AVAYA

Avaya Equinox® Solution Guide for Medium to Large Enterprises

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Contents

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Chapter 1: Introduction

Purpose

This document describes an Avaya solution from a holistic perspective focusing on the strategic, enterprise, and functional views of the architecture. This document also includes a high-level description of each verified reference configuration for the solution.

Chapter 2: Solution overview

Avaya Equinox® Solution Overview

Avaya Equinox® Solution is an offer converging the capabilities of Avaya Aura® and Avaya Scopia® to create the next generation solution for the best of both environments. Scalable audio conferencing, rich web collaboration, and switched video come from Avaya Aura®. Video processing and transcoding, standards-based video room system integration, and the broad range of remote access capabilities for desktop and mobile devices come from Avaya Scopia®.

New capabilities beyond the elements from Avaya Aura® and Avaya Scopia® include:

- WebRTC for easy conference participation by guests with zero download.
- Avaya IX™ Workplace Client for Android, iOS, Mac, and Windows with its rich user capabilities for UC deployments.
- Avaya Breeze® platform SDK / API enabling conferencing and collaboration features to be embedded as part of business processes and applications.

The result is the software-based Equinox Solution deployable in a virtualized environment:

- You do not need a dedicated appliance taking up rack space for each function. Less boxes or appliances mean it is considerably more efficient.
- End users have a single conferencing system to learn.
- IT managers have one system to support and one vendor to call for assistance.
- Avaya sales and partners have a single conferencing solution to sell.

The Equinox Solution, or Avaya Equinox® Conferencing, is a single platform for:

- Avaya Equinox® for Team Engagement (TE) with Avaya Aura® components
- Avaya Equinox® for Over The Top (OTT) for customers that want their conferencing solution to be a standalone entity and not integrated with Avaya Unified Communications
- Service Provider offerings

  Avaya has enhanced the room system product line for much easier deployment in enterprise applications. For service providers, this means easy bundling of our endpoints with services, while enterprise customers can enjoy much simpler installation and administration. You do not need an expert or technical resource to install or provision a room system. Anyone who can hook up the cables, connect the components together, and turn on the power can get a room system operational without an onsite technical resource. For example, the general facilities personnel.

Deliverables include migration or transition of content for existing Avaya Aura® and Avaya Scopia® customers. Note that some feature parity might not be achieved within this release.

As an open mobile enterprise engagement company, Avaya continues to extend its solutions portfolio to address a wider set of customer challenges and areas of higher value. Avaya's solutions, innovation roadmap, and channel development plans position the company to address trends over the coming years, including:

- Video becoming mainstream

- Increasing mobility demands driven by smartphones and tablets

- IT consumerization

- Demand for open, flexible platforms

- Common place adoption of communication-enabled business processes

- Context-driven communications

- Federation of communications across enterprise boundaries.

New in this release

For detailed information, see the product guides and Release Notes that you can download from http://support.avaya.com.

Release 9.1.10

Release 9.1.10 further reinforces data privacy handling at the solution level for General Data Protection Regulation (GDPR) compliancy. Avaya Equinox® Management centrally handles data privacy configuration for most components.

Avaya Equinox® Management:

- PIN security features

  The administrator can enforce strong PIN requirements and auto notifications to change the PIN.

- Enhancements on meetings that are scheduled on Avaya Meeting Scheduler Outlook Add-in for Windows

  Waiting rooms for one-time pin meetings are supported because Avaya Meeting Scheduler Outlook Add-in allows to reserve scheduled meetings in Avaya Equinox® Management.

  Each scheduled meeting adds random digits onto the virtual room number, which improves meeting security even if the virtual room is not configured for one-time pin. The user can schedule back-to-back or overlapping meetings in the same virtual room without any conflicts.

- Ability to add multiple virtual rooms per user in a Team Engagement (TE) deployment.

  The administrator can manually add a second virtual room to an existing user from the administrator portal of Avaya Equinox® Management. For example, the administrator can

enable the user's first virtual room for video, and the second virtual room for audio only to save video resources.

- Ability to change the participant's name in a waiting room

While the participant is in the waiting room, the operator can change the participant's name in the In-meeting Control interface of Avaya Equinox® Management. When the participant is online, the system displays the new name on the video screen for that participant.

- New report types for virtual rooms that allow to better track system usage.

- Users can now own multiple VMRs in an Equinox Conferencing Team Engagement deployment type. In addition, the obligation for a waiting room is now removed in the Equinox Conferencing Team Engagement deployment type.

- Meeting Operators can now change the name of participants when they are in the waiting room, and before a meeting starts. This allows operators to map and replace PSTN caller numbers with first and last names, so as to have these appear on the participant roster instead of displaying a PSTN number.

Unified Portal:

- New customizing features for branding.

- Volume indicator allows to check your voice level on the microphone panel of the Unified Portal.

- Users can save a list of participants in their Downloads folder.

- Users can view Avaya Meeting Scheduler Outlook Add-in in the Unified Portal interface.

Standalone Avaya Aura® Web Gateway:

From release 3.8.1 and above, the application integrates network separation of management services.

IP Office in Avaya Equinox Conferencing

Avaya Equinox Conferencing 9.1.10 no longer supports interoperability with IP Office. Cloud conferencing with Avaya Spaces is a better fit and the recommended solution for IP Office customers.

Product branding

Avaya Equinox Client was changed to Avaya IX™ Workplace Client.

Enhancements and bug fixes:

See the product Release Notes.

Documentation updates

The current documentation release includes features of release 9.1.9 SP1 (9.1.9.1).

For Avaya Aura® products, see the Avaya Aura® documentation and release notes.

Avaya Equinox® Management:

- Option to enable or disable the OS storage encryption during OVA deployment. The default value is **Enabled** for encryption.

- Meeting and moderator PIN security enhancements

- Personal data encryption
- Retention time of Call Detail Record (CDR) data
- Storage encryption

  Storage is encrypted together with Avaya Equinox® Management in the following modules:

  - All-In-One Avaya Equinox® Management, including All-In-One Avaya Aura® Web Gateway in Over-The-Top (OTT) deployment
  - Distributed Avaya Aura® Web Gateway in OTT deployment because the gateway has user data in its database
  - Distributed Equinox H.323 Gatekeeper and distributed Equinox Conference Control, both in TE and OTT deployments

- Server log retention time

  The administrator has the option to configure separate log retention days for the local server and for the distributed devices in the deployment.

  The local server comprises the All-In-One Avaya Equinox® Management, including All-In-One Avaya Aura® Web Gateway in OTT.

  The distributed devices include:

  - Distributed H.323 Gatekeeper
  - Distributed Equinox Conference Control
  - Avaya Aura® Web Gateway in OTT
  - Avaya Equinox® H.323 Edge
  - Avaya Equinox® Media Server

    For details, see the section about the server.

- Cleaning of management expiration logs

Avaya Equinox® Media Server:

The administrator can configure log retention time for the following uses of Avaya Equinox® Media Server on Avaya Equinox® Management:

- Avaya Aura® Media Server High Capacity Audio with Web Collaboration
- Web Collaboration Only Avaya Equinox® Media Server
- Avaya Aura® Media Server Media Gateway
- Avaya Equinox® Media Server Full Video and Web Collaboration

When Avaya Equinox® Conferencing is deployed in hardened security mode (FedRAMP), the administrator can configure log retention on the standalone Avaya Aura® Media Server with or without Web Collaboration.

Avaya Equinox® Streaming and Recording:

- Disk encryption for the Avaya Equinox® Streaming and Recording Windows Server itself and for the SAN partition, if a SAN is used for external storage.

- Personal data retention policies. This Service Pack adds the ability to define the storage period for any files containing personal data. This includes certain log files, as well as temporary recording files.

- Increased password security.

Key components

Avaya Equinox Conferencing provides a comprehensive portfolio of powerful visual, audio, and data communications solutions for the enterprise market that allow advanced voice, data and videoconferencing. Equinox Conferencing includes:

- Advanced network infrastructure solutions for conferencing, scheduling, device and bandwidth management, and directory services

- Advanced network connectivity, firewall traversal, and recording and streaming

- Advanced user experience solutions for board rooms, conference rooms, desktop and personal videoconferencing.

Equinox Conferencing deployments are fully standards-based and support the highest resolutions available in today's conferencing solutions providing interoperability and interconnectivity between any video-enabled device, such as a telepresence system, a meeting room or a desktop videoconferencing endpoint, with other telephony and conferencing systems. Institutions, enterprises, and application service providers use Equinox Conferencing solutions to create high quality, easy-to-use voice, video, and data communication, collaboration, and entertainment environments, regardless of the communication network - IP, WebRTC, SIP, H.323, 4G, ISDN or next generation networks.

The following sections further categorize the solution's components.

Foundation of Equinox Conferencing

The following figure illustrates the foundation for understanding Equinox Conferencing. The components shown below are part of the solution, depending on the deployment. For detailed information on the Avaya Aura® components, download the documentation from http:// support.avaya.com.
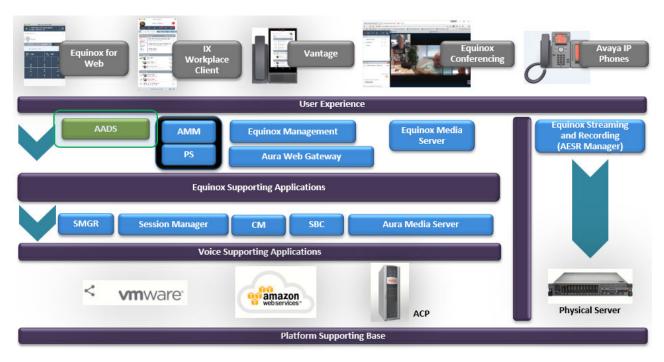
Figure 1: Foundation of Equinox Conferencing

Component	Description
Avaya Aura® Device Services (AADS)	Provides a single place in the Avaya Aura® architecture where devices (clients and endpoints) can store and retrieve data that users would want to see on any device, supporting a common user experience. In addition, it is a common place for configuration and deployment data.
Avaya Multimedia Messaging (AMM)	Delivers powerful IM and presence capabilities for Avaya IX™ Workplace Client users. Individuals and groups can interact and productively handle conversations and engage across locations and time. AMM is an Avaya Aura® component.
Avaya Aura® Presence Services (PS)	Collects and disseminates rich presence from Avaya and third party sources across a diverse set of business environments, enabling users throughout the network to reach the people they need, leveraging the multiple channels of communications available to them.
Equinox Management	Provides the common management framework of centralized management functions for provisioning and administration. Management can synchronize with the organization's LDAP with/without third party PBX and/or SIP proxy.

Table continues…

Component	Description
Avaya Aura® Web Gateway	Acts as a gateway to Avaya Aura® for clients and applications utilizing browser based WebRTC signaling and media.
Equinox Media Server	Provides Avaya's virtual application for multiparty audio, video, and data conferencing.
Avaya Aura® System Manager (SMGR)	Provides the common management framework of centralized management functions for provisioning and administration.
Avaya Aura® Session Manager	Provides the SIP routing and integration tool.
Avaya Aura® Communication Manager (CM)	Provides the open, extensible IP telephony platform that can be deployed as an IP PBX, a Session Initiation Protocol (SIP)-only environment, or a hybrid platform that supports both SIP and non-SIP environments.
Avaya SBCE	Allows external users and WebRTC users to connect to conferences in the enterprise local network. Avaya SBCE is an edge component. It provides: • Session Border Control (SBC). It allows connection remote audio and video SIP endpoints that are registered/not registered with the solution. These can be XT Series endpoints or third-party video endpoints (Cisco and Polycom). • HTTP reverse proxy • TURN/STUN server for ICE, for connecting WebRTC end users with audio and video through firewalls.
Avaya Aura® Media Server (AAMS)	Provides high scale audio engine.
Avaya Equinox® Streaming and Recording (AESR)	Provides audio, web, and HD video recording, and high scale streaming capability.

Related links

Back-end infrastructure components

The components of the Avaya Equinox® Solution are detailed in the following sections:

Related links

Avaya Equinox® Management overview

System administrators use Avaya Equinox® Management to control video network devices, such as gateways, media servers, and endpoints.

You access Equinox Management from the administrator portal. Service providers and organization administrators access the administrator portal to perform network-wide management, while customers of service providers access the administrator portal to perform similar tasks that are relevant only for their organization. Meeting operators, organizers, and regular users access the user portal to perform scheduling and management relevant to them.

The system administrator defines different user profiles with varying permissions to determine the management tasks available for a specific user.

Equinox Management sits at the core of your Equinox Solution deployment and offers the following capabilities:

- Video network device management

  Remotely configure, upgrade and monitor many of your video network devices via the administrator portal. These devices include Avaya Equinox® Media Server, Avaya Web Collaboration server, Avaya Equinox® Streaming and Recording, and many gateways.

- Endpoint management

  Remotely configure, upgrade and monitor both Equinox Solution and third-party endpoints via the administrator portal.

- Resources and bandwidth management

  Configure your network devices and endpoints for effective bandwidth control. For example, you can determine when meetings are cascaded between multiple media servers. You can also monitor in real-time from the administrator portal's dashboard, or generate reports to see network statistics for a given time period.

- User management

  You can manage user access by creating profiles with a set of capabilities. You can also create virtual rooms and assign endpoints. Equinox Management also integrates with existing directory servers such as Microsoft Active Directory for easy user provisioning.

- Interface to unified communication solutions

  Equinox Management provides the interface to market leading unified communication solutions such as Avaya Aura® Power Suite.

- SIP server integration

The smooth integration with third-party SIP servers leverages existing network call control for the videoconferencing system. The SIP server manages the call control and network usage, while Equinox Solution supplies the videoconferencing capabilities.

- Built-in gatekeeper

Equinox Management is shipped with a built-in gatekeeper, which is called *Avaya Equinox H.323 Gatekeeper*. It supplies the correct destination IP and authorizes the appropriate bandwidth for the call. In this way, Equinox Management can manage endpoint-initiated calls and point-to-point calls.

- Call authorization

Equinox Management integrates with the gatekeeper to authorize calls based on the settings you define for your network, such as user capabilities and allowed bandwidth.

- Multi-stream switching

Equinox Management maximizes network bandwidth efficiency during multi-participant communication. High scalability enables resources to be redistributed among participating endpoints, as needed.

- Mixed mode video support

Equinox Management enables maximum experience in terms of interoperability in legacy AVC room systems, and where mobile devices cannot support multiple decoding and encoding streams.

- Processed mode video support

Equinox Management optimizes legacy environments that do not support multi-stream switching technology or have bandwidth limitations.

Related links

Media components

The components of the Avaya Equinox® Solution are detailed in the following sections:

Related links

Avaya Equinox® Media Server overview

Avaya Equinox® Media Server is a virtual media server with the following built-in components for media processing and real-time collaboration:

Component	Supports
MCU	• Transcoding and composition of video • Audio and video support for WebRTC-based thin clients • Web collaboration
Media server	• High-scale audio and multi-stream video • WebRTC gateway
Web collaboration server	Web collaboration

Avaya Equinox® Media Server processes all media on the server CPU and does not need media accelerator blades. Avaya Equinox® Media Server supports multiple technologies for processing audio and video, such as transcoding and switching, and is compatible with different types of enterprise deployments.

Avaya Equinox® Media Server is part of the Avaya Equinox® solution. Components of Avaya Equinox® can be combined to fit the existing network topology and video conferencing requirements of the organization. Avaya Equinox® Media Server is required in the Over The Top and Team Engagement deployments of Avaya Equinox®.

You can configure Avaya Equinox® Media Server as a master or slave server in distributed enterprise networks to support high-quality video, high-capacity audio, and web collaboration. You can configure Avaya Equinox® Media Server as a dedicated web collaboration server. You can also configure Avaya Equinox® Media Server as a cascaded gateway to Scopia® Elite 6000 MCU. As a cascaded gateway, Avaya Equinox® Media Server acts as a WebRTC gateway or as a dedicated web collaboration server.

Avaya Equinox® needs a WebRTC gateway deployed with Avaya Equinox® Media Server to process WebRTC calls. In Over The Top deployments, an instance of Avaya Equinox® Media Server configured as a WebRTC gateway processes WebRTC calls. In Team Engagement deployments, Avaya Aura® Media Server acts as the WebRTC gateway.

The performance and capacity of each Avaya Equinox® Media Server deployment depends on the physical cores, RAM, disk space, and the network interfaces allocated to the virtual machine.

Related links

Scopia Elite MCU overview

The Scopia Elite MCU was the Scopia Conferencing solution's flagship platform for high definition multi-party videoconferencing.

The Scopia Elite MCU is now in End-of-Sale.

Related links

Peripherals and edge components

The Avaya Equinox® Solution offers multiple virtual components that support secure connectivity beyond the enterprise network firewall.

Related links

Avaya Equinox® H.323 Edge Client overview
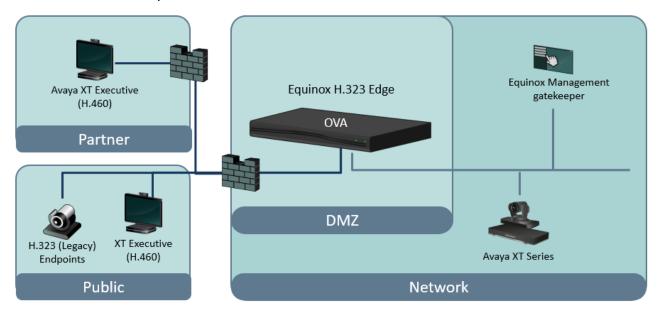
Avaya Equinox® H.323 Edge provides a complete firewall and NAT traversal solution and support for secure connectivity between enterprise networks and remote locations.

> ✱ **Note:**
>
> Equinox H.323 Edge is an optional component. Equinox H.323 Edge is required when you need to connect remote H.323–based video conferencing endpoints to an Avaya Equinox® solution conference through firewalls.

Equinox H.323 Edge is part of the Avaya Equinox® solution. Components of Avaya Equinox® can be combined to fit the existing network topology and video conferencing requirements of the enterprise. Equinox H.323 Edge is an optional Avaya Equinox® solution component which is deployed in Over The Top and Team Engagement deployments. Equinox H.323 Edge is deployed in network DMZs when enterprises need H.323–based calls to traverse the network firewall.

Equinox H.323 Edge maintains the security and advantages of firewall and NAT over heterogeneous video networks and supports seamless integration with existing video endpoints and infrastructure components.

Equinox H.323 Edge uses the H.460 protocol. H.460–compliant endpoints can directly communicate with Equinox H.323 Edge. The endpoints act as H.460 clients and Equinox H.323 Edge acts as an H.460 server.

Endpoints in private networks can communicate with the endpoints in public networks through Equinox H.323 Edge. Endpoints in public networks can join conferences hosted in private networks through Equinox H.323 Edge if there is an open connection through the firewall. H.323 Gatekeeper provides standalone address resolution functionality in H.323–based networks.

Equinox H.323 Edge supports static addresses for external endpoints for conferences hosted on the enterprise network. Users located outside the enterprise firewall can join conferences using addresses such as `1234@h323edge.company.com`, while users with endpoints logged in to Equinox H.323 Edge can directly dial numbers such as 1234 to join conferences.

Related links

Overview of the Avaya Session Border Controller for Enterprise

The Avaya SBCE delivers security to a SIP-based Unified Communications network. It is available in two versions: Advanced Services and Basic Services.

Advanced Services is a highly specialized Unified Communications (UC) security product that protects all IP-based real-time multimedia applications, endpoints and network infrastructure from potentially catastrophic attacks and misuse. It provides the real-time flexibility to harmonize and normalize all types of enterprise communications traffic to maintain the highest levels of network efficiency and security.

Basic Services provides a subset of the functionality of the Advanced Services offer. It has all the functionality required for an enterprise to terminate SIP trunks without the complexity and higher price associated with typical SBCs.

ASBCE can be deployed in enterprise communications and in service provider networks.

For more information, see the relevant documentation at http://support.avaya.com.

Related links

Equinox Streaming and Recording

For the streaming and recording of conferences, Avaya has developed the Avaya Equinox® Streaming and Recording Server (Equinox Streaming and Recording). Equinox Streaming and Recording is the Avaya platform for HD streaming and recording.

Related links

Clients

The Avaya Equinox® Solution features a single compelling user experience with support across mobile, desktop and browser.

Related links

Overview of Avaya IX™ Workplace Client for Unified Communications

Avaya IX™ Workplace Client (previously branded Avaya Equinox Client) is a downloadable, SIP-based unified communications client with real time collaboration capabilities that enable registered business users to easily manage their day-to-day communications from a single interface. It features high performance multimodal sessions, IP Telephony, IM/presence, web conferencing and point-to-point and multiparty video propel users through buddy and contact centric workflows with contextual controls. It requires an Aura account.

The follow key benefits are provided across all supported platforms:

- Enterprise grade UC and collaboration capabilities including; multi-party audio, multi-stream video and web conferencing leveraging and combining technologies from Avaya Aura® Conferencing and Avaya Scopia® Conferencing.

- Avaya Multimedia Messaging – an advanced, multi-device messaging solution with text, audio, video and file attachments, providing persistent point-to-point and multiparty conversations with named topics.

- Remote worker support with Avaya Session Border Controller for Enterprise (SBCE) enables secure VPN-less access to services when working outside of the private network.

- Simplified provisioning – The client is designed to import administrator defined settings and removes virtually all end-user configuration tasks short of entering username and password.

- Solution resiliency with automated Avaya Aura® Session Manager failover support including primary, secondary and branch simultaneous registration.

- 1–click to join from Top of Mind view or Outlook notification (plug-in needed).

- Security – all communication channels are secured to protect end-user privacy. Enhancements in this release also include host validation and client certificate support to enable trusted connections and to reliably authenticate both servers and connecting clients.

The client is delivered on the following operating systems:

- Avaya IX™ Workplace Client for iOS and Avaya IX™ Workplace Client for Android equip Apple iPhone and iPad and Android users with an easy-to-use mobile client that carries enterprise grade telephony and real-time web collaboration to their mobile phone.

- Avaya IX™ Workplace Client for Windows and Avaya IX™ Workplace Client for Mac provide out-of-the-box integration with Microsoft and Apple business applications, extending the full suite of Avaya Aura® unified communications and collaboration to platforms already in place.

For more information see *Using Avaya IX™ Workplace Client* at http://support.avaya.com

Related links

Clients on page 20

Overview of Avaya IX™ Workplace Client as a Meet-Me client

You can use Avaya IX™ Workplace Client for guest clients that dial into conferences via the Unified Portal. It is an addition and extension to Avaya IX™ Workplace Client product line. The Meet-Me client, which is built on top of the Avaya Breeze® platform SDK, is for desktop and mobile use. The Meet-Me client extends a room system experience to Meet-Me hosts and guest users for voice, video, and data communications. The client provides an effective way to extend video communications beyond typical enterprise boundaries to workers at home and on the road.

Meet-Me hosts are users who host conferences with audio/video and present content. These users have a virtual room and associated features like the ability to present content. Meet-Me guests are users who join conferences with audio/video. They may optionally need to present using screen sharing. Meet-Me in this context means that clients are joining the conference via HTTP based protocols and not SIP.

The client has the following characteristics:

- Requires application downloading, installing, and registration

- Installs on desktops and mobile devices.

- Provides guest and registered user access

- Launches from the application or from the Unified Portal.

- Launches from these supported browsers:

  - Chrome from version 53.0 (and above)

  - Firefox from version 52.0 (and above)

  - Internet Explorer from version 11 (and above)

  - Edge from version 14 (and above)

  - Safari from version 9.3.1 (and above)

- Allows participation in point-to-multipoint meetings

- One–click to join from Outlook notification (plug-in needed)

- Requires Avaya Session Border Controller for Enterprise (ASBCE) to securely traverse the organization's firewall and call into a meeting.

The client has the following functionalities:

- Support for HTTP signalling including HTTP tunnelling for mobile and desktop communications through firewalls and reuse of web ports.

- UCCP-based conferencing integration

- XT Series mobile link / screen link

- Codec enhancements

- Full BFCP support with TLS/TCP/UDP/auto fall back

- Multi (video) Stream Switching (MSS)

- Strip video layout

- Video pinning

- Web Collaboration Server presentation only mode

- Web collaboration remote control

- Support for four simultaneous talkers

- Slider that allows to review previously shared content without interrupting the presenter.

The client extends services to the following operating systems:

- Avaya IX™ Workplace Client for iOS and Avaya IX™ Workplace Client for Android equip Apple iPhone and iPad and Android users with an easy-to-use mobile client that carries enterprise grade telephony and real-time web collaboration to their mobile devices.

- Avaya IX™ Workplace Client for Windows and Avaya IX™ Workplace Client for Mac provide out-of-the-box integration with Microsoft and Apple business applications.

For more information see *Using Avaya IX™ Workplace Client* at http://support.avaya.com

Related links

Overview of Avaya Equinox® Meetings for Web

This client uses the WebRTC technology to provide meet-me experience to users from the browser without the need to download and locally install any components. This functionality is particularly useful for guest users, and also for registered enterprise users connecting into conferences from computers which are not their designated work computers (e.g. business center computer, personal home computer etc.). Users can make and receive audio or video calls from the browser on a desktop or on a mobile device. Web collaboration is also implemented as a built-in, integral part of business processes and control center activities. The client incorporates Avaya Javascript Client SDK.

Avaya Equinox® Meetings for Web supports:

Mode	Windows				MacOS		
	Chrome 74+	Firefox 66+	MS Edge 42+	MS IE 11+	Chrome 75+	Safari 12+	Firefox 66+
Full audio + video experience	✓	✓	✓		✓		✓
Audio + presentation	✓	✓	✓		✓		✓
Presentation Only	✓	✓	✓	✓	✓	✓	✓

> **Note:**
>
> On MS Edge 42+, the modes are disabled by default in Equinox Management due to limitations of MS Edge for WebRTC.

Related links

Endpoints

The following endpoints can be deployed with the Avaya Equinox® Solution:

Related links

About the XT Series

The Avaya Room System XT Series is a set of dedicated videoconferencing endpoints which incorporate state-of-the-art video technology for high definition (HD) conferencing. You can also locally host videoconferences with the built-in MCU on most XT Series models. The XT Series seamlessly works with a wide variety of endpoints, including H.323, SIP, software endpoints, and mobile device endpoints.

Figure 2: XT Series products

This section provides an overview of the general features and capabilities available in the XT Series:

- Excellent video quality, with resolutions of up to 1080p at an unprecedented 60 frames per second (fps), depending on the model.

- Support for dual HD video streams, allowing PC presentations to be shared alongside video from the camera in resolutions of up to 1080p at 60fps, depending on the model.

- Quickly and seamlessly share content on your computer with other endpoints.

- DVD-quality audio with up to 48 kHz sampling rate audio encoding capability, depending on the model. The sampling rate is a measure of the accuracy of the audio when it is digitized. The XT Series endpoints are shipped with different microphones depending on the model. You can add dedicated Microphone Pods or additional analog/digital microphones if required.

- The Avaya XT7000 Series and the Avaya XT5000 Series support stereo audio in point to point calls when an Avaya POD microphone is used. Stereo audio is only available if it is supported also by the remote party, when in a point to point SIP or H.323 call using AAC-LD, G.719 or OPUS audio codecs. When stereo is active, the additional POD microphone does not capture audio in the room, but it is available to mute/unmute the system.

- High quality video and audio even with limited bandwidth or poor network conditions, by using these compression methods (in addition to standard H.263 and H.264). It requires both sides of the transmission (sending and receiving endpoints) to support this protocol.

  - H.264 Scalable Video Coding Technology (SVC) in point-to-point calls. SVC extends the H.264 codec standard to dramatically increase error resiliency and video quality without the need for higher bandwidth.

  - H.264 High Profile is a standard for compressing video by up to 25% over the H.264 Baseline Profile, enabling high definition calls to be held over lower call speeds.

- H.265 supersedes H.264 as a compression standard, allowing high quality calls with even lower bandwidth consumption (Avaya XT7000 Series only).

- NetSense is a proprietary Equinox Solution technology which optimizes the video quality according to the available bandwidth to minimize packet loss. As the available bandwidth of a connection varies depending on data traffic, NetSense's sophisticated algorithm dynamically scans the video stream, and then reduces or improves the video resolution to maximize quality with the available bandwidth.

• Ability to record videoconferences to a locally connected USB drive or the network and to save them to a generic remote server - which could be Equinox Streaming and Recording for content management and playback - using FTP/S (may require license, depending on the model).

You can only directly record to the network if your Equinox Solution includes an Equinox Streaming and Recording server, the XT Series is managed by Equinox Management, and the meeting is hosted by a Equinox Media Server (or older model).

• For an even better experience, Avaya Collaboration Control enables you to remotely control the XT Series features using the intuitive touch interface of an iOS or Android™ device. It may require license, depending on the model.

• Secure point-to-point video calls and videoconferences, via encrypted connections or using TLS. You can have up to three remote encrypted participants in a videoconference.

🛈 **Important:**

Using encryption is subject to local regulation. In some countries it is restricted or limited for usage. For more information, consult your local reseller.

Among the latest XT Series products are Avaya Room System XT7100 and Avaya XT4300.

The Avaya Room System XT7100 is the new generation Avaya flagship product in the Avaya Room System XT Series of room systems. The XT7100 incorporates dual 1080p/60fps live video and content, HD audio, H.265, H.264 High Pofile and Scalable Video Coding (SVC), and nine sites multiparty calling. H.265 saves up to 50% bandwidth with respect to H.264 High Profile. Dual HDMI input allows simultaneous connection of two cameras in switching mode for a full coverage of large rooms or auditoriums.

In the Avaya Room System XT7100, you can use HD1 input for presentation content with a resolution up to 4K, while using HD2 for a live camera. This feature provides a further differentiator in the flagship endpoint of the XT Series because UltraHD content capture is key for several vertical applications, such as telemedicine.

The Avaya XT4300 offers outstanding value and cost-effective full HD video collaboration specifically designed for the needs of smaller and mid-sized conference rooms. The Avaya XT4300 offers optional embedded multi-party conferencing with support for up to four participants, also with mixed PC, Mobile, and room system clients.

Related links

Avaya CU360 overview

Avaya Collaboration Unit CU360 is an all-in-one video conference endpoint. Avaya CU360 has a built-in codec, camera, and microphone, and is ideal for video conferences in small rooms.

Avaya CU360 conferences can be hosted on Avaya Equinox® Media Server, Avaya Equinox® Meetings Online, and Avaya Scopia® Elite 6000 MCU. You can manage Avaya CU360 using Avaya Equinox® Management. You can also remotely control Avaya CU360 through Avaya Collaboration Control using IOS and Android devices.

Avaya CU360 has the following features:

- Excellent video quality with maximum resolution of 1080p@30fps.
- Dual HD video streams that support seamless content sharing at maximum resolution of 1080p@15fps, along with video.
- DVD-quality audio encoding.
- High-quality video and audio using H.263 and H.264. Avaya CU360 maintains the conference experience even with limited bandwidth or poor network conditions by using the following compression methods.
  - H.264 SVC in point-to-point calls for decoding. SVC extends the H.264 codec standard to dramatically increase error resiliency and video quality without the need for higher bandwidth.
  - H.264 High Profile is a standard for compressing video by up to 25% over H.264 Baseline Profile which supports high definition calls to be held over lower call speeds.
  - NetSense is a proprietary Avaya Equinox® Conferencing technology which optimizes the video quality according to the available bandwidth and minimizes packet loss. As the available bandwidth of a connection varies depending on the data traffic, NetSense's sophisticated algorithm dynamically scans the video stream and changes the video resolution to maximize quality with the available bandwidth.

  These compression methods work only when all endpoints participating in a conference support the protocol.
- Ability to record video conferences to a locally connected USB drive, a network drive, or to a remote server, such as Avaya Equinox® Streaming and Recording, using FTP. You can record video conferences to a remote server only if your Avaya Equinox® Conferencing deployment includes Avaya Equinox® Streaming and Recording.

About Avaya Collaboration Control for Android

Avaya Collaboration Control is an Android app that enables you to control Avaya Room System XT Series and Avaya CU360 endpoints.

You can download Avaya Collaboration Control for free from Google Play Store and install it on the following devices:

- Android phones/tablets
- Avaya Vantage™ K175 and K165.

The highly intuitive user interface of Avaya Collaboration Control makes it easy to start calls, moderate meetings, and view presentations.

Avaya Collaboration Control supports:

- Automatic detection of nearby endpoints using sonic pairing.
- Endpoint and personal Exchange calendar, which allows you to access your calendar, view scheduled meetings, and join directly by tapping its entry.
- Recording to a local USB storage device or to a network location.
- Endpoint camera control by panning, tilting, or zooming. You can control a remote camera in the meeting via Far-End Camera Control (FECC).
- Mouse pointer emulation for Avaya CU360.

The mouse pointer emulation can interact with:

- Avaya CU360 native app.
- Third party apps running on the device.

  For example, Avaya CU360 comes with some Android-based applications. You can install more Android-based applications and select one of them to be displayed in a split portion of the screen. Using the mouse pointer, you can move the slider on the screen to modify the space that the application uses.
- Android OS.

Related links

[Endpoints](#) on page 23

About Avaya Collaboration Control for iOS

Collaboration Control is an application available for iOS, and it enables you to control the following endpoints:

- Avaya Room System XT Series
- Avaya XT Telepresence
- Personal Avaya XTE240
- Avaya Collaboration Unit CU360

The intuitive user interface of Collaboration Control makes it easy to start calls, moderate meetings and view presentations, while the integrated calendar and enterprise directory make it easy to join meetings and invite others.

With Collaboration Control you can access the calendar of the physical conference room, view scheduled meetings, and then join directly by tapping its entry. In most endpoint models, you can control your endpoint's camera by simply tapping the screen, or even control a remote camera in the meeting via far end camera control (FECC).

You can moderate videoconferences whether they are hosted on the endpoint's built-in MCU, on Avaya Equinox® Media Server, or on Scopia Elite MCU. Moderators can manage the meeting's participants, including hiding their video, muting their audio, and changing the video layouts.

Collaboration Control also enables you to view shared data like presentations or spreadsheets directly within the app on the device. When in an Avaya meeting, you can review previously shared content without interrupting the presenter.

Collaboration Control supports:

- Automatic detection of nearby endpoint using sonic pairing
- Recording
- Endpoint calendar
- Endpoint contacts and contact groups
- Presentation view and zoom
- Remote control emulation and touchpad
- Email invite to an Avaya meeting.

Collaboration Control is a free app that you can download from the App Store.

⊛ **Note:**

This guide describes Collaboration Control features that relate to Avaya Room System XT Series release 9.2.1 and Avaya CU360 release 10.2. Earlier releases might have limitations or not work as described in this guide.

Related links

[Endpoints](#) on page 23

About Avaya H175 Video Collaboration Station

The H175 is a unique touchscreen device that delivers high quality voice calls, full HD video collaboration, and access to key productivity enhancing capabilities like presence, a synchronized calendar and synchronized contacts. The advanced H.264 High Profile video engine, detachable full HD 1080p camera, flexible HDMI inputs and outputs, along with wideband audio subsystem makes it fast and easy to enable a highly effective personal engagement environment or create a small "huddle" meeting station with the H175. Extensive connectivity offers convenience for both the user and the administrator. The Avaya H175 Video Collaboration Station has built-in WiFi, Gigabit Ethernet, plus an additional network outlet for a co-located PC which simplifies deployment to lower costs. Solidly built, elegantly designed, and ready to support the way you work for years to come, the H175 helps drive team engagement throughout your organization.

For more information see the relevant documentation at http://support.avaya.com.

Related links

[Endpoints](#) on page 23

About Avaya Vantage™

Avaya Vantage™ is the all-new dedicated desktop device that provides simple, instant, seamless & natural engagement. Users can fire up voice, chat, collaboration instantly through one touch connections with no unnatural breaks or pauses – eliminating the need to manage multiple devices in order to engage. Put your applications on this eye-catching, friendly device. It is perfect

for use on desktops, in hotel rooms, healthcare facilities, kiosks – wherever users need to run their applications. Open integration and extensibility with the Avaya Breeze® platform Client SDK means it's easy to personalize Avaya Vantage™ for your industry, business, and users.

Avaya Vantage™ is a SIP-based Android device that provides telephony and conferencing functionality. Avaya Vantage™ combines the advantages of a customizable unified communications solution and a fully functional Android device.

As an Android device, Avaya Vantage™ benefits from using various third party applications. With unified communications functionality depending on an application rather than on a particular device, customers are able to solve more business tasks using a single device.

Related links
[Endpoints](#) on page 23

SDKs

These tools allow third parties to develop innovative and differentiated user experiences. Avaya uses the same tools to create its own client applications.

Related links
[Key components](#) on page 12
[Overview of Avaya Breeze platform Software Development Kit for Avaya IX Workplace Client](#) on page 29
[Overview of Avaya Breeze platform Client Software Development Kit for Avaya Equinox®](#) [Meetings for Web](#) on page 30
[Overview of Equinox Management APIs](#) on page 30

Overview of Avaya Breeze® platform Software Development Kit for Avaya IX™ Workplace Client

The Avaya Breeze® platform Client SDK provides customers and developer partners a common, developer-friendly Software Development Kit that allows developers to quickly build innovative user experiences based on the full reach of Avaya Unified Communications, Collaboration and Multi-touch capabilities. Any and all functionality Avaya can integrate into its own clients and applications is available to developers.

The SDK is structured as a set of packages:

- Communication Services. Provides the essentials required to integrate voice, video, IM, presence, contact search conferencing and collaboration.

- Meeting Management Services. Provides the service required to schedule and manage meeting schedules.

- Recording Management Services. Provides recording and streaming services.

- Desk phone Services. Exposes developers to the Avaya Vantage™ device level functionality such as Vantage on-hook / off-hook handset services and its message waiting lamp.

- Customer Interaction Services. Provides all the elements to create a multi-channel (Voice, Video, Chat, SMS and email) agent and supervisor experience.
- Identity Management Services. Provides identity services for users accessing Avaya infrastructural services.
- Data Store Services. Provides access to the Avaya Breeze® platform Context Store Snap-in services. This is the in-memory database primarily used to track the customer journey.
- Sharing Services. Provides access to the Avaya Breeze® platform Co-Browse Snap-in. This allows agents and customers to share their screen.

Avaya IX™ Workplace Client is built with that SDK and brings together multiple communication modes in a single client, giving users a common interface across platforms, including Android, Windows, and iOS. Users can make and receive voice and video calls from their telephone extension, send instant messages, access their call history, access their Avaya Aura® and Microsoft Outlook contacts, share information with Web collaboration and manage their presence status. Avaya IX™ Workplace Client provides automatic integration with Avaya Equinox Conferencing.

For availability of this product, see Releases for the release of Avaya Breeze® platform you are using.

Related links

SDKs on page 29

Overview of Avaya Breeze® platform Client Software Development Kit for Avaya Equinox® Meetings for Web

The Avaya Breeze® platform Client Software Development Kit (SDK) is a set of APIs allowing Avaya and third party developers to consistently implement client solutions across a wide range of Avaya communication systems and applications by abstracting the complexity of the underlying infrastructure. The Client SDK provides a separation layer between the underlying infrastructure components and the client user experience. This allows Avaya and 3rd Parties to easily create new applications and differentiated user experiences using the Avaya infrastructure. This also allows for changes to occur in the underlying infrastructure, without affecting the client/application eco-system.

Any Java programmer can build, test, and deploy a custom service. No specialized telecommunications expertise is needed. The Client SDK provides sample application source code, Java libraries and the Javadoc Tool for Avaya Breeze® platform APIs. The Client SDK is available for download from Releases for the release of Avaya Breeze® platform you are using.

Related links

SDKs on page 29

Overview of Equinox Management APIs

Avaya Equinox® Management's APIs enable deployment of Equinox Management as a back engine to other applications, to tailor its user interface and fine tune its functionality.

The full range of functionality is captured in the XML API. Web services APIs are also available for compatibility with previous versions.

APIs offer third parties a way to integrate Equinox Management into their existing administration and monitoring applications to create a smooth and tailored deployment for their organization.

You can access these APIs over a secure connection, via TLS and now also via HTTPS.

Related links

About Equinox Management XML API

The Equinox Management XML API enables third party software to communicate with Equinox Management using the XML protocol via TCP/IP or HTTPS/TLS.

The XML APIs enable you to perform the full range of features, including:

- Managing the video network devices, including media servers, gateways, gatekeepers, endpoints, soft clients, and virtual rooms
- Scheduling videoconferences and resources, including sending invitations
- Moderating, monitoring and managing ongoing videoconferences
- Sending XML notifications about newly connected devices and ongoing videoconference activity
- Functionality in the Unified Portal
- User rights management, authentication and security

TCP/IP communications should be sent on port 3336. HTTP and HTTPS communications should be sent on the port used by the underlying web server of the Equinox Management computer.

Related links

Chapter 3: Considerations for Choosing your Equinox Solution

Considerations for Choosing your Equinox Solution

There are a number of criteria that must be considered to choose the most appropriate deployment for your organization, aside from the list detailed in Selecting Features of your Equinox Solution on page 60.

The Equinox solution is also called Equinox Conferencing.

Related links

Choosing the appropriate solution for your organization on page 32
Planning user access on page 33
Planning a Centralized or Distributed Topology (Cascading) on page 39
Planning Scalability and High Availability in the Equinox Solution on page 42
Assessing Bandwidth for Large Organizations on page 51
Setting WAN Bandwidth Limits on page 55
Using Network Traffic Priorities Across your Deployment on page 56
Updating the Dial Plan on page 57

Choosing the appropriate solution for your organization

The most appropriate solution for your organization is dependent on the organization size and the required capacity (number of concurrent sessions per ports in Avaya Equinox Conferencing for Over The Top or number of users in Avaya Equinox Conferencing for Team Engagement). These considerations together with the customer's major planned usage of the deployment towards video conferencing or high capacity audio conferencing will derive the selection of OVA size at installation.

To choose the configuration that best suits your requirements, consider the following:

- Do you need a small, medium, or large-sized solution?

  Within the context of Equinox Conferencing, a small deployment is defined as a deployment with up to 5,000 registered users. A medium deployment is defined as a deployment with up to 30,000 registered users. A large deployment is defined as a deployment with up to 150,000 registered users.

- Is your Equinox Conferencing going to be a standalone Over The Top solution, or will it include Avaya Aura® (Team Engagement)?

  The Avaya Aura® solution is also called a Unified Communications (UC) Team Engagement solution.

- How are you going to host Equinox Conferencing?

  Equinox Conferencing is available to purchase as a Virtual Appliance on the Avaya Solutions Platform (ASP), with pre-installed VMware and Avaya Virtualization Platform. The Dell PowerEdge R640 is the underlying server hardware for the Avaya Solutions Platform. Alternatively, customers buy their own servers, and then Equinox Conferencing is available as a Virtual Appliance in a Virtualized Environment.

- How many business site locations do you wish to serve and what is the distance between these locations?

  The global distribution of your end users will drive the number and location of servers.

Related links

Planning user access

To participate in Avaya Equinox® Conferencing, you can use different client applications:
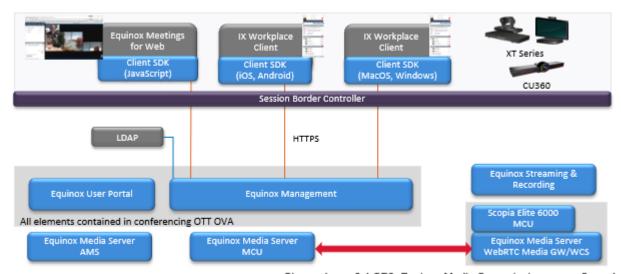
- On your Mac or PC with the Google Chrome™ or Mozilla Firefox™ browsers, you can attend meetings with Equinox Meetings for Web. This is a web-based client that does not require any installation. This client is launched seamlessly from Unified Portal.

- Alternatively, you can attend meetings by using an installed client called Avaya IX™ Workplace Client for Windows, Avaya IX™ Workplace Client for Mac, Avaya IX™ Workplace Client for Android, or Avaya IX™ Workplace Client for iOS. Once installed, this client is detected from Unified Portal and used for future meetings.

Unified Portal

With Unified Portal, you can plan meetings in advance, customize meeting properties, and send the details of meetings to participants. At the meeting start time, you can launch meetings in several ways. You can share and annotate files and record the meeting, depending on your application. After the meeting, you can play and distribute the recording. You can manage all your meetings, those chaired by you and those chaired by others, by using the single, calendar-enabled interface.

Unified Portal is provided by the Avaya Aura® Web Gateway which acts as a gateway for clients and applications utilizing browser based WebRTC signaling and media.

In non-Aura Equinox Conferencing OTT deployments, the components of the Avaya Aura® Web Gateway and Portal are hosted within the Equinox Conferencing solution.

Since release 9.1 SP3, Equinox Media Server instances configured to run as a WebRTC Gateway are required for fronting Equinox Media Servers for the OTT deployment type in order to handle WebRTC calls.

Figure 3: Non-Aura Equinox Conferencing OTT deployment

User Portal access in the Equinox Conferencing TE deployment

In Avaya Aura® TE deployments the components of the Avaya Aura® Web Gateway and Portal are provided on a single OVA for deployment in a customer supplied VMware environment. These components are shared and utilized by different Avaya Aura® clients and applications. The Web Gateway is also known as the Endpoint Service Gateway.
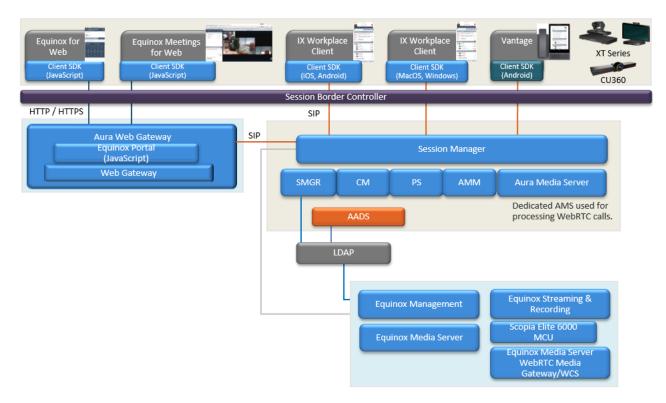
Figure 4: Equinox Conferencing TE deployment

⊛ **Note:**

> For the TE deployment type, Avaya Aura® Media Server instances configured to run as a WebRTC Gateway are required for fronting Avaya Equinox® Media Servers in order to handle WebRTC calls.

When users join the Equinox Conferencing call (TE deployment) using the meeting URL, they are presented with a portal page where they can enter the meeting ID or user credentials. The user can be an internal (named user) or external (guest user) to the enterprise.

This portal page is hosted on Avaya Aura® Web Gateway. As they join the meeting from their browser, audio and/or video codec for this call are provided through this WebRTC enabled browser. A virtual endpoint session will be created on Avaya Aura® Web Gateway for the duration of this user's participation in the conference call. Avaya Aura® Web Gateway receives signaling from the browser in a HTTP format and the gateway transforms this to SIP signaling required for the Aura solution.

During these signaling flows, Avaya Aura® Web Gateway, through Avaya Aura® Media Server (AAMS) and browser interactions, uses the ICE protocol to attempt to route the media to flow directly through the NATs/Firewalls. This initial exchange attempts to exchange media directly between the Web client and AAMS. If this is not possible, the Web Gateway attempts to exchange media through a TURN server hosted on the Session Border Controller. AAMS converts the WebRTC security and media formats to standard (S)RTP throughout the life of the call.

Avaya Aura® Web Gateway passes the audio and video media for the call to AAMS where the media will be adapted or transcoded to support the codec set utilized by Avaya devices and clients. The call is then presented to the conference as a SIP call.

When using Avaya IX™ Workplace Client as a SIP based client, the call is presented to Aura as a SIP call and does not utilize Avaya Aura® Web Gateway.

Deployment of Avaya Aura® Device Services is mandatory with Avaya Aura® Web Gateway because the gateway receives its user configuration information from AADS. AADS and the gateway must always be deployed with the same release level.

If customers are upgrading from Scopia to Equinox Conferencing, they may wish to retain their Scopia® Elite 6000 MCU as part of the upgraded solution. In this case Avaya Aura® Web Gateway utilizes Avaya Aura® Media Server(s) to handle WebRTC signaling and media, because Scopia® Elite 6000 MCU does not support WebRTC.

When users join the Equinox Conferencing call using the Avaya Equinox® Meetings for Web client, they are presented with a portal page where they can enter the Meetings ID. They do not need to download any software to be a participant in the conference call. They can be a participant to the meetings or the host or moderator of a meeting through this client. Dependent on their browser when sharing their applications or desktop, they will be prompted to download form the portal a browser extension when they attempt to start a collaboration session. The user can be an internal (named or guest user) or external (guest user) to the enterprise.

HTTPS reverse proxy

Participants in conferences have to interact with multiple servers through HTTPS. To avoid using multiple external public IPs, FQDNs, and certificates, the solution uses URL rewriting provided by Avaya SBCE. The method solves this interfacing complexity by allowing guests to access a conference via a single FQDN and a single IP address, using port 443. As each FQDN needs a certificate, and there is only one FQDN to interact with, this method also allows saving on the costs of commercial certificates. URL rewriting can be used in all Equinox deployments.

HTTP Media Tunneling

The administrator can use HTTP media tunneling to set up a media connection over TLS for users calling from external networks:

- Through Avaya SBCE
- Having a firewall in between blocking UDP (RTP) ports

If a guest user tries to join a remote conference in the Unified Communications (UC) TE deployment, HTTP-UA is used and HTTP tunneling is supported through Avaya SBCE. If the Equinox conference is in the OTT deployment, then signed-in or guest users join the meeting through Avaya SBCE, which uses HTTP-UA and supports HTTP tunneling.

Related links

Examples of WebRTC call planning

The following figures illustrate the different deployment possibilities with Avaya Equinox® Meetings for Web client.

The following figure shows how the WebRTC call to Equinox Media Server is forced through Equinox WebRTC Media Gateway (also called Avaya Aura® Media Server). This path is mandatory to improve packet loss handling. The gateway supports re-transmission resulting in

improved video quality. This path needs to be configured in Equinox Management for an OTT deployment.
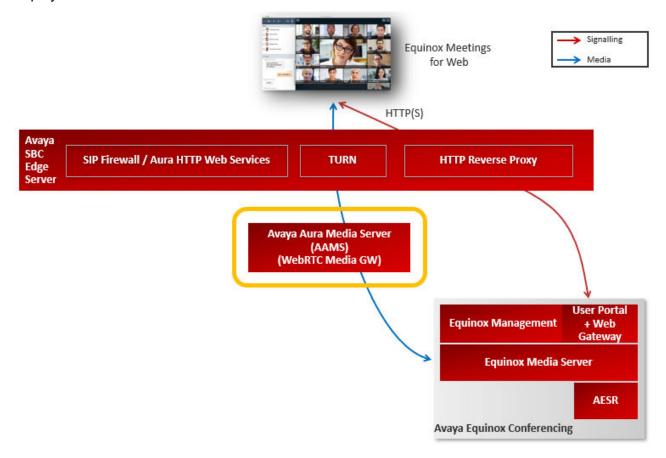
Figure 5: Packet loss handling in OTT Equinox Conferencing

WebRTC call in TE Equinox Conferencing

The following figure shows Avaya Equinox® Conferencing deployed in an Avaya Aura® TE environment with Scopia® Elite 6000 MCU. The client signalling path is through Avaya Aura® Web Gateway and the media is anchored on Avaya Aura® Media Server because Scopia® Elite 6000 MCU does not support WebRTC.
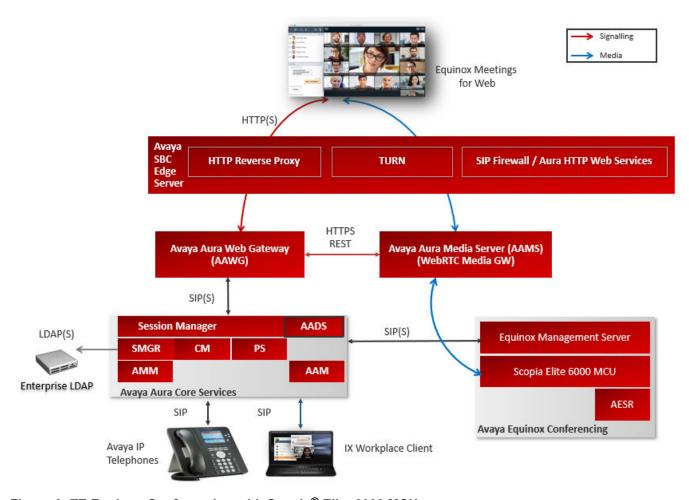
Figure 6: TE Equinox Conferencing with Scopia® Elite 6000 MCU

The following figure shows how the WebRTC call to Equinox Media Server is forced through Equinox WebRTC Media Gateway (also called Avaya Aura® Media Server). This path is mandatory to improve packet loss handling. The gateway supports re-transmission resulting in improved video quality. This path needs to be configured in Avaya Aura® Web Gateway for a TE deployment.
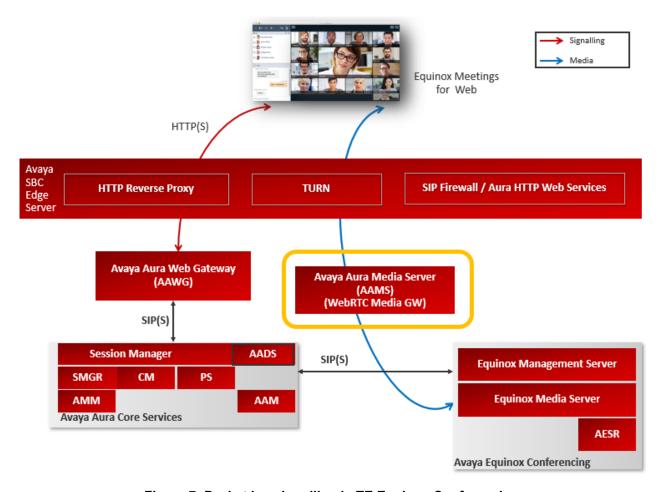
Figure 7: Packet loss handling in TE Equinox Conferencing

Related links

Planning a Centralized or Distributed Topology (Cascading)

When your organization has more than one site, like a headquarters and several branches, the Equinox Solution offers a unique method of cutting video bandwidth costs, known as cascaded meetings.

A cascaded videoconference is a meeting distributed over more than one physical Scopia Elite MCU and/or Equinox Media Server, where a master MCU/Media Server connects to one or more slave MCUs/Media Servers to create a single videoconference. It increases the meeting capacity by combining the resources of several MCUs/Media Servers. This can be especially useful for distributed deployments across several locations, reducing bandwidth usage.

✳ **Note:**

The following description applies to MCU/Media Server deployments.

Without cascading, if you choose a centralized MCU deployment, frequent videoconferences between branches can be expensive (Figure 8: Centralized MCU deployment, where all branches use the HQ MCU on page 40).
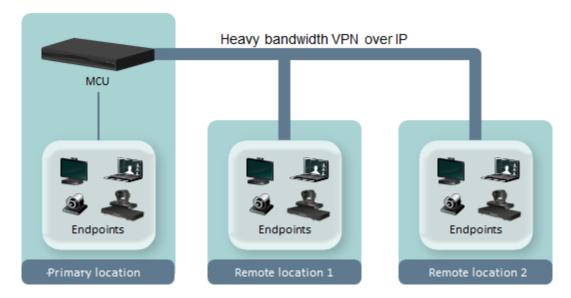
Figure 8: Centralized MCU deployment, where all branches use the HQ MCU

To reduce cross-site bandwidth costs, a distributed MCU deployment (Figure 9: Distributed MCU deployment cascading meetings for reduced WAN bandwidth on page 41) can perform cascaded conferences. Participants connect to their local MCU, and the conference is cascaded by connecting between the MCUs using a fraction of the bandwidth compared to the centralized deployment. The same principles apply to an MCU in the same location, thus increasing call capacity by cascading conferences between them.
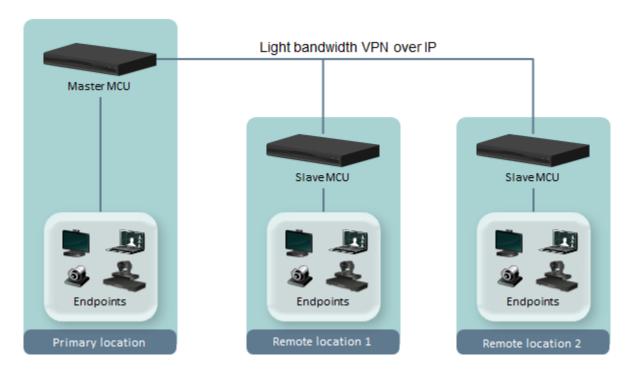
Figure 9: Distributed MCU deployment cascading meetings for reduced WAN bandwidth

The bandwidth used by a cascaded link is equivalent to only a single client connection in each direction: upload and download. The bandwidth value is determined by the MCU meeting type (or service), which is invoked when choosing a dial prefix for the meeting. You define the maximum bandwidth for each meeting type in the MCU. For more information on defining meeting types, see *Administrator Guide for Scopia® Elite 6000 MCU*.

Users do not need to choose a specific MCU. The powerful functionality of virtual rooms enables you to dial the same number anywhere in the world, while the Equinox Solution infrastructure transparently directs you to the correct meeting on the correct MCU.

The maximum supported number of participants in a single videoconference is 500 for both the centralized and distributed MCU deployment.

Users do not need to manually enable cascading when creating meetings. This is performed transparently by Avaya Equinox® Management using sophisticated cascading algorithms.

When an endpoint initiates a meeting on an MCU, that MCU becomes the master MCU. Other MCUs which participate in the meeting are designated as slave MCUs. There are a number of factors that might influence when the system automatically chooses to cascade to a different MCU. For example, to avoid reaching the maximum bandwidth threshold, the system would attempt cascading with a different MCU, a slave MCU. Endpoints would then join the videoconference from the slave MCU. Only one level of cascading is supported: all slave MCU conferences must cascade to the same master MCU conference. Administrators can also customize the priority given to cascading in a distributed topology, as explained in *Administrator Guide for Avaya Equinox® Management*.

Cascading has the following characteristics:

- A cascaded connection uses two ports —one port on the master MCU, and one port on the slave MCU.

- Make sure that the Meeting Type (MCU service), representing the required meeting properties and accessed with a dial prefix, is available on all participating MCUs. For example, if the meeting uses MCU service 81, then 81 must exist on the master MCU and on the slave MCUs.

- Participants connecting to the slave MCU:

  - View only the default meeting layout

  - Can send and receive video with a resolution up to 1080p x 60fps for Scopia® Elite 6000 MCU. The video resolution depends on the cascading connection settings.

  - Perform actions (such as joining the meeting) via their endpoint or web interface, and not via DTMF.

- Only one participant at a time (typically the active speaker) connecting from each slave MCU can send video and be seen by other meeting participants in the video layout.

- The lecturer and any telepresence endpoint always connect to the videoconference from the master MCU. Port s are reserved on the master MCU to support these features.

- Endpoints seamlessly join a videoconference according to the cascading logic implemented on the sites. An endpoint connected to a slave MCU and trying to launch a feature which is not supported by the slave MCU gets a relevant error message. You can move an endpoint to a master MCU when scheduling your videoconference. For more information, see *User Guide for Avaya Equinox® Management*.

- Scopia Elite MCU does not support cascading to legacy Scopia MCU instances.

You can customize the cascading priorities in Equinox Management in a number of ways:

- Default to using a local MCU first, and only cascade conferences if required.

- Prioritize cascading wherever possible, to keep bandwidth costs to an absolute minimum.

- Avoid cascading as often as possible.

For more information on implementing cascading in Equinox Management, see *Administrator Guide for Avaya Equinox® Management*.

Related links

[Considerations for Choosing your Equinox Solution](#)

Planning Scalability and High Availability in the Equinox Solution

Scalability describes the ability to increase the capacity of a network device by adding another identical device (one or more) to your existing deployment. In contrast, a non-scalable solution would require replacing existing components to increase capacity.

High availability is a state where you ensure better service and less downtime by deploying additional servers. There are several strategies for achieving high availability, including deployment of redundant servers managed by load balancing systems.

There are several ways to ensure your deployment of the Equinox Solution maintains a very high degree of availability, and also add extra capacity to your video infrastructure:

Related links

Considerations for Choosing your Equinox Solution on page 32
High Availability of Equinox Management on page 43
Scalability and High Availability with Multiple Avaya Equinox® Media Servers on page 44
High Availability of Equinox Streaming and Recording on page 45
Scalability and High Availability of Equinox H.323 Edge server on page 46
Redundancy of Avaya Aura components on page 47

High Availability of Equinox Management

To provide high availability and continued service, you can deploy redundant Avaya Equinox® Management servers, in one of the following ways:

- Local redundancy

  Deploy two Equinox Management servers in the same location: a primary server and a secondary server. If the primary server fails, the secondary server automatically takes over without disrupting Equinox Management functionality (does not include load balancing).

- Geographic redundancy

  Deploy three Equinox Management servers. Set up two servers as primary/secondary servers in the same location (local redundancy), and deploy the third as an off-site backup server in a different location. You can manually activate this server if the other servers fail, ensuring continued service even if there is a major failure or disaster at the main location.

  🛈 Important:

  We recommend configuring the backup server while the system is inactive. This is because a huge amount of data is transferred to the remote site, which can deplete network bandwidth resources.

Figure 10: Local and geographic redundancy on page 44 illustrates the different options of deploying Equinox Management redundancy.
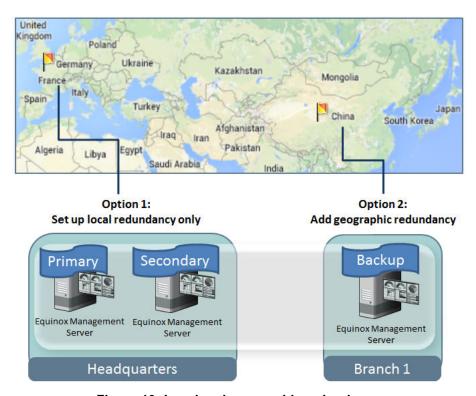
Figure 10: Local and geographic redundancy

Equinox Management's redundant solution requires a license, but does not require third-party load balancers. Data is continuously synchronized between all Equinox Management servers, including the internal database, system property files, and device upgrade packages.

Deploy your Equinox Solution by referring to component names rather than IP addresses. Using a server name (or FQDN), like *aemg.company.com*, reduces maintenance when servers switch to their backups.

😊 **Note:**

For all deployments, you must use FQDNs. FQDNs are essential when using TLS.

Local redundancy can be deployed with an internal or external database. Geographic redundancy supports only the internal database. See *Deploying Avaya Equinox® Solution*.

Once Equinox Management's high availability is configured, you can view the redundancy status in real-time, including the current status and server addresses (see *Administrator Guide for Avaya Equinox® Management* for details).

Related links

Scalability and High Availability with Multiple Avaya Equinox® Media Servers

High availability for Equinox Media Servers (MS) can be achieved by adding N+ 1 servers instances in an active-active mode.

You can deploy multiple Equinox Media Servers to make more simultaneous calls available in your video network. For more information on scaling your Equinox Media Server deployment, see *Administrator Guide for Avaya Equinox® Media Server* or *Administrator Guide for Scopia® Elite 6000 MCU*.

You do not need to deploy a load balancer for multiple Equinox Media Servers because they can be managed by the same Equinox Management application and be in an active-active scenario.Equinox Management can be configured to maintain high availability of video call service by coordinating amongst multiple units. Equinox Management can switch to an alternative unit if an Equinox Media Server fails to maintain and preserve the service.

For details of how to configure Equinox Management for high availability, see the *Administrator Guide for Avaya Equinox® Management*.

Related links

[Planning Scalability and High Availability in the Equinox Solution](#) on page 42

High Availability of Equinox Streaming and Recording

You can deploy multiple Equinox Streaming and Recording Media Nodes in multiple locations to get higher capacity for simultaneous recording and outgoing streaming to users. Consider the following:

- A scalable deployment is built on multiple Equinox Streaming and Recording Servers. It uses one centralized Manager running on a dedicated server and Media Nodes for delivering the streaming and/or recording functionalities on separate servers. For example, if you need a large audience watching live streaming, focus on deploying more Media Nodes with streaming functionality.
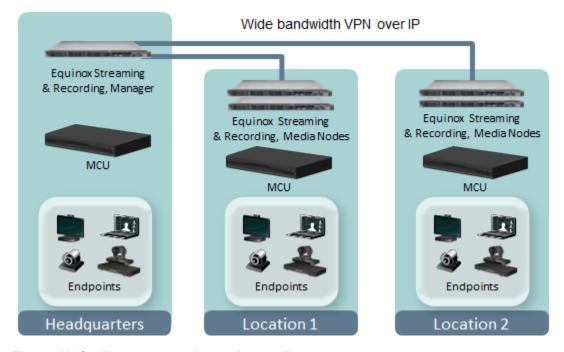
Figure 11: Scaling up streaming and recording

The maximum number of live stream viewers in the system is 100,000. You can have 3,500 live stream viewers per Media Node configured for streaming only, and 1,500 viewers for combined recording and streaming Media Nodes.

- Level of required scalability

Decide how to scale up Media Nodes at each location. You can put a Media Node for local recording and streaming at each site to increase capacity and quality and minimize bandwidth over the WAN or VPN. You can also cluster Media Nodes for playback, recording, and streaming. This allows, for example, sending one copy of the stream over the WAN to other locations and have it replicated there.

If possible, install Media Nodes near Equinox Media Server or Scopia Elite MCU to avoid video loss due to bad network connection. For example, if you have MCUs in three or four different locations, and if you want people in these locations to be able to record and watch without the latency of going across long distances, consider installing one or more Media Nodes in each of the locations where the MCUs are located.

You can create viewer mappings to have users in IP zones mapped to Media Nodes in the same zone and map recording servers to the same zone (or location) as the MCU. For more information, see the *Administrator Guide for Equinox Streaming and Recording Server*.

- Using a Private Content Delivery Network (CDN), a 3rd Party CDN, or a combination of both

You can build your own private CDN with clusters of Media Nodes located within one location, or a small cluster in the main location and a large distributed environment across your organization. Viewers belonging to the organization can get their recordings and live media from their local Media Nodes without affecting the network.

If you have many viewers wanting to access streaming and recording from external networks, you can add CDN ability to your deployment by turning on a Virtual Delivery Node (VDN) that communicates with a third-party CDN such as Highwinds. External customers buy an account with Highwinds and decide how much bandwidth and storing they need.

Or, you can work with a combination of private and third-party CDNs. With this type of deployment, you can keep contents inside your private network and choose which live events and recordings go out to the CDN for external customers to watch and view.

> ✳ **Note:**
>
> Only Highwinds is supported as cloud CDN at this time.

For more information on deploying additional servers, see *Deploying Avaya Equinox® Solution* and *Administration Guide for Equinox Streaming and Recording Server*.

Related links

Scalability and High Availability of Equinox H.323 Edge server

You can configure Equinox H.323 Edge server for scalability and high availability. More servers translates to higher capacity. With a load balancer in place, if one server fails, the remaining servers can continue working, offering even higher reliability in video services.

Add Equinox H.323 Edge servers to increase capacity and reliability of remote access endpoints connecting to videoconferences in your organization.

You can deploy multiple Equinox H.323 Edge servers using web load balancers. A list of test load balancers is available on request.

When dialing out, you can configure the H.323 Gatekeeper to find an Equinox H.323 Edge server at one of several IP addresses, thereby enabling the gatekeeper to perform a round robin search for an available Equinox H.323 Edge server. The gatekeeper is an application service in Equinox Management.

For more information on the configuration of each of these deployments, see the component's administrator guide.

Related links

[Planning Scalability and High Availability in the Equinox Solution](#) on page 42

Redundancy of Avaya Aura® components

The following figure illustrates the planning of the redundant Avaya Aura® devices.
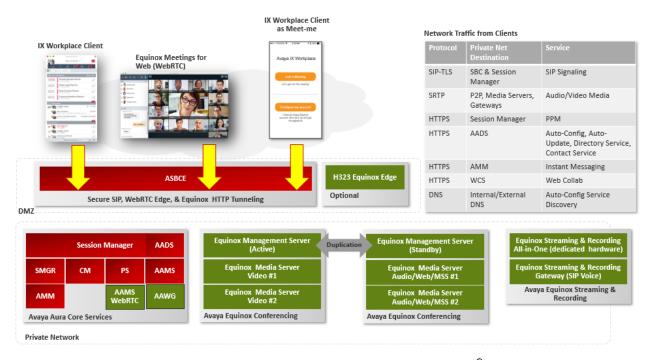
Figure 12: Equinox redundancy deployment with Avaya Aura® components

In a geographically distributed system, resources are deployed in multiple data centers to reduce media delays. For this purpose, the following components are deployed in each data center:

- Avaya Aura® Media Server
- Avaya Session Border Controller for Enterprise
- Avaya Aura® Web Gateway

Avaya Equinox® Solution Guide for Medium to Large Enterprises

- Web Collaboration Server
- Avaya Aura® Session Manager
- Avaya Aura® Communication Manager
- Avaya Aura® Device Services

In a geographically distributed system, you must also install the following two components:

- Global Server Load Balancing (GSLB), which provides different routes and addresses based on the location of the client.
- Load balancer, which balances traffic between two or more Avaya Aura® Web Gateway nodes, which may be located in the same data center or in different data centers.

For simplicity, System Manager is deployed in Data Center 1 (DC1), while Session Manager, Communication Manager, and Avaya Aura® Device Services are deployed in all data centers.
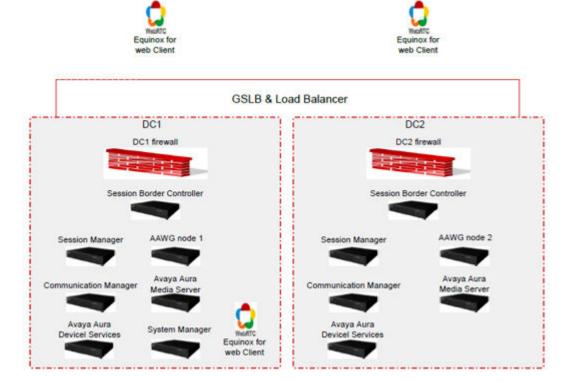
Figure 13: Load balancing topology

Avaya Aura® Web Gateway

To set up an Avaya Aura® Web Gateway cluster, use the front-end FQDN for the cluster. If you are using an external load balancer, the front-end FQDN for the cluster will be the FQDN of the load balancer. If not, it will be the FQDN of the virtual IP assigned to the Avaya Aura® Web Gateway cluster.

Avaya Aura® Media Server

An N+1 load sharing cluster is a collection of Avaya Aura® Media Servers that work closely together. The cluster can be viewed as one system that is capable of providing service at an

increased capacity and with redundancy. All the nodes in a cluster must be running the same application set. An Avaya Aura® MS N+1 load sharing cluster must consist of a primary and secondary server. You can add additional servers, known as standard servers.

Avaya Aura® Device Services

Avaya Aura® Device Services and Session Manager share the same Cassandra database. Avaya Aura® Device Services is hosted in a separate Tomcat container, whereas the existing Session Manager services including Personal Profile Manager (PPM) are hosted in a JBOSS container. A common contacts schema is shared between Avaya Aura® Device Services and PPM. The Data Replication Service (DRS) synchronization performs the synchronization between System Manager and the local Avaya Aura® Device Services DRS.

All the Session Manager instances are members of a Cassandra cluster. Each Session Manager instance in the cluster can also be configured as part of a data center. If an instance of Session Manager in a cluster is down, the device data for a user is available from an another instance of Session Manager in the user community.

An Avaya Aura® Device Services cluster requires Avaya Aura® Device Services servers that belong to the same network, with one seed node and up to 27 additional nodes. The installation of a cluster consists of installing the Avaya Aura® Device Services server on all the nodes by following a process similar to the single-server installation, while also configuring cluster-specific details.

For redundancy, you require multiple nodes and a virtual IP address or an external load balancer. The client applications use the FQDN that resolves to the virtual IP address or the FQDN of the load balancer to gain access to Avaya Aura® Device Services cluster topology.
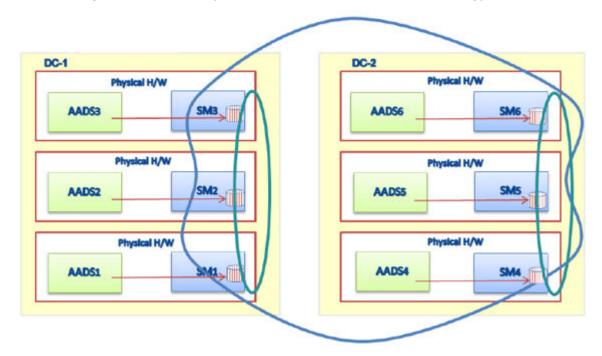
Figure 14: Cassandra cluster topology

High availability of Avaya SBCE

Avaya SBCE can be deployed as a pair either in the enterprise DMZ or core, or geographically dispersed, where each SBCE resides in a separate, physical facility.

In either configuration, SBCE HA pairs can be deployed in an enterprise in a parallel mode configuration. In the parallel configuration, the signaling packets are routed only to the active or primary SBCE, which performs all data processing.

The interface ports on the standby SBCE do not process any traffic. The management interfaces on the SBCE appliances have different IP addresses, but the signaling or media interfaces have the same IP address. On failover, the standby SBCE advertises the new MAC as the Layer 2 address for the common IP address.

The SBCE devices are synchronized through the heartbeat on the dedicated interfaces, and both SBCE devices are in continuous communication with the Avaya Element management System (EMS). When the EMS detects a failure on the active SBCE, the active SBCE network interface ports are automatically disabled. The ports of the standby SBCE are enabled. Failure detection and operational transfer occur without dropping packets or adding any significant amount of latency into the data paths. The EMS reports the change in status to the EMS for action by the system administrator.
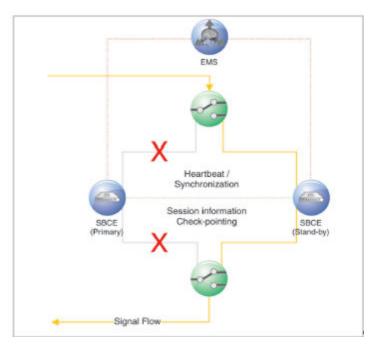
Figure 15: Avaya SBCE High availability

Related links

[Planning Scalability and High Availability in the Equinox Solution](#) on page 42

Assessing Bandwidth for Large Organizations

About this task

As part of planning your videoconferencing solution, you must assess the bandwidth required for videoconferencing in your organization.

Most large organizations manage their data in one or more data centers around the globe. Typically, with the arrival of videoconferencing you need to increase amount of data incoming and outgoing from the data center. You must assess the bandwidth for every data center in your organization separately as described in the following steps.

For bandwidth considerations for Equinox Streaming and Recording, see *Administrator Guide for Avaya Equinox® Streaming and Recording Server*.

Procedure

1. Estimate the number video users allocated to this data center.

   Often, not every employee in an organization is a video user. Look at your organization and decide which departments and employees need video capabilities. This decision often depends on your organization's field of expertise, the kind of services or products it offers. While for some organizations it is important to add video to their technical support service, for instance, other organizations may choose to provide video capabilities for management executives only.

   To illustrate how to assess bandwidth, we use an example of 10,000 video users in this topic.

2. Decide what endpoint types these users will have.

   The videoconferencing experience greatly depends on the endpoint type and has a significant impact on bandwidth.

   Different videoconferencing endpoints have different bandwidth requirements, depending on the resolution they support. There are five types of Equinox Solution endpoints:

   • Avaya IX™ Workplace Client for Android, Avaya IX™ Workplace Client for iOS

   • Avaya IX™ Workplace Client for Windows, Avaya IX™ Workplace Client for Mac

   • Avaya XTE240 for premium HD experience on a dedicated endpoint (low bandwidth consumption)

   • Avaya Room System XT Series to participate in a videoconference from a meeting room (medium bandwidth consumption)

   • Avaya XT Telepresence for conducting the most life-like videoconferences (high bandwidth consumption).

3. Estimate to how many users will be assigned each endpoint type.

   For example, the distribution of the 10,000 video users allocated to this data center may be like this:

Table 1: Example of estimation of users per endpoint type

Endpoint type	Number of users
Avaya IX™ Workplace Client for Android, Avaya IX™ Workplace Client for iOS	200
Avaya IX™ Workplace Client for Windows, Avaya IX™ Workplace Client for Mac	10,000
Avaya XTE240	50
Avaya Room System XT Series	80
Avaya XT Telepresence	10

4. Define the ratio of users in concurrent videoconferences to all users allocated to this data center.

   Define the peak for how many simultaneous recordings and streaming viewers are required in this data center.

   Define the peak ratio for every endpoint type separately.

   Ratios may significantly vary depending on the nature of your organization. For example, in a hi-tech organization where most employees are tech-savvy, the ratio is likely to be higher than average.

   ❗ Important:

   Even if the initial implementation of Equinox Solution is done on a smaller scale and the learning curve in your organization is very long, focus on the target. Think what the ratio will be when Equinox Solution is fully deployed and people feel comfortable using it. For example, even if during the first year it is likely that only 1 in 30 Avaya XTE240 users will be in a concurrent call, the ratio you use to calculate bandwidth should be 1 in 15, which is your target.

Table 2: Typical peak ratios per endpoint type

Endpoint type	Ratios
Avaya IX™ Workplace Client for Android, Avaya IX™ Workplace Client for iOS	Between 1/20 and 1/10
Avaya IX™ Workplace Client for Windows, Avaya IX™ Workplace Client for Mac	Between 1/20 and 1/10
Avaya XTE240	Between 1/15 and 1/10
Avaya Room System XT Series	Between 1/15 and 1/8
Avaya XT Telepresence	Between 1/10 and 1/5

5. Calculate peak usage per endpoint type.

   Peak usage is the maximum number of users of the same endpoint type in videoconferences happening at the same time. Calculate this value for each endpoint type separately according to the following formula:

```
Peak usage = number of users / ratio
```

For instance, if you have 10,000 Avaya XTE240 users allocated to this data center and the ratio is average, the peak usage for Avaya XTE240 is 10,000/15 = 666.

6. Calculate the peak bandwidth per endpoint type according to the formula:

```
Peak bandwidth = peak usage x max bandwidth for this endpoint type
```

Table 3: Bandwidth consumed by different endpoint types on page 53 shows possible values of maximum bandwidth for this endpoint type.

Table 3: Bandwidth consumed by different endpoint types

Endpoint type	Resolution	Maximum bandwidth consumption
Avaya IX™ Workplace Client for Android, Avaya IX™ Workplace Client for iOS	720p	768 Kbps
Avaya IX™ Workplace Client for Windows, Avaya IX™ Workplace Client for Mac	720p	768 Kbps
Avaya XTE240	720p at 30fps	768 Kbps
Avaya Room System XT Series	1080p at 60fps	2560 Kbps
Avaya XT Telepresence	1080p at 60fps	7680 Kbps

In our example, the peak bandwidth (under condition that the ratio is average) is going to be as follows:

Table 4: Example of peak bandwidth calculation per endpoint types

Endpoint type	Peak Usage	Maximum bandwidth consumption	Peak bandwidth
Avaya IX™ Workplace Client for Android, Avaya IX™ Workplace Client for iOS	13	512 Kbps	6,656 Kbps
Avaya IX™ Workplace Client for Windows, Avaya IX™ Workplace Client for Mac	666	768 Kbps	523,476 Kbps
Avaya XTE240	4	768 Kbps	3,072 Kbps
Avaya Room System XT Series	8	2,560 Kbps	20,480 Kbps
Avaya XT Telepresence	1	7,680 Kbps	7,680 Kbps

Calculate the number of live streams you want to support, what type of streaming (for example 1080P 2M), and figure how many streaming Media Nodes need to be deployed in this data center.

7. Calculate the total bandwidth for this data center by adding all values of peak bandwidth per endpoint type. This value is your rough bandwidth estimation.

In our example your total bandwidth value is 561,364 Mbps.

8. Fine-tune your estimation by deciding on the following bandwidth effective policies supported in Equinox Solution:

- Compressing video by using H.264 High Profile. H.264 High Profile is a standard for compressing video by up to 25% over the H.264 Baseline Profile, enabling high definition calls to be held over lower call speeds. See

Table 5: Optimized bandwidth consumption

Endpoint type	Resolution	Maximum bandwidth	Maximum bandwidth with High Profile
Avaya IX™ Workplace Client for Android, Avaya IX™ Workplace Client for iOS	480p	512 Kbps	384 Kbps
Avaya IX™ Workplace Client for Windows, Avaya IX™ Workplace Client for Mac	720p	768 Kbps	512 Kbps
Avaya XTE240	720p at 30fps	768 Kbps	512 Kbps
Avaya Room System XT Series	1080p at 60fps	2,560 Kbps	2 Mbps
Avaya XT Telepresence	1080p at 60fps	7,680 Kbps	6 Mbps

➕ **Tip:**

Some Avaya endpoints do not support H.264 High Profile, for example some older XT Series models, Avaya Equinox® VC240 or legacy third-party endpoints.

- Diverting videoconferences from an MCU/Media Server that reached its capacity limit during peak hours to an idle MCU/Media Server in a data center in a different time zone.

- Guaranteeing bandwidth for VIP endpoints at the expense of other endpoints.

This method suits hierarchical organizations where fluctuations in quality of the video for high-ranking managers are not acceptable.

In this case you can assign the VIP status to XT Series and Avaya XTE240 endpoints used by management and configure Equinox Management not to downgrade their video quality even at times when there is not enough bandwidth. This is achieved by downgrading experience of regular users and using the saved bandwidth to provide premium experience to the VIP endpoints, as shown in

Figure 16: Example of a hierarchical organization

• Setting bandwidth limits for Equinox Streaming and Recording

In the Media Node configuration of Equinox Streaming and Recording, you can control the amount of bandwidth used for caching Media Node recordings from one zone to another to not fill up the WAN pipe.

• Rejecting calls upon reaching the maximum bandwidth.

You can use your Equinox Management to setting the bandwidth limits for calls across locations, or the bandwidth dedicated to calls within a location and defining the system behavior. For more information see *Administrator Guide for Equinox Management*.

9. Finally, you need to add margins to make sure that even in poor network conditions video quality does not drop below the standard you decided on.

Consider your organization's culture and practices: how tolerant will videoconference participants be to noticeable fluctuations in video quality? If participants, especially VIP endpoint owners, do not expect degraded video quality, make sure that the margin you add is enough to guarantee sufficient bandwidth at any time.

> ❗ **Important:**
>
> An average margin is 20% of your fine-tuned estimation.

Related links

[Considerations for Choosing your Equinox Solution](#) on page 32

Setting WAN Bandwidth Limits

Avaya Equinox® Management includes a bandwidth management functionality which enables administrators to set limits on WAN bandwidth usage, and trigger system alerts when that usage rises above a defined threshold. You can also define the system behavior when the bandwidth limit has been reached.

This powerful feature enables administrators to monitor and manage WAN bandwidth usage and keep it under a defined limit at all times.

Related links

Using Network Traffic Priorities Across your Deployment

Quality of Service (QoS) determines the priorities of different types of network traffic (audio, video and control/signaling), so in poor network conditions, prioritized traffic is still fully transmitted.

QoS priorities are expressed as a number for each traffic type. The higher the number, the higher its priority.

If you are adding videoconferencing to your current deployment, it is important to ensure that all Equinox Solution components have QoS settings that match the QoS priorities of the organization:

- If QoS is not used by your organization, disable the QoS feature on the Equinox Solution components.

- If QoS is used by your organization, find out the QoS values of the network entities used inside the private network in your organization and modify the QoS values on the Equinox Solution components to match them.

There are three types of traffic in the Equinox Solution as described in .

Table 6: Types of traffic and their priorities in Equinox Solution

Traffic type	Description	Priority	Default value
Audio	Real-time voice	First	46
Video	Real-time video and presentations	Second	34
Control/ signaling	Data related to the call connection and media management	Third	26

❗ Important:

Do not change the priorities of the traffic types when you modify the QoS values. For example, if you change the value for audio, make sure it is still the highest number for all three traffic types.

If you are planning a new deployment, we recommend that you use the default QoS settings of the Equinox Solution to ensure consistent optimum throughput of traffic across all solution components. Configure the routers and switches to match these settings.

You must introduce QoS together with the lip-sync feature. Lip-sync is a method of marking matching packets of audio and video traffic so that they are reproduced together upon arrival. You must use QoS only in deployments where videoconferencing devices (including all endpoints)

support lip-sync, because otherwise audio and video packets arrive even with a bigger time lapse than when QoS is not used. All Avaya videoconferencing endpoints support lip-sync.

Related links

Updating the Dial Plan

A dial plan defines a way to route a call and to determine its characteristics. In traditional telephone networks, prefixes often denote geographic locations. In videoconferencing deployments, prefixes are also used to define the type and quality of a call. For example, dial 8 before a number for a lower bandwidth call, or 6 for an audio-only call, or 5 to route the call to a different branch.

Adding video to a typical, phone-only deployment requires changing the dial plan of your organization.

To plan the update to your current dial plan, you begin with analyzing the existing deployment. There are two types of dial plans as described in :

Table 7: Types of dial plans

Type	Description	Example
International	The dial plan duplicates exactly the same dialing prefixes as traditional telephone networks, where the prefixes denote geographic locations. Locations are classified: internal extensions, local numbers, long distance and international numbers. Each location class has a prefix class to match. Result: if users are in different locations, they must dial all prefixes to reach a destination, but if they are in the same location, they can omit the shared prefixes.	+1-212-282-9248 for a destination in USA, where "**+**" is for an international call, "**1**" is for the US, "**212**" is for the state of New York, "**282**" is for the area in the state, and "**9248**" is the actual number within the area.
Proprietary	The dial plan uses proprietary prefixes created for destinations inside your organization that replace traditional external prefixes which can be very long. Result: A user dials a short combination of a prefix and an extension.	49248, for a destination in USA, where "**4**" denotes the country, the state and the area and "**9248**" is the actual number within the area.

When you add videoconferencing to your existing deployment, every video user has at least two devices: a regular audio phone, which has a defined number, and one or several new videoconferencing endpoints. Your task is, essentially, deciding what number to assign to the videoconferencing endpoints.

You can define the dial plan for the video device in one of the following ways:

- Using ID dialing (forking).

  The user has only one number (ID) for all devices assigned; it may be a phone, an Avaya XTE240, or an Avaya IX™ Workplace Client. When this number is dialed, all devices ring. The user takes the call on the device most suitable at this moment. The type of the call and its quality depend on the device used to answer the call. The moment the user takes the call, the other devices stop ringing. For example, you dial 6789 to reach a user, and both the user's phone and Avaya XTE240 start ringing. If the user accepts the call on the phone, the user joins the videoconference with audio only. If the user accepts the call on Avaya XTE240, the user joins the videoconference with audio and video in HD at up to 1080p at 60 frames per second.

  This is the simplest dial plan from the end-user perspective, as people only need to remember one number, and they always reach users wherever they may be. However, this method may require more time to implement.

  🛈 **Important:**

  This option may require upgrading your dial plan system if your current system does not support ID dialing.

- Assigning a prefix for the video device.

  The user keeps the old number for the phone and is assigned a prefix for the videoconferencing endpoint. You may add one prefix for all videoconferencing endpoints or separate prefixes for different types of videoconferencing endpoints assigned to this user. For example, to call the user's phone, you need to dial 6789; to reach the user on Avaya XTE240, you must dial 11-6789, because 11 is the prefix for the user's videoconferencing endpoint.

- Assigning a separate number for the video device.

  The user has two different numbers: one for the phone and one for the videoconferencing endpoint. For example, to call the user's phone, you need to dial 6789; to reach the user on Avaya XTE240, you must dial 1234.

Table 8: Adding video to an existing telephone dial plan

	Phone number	ID dialing	Prefix for video endpoint	Separate number for video endpoint
Proprietary dial plan	6789	6789	11-6789	1234
International dial plan	1-212-282-6789	1-212-282-6789	11-1-212-282-6789	1-212-282-1234
User experience		Users need to remember only one number for all devices.	Users must remember the main number and one or more prefixes.	Users need to remember a number for every assigned device.

Related links

Chapter 4: Selecting Features of your Equinox Solution

Selecting Features of your Equinox Solution

To determine the nature of your Equinox Solution deployment, we recommend reviewing the features you require, and then use this as a guide to the required components of your video solution.

The list of features include:

Related links

Deployment security

Equinox Solution deployments offer robust security in video communications based on standard protocols and powerful encryption algorithms, resulting in a well-integrated and secure solution.

> ✳ **Note:**

Avaya recommends encrypted SIP as the preferred protocol, with TLS and SRTP for secure data transfer.

There are several aspects to the security of a deployment:

- The content of a video call, including its video, audio and data presentations can be encrypted to protect from eavesdroppers. Connections can also be authenticated to ensure each member of the call is who they claim to be.

  In addition to the media content of a call, the signaling and management streams can also be secured when crossing network zones, depending on the nature of your deployment and network topology.

- The permissions and rights of users can be defined via user groups, to determine the functionality available to each user of the system. Enabling or disabling a feature can be achieved by defining groups and moving users among the various groups.

🛈 **Important:**

Using encryption is subject to local regulation. In some countries it is restricted or limited for usage. For more information, consult your local reseller.

The following figures below give an overview of the security of media, signaling, and management connections in an Equinox Solution deployment.
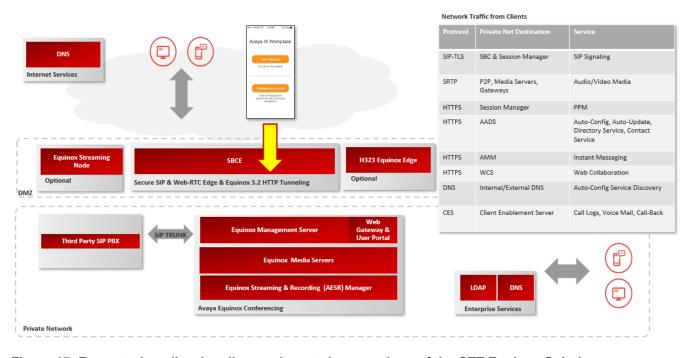
Figure 17: Encrypted media, signaling, and control connections of the OTT Equinox Solution
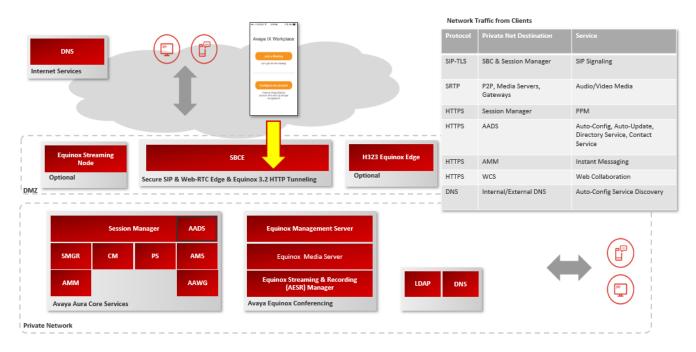
Figure 18: Encrypted media, signaling, and control connections of the TE Equinox Solution

Related links

[Selecting Features of your Equinox Solution](#) on page 60
[Authentication and Encryption](#) on page 62
[About Signaling Security](#) on page 64
[About Management Security](#) on page 64

Authentication and Encryption

The authentication and encryption of the Equinox Solution's infrastructure uses standard protocols and algorithms to provide a solution that is secure, effective and reliable. There are three types of data streams to a video communication in the Equinox Solution infrastructure which can be secured:

- Media

  Media refers to the live audio, video and shared data streams sent during a call.

- Signaling (call and media control)

  Signaling, also known as call control, sets up, manages and ends a connection or call. Control, or media control, sets up and manages the media of a call (its audio, video and data).

- Management

  Management refers to the administration messages sent between components of the Equinox Solution as they manage and synchronize data between them.

> **Important:**
>
> Using encryption is subject to local regulation. In some countries it is restricted or limited for usage. For more information, consult your local reseller.

The sections in this chapter are:

Related links

About Media Security

Securing the media communications in the Equinox Solution refers to encrypting the content of a call, including its audio, video, and data presentations.

Media refers to the live audio, video and shared data streams sent during a call. Presentation and Far end camera control (FECC) are examples of information carried on the data stream. Media is transmitted via the RTP and RTCP protocols in both SIP and H.323 calls. The parallel data stream of both live video and presentation, is known as dual video.

In a Equinox Solution deployment, call content in both SIP and H.323 environments are encrypted:

- In SIP environments, the media is encrypted and authenticated using the Secure Real-time Transport Protocol (SRTP).

- In H.323 environments, encryption of call content is secured with the H.235 encryption annex standard. H.323 endpoints can access the Avaya Equinox® H.323 Edge server with an encrypted H.235 connection, provided the endpoint itself supports the H.235 standard.

> **Note:**
>
> - Avaya recommends encrypted SIP as the preferred protocol, with TLS and SRTP for secure data transfer.
>
> - Deploy Equinox H.323 Edge server only in legacy Avaya Scopia solution deployments. The H.323 protocol is used only in legacy Avaya Scopia deployments.

WebRTC for Avaya Equinox® Meetings for Web is only supported in a secured environment (HTTPS). Media from/to the browser is encrypted.

Equinox Streaming and Recording does encrypted HTTPS media on the recording playback or HLS live stream.

H.460 endpoints can access the Equinox H.323 Edge server directly with an encrypted data stream.

> **Important:**
>
> Using encryption is subject to local regulation. In some countries it is restricted or limited for usage. For more information, consult your local reseller.

Components associated with coordinating and directing calls, such as the Equinox Management or H.323 Gatekeeper, do not directly send or receive call content, since their function is to direct

traffic and manage network connections. Therefore they do not feature in the media layer of the solution.

Related links

[Authentication and Encryption](#) on page 62

About Signaling Security

Signaling, also known as call control, sets up, manages and ends a connection or call. These messages include the authorization to make the call, checking bandwidth, resolving endpoint addresses, and routing the call through different servers. Signaling is transmitted via the H.225.0/ Q.931 and H.225.0/RAS protocols in H.323 calls, or by the SIP headers in SIP calls. Signaling occurs before the control aspect of call setup.

Control, or media control, sets up and manages the media of a call (its audio, video and data). Control messages include checking compatibility between endpoints, negotiating video and audio codecs, and other parameters like resolution, bitrate and frame rate. Control is communicated via H.245 in H.323 endpoints, or by SDP in SIP endpoints. Control occurs within the framework of an established call, after signaling.

In a SIP environment, much of the signaling that crosses network zones is encrypted and authenticated using the Transport Layer Security (TLS) standard.

For example, all signaling messages sent from Avaya Equinox® Management's Back-to-Back User Agent to SIP servers are secured via the Transport Layer Security (TLS) protocol.

The following Meet-Me clients might be outside a VPN in the public network, and are encrypted and authenticated over HTTPS, using TLS:

- Avaya IX™ Workplace Client for Android
- Avaya IX™ Workplace Client for iOS
- Avaya IX™ Workplace Client for Windows
- Avaya IX™ Workplace Client for Mac

Streaming and recording media streams are encrypted with HTTPS / SSL.

Related links

[Deployment security](#) on page 60

About Management Security

Management refers to the administration messages sent between components of the Equinox Solution as they manage and synchronize data between them. Management also includes front-end browser interfaces configuring server settings on the server. Management messages are usually transmitted via protocols like HTTP, SNMP, FTP or XML. For example, Equinox Management uses management messages to monitor the activities of an MCU/Media Server, or when it authorizes the MCU/Media Server to allow a call to proceed.

When management communications are performed via a web interface, they are secured and authenticated via the HTTPS protocol.

When management messages cross network zones, they are typically encrypted and authenticated. For example, Equinox Management's management messages to the Equinox media Server are protected using TLS.

Related links

[Deployment security](#) on page 60

Securing Access to Functionality with User Profiles

User groups and the functionality granted to each group can be defined in a number of components of the Equinox Solution. Each server component can only be accessed with a login, and depending on the privileges of that username, different functionality is visible to that user. However, from the perspective of the Equinox Solution, you can define a single repository of users and user groups with Avaya Equinox® Management.

Equinox Management can define its own user database, or it can use the LDAP corporate database like Microsoft's Active Directory. The Equinox Management user database can be pushed or downloaded to the various components of a Equinox Solution deployment, so they are all synchronized with the same user profiles and rights.

For more information on setting up a unified user database, see the *Administrator Guide for Equinox Management*.

Related links

[Selecting Features of your Equinox Solution](#) on page 60

Virtualization

Our complete Avaya Equinox® Solution includes all the components necessary to provide a total video, voice, and data collaboration solution on a customer's network and introduces the use of virtualized conferencing applications delivered either as OVA files for installation on an Avaya Virtualization Platform, or on the customer's VMware-ready server, or as pure software.

Avaya infrastructure, peripheral and edge products use one of the following product delivery models:

- Hardware appliance

  In this model the customer purchases a pre-packaged product that contains all necessary hardware and firmware for the product operation. This is typically the model with custom hardware devices such as DSP based servers.

- Pre-installed Avaya Solutions Platform (ASP) servers

  Products that are enabled by a standard server may use the Avaya Virtualization Platform infrastructure, which is a set of pre-defined OEM servers that Avaya sources from manufacturers such as Dell and HP. Those servers are carefully selected and tested by the product house to ensure a perfect fit for the product they host. Products that utilize this

infrastructure are typically pre-loaded with the relevant OS and Avaya application prior to be shipped to the channel. An activation license must be purchased and used to activate the product.

- Pure software delivery model

In this model, Avaya delivers an installation file that must be installed on a customer provided server and OS. The product documentation provides server hardware compatibility guides as well as relevant OS versions to be used.

- Virtual Appliance product delivery

With this model, Avaya provides a virtual appliance that contains everything that is needed to run the product in a virtualized environment. Avaya typically uses VMware vSphere Client virtual appliances. The virtual appliance is an OVA container that encompasses the relevant operating system, application files and installation and startup scripts.

> **Note:**
>
> Avaya Equinox® Streaming and Recording Server is available as a pre-installed appliance on an ASP server.

Infrastructure product	Hardware Appliance	Virtual Machine
Equinox Management Server		✔
Equinox Media Server		✔
Equinox H.323 Edge server		✔
Avaya Session Border Controller for Enterprise	✔	✔
Equinox Streaming and Recording Server	✔	
Avaya Equinox® Recording Gateway		✔

Related links

Video Multi-Stream Switching

Avaya Equinox® Media Server supports MSS, offering capabilities such as:

- Availability for Avaya Equinox® Client from version 3.3.
- The MSS Virtual Room (VR) is defined via a special meeting type in the web interface of Avaya Equinox® Management.
- MSS meetings are allocated on the Equinox Media Server engine. Maximum capacity for MSS video and audio only conference is 500 participants per conference, like in the transcoding technology.

- Non-MSS clients are connected with best effort video.

    - The switched VR supports H.264 and SIP.

    - Clients and endpoints that support H.264 are limited to 180p, which is the MSS base layer.

    - Content is web-collaboration only. Endpoints that use legacy content like BFCP cannot share or receive content.

    - The MSS VR is designed for desktop/mobile users rooms that support multiple stream decoding and encoding. For system interoperability and traditional video conferencing, the processed-mode VR is still used to deliver the best video experience in terms of quality and resolution.

- Lecture mode enhancements

    - In video conferencing:

        - The lecturer see other participants, based on the Active Speaker's list.

        - All other participants see the lecturer only in the highest available resolution.

        - When returning to normal mode, all participants resume normal behavior and see the Active Speaker list in the layout they were using before lecture mode started.

    - In audio conferencing:

        - All participants are muted except the lecturer. Only the moderator can unmute participants. Participants can raise hand to request speech.

        - When stopping lecture mode, all participants remain muted.

Related links

Superior Video Quality

Equinox Solution employs a number of algorithms in parallel to improve end-to-end video quality standards and ensure they are among the highest in the industry.

The following video quality algorithms are implemented in the Equinox Solution:

Related links

Scalable Video Coding Algorithm

Scalable Video Coding (SVC) is an extension to the H.264 codec standard. SVC video technology allows videoconferencing devices to send and receive multi-layered video streams composed of a small base layer and optional additional layers that enhance resolution, frame rate and quality.

Layering provides a dramatically higher degree of error resiliency and video quality with no significant need for higher bandwidth. Additionally, a single multi-layer SVC video stream can support a broad a range of devices and networks.

Figure 19: Graph showing SVC's resilience to packet loss on page 68 illustrates that as the signal degrades and packet loss increases, the video quality or peak signal to noise ratio (PSNR) does not significantly fall, in comparison to the regular H.264 transmission.
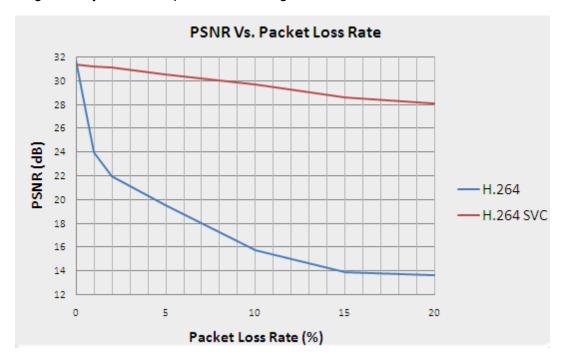
Figure 19: Graph showing SVC's resilience to packet loss

With SVC, Equinox Solution enables full interoperability with existing devices while enjoying all the benefits of very high network error resiliency and high quality support for room and telepresence systems. SVC will also improve the quality of connections between cascaded MCUs and allow H.264 Advanced Video Coding (AVC) endpoints to leverage the benefits of SVC.

SVC has been implemented in several components of the Equinox Solution, such as:

- Avaya Equinox® Media Server
- Scopia® Elite 6000 MCU
- Avaya CU360
- Avaya XT5000 Series
- Avaya XT4000 Series
- Avaya XT7000 Series
- Avaya XTE240
- Avaya IX™ Workplace Client, using Temporal Scalability Video Coding (TSVC). Temporal scalable encoding provides the scalable in the temporal resolution (frame rate). Different temporal layer provides different frame rates of the encoded video. For enabling finer grained

dynamic control of the bitrate and better error resilience in the video conferencing service, temporal scalability is enabled in SVC.

By applying SVC in an MCU/Media Server, rather than a gateway approach, the Equinox Solution enables an evolution rather than revolution to reap the benefits of scalable video in a mixed video coding world. Equinox Solution's SVC-enabled desktop and videoconferencing infrastructure interoperates with any standards-based endpoint, with no need for dedicated transcoding gateways.

Related links

[Superior Video Quality](#) on page 67

Forward Error Correction Algorithm

The Forward Error Correction (FEC) algorithm is a proactive method of sending redundant information in the video stream to preempt quality degradation. The proactive element is the reason it is referred to as a 'forward' algorithm. FEC relies on another algorithm, SVC (see [Scalable Video Coding Algorithm](#) on page 67) to identify the key frames in the video stream that should be protected by FEC.

There are several variants of the FEC algorithm. The Reed-Solomon algorithm (FEC-RS) sends redundant packets per block of information, enabling the sender (like Avaya Equinox® Media Server or Scopia Elite MCU) to manage up to 10% packet loss in the video stream with minimal impact on the smoothness and quality of the video.

FEC is implemented in several components of the Equinox Solution, such as:

- Avaya Equinox® Media Server
- Scopia® Elite 6000 MCU
- Avaya XT5000 Series
- Avaya XT4000 Series
- Avaya XT7000 Series
- Avaya XTE240
- Avaya Equinox® Meetings for Web (WebRTC for FEC)
- Avaya IX™ Workplace Client

Related links

[Superior Video Quality](#) on page 67

NetSense Algorithm

NetSense is a proprietary Equinox Solution technology which optimizes the video quality according to the available bandwidth to minimize packet loss. As the available bandwidth of a connection varies depending on data traffic, NetSense dynamically scans the video stream, and then reduces or improves the video resolution to maximize quality with the available bandwidth.

Whether sending or receiving video, a Equinox Solution product armed with NetSense can send a flow control request to other participants, including third party endpoints oblivious to NetSense, to lower or raise their video resolution based on its information of the available bandwidth. Therefore

using Equinox Solution infrastructure with third party endpoints ensures you get the best performance of that endpoint whatever the bandwidth connection.

The criteria by which NetSense is measured is three-fold:

- Can the algorithm make the most use of available bandwidth? For example, if there is an extra 200kb/s available on a connection, how much of that extra bandwidth will be used?

- What is the resulting level of packet loss?

- How quickly can the algorithm respond to changes in the bandwidth?

Our tests demonstrate that Equinox Solution's NetSense algorithm scores consistently high on all three counts, leading to a more reliable and higher quality video signal than other products on the market.

NetSense Algorithm is supported by several components of the Equinox Solution, such as:

- Equinox Media Server
- Scopia® Elite 6000 MCU
- Avaya CU360
- Avaya XT5000 Series
- Avaya XT4000 Series
- Avaya XT7000 Series
- Avaya XTE240

Related links

[Superior Video Quality](#) on page 67

H.264 High Profile

H.264 High Profile is now supported throughout the components of the Equinox Solution.

✳ Note:

Equinox Meetings for Web does not support H.264 High Profile.

H.264 High Profile is a standard for compressing video by up to 25% over the H.264 Baseline Profile, enabling high definition calls to be held over lower call speeds. It requires both sides of the transmission (sending and receiving endpoints) to support this protocol. H.264 High Profile uses compression algorithms like:

- CABAC compression (Context-Based Adaptive Binary Arithmetic Coding)
- 8x8 transforms which more effectively compress images containing areas of high correlation

These compression algorithms demand higher computation requirements, which are offered with the dedicated hardware available in Equinox Solution components. Using H.264 High Profile in videoconferencing requires that both the sender and receiver's endpoints support it. This is different from SVC which is an adaptive technology working to improve quality even when only one side supports the standard.

Related links

[Superior Video Quality](#) on page 67

Streaming and Recording Videoconferences

Streaming is a method to send live or recorded videoconferences in one direction to viewers. Recipients can only view the content; they cannot participate with a microphone or camera to communicate back to the meeting.

The streaming functionality of the Equinox Solution enables unicasts sending a stream directly to a streaming client address, or multicast streaming which sends a stream to multiple clients within a defined network. With Equinox Streaming and Recording, all that is needed for viewing live streaming or playback is a web browser. No plugins required. HTML5, Silverlight, and Windows Media Player are supported for playback viewing. Live streaming sessions are setup easily by end users from the Avaya Equinox® Unified Portal.

A recording of a videoconference can be played back at any time. Recordings include audio, video and shared data (if presented).

Similar to live streams, recordings can be viewed either from the Unified Portal or via a URL shared by the recording owner.

End users can start, stop and pause recording sessions from their Unified Portal with a single mouse click. Recording sessions may be initiated ad hoc without the need to schedule system resources in advance. Users may also configure their Unified Portal to automatically record their meetings via Unified Portal settings or can schedule a recording session to start automatically at a predetermined date and time from their Unified Portal.

From the Unified Portal users may set and change viewer permissions (who is allowed to see a recording), organize recordings into categories and set labels and tags for searching.

During a meeting users can also start recording from connected room system endpoints by accessing the DTMF moderation menu.

In addition to the new Equinox Streaming and Recording solution, Avaya Room System XT Series also has a separate built-in recording feature, enabling you to record videoconferences and store the file to a USB storage device which is attached directly to the XT Codec Unit. You can view the MP4 file on any standard media player. Some XT Series models require a license to enable this feature.

For more information on streaming and recording features and how to configure recording features in each of these products, see the documentation for that product.

Related links

[Selecting Features of your Equinox Solution](#) on page 60

Auto-Attendant Functionality

Auto-Attendant is a video-based IVR which provides quick access to meetings through a set of visual menus. Participants can select the DTMF tone-based menu options using the standard numeric keypads of endpoints. Auto-Attendant works with H.323 and SIP endpoints.

This feature is especially useful when users are not aware of the specific number of a videoconference but would like to join by choosing from a list of active meetings.

This functionality is available in Avaya Equinox® Media Server, Scopia Elite MCU, and Avaya Equinox® Management.

When Equinox Management is present, we recommend using its Auto-Attendant feature in preference to the MCU, as its list of active meetings covers the entire deployment, not a single MCU.

For more information on configuring the Auto-Attendant of Equinox Management, see *Administrator Guide for Avaya Equinox® Management*. For details of configuring the Auto-Attendant on the MCU, see *Administrator Guide for Scopia Elite MCU* or the *Administrator Guide for Avaya Equinox® Media Server*.

Related links

[Selecting Features of your Equinox Solution](#) on page 60

URI-based dialing

The Avaya Equinox® solution supports URI-based dialing, which is a dialing format to make and receive calls from external endpoints.

URI is an address format where the address consists of the endpoint's name or number, followed by the domain name of the server to which the endpoint is registered, such as <endpoint name>@<server_domain_name>. For example, 5000@198.51.100.51.

All Avaya Equinox® solution endpoints work transparently with URI-based dialing, including the Avaya Room System XT Series. You can also perform URI-based dialing from the conference control feature of Avaya Equinox® Management.

Avaya Equinox® H.323 Edge supports URI-based dialing for H.323–based endpoints. Outgoing and incoming calls to and from external endpoints traverse through the enterprise firewall.

DNS configuration to allow inbound DNS-based URI calls

Configure DNS to ensure that calls to your enterprise can be dialed using the shortest possible name. Use SRV records under the host name record to configure services under the same domain as the host. You can also map the SRV records to sub-domains.

Create the following two new resource records and map them with the same domain to allow inbound DNS-based URI calls to your enterprise:

- A resource record called the Host (A or AAAA) record for the enterprise host address.

- Service records called SRV records for the H.323 services in the following format:

```
<_service name._protocol name.domain name>    <class>        <type>
<priority>       <weight>       <port number>       <target host name>
```

Create the following SRV records for Avaya Equinox® H.323 Edge:

Descriptive name of service	Service, Protocol and Domain name	Class	Type	Priority	Weight	Port number	Target host name
Call Signaling	_h323cs._tcp.company.com	IN	SRV	0	0	1720	pfs.company.com
Location Service	_h323ls._udp.company.com	IN	SRV	0	0	1719	pfs.company.com
Registration Service	_h323rs._udp.company.com	IN	SRV	0	0	1719	pfs.company.com

Related links

Remote Access to Videoconferencing

The Equinox Solution includes a number of ways to access video calls from remote locations outside the company network. There are three categories of remote users:

- Home workers

When using a PC from home, Avaya IX™ Workplace Client offers an easy way to turn a PC into an HD endpoint. This technology includes all the tunneling functionality required to maintain an encrypted connection with the company while traversing both a home wireless router (NAT) and accessing Avaya SBCE in the company's DMZ.

You can participate in a video call by using a dedicated H.323 endpoint, like Avaya Room System XT Series. Your call traverses the NAT router and is routed to the Avaya Equinox® H.323 Edge server in the company's DMZ.

If you have a SIP client like Avaya IX™ Workplace Client or an endpoint like Avaya Room System XT Series that also works with the SIP protocol, you can access a remote videoconference through Avaya SBCE that you deploy in the organization's DMZ.

Avaya Equinox® Meetings for Web is a pure web conferencing client without a need for an installation. This ability allows easy and quick guest access to meetings without the barrier of a requirement to download and install software to the local machine.

- On the road

Avaya IX™ Workplace Client for Android or Avaya IX™ Workplace Client for iOS enable people with video-enabled phones to participate in a conference. The phone connects to Avaya SBCE in the company's DMZ.

A laptop can be an effective way to connect to videoconferences by installing Avaya IX™ Workplace Client. You can also use Avaya Equinox® Meetings for Web.

• Partner organizations with their own firewall

A PC installed with Avaya IX™ Workplace Client can join a videoconference even when it is located in a partner organization behind its firewall. Avaya IX™ Workplace Client can easily traverse both that firewall and the firewall of the company housing the video infrastructure to reach Avaya SBCE which is located in the DMZ.

If you have an H.323 endpoint which supports the secure H.460 protocol, like Avaya Room System XT Series, it can directly access Avaya Equinox® H.323 Edge server in the company's DMZ.

Alternatively, H.323 endpoints that do not support the H.460 protocol use a local gatekeeper and Avaya Equinox® H.323 Edge Client to navigate both firewalls.

Users located remotely and who have SIP endpoints can join a videoconference if your deployment includes Avaya SBCE. You can also use Avaya Equinox® Meetings for Web.

Related links

[Selecting Features of your Equinox Solution](#) on page 60

User Profiles for Video Across Networks and Remote Sites

For administrators, the Equinox Solution has many features for efficient user management throughout networks and remote sites, enabling centralized management of user names, user groups, and user privileges.

Related links

[Selecting Features of your Equinox Solution](#) on page 60
[Defining Video Users Across an Enterprise](#) on page 74
[Assigning Privileges for Video Users](#) on page 75

Defining Video Users Across an Enterprise

Profiles of users and groups of users can be defined within Avaya Equinox® Management, or they can be synchronized directly from the organization's LDAP user directory, interfacing with popular solutions like Microsoft's Active Directory.

Equinox Management's unified corporate address book feature synchronizes the enterprise's directory to all endpoints and soft clients in the enterprise from one central location, making contact lists easy to manage. This feature is also fully compatible with third party endpoints, since Equinox Management employs standard protocols when updating endpoint contact lists.

Synchronizing endpoint and soft client address books with the enterprise directory applies equally to both local and remote endpoints and soft clients that may be located in different branches or sites.

For enterprise editions of Equinox Management, all tasks are performed by the system administrator, defined during installation, or by additional administrators defined by the system administrator.

For more information, see *Administrator Guide for Avaya Equinox® Management*.

Related links

[User Profiles for Video Across Networks and Remote Sites](#) on page 74

Assigning Privileges for Video Users

You can regulate user rights and privileges by assigning a profile to an individual user or a user group. A user profile is a compilation of user-related capabilities and rights, such as available meeting types, ability to schedule meetings, access to desktop and mobile functionality, allowed bandwidth for Avaya IX™ Workplace Client calls.
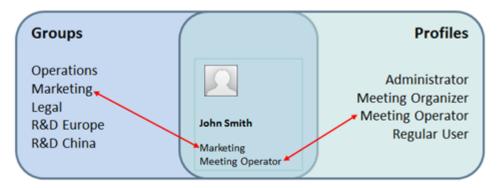
Figure 20: Using user groups and profiles to define a user

There are four predefined user profiles that can be assigned in the Avaya Equinox® Management:

- Users

  Users in this category can create, participate and moderate their own meetings, view scheduled meetings, and modify their own profile, but they cannot manage their own virtual room.

- Meeting organizers

  Organizers have all the abilities of regular users, but they can also manage their own virtual rooms, and personal address books. They can also create and manage meetings for others.

- Operators

  Meeting operators have all the rights of organizers, and additionally they can view and manage all meetings in an organization.

- Administrators

  Administrators have all the rights of an operator, and additionally they can view and manage all network devices, room terminals, and users with their virtual rooms in the organization.

- Service Provider Administrators

  This category of users can manage devices and meetings across multiple organizations.

In addition to the predefined user profiles, you can configure new profiles to meet the user provisioning needs of your organization.

For more information, see *Administrator Guide for Avaya Equinox® Management*.

Related links

[User Profiles for Video Across Networks and Remote Sites](#) on page 74

Scheduling and Resource Reservation

Scheduling a video meeting is similar to scheduling any other meeting. To schedule a regular meeting you need find a free slot in the participants' calendars and a free conference room. Videoconference meetings can include both physical and virtual meeting rooms, and you may need to reserve video resources, both Media Server capacity and bandwidth.

Scheduling video resources of a planned meeting reserves the required number of Media Server video ports for the meeting, to ensure sufficient capacity and bandwidth at the time of the call.

These criteria lead to three videoconferencing scheduling options in the Equinox Solution:

- Ad-hoc calls are unscheduled, and enable any endpoint to make a call.

- Time-only scheduling notifies participants of the time and virtual location of a videoconference, but no video resources are reserved.

- Time and resource scheduling is used for meetings where high quality video is imperative. It notifies both the participants and Avaya Equinox® Management of the time, the number of participants, and the virtual location of the videoconference. Equinox Management then reserves the number of Media Server ports to be used for the meeting at that time.

  Using this information, Equinox Management will allow or disallow any ad-hoc calls made at that time based on the resources it has set aside for the scheduled meeting.

Related links

[Selecting Features of your Equinox Solution](#) on page 60

Sharing Content

A central feature of Equinox Conferencing is the ability to transmit shared data alongside HD video, whether as presentations or as desktop sharing, streamed as a separate H.239 data channel from a connected PC. This feature is available in components such as:

- Avaya Room System XT Series

- Avaya CU360

- Avaya Equinox® Media Server

- Scopia Elite MCU
- Avaya Equinox® Management

Avaya IX™ Workplace Client can receive presentations.

In addition, the content slider enables conference participants viewing a presentation to go back and view slides that were previously transmitted at any time during the call, even if those slides are no longer presented in view by the conference lecturer.

The Web Collaboration Server of Equinox Conferencing introduces white boarding and application sharing which is becoming more prevalent with users docking their tablets and ultrabooks and using both displays. This also enables remote desktop control, where a user sharing the desktop can also share the keyboard and mouse with one other meeting participant.

For interoperability, the Web Collaboration Server transcodes to and from H.239 and BFCP for H.323 and SIP endpoints. If the new web collaboration feature is turned off or not available, the solution uses today's standard H.239 presentation mode.

Related links

Intuitive Video Layouts and Moderator Control

When presenting the multiple video images in a videoconference, there is always a question of choosing the best arrangement of images on a monitor in a way that is both convenient and relevant. Key features like the automatic highlighting of a participant currently speaking makes the layout choices of the Equinox Solution among the best in the industry.
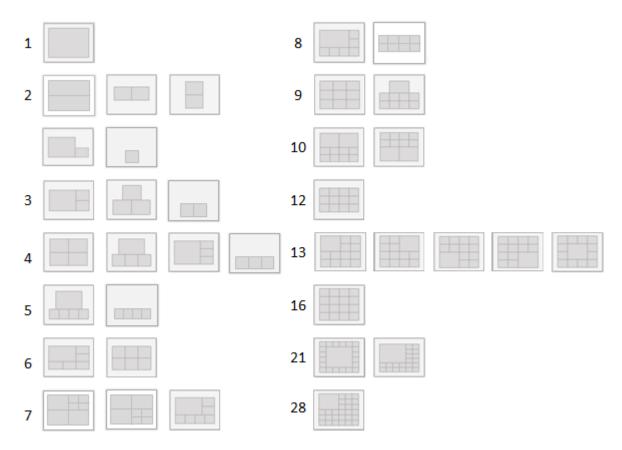
Figure 21: Supported layouts of Equinox Media Server or Scopia Elite MCU

Moderator control, sometimes known as chair control, is also a central feature in Equinox Solution videoconferences. A moderator has special rights in a videoconference, including blocking the sound and video of other participants, inviting new participants, disconnecting others, determining video layouts, and closing meetings.

Both these functionalities are available from a number of Equinox Solution components, such as:

- Avaya IX™ Workplace Client
- Avaya Equinox® Meetings for Web
- Avaya Collaboration Control
- Avaya Equinox® Media Server
- Scopia Elite MCU
- XT Series (for conferences held on Equinox Media Server or Scopia Elite MCU)
- Avaya CU360
- Avaya Equinox® Management

Administrators can use the video layout and moderator control from Equinox Media Server or Scopia Elite MCU to control a single MCU's videoconferences, or Equinox Management to manage conference layouts on a corporate level across the organization.

Participants can control their own endpoint's layout in desktop or mobile clients. In addition, participants can control the layout of Avaya Room System XT Series or Avaya CU360 using Avaya Collaboration Control.

Related links

Chapter 5: Solution specifications

Solution specifications for medium to large enterprises

Avaya has created this conferencing solution for medium-size enterprises. The solution offers the full range of Avaya Conferencing features, particularly multiple simultaneous conferences. The solution is suited for enterprises with a single main branch containing several meeting rooms, or for enterprises structured as a headquarter and several branches.

The solution is called Avaya Equinox® for Over The Top (OTT) when it ties to the customer existing infrastructure and provides services over the top of this infrastructure without requiring it to be upgraded or replaced.

The solution that tightly integrates with Avaya Aura® components is called Avaya Equinox® for Team Engagement (TE) and is deployed in medium and large enterprises.

The figures below illustrate examples of distributed OTT and TE deployments.
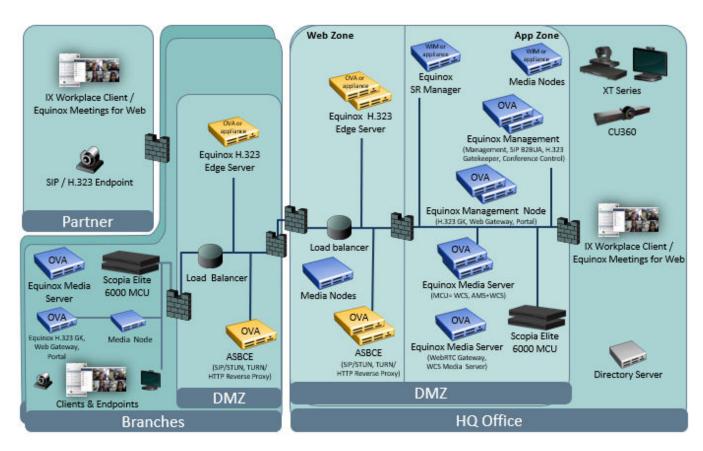
Figure 22: OTT deployment for medium to large enterprises
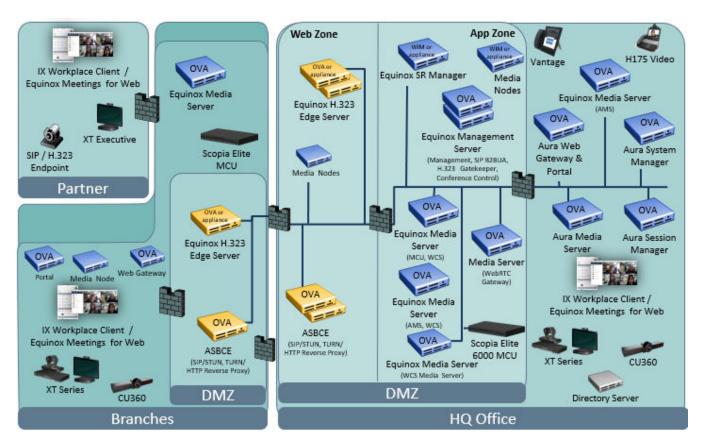
Figure 23: TE deployment for medium to large enterprises

This solution:

- Targets up to 30,000 registered users.

- Supports up to 2,000 concurrent sessions.

- Requires port-based licenses when deployed as Avaya Equinox® for Over The Top , and user licenses (Avaya Aura® Power Suite) when set up for Avaya Equinox® for Team Engagement.

- Integrates with the Avaya Aura® environment and provides a single unified solution for high capacity audio, web, and video conferencing.

- Recommends the use of two DMZ zones with three firewalls: the web zone for publicly accessed servers; the application zone for application servers.

- Includes Equinox Management for managing the organization's network, web-services, and signaling/control components. This virtual application, which is delivered as an OVA, fully integrates with the enterprise active directory and provides intelligent cross-zone bandwidth management regardless of protocols being used for calls. Equinox Management includes these modules: Management, Web Gateway and Portal (web services), SIP B2BUA (signaling/control), and H.323 Gatekeeper.

- Adds the Equinox Management node for specific loads and geographic distribution requirements. Usually, the customer must distribute the Web Gateway and User Portal in

large deployments when numerous users access the portal to join conferences, download client plugin, and schedule meetings. Likewise, a large deployment with numerous H.323 calls requires a distributed H.323 Gatekeeper. The Node includes these modules which can be installed as follows:

  - Either H.323 Gatekeeper

    Or,

  - User Portal and Web Gateway

    Or,

  - User Portal (when Web Gateway is disabled, as in base upgrades/migrations or in non-encrypted versions of the core Equinox Management)

The User Portal and Web Gateway that are part of the Equinox Management OTT OVA are also used as independent element in Aura 7.x Core as they are relevant for simple P2P use cases and not only for conferencing. In TE deployment, the User Portal and Web Gateway functional elements are part of the Aura deployments

• Deploys the Equinox Media Server which provides rich audio, video, and data conferencing functionalities to the solution. The server includes: HD video SW transcoding MCU, High Scale audio engine, and Web Collaboration Engine. The server is ready to support different video technologies such as transcoding and switching. The video multi-stream switching technology is implemented in synergy with software and hardware client that support the same technology. The server can also be deployed as a Web Gateway to add the WebRTC functionality to the existing Scopia® Elite 6000 MCU. The server can also function as a Web Collaboration Gateway to provide advanced content sharing functionalities to Scopia® Elite 6000 MCU. The server supports two working modes: video, audio, and web collaboration per single OVA; high capacity audio and web collaboration per single OVA. The administrator can switch the working mode from the Equinox Management interface. The Equinox Media Server cannot work in a mixed mode. For a solution with both working modes, the deployment must include two Equinox Media Server: one for Full Audio, Video, Web Collaboration, and one for High Capacity Audio and Web Collaboration. For WebRTC, the MCU uses Avaya Aura® Media Server as a WebRTC Gateway.

For TE deployment from release 9.1 SP3, Aura Media Server instances configured to run as a WebRTC Gateway front Equinox Media Servers in order to handle WebRTC calls.

For OTT deployment from release 9.1 SP3, Equinox Media Server instances configured to run as a WebRTC Gateway front Equinox Media Servers in order to handle WebRTC calls.

• Deploys Scopia® Elite 6000 MCU which provides audio, video, and data conferencing functionalities and sustains high quality frame rate video supporting 60 fps. For web collaboration, the MCU uses Equinox Media Server as a Web Collaboration Gateway. For WebRTC, the MCU uses Avaya Aura® Media Server as a WebRTC Gateway. Scopia® Elite 6000 MCU is a hardware appliance.

• Deploys the Equinox H.323 Edge which provides firewall and NAT traversal for remote H.323 video HD room systems (Avaya and standard third party). The server is installed as a virtual appliance (OVA).

- Supports Avaya Session Border Controller for Enterprise (or an Avaya approved edge device), as an option. Avaya SBCE provides SIP firewall traversal, HTTP Reverse proxy, and STUN/TURN firewall traversal. Avaya SBCE is deployed as a virtual appliance (OVA) or as an appliance with pre-installed software.

- Adds the Equinox Streaming and Recording facility, as an option. The AESR is deployed as a pre-installed appliance on Avaya ASP server.

Related links

[Reference configurations for Over The Top deployments](#) on page 84
[Reference configuration for Team Engagement deployment](#) on page 87
[Avaya Equinox Streaming and Recording Server](#) on page 88

Reference configurations for Over The Top deployments

Centralized deployment

The Centralized solution offers the full range of conferencing features, particularly multiple simultaneous video, audio and data conferences that can be recorded and streamed for reliable delivery of high scale, high quality video. The solution is deployed with a minimal set of conferencing infrastructure at the company's site, allowing to call from endpoints and soft clients such as Avaya IX™ Workplace Client. Reverse proxy and STUN/TURN functionalities are required for accessing infrastructure components such the Web Gateway and the Unified Portal. The Avaya Session Border Controller for Enterprise (ASBCE) or an approved third party edge device can provide these functionalities.

- Basic deployment
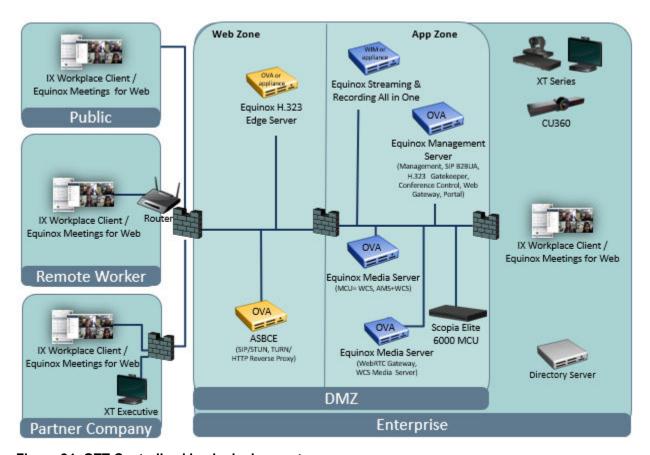
Figure 24: OTT Centralized basic deployment

- Redundant deployment

    The solution is highly scalable and fully redundant. To increase capacity, you can add more of the same components, like extra Equinox Media Server, Equinox Streaming and Recording, and Avaya Session Border Controller for Enterprise (ASBCE). Equinox Management is duplicated for redundancy and high availability. Avaya Equinox® H.323 Edge servers can be clustered behind a load balancing system for scalability and high availability. ASBCEs are clustered and load balanced from Equinox Management.
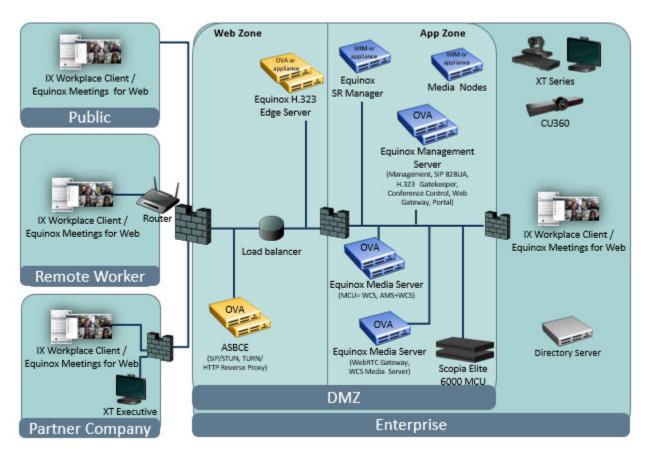
Figure 25: OTT Centralized redundant deployment

Distributed deployment

The solution is aimed at medium enterprises structured as a headquarter and several branches. Typically, each branch would have one or more meeting rooms, and a headquarter would have several meeting rooms. In this deployment, the infrastructure is distributed in both headquarter and branches. The Equinox Management application is split into management applications in the headquarter office, and the Web Gateway, Unified Portal, and Gatekeeper applications in branches to support service distribution. ASBCE is required for supporting Avaya IX™ Workplace Client clients and SIP endpoints. The solution is highly scalable. To increase capacity, you can add more of the same components like extra Equinox Media Servers.
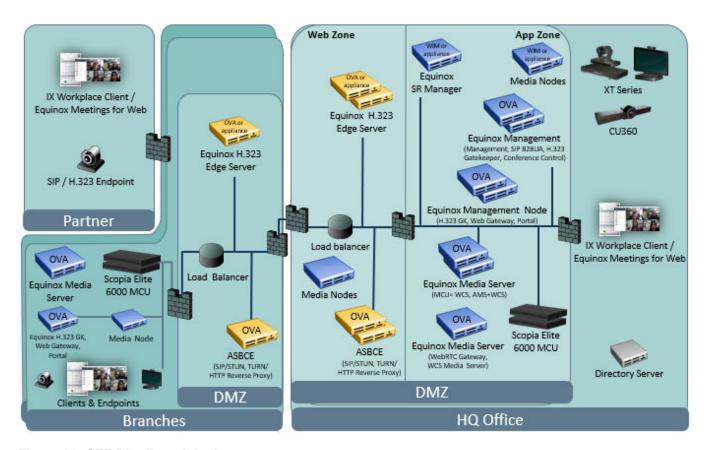
Figure 26: OTT Distributed deployment

Related links

Reference configuration for Team Engagement deployment

The Avaya Equinox® for Team Engagement solution integrates Avaya Equinox® Conferencing with Avaya Aura® existing and new customer solutions. An Aura environment includes Avaya Aura® Session Manager, Avaya Aura® Communication Manager, Avaya Aura® System Manager, Avaya Aura® Presence Services along with Conferencing 9.0 (and up). The solution provides Unified Communications services for the enterprise including internal/external voice, audio/video conferencing, and IM/Presence. Administrators can assign virtual rooms to users. Both internal and external users join conferences in a guest role. The solution provides the full range of conferencing features, and particularly multiple simultaneous video, audio and data conferences that can be recorded and streamed for reliable delivery of high scale, high quality video. The solution supports products like Avaya IX™ Workplace Client, Avaya H175 Video Collaboration Station, Avaya Vantage™, Avaya SBCE, and SIP telephony infrastructure.
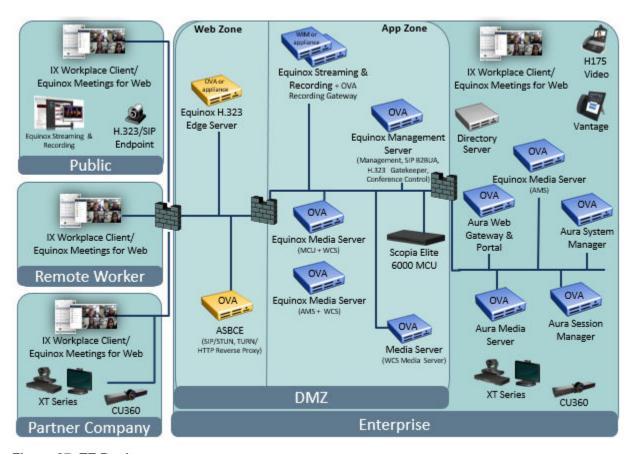
Figure 27: TE Deployment

Related links

Avaya Equinox® Streaming and Recording Server

For the streaming and recording of conferences, Avaya has developed the Avaya Equinox® Streaming and Recording Server (Equinox Streaming and Recording). Equinox Streaming and Recording is the Avaya platform for HD streaming and recording.

Before you install Equinox Streaming and Recording, you must make a number of decisions in order to ensure that the solution exactly matches the requirements of your deployment. For example, you must make a decision about scalability in accordance with the size of your enterprise. For a small enterprise, you can choose a single appliance which houses all of the Equinox Streaming and Recording components. For a large enterprise, you can choose a distributed solution with multiple media nodes. Equinox Streaming and Recording is highly flexible and easily adaptable, whatever your requirements. In addition, you must decide if you require a high degree of redundancy[1] and whether you would like to enable external access and storage in the 'cloud'. In both the Over The Top (OTT) and Team Engagement (TE) solutions, Equinox

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[1] High Availability is not supported for the Manager in this release. High Availability is not supported for All-in-one servers.

Streaming and Recording is optional, however if you want to record and playback videoconferences, you must install it.

If you would like users outside of the enterprise to access recordings, you can deploy Equinox Streaming and Recording in a Demilitarized Zone (DMZ) or use a reverse proxy server. In this way, the Equinox Streaming and Recording is similar to the Avaya Web Collaboration server (WCS). If you would like users outside of the enterprise to access the videoconference, you must deploy the WCS in a DMZ or use a reverse proxy server. Equinox Streaming and Recording and WCS also support a Network Address Translation NAT Firewall configuration in a DMZ deployment. NAT Firewall is an additional layer of security. It blocks unrequested inbound traffic.

Components

The Avaya Equinox® Streaming and Recording Server consists of the following components:

- Equinox Streaming and Recording Conference Point™ (CP)
- Equinox Streaming and Recording Delivery Node™ (DN)
- Equinox Streaming and Recording Virtual Delivery Node™ (VDN)
- Equinox Streaming and Recording Manager™
- Equinox Recording Gateway™

Equinox Streaming and Recording Conference Point™

You must configure a conference point to capture H.323 video content and deliver live and on demand webcasting. The Equinox Streaming and Recording conference point includes an embedded transcoder to convert H.323 calls into .MP4 format.

Each conference point must be associated with a delivery node. A delivery node streams and optionally archives the content captured by the conference point and delivers it to client systems.

You can configure a conference point to be in a geographic location. This means that you can assign a location to one or more conference points which coincide with locations set for Scopia Elite MCUs and/or Equinox Media Servers in Equinox Management. When a program starts, Equinox Management includes the desired location, and a conference point close to the MCU/Media Server can be selected. If there are no conference points matching the location passed by Equinox Management, then any conference points without a location are treated as a single pool of conference points, and one of those is selected. If there are no conference points available, the call fails.

Each conference point has a limit to the number of simultaneous high definition or standard definition calls it can handle.

The CP includes the following features:

- Video conferencing H.323 capture and transcoding
- High definition support
- Scalability for up to 40 480p, or up to 60 360p recordings, or up to 75 audio-only recordings
- Scalability for up to 10 1080p recordings, or for up to 20 720p recordings
- G.711 and AAC-LC audio capture and transcoding
- H.263, H.263+, H.264 capture and transcoding

The media node or all-in-one server can include the CP and transcoder components. The H.323 video and audio and the optional H.239 stream received by the CP are sent to the internal encoder for transcoding into H.264/AAC MP4/MPEGTS/HLS formats.

- Operating Systems: The transcoder runs on the Windows Server 2012 R2 or Windows Server 2016 64-bit operating system with Hyper-V (an add-on to the Windows Server that allows a Linux operating system to run on the same server). The CP runs on the CentOS 6.6 64-bit operating system. Using virtualization software, this enables both applications to run two different operating systems on the same server.

- Licensing: The server requires a single media node license for the CP. The license defines the number of simultaneous H.323 connections. An H.323 connection includes audio, video, and an optional H.239 secondary stream.

- Transcoding H.323 audio and Video: The CP connects H.323 calls to the Scopia Elite MCUs (Multipoint Control Units) and/or Equinox Media Servers. When it establishes a video connection, the CP sends the audio and video data from the MCU/Media Server to the internal transcoder. The transcoder converts the data into a format that is suitable for streaming.

- Transcoding with H.239: H.239 is an ITU recommendation that allows for establishment of multiple channels within a single H.323 session. Existing videoconference equipment can be used to stream audio and video and a secondary channel can stream a slide presentation or another data stream to the viewers of a program. This function is typically used to stream slide presentations synchronized with live audio and video. If a program uses a secondary H.239 channel, the encoder inputs the second stream, decodes, scales and mixes it with the main video input for transcoding/streaming. The streams are then sent to the DN for delivery to the distribution network. The dual stream can also be recorded as a single MP4 program.

- High definition support: The CP supports high definition video and higher rate streaming quality and bandwidth. The CP supports the following ITU recommendations:

  - H.261 up to CIF Video

  - H.262 up to CIF video

  - H.263 up to CIF video

  - H.264 up to 1080p video

  - H.263+ up to 1024 x 768 H.239 data

  - H.264 up to 1080p H.239 data

  - G.711 audio

  - AAC-LC audio

  The CP negotiates up to H.264 Level 3.2 video at 1.92 Mbps, and accepts up to 1080p and down to H.261 QCIF along with G.711 or AAC-LC audio. The streaming resolution and bandwidth rate depend on what you select for the bitrate when creating the program and what the Scopia Elite MCU and/or Equinox Media Server negotiates.

Equinox Streaming and Recording Delivery Node™

The DN provides on-demand and broadcast video delivery. Used alone or in a hierarchy of devices, the DN supports thousands of concurrent streams. The DN uses intelligent routing, content caching, and inherent redundancy to ensure transparent delivery of high-quality video.

Delivery nodes (DN) store all content that is created by the conference point and deliver the content to client systems at playback time. You must associate the conference point with the delivery nodes.

A source DN is the original DN that receives a recording file from its associated conference point. A source DN sends the recording file to all of the other DNs in the network.

The Delivery Node Details dialog displays a list of recording files, known as **Source Programs** and **Distributed Programs**. Source programs are programs (recording files) for which this delivery node is the main source for storage. Distributed programs are programs which other delivery nodes have forwarded to this delivery node.

Equinox Streaming and Recording Virtual Delivery Node™ (VDN)

A virtual delivery node (VDN) delivers content to a global content delivery network (CDN) provider for cloud-based viewer playback. The appliance and the network of the CDN act as one delivery mechanism. Therefore, the VDN appliance and the CDN together create the Equinox Streaming and Recording VDN solution.

Upon program creation, the publisher includes the options of distributing the program to delivery nodes and to the Equinox Streaming and Recording VDN solution. VDN supports publishing recordings as well as live broadcast.

You can view the programs distributed to the VDN appliance and to be delivered to the CDN with the associated status of the program.

Equinox Streaming and Recording currently only supports the Highwinds Cloud CDN.

Equinox Streaming and Recording Manager™

The Equinox Streaming and Recording Manager provides a web-based interface to configure and manage streaming and recording software, devices, services, and users. The Equinox Streaming and Recording Manager application resides on a single hardware platform and provides access to all content in the Equinox Streaming and Recording environment.

There are two Equinox Streaming and Recording Manager portals:

- Equinox Streaming and Recording Manager Administrator Portal: Administrators use this portal to perform the following tasks:

  - Configure and manage video communications devices

  - Manipulate content

  - Monitor user roles

  - Create and set global policies

  - Identify best practices and usage effectiveness through comprehensive reporting

  - Allow access to the VDN for CDN deployment or programs

  - Manage organizations, in a multi-tenant deployment (including what profiles, categories and CDN settings they can access)

  - Create and manage viewer mappings to associate viewers with the appropriate distribution node location

- Avaya Equinox® Unified Portal: Viewers select the **Recordings and Events** tab on the main Avaya Equinox® Unified Portal page to access the viewer portal. Users can select the

Schedule tab to schedule an event. Users can perform the following tasks in relation to recordings:

- View programs

- Navigate categories

- View live or on-demand programs

Avaya Equinox® Recording Gateway™

You can configure Equinox Streaming and Recording to record:

• Audio-only conferences

• Audio and web collaboration conferences and MSS video

Audio-only and audio and web collaboration conferences use SIP. Video, audio, and web collaboration conferences use H.323. In order to support this mix of protocols, you must deploy an Avaya Equinox® Recording Gateway. You can deploy the Equinox Recording Gateway using the Avaya Equinox® Management interface. The Equinox Recording Gateway is similar to an Avaya Equinox® Media Server but does not accept regular client connections and is only used for recording purposes. When you add the media server (MCU) configured for high scale audio, you get three additional meeting types - Audio Service, Audio Service with Web Collaboration and MSS video, Audio and Web Collaboration. Each meeting type is also matched to a particular rate of encoding and screen resolution. This means that recordings do not use unnecessary resources and disk space if they are not required by the meeting type.

When a user records a conference, Equinox Management identifies the type of recording that is required by the user. It routes the media to the appropriate gateway, if one is required. Equinox Management also determines the most appropriate capture rate, resolution, frame rate, and encode rate for the Equinox Streaming and Recording Conference Point.

The Equinox Recording Gateway does not require a separate license. When you buy a media node, you receive an Equinox Recording Gateway as well. For more information on adding the gateway to Equinox Management and for information on configuring the meeting types, see *Administering Avaya Equinox® Management*, which is available on support.avaya.com.

> ✳ **Note:**
>
> Multicasting is not supported any longer. You cannot configure multicast settings.

Related links

Example of a direct DMZ deployment

[Figure 28: Example of a Direct DMZ Deployment](#) on page 93 displays an example of an Equinox Streaming and Recording deployment that is situated directly in the demilitarized zone (DMZ). The deployment is a centralized or all-in-one solution, which means that all of the Equinox Streaming and Recording components reside on a single server. An all-in-one solution is suitable for a small or medium deployment that does not require redundancy.

In a typical small deployment, all of the Equinox Streaming and Recording components reside on a single server. The Equinox Streaming and Recording Manager and the transcoder run directly on the host server. The conference point (CP), delivery node (DN), and, optionally, a virtual delivery node (VDN) run as virtual servers. VDNs enable enterprises to host recordings in the cloud.
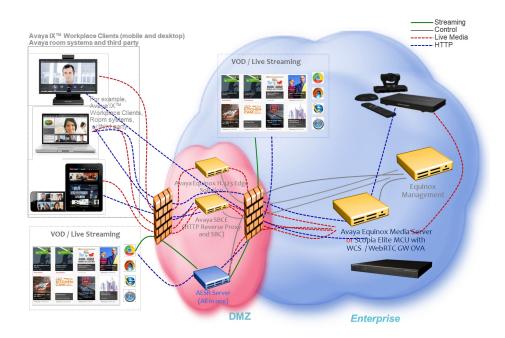
Figure 28: Example of a Direct DMZ Deployment
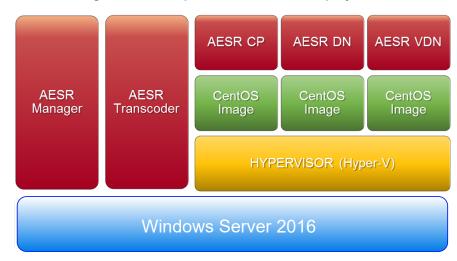
Figure 29: Components in an All-In-One Deployment with Virtual Software

Related links

[Avaya Equinox Streaming and Recording Server](#) on page 88

Example of a reverse proxy deployment

Figure 30: Example of a Reverse Proxy Deployment on page 94 displays an example of an Equinox Streaming and Recording deployment that includes a reverse proxy server. The deployment is a centralized or all-in-one solution.
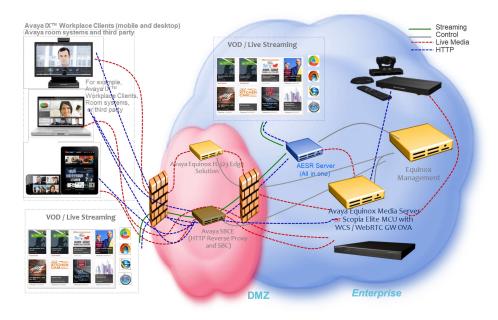
Figure 30: Example of a Reverse Proxy Deployment

Related links

Avaya Equinox Streaming and Recording Server on page 88

Example of a distributed deployment

Figure 31: Example of a Distributed Deployment on page 95 displays an example of a distributed Equinox Streaming and Recording deployment. The deployment also uses a reverse proxy server. In this example, there are several delivery nodes (DNs) and/or conference points (CPs). This configuration enables Equinox Streaming and Recording to host large numbers of recordings. A configuration with multiple media nodes can also provide redundancy.

In a typical distributed deployment, the Equinox Streaming and Recording Manager resides on a separate, dedicated server. The various media nodes can operate as CPs, DNs, or virtual delivery nodes (VDNs). VDNs enable enterprises to host recordings in the cloud.
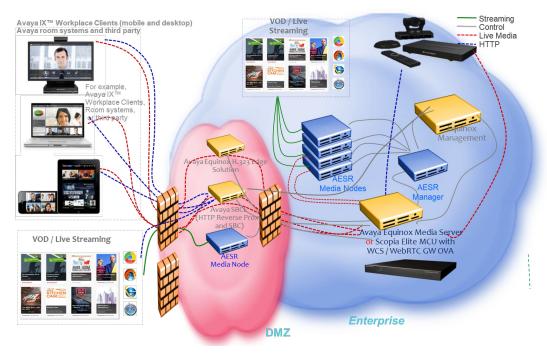
Figure 31: Example of a Distributed Deployment

Related links

[Avaya Equinox Streaming and Recording Server](#) on page 88
[Deployment choices for centralized and distributed solutions](#) on page 95

Deployment choices for centralized and distributed solutions

The Equinox Streaming and Recording server performs three functions:

- Content recording

- Content delivery

- Content management

Content delivery, in this context, refers to streaming.

When you run the configuration utility (or *wizard*), you choose between three deployment options for the Avaya Equinox® Streaming and Recording Server (Equinox Streaming and Recording). You can choose to house all three functions on a single server. Alternatively, you can choose to house the management function on one server and the recording and delivery functions on another server or servers. This configuration involving multiple servers is called a distributed system.

If you intend to house all three functions on a single server, you must run the configuration utility on that server. On the selection screen, you must choose **All-in-One**..

> ⊛ **Note:**
>
> Avaya does not support the expansion of an All-in-One system to a Distributed System. You must carefully plan your deployment in view of your future capacity needs. If it is likely that your recording needs will go beyond the capacity of an All-in-One system in the future, Avaya recommends that you start with a small Distributed System (one standalone Manager and one Media Node) from day one. You can then add more Media Nodes to the system as needed.

If you intend to install a distributed system, you must run the configuration utility on each server in the system. On the selection screen, you must choose whether the server will house the content management or the recording and delivery functions.

Related links

All-in-one

If your Equinox Streaming and Recording deployment is an all-in-one system, all Equinox Streaming and Recording components reside on a single server.

Related links

Content Management components only

If your Equinox Streaming and Recording deployment is a distributed system, the Equinox Streaming and Recording components reside on multiple servers. You must install the content management components on one server and install the recording and delivery components on another server or servers.

For a distributed system, you must run the Equinox Streaming and Recording Configuration Utility on each of the servers. When you are running the configuration utility on the server which will act as the content management server, you must select **Content management components only** on the Select Configuration dialog of the configuration wizard.

Related links

Media Node only

If your Equinox Streaming and Recording deployment is a distributed system, the Equinox Streaming and Recording components reside on multiple servers. You must install the content management components on one server and install the recording and delivery components on another server or servers.

For a distributed system, you must run the Equinox Streaming and Recording Configuration Utility on each of the servers. You can install the recording component on one server and the delivery component on another server. Alternatively, you can install both aspects on a single server. In this

distributed configuration, these servers act as media nodes. When you are running the configuration utility on a server which will act as a media node, you must select **Media Node only** on the Select Configuration dialog of the configuration wizard.

A media node that is used for the recording component is called a Conference Point (CP).

A media node that is used for the delivery component is called a Delivery Node (DN).

Related links

[Deployment choices for centralized and distributed solutions](#) on page 95

Scalability

Introduction

Equinox Streaming and Recording is installed on Dell™ PowerEdge™ R640 Server, provided by Avaya. If you are providing your own server, the specifications must match those of the Avaya-provided servers. For more information about obtaining and installing the Equinox Streaming and Recording WIM, see the *Equinox Streaming and Recording Disaster Recovery Guide*, which is available from support.avaya.com.

> ✱ **Note:**
>
> The Avaya-provided appliance server, that ships with the Equinox Streaming and Recording application pre-installed, is a Dell™ PowerEdge™ R640 Server with 2x Intel Skylake G-6132 2.6 GHz processors; 28 cores; 12x 16GB RDIMMs of RAM and 6 HDDs of 600GB each. In the Avaya naming, it is referred to as the Avaya Solutions Platform (ASP) 110 Profile #5. The previous Avaya-provided appliance server for Equinox Streaming and Recording is now in end of life by the original manufacturers. Avaya also allow our customers to source their own servers to install the Equinox Streaming and Recording software image on it by themselves.

Equinox Streaming and Recording supports up to 10 high definition (1080p or 720p) or 30 standard definition (480p) recordings with H.239 simultaneously. The system negotiates high definition whenever possible.

The resolution negotiated is based on the configuration of the MCU/Media Server service as well as the Equinox Streaming and Recording profile. By limiting the profile to 480p or less, you can do 30 simultaneous recordings (trading off higher quality recordings versus the ability to do more recordings).

Recording (Dell™ PowerEdge™ R640)

The Dell™ PowerEdge™ R640 (or Avaya-approved equivalent customer provided Dell servers[2]) offers high scalability. When the Conference Point (CP) is configured on an all-in-one server or when it is configured with a DN, Equinox Streaming and Recording supports 20 high definition and 50 low definition simultaneous recordings. These values are an increase from 10 high definition and 30 low definition in older deployments, as listed in [Table 9: Concurrent recordings on the Dell™ PowerEdge™ R640](#) on page 98. When the CP is on a separate server, it offers even higher scalability with 40 medium definition and 60 low definition simultaneous recordings.

---

[2] For more information on supported servers, contact Avaya using https://support.avaya.com.

Table 9: Concurrent recordings on the Dell™ PowerEdge™ R640

	CP-only	**All-in-one or with a DN**
1080p	10	10
720p	20	20
480p	40	30
360p	60	50

Playback

On a standalone media node configured for DN only, Equinox Streaming and Recording supports up to 3,500 viewers at 720p / 768K for live broadcast or video on demand playback simultaneously.

On all-in-one servers or media nodes configured with DN and CP, Equinox Streaming and Recording supports up to 1,500 viewers at 720p / 768K for live broadcast or video on demand playback simultaneously.

Related links

[Avaya Equinox Streaming and Recording Server](#) on page 88

Specifications for back-end infrastructure components for medium to large enterprises

Specifications for infrastructure components

The Equinox Solution comprises different types of deployments:

- Centralized Over The Top solution with redundancy
- Distributed Over The Top or Team Engagement, with high availability and redundancy
- Over the Top Service Provider and Cloud Services

The hardware requirements for the Equinox Solution are the same whether you are installing the product in an Over The Top or Team Engagement deployment.

Equinox Management includes these modules: Management, Web Gateway and Portal (web services), SIP B2BUA (signaling/control), Equinox Conference Control, and H.323 Gatekeeper. In an OTT deployment with more than 2,000 concurrent sessions, the Web Gateway, Portal, and H.323 Gatekeeper are installed as separate OVAs and nodes. In a TE deployment with more than 2,000 concurrent sessions, WGW, Portal, and H.323 Gatekeeper are installed as separate OVAs and nodes. For OVA installation, server requirements depend upon the number of concurrent calls.

Equinox Media Server includes these modules: MCU, Avaya Aura® Media Server (AAMS), Web Collaboration Server (WCS). The server can be also deployed as a gateway or add-on for Scopia® Elite 6000 MCU. In this mode, the server can function as a Web Gateway (WGW) that adds the WebRTC functionality to Scopia® Elite 6000 MCU and Equinox Media Server, or as a Web Collaboration Server Gateway (WCS GW) that adds advanced content sharing

functionalities. Usage and capabilities of this VM are determined by licensing or from the administrator web interface of Equinox Management.

In a TE deployment, Equinox Media Server and Scopia® Elite 6000 MCU both use the Web Gateway of Avaya Aura® Media Server.

For specifications of the Avaya Aura®, see the components' documentation.

Related links

Technical Specifications of Equinox Management

The Equinox Management server OVA supports two different working modes:

- **All-In-One**: Includes all of the components working in one VM, for medium capacity deployment.

- **Distributed**: For medium or high capacity deployment, one management server works with one or multiple distributed management servers. For distributed deployment, one management server runs Equinox Management, while the distributed management server works either as an H.323 Gatekeeper, an Equinox Conference Control (UCCS), or as a User Portal + Web Gateway.

> ✳ **Note:**
>
> - Using low memory capacity in OVA configuration can cause the User Portal + Web Gateway to fail.
>
> - To support high capacity calls, the network must ensure that each subnet has enough bandwidth to support all required bandwidths for both media and signaling.

The following table describes the hardware requirements for Equinox Management deployment, according to the available configuration types:

Table 10: Matching hardware server specifications with your product

Configuration Capacity	Server CPU (processor x physical cores)	Server RAM (GB)	VM Minimum vCPUs	VM CPU Reservation (MHz)	RAM Reservation (GB)	DISK Reservation	Usage	Capacity (Calls/ Registered Users)
Low	2.4 x 4	8	4	8000	6	200	Distributed Management Node server User Portal + Web Gateway or H.323 Gatekeeper	H.323 – 2,000/10,000 User Portal + Web Gateway – 1,000/10,000

Table continues…

Configuration Capacity	Server CPU (processor x physical cores)	Server RAM (GB)	VM Minimum vCPUs	VM CPU Reservation (MHz)	RAM Reservation (GB)	DISK Reservation	Usage	Capacity (Calls/ Registered Users)
Medium — High	2.5 x 8	24	8	15000	16	200	**Medium** — Scale All-In-One Management Server (with Equinox Management & Web Gateway) — OTT **High** (with Equinox Management but without User Portal + Web Gateway, OTT/TE) Internal H.323 Gatekeeper capacity limited (see **Important** note below table)	**Medium (All–In–One)** – 2,000/30,000 **High** — 15,000

🛈 **Important:**

- When User Portal + Web Gateway resides with Equinox Management server, select the **Medium-High** VM model.

- H.323 Gatekeeper is limited to 2,000 calls (10,000 registrations); to increase capacity, use distributed Management Node VMs.

- User Portal + Web Gateway is limited to 3,000 calls. To increase capacity, use distributed Management Node VMs.

- Equinox Conference Control is limited to 2,000 calls.

The following table describes the usability and capacities for the various VM models used in Equinox Management.

Table 11: Usability and Capacities for your product

VM Model	Usability	Required License	Set Usage By	Capacity
Low	Distributed User Portal + Web Gateway - Small	Management Server License	Activating components through the Equinox Management UI	1,000 Web Gateway calls 2,000 User Portal sessions
Low	H.323 Gatekeeper	Management Server License	Activating component through the Equinox Management UI	2,000 calls 10,000 registrations
Medium-High	All-in-one Medium (Equinox Management, B2B, H.323 Gatekeeper, Equinox Conference Control, User Portal + Web Gateway)	Management Server License	VM automatically becomes all-in-one when User Portal + Web Gateway is activated. Capacity limitations are enforced by Equinox Management.	2,000 total calls (including 1,000 Web Gateway calls) 30,000 registered users 2,000 User Portal sessions
Medium-High	High scale management (Equinox Management, B2B, H.323 Gatekeeper, Equinox Conference Control)	Management Server License	VM automatically becomes HIGH when User Portal + Web Gateway is inactive by administrator. Relevant for TE and large OTT deployments.	15,000 total calls 150,000 registered users (400,000 unregistered users) 2,000 H.323 Gatekeeper calls
Medium-High	Distributed User Portal + Web Gateway - Medium	Management Server License	VM automatically becomes User Portal + Web Gateway when receiving license	2,000 Web Gateway calls 4,000 portal sessions
Medium-High	Distributed Equinox Conference Control	Management Server License	VM automatically becomes Equinox Conference Control when receiving license	2,000 total calls

Related links

Technical specifications of Avaya Equinox® Media Server

- The Huge configuration requires customer-provided servers that support the 2S-3 UPI topology. The 2S-3 UPI topology supports three UPI links between server CPUs, which improves the server performance and efficiency.

- The Medium configuration requires the following CPU configuration to support the 1080p*60fps video resolution:

  - Server CPU speed: More than 2.4Ghz

  - CPU reservation: 27000MHz

Deployment-specific virtual machine requirement

Require ment	Huge configur ation	Ultra High configur ation	Ultra High configur ation with 60fps video	High configur ation	High configur ation with 60fps video	Medium configur ation	Medium configur ation with 60fps video	Low configur ation
Server CPU cores	48	24	24	16	16	12	12	6
Virtual cores	48	48	24	32	16	12	12	6
CPU reservatio n in MHz	120000	55000	54780	35000	34860	21800	27000	9900
2.5" SAS hard disk capacity in MB	122800	122800	122800	122800	122800	122800	122800	122800
RAM reservatio n in MB	147000	58000	58000	20000	20000	13000	13000	10000
Disk space reservatio n in MB	120000	120000	120000	120000	120000	120000	120000	120000
NIC	2	2	2	2	2	2	2	2
Maximum licenses applicabl e in Over The Top deployme nt	8	4	4	2	2	1	1	Only for migration s from existing Avaya Aura® Conferen cing deployme nts

Capacity and scalability

Maximum ports supported

- In the Full Audio, Video, and Web Collaboration working mode, the maximum supported ports for 720p*30fps video is exclusive of audio ports.

- In the High Capacity Audio, Multi-Stream Video and Web Collaboration mode, the maximum supported ports for audio in each deployment type also includes support for web collaboration.

- The Low configuration deployment is only for migrations from existing Avaya Aura® Conferencing deployments when you need to use the existing server. The Low configuration applies only to Avaya Equinox® Team Engagement deployments and supports a maximum of 200 audio-only ports with web collaboration.

Deployment configuration	Maximum ports supported for a specific video resolution				
	1080p*60fps	1080p*30fps	720p*60fps	720p*30fps	480p*30fps
Huge	20	40	40	80	120
Ultra High	—	20	—	40	80
Ultra High with 60fps video	10	20	20	40	80
High	—	10	—	20	40
High with 60fps video	5	10	10	20	40
Medium	—	5	—	10	20
Medium with 60fps video	3	5	5	10	20

Full Audio, Video, and Web Collaboration mode ports capacity

The port allocation is based on the resources that each user needs. Different users need different amount of resources based on the video resolution of the connections. Meetings can have multiple users that need a different amount of resources based on the video resolution of the connection. For example, users with connections at 480p*30fps video resolution use 25% of the resources of users with connections at 1080p*30fps video resolutions or 50% of the resources of users with connections at 720p*30fps.

Equinox Media Server supports 1080p*60fps and 720p*60fps video resolutions as optional features. You must manually enable the video resolutions for video calls.

Deployment configuration	Port-based licenses for Over The Top deployments	Maximum ports supported for video				Audio using G.711 codec	Web collaboration
		1080p*60fps using H.264 codec	1080p*30fps and 720p*60fps using H.264 codec 720p*30fps using VP8 codec	720p*30fps using H.264 codec 480p*30fps using VP8 codec	480p*30fps using H.264 codec		
Huge	8	20	40	80	120	120	120
Ultra High	4	10	20	40	80	80	160
Ultra High	3	7	15	30	60	60	120
High	2	5	10	20	40	40	80
Medium	1	3	5	10	20	20	40

High Capacity Audio, Multi-Stream Video and Web Collaboration mode ports capacity

The Low configuration deployment is only for migrations from existing Avaya Aura® Conferencing deployments when you need to use the existing server. The Low configuration applies only to Avaya Equinox® Team Engagement deployments and supports a maximum of 200 audio-only ports with web collaboration.

The video stream uses H.264 SVC for receiving video and H.264 AVC for transmitting video. The multi-stream video uses one H.264 SVC stream for receiving and four H.264 SVC streams for transmitting video.

Deployment configuration	Port-based licenses for Over The Top deployments	Maximum support ports for audio, multi-stream video, and web collaboration			Audio-only Audio and web collaboration	
		720p*30fps video using H.264 codec and audio using G.711 codec Single active speaker window	360p*30fps video using H.264 codec and audio using G.711 codec Single active speaker window	360p*30fps video using H.264 codec and audio using G.711 codec Multi-stream 4–window switching	Audio using G.711 codec	Web collaboration
Ultra High	4	1200	1400	700	2000	2000
Ultra High	3	900	1050	525	1500	1500
High	2	600	700	350	1000	1000
Medium	1	300	350	175	500	500

Table continues…

Deployment configuration	Port-based licenses for Over The Top deployments	Maximum support ports for audio, multi-stream video, and web collaboration			Audio-only Audio and web collaboration	
		720p*30fps video using H.264 codec and audio using G.711 codec Single active speaker window	360p*30fps video using H.264 codec and audio using G.711 codec Single active speaker window	360p*30fps video using H.264 codec and audio using G.711 codec Multi-stream 4–window switching	Audio using G.711 codec	Web collaboration
Low	Only for migrations from existing Avaya Aura® Conferencing deployments	—	—	—	200	200

Ports configuration

For information about configuring ports for Equinox Media Server, see *Avaya Port Matrix — Avaya Equinox® Product Offerings* on the Avaya Support website at http://support.avaya.com/.

Specifications for peripherals and edge components

Technical specifications of Equinox H.323 Edge

Requirement	Specification
Communications	• H.323 • IPv4 • Bit rate: up to 4Mbps per call
Call capacity	• Up to 120 concurrent calls • Up to 720 registered devices
Hardware load balancers for clusters Load-balancers are optional. Load balancers are needed only when you cannot configure dual NIC virtual machines to use the built-in virtual machine clustering mechanism.	• Radware AppDirector 208 • Radware AppDirector 1000 • F5 BIG-IP Load Traffic Manager 1600 Series

Table continues…

Requirement	Specification
Firewall traversal	• H.460.18, H.460.19 including support for multiplexed media
	• Direct Public Access (DPA) solution for direct communication between internal endpoints in the internal network and external ones in the public network.
	• If the remote system has Equinox H.323 Edge Client, you can send the communications data securely through the firewall by establishing a route for the data through Equinox H.323 Edge Client
Security	H.235 for call privacy in all traversal modes, such as H.460, tunneling, and DPA

Technical specifications of Equinox Recording Gateway

Avaya Equinox® Recording Gateway (AERG) is required to facilitate audio only and content recording into Equinox Streaming and Recording. The virtual machine requires the following minimum set of resources to be available on the ESXi host before deployment (these are available on the Avaya Solutions Platform (ASP).

Table 12: Minimum VM requirements

Component	Specification
Server CPU (GHz) x physical cores	2.3 x 12
VM vCPUs (HT)	24
VM CPU reservation (MHz)	25,500
VM RAM reservation (GB)	14
Disk reservation (GB)	120
Number of NICs	2

✱ Note:

You can co-host one instance of the AERG VM with one instance of the Medium Configuration Equinox Media Server on the same ASP or equivalent server.

For all other cases, refer to the minimum VM requirements' table above for deploying the AERG OVA.

Table 13: Usage and capacity

VM Configuration	Usage	Concurrent sessions (port capacity)	Note
Low	Recording GW for High Capacity Audio (SIP to H.323)	Up to 30 audio only and content conference recordings Up to 30 pure audio only conference recordings	10 FHD Avaya Equinox® Streaming and Recording video recording ports are able to record from 18 to 65 audio and content sessions depending on the rate profile or 75 audio-only sessions. For more information, see the *Avaya Equinox® Streaming and Recording Release Notes*. May be co-hosted with Medium Configuration Equinox Media Server OVA

Related links

Technical specifications of Avaya SBCE

Capacity and scalability specification

High-capacity servers

Solutions	Server Type					
	Dell™ PowerEdge™ R640 Avaya Solutions Platform 100 series server with profile 5	Dell R630 server with TILEncore-Gx36 Intelligent Application Adapter	HP DL360 G9 server with TILEncore-Gx36 Intelligent Application Adapter	Dell™ PowerEdge™ R640 Avaya Solutions Platform 100 series server with profile 3	Dell R630 server	HP DL360 G9 server
Remote Worker Users (Sessions)	20,000 (10,000)	20,000 (7,500)	20,000 (7,500)	20,000 (8,000)	20,000 (7,500)	20,000 (7,500)

Table continues…

Solutions	Server Type					
	Dell™ PowerEdge™ R640 Avaya Solutions Platform 100 series server with profile 5	Dell R630 server with TILEncore-Gx36 Intelligent Application Adapter	HP DL360 G9 server with TILEncore-Gx36 Intelligent Application Adapter	Dell™ PowerEdge™ R640 Avaya Solutions Platform 100 series server with profile 3	Dell R630 server	HP DL360 G9 server
Avaya Equinox® Conferencing Video Sessions	800	800	800	800	800	800
TURN/STUN Audio-only Sessions	6,000	6,000	6,000	5,000	5,000	5,000
TURN/STUN Audio and Video Sessions	1,000	1,000	1,000	1,000	1,000	1,000
TURN/STUN Tunneling Audio-only Sessions	600	600	600	600	600	600
TURN/STUN Tunneling Audio and Video Sessions	300	300	300	300	300	300
HTTP Media Audio-only Tunneling Sessions	220	220	220	220	220	220
HTTP Media Audio and Video Tunneling Sessions	110	110	110	110	110	110

Mid-capacity servers

Solutions	Server Type					
	Dell™ PowerEdge™ R340 Avaya Solutions Platform 100 series server	Dell R330 server	HP DL360 G9 server	VMware ESXi 6.x-based server	Avaya Aura® Appliance Virtualization Platform	Nutanix AHV on Nutanix server
Remote Worker Users (Sessions)	5,000 (2,000)	5,000 (2,000)	5,000 (2,000)	6,000 (3,000)	6,000 (3,000)	6,000 (3,000)
Avaya Equinox® Conferencing Video Sessions	200	200	200	200	200	200
TURN/STUN Audio-only Sessions	1,200	1,200	1,200	1,800	1,200	1,200
TURN/STUN Audio and Video Sessions	300	300	300	300	300	300
TURN/STUN Tunneling Audio-only Sessions	220	220	220	220	220 (4 vCPU) 550 (10 vCPU)	220
TURN/STUN Tunneling Audio and Video Sessions	110	110	110	110	110 (4 vCPU) 275 (10 vCPU)	110
HTTP Media Audio-only Tunneling Sessions	220	220	220	220	220 (4 vCPU) 550 (10 vCPU)	220
HTTP Media Audio and Video Tunneling Sessions	110	110	110	110	110 (4 vCPU) 275 (10 vCPU)	110

Additional capacity values for high-capacity and mid-capacity servers

Avaya SBCE supports up to 250 Internet telephony service providers (ITSPs) per system.

Avaya SBCE supports up to 250 tenants per system.

Avaya SBCE supports the following reverse proxy capacities per system:

- 500 HTTP requests per second
- 50 TLS connections per second
- 2,000 concurrent webSockets

General capacity considerations

Each value in the tables represent the maximum capacity supported by Avaya SBCE for that solution and cannot be combined for overall capacity calculations.

The capacity specifications are based on:

- Codec specification: the G729 and G711 codecs are used for measuring transcoded capacities. Different codecs will have varying results.
- Call model: the SIP RFC call model in trunk mode is used to establish these capacity specifications.
- IPv4 vs. IPv6: IPv4 as the transport protocol for calculating non-encrypted sessions with trunking for the Avaya Solutions Platform 100 series server with profile 5 (Dell™ PowerEdge™ R640). With IPv6, the value may decrease by 20%.
- All the audio and video session counts are calculated by assuming Avaya SBCE anchors media. For all other platforms except Portwell CAD-0230 and Portwell CAF-0251, the performance metrics are calculated by testing with the dedicated SBCE device managed by a separate EMS.

Remote Worker capacity considerations

One exception to the standard capacity values is for remote users and Remote Worker call capacity because registration is required for Remote Worker functionality. Mixed usage of the traffic capacities for solutions will vary and must be determined based on these requirements.

While implementing Remote Worker at maximum capacity limits, set registration expiry timers in Session Manager and in every client at a minimum of 3,600 seconds or one hour.

While implementing Remote Worker at maximum capacity limits in one Avaya SBCE or HA pair, under worst-case failover conditions, re-registration for 10,000 users can take up to 20 minutes. During re-registration, all ongoing calls continue uninterrupted. However, under worst-case conditions, a user cannot receive or make new calls during this re-registration time period. Distributing users across multiple Avaya SBCE systems significantly reduces this re-registration time.

VMware ESXi capacity considerations

For VMware ESXi 6.x, it is recommended that capacities are measured with 4 CPU and 8 GB RAM. For more information, see *Deploying Avaya Session Border Controller for Enterprise on a Virtualized Environment Platform*.

Related links

Specifications for Equinox Streaming and Recording

System requirements for Equinox Streaming and Recording

Before you log on to Equinox Streaming and Recording Manager user pages (in other words, Avaya Equinox® Unified Portal), your client system must meet the system requirements listed in

Table 14: Requirements

Component	Requirement
Web browser	• Microsoft Internet Explorer 11 • Microsoft Edge™ N-1 or later • Mozilla Firefox™ N-1 or later (Mac or Windows) • Chrome™ N-1 or later (Mac, Windows, or Android) • Safari™ N-2 or later (Mac, iOS) JavaScript must be enabled.
Operating system	• Mac OS X 10.7 (Lion) or later • Windows™ 10 • iOS N-1 or later • Android 4.0.3. or later
HTMLV5 Browsers	A select number of browsers support video playback directly for MP4 VoD files including: • Microsoft Internet Explorer 11 • Safari 6™ or later • Chrome 30™ or later • Microsoft Edge™
IOS Tablet and Phones, Android Tablets and Phones, Windows Phones/Tablets	Playback function for MP4 VoD files

> ✱ **Note:**
>
> To support non-Western language character sets, install the particular language pack on the client system from which you are accessing the Equinox Streaming and Recording Manager. Refer to the operating system documentation for your system.

For the browsers and operating system combinations listed in users can play recordings without the requirement of the Adobe Flash Plugin.

Table 15: Flash Not Required

Desktop Browser	Desktop Browser version	Operating System
Google Chrome	34+	All Equinox Streaming and Recording Supportive Desktop OS (Win 10+, MAC)
Mozilla Firefox	42+	All Equinox Streaming and Recording Supportive Desktop OS (Win 10+, MAC)
Microsoft Internet Explorer	11+	Windows 10
Apple Safari	6.0+	MAC OS X 10.6+
Microsoft Edge	All	Windows 10

Related links

Minimum specifications for Equinox Streaming and Recording

The minimum specifications for Equinox Streaming and Recording are listed in the Equinox Streaming and Recording Release Notes, which are available on https://support.avaya.com/.

Related links

Chapter 6: Product compatibility

Product compatibility

For the latest and most accurate compatibility information go to https://support.avaya.com/CompatibilityMatrix/Index.aspx.

Chapter 7: Resources

Documentation

See the following related documents at http://support.avaya.com.

Title	Use this document to:	Audience
Implementing		
Deploying Avaya Equinox® Solution	Plan for and deploy Avaya Equinox® Solution	Partners, Services, and Support personnel
Deployment Guide for Avaya Equinox® H.323 Edge	Plan for and deploy Avaya Equinox® H.323 Edge	Partners, Services, and Support personnel
Deployment Guide for Avaya Room System XT Series	Plan for and deploy Avaya Room System XT Series	Partners, Services, and Support personnel
Installing and Administering Avaya Collaboration Unit CU360	Plan for and deploy Avaya Collaboration Unit CU360	Partners, Services, and Support personnel
Deployment Guide for Avaya XT Telepresence	Plan for and deploy Avaya XT Telepresence	Partners, Services, and Support personnel
Avaya Equinox® Solution Guide for Small to Medium (SMB) Enterprises	Plan for and deploy Avaya Equinox® Solution for small and medium enterprises	Partners, Services, and Support personnel
Avaya Equinox® Solution Guide for Medium to Large Enterprises	Plan for and deploy Avaya Equinox® Solution for medium and large enterprises	Partners, Services, and Support personnel
Avaya Equinox® Solution Guide for Large Enterprises and Service Providers	Plan for and deploy Avaya Equinox® Solution for large enterprises and service providers	Partners, Services, and Support personnel
Installation Notes — Discovering the IP address of the XT Server	Install XT Server	Partners, Services, and Support personnel

Table continues…

Comments on this document? infodev@avaya.com

Title	Use this document to:	Audience
Rack Mounting Guide for Avaya Scopia® Elite 6000 MCU	Install the Avaya Scopia® Elite 6000 MCU hardware	Partners, Services, and Support personnel
Avaya Aura® Core Solution Description	Overview of the Avaya Aura® components and information on the deployment of these components	Partners, Services, and Support personnel
Avaya Aura® Communication Manager Overview and Specification	Overview of Avaya Aura® Communication Manager components and information on the deployment of these components	Partners, Services, and Support personnel
Avaya Aura® Presence Services Overview and Specification	Overview of Avaya Aura® Presence Services components and information on the deployment of these components	Partners, Services, and Support personnel
Avaya Aura® Session Manager Overview and Specification	Overview of Avaya Aura® Session Manager components and information on the deployment of these components	Partners, Services, and Support personnel
Avaya Aura® System Manager Overview and Specification	Overview of Avaya Aura® System Manager components and information on the deployment of these components	Partners, Services, and Support personnel
Avaya Multimedia Messaging Overview and Specification	Overview of Avaya Multimedia Messaging components and information on the deployment of these components	Partners, Services, and Support personnel
Avaya Session Border Controller for Enterprise Overview and Specification	Overview of Avaya Session Border Controller for Enterprise components and information on the deployment of these components	Partners, Services, and Support personnel
Deploying Avaya Aura® Device Services	Plan for and deploy Avaya Aura® Device Services	Partners, Services, and Support personnel
Deploying Avaya Aura® Web Gateway	Plan for and deploy Avaya Aura® Web Gateway	Partners, Services, and Support personnel
Deploying and Updating Avaya Aura® Media Server Appliance	Plan for and deploy Avaya Aura® Media Server on either of the following appliances: • Virtual appliances: Avaya Aura® MS appliances on the Appliance Virtualization Platform or VMware® virtualized environment. • Physical appliances: Avaya Aura® MS appliances on Avaya Solutions Platform (ASP) Servers.	Partners, Services, and Support personnel

Table continues…

Comments on this document? infodev@avaya.com

Title	Use this document to:	Audience
Installing and Updating Avaya Aura® Media Server Application on Customer Supplied Hardware and OS	Plan for and deploy Avaya Aura® Media Server application. Avaya provides a non-appliance, software-only, application version of Avaya Aura® MS which is installed on servers that you provide.	
Administering		
Administrator Guide for Avaya Scopia® Elite 6000 MCU	Perform administration tasks for Avaya Scopia® Elite 6000 MCU	System administrators
Administrator Guide for Avaya Scopia® Elite 6000 MCU for Avaya Aura® Power Suite	Perform administration tasks for Avaya Scopia® Elite 6000 MCU for Avaya Aura® Power Suite	System administrators
Administering Avaya Equinox® Media Server	Perform administration tasks for Avaya Equinox® Media Server	System administrators
Administrator Guide for Avaya Equinox® Management	Perform administration tasks for Avaya Equinox® Management	System administrators
Administrator Guide for Avaya Equinox® Streaming and Recording Server	Perform administration tasks for Avaya Equinox® Streaming and Recording Server	System administrators
Quick Setup Guide for Avaya XT5000 Series Codec Only	Perform administration tasks for the Avaya XT5000 Series codec	System administrators
Avaya XT5000 Series Codec Only	Perform administration tasks for the Avaya XT5000 Series codec	System administrators
Avaya XTE240	Perform administration tasks for Avaya XTE240	System administrators
Avaya XT Series Premium 3–way Microphone Pod	Perform administration tasks for Avaya XT Series Premium 3–way Microphone Pod	System administrators
Avaya XT4300	Perform administration tasks for Avaya XT4300	System administrators
Avaya XT4300 Codec Only	Perform administration tasks for the Avaya XT4300 codec	System administrators
Avaya Room System XT7100 Codec Only	Perform administration tasks for the Avaya Room System XT7100 codec	System administrators
Avaya XT Series Deluxe Camera	Perform administration tasks for Avaya XT Series Deluxe Camera	System administrators
Avaya XT Series Flex Camera	Perform administration tasks for Avaya XT Series Flex Camera	System administrators
Quick Tips for Avaya Room System XT Series	Perform administration tasks for Avaya Room System XT Series	System administrators
Supporting		

Table continues…

Title	Use this document to:	Audience
Reference Guide for Avaya Equinox® Management XML API	Understand how to perform administration tasks on Avaya Equinox® Management	System administrators, Customers, Partners, Services, and Support personnel
SAMPLE Reference Guide for Avaya Equinox® Management XML API	Understand how to perform administration tasks on Avaya Equinox® Management	System administrators, Customers, Partners, Services, and Support personnel
Reference Guide for Avaya Equinox® Management SNMP Traps	Understand how to configure Avaya Equinox® Management to send information to a remote SNMP management client of its operational status	System administrators, Customers, Partners, Services, and Support personnel
Reference Guide for Avaya Equinox® Management CDR Files	Understand how to perform administration tasks on Avaya Equinox® Management	System administrators, Customers, Partners, Services, and Support personnel
Reference Guide for Port Security for Avaya Equinox® Solution	Understand how to perform the administration tasks on Avaya Equinox® Solution	System administrators, Customers, Partners, Services, and Support personnel
Avaya WebRTC Snap-in Reference	Understand how to perform the administration tasks on Avaya WebRTC Snap-in	System administrators, Customers, Partners, Services, and Support personnel
Using		
User Guide for Avaya Equinox® Management	Understand the features of and use Avaya Equinox® Management	Customers
Using Avaya Equinox® Unified Portal	Understand the features of and use Avaya Equinox® Unified Portal	Customers
User Guide for Avaya Equinox® H.323 Edge Client	Understand the features of and use Avaya Equinox® H.323 Edge Client	Customers
User Guide for Avaya Room System XT Series	Understand the features of and use Avaya Room System XT Series	Customers
Using Avaya Collaboration Unit CU360	Understand the features of and use Avaya Collaboration Unit CU360	Customers
Avaya Collaboration Unit CU360 Quick Setup Guide	Understand the features of and use Avaya Collaboration Unit CU360	Customers

Table continues…

Title	Use this document to:	Audience
Avaya Collaboration Unit CU360 Quick Tips Guide	Understand the features of and use Avaya Collaboration Unit CU360	Customers
Using Avaya Collaboration Control for Android	Understand the features of and use Avaya Collaboration Control	Customers
Using Avaya Collaboration Control for iOS	Understand the features of and use Avaya Collaboration Control	Customers

Finding documents on the Avaya Support website

Procedure

1. Go to https://support.avaya.com.

2. At the top of the screen, type your username and password and click **Login**.

3. Click **Support by Product** > **Documents**.

4. In **Enter your Product Here**, type the product name and then select the product from the list.

5. In **Choose Release**, select the appropriate release number.

   The **Choose Release** field is not available if there is only one release for the product.

6. In the **Content Type** filter, click a document type, or click **Select All** to see a list of all available documents.

   For example, for user guides, click **User Guides** in the **Content Type** filter. The list only displays the documents for the selected category.

7. Click **Enter**.

Accessing the port matrix document

Procedure

1. Go to https://support.avaya.com.

2. Log on to the Avaya website with a valid Avaya user ID and password.

3. On the Avaya Support page, click **Support By Product** > **Documents**.

4. In **Enter Your Product Here**, type the product name, and then select the product from the list of suggested product names.

5. In **Choose Release**, select the required release number.

6. In the **Content Type** filter, select one or more of the following categories:

   • **Application & Technical Notes**

   • **Design, Development & System Mgt**

The list displays the product-specific Port Matrix document.

7. Click **Enter**.

Avaya Documentation Center navigation

The latest customer documentation for some programs is now available on the Avaya Documentation Center website at https://documentation.avaya.com.

❗ **Important:**

For documents that are not available on Avaya Documentation Center, click **More Sites** > **Support** on the top menu to open https://support.avaya.com.

Using the Avaya Documentation Center, you can:

- Search for content by doing one of the following:

  - Click **Filters** to select a product and then type key words in**Search**.

  - From **Products & Solutions**, select a solution category and product, and then select the appropriate document from the list.

- Sort documents on the search results page.

- Click **Languages** (⊕) to change the display language and view localized documents.

- Publish a PDF of the current section in a document, the section and its subsections, or the entire document.

- Add content to your collection by using **My Docs** (☆).

  Navigate to the **Manage Content** > **My Docs** menu, and do any of the following:

  - Create, rename, and delete a collection.

  - Add topics from various documents to a collection.

  - Save a PDF of selected content in a collection and download it to your computer.

  - Share content in a collection with others through email.

  - Receive collection that others have shared with you.

- Add yourself as a watcher using the **Watch** icon (👁).

  Navigate to the **Manage Content** > **Watchlist** menu, and do the following:

  - Enable **Include in email notification** to receive email alerts.

  - Unwatch selected content, all content in a document, or all content on the Watch list page.

  As a watcher, you are notified when content is updated or deleted from a document, or the document is removed from the website.

- Share a section on social media platforms, such as Facebook, LinkedIn, and Twitter.

• Send feedback on a section and rate the content.

> **Note:**
>
> Some functionality is only available when you log on to the website. The available functionality depends on the role with which you are logged in.

Training

The following courses are available on the Avaya Learning website at <u>http://www.avaya-learning.com</u>. After logging in to the website, enter the course code or the course title in the **Search** field and press **Enter** or click **>** to search for the course.

Course code	Course title
Avaya Equinox® administration training course	
2038W	Avaya Equinox® Administration
Avaya Equinox® Team Engagement solution courses	
3140W	Avaya Equinox® Solutions Overview
3170W	Avaya Equinox® Solutions Customer Field Study
3171T	APDS Avaya Enterprise Team Engagement Solutions Online Test
Avaya Equinox® Over The Top solution courses	
3281W	Avaya Video Conferencing Solutions Overview
3283W	Avaya Video Conferencing Solutions Customer Field Study
3271T	APDS Avaya Video Conferencing Solutions Online Test
Avaya Equinox® Sales course	
3140WD02	Designing Avaya Equinox® Clients & Breeze Client SDK Sales Readiness Quiz
3140WD03	Avaya Equinox® Sales Readiness — Design Delta Training

Support

Go to the Avaya Support website at <u>https://support.avaya.com</u> for the most up-to-date documentation, product notices, and knowledge articles. You can also search for release notes, downloads, and resolutions to issues. Use the online service request system to create a service request. Chat with live agents to get answers to questions, or request an agent to connect you to a support team if an issue requires additional expertise.

Using the Avaya InSite Knowledge Base

The Avaya InSite Knowledge Base is a web-based search engine that provides:

- Up-to-date troubleshooting procedures and technical tips

- Information about service packs

- Access to customer and technical documentation

- Information about training and certification programs

- Links to other pertinent information

If you are an authorized Avaya Partner or a current Avaya customer with a support contract, you can access the Knowledge Base without extra cost. You must have a login account and a valid Sold-To number.

Use the Avaya InSite Knowledge Base for any potential solutions to problems.

1. Go to http://www.avaya.com/support.

2. Log on to the Avaya website with a valid Avaya user ID and password.

   The system displays the Avaya Support page.

3. Click **Support by Product** > **Product-specific Support**.

4. In **Enter Product Name**, enter the product, and press Enter.

5. Select the product from the list, and select a release.

6. Click the **Technical Solutions** tab to see articles.

7. Select relevant articles.

Glossary

1080p	See [Full HD](#) on page 126.
720p	See [HD](#) on page 128.
AAC	Avaya Aura® Conferencing is an enterprise conferencing and collaboration product providing ondemand audio, video, and Web conferencing and advanced conference controls for a seamless unified communications experience. The AAC video conferencing supports high-definition resolutions up to 720p through a software video routing technology that is based on the H.264 AVC and SVC standard. The distributed architecture of AAC utilizes advanced bandwidth management and optimization techniques where Avaya Aura® Media Servers are deployed at the edge of the network to optimize the WAN bandwidth usage. This supports large scale, high quality audio and video conferencing in an enterprise network.
AGC (Automatic Gain Control)	Automatic Gain Control (AGC) smooths audio signals through normalization, by lowering sounds which are too strong and strengthening sounds which are too weak. This is relevant with microphones situated at some distance from the speaker, like room systems. The result is a more consistent audio signal within the required range of volume.
Alias	An alias in H.323 represents the unique name of an endpoint. Instead of dialing an IP address to reach an endpoint, you can dial an alias, and the gatekeeper resolves it to an IP address.
Auto-Attendant	Auto-Attendant is a video-based IVR which provides quick access to meetings through a set of visual menus. Participants can select the DTMF tone-based menu options using the standard numeric keypads of endpoints. Auto-Attendant works with H.323 and SIP endpoints.
Avaya Content Slider	See [Content Slider](#) on page 123.
Avaya Equinox® Streaming and Recording Manager	The Avaya Equinox® Streaming and Recording Manager provides a web-based interface to configure and manage Equinox Streaming and Recording Server software, devices, services, and users. The Equinox Streaming and Recording Server Manager application resides on a single hardware platform and provides access to all content in the Equinox Streaming and Recording Server environment.

Avaya Equinox® Streaming and Recording Manager Portals	The Equinox Streaming and Recording Server Manager provides a portal for administering content. When you log in to the web interface, you can access the Administrator portal.
Balanced Microphone	A balanced microphone uses a cable that is built to reduce noise and interference even when the cable is long. This reduces audio disruptions resulting from surrounding electromagnetic interference.
Bitrate	Bitrate is the speed of data flow. Higher video resolutions require higher bitrates to ensure the video is constantly updated, thereby maintaining smooth motion. If you lower the bitrate, you lower the quality of the video. In some cases, you can select a lower bitrate without noticing a significant drop in video quality; for example during a presentation or when a lecturer is speaking and there is very little motion. Bitrate is often measured in kilobits per second (kbps).
Call Control	See Signaling on page 133.
Cascaded Videoconference	A cascaded videoconference is a meeting distributed over more than one physical Scopia Elite MCU and/or Equinox Media Server, where a master MCU/Media Server connects to one or more slave MCUs/Media Servers to create a single videoconference. It increases the meeting capacity by combining the resources of several MCUs/Media Servers. This can be especially useful for distributed deployments across several locations, reducing bandwidth usage.
CDN	Equinox Streaming and Recording enables you to publish content to the cloud, using a virtual delivery node (VDN) and a content delivery network (CDN). The VDN and the network of the CDN act as one delivery mechanism. When a user creates a recording (program), they can choose to distribute it to the CDN, as well as to the regular delivery node (DN).
CIF	CIF, or Common Intermediate Format, describes a video resolution of 352 × 288 pixels (PAL) or 352 x 240 (NTSC). This is sometimes referred to as Standard Definition (SD).
Conference Point	The Avaya Equinox® Streaming and Recording Conference Point is a video conferencing gateway appliance that captures standard or high definition video conferences. It transcodes, creates, and records the video conferences in a streaming media format. You can use it to capture H.323 video for instant video webcasting or on-demand publishing.
Content Slider	The Avaya Content Slider stores the data already presented in the videoconference and makes it available for participants to view during the meeting.

Continuous Presence	Continuous presence enables viewing multiple participants of a videoconference at the same time, including the active speaker. This graphics-intensive work requires scaling and mixing the images together into one of the predefined video layouts. The range of video layouts depends on the type of media processing supported, typically located in the MCU/Media Server.
Control	Control, or media control, sets up and manages the media of a call (its audio, video and data). Control messages include checking compatibility between endpoints, negotiating video and audio codecs, and other parameters like resolution, bitrate and frame rate. Control is communicated via H.245 in H.323 endpoints, or by SDP in SIP endpoints. Control occurs within the framework of an established call, after signaling.
CP	See Continuous Presence on page 124.
Dedicated Endpoint	A dedicated endpoint is a hardware endpoint for videoconferencing assigned to a single user. It is often referred to as a personal or executive endpoint, and serves as the main means of video communications for this user. For example, Avaya XTE240. It is listed in the organization's LDAP directory as associated exclusively with this user.
Delivery Node	The Avaya Equinox® Streaming and Recording Delivery Node provides on-demand and broadcast video delivery. You can use it alone or in a hierarchy of devices. It supports thousands of concurrent streams. The Delivery Node uses intelligent routing, content caching, and inherent redundancy to ensure transparent delivery of high-quality video.
Dial Plan	A dial plan defines a way to route a call and to determine its characteristics. In traditional telephone networks, prefixes often denote geographic locations. In videoconferencing deployments, prefixes are also used to define the type and quality of a call. For example, dial 8 before a number for a lower bandwidth call, or 6 for an audio-only call, or 5 to route the call to a different branch.
Dial Prefix	A dial prefix is a number added at the beginning of a dial string to route it to the correct destination, or to determine the type of call. Dial prefixes are defined in the organization's dial plan. For example, dial 9 for an outside line, or dial 6 for an audio only call.
Distributed Deployment	A distributed deployment describes a deployment where the solution components are geographically distributed in more than one network location.
DNS Server	A DNS server is responsible for resolving domain names in your network by translating them into IP addresses.

DTMF	DTMF, or touch-tone, is the method of dialing on touch-tone phones, where each number is translated and transmitted as an audio tone.
Dual Video	Dual video is the transmitting of two video streams during a videoconference, one with the live video while the other is a shared data stream, like a presentation.
Dynamic Video Layout	The dynamic video layout is a meeting layout that switches dynamically to include the maximum number of participants it can display on the screen (up to 9 on the XT Series, or up to 28 on Scopia Elite MCU and/or Equinox Media Server). The largest image always shows the active speaker.
Endpoint	An endpoint is a tool through which people can participate in a videoconference. Its display enables you to see and hear others in the meeting, while its microphone and camera enable you to be seen and heard by others. Endpoints include dedicated endpoints, like Avaya XTE240, software endpoints, mobile device endpoints, room systems like XT Series, and telepresence systems like Avaya XT Telepresence.
Endpoint Alias	See Alias on page 122.
FEC	Forward Error Correction (FEC) is a proactive method of sending redundant information in the video stream to preempt quality degradation. FEC identifies the key frames in the video stream that should be protected by FEC. There are several variants of the FEC algorithm. The Reed-Solomon algorithm (FEC-RS) sends redundant packets per block of information, enabling the sender (like the Scopia Elite MCU and/or Equinox Media Server) to manage up to ten percent packet loss in the video stream with minimal impact on the smoothness and quality of the video.
FECC	Far End Camera Control (FECC) is a feature of endpoint cameras, where the camera can be controlled remotely by another endpoint in the call.
Forward Error Correction	See FEC on page 125.
FPS	See Frames Per Second on page 125.
Frame Rate	See Frames Per Second on page 125.
Frames Per Second	Frames Per Second (fps), also known as the frame rate, is a key measure in video quality, describing the number of image updates per second. The average human eye can register up to 50 frames per second. The higher the frame rate, the smoother the video.
FTP	The File Transfer Protocol (FTP) is a standard network protocol used to transfer computer files from one host to another host over a TCP-based

network, such as the Internet. FTP is built on a client-server architecture and uses separate control and data connections between the client and the server. FTP users may authenticate themselves using a clear-text sign-in protocol, normally in the form of a username and password, but can connect anonymously if the server is configured to allow it.

Full HD
Full HD, or Full High Definition, also known as 1080p, describes a video resolution of 1920 x 1080 pixels.

Full screen Video Layout
The full screen view shows one video image. Typically, it displays the remote presentation, or, if there is no presentation, it displays the other meeting participant(s).

Gatekeeper
A gatekeeper routes audio and video H.323 calls by resolving dial strings (H.323 alias or URI) into the IP address of an endpoint, and handles the initial connection of calls. Gatekeepers also implement the dial plan of an organization by routing H.323 calls depending on their dial prefixes. Equinox Management includes a built-in Avaya Equinox H.323 Gatekeeper, while H.323 Gatekeeper is a standalone gatekeeper.

Gateway
A gateway is a component in a video solution which routes information between two subnets or acts as a translator between different protocols. For example, a gateway can route data between the headquarters and a partner site, or between two protocols like the 100 Gateway and another.

Geographic Redundancy
Geographic redundancy is a deployment of a redundant server in a geographically different location in case a local disaster happens. This server is an addition to the local high availability servers.

GLAN
GLAN, or gigabit LAN, is the name of the network port on the XT Series. It is used on the XT Series to identify a 10/100/1000MBit ethernet port.

H.225
H.225 is part of the set of H.323 protocols. It defines the messages and procedures used by gatekeepers to set up calls.

H.235
H.235 is the protocol used to authenticate trusted H.323 endpoints and encrypt the media stream during meetings.

H.239
H.239 is a widespread protocol used with H.323 endpoints, to define the additional media channel for data sharing (like presentations) alongside the videoconference, and ensures only one presenter at a time.

H.243
H.243 is the protocol used with H.323 endpoints enabling them to remotely manage a videoconference.

H.245
H.245 is the protocol used to negotiate call parameters between endpoints, and can control a remote endpoint from your local endpoint. It is part of the H.323 set of protocols.

H.261	H.261 is an older protocol used to compress CIF and QCIF video resolutions. This protocol is not supported by the XT Series.
H.263	H.263 is an older a protocol used to compress video. It is an enhancement to the H.261 protocol.
H.264	H.264 is a widespread protocol used with SIP and H.323 endpoints, which defines video compression. Compression algorithms include 4x4 transforms and a basic motion comparison algorithm called P-slices. There are several profiles within H.264. The default profile is the H.264 Baseline Profile, but H.264 High Profile uses more sophisticated compression techniques.
H.264 Baseline Profile	See H.264 on page 127.
H.264 High Profile	H.264 High Profile is a standard for compressing video by up to 25% over the H.264 Baseline Profile, enabling high definition calls to be held over lower call speeds. It requires both sides of the transmission (sending and receiving endpoints) to support this protocol. H.264 High Profile uses compression algorithms like:

- CABAC compression (Context-Based Adaptive Binary Arithmetic Coding)
- 8x8 transforms which more effectively compress images containing areas of high correlation

These compression algorithms demand higher computation requirements, which are offered with the dedicated hardware available in Equinox Solution components. Using H.264 High Profile in videoconferencing requires that both the sender and receiver's endpoints support it. This is different from SVC which is an adaptive technology working to improve quality even when only one side supports the standard.

H.320	H.320 is a protocol for defining videoconferencing over ISDN networks.
H.323	H.323 is a widespread set of protocols governing the communication between endpoints in videoconferences and point-to-point calls. It defines the call signaling, control, media flow, and bandwidth regulation.
H.323 Alias	See Alias on page 122.
H.350	H.350 is the protocol used to enhance LDAP user databases to add video endpoint information for users and groups.
H.460	H.460 enhances the standard H.323 protocol to manage firewall and NAT traversal using ITU-T standards. H.460–compliant endpoints can directly communicate with Equinox H.323 Edge. The endpoints act as H.460 clients and Equinox H.323 Edge acts as an H.460 server.

HD	A HD ready device describes its high definition resolution capabilities of 720p, a video resolution of 1280 x 720 pixels.
High Availability	High availability is a state where you ensure better service and less downtime by deploying additional servers. There are several strategies for achieving high availability, including deployment of redundant servers managed by load balancing systems.
High Definition	See HD on page 128.
High Profile	See H.264 High Profile on page 127.
HTTP	The Hypertext Transfer Protocol (HTTP) is an application protocol for distributed, collaborative, hypermedia information systems. HTTP is the foundation of data communication for the World Wide Web.
	Hypertext is structured text that uses logical links (hyperlinks) between nodes containing text. HTTP is the protocol to exchange or transfer hypertext.
HTTPS	HTTPS is the secured version of the standard web browser protocol HTTP. It secures communication between a web browser and a web server through authentication of the web site and encrypting communication between them. For example, you can use HTTPS to secure web browser access to the web interface of many Equinox Solution products.
Image Resolution	See Resolution on page 132.
IVR	Pre-recorded greetings to participants and announcements as each new participant joins a meeting. You can record messages to provide custom greetings and announcements, but typically Equinox Management supplies these messages across all media servers in the organization.
kbps	Kilobits per second (kbps) is the standard unit to measure bitrate, measuring the throughput of data communication between two devices. Since this counts the number of individual bits (ones or zeros), you must divide by eight to calculate the number of kilobytes per second (KBps).
KVM	Kernel-based Virtual Machine
LDAP	LDAP is a widespread standard database format which stores network users. The format is hierarchical, where nodes are often represented as *branch location > department > sub-department*, or *executives > managers > staff members*. The database standard is employed by most user directories including Microsoft Active Directory. H.350 is an extension to the LDAP standard for the videoconferencing industry.
Lecture Mode	Lecture mode allows the participant defined as the lecturer to see all the participants, while they see only the lecturer. All participants are muted

except the lecturer, unless a participant asks permission to speak and is unmuted by the lecturer. This mode is tailored for distance learning, but you can also use it for other purposes like when an executive addresses employees during company-wide gatherings.

Legacy endpoints	Legacy endpoints are H.323–based endpoints that do not support H.460.
Load balancer	A load balancer groups together a set (or cluster) of servers to give them a single IP address, known as a virtual IP address. It distributes client service requests amongst a group of servers. It distributes loads according to different criteria such as bandwidth, CPU usage, or cyclic (round robin). Load balancers are also known as application delivery controllers (ADC).
Location	A location is a physical space (building) or a network (subnet) where video devices can share a single set of addresses. A distributed deployment places these components in different locations, often connected via a VPN.
Management	Management refers to the administration messages sent between components of the Equinox Solution as they manage and synchronize data between them. Management also includes front-end browser interfaces configuring server settings on the server. Management messages are usually transmitted via protocols like HTTP, SNMP, FTP or XML. For example, Equinox Management uses management messages to monitor the activities of an MCU/Media Server, or when it authorizes the MCU/Media Server to allow a call to proceed.
MBps	Megabytes per second (MBps) is a unit of measure for the bitrate. The bitrate is normally quoted as kilobits per second (kbps) and then converted by dividing it by eight to reach the number of kilobytes per second (KBps) and then by a further 1000 to calculate the MBps.
MCU	A Multipoint Control Unit (MCU) connects several endpoints to a single videoconference. It can manage multiple separate conferences simultaneously. It manages the audio mixing and creates the video layouts, adjusting the output to suit each endpoint's capabilities (transcoding). The term MCU refers to any Avaya or third party MCU.
Media	Media refers to the live audio, video and shared data streams sent during a call. Presentation and Far end camera control (FECC) are examples of information carried on the data stream. Media is transmitted via the RTP and RTCP protocols in both SIP and H.323 calls. The parallel data stream of both live video and presentation, is known as dual video.
Media Control	See
Media Server	A Media Server connects several endpoints to a single videoconference and can manage multiple separate conferences simultaneously. It

manages the audio mixing and creates the video layouts, adjusting the output to suit each endpoint's capabilities (transcoding). The term Media Server refers to Avaya Equinox® Media Server. See also MCU.

Meeting type   Meeting types (also known as MCU/Media Server services) are meeting templates which determine the core characteristics of a meeting. For example, they determine if the meeting is audio only or audio and video, they determine the default video layout, the type of encryption, PIN protection and many other features. You can invoke a meeting type by dialing its prefix in front of the meeting ID. Meeting types are created and stored in the Avaya Equinox® Media Server, with additional properties in Equinox Management.

Moderator   A moderator has special rights in a videoconference, including blocking the sound and video of other participants, inviting new participants, disconnecting others, determining video layouts, and closing meetings. An owner of a virtual room is the moderator when the room is protected by a PIN. Without this protection, any participant can assume moderator rights.

MTU   The MTU, or Maximum Transmission Unit, is the maximum size of data packets sent around your network. This value must remain consistent for all network components, including servers like the MCU and/or Equinox Media Server and endpoints like XT Series and other network devices like network routers.

Multi-Point   A multi-point conference has more than two participants.

Multi-tenant   Service provider, or multi-tenant, deployments enable one installation to manage multiple organizations. All the organizations can reside as tenants within a single service provider deployment. For example, Equinox Management can manage a separate set of users for each organization, separate local administrators, separate bandwidth policies etc. all within a single multi-tenant installation.

NAT   A NAT, or Network Address Translation device, translates external IP addresses to internal addresses housed in a private network. This enables a collection of devices like endpoints in a private network, each with their own internal IP address, can be represented publicly by a single, unique IP address. The NAT translates between public and private addresses, enabling users toplace calls between public network users and private network users.

NetSense   NetSense is a proprietary Equinox Solution technology which optimizes the video quality according to the available bandwidth to minimize packet loss. As the available bandwidth of a connection varies depending on data traffic, NetSense's sophisticated algorithm dynamically scans the

video stream, and then reduces or improves the video resolution to maximize quality with the available bandwidth.

Nonce

A parameter that varies with time. A nonce can be a time stamp, a visit counter on a web page, or a special marker intended to limit or prevent the unauthorized replay or reproduction of a file.

Because a nonce changes with time, it is easy to tell whether or not an attempt at replay or reproduction of a file is legitimate; the current time can be compared with the nonce. If it does not exceed it or if no nonce exists, then the attempt is authorized. Otherwise, the attempt is not authorized.

In SSL / TLS, a nonce is a 32-bit timestamp and a 28-byte random field that is used during key exchange to prevent replay attacks.

OVA

Open Virtualization Appliance. An OVA contains the virtual machine description, disk images, and a manifest zipped into a single file. The OVA follows the Distributed Management Task Force (DMTF) specification.

Over The Top deployments

Over The Top deployments of Avaya Equinox® Solution are independent of Avaya Aura®. The deployments use port-based licensing.

Over The Top deployments are also called standalone deployments.

Packet Loss

Packet loss occurs when some of the data transmitted from one endpoint is not received by the other endpoint. This can be caused by narrow bandwidth connections or unreliable signal reception on wireless networks.

PaP Video Layout

The PaP (Picture and Picture) view shows up to three images of the same size.

Phantom Power

Microphones which use phantom power draw their electrical power from the same cable as the audio signal. For example, if your microphone is powered by a single cable, it serves both to power the microphone and transmit the audio data. Microphones which have two cables, one for sound and a separate power cable, do not use phantom power.

PiP Video Layout

The PiP (Picture In Picture) view shows a video image in the main screen, with an additional smaller image overlapping in the corner. Typically, a remote presentation is displayed in the main part of the screen, and the remote video is in the small image. If the remote endpoint does not show any content, the display shows the remote video in the main part of the screen, and the local presentation in the small image.

PLDS

Avaya's Product Licensing Delivery System

Point-to-Point	Point-to-point is a feature where only two endpoints communicate with each other without using MCU/Media Server resources.
PoP Video Layout	The PoP (Picture out Picture) view shows up to three images of different size, presented side by side, where the image on the left is larger than the two smaller images on the right.
Prefix	See [Dial Prefix](#) on page 124.
PTZ Camera	A PTZ camera can pan to swivel horizontally, tilt to move vertically, and optically zoom to devote all the camera's pixels to one area of the image. For example, the XT Standard Camera is a PTZ camera with its own power supply and remote control, and uses powerful lenses to achieve superb visual quality. In contrast, fixed cameras like webcams only offer digital PTZ, where the zoom crops the camera image, displaying only a portion of the original, resulting in fewer pixels of the zoomed image, which effectively lowers the resolution. Fixed cameras also offer digital pan and tilt only after zooming, where you can pan up to the width or length of the original camera image.
QCIF	QCIF, or Quarter CIF, defines a video resolution of 176 × 144 pixels (PAL) or 176 x 120 (NTSC). It is often used in older mobile handsets (3G-324M) limited by screen resolution and processing power.
Redundancy	Redundancy is a way to deploy a network component, in which you deploy extra units as 'spares', to be used as backups in case one of the components fails.
Registrar	A SIP Registrar manages the SIP domain by requiring that all SIP devices register their IP addresses with it. For example, once a SIP endpoint registers its IP address with the Registrar, it can place or receive calls with other registered endpoints.
Resolution	Resolution, or image/video resolution, is the number of pixels which make up an image frame in the video, measured as the number of horizontal pixels x the number of vertical pixels. Increasing resolution improves video quality but typically requires higher bandwidth and more computing power. Techniques like SVC, H.264 High Profile and FEC reduce bandwidth usage by compressing the data to a smaller footprint and compensating for packet loss.
Restricted Mode	Restricted mode is used for ISDN endpoints only, when the PBX and line uses a restricted form of communication, reserving the top 8k of each packet for control data only. If enabled, the bandwidth values on these lines are in multiples of 56kbps, instead of multiples of 64kbps.
Room System	A room system is a hardware videoconferencing endpoint installed in a physical conference room. Essential features include its camera's ability to PTZ (pan, tilt, zoom) to allow maximum flexibility of camera angles

enabling participants to see all those in the meeting room or just one part of the room.

RTCP

Real-time Control Transport Protocol, used alongside RTP for sending statistical information about the media sent over RTP.

RTP

RTP or Real-time Transport Protocol is a network protocol which supports video and voice transmission over IP. It underpins most videoconferencing protocols today, including H.323, SIP and the streaming control protocol known as RTSP. The secured version of RTP is SRTP.

RTSP

RTSP or Real-Time Streaming Protocol controls the delivery of streamed live or playback video over IP, with functions like pause, fast forward and reverse. While the media itself is sent via RTP, these control functions are managed by RTSP

Sampling Rate

The sampling rate is a measure of the accuracy of the audio when it is digitized. To convert analog audio to digital, it must collect or sample the audio at specific intervals. As the rate of sampling increases, it raises audio quality.

SBC

A Session Border Controller (SBC) is a relay device between two different networks. It can be used in firewall/NAT traversal, protocol translations and load balancing.

SD

Standard Definition (SD), is a term used to refer to video resolutions which are lower than HD. There is no consensus defining one video resolution for SD.

Service

Also known as MCU/Media Server service. See Meeting type on page 130.

SIF

SIF defines a video resolution of 352 x 240 pixels (NTSC) or 352 x 288 (PAL). This is often used in security cameras.

Signaling

Signaling, also known as call control, sets up, manages and ends a connection or call. These messages include the authorization to make the call, checking bandwidth, resolving endpoint addresses, and routing the call through different servers. Signaling is transmitted via the H.225.0/Q.931 and H.225.0/RAS protocols in H.323 calls, or by the SIP headers in SIP calls. Signaling occurs before the control aspect of call setup.

Single Sign On

Single Sign On (SSO) automatically uses your network login and password to access different enterprise systems. Using SSO, you do not need to separately login to each system or service in your organization.

SIP

Session Initiation Protocol (SIP) is a signaling protocol for starting, managing and ending voice and video sessions over TCP, TLS or UDP.

	Videoconferencing endpoints typically are compatible with SIP or H.323, and in some cases (like Avaya Room System XT Series), an endpoint can be compatible with both protocols. As a protocol, it uses fewer resources than H.323.
SIP Registrar	See [Registrar](#) on page 132.
SIP Server	A SIP server is a network device communicating via the SIP protocol.
SIP URI	See [URI](#) on page 136.
Slider	See [Content Slider](#) on page 123.
SNMP	Simple Network Management Protocol (SNMP) is a protocol used to monitor network devices by sending messages and alerts to their registered SNMP server.
Software endpoint	A software endpoint turns a computer or portable device into a videoconferencing endpoint via a software application only. It uses the system's camera and microphone to send image and sound to the other participants, and displays their images on the screen.
SQCIF	SQCIF defines a video resolution of 128 x 96 pixels.
SRTP	Secure Real-time Transport Protocol (SRTP) adds security to the standard RTP protocol, which is used to send media (video and audio) between devices in SIP calls. It offers security with encryption, authentication and message integrity. The encryption uses a symmetric key generated at the start of the call, and being symmetric, the same key locks and unlocks the data. So to secure transmission of the symmetric key, it is sent safely during call setup using TLS.
SSO	See [Single Sign On](#) on page 133.
Standard Definition	See [SD](#) on page 133.
Streaming	Streaming is a method to send live or recorded videoconferences in one direction to viewers. Recipients can only view the content; they cannot participate with a microphone or camera to communicate back to the meeting.
STUN	A STUN server enables you to directly dial an endpoint behind a NAT or firewall by giving that computer's public internet address.
SVC	SVC extends the H.264 codec standard to dramatically increase error resiliency and video quality without the need for higher bandwidth. It is especially effective over networks with high packet loss (like wireless networks) which deliver low quality video. It splits the video stream into layers, comprising a small base layer and then additional layers on top which enhance resolution, frame rate and quality. Each additional layer is

only transmitted when bandwidth permits. This allows for a steady video transmission when available bandwidth varies, providing better quality when the bandwidth is high, and adequate quality when available bandwidth is poor.

SVGA   SVGA defines a video resolution of 800 x 600 pixels.

Switched video   Switching is the process of redirecting video as-is without transcoding, so you see only one endpoint's image at a time, usually the active speaker, without any video layouts or continuous presence (CP). Using video switching increases the port capacity of Scopia Elite MCU and Avaya Equinox® Media Server equal to the number of standard definition ports.

> ❗ **Important:**
>
> Use switched video only when all endpoints participating in the videoconference support the same resolution. If a network experiences high packet loss, switched video might not be displayed properly for all endpoints in the videoconference.

SXGA   SXGA defines a video resolution of 1280 x 1024 pixels.

Team Engagement deployments   Team Engagement deployments of Avaya Equinox® Solution are integrated with Avaya Aura®. The deployments use user-based licensing for the main components.

Telepresence   A telepresence system combines two or more endpoints together to create a wider image, simulating the experience of participants being present in the same room. Telepresence systems always designate one of the endpoints as the primary monitor/camera/codec unit, while the remainder are defined as auxiliary or secondary endpoints. This ensures that you can issue commands via a remote control to a single codec base which leads and controls the others to work together as a single telepresence endpoint.

Telepresence - Dual row telepresence room   Dual row telepresence rooms are large telepresence rooms with two rows of tables that can host up to 18 participants.

TLS   TLS enables network devices to communicate securely using certificates, to provide authentication of the devices and encryption of the communication between them.

Transcoding   Transcoding is the process of converting video into different sizes, resolutions or formats. This enables multiple video streams to be combined into one view, enabling continuous presence, as in a typical videoconferencing window.

Unbalanced Microphone	An unbalanced microphone uses a cable that is not especially built to reduce interference when the cable is long. As a result, these unbalanced line devices must have shorter cables to avoid audio disruptions.
Unicast Streaming	Unicast streaming sends a separate stream of a videoconference to each viewer. This is the default method of streaming.
Unified Portal	Unified Portal is a graphic user interface (GUI) for Avaya Equinox® Solution users. Using this GUI, users can schedule and attend meetings. They can also access their recordings and broadcasts. It is the typical way that users interact with and access Avaya Equinox® Streaming and Recording. There is a user guide for Unified Portal available on https://support.avaya.com/. Avaya recommends distributing this guide to all users.
URI	URI is an address format where the address consists of the endpoint's name or number, followed by the domain name of the server to which the endpoint is registered, such as <endpoint name>@<server_domain_name>. For example, 5000@198.51.100.51.
URI Dialing	Accessing a device via its URI on page 136.
User profile	A user profile is a set of capabilities or parameter values which can be assigned to a user. This includes available meeting types (services), access to functionality, and allowed bandwidth for calls.
UUID	Universally unique identifier
VAPP	Virtual Application Instance
VGA	VGA defines a video resolution of 640 x 480 pixels.
Video Layout	A video layout is the arrangement of participant images as they appear on the monitor in a videoconference. If the meeting includes a presentation, a layout can also refer to the arrangement of the presentation image together with the meeting participants.
Video Resolution	See Resolution on page 132.
Video Switching	See Switched video on page 135.
Videoconference	A videoconference is a meeting of more than two participants with audio and video using endpoints. Professional videoconferencing systems can handle many participants in single meetings, and multiple simultaneous meetings, with a wide interoperability score to enable a wide variety of endpoints to join the same videoconference. Typically you can also share PC content, like presentations, to other participants.
Viewer Portal	The Avaya Equinox® Streaming and Recording Viewer Portal is embedded in the Unified Portal. To access the Viewer Portal, you can

select **Recordings and Events** on the main page of the Unified Portal. From the Viewer Portal, you can watch recordings and navigate through the categories.

Virtual Delivery Node	The Avaya Equinox® Streaming and Recording Virtual Delivery Node (VDN) is a device to push content to an external Content Delivery Network (CDN). The method for publishing content to a CDN is tightly coupled to the Avaya Equinox® Streaming and Recording platform which allows a company's video assets to be managed from a central location.
	If you want to use a VDN and a CDN, you must buy cloud storage and services from Highwinds, with the appropriate bandwidth and capacity for your needs. You apply the credentials you receive from Highwinds in the Avaya Equinox® Streaming and Recording Manager to securely access the CDN.
Virtual Room	A virtual room offers a virtual meeting place for instant or scheduled videoconferences. An administrator can assign a virtual room to each member of the organization. Users can send invitations to each other via a web link which brings you directly into their virtual room. Virtual meeting rooms are also dialed like phone extension numbers, where a user's virtual room number is often based on that person's phone extension number. You can personalize your virtual room with PIN numbers, custom welcome slides and so on. External participants can use a zero-download web application to access a registered user's virtual room and participate in a videoconference.
VISCA Cable	A crossed VISCA cable connects two PTZ cameras to enable you to use the same remote control on both.
Waiting Room	A waiting room is a holding place for participants waiting for the host or moderator to join the meeting. While waiting, participants see a static image with the name of the owner's virtual room, with an optional audio message periodically saying the meeting will start when the host arrives.
Webcast	A webcast is a streamed live broadcast of a videoconference over the internet. Enable webcasts by enabling the streaming feature. To invite users to the webcast, send an email or instant message containing the webcast link or a link to the Unified Portal and the meeting ID.
WUXGA	WUXGA defines a video resolution of 1920 x 1200 pixels.
XGA	XGA defines a Video resolution of 1024 x 768 pixels.
Zone	Gatekeepers like H.323 Gatekeeper split endpoints into zones, where a group of endpoints in a zone are registered to a gatekeeper. Often a zone is assigned a dial prefix, and usually corresponds to a physical location like an organization's department or branch.