

CISCO *Live!*



#CiscoLive



The bridge to possible

Webex QoS and Bandwidth Management Demystified

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BRKCOL-2092



#CiscoLive

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 June 17, 2022.



<https://ciscolive.ciscoevents.com/ciscolivebot/#BRKCOL-2092>

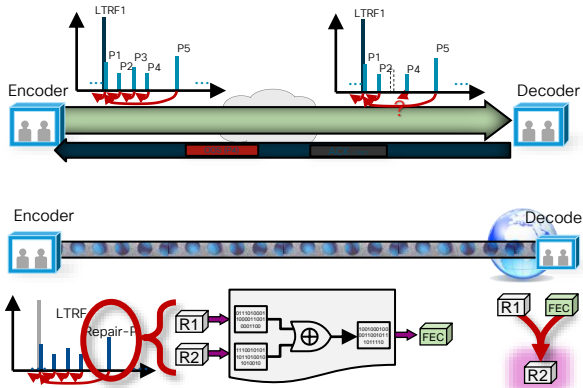


Agenda

- Bandwidth Management Strategy
- QoS Marking for Webex Clients / Apps
- QoS Marking for Webex Edge Devices
- NBAR for Webex Devices and Webex App

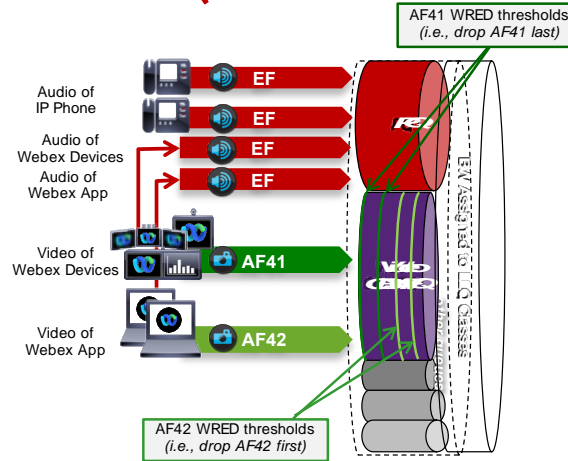
Our Strategy

“Smart” Media Techniques



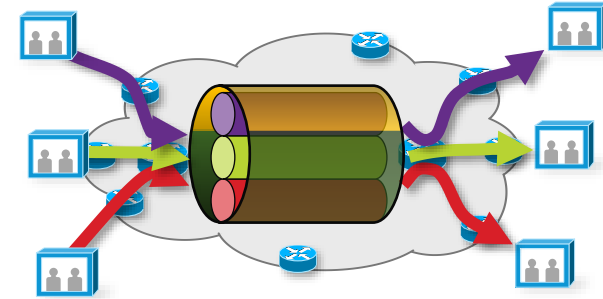
- Use media resilience to reduce impact of packet loss
- Apply rate adaptation to reduce network congestion

Commonly Deployed QoS Tools



- Consolidate mechanisms to identify Collaboration media
- Evolve classification and scheduling recommendations

New Design & Deployment Guidelines



Leverage media resilience and rate adaptation to enable pervasive video deployments through:

- simplified provisioning
- optimized bandwidth utilization

DSCP Classification

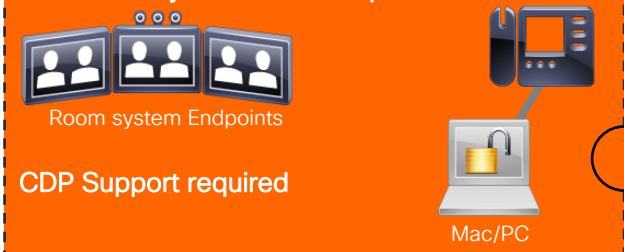
- EF: Expedited Forwarding (PQ)
 - Used for voice media
- AF: Assured Forwarding (CWBFQ)
 - Used for video media
- CS: Class Selector
 - Used for signaling

DSCP Class	DSCP	ToS Prec.
none	0	0
CS1	8	1
AF11	10	1
AF12	12	1
AF13	14	1
CS2	16	2
AF21	18	2
AF22	20	2
AF23	22	2
CS3	24	3
AF31	26	3
AF32	28	3
AF33	30	3
CS4	32	4
AF41	34	4
AF42	36	4
AF43	38	4
CS5	40	5
EF	46	5
CS6	48	6
CS7	56	7

Trust and Enforcement

- Devices and Places in the Network

Conditionally-Trusted Endpoints



Trusted Endpoints / Devices



Untrusted Endpoints / Devices



Trusted Devices



Multiple Access Policies

NOT IDEAL

Access

Distribution

Core

WAN Edge

IOS SIP Gateway

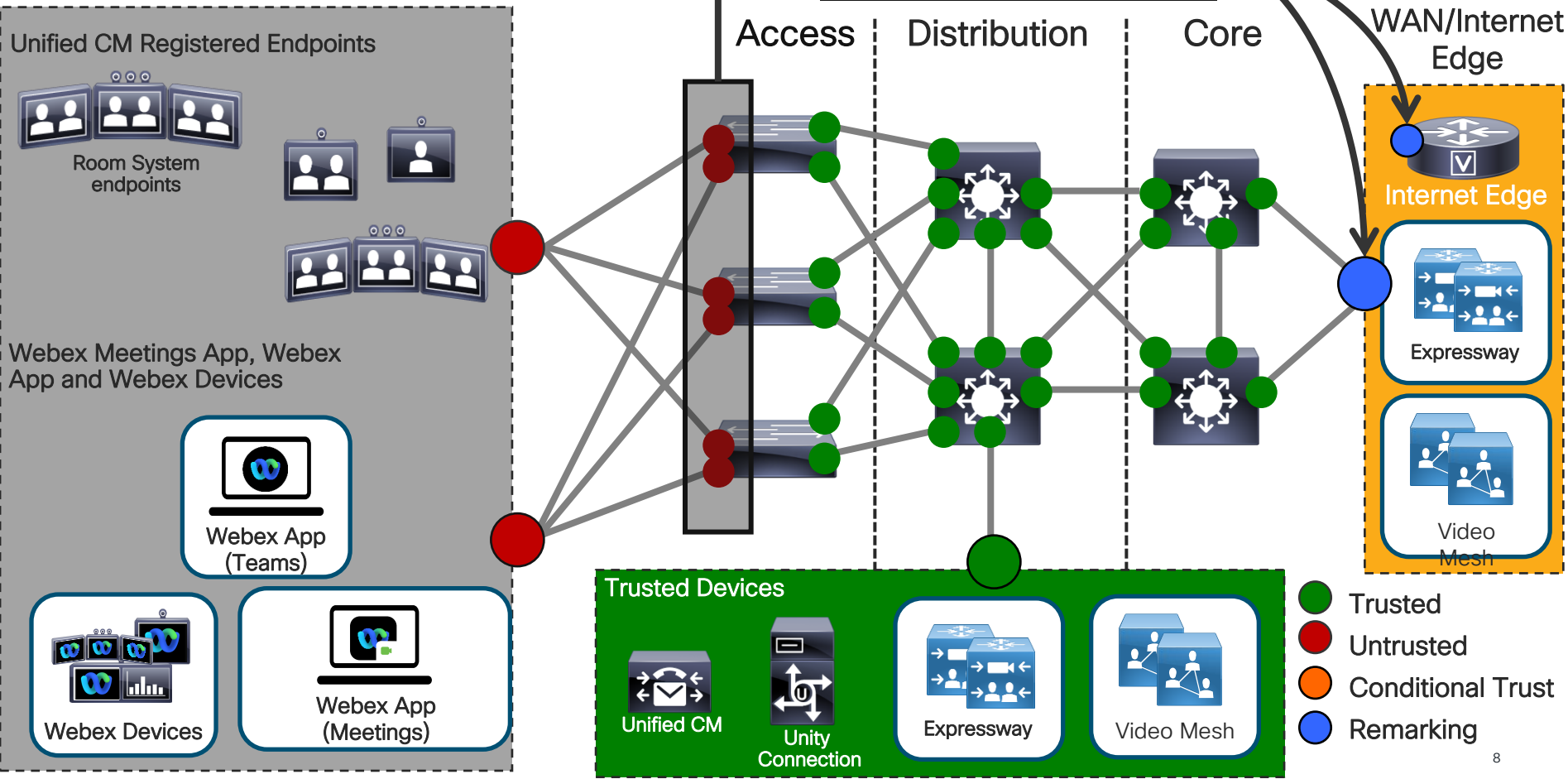
SRST Gateway

Unified BE

- Trusted
- Untrusted
- Conditional Trust
- Remark

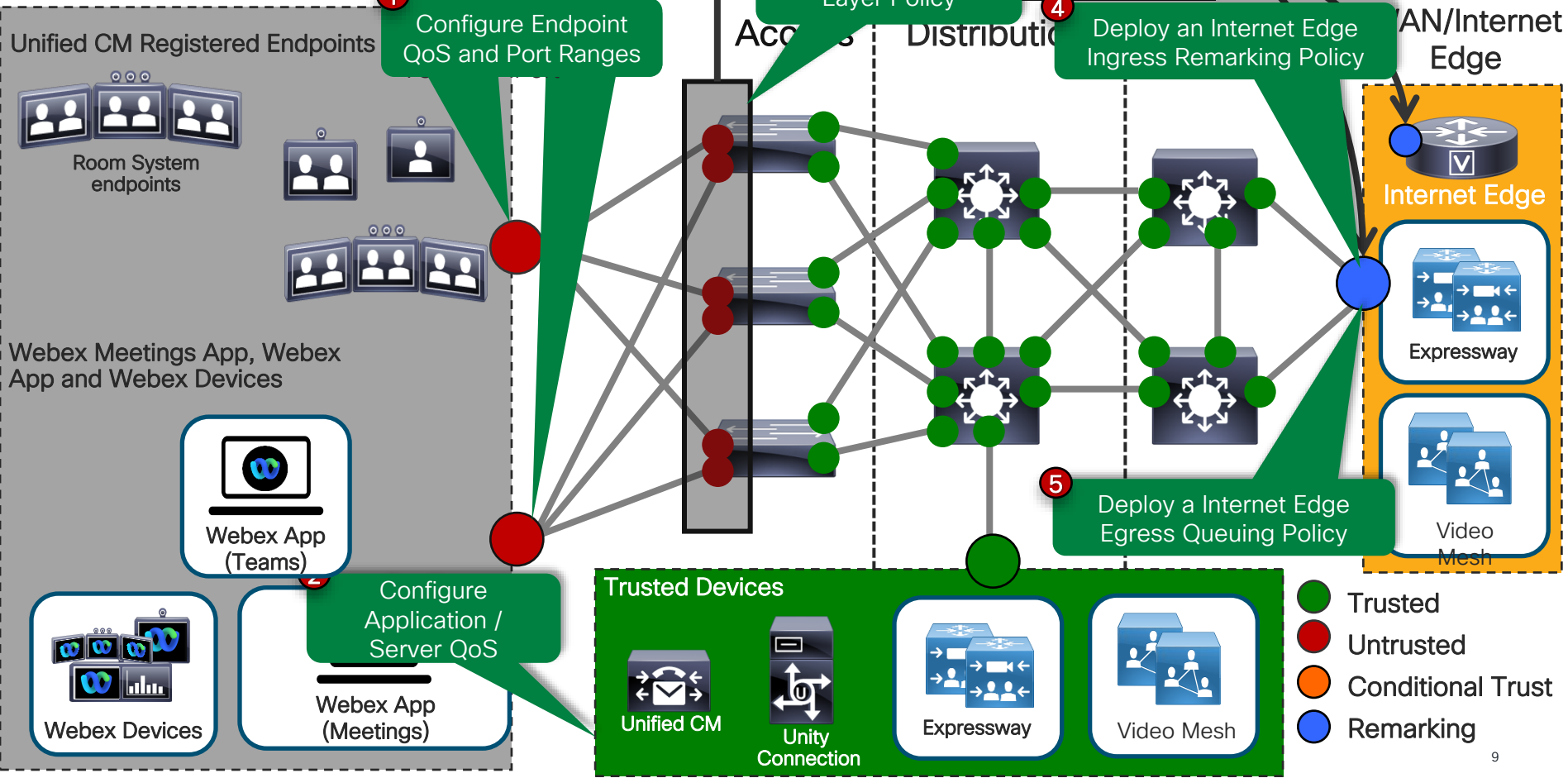
Trust and Enforcement

Devices and Places in the Network

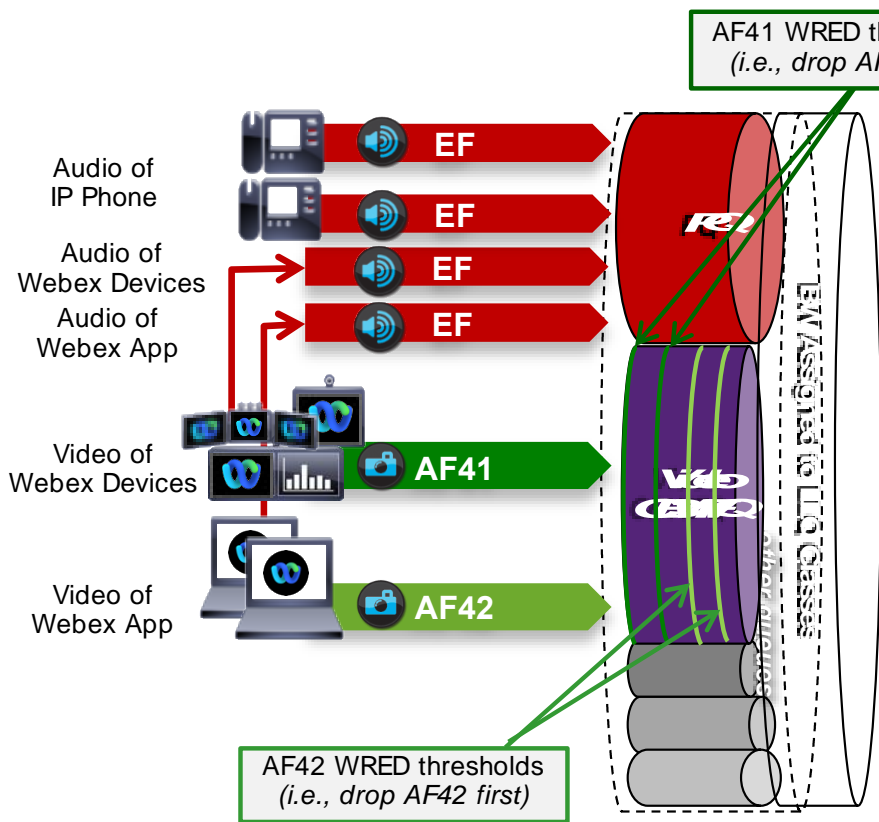


Trust and Enforcement

Devices and Places in the Network



WAN Queuing Considerations



- Map audio streams of voice and video calls (EF) to a priority queue
- Map video streams of video calls (AF41 and AF42) to a class-based queue with WRED:
 - AF41: higher drop thresholds (e.g., 50-100% of queue depth)
 - AF42: lower drop thresholds (e.g., 15-35% of queue depth)
- During congestion, AF42 traffic is dropped first:
 - Packet loss triggers rate adaptation
 - Media resilience limits the impact

Summary

- Simplified Ingress QoS Policy – Use throughout the network
- Egress Queuing Policy
 - Single video queue for AF class traffic model is recommended
 - When considering multiple classes: Video AF41, AF42, AF43 (Prioritized Video vs Opportunistic Video)

See Preferred Architecture for Cisco Collaboration 14 Enterprise On-Premises Deployments, CVD – Bandwidth Management Chapter for more information on Opportunistic Video Classification

QoS Marking for Webex Clients / Apps



A note about Webex App and Webex Devices



Webex Devices include Webex Room Series, Board Series and Desk Series



Webex Meetings App in this context is our previous meetings app still widely deployed and used.

Webex App
(Workloads)



Webex App (Teams) refers to the native calling functionality for Webex App. It is used for Webex Space Meetings, 1:1 calls to a Webex Account holder (“Call on Webex” calling option in Webex App) as well as SIP URI dialing. **This workload was formerly accomplished with Webex Teams.**



Webex App (Meetings) Full-Featured Meetings or Meetings Experience is a feature enhancement to Webex App. When you start or join a Webex scheduled or Personal Room meeting from the Webex app, you get access to advanced features. This workload was formerly accomplished with **Webex Meetings Desktop and Mobile App**

Webex App Modalities – 1

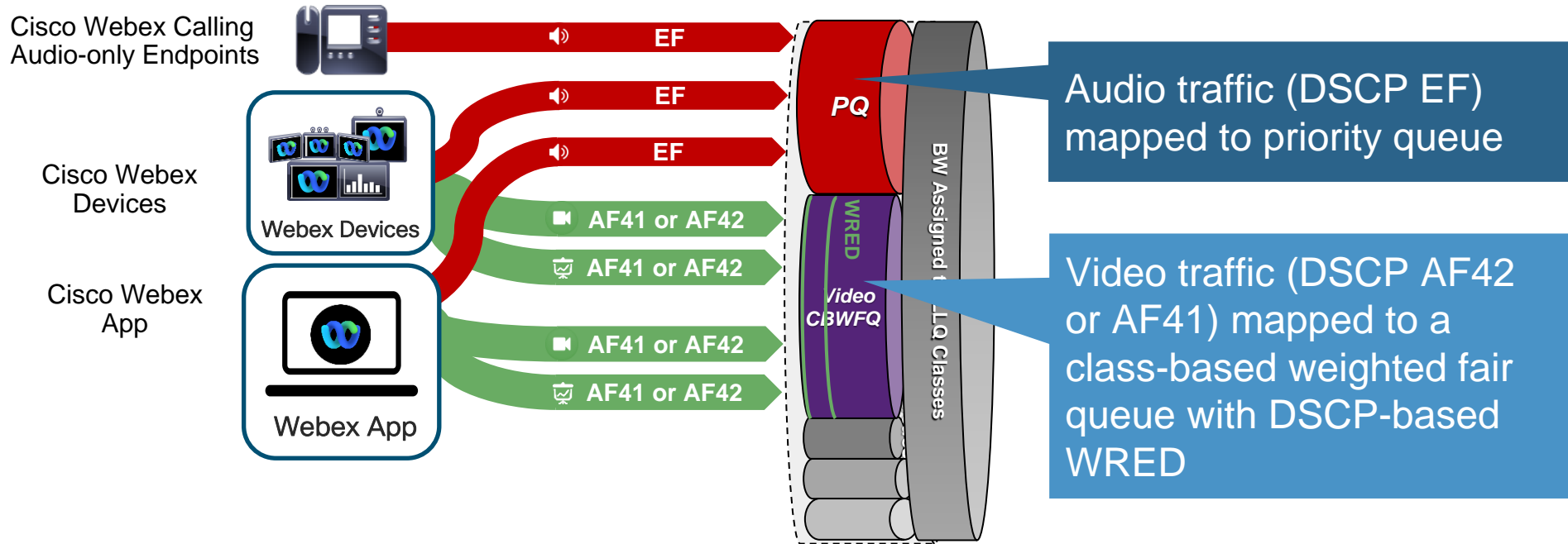
- **Webex App:** This will refer to the native calling functionality for Webex App. It is used for Webex Space Meetings (meetings started from a Webex space), 1:1 calls to a Webex Account holder (“Call on Webex” calling option in Webex App) as well as SIP URI dialing. This is also the call functionality for Webex scheduled or Personal Room meetings For Webex Orgs enabled with Video Mesh Clusters or on the FedRamp program created prior to May, 15 2021, or if [Full-Featured Meetings](#) has not been enabled or has been disabled. This workload was formerly accomplished with Webex Teams.
- **Webex App (Meetings):** [Full-Featured Meetings](#) or Meetings Experience is a feature enhancement to Webex App. When you start or join a Webex scheduled or Personal Room meeting from the Webex app, you get access to advanced features such as stage view, breakout sessions, reactions, Webex Assistant for Meetings (where available), and People Insights profiles. This is the default setting for Webex Meetings Orgs enabled after May, 15 2021, unless the customer chose to opt out. All Webex Meetings Orgs enabled prior to May, 15 2021, will have this feature enabled by default unless disabled for Video Mesh Cluster or on the FedRamp program. Alternatively, **Webex Meetings Desktop and Mobile App** is used for this workload.

Webex App Modalities - 2

- **Webex App (Calling):** Integrated calling to [Webex Calling](#), a cloud-based phone system that is optimized for mid-sized businesses offering enterprise-grade cloud calling, mobility, and PBX features. This solution lets you register your Webex App directly to the Webex Calling Platform (service is offered through a Service Provider (SP) or a Value-Added Reseller (VAR)). This workload was formerly accomplished by **Webex Calling App**.
- **Webex App (Unified CM):** The Calling in Webex (Unified CM) solution lets you register Webex App directly to your Cisco Unified Communications Manager call control environment (on-premises enterprise, Business Edition 6000/7000, Unified CM Cloud or as delivered through an HCS partner solution). This solution enhances the calling experience for end users, allowing them to directly make calls in Webex through your Unified CM environment, use mid-call features, and control their Unified CM registered desk phone from Webex. When dialing from Webex, users can use the same dial strings or prefixes as they do on their desk phones; Webex functions like any other desk phone registered to your Unified CM. Unified CM calls that are established in Webex use the configuration that's in place for your Unified CM deployment (such as location, bandwidth settings, point to point media, and so on). Alternatively, **Jabber** is used for this workload.

Cisco Webex Media

Assigning Cisco Webex Media Traffic To Queues



Cisco Webex App Media

Webex App and devices Native Marking

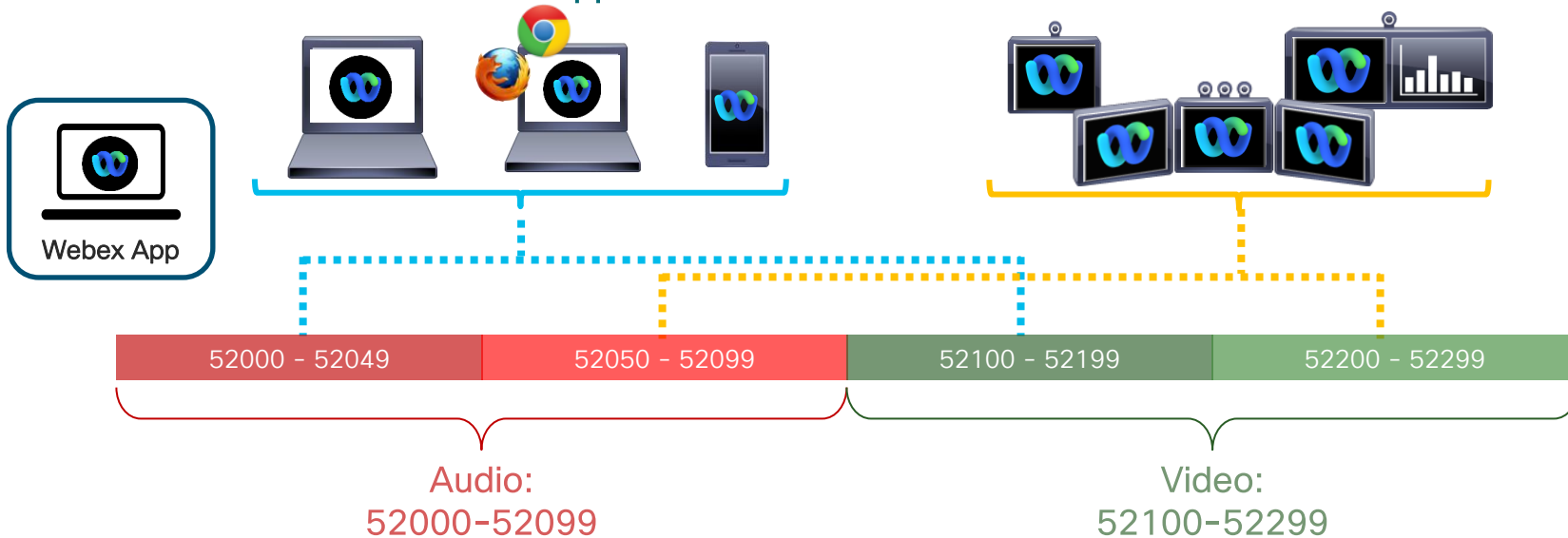
Traffic Type	PHB; DSCP (decimal value)	802.11 User Priority (UP)*	Notes
Audio	EF; 46	6	Includes audio streams of voice-only calls, audio streams of video calls, and related RTCP packets
Prioritized video	AF41; 34	5	Includes video streams (main video and presentations or content) and related RTCP packets
Other traffic	Best Effort; 0	0	Includes messaging, file transfer, configuration, call and meeting setup

While WiFi Layer 2 User Priority is noted here it is a subject of its own consideration. Not all platforms and operating systems (OS) mark the same at L2 and there are enablement functions and considerations that are applicable to the various platforms from mobile, to desktop and across various OS's.

Webex App and Webex Devices Media Source UDP Port Ranges for Apps and Devices

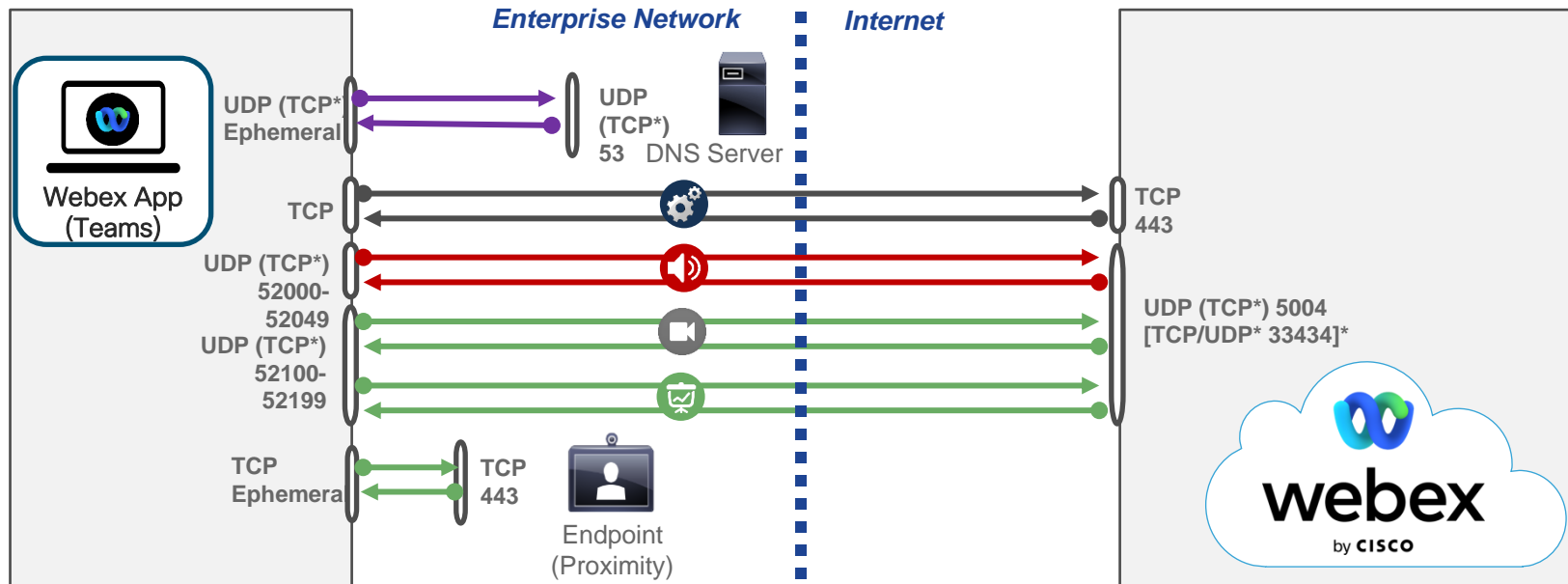
Webex App *

Webex Devices



Windows Clients: UDP Source Port Differentiation Enablement. Contact your local account team if you would like this enabled for your organization. Without enablement Audio and Video/Share cannot be differentiated by Windows OS and the source ports will be the same for audio/video/share on Windows devices.

Port Usage Today – Webex app *



* Backup connections



Windows Clients: UDP Source Port Differentiation Enablement. Contact your local account team if you would like this enabled for your organization. Without enablement Audio and Video/Share cannot be differentiated by Windows QoS Policies (GPO) because the source ports will be the same for audio/video/share.

Webex app (Teams) for Windows - UDP Source Port Differentiation **Disabled** **

Default
Not Recommended



Attributes	Windows QoS Policy	NOTES
Application name	CiscoCollabHost.exe*	*Application sits in a user directory and Windows QoS Profiles do not recognize %USERPROFILE% variable.
Protocol	UDP	
Source Port Range Audio	Any	Workaround: As such one can create a generic QoS profile based on source and destination UDP ports ONLY selecting ANY as the application name.
Source Port Range Video	Any	
Destination Port	5004	
DSCP value	34 (AF41) Video	

- Create a single QoS profile for Audio/Video/Share as each will have the same destination port range and source ports are not differentiated.

****Windows Clients:** UDP Source Port Differentiation Enablement. Contact your local account team if you would like this enabled for your organization. Without enablement Audio and Video/Share cannot be differentiated by Windows QoS Policies (GPO) because the source ports will be the same for audio/video/share.

Webex app (Teams) for Windows - UDP Source Port Differentiation **Enabled****

Not Default
Recommended



Attributes	Windows QoS Policy	NOTES
Application name	CiscoCollabHost.exe*	*Application sits in a user directory and Windows QoS Profiles do not recognize %USERPOFILE% variable.
Protocol	UDP	
Source Port Range Audio	52000 to 52099	Workaround: As such one can create a generic QoS profile based on source and destination UDP ports ONLY selecting ANY as the application name.
Source Port Range Video	52100 to 52299	
Destination Port	5004	
DSCP value	46 (EF) Audio / 34 (AF41) Video	

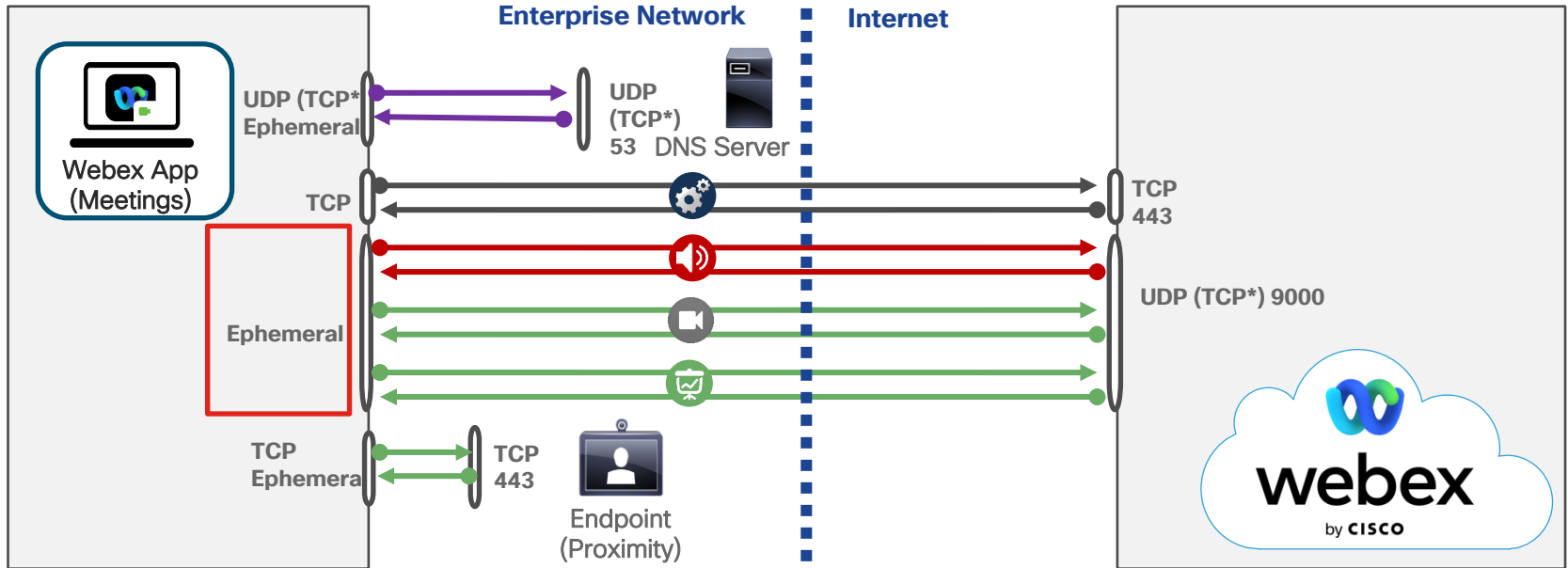
- Create a separate QoS profile for Audio and Video/Share as each have different source port range to mark traffic differently.
- **UDP Source Port Differentiation for Windows** is enabled by the BU at this time.

****Windows Clients:** UDP Source Port Differentiation Enablement. Contact your local account team if you would like this enabled for your organization. Without enablement Audio and Video/Share cannot be differentiated by Windows QoS Policies (GPO) because the source ports will be the same for audio/video/share.

Port Usage – Webex App (Meetings)

Dedicated network source port ranges

Prior to
version 42.7*



* Prior to Webex App (Meetings) version 42.7 all clients used ephemeral source ports

Webex app (Meetings) for Windows - UDP Source Port Differentiation **Disabled After MSI Package Installation** **

Not Recommended

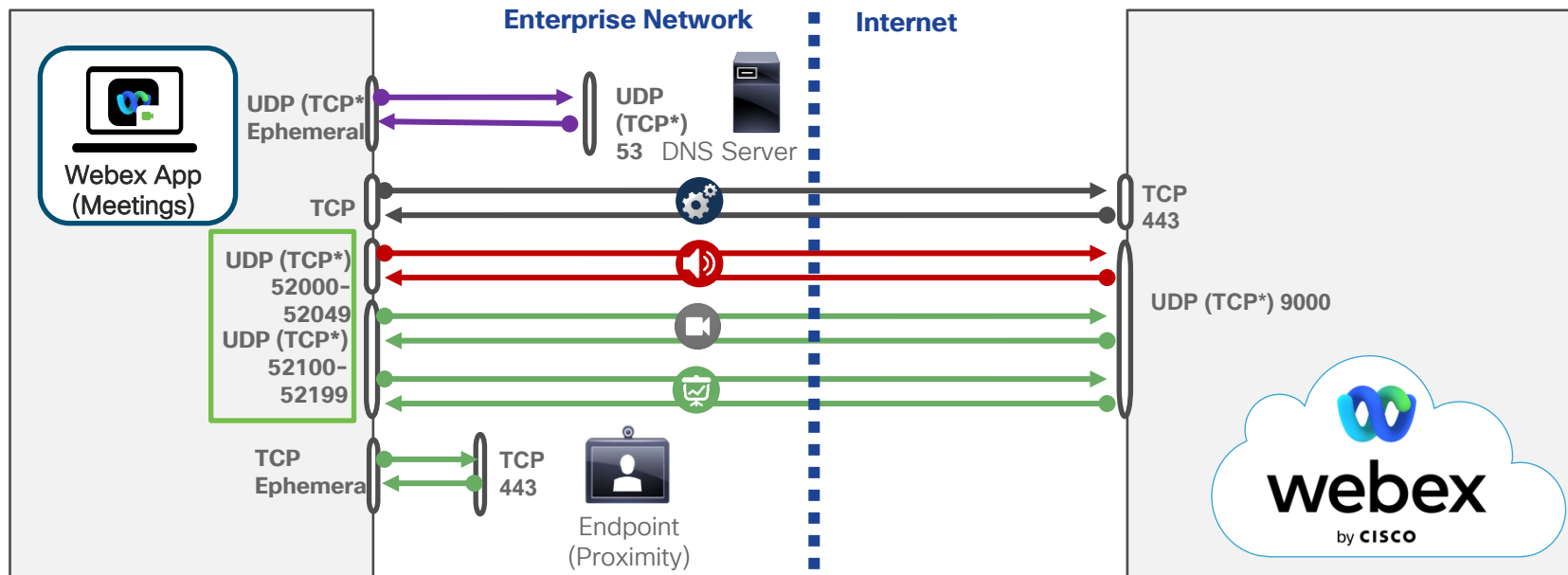


Attributes	Windows QoS Policy	NOTES
Application name	atmgr.exe**	**Applications sits in a program files directory and the variable %Program Files% works to designate a generic path to the program for all users.
Protocol	UDP	
Source Port Range Audio	Any	
Source Port Range Video	Any	
Destination Port	9000	
DSCP value	34 (AF41) Video	

- **Installed without any special installation commands**
- Create a single QoS profile for Audio/Video/Share as each will have the same destination port range and source ports are not differentiated.

Port Usage – Webex App (Meetings)

Dedicated network source port ranges – Enabled by Default as of ver 42.7*



* As of to Webex App (Meetings) version 42.7 due out in July all clients except Windows clients will use designated source ports. Windows clients will require a further installation step (next slide).

Webex app (Meetings) for Windows - UDP Source Port Differentiation **Enabled During MSI Package Installation** **

Recommended



Attributes	Windows QoS Policy	NOTES
Application name	atmgr.exe**	**Applications sits in a program files directory and the variable %Program Files% works to designate a generic path to the program for all users.
Protocol	UDP	
Source Port Range Audio	52000 to 52099	
Source Port Range Video	52100 to 52299	
Destination Port	9000	
DSCP value	46 (EF) Audio / 34 (AF41) Video	

- **Enabled During Installation**
- Command line for MSI package installation (Recommended)
 - 32bit MSI: `msiexec /i webexapp.msi LOCALPORTRANGE="1"`
 - 64bit MSI: `msiexec /i webexmeetings.msi LOCALPORTRANGE="1"`

New Feature for Webex App (Meetings) 42.7

- Source Ports for Webex App (Meetings) / Webex Meetings App
- Enabled by default in 42.7
- Install option additionally required for Windows platforms. Without the install option source ports remain ephemeral!

Feature Enablement for Webex App Source Ports



Webex App for Windows

- Webex App: When you start or join Webex Space Meetings, 1:1 calls to a Webex Account holder ("Call on Webex" calling option in Webex App) as well as SIP URI dialing.
- Feature Toggle: desktop-qos-enabled set to True
- Enables Windows Only platforms to use dedicated source ports for audio, video and share.
- Disabled by default and requires BU enablement. Contact your account team for more info!

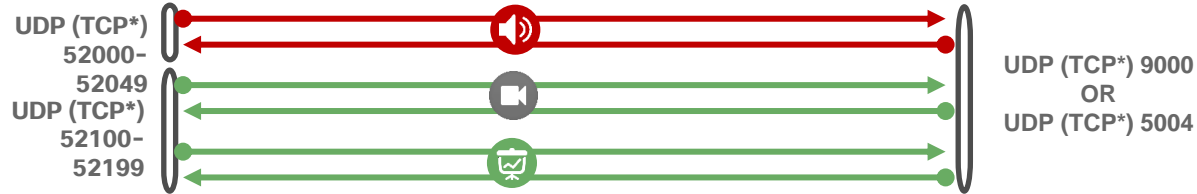


Webex App (Meetings) for ALL platforms

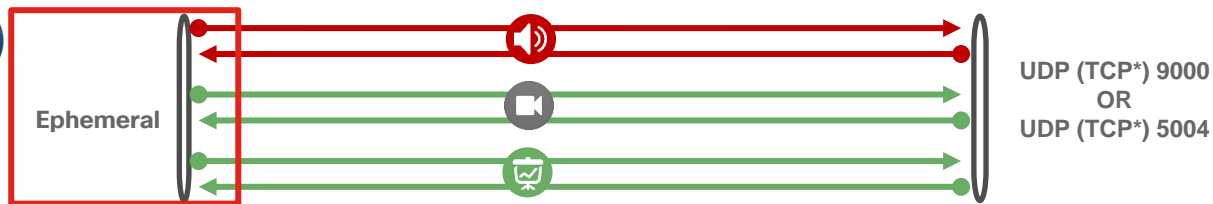
- Webex App (Meetings): When you start or join a Webex scheduled or Personal Room meeting from the Webex app. **Webex Meetings Desktop and Mobile App** was previously used for this workload and also applies.
- Feature Toggle: EnableSetPortRange set to 1
- Enables ALL Platforms to use dedicated source ports for audio, video and share.
- Enabled by default. However, requires an installation switch with the MSI install to configure in Windows platforms.

42.7 – Default Configuration

Webex App for Apple and Android Devices

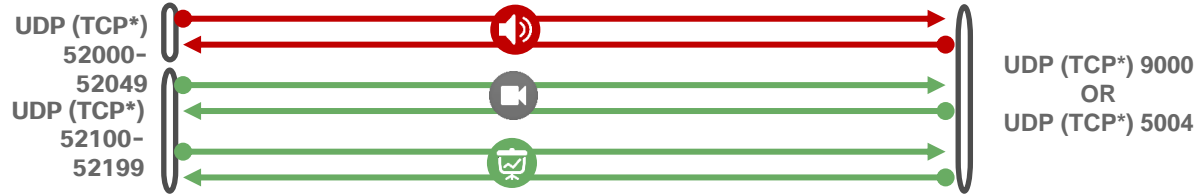


Webex App for Windows

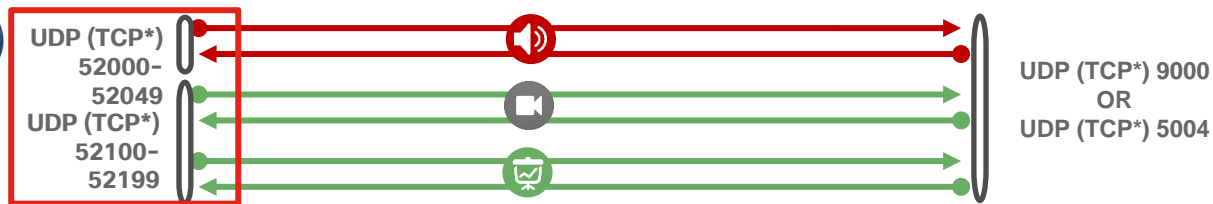


42.7 – Enabled for Windows

Webex App for Apple and Android Devices

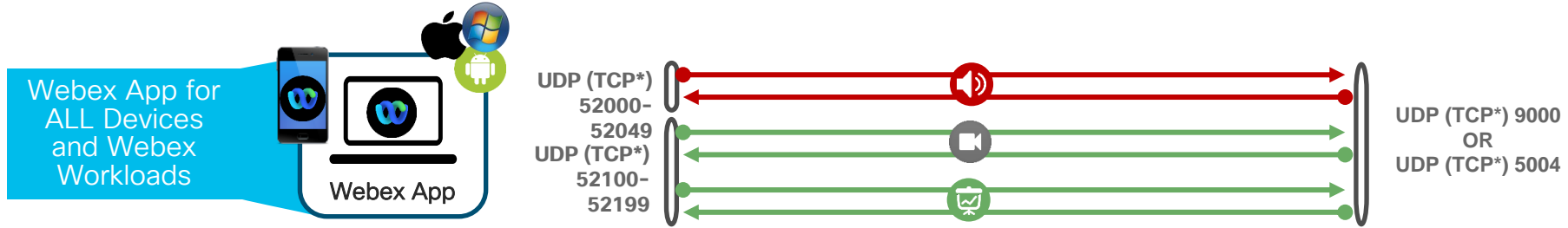


Webex App for Windows



Webex App for ALL Devices and Workloads

To Summarize



Requirements for Source Ports Enablement on All non-windows Devices

- Enabled by default as of 42.7

Requirements for Source Ports Enablement on Windows Devices

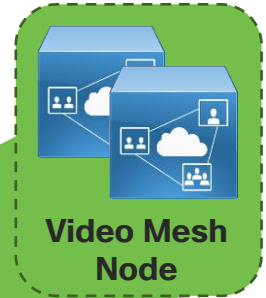
- Ensure Webex App version 42.7
- Webex App (Teams) Enable Feature Toggle for the Webex Org: `desktop-qos-enabled` set to True. Webex App (Meetings) Feature Toggle Enabled by Default.
- Install Webex App with MSI install option switch configured

QoS Marking for Webex Edge Devices

Video Mesh Node – Ports

- Webex Control Hub Services > Video Mesh
- QoS (Enabled by Default)
- Enables Cascade Port Ranges and Native Marking
 - Audio 52500-62999 (EF)*
 - Video 63000-65500 (AF41)*

Video Mesh Cluster



Service Configuration

QoS

Quality of Service ⓘ

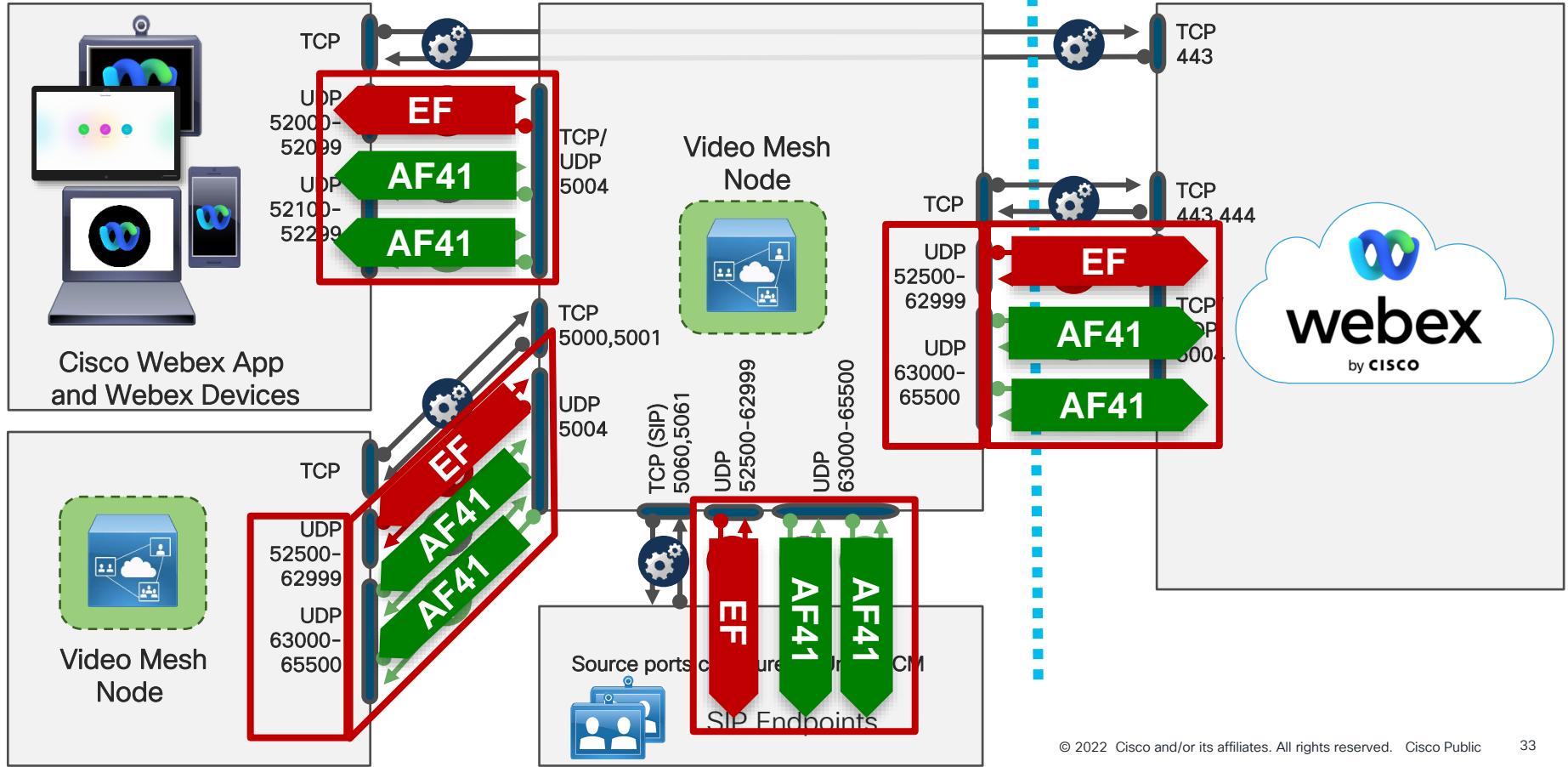
Enabling this setting modifies the UDP port range for Video Mesh cascade media and the Quality of Service (QoS) markings for both Video Mesh cascade and SIP client media. See the [Ports and Protocols documentation](#) for guidance.



* When disabled changes the source ports that are used for audio, video, and content sharing from the Video Mesh node to the range 34000 to 34999

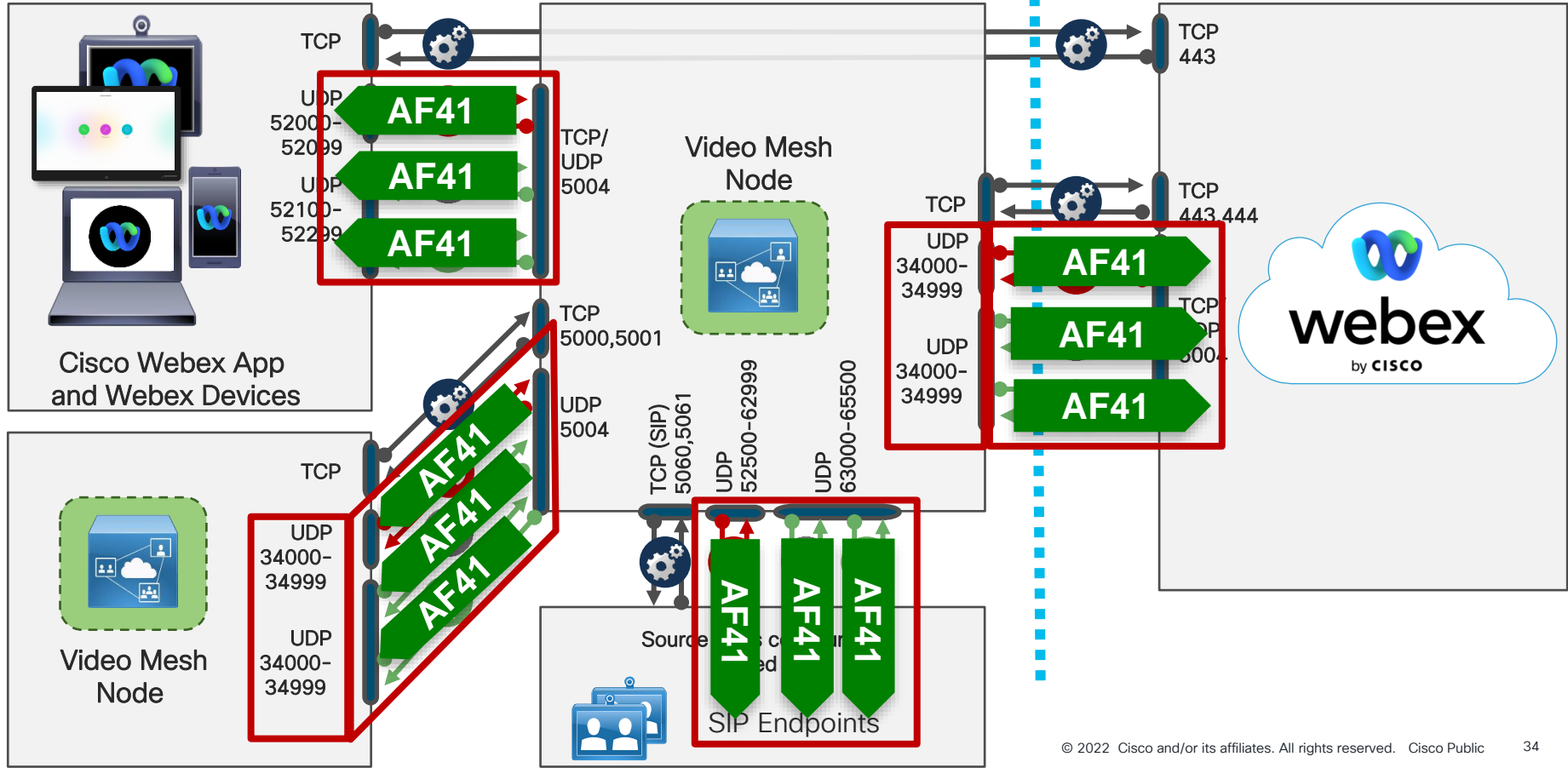
Video Mesh - Native Marking QoS “Enabled” (Default)

Enterprise Network Internet



Video Mesh - Native Marking QoS “Disabled”

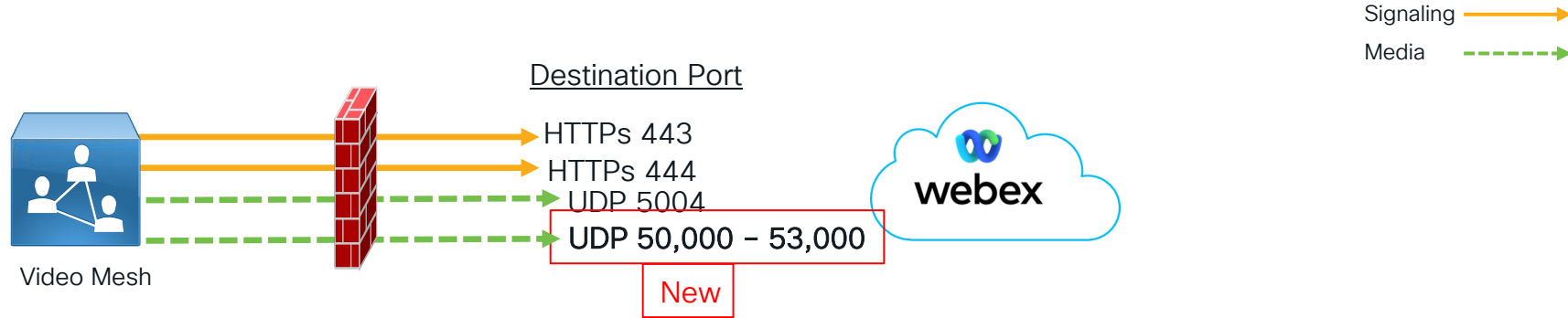
Enterprise Network Internet



VMN Cascade updates

VMN: New media cascade destination port range

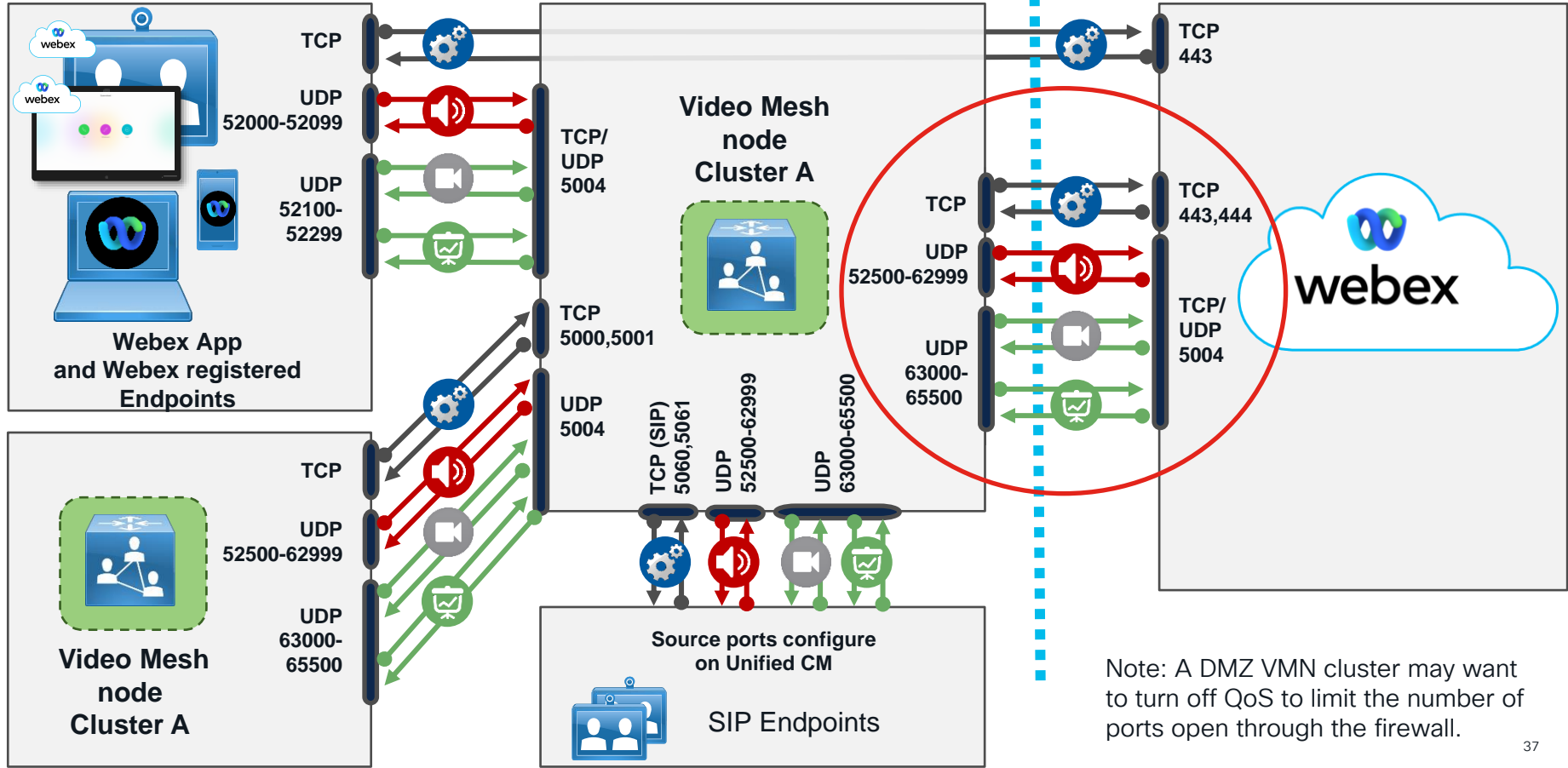
<https://help.webex.com/en-us/article/ndd6sj9/Video-Mesh-port-updates-for-February-2022>



- Part of the continuous improvements in the Webex platform.
- Added new media cascade using UDP 50,000 – 53,000 destination ports.
- VMN continues to use destination UDP 5004 for media cascades.
- Once the enablement is completed:
 - 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

Port Usage Qos Enabled (Default)

Enterprise Network | *Internet*



Note: A DMZ VMN cluster may want to turn off QoS to limit the number of ports open through the firewall.

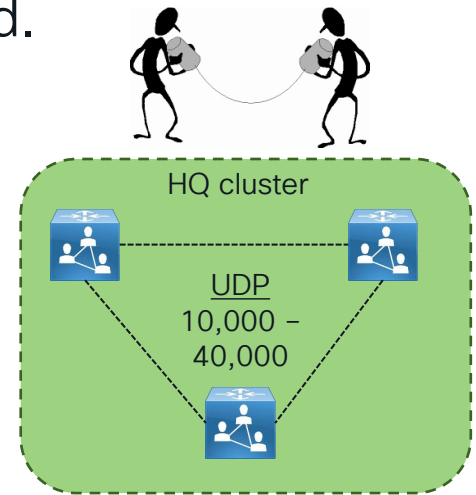
- Original Cascade

- New Cascade

-
- Video Mesh node Cluster A**
- Original Cascade**
- | Source Port | Protocol | Destination Port |
|-------------------|----------|------------------|
| TCP 443,444 | TCP | TCP 443,444 |
| UDP 52500 - 59499 | UDP | TCP/UDP 5004 |
| UDP 63000 - 64667 | UDP | TCP/UDP 5004 |
- New Cascade**
- | Source Port | Protocol | Destination Port |
|-------------------|----------|-------------------|
| TCP 443,444 | TCP | TCP 443,444 |
| UDP 56000 - 59499 | UDP | UDP 50000 - 51499 |
| UDP 63835 - 64667 | UDP | UDP 51500 - 53000 |
- webex**







Intracuster Connectivity

- Communication between cluster nodes is required.
- Specific ranges for signaling and media.
 - Source IP – Video Mesh Node's IP address
 - Signaling – HTTPS 443
 - **Media:**
 - Source port range – random
 - Destination port range – UDP 10,000 – 40,000
- Must allow nodes to communicate or calls will fail.
- VMN nodes perform media port connectivity checks every 6 hours.



Media Signatures for Cisco Webex App and Webex Devices

Client/Device to Cloud (Reverse for Cloud to Client/Device)







Source IP	Destination IP	Source UDP Ports	Destination UDP Ports	Recommended DSCP	Media Type
Webex App* 	Webex cloud and Video Mesh Media Services	52000 to 52049	5004	EF	Audio
Webex App* 	Webex cloud and Video Mesh Media Services	52100 to 52199	5004	AF41	Video
Webex App (Meetings)** 	Webex cloud	52000 to 52049	9000	EF	Audio
Webex App (Meetings)** 	Webex cloud	52100 to 52199	9000	AF41	Video
Webex Devices 	Webex cloud and Video Mesh Media Services	52050 to 52099	5004	EF	Audio
Webex Devices 	Webex cloud and Video Mesh Media Services	52200 to 52299	5004	AF41	Video

* Webex App (Teams) for Windows requires Org feature enablement

** Webex App (Meetings) for Windows requires Install feature enablement

Media Signatures for Cisco Webex App and Webex Devices

Client/Device to Cloud (Reverse for Cloud to Client/Device)

Source IP		Destination IP	Source UDP Ports	Destination UDP Ports		
Webex App*		Webex cloud and Video Mesh Media Services	52000 to 52049	5004		
Webex App*		Webex cloud and Video Mesh Media Services	52100 to 52199	5004		
Webex App (Meetings)**		Webex cloud	52000 to 52049	9000	EF	Audio
Webex App (Meetings)**		Webex cloud	52100 to 52199	9000		
Webex Devices		Webex cloud and Video Mesh Media Services	52050 to 52099	5004		
Webex Devices		Webex cloud and Video Mesh Media Services	52200 to 52299	5004	AF41	Video

Webex App And Webex Devices Audio source ports are separate but combined form a contiguous block to facilitate firewall or ACL configurations **52000 to 52099**







Webex App And Webex Devices Video source ports are separate but combined form a contiguous block to facilitate firewall or ACL configurations **52100 to 52299**

* Webex App (Teams) for Windows requires Org feature enablement

** Webex App (Meetings) for Windows requires Install feature enablement

Media Signatures for Cisco Webex App and Webex Devices

Client/Device to Cloud (Reverse for Cloud to Client/Device)

Source IP	Destination IP	Source UDP Ports	Destination UDP Ports	Recommended DSCP	Media Type
Webex App (Teams)* 	Webex cloud and Video Mesh Media Services	52000 to 52049	5004	EF	Audio
Webex App (Teams)* 	Webex cloud and Video Mesh Media Services	52100 to 52199	5004	EF	Audio
Webex App (Meetings)** 	Webex cloud	52000 to 52049	9000	EF	Audio
Webex App (Meetings)** 	Webex cloud	52100 to 52199	9000	EF	Audio
Webex Devices 	Webex cloud and Video Mesh Media Services	52050 to 52099	5004	EF	Audio
Webex Devices 	Webex cloud and Video Mesh Media Services	52200 to 52299	5004	AF41	Video

Webex App (Teams) for Windows requires Org feature enablement

Webex App (Meetings) for ALL platforms requires Org feature enablement. For Windows requires installation command

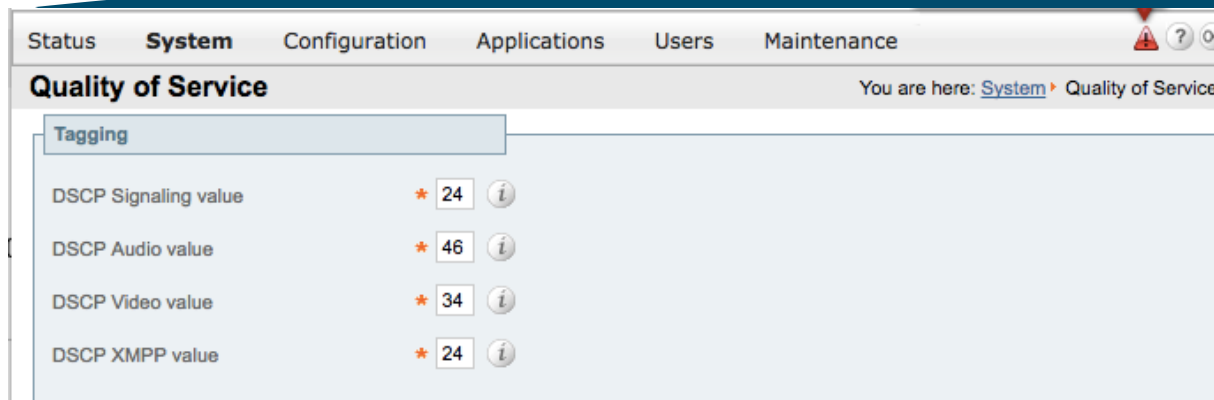
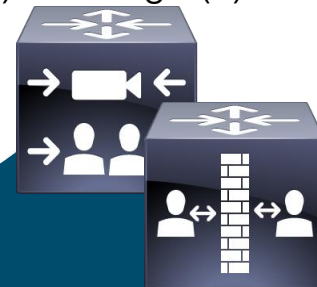
* Webex App (Teams) for Windows requires Org feature enablement

** Webex App (Meetings) for Windows requires Install feature enablement

Expressway – Native Marking

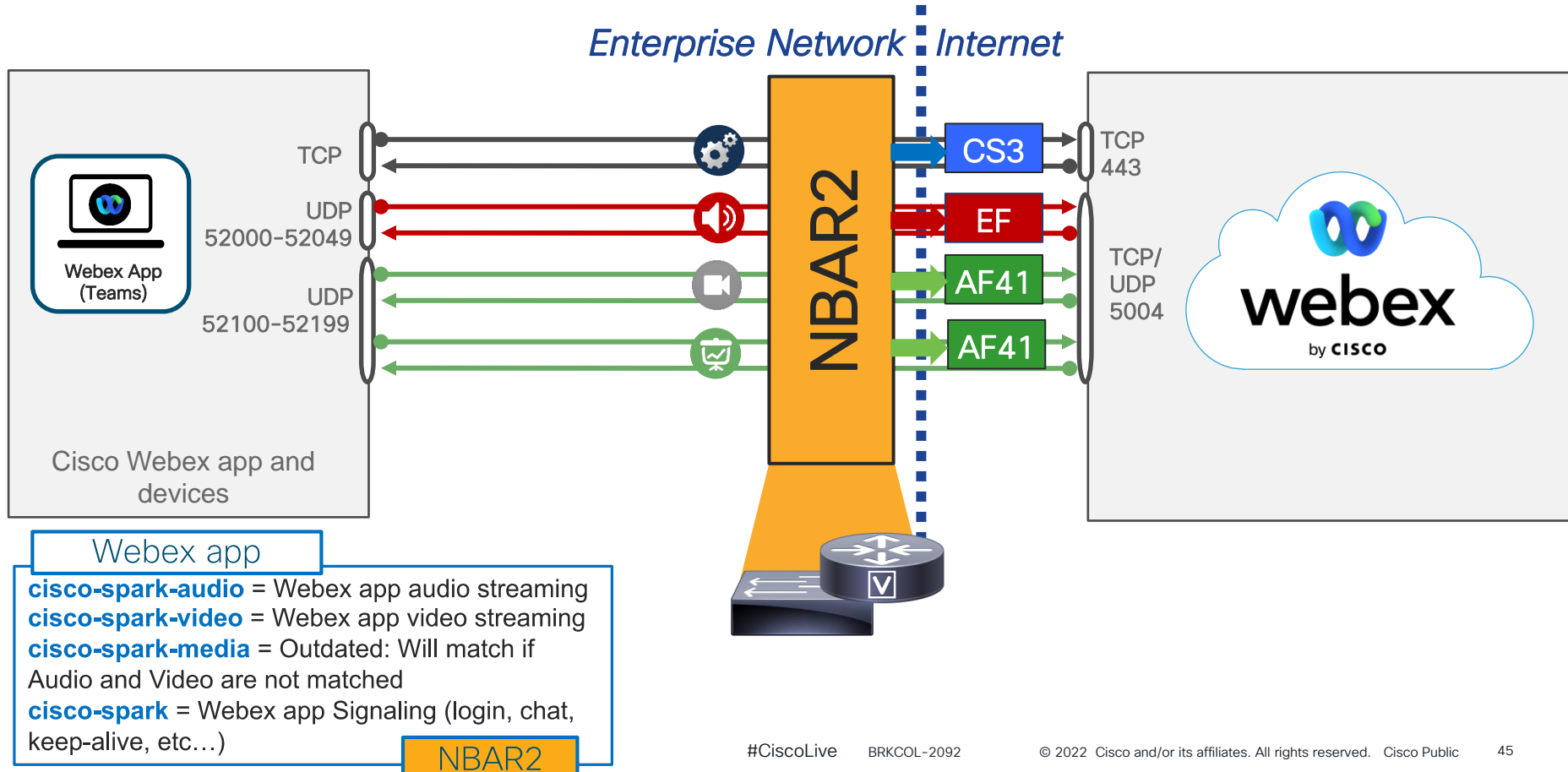
- System → Quality of Service
 - DSCP Signaling value 24 (Default) → **CS3**
 - DSCP Audio value 46 (Default) → **EF**
 - DSCP Video value 34 (Default) → **AF41**
 - DSCP XMPP value 24 (Default) → **CS3**

Cisco Expressway Core (C) and Edge (E)

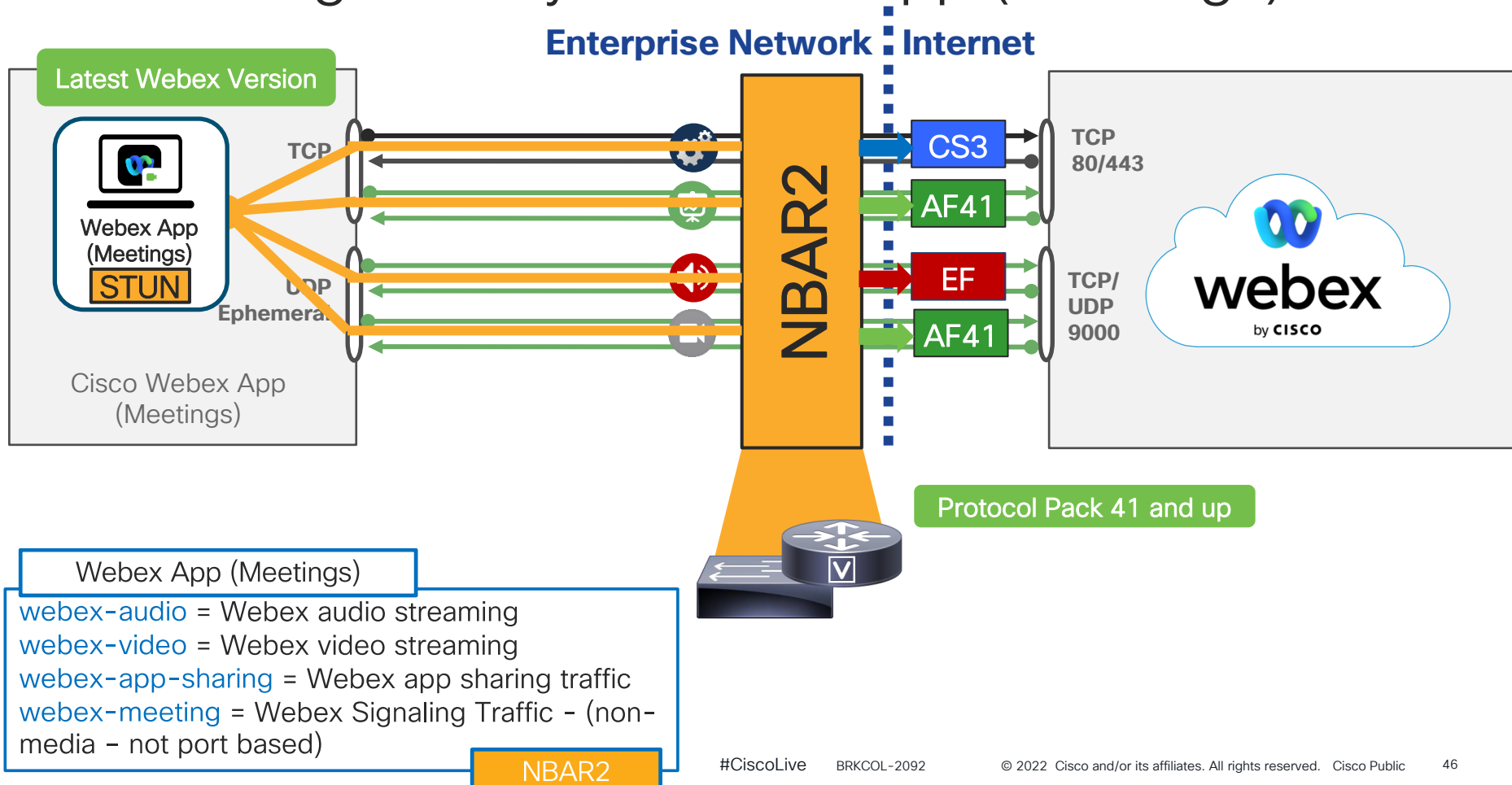


NBAR for Webex Devices and Webex App

Port Usage Today – Webex App (Teams)



Port Usage Today – Webex App (Meetings)



Media and Signaling Signatures for Cisco Webex App (Meetings) and Webex Meetings Application

Client to Cloud (Reverse for Cloud to Client)

REFERENCE



Source IP	Destination IP	Source UDP Ports	Destination UDP Ports	Recommended DSCP*	Media Type
Webex App (Meetings)*	Webex Cloud	52000 to 52049	9000	EF	Audio
Webex App (Meetings)*	Webex Cloud	52100 to 52199	9000	AF41	Video

ACL

*Source ports require enablement for all platforms otherwise ephemeral source ports are used.

Source IP	Destination IP	NBAR2	Recommended DSCP*	Media Type
Webex App (Meetings)	Webex Cloud	webex-audio	EF	Audio
Webex App (Meetings)	Webex Cloud	webex-video	AF41	Video
Webex App (Meetings)	Webex Cloud	webex-app-sharing	AF41	Share
Webex App (Meetings)	Webex Cloud	webex-meeting	CS3	Signaling

NBAR2

Audio and video differentiation is possible with NBAR2 and does not require source port differentiation

Media and Signaling Signatures for Cisco Webex App (Space and 1:1 Meetings)

REFERENCE

Client to Cloud (Reverse for Cloud to Client)



Webex App
(Teams)

Source IP	Destination IP	Source UDP Ports	Destination UDP Ports	Recommended DSCP*	Media Type
Webex App*	Webex Cloud	52000 to 52049	5004	EF	Audio
Webex App*	Webex Cloud	52100 to 52199	5004	AF41	Video

ACL

*Source ports requires enablement for Webex App for Windows. All other platforms default to these source ports.

Source IP	Destination IP	NBAR2	Recommended DSCP*	Media Type
Webex App (Space/1:1) Webex Devices	Webex Cloud	cisco-spark-audio	EF	Audio
Webex App (Space/1:1) Webex Devices	Webex Cloud	cisco-spark-audio	AF41	Video/Share
Webex App (Space/1:1) Webex Devices	Webex Cloud	cisco-spark	CS3	Signaling

NBAR2

Audio and video differentiation is possible with NBAR2 and does not require source port differentiation

Webex App and Devices Ingress QoS Policy



Update QoS configuration

```
ip access-list extended QOS_VOICE
 permit udp any range 17000 17999 any dscp ef
ip access-list extended QOS_PRIORITIZED_VIDEO
 permit udp any range 17000 17999 any dscp af41
```

Webex App (Teams) and Webex Devices

cisco-spark-audio = Teams audio streaming
cisco-spark-video = Teams video streaming
cisco-spark-media = Outdated: Will match if Audio and Video are not matched
cisco-spark = Teams Signaling (login, chat, keep-alive, etc...)

NBAR2

```
ip access-list extended QOS_VOICE
 permit udp any range 17000 17999 any dscp ef
ip access-list extended QOS_PRIORITIZED_VIDEO
 permit udp any range 17000 17999 any dscp af41
```

```
ip access-list extended QOS_WEBEX_APP_AUDIO
 permit udp any range 52000 52099 any eq 5004
 permit udp any eq 5004 any range 52000 52099
ip access-list extended QOS_WEBEX_APP_VIDEO
 permit udp any range 52100 52299 any eq 5004
 permit udp any eq 5004 any range 52100 52299
```

```
class-map match-any VOICE
```

```
 match protocol cisco-spark-audio
```

```
 match access-group name QOS_WEBEX_APP_AUDIO
```

```
class-map match-any PRIORITIZED_VIDEO
```

```
 match protocol cisco-spark-video
```

```
 match access-group name QOS_WEBEX_TEAMS_VIDEO
```

Webex App and Devices Ingress QoS Policy



Webex Devices



Webex App



Update QoS configuration

```
ip access-list extended QOS_VOICE
 permit udp any range 17000 17999 any dscp ef
ip access-list extended QOS_PRIORITIZED_VIDEO
 permit udp any range 17000 17999 any dscp af41
```

Webex App (Teams) and Webex Devices

cisco-spark-audio = Teams audio streaming
cisco-spark-video = Teams video streaming
cisco-spark-media = Outdated: Will match if Audio and Video are not matched
cisco-spark = Teams Signaling (login, chat, keep-alive, etc...)

NBAR2

```
ip access-list extended QOS_VOICE
 permit udp any range 17000 17999 any dscp ef
ip access-list extended QOS_PRIORITIZED_VIDEO
 permit udp any range 17000 17999 any dscp af41
```

```
ip access-list extended QOS_WEBEX_APP_AUDIO
 permit udp any range 52000 52099 any eq 5004
 permit udp any eq 5004 any range 52000 52099
ip access-list extended QOS_WEBEX_APP_VIDEO
 permit udp any range 52100 52299 any eq 5004
 permit udp any eq 5004 any range 52100 52299
```

```
class-map match-any VOICE
```

```
 match protocol cisco-spark-audio
```

```
 match access-group name QOS_VOICE
```

```
 match access-group name QOS_WEBEX_APP_AUDIO
```

```
class-map match-any PRIORITIZED_VIDEO
```

```
 match protocol cisco-spark-video
```

```
 match access-group name QOS_PRIORITIZED_VIDEO
```

```
 match access-group name QOS_WEBEX_TEAMS_VIDEO
```

Webex App (Meetings) Ingress QoS Policy



Webex App
(Meetings)



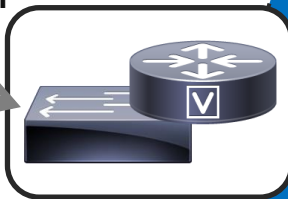
Update QoS
configuration

```
ip access-list
  permit udp
...
class-map match-any
  match access-group
...
```

Webex App (Meetings)

webex-audio = Webex audio streaming
webex-video = Webex video streaming
webex-app-sharing = Webex app sharing traffic
webex-meeting = Webex Signaling Traffic -
(non-media, not port based)

NBAR2



```
ip access-list extended QOS_VOICE
  permit udp any range 17000 17999 any dscp ef
ip access-list extended QOS_PRIORITIZED_VIDEO
  permit udp any range 17000 17999 any dscp af41

ip access-list extended QOS_WEBEX_MTG_AUDIO
  permit udp any range 52000 52049 any eq 9000
  permit udp any eq 9000 any range 52000 52049
ip access-list extended QOS_WEBEX_MTG_VIDEO
  permit udp any range 52100 52199 any eq 9000
  permit udp any eq 9000 any range 52100 52199

class-map match-any VOICE
  match protocol webex-audio
  match access-group name QOS_VOICE
  match access-group name QOS_WEBEX_MTG_AUDIO

class-map match-any PRIORITIZED_VIDEO
  match protocol webex-video
  match access-group name QOS_PRIORITIZED_VIDEO
  match access-group name QOS_WEBEX_MTG_VIDEO
```

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- Attendees who fill out a minimum of four session surveys and the overall event survey will get Cisco Live branded socks!
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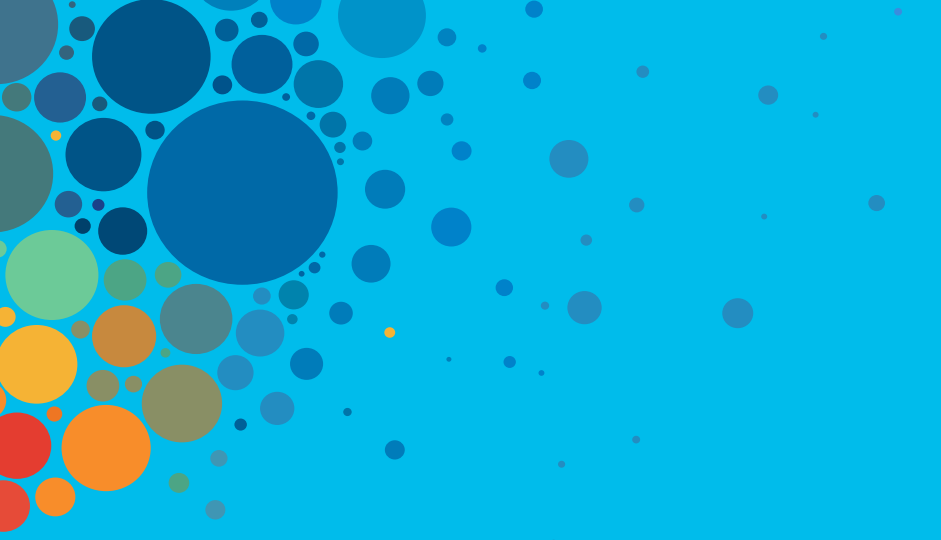
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Thank you

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