zero touch upgrades* from the cloud to keep in sync with Webex enhancements.
- Secure on-premises *Private Meetings* to keep all meeting media on the customer's network.
- Rich set of provisioning and troubleshooting *APIs* for seamless onboarding, quick fault isolation, and native integration with the customers' 3'party monitoring apps.

Webex Video Mesh



Video Mesh supported devices and apps

Supported

Any Webex registered device

- SX, MX, DX, Room series, Webex Board, Webex Share, Desk series

Webex App browser client

- web.webex.com

Webex App (**without** the [Full Featured Webex Experience](#) toggle)

- Desktop and Mobile

Unified CM registered devices

- Calling a Webex scheduled meeting or personal room.
- Edge for Devices with Webex Optimized Experience
 - Webex Join Protocol = Webex and Cloud upgrade mode on
- On-premises UCM and UCM cloud
 - SX, MX, DX, Room series, Desk series, Jabber

Cisco VCS/Exp. registered devices

- Calling a Webex scheduled meeting or personal room.
- SIP or H.323 (requires Interworking)

Unsupported

Webex Calling-registered phones

Webex Meetings client

Webex App with the [Full Featured Webex Experience](#)

Webex callback to a SIP URI that is to an on premises-registered endpoint

Hardware Requirements

Platform	Specifications	Notes
Cisco Meeting Server 1000	<ul style="list-style-type: none">• 72vCPUs• 60GB main memory• 80GB local hard disk space	
Cisco Meeting Server 2000	<ul style="list-style-type: none">• 72vCPUs• 60GB main memory• 80GB local hard disk space	<ul style="list-style-type: none">• Each blade must be a complete Cisco Meeting Server 1000 with dedicated CPU, RAM and hard drives per blade.
OR		
	<ul style="list-style-type: none">• 72vCPUs• 60GB main memory• 80GB of NFS storage	<ul style="list-style-type: none">• Each blade must have dedicated CPU and RAM.• Peak IOPs (input/output operations per second) for NFS storage is 300 IOPS.
Specification based configuration	<ul style="list-style-type: none">• 2.6 GHz Intel Xeon E5-2600v3 or later processor• 72vCPUs• 60GB main memory• 80GB local hard disk space OR <ul style="list-style-type: none">• 2.6 GHz Intel Xeon E5-2600v3 or later processor• 72vCPUs• 60GB main memory• 80GB of NFS storage	<ul style="list-style-type: none">• Each Video Mesh virtual machine must have dedicated CPU, RAM and hard drives.• Each Video Mesh virtual machine must have CPU and RAM reserved for itself.• Peak IOPs (input/output operations per second) for NFS storage is 300 IOPS.

Capacity – Full Version of software

What can impact capacity of the node?

- Types of devices and clients in the meeting
- Video resolution requirements in the meeting
- Number of participants joining from the cloud
- Topology of the meeting

Software Options

1. Full Version
 - Preferred installation method. Designed to support all types of applications and devices.
 2. VMNLite Version
 - Optimized image for cloud registered and Webex App deployments.
 3. Demo Version
 - To be used in a lab for testing purpose only.
- The Full version and VMNLite version can be mixed in a single cluster.

Scenario	Resolution	Participant capacity
Meetings with only Webex App participants	720p	100–130*
Meetings and 1-to-1 calls with only Webex App participants	720p	60–100*
Meetings with only SIP participants	720p	70–80*
Meetings with only SIP participants	1080p	30–40*
Meetings with Webex App and SIP participants	720p	75–110*

* Use these numbers as general guidance.

Capacity – VMNLite version of software

What can impact capacity of the node?

- Types of devices and clients in the meeting
- Video resolution requirements in the meeting
- Number of participants joining from the cloud
- Topology of the meeting

Software Options

1. Full Version
 - Preferred installation method. Designed to support all types of applications and devices.
 2. VMNLite Version
 - Optimized image for cloud registered and Webex App deployments.
 3. Demo Version
 - To be used in a lab for testing purpose only.
- The Full version and VMNLite version can be mixed in a single cluster.

Scenario	Resolution	Participant capacity with 3 VMNLite nodes on a CMS 1K server
Meetings with only Webex App participants	720p	250–300*
Meetings and 1-to-1 calls with only Webex App participants	720p	175–275*

* Use these numbers as general guidance.

Webex Suite Meetings Platform

Webex Suite Meeting Platform



It is the [new name](#) for the next generation of the Webex Meeting Platform!

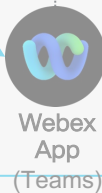
In order to understand why the new platform, we need to understand the history.



2023

Webex Meetings
(Mobile and
Desktop)

Webex Teams

Webex App
(Full Featured Meetings)Webex
App
(Teams)Webex
App

Cisco Jabber

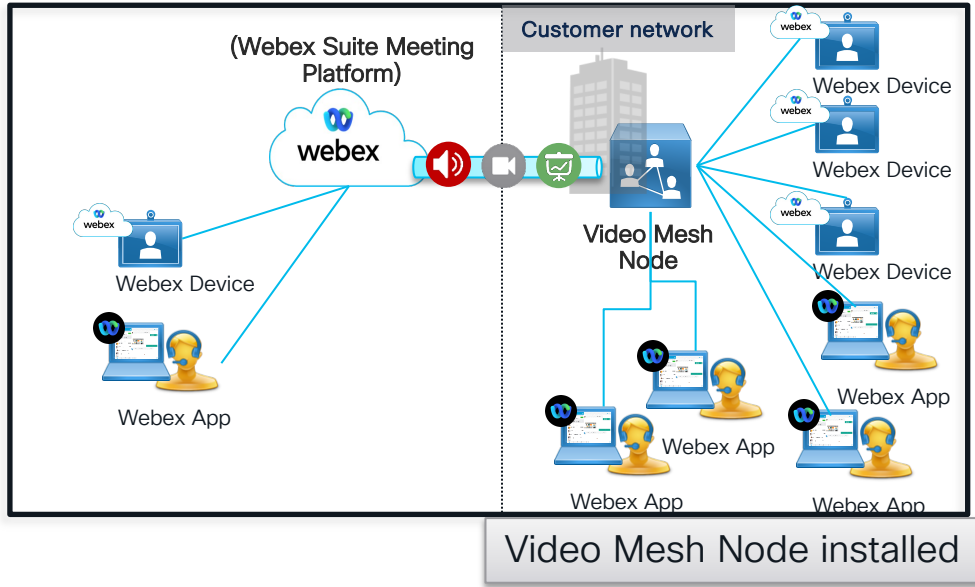
Hybrid Media
Node

Video Mesh Node



Video Mesh Node

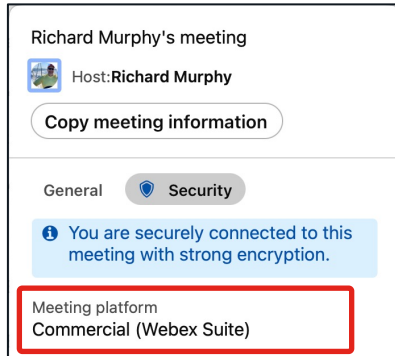
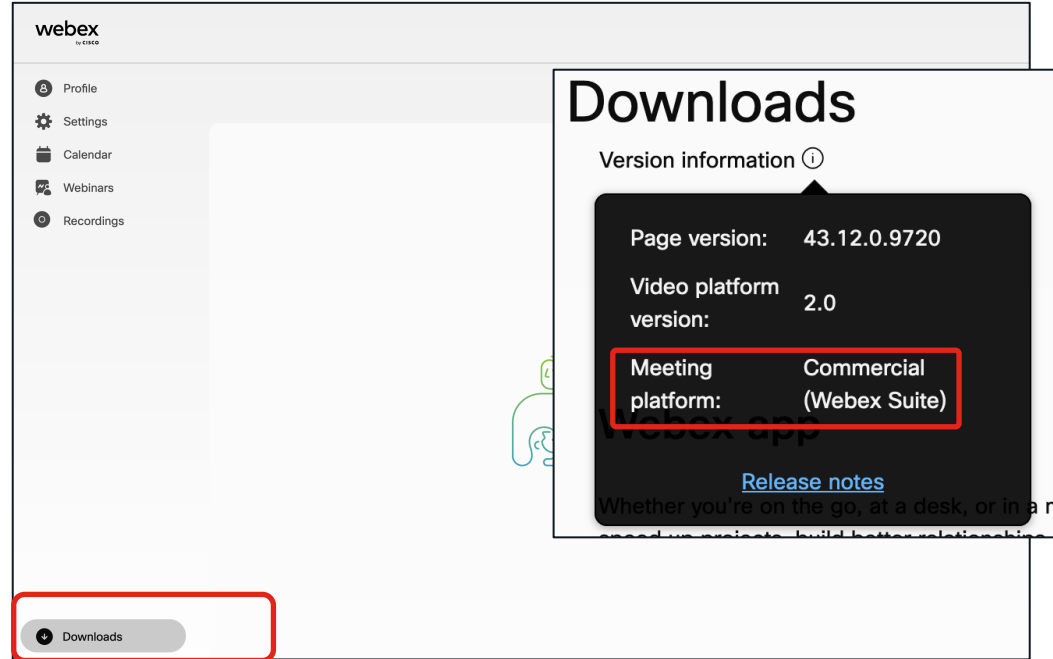
Why do you need Video Mesh?



- **Bandwidth savings** on the Internet link
- Uses QoS network infrastructure for **improved meeting experience** for the users
- **Lower latency connections** to the meeting for improved quality during the meeting.
- Deployed as a “**media proxy**” in the DMZ
- **Hosts Private Webex Meetings** where the meeting’s audio, video and content stays on the customer network
- **Easy deployment** via GUI and APIs
- Video Mesh Monitoring Tool and ThousandEyes Integration for **greater observability** into the network conditions.
- **Aligned with Webex Meetings** cloud architecture features and functionality

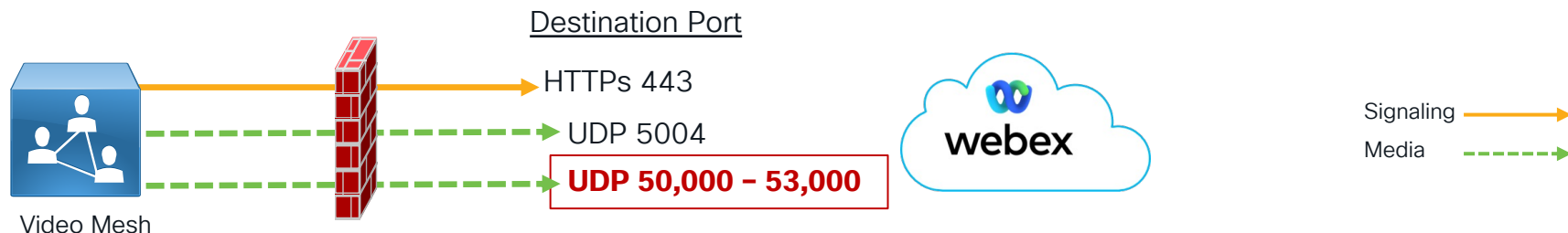
Am I on the Webex Meeting Suite Platform?

- [Help.Webex.com](https://help.webex.com) – information on how to tell if you are on the platform.
- “Commercial (Webex Suite)”
 - Means you are on the platform
 - Visible in the downloads page
 - Visible in the meeting info



VMN – Media cascade destination port range

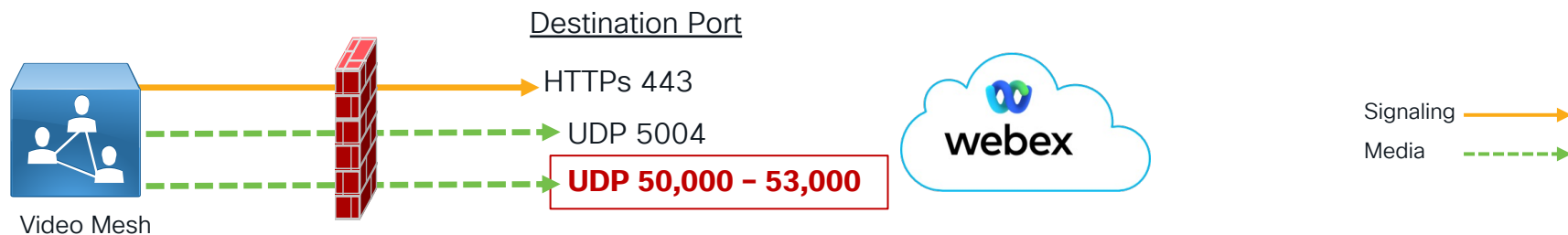
- <https://help.webex.com/en-us/article/ndd6sj9/Video-Mesh-port-updates-for-February-2023>



- Part of the continuous improvements in the Webex platform.
- Added media cascade using UDP 50,000 – 53,000 destination ports.
- VMN continues to use destination UDP 5004 for media cascades.
- Cascade uses:
 - 1:1 meetings will use UDP 5004
 - Space and Webex meetings will use UDP 50,000 – 53,000
- VMNs test connectivity to all cloud clusters on specific ports in the range every 4 hours

VMN – Media cascade destination port range

- Port consolidation targeted for Q1 CY24 (date subject to change)



- Eliminating the UDP 50,000 – 53,000 range
- All cascades will use UDP 5004.
- Enablement will be automatically done

*subject to change

Optimize utilization of your Video Mesh deployment

- Cluster setting allowing specific client or device types to optimize the Video Mesh resources to priority usage for better quality meetings.
- All non selected clients or devices types will overflow to Webex.
- Private Meetings clusters are unable to overflow to Webex.
- Control Hub Analytics of client types landing on the cluster

Video Mesh Clusters

Resources Settings

Client Type Inclusion Settings

Please select the client types that can utilize the Video Mesh clusters.

Cluster	Webex app - Desktop	Webex app - Mobile	Webex app - VDI	Webex Devices	SIP Devices
Amsterdam	☒	☐	☒	☒	☒
Bangalore	☒	☐	☒	☒	☒
London - Private Cluster	☒	☒	☒	☒	☒
Miami	☒	☐	☒	☒	☒

SIP Dial-in Flow to VMN

With SIP Devices disabled

ucdemolab = Webex sitename

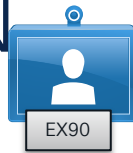
Signaling →
Media →



← Meeting request (Device Type = SIP)

Response → 409 response code

Note: A SIP 488 (NOT_ACCEPTABLE_HERE) response tells Unified CM to go to the next route group



UCM

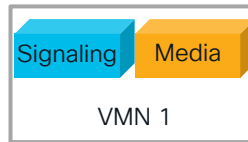
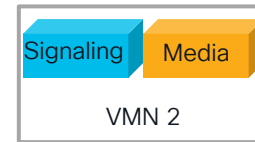
SIP Route Pattern
ucdemolab.webex.com

Route List

Route Group
RG_HQ

HQ_VMN SIP Trunk

488 response code



Core Network Cluster

Client Type Inclusion
Settings

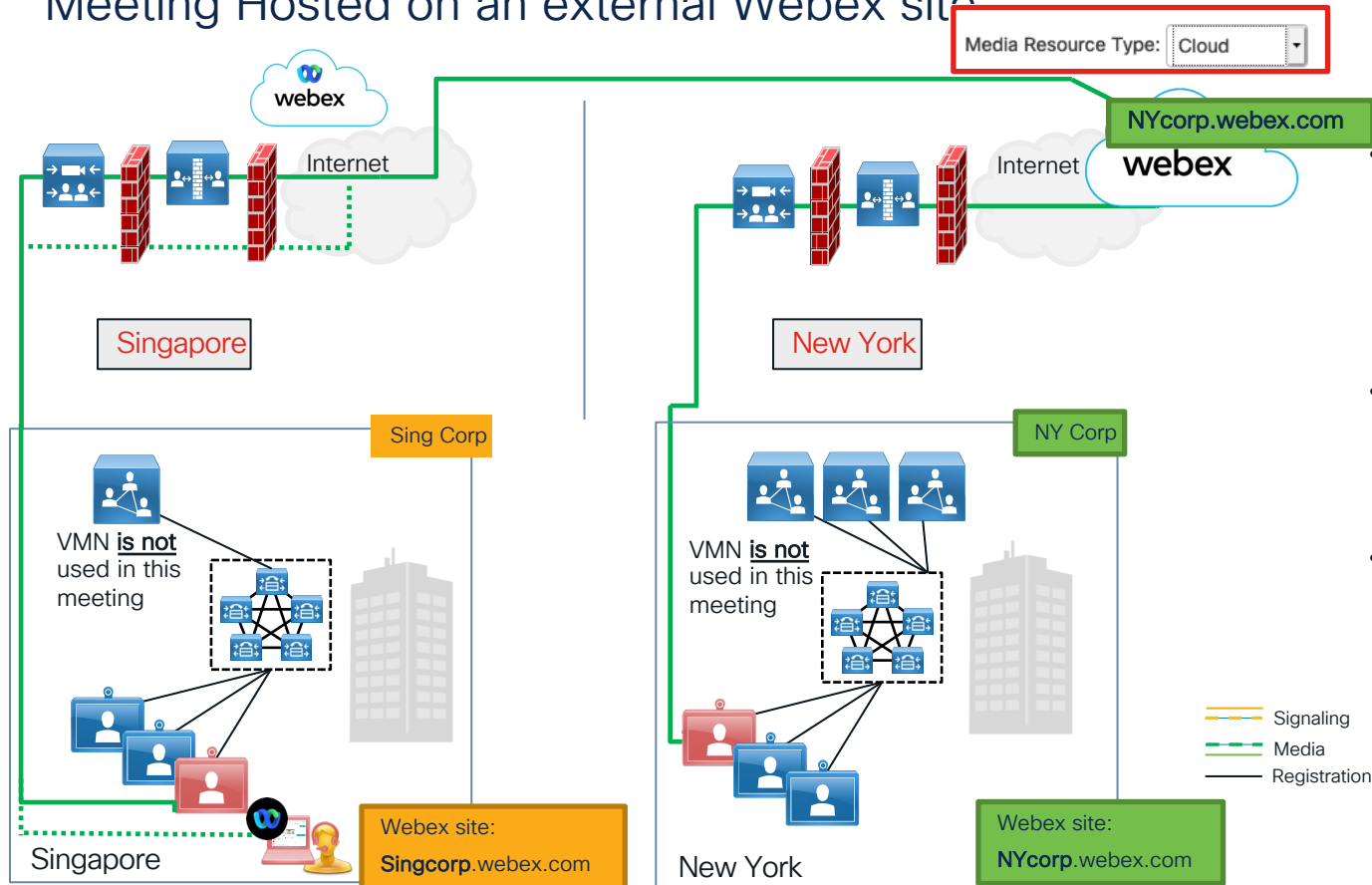
Please select the client types that can utilize the Video Mesh clusters.

Cluster	Webex app - Desktop	Webex app - Mobile	Webex app - VDI	Webex Devices	SIP Devices
Core Network	☒	☒	☒	☒	☐

Exclude SIP Devices

External Meetings

Meeting Hosted on an external Webex site



- 2 different organizations have a meeting.
- In Control Hub, the Media Resource Type is set to “**Cloud**” for *NYcorp.webex.com* (This means the site **does not** accept VMN cascades.)
- Media from SingCorp and NYCorp goes to Webex because of the Media Resource setting. This is an overflow situation because the VMN media cascade can not be established.
- **Problem:** I want to use my VMNs for all meetings. Why is my usage dictated by the meeting host site’s setting?
- **Answer:** Change the behavior to allow the admin to choose what happens in this scenario.
 - The Control Hub VMN cluster setting, “Prefer Video Mesh for All External Webex Meetings”, is used to manipulate this behavior.

Prefer Video Mesh for All External Webex Meetings

- Go to the Global Video Mesh Cluster settings
 - Enabled - means use my Video Mesh
 - Disabled - means by-pass my Video Mesh and use Webex cloud resources (default)

Prefer Video Mesh for All External Webex Meetings

Prefer Video Mesh for All External Webex Meetings

For Webex meetings on another organization's site, first use any available Video Mesh clusters on our own organization.



<https://help.webex.com/en-us/article/nzvixgk/Keep-your-media-on-Video-Mesh-for-all-external-Webex-meetings>

Software packages



Full version

Full Transcoding and Limited
Switching



VMNLite

Optimized for switched traffic

VMNLite Deployment Option – Verification

The screenshot shows the Cisco Webex Video Mesh Node Overview page. A sidebar on the left contains navigation links: Overview (selected), Network, Trust Store & Proxy, Server Certificate, Troubleshooting, and Administration. The main content area is titled 'Overview' and contains three panels: 'Call Status', 'Node Details', and 'Node Health'. A red box labeled 'Deployment Type = VMNLite' points to the 'Deployment Type' field in the 'Node Details' panel. Another red box labeled 'vCPU, RAM and HDD Specs' points to the 'Node Health' panel.

Deployment Type = VMNLite

Node Details	
Type	Video Mesh Node
Image	Production
Deployment Type	VMNLite
Provisioning	Cloud
OS Version	2512.2.0 (Flatcar)
QoS	Off
Maintenance Mode	Off
Proxy Type	Explicit

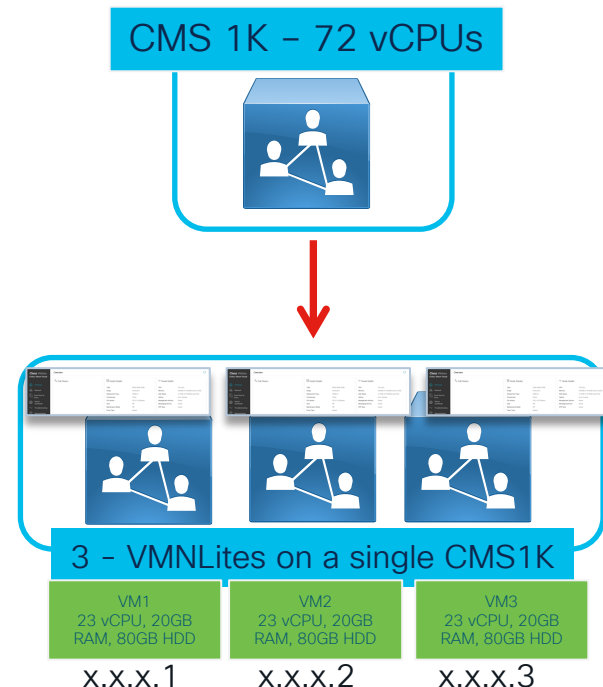
vCPU, RAM and HDD Specs

Node Health	
CPU	23 cores
Memory	0.85GB of 19.60GB used (4.32%)
Disk Space	2.16GB of 78.85GB used (3%)
Uptime	Up 4 minutes
Management Service	Active
Messaging Service	Active
NTP Sync	Active

- https://<ip_addr_VMN>/setup
- “Go to node” in Control Hub

VMNLite

- Most customers are not fully utilizing the transcoding service.
- Transcoding utilizes more CPUs than switching
- Webex App will use the VMN when on the Webex Suite Meetings Platform
- Customers can increase scale and minimize overflows
- Investment protection of CMS 1K hardware
- One instance of 70 vCPU VMN can be replaced with three instances of VMNLite on the same hardware.



Installation Options

1. Manual provisioning via Control Hub

- Recommended for a small number of nodes being deployed
- Installer must configure all parameters individually on each Video Mesh node

2. Bulk provisioning via APIs

- Used for more than one node installation.
- Saves time for the installer
- All configuration parameters can be configured with the script.

Video Mesh Nodes Provisioning Automation

- The script automates the deployment of Video Mesh Nodes on VMWare ESXi servers.
 - Uses Ovftool API to manage machines on the ESXi
 - Configuration files used to deploy the VMN
 - <https://github.com/CiscoDevNet/webex-video-mesh-node-provisioning>

Sample csv:

esxi_host	username	password	datastore_name	name	ip	mask	gateway	dns	ntp	hostname	esxi_internal_network	esxi_external_network	deployment_option
1.1.1.1	user	password	datastore1	test_vm3	3.3.3.3	5.5.5.5	6.6.6.6	7.7.7.7	8.8.8.8	user1	VM Network	VM Network	CMS1000
2.2.2.2	user	password	datastore2	test_vm4	4.4.4.4	5.5.5.5	6.6.6.6	7.7.7.7	8.8.8.8	user2	VM Network	VM Network	VMNLite

Video Mesh Nodes Day 2 tasks

- Make network changes to nodes that are already registered to their clusters and organizations.
- Change these common settings: hostname, domain, DNS servers, NTP servers, DNS Caching and MTU.
- <https://github.com/CiscoDevNet/webex-video-mesh-node-provisioning#network>

Sample csv:

video_mesh_\node	username	password	hostname	domain	dns	ntp
1.1.1.1	admin	passwd	host1		3.3.3.3	6.6.6.6 7.7.7.7
hostname.domain	admin	passwd	host2	abc.com	4.4.4.4 5.5.5.5	

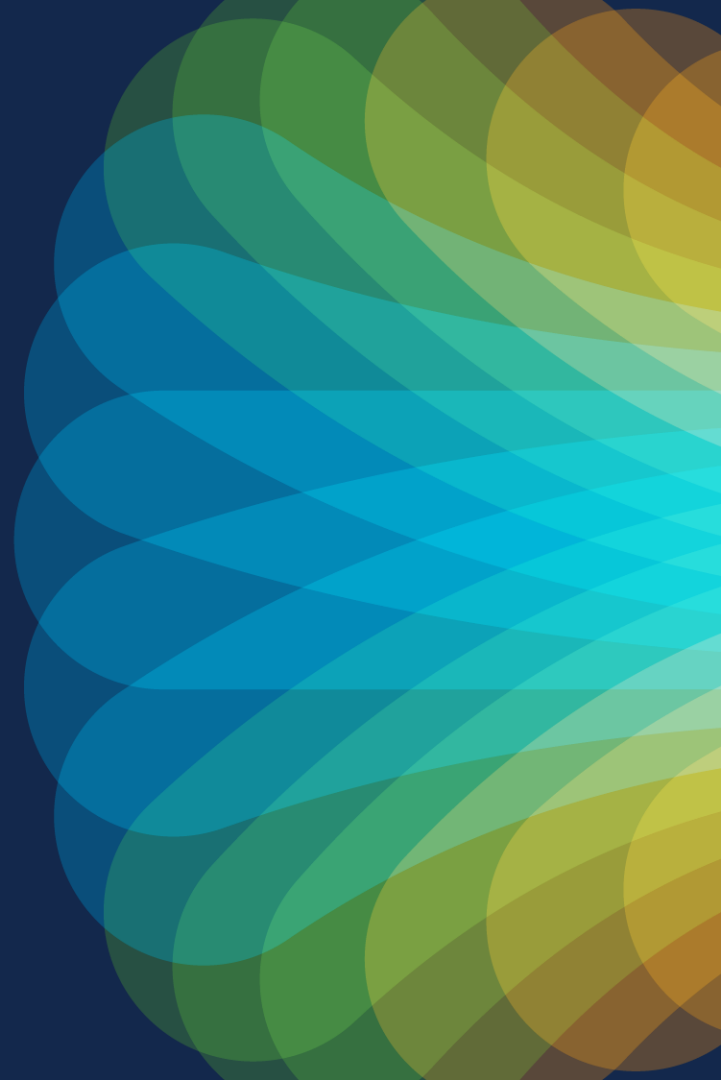
Video Mesh Nodes Day 2 tasks

- Make certificate changes to nodes that are already registered to their clusters and organizations.
- Improves the certificate management process for the customers by reducing the amount of overall overhead and manual installation.
- Creates multiple CSRs in parallel depending on the input provided by the customers.
- Upload and install the CA signed certificates and the private keys in bulk.
- NOTE: This feature does not support separate certificate management for dual NIC.
- https://github.com/CiscoDevNet/webex-video-mesh-node-provisioning/blob/main/server_cert_management/README.md

Sample csv:

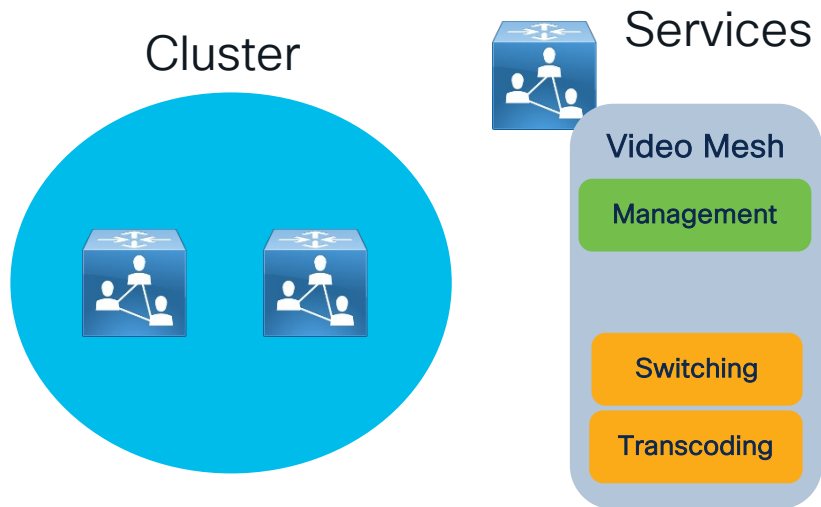
video_mesh_node	username	password	common_name	email	san
1.1.1.1	user1	passwd1	test1.example.com	email1.example.com	test1.example.com
2.2.2.2	user2	passwd2	2.2.2.2		
test3.example.com	test3_user	passwd3	test3.example.com	email3.example.com	test3.example.com test4.example.c

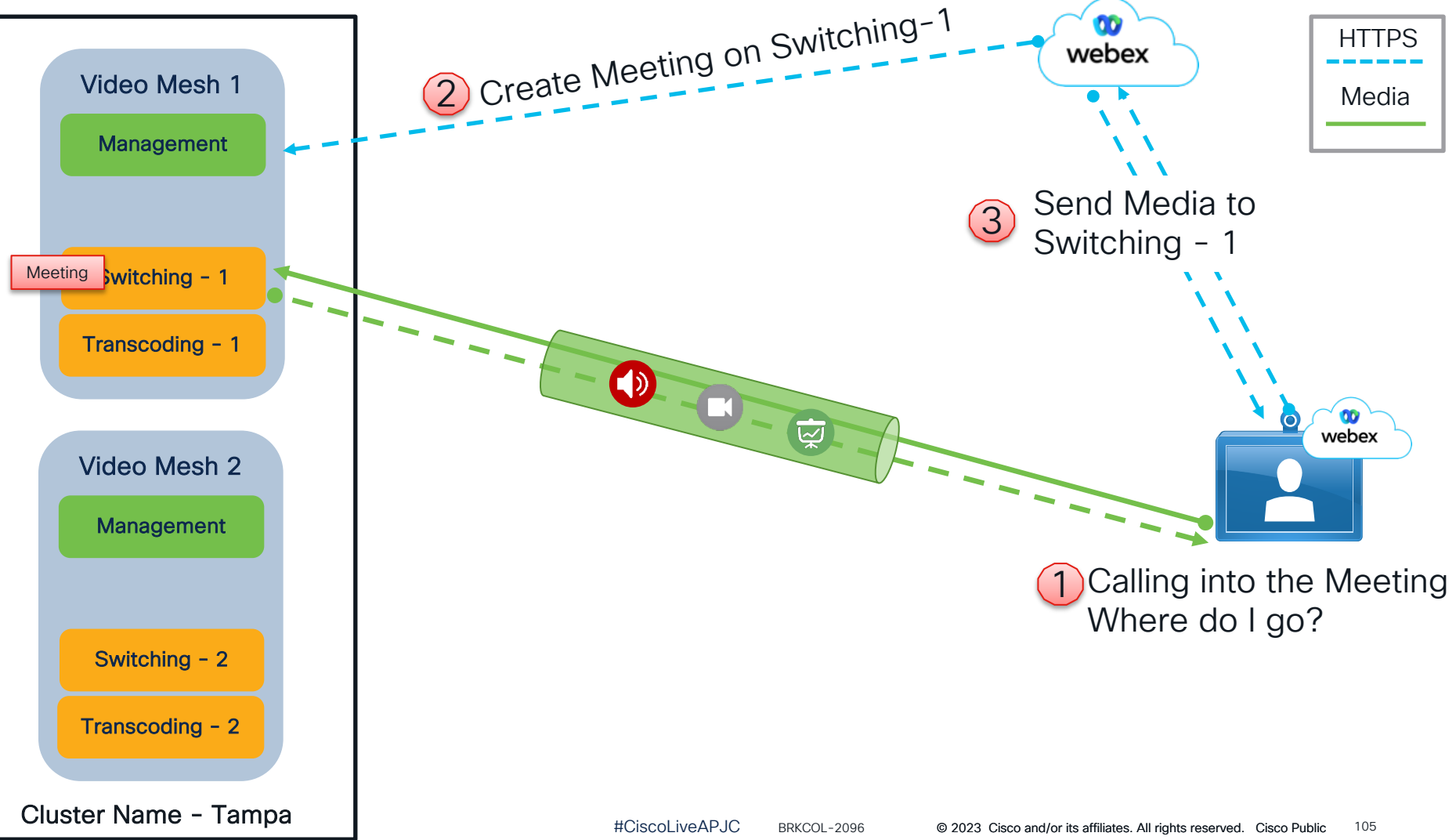
Troubleshooting



Clusters

- Each node is a physical device registered to Control Hub
- Each cluster is collection of devices in a logical grouping within Control Hub
- Each node has multiple services for example: management, switching, and transcoding.
- For meetings, any cluster's switching or transcoding service can be used for meetings.





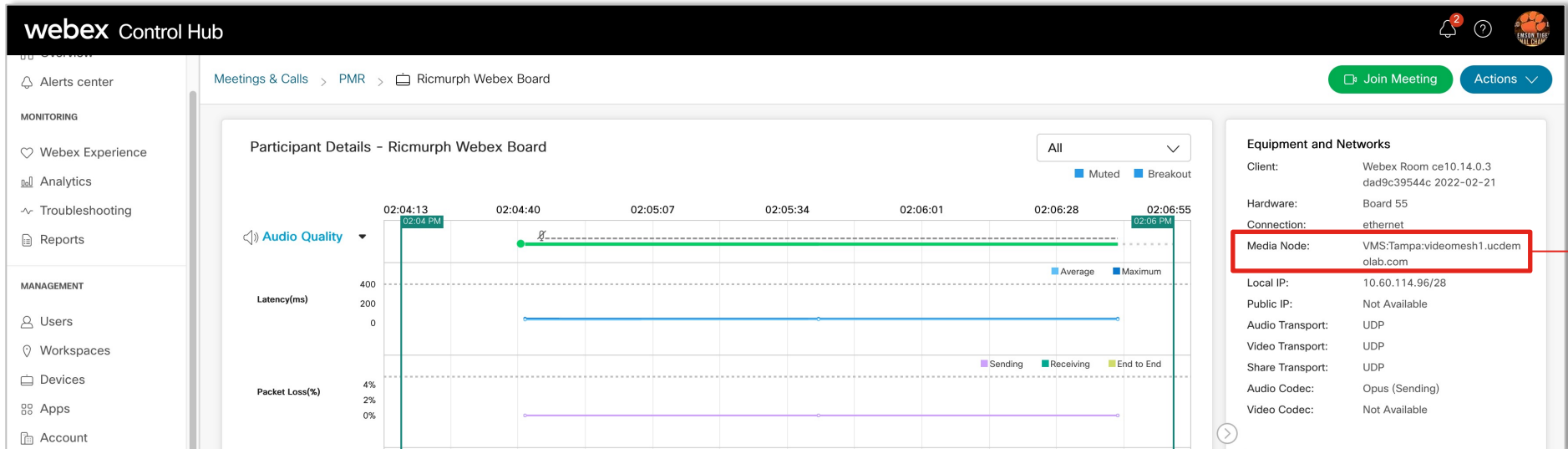
Video Mesh node identified in Troubleshooting

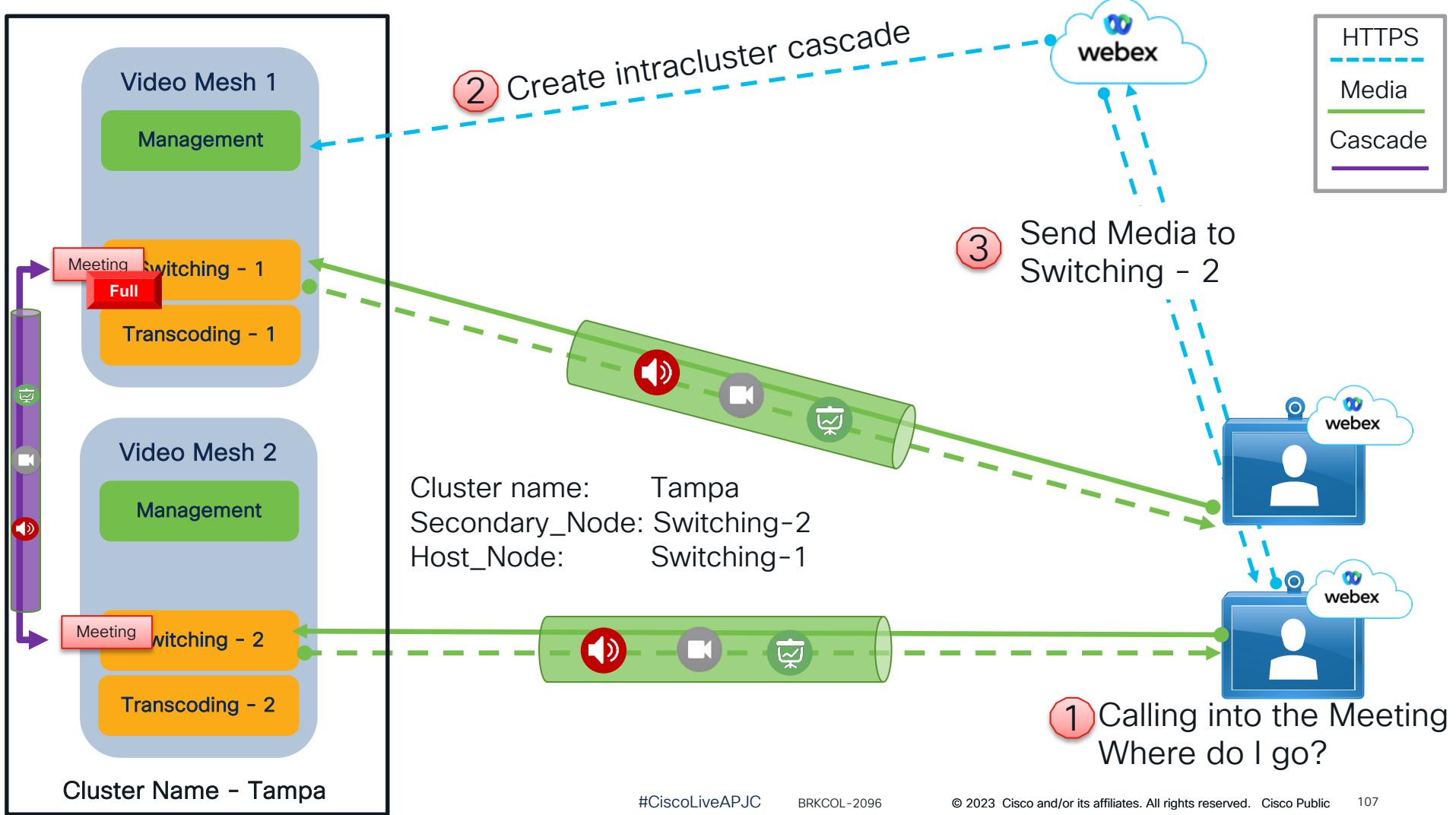
- If the device is connected to a Video Mesh cluster, it will show

- *VMS:Cluster_Name: Node_name* as the media node.

- *VMS: Tampa : videomesh1.ucdemolab.com*

- If “VMS:” is not shown, then it is connected to a Webex cloud media node.





Video Mesh node identified in Troubleshooting

- If the device is connected to multiple nodes in the same Video Mesh cluster, it will have

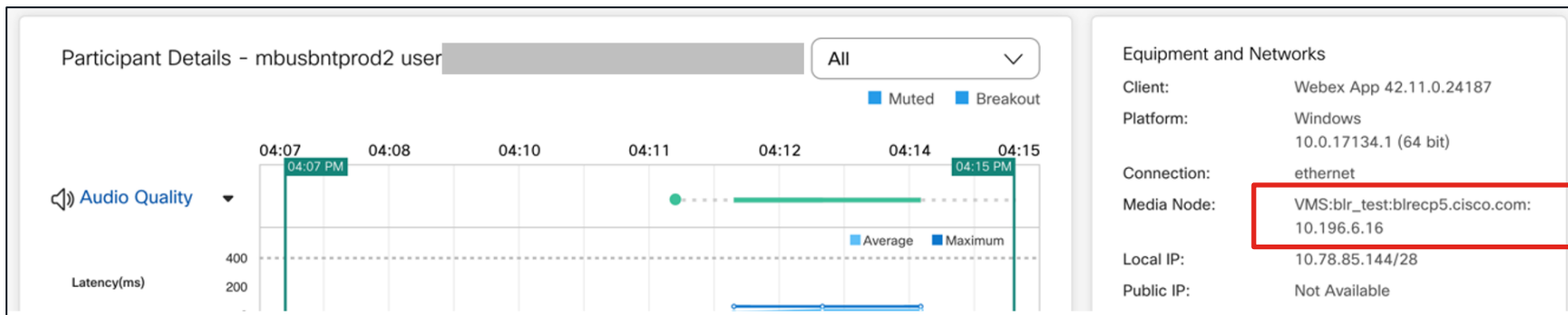
- *VMS:Cluster_Name: Secondary_Node: Host_Node* ←

- *VMS: blr_test : blrecp5.cisco.com : 10.196.6.16*

(screen shot below)

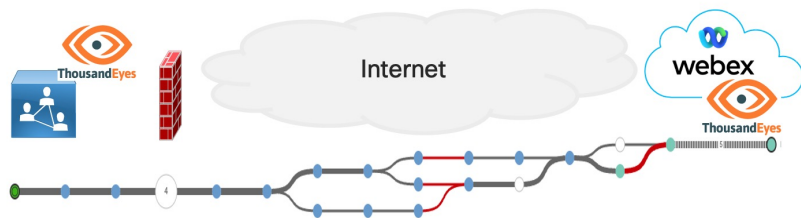
- *VMS: Tampa : Switching-2 : Switching-1*

(previous slide's example)



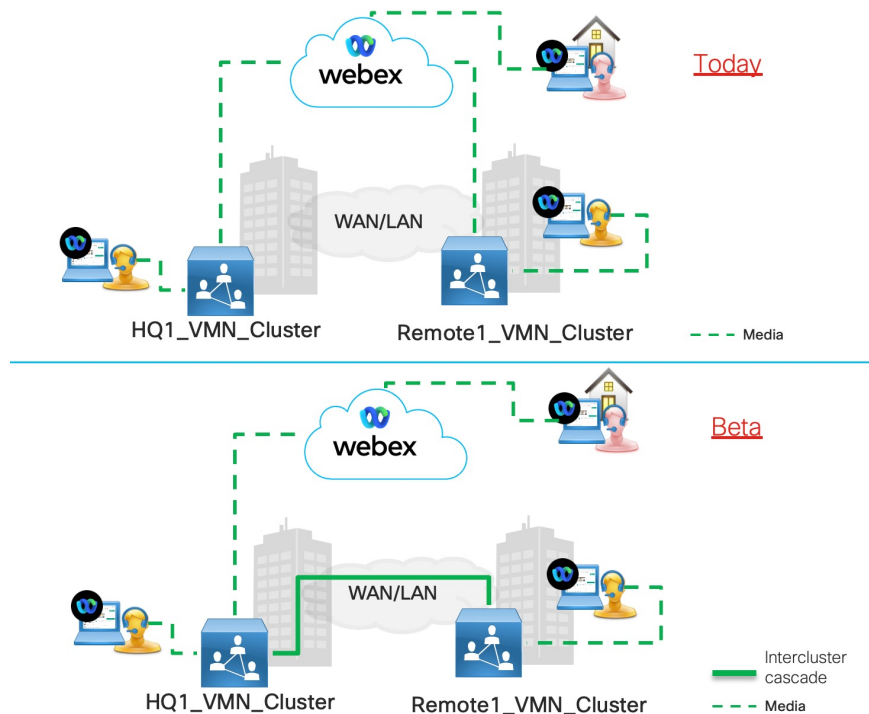
Betas

ThousandEyes Within Video Mesh Node Beta



- The Video Mesh platform is now integrated with the ThousandEyes Enterprise Agent enabling the admin to perform end-to-end monitoring across the customer's hybrid digital ecosystem.
- This integration equips the admin with a wide array of network monitoring tests opening visibility into many areas of the network path.
- Issues anywhere along a customer's network infrastructure can be narrowed down and diagnosed with greater precision, improving the efficiency of their deployment
- <https://gobeta.Webex.com>

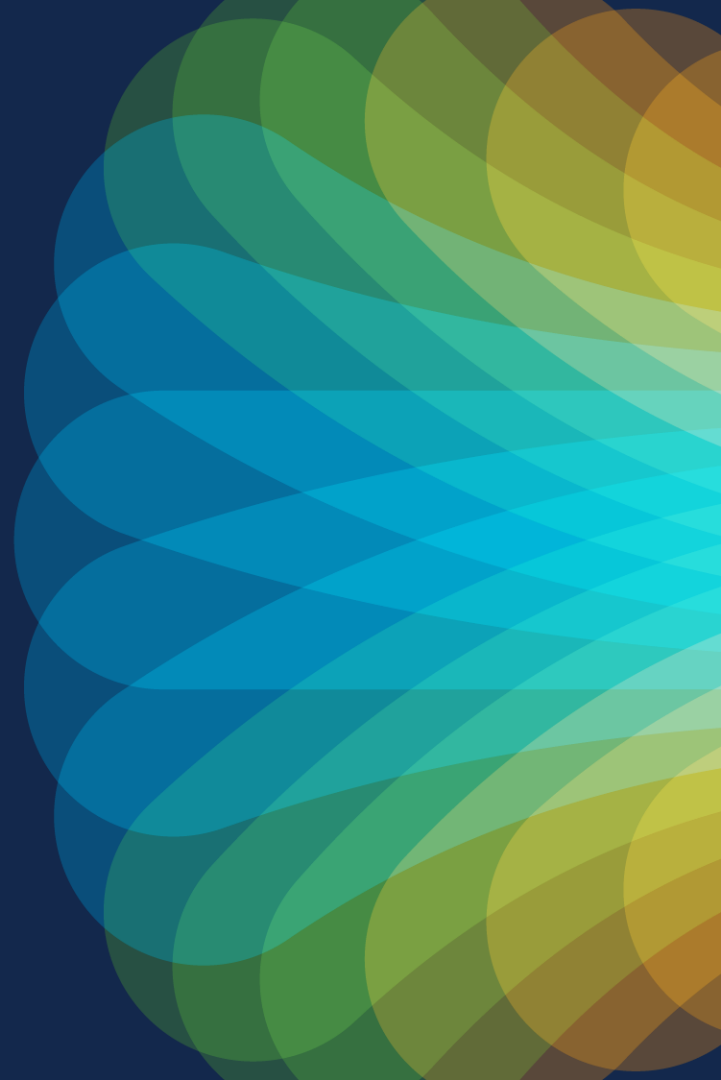
Inter-Cluster Cascade Beta



- Webex meetings follow a hub and spoke cascade design with Webex cloud as the hub and the on-premises Video Mesh clusters as the spokes. These cascades would go over the Internet or the Edge Connect link to Webex.
- The Inter-Cluster Cascade feature intends to improve call quality and bandwidth utilization by enabling direct cascades between Video Mesh clusters of an organization.
- Customers will be vetted to make sure they meet the requirements before enablement of this feature.
- **Requirements:**
 1. Ensure sufficient WAN bandwidth (20mbps) between Video Mesh clusters of your organization before enabling Inter-Cluster Cascades.
 2. All clusters in the organization must have more than one VMN node.

<https://gobeta.webex.com>

Reference Material



Video Mesh Reference Links

	Deployment Guide	http://www.cisco.com/go/video-mesh
	Release Notes	https://help.webex.com/en-us/jgobq2/Cisco-Webex-Video-Mesh-Release-Notes
	Preferred Architecture	https://www.cisco.com/c/dam/en/us/td/docs/solutions/PA/WbxEdge/PAEdgeVMN.pdf
	Cisco Validated Design	https://www.cisco.com/c/dam/en/us/td/docs/solutions/CVD/Collaboration/hybrid/pa_hybrid_vmn.pdf
	Video Mesh Analytics	https://help.webex.com/en-us/n0rlwx/Analytics-for-Your-Cloud-Collaboration-Portfolio#Cisco_Concept.dita_a07f1228-c4a7-445c-952a-e4d0f97cc23d
	Network requirements	https://help.webex.com/en-us/WBX000028782/Network-Requirements-for-Webex-Teams-Services

Edge Connect Reference Links

Tutorial Videos

- ECX Portal Tutorials: <https://ecxfabric-documentation.equinix.com/hc/en-us/articles/360013215672-Video-tutorials>
- ECX Portal Edge Connect Ordering Tutorial: <https://www.youtube.com/watch?v=WhRHgbUXGns>

Cisco Webex Edge Connect Documentation

- <https://collaborationhelp.cisco.com/article/en-us/n68tcpb>
- https://www.cisco.com/c/dam/en/us/td/docs/solutions/PA/EdgeConnect/PA_Edge_Connect_Design.pdf

Equinix Cloud Exchange Portal

- <https://cloudexchangeportal.equinix.com>

Network requirements for Webex Services

- Webex Meetings: <https://collaborationhelp.cisco.com/article/en-us/WBX264>
- Webex app and devices: <https://collaborationhelp.cisco.com/article/en-us/WBX000028782>

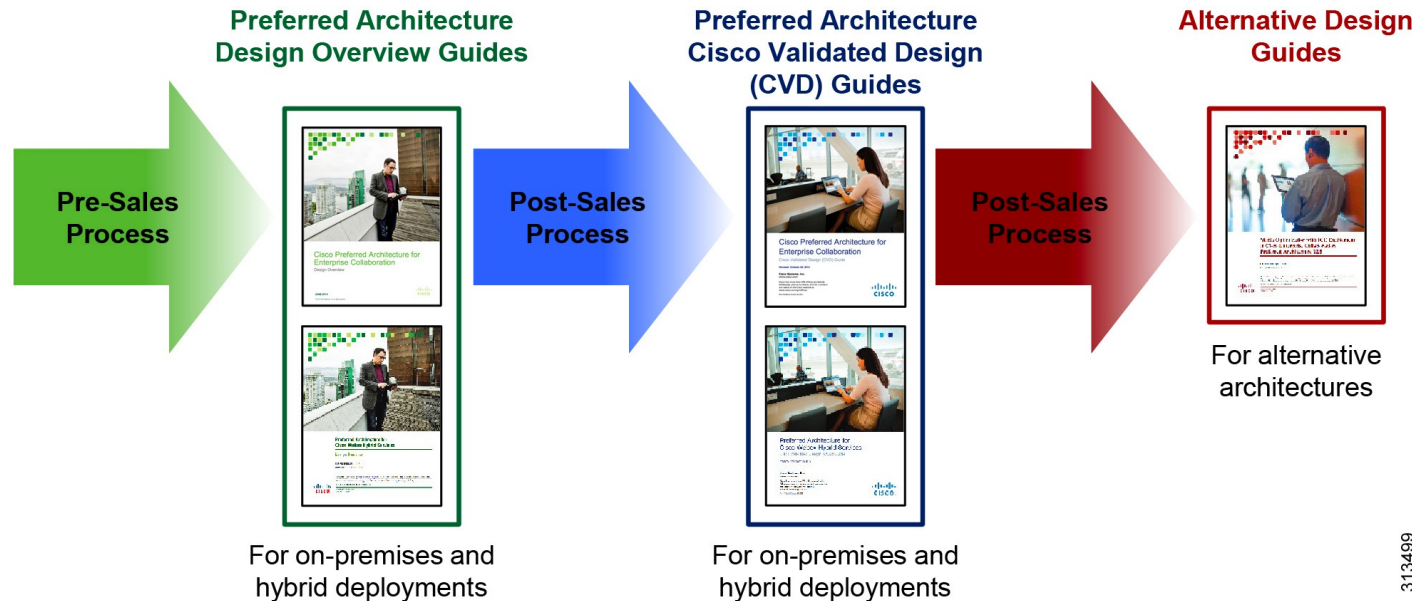
Network connectivity test (Webex app Client specific)

- <https://mediatest.webex.com>

AS13445 Looking Glass (ping, BGP neighbor and prefix advertisement)

- <https://lq.webex.com/>

Cisco Preferred Architecture for Cisco Webex Edge Connect for Webex Meetings and Calling



- https://www.cisco.com/c/dam/en/us/td/docs/solutions/PA/EdgeConnect/PA_Edge_Connect_Design.pdf



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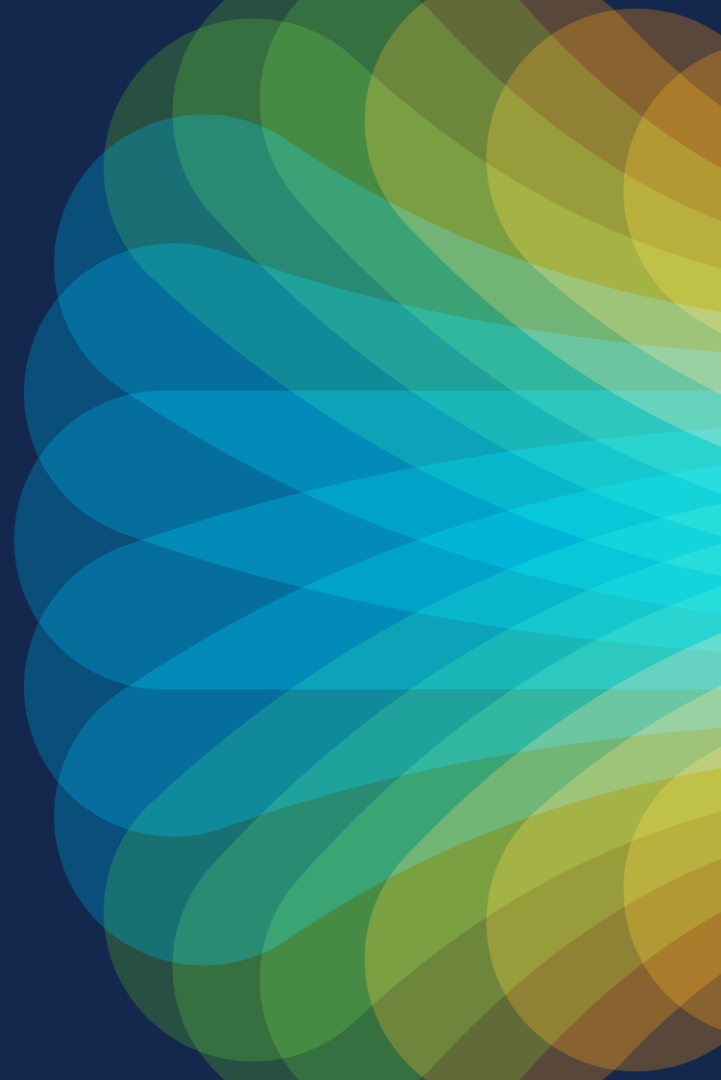


The bridge to possible

Thank you

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The background is a vibrant, abstract graphic featuring a spectrum of colors from red to blue. On the left, there are horizontal, wavy bands of color. On the right, a bright white light source emits a series of sharp, radiating lines that fan out across the frame, creating a sense of energy and movement.

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