Avaya Equinox Solution Guide for Small to Medium (SMB) Enterprises

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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

Overview

The 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, along with 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 Equinox™ for Android, iOS, Mac, and Windows with its rich user capabilities for UC deployments.
- Avaya Breeze™ SDK / API enabling conferencing and collaboration features to be embedded as part of business processes and applications.

The result is Equinox Solution, a software-based (with the exception of Equinox Streaming and Recording, and Scopia® Video Gateway for Microsoft Lync) 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 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 desire their conferencing solution to be stand-alone and not integrated with Avaya Unified Communications
- Service Provider and Cloud offerings

  We have enhanced our room system product line for much easier deployment in both cloud and enterprise applications. For cloud partners and service providers this means easy bundling of our endpoints with services, while enterprise customers will enjoy much simpler installation and administration. No expert or technical resource will be needed to install or provision a room system. As long as someone can hook up the cables, connect the components together, and turn on the power, they can get a room system operational without an onsite technical resource. Room systems can then be deployed by general facilities personnel.

Deliverables include migration / transition content for existing Avaya Aura® and Avaya Scopia® customers. Note that some feature parity will 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, the consumerization of IT; demand for open, flexible platforms; common place adoption of communications enabled business processes; context-driven communications and the federation of communications across enterprise boundaries.

In addition, Avaya is also positioned to serve the three most critical needs of today’s CIOs:

- Managing the reliable and secure integration of an increasing number and variety of devices and endpoints.
- Leveraging existing technology infrastructure while positioning for the future.
- Managing the shift to cloud-based applications

New in this release

Release 9.0.2 features the following changes:

- The Avaya Equinox™ Client now integrates the Meet-Me capability and replaces Scopia Desktop Client and Scopia Mobile in the Equinox Solution. The key benefits of the Meet-Me client are:
  - 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 need to host conferences with audio/video and present content. These users will have a virtual room and associated features such as the ability to present content. Meet-me guests are users who need to join conferences with audio/video as a guest. 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.
  - Contributes to the final client convergence step for conferencing, so that all current functionalities provided in Scopia Desktop Client and Scopia Mobile are available within Avaya’s single client solution, making it easy for existing customers to migrate. The rich feature set and the updated user interface design offer greater efficiency and ease-of use and are differentiators for both new and old customers.
  - Common desktop and mobile experience across all Avaya Equinox™ Clients. The user needs to download the application and can launch from the Unified Portal or from the desktop.

- Services the following operating systems:
  - Avaya Equinox™ for iOS and Avaya Equinox™ for Android OS 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 Equinox™ for Windows and Avaya Equinox™ for Mac provide out-of-the-box integration with Microsoft and Apple business applications.
- 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)
- Requires the Avaya Session Border Controller for Enterprise (ASBCE) to securely traverse the organization's firewall and call into a meeting.

  Legacy customers who do not deploy the ASBCE in their solution can keep on using Scopia Desktop. Contact Avaya Support for more information.

- Avaya Equinox Meetings for Web adds the following capabilities to video collaboration:
  - Supports audio only (a call that has no video or data), or audio only & web collaboration (a call that has audio and data using web, but no video), as well as video only collaboration.
  - Allows on the fly changes of microphones and cameras from the browser while in a conference.
  - Provides a preference settings page for joining a meeting with muted/unmuted microphone, speaker, and blocked/unblocked video.
  - Supports detaching the presentation from the rest of the client. When a moderator is sharing information, the Unified Portal displays the information in a collaboration window. The user can detach the window and move it around the screen.

Key components

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

Avaya Equinox™ 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. Avaya Equinox™ solutions are used by institutions, enterprises, and application service providers 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.

Each of the solution components can be categorized into these types:

Related links

Back-end infrastructure components on page 11
Peripherals and edge components on page 15
Equinox Streaming and Recording on page 17
Clients on page 17
Endpoints on page 22
SDKs on page 25

Back-end infrastructure components

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

Related links

Key components on page 10
Equinox Management Overview on page 11
Media components on page 13

Equinox Management Overview

System administrators use Avaya Equinox Management to control video network devices, such as gateways, media servers, and endpoints. In addition, users can use Equinox Management to schedule videoconferences.

You can access Equinox Management either from the administrator portal or the user portal (Figure 1: Equinox Management portals on page 12). 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.

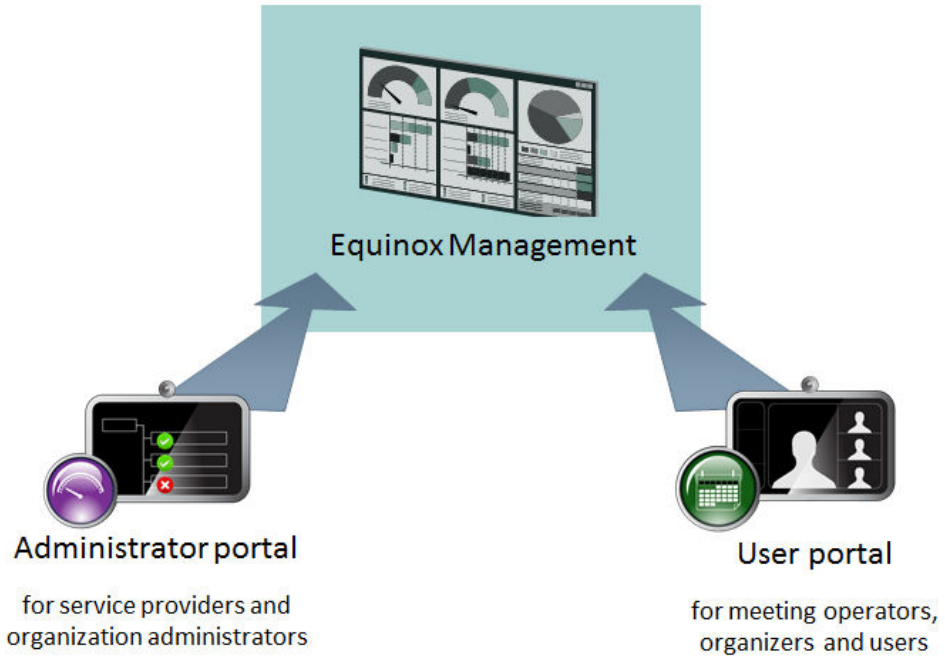


Figure 1: Equinox Management portals

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, Scopia Elite MCU, Avaya Equinox 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 and MCUs (for more information, see *Administrator Guide for Avaya Equinox Management*). 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 and IBM Lotus Domino for easy user provisioning.

- Meeting management

  Schedule, moderate, and reserve resources for your videoconferences via the user portal. Equinox Management can also work with Microsoft Outlook or IBM Lotus Notes for easy and intuitive calendar application scheduling.

  Using the Equinox Management plug-in for Microsoft Outlook, you can easily schedule meetings with resources directly from Microsoft Outlook (2010 or later) or a calendar application on your mobile device.

- Interface to unified communication solutions

  Equinox Management provides the interface to market leading unified communication solutions such as Avaya Aura® Power Suite, Microsoft Lync and Microsoft Skype for Business.

- 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.

Related links

Back-end infrastructure components on page 11

Media components

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

Related links

Back-end infrastructure components on page 11
Equinox Media Server overview on page 13
Scopia Elite MCU overview on page 14

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

Table continues…

Component	Supports
	• Audio and video support for WebRTC-based thin clients • Web collaboration
Media server	• High-scale audio • WebRTC gateway
Web collaboration server	Web collaboration

Equinox Media Server processes all media on the server CPU and does not need media accelerator blades. 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.

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. Equinox Media Server is required in the Over The Top and Team Engagement deployments of Avaya Equinox.

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

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

Related links

Media components on page 13

Scopia Elite MCU overview

The Scopia Elite MCU is Equinox Solution’s flagship platform for high definition multi-party videoconferencing.

An MCU, or Multipoint Control Unit, connects several endpoints to a single videoconference. It manages the audio mixing and creates the video layouts, adjusting the output to suit each endpoint's capabilities.

The MCU harnesses revolutionary processing power for the most demanding videoconferencing applications using the latest DSP technologies. For an uncompromised videoconferencing experience, the MCU supports dual channels of Full HD 1080p at 60 frames per second for video and content, H.264 High Profile for bandwidth efficiency, H.264 Scalable Video Coding (SVC) for high network error resiliency, and full support for many telepresence systems.

With the MCU, each videoconference participant receives a quality experience optimized to their individual capabilities, from wireless mobile devices to HD room systems and immersive telepresence systems. The MCU leads in video interoperability, working with the broadest range of video systems on the market from leading UC clients to mobile devices and telepresence systems.

The MCU also features a patented, distributed architecture approach known as the Virtual MCU or cascaded videoconferences, which brings unparalleled scalability to its superb videoconferencing experience.

Related links

Media components on page 13

Peripherals and edge components

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

Related links

Key components on page 10
Equinox H.323 Edge overview on page 15
About Scopia Desktop on page 16
Overview of the Avaya Session Border Controller for Enterprise on page 17

Equinox H.323 Edge overview

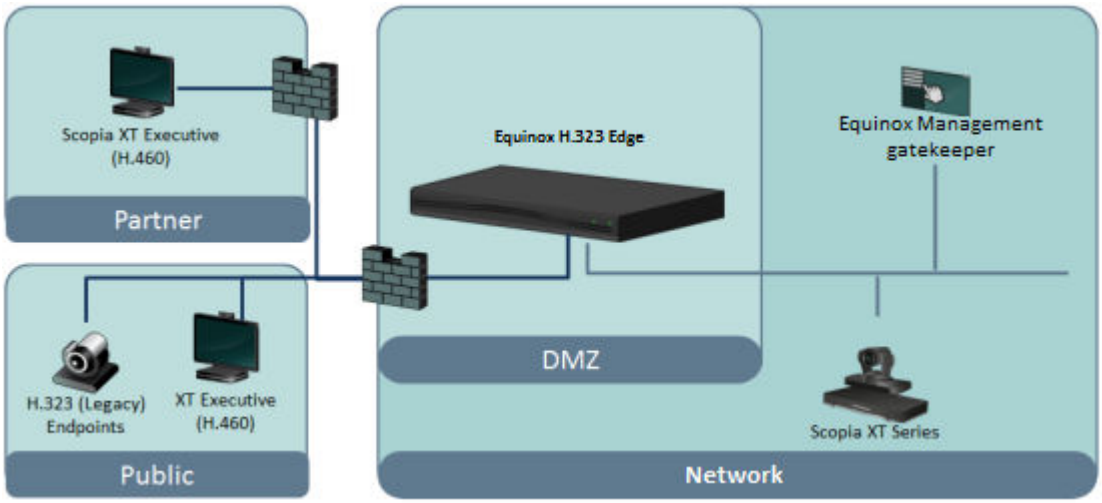
Avaya Equinox H.323 Edge provides a complete firewall and NAT traversal solution and support for secure connectivity between enterprise networks and remote locations.

Note:

Deploy Equinox H.323 Edge only in legacy Avaya Scopia solution deployments which use the H.323 protocol.

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 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.

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

Peripherals and edge components on page 15

About Scopia Desktop

Avaya Equinox™ Meet-Me Client now integrates the Meet-Me functionality and replaces the Scopia client. This replacement is optional for an OTT deployment. Contact your administrator to continue using Scopia Desktop in the following cases: your deployment includes a third party session border controller (and not the Avaya SBCE required for Avaya Equinox™ Meet-Me); you currently need the Scopia Content Slider (which will be part of future releases).

Scopia Desktop is a desktop videoconferencing system turning Windows PCs, Apple Macintosh computers and mobile devices into videoconferencing endpoints. It includes the latest in video technology including support for HD video, NetSense for video quality optimization, Scalable Video Coding (SVC) for unsurpassed error resiliency and H.264 when viewing both meeting participants and data collaboration. Its audio system provides echo cancellation, background noise suppression, and is highly resilient to network errors common on the Internet.

Scopia Desktop is comprised of the Scopia Desktop Server and a lightweight Scopia Desktop Client which turns a PC or Mac into a videoconferencing endpoint. Scopia Mobile users can also access the Scopia Desktop Server from their iOS and Android devices. For more information on Scopia Mobile, see the *User Guide for Scopia Mobile*.

Related links

Peripherals and edge components on page 15

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

Peripherals and edge components on page 15

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 next generation HD streaming and recording platform. The Avaya Equinox Streaming and Recording Server replaces the Avaya Scopia Content Center Recording Server (SCC) server.

Related links

Key components on page 10

Clients

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

Related links

Key components on page 10

Overview of Avaya Equinox Meet-Me client on page 18
Overview of Avaya Equinox Meetings for Web on page 19
Overview of Scopia Desktop Client on page 20
Overview of Scopia Mobile on page 21

Overview of Avaya Equinox Meet-Me client

The Meet-Me is a rich client that replaces Scopia Desktop Client and Scopia Mobile with similar advanced functionality. Avaya built this client on top of the Avaya Breeze™ SDK.

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.
- Allows participating in point-to-multipoint meetings
- 1–click to join from Outlook notification (plug-in needed)

The client has the following functionalities:

- Support for HTTP Signalling including HTTP tunnelling for mobile and desktop communications through firewalls by reusing web ports.
- UCCP-based conferencing integration.
- Feature parity with Scopia Desktop
  - 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

  Note:

  The Avaya Scopia Content Slider will be supported in future releases. The slider allows reviewing previously shared content without interrupting the presenter.
- Support for four simultaneous talkers

The client extends services to the following operating systems:

- Avaya Equinox™ for iOS and Avaya Equinox™ for Android OS 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 Equinox™ for Windows and Avaya Equinox™ for Mac provide out-of-the-box integration with Microsoft and Apple business applications.

For more information see *Using Avaya Equinox™ for Android, iOS, Mac, and Windows* at http://support.avaya.com

Related links

Clients on page 17

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:

- Participation in multiparty conferences
- Registered and guest users
- Windows 7 (64 Bit), Windows 10 (64 Bit), MacOS Sierra version 10.12.2
- Chrome from version 53.0 and up (Mac and Windows)
- Browser-based audio, video, and web collaboration per browser capabilities listed in the table below.

Functionalities	Chrome version 53 and up
Roster and commands	✓
Web Collaboration Receive/Library Sharing/Whiteboard	✓
Web Collaboration Screen/Application Sharing	✓
WebRTC Audio G.711	✓
WebRTC Audio Opus	✓
WebRTC Video H.264	X
WebRTC Video VP8	✓

Note:

Users who require desktop screen and application sharing need the web collaboration browser extension that includes: full screen share with the ability of choosing the screen, application sharing, and portions of screen sharing.

For more information, see *Using Unified Portal* at http://support.avaya.com.

Related links

Clients on page 17

Overview of Scopia Desktop Client

Avaya Equinox™ Meet-Me Client now integrates the Meet-Me functionality and replaces the Scopia client. This replacement is optional for an OTT deployment. Contact your administrator to continue using Scopia Desktop in the following cases: your deployment includes a third party session border controller (and not the Avaya SBCE required for Avaya Equinox™ Meet-Me); you currently need the Scopia Content Slider (which will be part of future releases).

The Scopia Desktop Client is a simple web browser plug-in for interactive videoconferencing. With Scopia Desktop Client you can experience high definition videoconferencing, connecting you with other participants who may be using dedicated endpoints, room systems or even telepresence systems, all from your PC or Mac. Scopia Desktop Client is part of Avaya Equinox Solution for SMBs (small and medium businesses) which includes Scopia Desktop and Avaya Scopia® XT Series with its built-in MCU which endpoints and room systems use to connect.

Clients can be centrally managed and deployed without complex licensing fees or installation issues. Users receive a web link in their invitation to join a videoconference, and in moments they are connected and participating. The Scopia Desktop Client includes the main videoconference client with a built-in chat window and presentation viewing abilities (Figure 2: The Scopia Desktop Client user interface on page 21).

Figure 2: The Scopia Desktop Client user interface

Scopia Desktop Client supports a number of algorithms and standards to make the most efficient use of bandwidth, including:

- 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.
- NetSense

  NetSense is a proprietary Equinox Solution technology which optimizes the video quality according to the available bandwidth to minimize packet loss.

An Avaya Equinox Add-in for Microsoft Outlook enables easy scheduling of meetings directly from within Microsoft Outlook. You can install the add-in together with Scopia Desktop Client.

Related links

Clients on page 17

Overview of Scopia Mobile

Scopia Mobile is an application for iOS and Android devices that works with Scopia Desktop Server to connect users to video conferences. The mobile phone version offers maximum portability, while the tablet version leverages the larger screen.

You can transfer active video conferences between Scopia Mobile and Avaya Scopia® XT Series endpoints by linking Scopia Mobile with the endpoint. When you transfer the video conference to an endpoint, Scopia Mobile changes to the standby mode. For example, when you are out of the office,

you can join a video conference on Scopia Mobile. When you reach the office, you can transfer the video conference to an endpoint.

Scopia Mobile offers secure video conferencing through SRTP and high-quality video by using advanced technologies such as H.264 High Profile, SVC, and FEC.

You can use Scopia Mobile either as a registered user having full access to the Scopia Mobile features or as a guest user who can participate in video conferences. The following table provides information about the features available to registered users and guests:

Features	Registered user	Guest
Own a virtual room.	Yes	—
Log in to Scopia Mobile.	Yes	—
Create instant video conferences.	Yes	—
Moderate video conferences, invite other participants, and view the participant list.	Yes	—
Join active video conferences.	Yes	Yes
Send or receive audio and video and view presentations.	Yes	Yes

To become a registered Scopia Mobile user, contact your system administrator.

Related links

Clients on page 17

Endpoints

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

Related links

Key components on page 10
About the XT Series on page 22

About the XT Series

The Avaya Scopia® 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, Scopia Desktop Clients, Scopia Mobile devices, and ISDN endpoints (via 100 Gateway).

Figure 3: 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 microphones if required.
- The Avaya Scopia® XT7000 Series and the Avaya Scopia® 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 or G.719 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 (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, Scopia® Control enables you to remotely control the XT Series features using the intuitive touch interface of an iOS 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 Scopia® XT7100 and Avaya Scopia® XT4300.

The Avaya Scopia® XT7100 is the new generation Avaya flagship product in the Avaya Scopia® 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.

The Avaya Scopia® XT4300 offers outstanding value and cost-effective full HD video collaboration specifically designed for the needs of smaller and mid-sized conference rooms. The 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

Endpoints on page 22
About Scopia® Control on page 24

About Scopia® Control

Scopia® Control is an Apple® iPad™/iPhone™ app which enables you to control an Avaya Scopia® XT Series room system, telepresence system or personal endpoint from the app. Scopia® Control's intuitive user interface 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 Scopia® Control you can access the calendar of the physical conference room, view scheduled meetings, and then join directly by tapping its entry. In most XT Series 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 or on the external MCU (which can be the Avaya Equinox Media Server or the Scopia Elite MCU) when it is part of your deployment. Moderators can manage all the meeting's participants, including hiding their video, muting their audio, and changing the video layouts.

Scopia® Control also enables you to view shared data like presentations or spreadsheets directly within the app on the device. You can review previously shared content without interrupting the presenter using the integrated Avaya Scopia Content Slider functionality (when in the Equinox Solution meeting).

Scopia® Control supports:

- Automatic detection of nearby XT Series endpoint using Sonic Proximity
- Recording page
- Calendar from XT Series endpoints
- Contacts from XT Series endpoints and from Scopia Desktop Server. It also supports groups only from XT Series endpoints.
- Presentation view and zoom
- Remote control and touchpad
- Email invite to Equinox Solution meeting

The Scopia® Control app is available for download free from the App Store, and will connect to any XT Series endpoint with the appropriate license installed.

Related links

About the XT Series on page 22

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 10
Overview of Avaya Breeze Client Software Development Kit for Avaya Equinox Meetings for Web on page 26
Overview of Equinox Management APIs on page 26

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

The Avaya Breeze™ 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™ APIs. The Client SDK is available for download from Releases for the release of Avaya Breeze™ you are using.

Related links

SDKs on page 25

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.

Important:

For updated and new Equinox Management deployments, we recommend using only the XML API to provide the widest functionality and compatibility with future 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

SDKs on page 25
About Equinox Management XML API on page 26

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 MCUs, 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

Overview of Equinox Management APIs on page 26

Chapter 3: 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

Avaya Aura features on page 28
Securing Your Deployment on page 29
Securing Access to Functionality with User Profiles on page 33
Virtualization on page 33
Superior Video Quality on page 35
Streaming and Recording Videoconferences on page 39
Auto-Attendant Functionality on page 40
URI Dialing Functionality on page 40
Remote Access to Videoconferencing on page 42
User Profiles for Video Across Networks and Remote Sites on page 43
Scheduling and Resource Reservation on page 45
Sharing Content on page 46
Intuitive Video Layouts and Moderator Control on page 46

Avaya Aura® features

For more information, see the Avaya Aura® documentation.

Related links

Selecting Features of your Equinox Solution on page 28

Securing Your Deployment

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 figure below gives an overview of the security of media, signaling, and management connections in an Equinox Solution deployment, which recommends the use of two DMZ zones with three firewalls: the web zone for publicly accessed servers; the application zone for application servers.

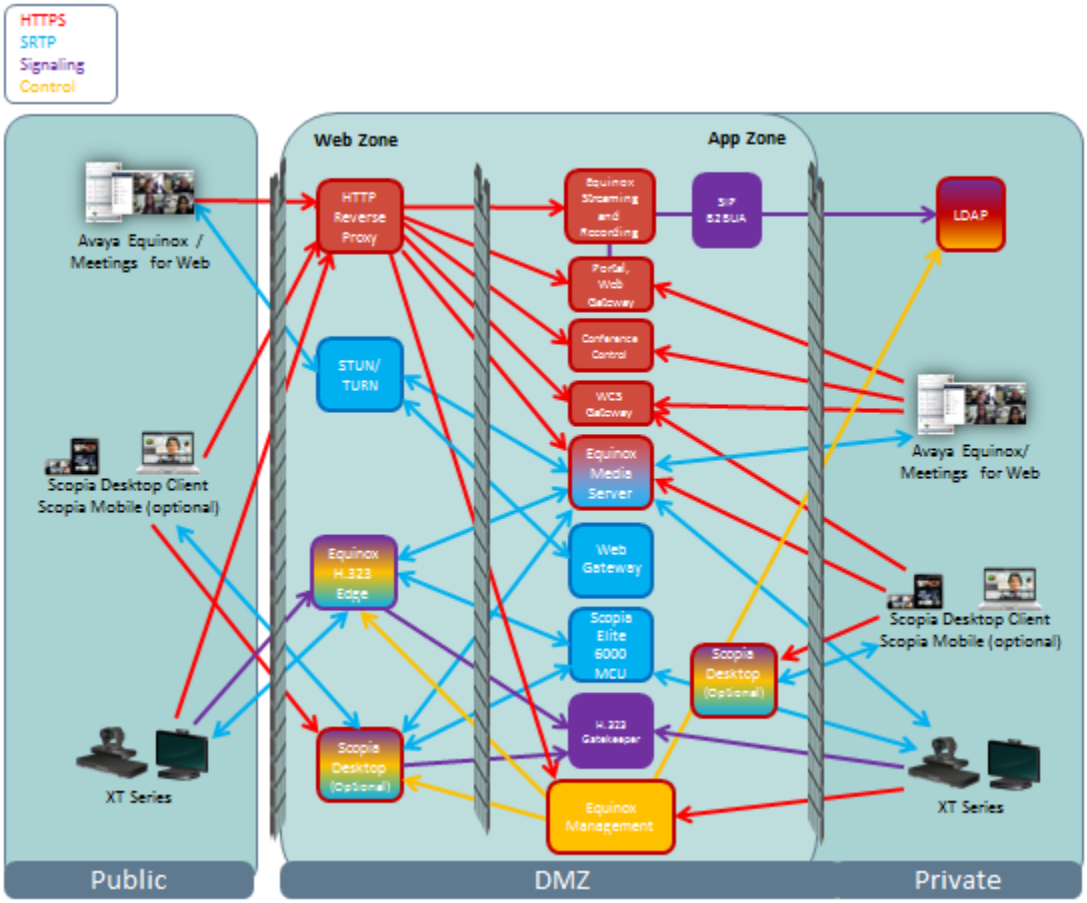


Figure 4: Encrypted media, signaling, and control connections of the OTT Equinox Solution

The sections in this chapter are:

Related links

Selecting Features of your Equinox Solution on page 28
Authentication and Encryption on page 30
About Signaling Security on page 32
About Management Security on page 32

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

Securing Your Deployment on page 29
About Media Security on page 31

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.

(Optional in OTT deployments) The Scopia Desktop Server's secure connection with the Scopia Desktop Client is another line of communication that must be secured, since it often stretches across network zones and outside the corporate network. Scopia Desktop's media over a TCP connection is encrypted using HTTPS, while under UDP connections, media is encrypted using S-RTP, using random encryption keys exchanged over HTTPS.

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 30

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.

Avaya Equinox™Meet-Me Clients and Scopia Desktop software-based clients (optional, for OTT deployments) might be outside a VPN in the public network, and are encrypted and authenticated over HTTPS, using TLS.

Streaming and recording media streams are encrypted with HTTPS / SSL. If media encryption is set up for Scopia Desktop Server, it must also be enabled in Equinox Streaming and Recording.

Related links

Securing Your Deployment on page 29

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

Securing Your Deployment on page 29

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 28

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 Common Server, 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 common servers

  Products that are enabled by a standard server may use the Avaya Common Server 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.

In the case of the Equinox Solution, the Avaya Common Servers are not pre-installed with the Equinox application components except for Equinox Streaming and Recording. It is up to the customer to purchase OVAs on the one hand, Avaya Common Server on the other hand, and do the installation.

- 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.

Certain products, such as Avaya Equinox H.323 Edge server and Avaya Scopia® Web Collaboration server, are delivered as OVAs or as hardware versions. Others, such as Scopia® Elite 6000 MCU are delivered as hardware only.

Avaya Equinox Streaming and Recording Server is available either as appliances (pre-installed Avaya Common Server) or as a Windows software image for installation on customer-provided servers (same specifications as Avaya Common Server).

Infrastructure product	Hardware Appliance	Pure Software	Virtual Machine
Equinox Management Server			✓
Equinox Media Server			✓
Scopia® Elite 5000 Series MCU	✓		
Scopia® Elite 6000 MCU	✓		
Equinox H.323 Edge server	✓		✓
Avaya Scopia® Web Collaboration server	✓ (Avaya Scopia® upgrade)		✓ (Equinox Management Server - greenfield customer)
Scopia Desktop Server (Legacy)		✓	

Table continues…

Infrastructure product	Hardware Appliance	Pure Software	Virtual Machine
Avaya Session Border Controller for Enterprise	✓		✓
Scopia® Video Gateway (Microsoft Lync)	✓		
Equinox Streaming and Recording Server	✓	✓	
Avaya Equinox Recording Gateway			✓

Note:

Avaya Equinox™ Meet-Me Client now integrates the Meet-Me functionality and replaces the Scopia client. This replacement is optional for an OTT deployment. Contact your administrator to continue using Scopia Desktop in the following cases: your deployment includes a third party session border controller (and not the Avaya SBCE required for Avaya Equinox™ Meet-Me); you currently need the Scopia Content Slider (which will be part of future releases).

Related links

Selecting Features of your Equinox Solution on page 28

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

Selecting Features of your Equinox Solution on page 28
Scalable Video Coding Algorithm on page 35
Forward Error Correction Algorithm on page 37
NetSense Algorithm on page 37
H.264 High Profile on page 38

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 5: Graph showing SVC's resilience to packet loss on page 36 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.

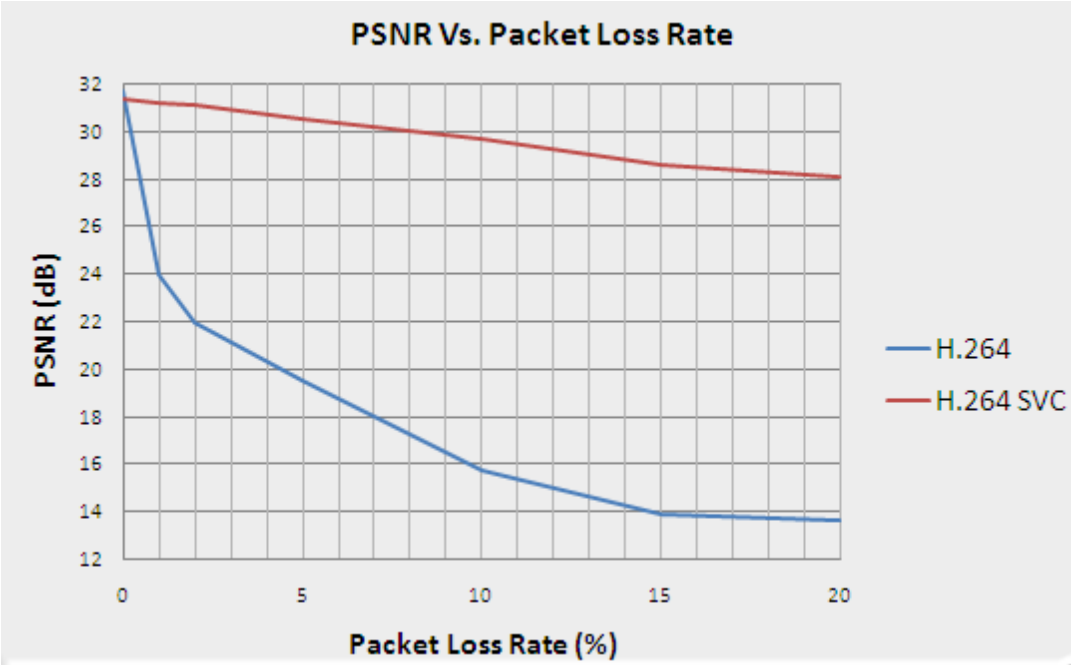


Figure 5: Graph showing SVC's resilience to packet loss

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:

- Equinox Media Server
- Scopia® Elite 6000 MCU
- Scopia® Elite 5000 Series MCU
- Avaya Scopia® XT5000 Series
- Avaya Scopia® XT4000 Series
- Avaya Scopia® XT7000 Series
- XT Executive
- (Legacy) Scopia Desktop
- Equinox Meet-Me Client (TSVC)

By applying SVC in an MCU, 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 35

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 35) 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 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:

- Equinox Media Server
- Scopia® Elite 6000 MCU
- Scopia® Elite 5000 Series MCU
- Avaya Scopia® XT5000 Series
- Avaya Scopia® XT4000 Series
- Avaya Scopia® XT7000 Series
- XT Executive
- (Legacy) Scopia Desktop
- Equinox Meetings for Web (WebRTC for FEC)
- Equinox Meet-Me Client

Related links

Superior Video Quality on page 35

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
- Scopia® Elite 5000 Series MCU
- Avaya Scopia® XT5000 Series
- Avaya Scopia® XT4000 Series
- Avaya Scopia® XT7000 Series
- XT Executive

Related links

Superior Video Quality on page 35

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 35

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. There are two types of streaming supported in Equinox Solution: unicast which sends a separate stream to each viewer, and multicast which sends one stream to a range of viewers.

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, Flash, and Windows Media Player are supported for playback viewing. Live streaming sessions are setup easily by end users from the new 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.

Equinox Streaming and Recording only supports the new Unified Portal. Scopia Desktop portal is no longer supported for accessing recordings.

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 Scopia® 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 28

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 28

URI Dialing Functionality

The Equinox Solution fully supports URI dialing, a dial format for contacting endpoints outside your organization.

URI is an address format used to locate a SIP device on a network, 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. For example,<*endpoint name*>@<*server_domain_name*>. When dialing URI between organizations, the server might often be the Avaya Equinox H.323 Edge of the organization.

All Equinox Solution endpoints work transparently with URI dials, including the Avaya Scopia® XT Series. You can also perform URI dials from the conference control of Avaya Equinox Management.

URI dialing is compatible with Avaya Equinox H.323 Edge (for H.323 endpoint) and other third party firewall traversal systems such as SBCs (for SIP endpoints). Dialing an endpoint from one organization to another requires first traversing your own firewall with Avaya Equinox H.323 Edge, out through the internet, and then into the firewall of the recipient’s organization using their firewall traversal system (Figure 6: Example of URI dialing between two enterprises using Avaya Equinox H. 323 Edge on page 41).

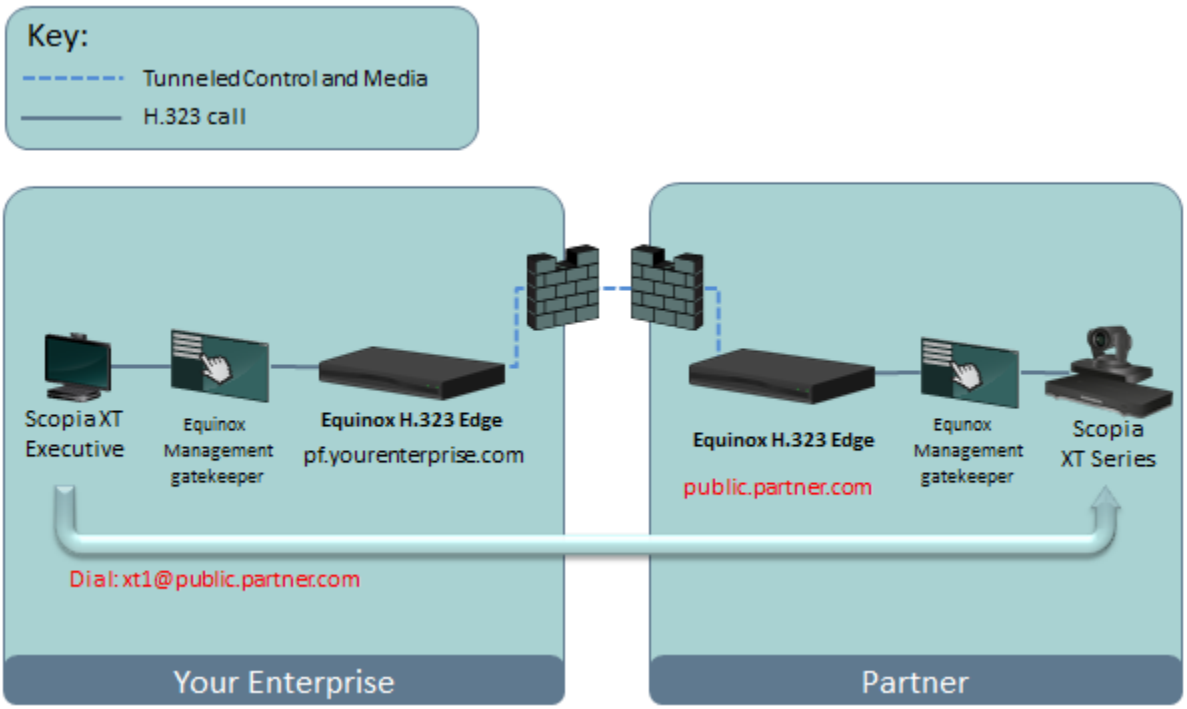


Figure 6: Example of URI dialing between two enterprises using Avaya Equinox H.323 Edge

To access an endpoint in the other company, the URI's domain name is the second company's firewall traversal system, like the name of their Equinox H.323 Edge server, or the organization's domain name. For example, in Figure 6: Example of URI dialing between two enterprises using Avaya Equinox H.323 Edge on page 41, dialing to the partner company requires knowing the following:

- The name or number of the endpoint, in this example *xt1*
- The domain name of the Equinox H.323 Edge server of that company, *public.partner.com* in this example, or the organization's domain name, *partner.com*.

Important:

As with regular web domain names, the name of the Equinox H.323 Edge server resolves to an IP address via standard DNS lookup if it has been allocated a global DNS name. If the server's IP address does not have a DNS name, the URI dial should directly specify the server's IP address instead. For example, the URI *xt1@123.456.789.1* specifies the alias followed by the server's IP address.

To set up this connection, you need to configure the Equinox H.323 Edge server to accept H.323 calls and forward them. You also need to configure the H.323 Gatekeeper to define one or more Equinox H.323 Edge servers as H.323 Gatekeeper's neighbor, to facilitate the routing of these calls.

Related links

Selecting Features of your Equinox Solution on page 28

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™ Equinox Meet-Me for Windows 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 the Avaya SBCE in the company's DMZ.

  If you have a laptop with Microsoft Lync or Skype for Business client installed, you can smoothly access a videoconference call without using a VPN connection. Your call is routed to the existing MS Audio/Video (A/V) Edge Server and uses the Equinox Solution for network security.

  You can participate in a video call by using a dedicated H.323 endpoint, like the Avaya Scopia® 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 the Avaya Equinox™ client or an endpoint like the Avaya Scopia® XT Series that also works with the SIP protocol, you can access a remote videoconference through the Session Border Controller (SBC) deployed in the organization's DMZ.

  The 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™ Equinox Meet-Me for iOS or Avaya™ Equinox Meet-Me for Android enables people with video-enabled phones to participate in a conference. The phone connects to the Avaya SBCE in the company's DMZ.

  A laptop can be an effective way to connect to videoconferences by installing Avaya™ Equinox Meet-Me for Mac. Its tunneling technology does not require any gateway or dedicated firewall traversal. You can also use Avaya Equinox Meetings for Web.

  Microsoft Lync or Skype for Business offers another way of accessing videoconference calls while using the existing MS A/V Edge Server for call routing. The Equinox Solution components take care of network security.

- Partner organizations with their own firewall

  A PC installed with Avaya™ Equinox Meet-Me for Windows can join a videoconference even when it is located in a partner organization behind its firewall. Avaya™ Equinox Meet-Me for Windows can easily traverse both that firewall and the firewall of the company housing the video infrastructure to reach the Avaya SBCE located in the DMZ.

  A laptop installed with Microsoft Lync or Skype for Business client and pertaining to a partner organization belongs to a federation of trusted clients pre-authenticated by the MS A/V Edge

Server. As such, the federated client is considered as connected inside the enterprise and can join a videoconference using the existing Lync or Skype for Business deployment and the Equinox Solution components, including the Scopia® Video Gateway.

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

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

Users located remotely with SIP endpoints can join a videoconference if your deployment includes an SBC. You can also use the Avaya Equinox Meetings for Web.

Related links

Selecting Features of your Equinox Solution on page 28

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 28
Defining Video Users Across an Enterprise on page 43
Assigning Privileges for Video Users on page 44

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 or IBM's Domino.

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 43

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 Equinox™ calls.

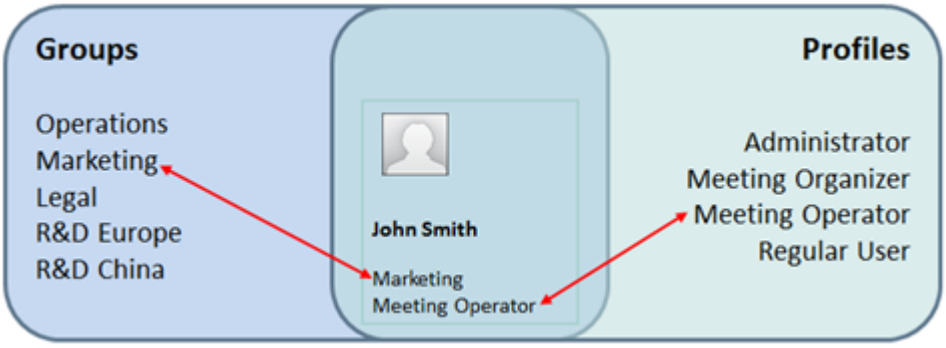


Figure 7: Using user groups and profiles to define a user

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 43

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 MCU capacity and bandwidth.

Scheduling video resources of a planned meeting reserves the required number of MCU 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.

  You can use the Avaya Equinox Add-in for Microsoft Outlook to create time-only schedules in Microsoft Outlook. For more information, see the *User Guide for Avaya Equinox Add-in for Microsoft Outlook*.

  For Lotus Notes integration, use the Avaya Equinox Add-in for IBM Lotus Notes, which can act as a time-only scheduler in deployments which lack Equinox Management. For more information, see the *Deployment Guide for Avaya Equinox Add-in for IBM Lotus Notes*.
- 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 MCU 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.

  Use the Avaya Equinox Add-in for Microsoft Outlook to create time and resource schedules in Microsoft Outlook. For more information, see the *User Guide for Avaya Equinox Add-in for Microsoft Outlook*.

  For Lotus Notes integration, use the Avaya Equinox Add-in for IBM Lotus Notes, which extends its functionality to time and resource scheduling in deployments with Equinox Management. For more information, see the *Deployment Guide for Avaya Equinox Add-in for IBM Lotus Notes*.

Related links

Selecting Features of your Equinox Solution on page 28

Sharing Content

A central feature of the Equinox Solution 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:

- XT Series
- Equinox Media Server
- Scopia Elite MCU
- Equinox Management

Avaya Equinox™ clients can receive presentations.

The Avaya Equinox™ Web Collaboration Server 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.

Avaya Equinox Meetings for Web users need to download a browser plug-in for sharing their screens.

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

Selecting Features of your Equinox Solution on page 28

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 8: 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 Equinox™ Meet-Me (desktop and mobile)
- Avaya Equinox Meetings for Web
- XT Series (for conferences held on Equinox Media Server or Scopia Elite MCU)
- Scopia® Control
- Equinox Media Server
- Scopia Elite MCU
- Equinox Management

Administrators can use the video layout and moderator control from Equinox Media Server or Scopia Elite MCU's videoconferences, or the Avaya 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 the Avaya Scopia® XT Series room system using Scopia® Control.

For more information on the moderator and layout controls of the MCU, see *User Guide for Scopia Elite MCU.* For details of configuration from Equinox Management, see *Deploying Unified Portal*.

Related links

Selecting Features of your Equinox Solution on page 28

Chapter 4: 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 28:

Related links

Avaya Aura network planning and design considerations on page 49
Firewall and NAT traversal options on page 49
Planning a Centralized or Distributed Topology (Cascading) for MCU on page 53
Planning User Access to Videoconferences on page 55
Planning Scalability and High Availability in the Equinox Solution on page 57
Assessing Bandwidth for Large Organizations on page 63
Setting WAN Bandwidth Limits on page 68
Using Network Traffic Priorities Across your Deployment on page 68
Updating the Dial Plan on page 69

Avaya Aura network planning and design considerations

For the latest and most accurate information on planning and designing your network for use with Avaya Aura components, go to https://support.avaya.com/

Related links

Considerations for Choosing your Equinox Solution on page 49

Firewall and NAT traversal options

The Equinox Solution provides a number of firewall and NAT traversal options allowing remote endpoints and clients to securely access the organization's protected network and initiate or join videoconferences.

These figures illustrate how the components interact with the means for protecting the organization against intrusive attempts:

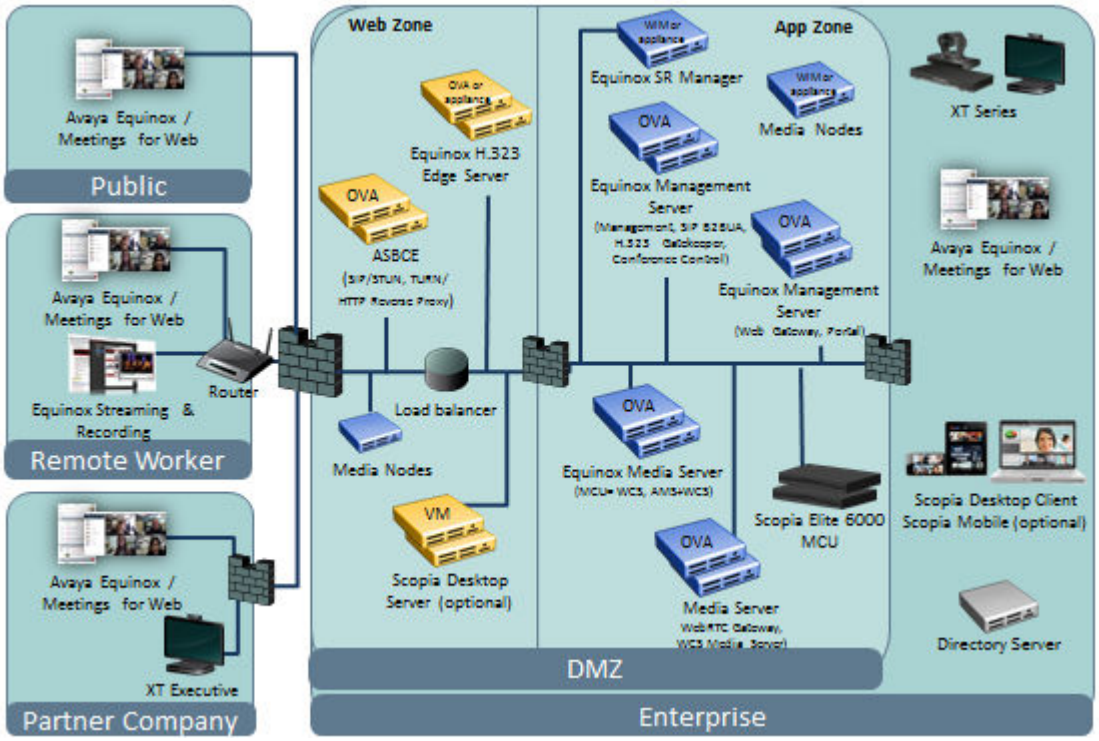


Figure 9: Firewall and NAT traversal in the Equinox Solution — OTT deployment

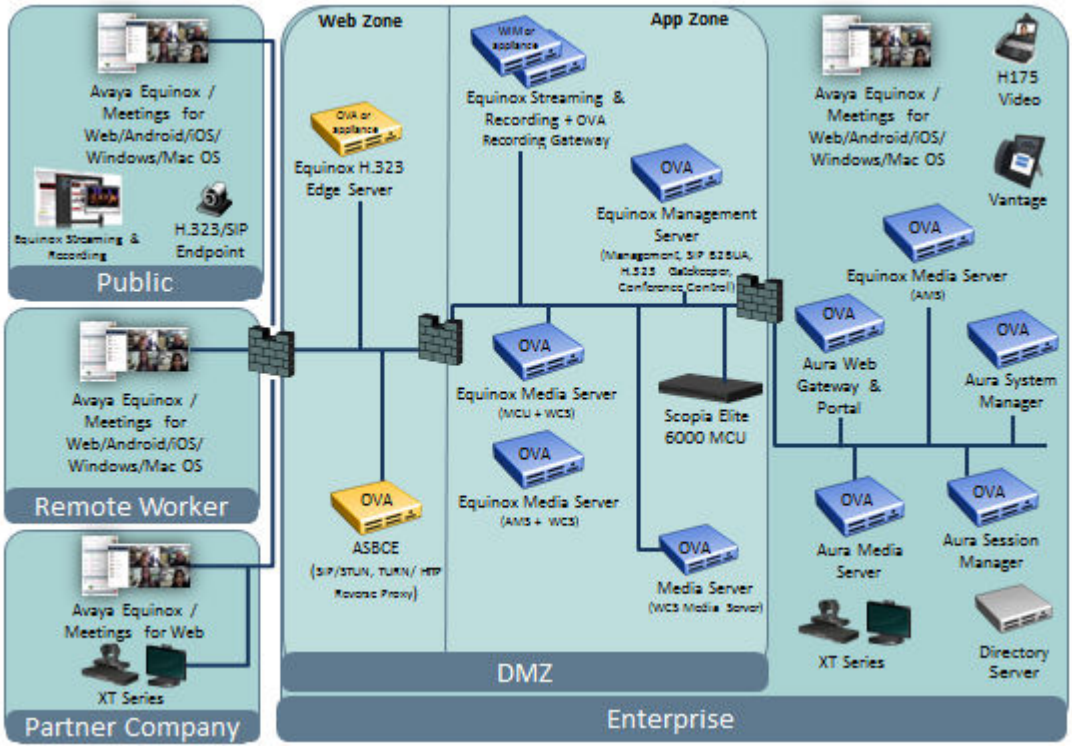


Figure 10: Firewall and NAT traversal in the Equinox Solution — Team Engagement deployment

- Two DMZ, one external (web zone) and one internal (application zone) with three firewalls.
- The Service Provider hosts the video infrastructure while their customers deploy only endpoints and soft clients. Connectivity is managed over a dedicated VPN or over the public Internet using standard firewall protocols such as H.460 and STUN/ICE/TURN. As privacy is crucial, all communications are fully secured using standard protocols like H.235 and TLS/SRTP.
- Remote H.323–standards endpoints can directly and securely dial into a meeting or an endpoint via Avaya Equinox H.323 Edge that provides a complete firewall and NAT traversal solution for H.323 deployments:

  This includes:

  - XT Series endpoints that are registered to Equinox H.323 Edge server via H.323 (with or without H.460)
  - H.460 compliant endpoints that are registered to Equinox H.323 Edge server
  - Guest endpoints (unregistered H.323 endpoints)
  - Multiple endpoints (can include non-H.460 endpoints) at a remote site that use Avaya Equinox H.323 Edge Client as a proxy to communicate with Equinox H.323 Edge server. This is useful if, for example, the organization has insufficient IP addresses available or if they have non-H.460 endpoints.

Other key features of Avaya Equinox H.323 Edge for seamless and intuitive connectivity between enterprises, partners, and home workers include:

- Full compatibility with H.323 Gatekeeper features such as enhanced dial plan, hierarchy, conference hunting, CDR records, and API for integration.
- Solving enterprise and remote site traversal issues without reconfiguring current security measures in existing firewalls.
- Using Equinox H.323 Edge server in a single or dual NIC configuration depending on the customer security policy and firewall utilization.
- URI dialing (for details, see URI Dialing Functionality on page 40).

- Remote XT Series SIP endpoints can use the Avaya Session Border Controller for Enterprise (Avaya SBCE) to securely traverse the organization's firewall and call into a meeting or an endpoint. The Avaya SBCE only supports remote workers using registered endpoints that are controlled by the enterprise.

  For information on the Avaya SBCE, see *Avaya Session Border Controller for Enterprise Overview and Specification*. For configuring the XT Series SIP endpoints and Avaya SBCE to work together, see the *Deployment Guide for Avaya Scopia® XT Series* and *Administering Avaya Session Border Controller for Enterprise*.

  Other key features of the Avaya SBCE include support of Far End Camera Control (FECC) and Binary Floor Control Protocol (BFCP).

- Remote Avaya Equinox™ Meet me and Meetings for Web (WebRTC) clients connect directly with the Avaya SBCE located in the DMZ. Avaya SBCE includes the URL rewriting feature, which enables clients to interact with different servers in the deployment via a single IP address and a single FQDN. As each FQDN needs a certificate, and there is only one FQDN to interact with, this feature also allows saving on the costs of commercial certificates. For more information, see *Deploying Avaya Equinox Solution*.
- (Optional in OTT) Scopia Desktop Client and Scopia Mobile have their own secure traversal methods and are connected directly to the Scopia Desktop Server located in the DMZ.
- Streaming clients use the Avaya SBCE reverse proxy functionality (or Avaya authorized, third party proxies) to connect the Media Node and Manager of the Equinox Streaming and Recording server. For a list of third party reverse proxies, see *Administration Guide for Avaya Equinox Streaming and Recording Server*.

  A reverse proxy is a web server that terminates connections with clients and makes new connections to backend servers on their behalf. A backend server is defined as a server to which the reverse proxy makes a connection to fulfill the request from the client. These backend servers can take various forms, and reverse proxy can be configured differently to handle each of them.

- Remote Microsoft Lync or Skype for Business clients traverse firewalls using the Microsoft Audio/Video (MS A/V) Edge Server. The server integrates the TURN/STUN which enables remote endpoints to securely access the organization network. With the Scopia® Video Gateway bridging between Lync and H.323 networks, remote Microsoft Lync clients can join an H.323 videoconference.

Related links

Considerations for Choosing your Equinox Solution on page 49

Planning a Centralized or Distributed Topology (Cascading) for MCU

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.

Without cascading, if you choose a centralized MCU deployment, frequent videoconferences between branches can be expensive (Figure 11: Centralized MCU deployment, where all branches use the HQ MCU on page 53).

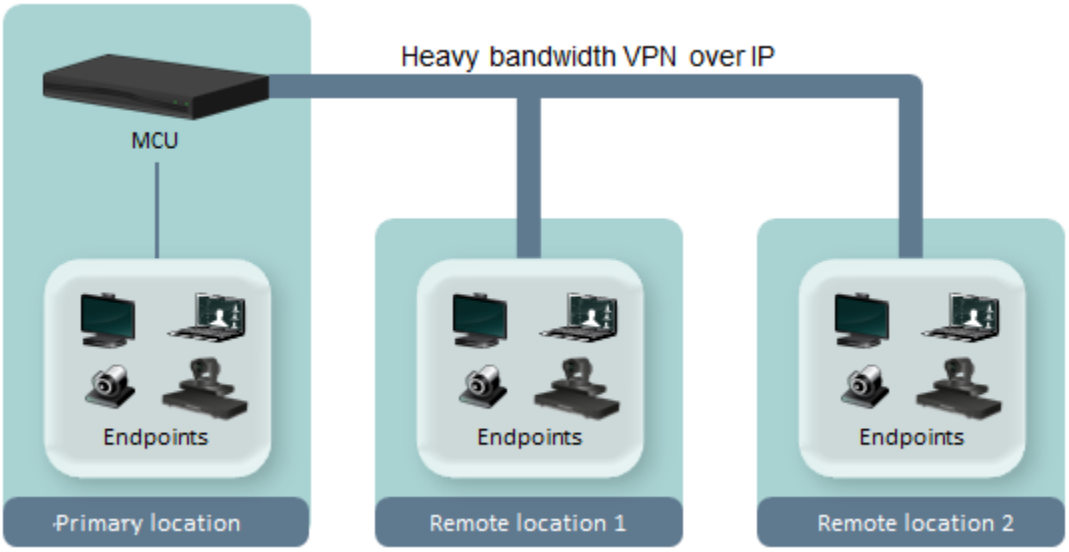


Figure 11: Centralized MCU deployment, where all branches use the HQ MCU

To reduce cross-site bandwidth costs, a distributed MCU deployment (Figure 12: Distributed MCU deployment cascading meetings for reduced WAN bandwidth on page 54) 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.

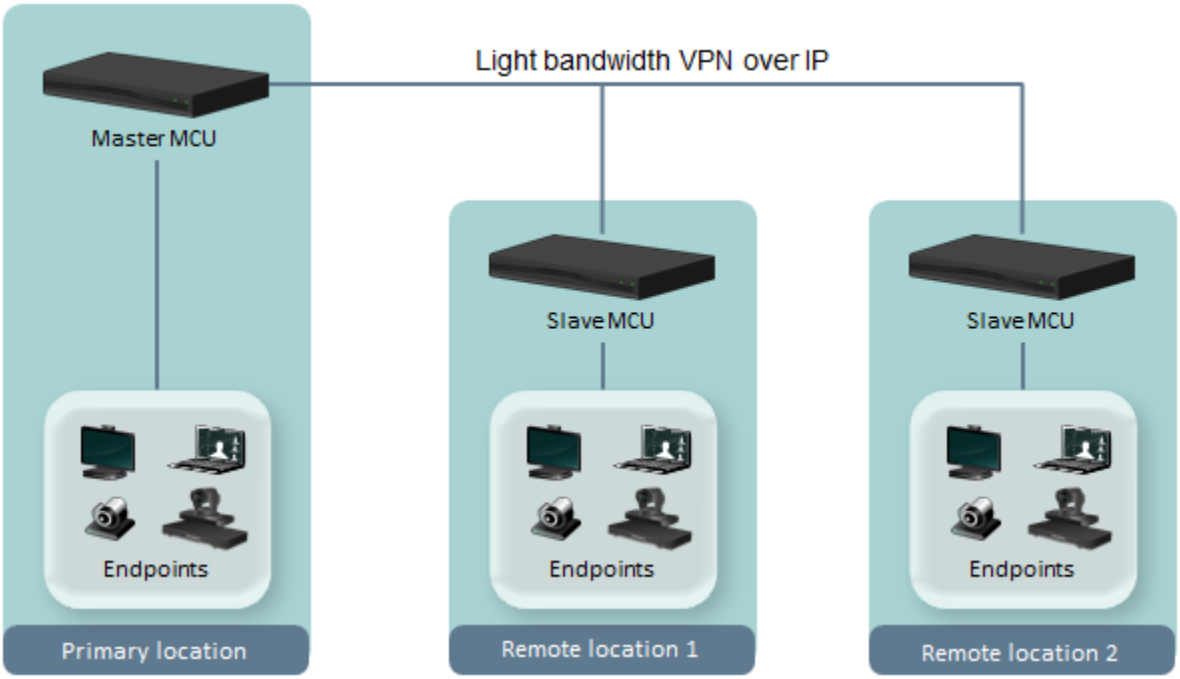


Figure 12: Distributed MCU deployment cascading meetings for reduced WAN bandwidth

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 and 720p x 30fps for Scopia® Elite 5000 Series 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 on page 49

Planning User Access to Videoconferences

As part of deploying Equinox Solution, you need to plan how users in your organization start videoconferences.

Users can either schedule a meeting in advance, and reserve the required video network resources, or they can start an instant meeting. Scheduling meetings with resources ensures a high quality

user experience. If there are not enough resources during the videoconference, the system may either downgrade the video quality or block additional participants from joining.

Users can schedule meetings with resources in one of two ways:

- From Microsoft Outlook (2010 or later), using an Equinox Management plug-in for Microsoft Outlook.
- From the Equinox Management User Portal.

When scheduling from either one of these plug-ins for Microsoft Outlook, Equinox Management reserves both the endpoint resources and their required media server connections.

Users can start instant meetings in one of the following ways:

- Dialing an endpoint directly from another endpoint. To dial more than one endpoint, users dial a virtual room number (personal or public), or an IVR session (a default room with a generic greeting).
- Dialing an endpoint from their virtual room with a client such as Avaya Equinox™ Meet-Me, using the MCU dial prefix.

You set up the media server prefix and virtual room numbers according to your organization's dial plan.

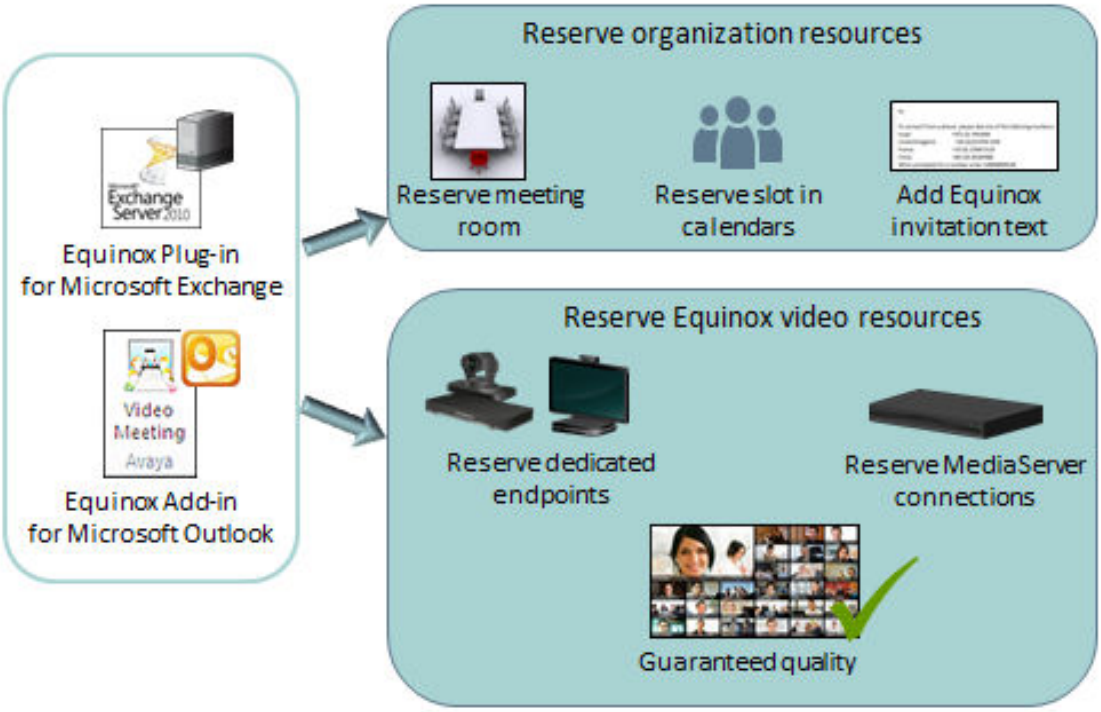


Figure 13: Planning User Access to Scheduling Meetings

The most common way for users to schedule videoconferences is from Microsoft Outlook, since they are already familiar with its interface and are using it to schedule all other (non-video) meetings. This requires deploying one of the Equinox Management plug-ins for Microsoft Outlook.

Decide which plug-in is right for your organization by using Table 1: Comparing features of the different Microsoft Outlook Plug-ins on page 57 as a guide. For example, if users in your organization have Mac computers or schedule meetings on-the-go from their mobile devices, deploy Equinox Plug-in for Microsoft Exchange (see *Administrator Guide for Avaya Equinox Management*). The Avaya Equinox Add-in for Microsoft Outlook (64-bit), allows more settings to be configured from Outlook, but requires installation on each client (see *User Guide for Avaya Equinox Add-in for Microsoft Outlook*).

Table 1: Comparing features of the different Microsoft Outlook Plug-ins

Features	Equinox Plug-in for Microsoft Exchange	Avaya Equinox Add-in for Microsoft Outlook
Supported clients	Microsoft Outlook clients on PC Microsoft Outlook clients on Mac Microsoft Outlook Web Application Other calendar applications (such as iOS and Windows-based mobile devices connected to Exchange)	Microsoft Outlook clients on Windows-based PC only (64-bit)
Installation	Installed on Microsoft Exchange server only (not on each client)	Requires installation on each user's computer
User access	All users with a virtual room (even if connecting from a public network)	Only internal users with a virtual room (cannot connect from a public network)
Advanced Meeting Settings (such as reserving extra resources)	Configured from the Equinox Management user portal	Configured directly from Outlook

(Optional, for OTT deployments) There is an additional plug-in available that does not require a user account in Equinox Management (see *Administrator Guide for Avaya Scopia Desktop Server*). Users cannot reserve video network resources with this plug-in.

Related links

Considerations for Choosing your Equinox Solution on page 49

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 49
High Availability of Equinox Management on page 58
Scalability and High Availability of Scopia Desktop Server and Equinox H.323 Edge server on page 60
Scalability with Equinox Streaming and Recording on page 60
Scalability and High Availability with Multiple MCUs on page 62
Scalability and High Availability with Scopia® Video Gateway on page 62

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 14: Local and geographical redundancy on page 59 illustrates the different options of deploying Equinox Management redundancy.

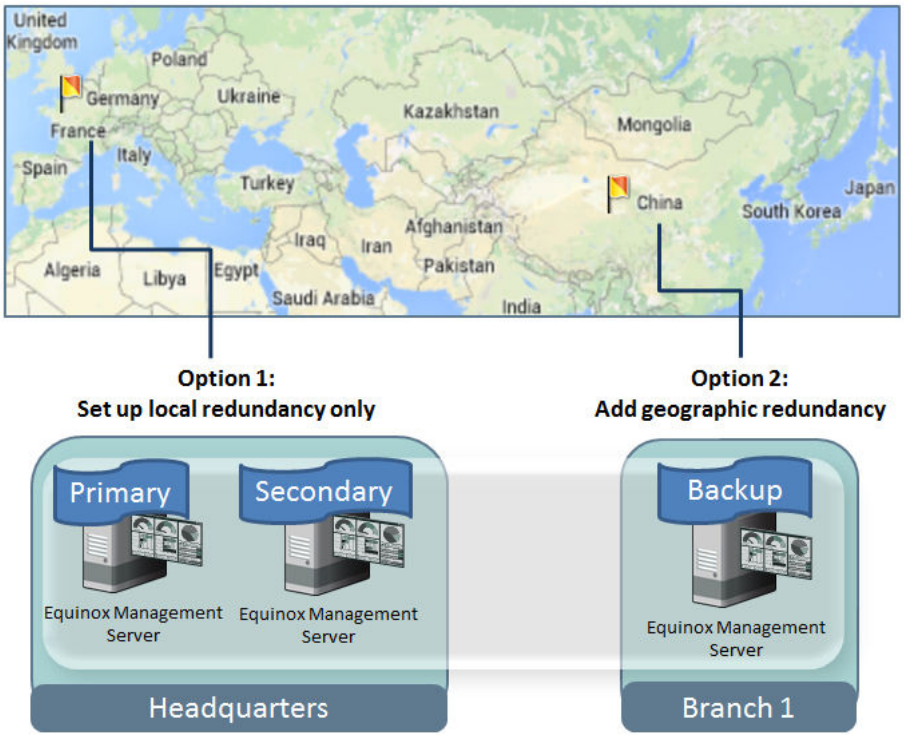


Figure 14: Local and geographical redundancy

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 *smgmt.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; geographical redundancy supports only the internal database (see *Administrator Guide for Avaya Equinox Management*).

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).

The topics below describe redundancy configuration and monitoring:

Related links

Planning Scalability and High Availability in the Equinox Solution on page 57

Scalability and High Availability of Scopia Desktop Server and Equinox H. 323 Edge server

You can configure Scopia Desktop Server and Equinox H.323 Edge server for scalability and high availability. More servers translates to higher capacity, and with a load balancer in place, if one server fails, the remaining servers can continue working, offering even higher reliability in video services. Equinox H.323 Edge servers and Scopia Desktop Servers can share the same load balancing deployment

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

(Optional, for OTT deployments) Add Scopia Desktop Server to increase the reliability and number of Scopia Desktop Clients connecting to your enterprise with video and data at the same time.

Note:

Equinox Solution release 9.0.2 provides the Scopia Desktop Client and Scopia Mobile functionality in the Avaya Equinox™ Meet-Me Client. Contact your administrator to continue using Scopia Desktop in the following cases: you do not wish to deploy the Avaya SBCE (required for Avaya Equinox™ Meet-Me); you currently need the Scopia Content Slider (which will be part of future releases).

You can choose one of the following:

- You can deploy multiple Scopia Desktop Servers, using Avaya's authorized load balancers.
- You can deploy multiple Equinox H.323 Edge servers, using Avaya's authorized load balancers.

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. From Release 9.0, the gatekeeper is an application service in Equinox Management.

For more information on the configuration of each of these deployments, see the components' administrator guides.

Related links

Planning Scalability and High Availability in the Equinox Solution on page 57

Scalability with 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.

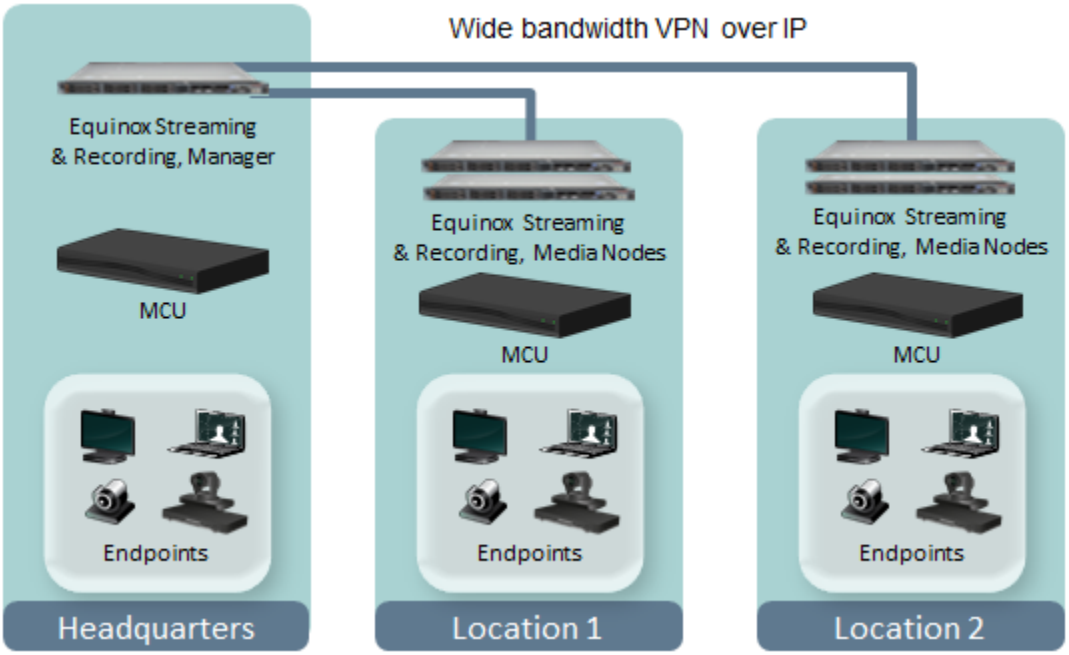


Figure 15: Scaling up streaming and recording

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

Planning Scalability and High Availability in the Equinox Solution on page 57

Scalability and High Availability with Multiple MCUs

You can deploy multiple MCUs to make more simultaneous calls available in your video network. For more information on scaling your MCU 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 MCUs. Equinox Management can be configured to maintain high availability of video call service by coordinating amongst multiple MCUs. Equinox Management can hot switch to an alternative unit if an MCU fails to maintain and preserve high availability of 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 57

Scalability and High Availability with Scopia® Video Gateway

You can deploy multiple Scopia® Video Gateways to make more simultaneous calls from endpoints with these protocols available in your video network. For more information on scaling your gateway deployments, see the *Lync Deployment Guide for Scopia® Video Gateway for Microsoft Lync* .

Avaya Equinox Management acts as the load balancer in these deployments and can hot switch to an alternative unit if one of the gateways fails to maintain and preserve high availability of the service.

Related links

Planning Scalability and High Availability in the Equinox Solution on page 57

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.

   Note:

   Scopia Desktop is optional in OTT deployments

   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™ Equinox Meet-Me for iOS, Avaya™ Equinox Meet-Me for Android, or Scopia Mobile for access on mobile devices (low bandwidth consumption)
   - Avaya™ Equinox Meet-Me for Windows, Avaya™ Equinox Meet-Me for Mac, or Scopia Desktop Client for access on desktop computers (low bandwidth consumption)
   - XT Executive for premium HD experience on a dedicated endpoint (low bandwidth consumption)
   - XT Series to participate in a videoconference from a meeting room (medium bandwidth consumption)
   - 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 2: Example of estimation of users per endpoint type

Endpoint type	Number of users
Avaya™ Equinox Meet-Me for iOS, Avaya™ Equinox Meet-Me for Android, or Scopia Mobile	200
Avaya™ Equinox Meet-Me for Windows, Avaya™ Equinox Meet-Me for Mac, or Scopia Desktop Client	10,000
XT Executive	50
XT Series	80
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 Scopia Desktop users will be in a concurrent call, the ratio you use to calculate bandwidth should be 1 in 15, which is your target.

   Table 3: Typical peak ratios per endpoint type

Endpoint type	Ratios
Avaya™ Equinox Meet-Me for iOS. Avaya™ Equinox Meet-Me for Android, or Scopia Mobile	Between 1/20 and 1/10
Avaya™ Equinox Meet-Me for Windows, Avaya™ Equinox Meet-Me for Mac, or Scopia Desktop Client	Between 1/20 and 1/10
XT Executive	Between 1/15 and 1/10
XT Series	Between 1/15 and 1/8
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 Scopia Desktop users allocated to this data center and the ratio is average, the peak usage for Scopia Desktop 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 4: Bandwidth consumed by different endpoint types on page 65 shows possible values of maximum bandwidth for this endpoint type.

Table 4: Bandwidth consumed by different endpoint types

Endpoint type	Resolution	Maximum bandwidth consumption
Avaya™ Equinox Meet-Me for iOS, Avaya™ Equinox Meet-Me for Android, or Scopia Mobile	720p	768 Kbps
Avaya™ Equinox Meet-Me for Windows, Avaya™ Equinox Meet-Me for Mac, or Scopia Desktop Client	720p	768 Kbps
XT Executive	720p at 30fps	768 Kbps
XT Series	1080p at 60fps	2560 Kbps
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 5: Example of peak bandwidth calculation per endpoint types

Endpoint type	Peak Usage	Maximum bandwidth consumption	Peak bandwidth
Avaya™ Equinox Meet-Me for iOS, Avaya™ Equinox Meet-Me for Android, or Scopia Mobile	13	512 Kbps	6,656 Kbps
Avaya™ Equinox Meet-Me for Windows , Avaya™ Equinox Meet-Me for Mac, or Scopia Desktop Client	666	768 Kbps	523,476 Kbps
XT Executive	4	768 Kbps	3,072 Kbps
Avaya Scopia® XT Series	8	2,560 Kbps	20,480 Kbps
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 6: Optimized bandwidth consumption on page 66.

     Table 6: Optimized bandwidth consumption

Endpoint type	Resolution	Maximum bandwidth	Maximum bandwidth with High Profile
Avaya™ Equinox Meet-Me for iOS, Avaya™ Equinox Meet-Me for Android, or Scopia Mobile	480p	512 Kbps	384 Kbps
Avaya™ Equinox Meet-Me for Windows, Avaya™ Equinox Meet-Me for Mac, or Scopia Desktop Client	720p	768 Kbps	512 Kbps
XT Executive	720p at 30fps	768 Kbps	512 Kbps
XT Series	1080p at 60fps	2,560 Kbps	2 Mbps
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 that reached its capacity limit during peak hours to an idle MCU 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 XT Executive 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 on page 67.

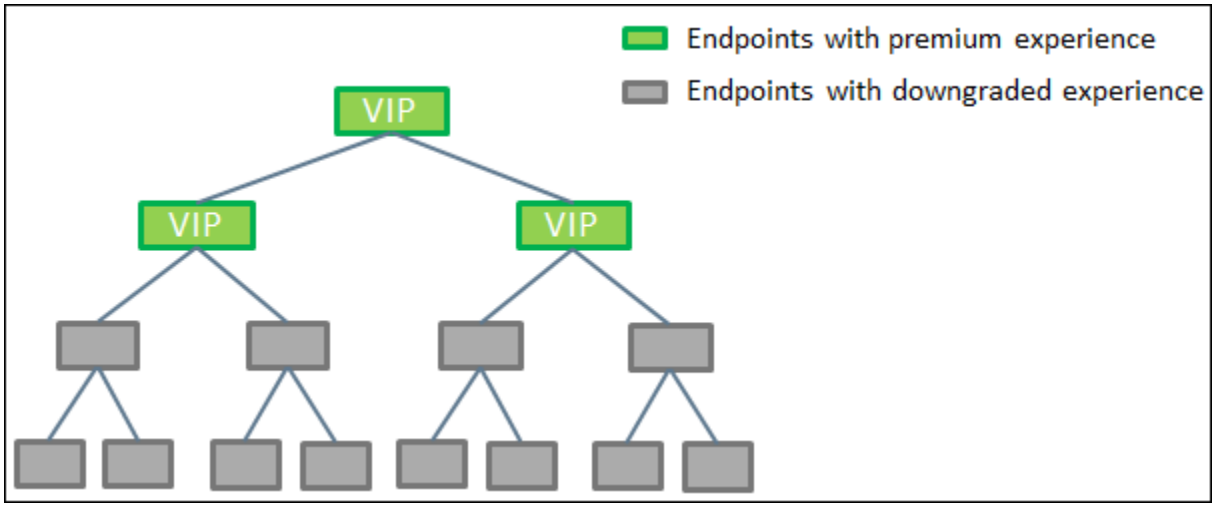


Figure 16: Example of a hierarchical organization

- Setting bandwidth limits for Scopia Desktop users.

  You can define different maximum bandwidth for Scopia Desktop authenticated users and guests using Equinox Management. The maximum bandwidth configured in Equinox Management cannot exceed the maximum bandwidth configured on a Scopia Desktop to which the users connect. For more information see *Administrator Guide for Equinox Management*.

- 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 49

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

Considerations for Choosing your Equinox Solution on page 49

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 Scopia Solution as described in Table 7: Types of traffic and their priorities in Equinox Solution on page 68.

Table 7: 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

Considerations for Choosing your Equinox Solution on page 49

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 8: Types of dial plans on page 69:

Table 8: 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, a XT Executive, an Avaya Equinox™ Meet-Me client (desktop or mobile), a Scopia Desktop Client and a Scopia Mobile device (Scopia Desktop is optional for OTT deployments). 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 his phone and XT Executive start ringing. If the user accepts the call on his phone, he joins the videoconference with audio only. If the user accepts the call on his XT Executive, he 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 a user on his phone, you need to dial 6789; to reach him on his XT Executive, you must dial 11-6789, because 11 is the prefix for his 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 a user on his phone, you need to dial 6789; to reach him on his XT Executive, you must dial 1234.

Table 9: 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

Table continues…

	Phone number	ID dialing	Prefix for video endpoint	Separate number for video endpoint
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

Considerations for Choosing your Equinox Solution on page 49

Chapter 5: Solution specifications

Solution specification for SMB enterprises

Avaya has created this centralized conferencing solution for small 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.

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 figure below illustrates a basic OTT deployment.

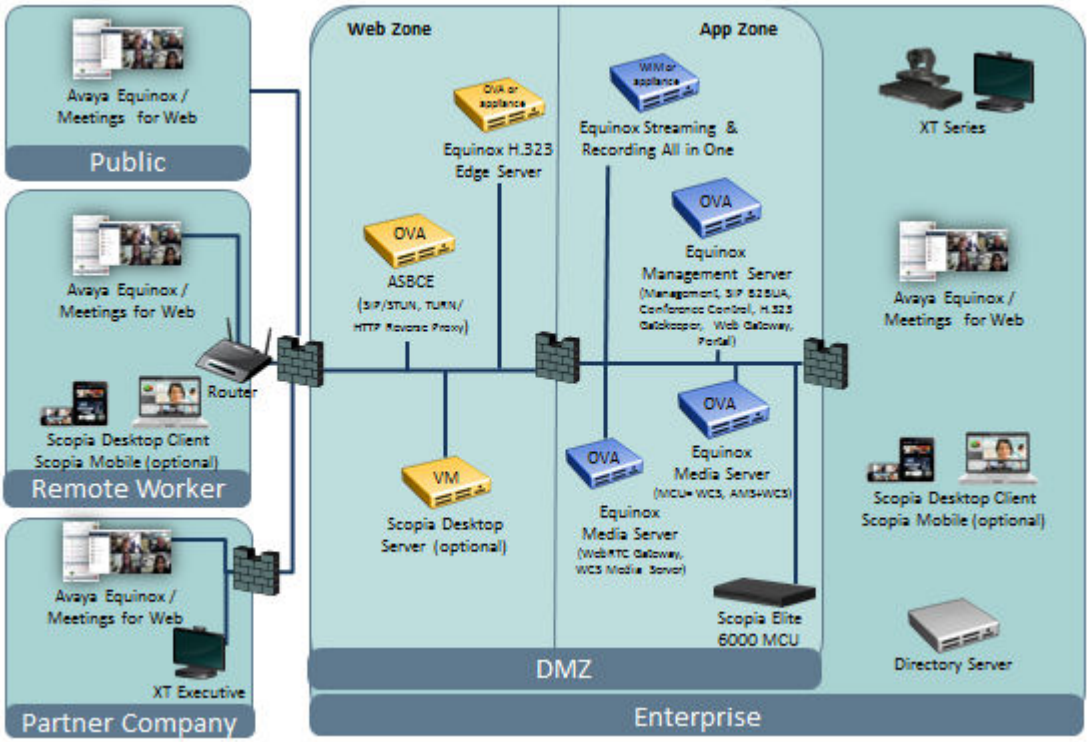


Figure 17: Example of a complete centralized solution

This complete centralized conferencing solution:

- Targets up to 5,000 registered users.

- Supports up to 500 concurrent sessions.
- Requires port-based licenses
- 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. The virtual application fully integrates with the enterprise active directory and provides intelligent cross-zone bandwidth management regardless of protocols being used for calls. The application deploys as an All-in-one Open Virtualized Appliance (OVA): all its modules (Management, SIP B2BUA, H.323 Gatekeeper, Equinox Conference Control, Web Gateway, User Portal) are installed on the same virtual machine.
- 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 will be introduced in the following releases in synergy with software and hardware client support for the same technology. The server can also deploy 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, that has also WebRTC, and one for High Capacity Audio and Web Collaboration.
- 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 Equinox Media Server as a Web Gateway. The 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), or as a hardware appliance for existing customers.
- (Legacy) Uses the Scopia Desktop Server with its built-in firewall traversal methods. Scopia Desktop Clients and Scopia Mobiles connect directly to the server in the DMZ, enabling their users to join conferences. The server is deployed as an application on a virtual machine.
- Supports Avaya Session Border Controller for Enterprise (or an Avaya approved edge device), as an option. The ASBCE provides SIP firewall traversal, HTTP Reverse proxy, and STUN/TURN firewall traversal. The ASBCE 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 can be deployed as an appliance on an Avaya Common Server or as a Windows software image (WIM) on a customer-provided server running the same specifications as or similar to an Avaya Common Server.

Related links

Reference configurations on page 74
Specifications for infrastructure components on page 75
Specifications for peripherals and edge components on page 78

Reference configurations

The centralized Avaya Equinox for Over The Top solution deploys the complete set of conferencing facilities at the company's site. There are two configurations for the solution:

Basic configuration

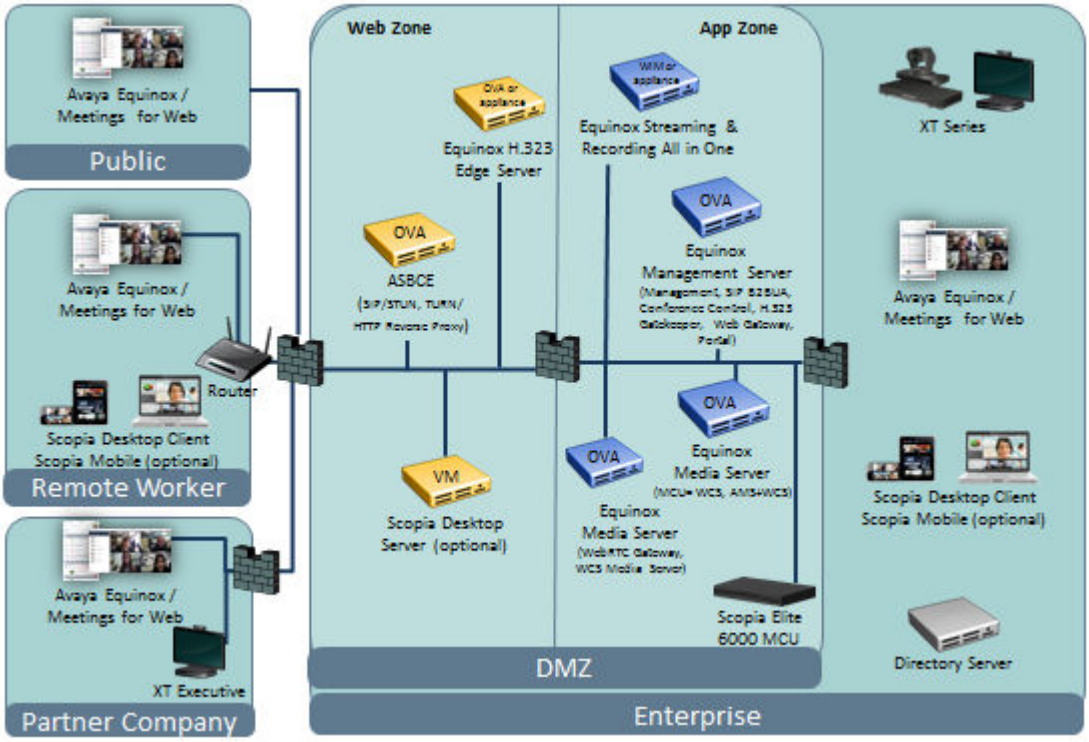


Figure 18: Basic configuration

Redundant configuration

The solution is highly scalable and fully redundant. To increase capacity, you can add more of the same components, like extra Equinox Management, Equinox Media Server, Equinox Streaming and Recording, Avaya Session Border Controller for Enterprise and others.

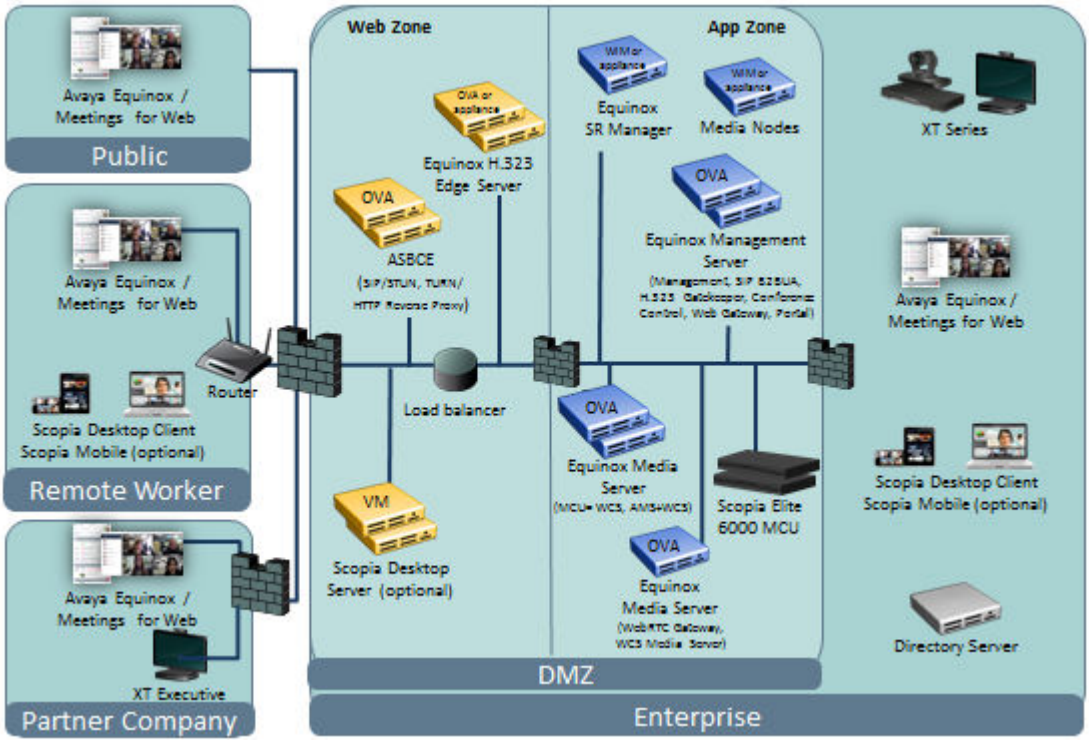


Figure 19: Redundant configuration

Related links

Solution specification for SMB enterprises on page 72

Specifications for infrastructure components

This deployment is targeted for customers who are starting with minimum capacity calls from H.323 or SIP standard endpoints, Scopia Desktop Clients, Scopia Mobiles, and Avaya Equinox Meetings for Web (Web RTC).

The recommended server is Avaya Common Server. The customer can use any server, as long as it complies with the minimum requirements listed in the tables below.

Table 10: Minimum requirements

Avaya Common Server	Description
HP ProLiant DL360 G9 (main server) Or Dell R630 (alternate server)	• Appliance Appliance Virtualization Platform(AVP) hypervisor • 2x Intel E5-2680v3 (12 cores), for a total 24 physical cores. • Core frequency 2,5 GHz • Memory 64GB • HDD Drive 4*300GB • Network 6 x 1GB Ethernet

Avaya Common Server	Description
	• Power Supplies 2*750 Watt AC • 1U rack

Performances and capacity of the server are related to the allocated processor power allocated (physical cores), RAM, disk spaces, and network interfaces associated to the Virtual Machine.

Equinox Management (formerly Scopia® Management)

This All-in-One OVA includes several services and functionalities: (iVIEW, SIP B2BUA, H.323 Gatekeeper, Control Server, Web Gateway (WGW), Porta). The basic Equinox Management license required is for up to 2000 concurrent calls. This license includes all management functions, Unified Portal, and signaling Web Gateway for Equinox Meet Me web calls. There might be 1000 Meet Me web calls out of 2000 calls.

Server/VM parameter	Medium/high configuration
Recommended server CPU (GHz) x physical cores)	2.5 x 8
VM vCPU reservation	8
VM CPU reservation (MHz)	15000
VM RAM reservation (GB)	16
Disk reservation (GB)	200
Number of NICs	2
Usage	Centralized OTT deployment
Capacity	2000 calls (1000 of them can be Meet Me Web calls) 30,000 registered users 2000 user portal sessions

Equinox Media Server

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 the Scopia® Elite 6000 MCU. In this mode, the Equinox Media Server can function as a Web Gateway (WGW) for adding the WebRTC functionality to the Scopia® Elite 6000 MCU, or as a Web Collaboration Server Gateway (WCS GW) for adding advanced content sharing functionalities. Usage and capabilities of this VM are determined by licensing or from the administrator web interface of the Equinox Management server.

Server/VM	Medium configuration	High configuration	Comment
Recommended server CPU (GHz) x physical cores)	2.0 x 12	2.5 x 16	
VM vCPU reservation	12	32	
VM CPU reservation (MHz)	21900	35000	
VM RAM reservation (GB	14	20	

Table continues…

Server/VM	Medium configuration	High configuration	Comment
Disk reservation (GB)	120	120	
Number of NICs	2	2	
Maximum number of licenses applicable in OTT model	1	Up to 2	
Maximum number of video ports at 720p30 *	10	20	Full Audio, Video and Web Collaboration mode. For this working mode, the audio capacity of the Media Server is twice the 720p30 port capacity. For example, in the Medium configuration 10 720p ports correspond to 20 audio ports.
Maximum number of audio ports*	500	1000	High Capacity Audio and Web Collaboration mode

Hardware parameter	Medium configuration	High configuration	Comment
CPU Physical cores	12	16	
Core frequency	2.0 GHz	2.5 GHz	
RAM Memory	16 GB	24 GB	
HDD Drive 2.5” SAS	120 GB	120 GB	
Maximum number of licenses applicable in OTT model	1	Up to 2	
Maximum number of video ports at 720p30	10	20	Full Audio, Video and Web Collaboration mode. For this working mode, the audio capacity of the Media Server is twice the 720p30 port capacity. For example, in the Medium

Table continues…

Hardware parameter	Medium configuration	High configuration	Comment
			configuration 10 720p ports correspond to 20 audio ports.
Maximum audio ports	500	1000	High Capacity Audio and Web Collaboration mode

Scopia® Elite 6000 MCU

These models can be part of the deployment. The table lists the component supported capacity.

Audio/video calls	Elite 6105	Elite 6110	Elite 6120	Used with
High Definition (720p/30) Continuous Presence Ports (with additional license option)	10 HD ports	20 HD ports	40 HD ports	Equinox Media Server functioning as WCS Media GW or WebRTC Media GW (see above)
Enhanced Definition (480p/30) Continuous Presence Ports	20 SD ports	40 SD ports	80 SD ports	

Related links

Solution specification for SMB enterprises on page 72

Specifications for peripherals and edge components

Equinox H.323 Edge server (formerly Scopia® PathFinder)

Three delivery options are offered:

- Appliance with Release 9 software preinstalled
- OVA ESXi to be deployed on a customer provided server (Intel® Xeon® Processor)
- OVA AVP to be deployed on an Avaya Common Server

The appliance comes with either a 10 or 20 pre-installed port license. This capacity can further be increased by increment of 10 ports up to a maximum of 100 ports (100 concurrent traversal calls / 600 concurrent registrations).

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 Common Server).

Table 11: Minimum VM requirements

Component	Specification
Server	Intel Xeon @ 2.0GHz, 4 physical cores
Server RAM	8GB
VM minimum vCPUs	2
VM CPU reservation	3000MHz
VM RAM reservation	2GB
Server disk space reservation	40GB
Number of NICs	1 shared Deploy a dual-NIC configuration of Equinox H.323 Edge server with dedicated NICs for the internal and external networks for more security and robustness.
Software	VMware ESXi version 5.5 and 6.0
Capacity	Maximum 120 calls and 720 registered users

Table 12: Usage and capacity

VM Configuration	Usage	Concurrent sessions (port capacity)
Low	H.323 firewall traversal for remote H.323 conferencing rooms	The capacity of the OVA version is available in increments of 10 ports up to a maximum of 120 ports

Avaya Equinox Recording Gateway (AERG)

The gateway is required to facilitate audio only and content recording into the 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 Common Server).

Table 13: 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 Avaya Common Server Release 3 physical server or equivalent server.

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

Table 14: 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

Scopia Desktop Server

Avaya Equinox™ Meet-Me Client now integrates the Meet-Me functionality and replaces the Scopia client. This replacement is optional for an OTT deployment. Contact your administrator to continue using Scopia Desktop in the following cases: your deployment includes a third party session border controller (and not the Avaya SBCE required for Avaya Equinox™ Meet-Me); you currently need the Scopia Content Slider (which will be part of future releases).

This table lists the component supported capacity.

Table 15: Usage and capacity

Virtual application configuration	Usage	Concurrent sessions (port capacity)
Low	H.323/H.460	100 HD
Medium		150 SD

ASBCE

For more information, see the component's documentation.

Related links

Solution specification for SMB enterprises on page 72

Introducing Avaya Equinox Streaming and Recording

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 next generation HD streaming and recording platform. The Avaya Equinox Streaming and Recording Server replaces the Avaya Scopia Content Center Recording Server (SCC) server.

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 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 Scopia® 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 Equinox Streaming and Recording 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™
- Avaya 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 Windows Media or .MP4 format.

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

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 480pm, or up to 60 360p recordings, or 75 audio-only 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 Windows Media™ format or H.264/AAC MP4/MPEGTS/HLS formats.

- Operating Systems: The transcoder runs on the Windows Server 2012 R2 64-bit operating system with Hyper-V (an add-on to Windows Server 2012 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
- Video, audio, and web collaboration conferences

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 a Avaya Equinox Recording Gateway. You can deploy the Avaya Equinox Recording Gateway using the Avaya Equinox Management interface. The Avaya 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 two additional meeting types - Audio Service and Audio Service with 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, Avaya 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. Avaya Equinox Management also determines the most appropriate capture rate, resolution, frame rate, and encode rate for the Equinox Streaming and Recording Conference Point.

The Avaya Equinox Recording Gateway does not require a separate license. When you buy a media node, you receive an Avaya Equinox Recording Gateway as well. For more information on

adding the gateway to Avaya Equinox Management and for information on configuring the meeting types, see *Administering Avaya Equinox Management*, which is available on support.avaya.com.

Related links

Solution specification for SMB enterprises on page 72
Example of a direct DMZ deployment on page 85
Example of a reverse proxy deployment on page 86
Scalability on page 87
System requirements on page 88

Example of a direct DMZ deployment

Figure 20: Example of a Direct DMZ Deployment on page 85 displays an example of a 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.

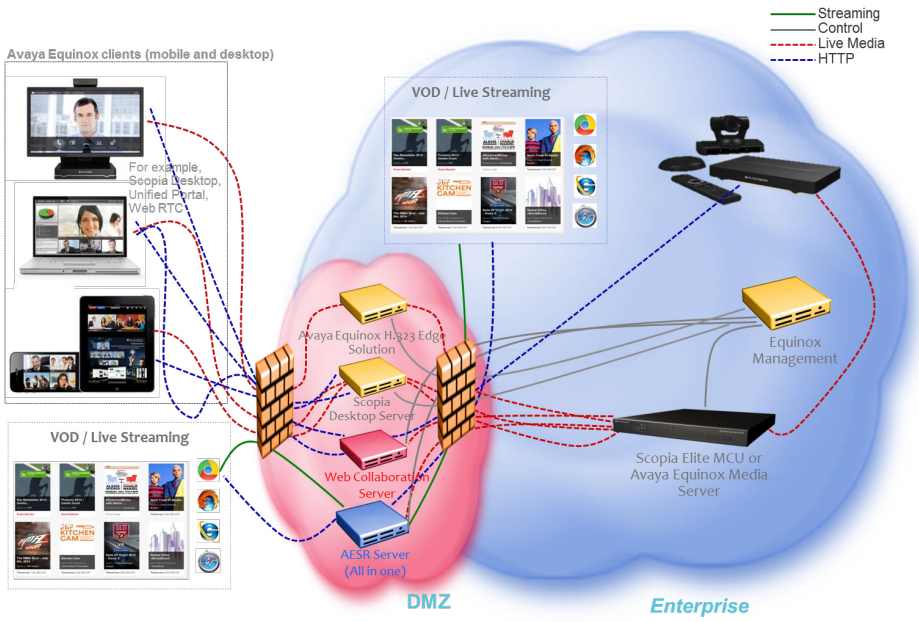


Figure 20: Example of a Direct DMZ Deployment

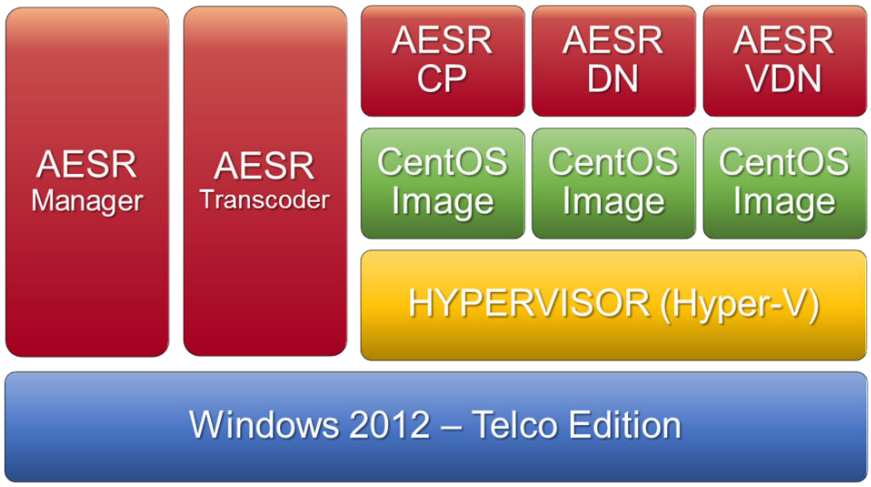


Figure 21: Components in an All-In-One Deployment with Virtual Software

Related links

Avaya Equinox Streaming and Recording Server on page 81

Example of a reverse proxy deployment

Figure 22: Example of a Reverse Proxy Deployment on page 86 displays an example of a Equinox Streaming and Recording deployment that includes a reverse proxy server. The deployment is a centralized or all-in-one solution.

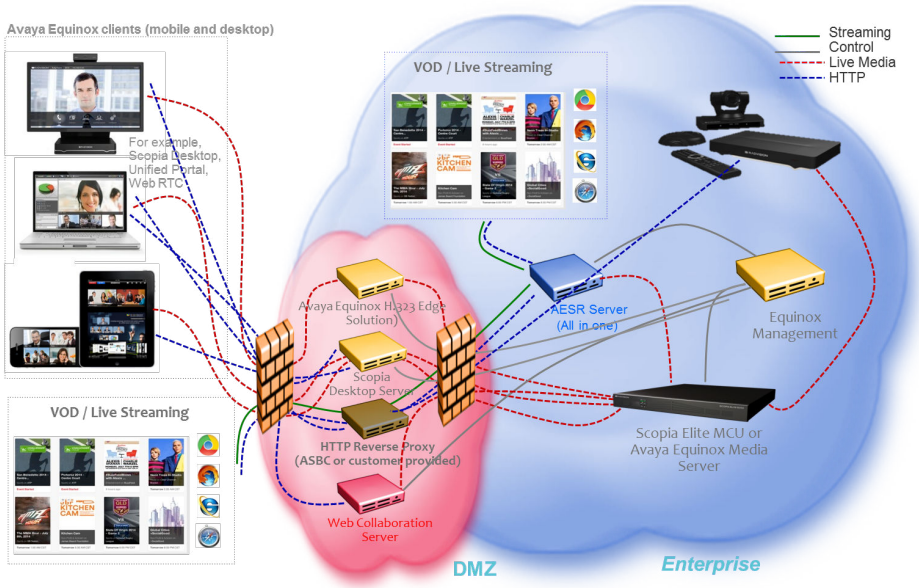


Figure 22: Example of a Reverse Proxy Deployment

Related links

Avaya Equinox Streaming and Recording Server on page 81

Scalability

Introduction

The Equinox Streaming and Recording is installed on a Dell™ PowerEdge™ R620, Dell™ PowerEdge™ R630, or HP ProLiant DL360 G9 server, provided by Avaya. Alternatively, you can purchase a Microsoft™ Windows Image (WIM) and install Equinox Streaming and Recording on your own server. 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 servers: Dell™ PowerEdge™ R620, Dell™ PowerEdge™ R630, and HP ProLiant DL360 G9 are often referred to as the Avaya Common Server(s).

Recording (Dell™ PowerEdge™ R620)

Equinox Streaming and Recording supports up to 10 high definition (1080p) 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).

Equinox Streaming and Recording supports a mix of resolutions, and can do three standard definition calls for every one high definition call. So, for example, if the system is licensed for 10 concurrent recordings, you can do any of the combinations of calls in Table 16: Call Combinations on the Dell PowerEdge R620 on page 87.

Table 16: Call Combinations on the Dell™ PowerEdge™ R620

High Definition	Standard Definition
0	30
1	27
2	24
3	21
4	18
5	15
6	12
7	9
8	6
9	3
10	0

Recording (Dell™ PowerEdge™ R630 and HP ProLiant DL360 G9)

The Dell™ PowerEdge™ R630 and HP ProLiant DL360 G9 (or Avaya-approved equivalent[2]) offers higher scalability than the Dell™ PowerEdge™ R620. When the 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 a Dell™ PowerEdge™ R620 deployment, as listed in Table 17: Concurrent recordings on the Dell PowerEdge R630 and HP ProLiant DL360 G9 on page 88. When the CP is on a separate server, it offers even higher scalability with 40 medium definition and 60 low definition simultaneous recordings.

Table 17: Concurrent recordings on the Dell™ PowerEdge™ R630 and HP ProLiant DL360 G9

	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 81

System requirements

Before you log on to Equinox Streaming and Recording Manager administration pages, your client system must meet the system requirements listed in Table 18: Requirements on page 88.

Table 18: Requirements

Component	Requirement
Operating system	• Mac OS X 10.7 (Lion) or later • Windows Vista™ • Windows 20XX • Windows 7™ (32 and 64 Bit) • Windows 8™ • Windows 10™

Table continues…

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

Component	Requirement
Web browser	• Microsoft Internet Explorer 8.0™ or later • Microsoft Edge™ • Mozilla Firefox 35™ or later (Mac or Windows) • Chrome 30™ or later (Mac or Windows) • Safari 6™ or later (Mac) JavaScript must be enabled.

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 19: Requirements on page 89.

Table 19: Requirements

Component	Requirement
Web browser	• Microsoft Internet Explorer 11.0™ or later • 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™ 7 (32 and 64 Bit) • Windows™ 8 • Windows™ 8.1 • Windows™ 10 • iOS N-1 or later • Android 4.0.3. or later
Media Player	Microsoft Windows Media Player™ Release 9.0, 10.0, or 11.0 to view programs.
Silverlight	Microsoft Silverlight™ player to view programs.
HTMLV5 Browsers	A select number of browsers support video playback directly for MP4 VoD files including: • Internet Explorer 9, 10, 11 • Safari 6™ or later • Chrome 30™ or later • Microsoft Edge™

Table continues…

Component	Requirement
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.

Related links

Avaya Equinox Streaming and Recording Server on page 81

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 Scopia® XT Series	Plan for and deploy Avaya Scopia® XT Series	Partners, Services, and Support personnel
Deployment Guide for XT Telepresence	Plan for and deploy XT Telepresence	Partners, Services, and Support personnel
Deployment Guide for Avaya Video Collaboration Solution for IP Office	Plan for and deploy Avaya Video Collaboration Solution for IP Office	Partners, Services, and Support personnel
Deployment Guide for Avaya Equinox Add-in for IBM Lotus Notes	Plan for and deploy Avaya Equinox Add-in for IBM Lotus Notes	Partners, Services, and Support personnel
Deployment Guide for Avaya Scopia® Video Gateway for Microsoft Lync	Plan for and deploy Avaya Scopia® Video Gateway for Microsoft Lync	Partners, Services, and Support personnel
OCS Deployment Guide for Avaya Scopia® Video Gateway for Microsoft Lync	Plan for and deploy Avaya Scopia® Video Gateway for Microsoft Lync	Partners, Services, and Support personnel
Deployment Guide for Avaya Scopia XT Desktop Server for IP Office	Plan for and deploy Avaya Scopia XT Desktop Server for IP Office	Partners, Services, and Support personnel

Table continues…

Title	Use this document to:	Audience
Deployment Guide for Avaya Scopia XT Desktop Server	Plan for and deploy Avaya Scopia XT Desktop Server	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
Installation Guide for Avaya Scopia XT Desktop Server	Install Avaya Scopia XT Desktop Server	Partners, Services, and Support personnel
Installation Guide for Avaya Scopia Desktop Server for Avaya Aura® Power Suite	Install Avaya Scopia Desktop Server for Avaya Aura® Power Suite	Partners, Services, and Support personnel
Installation Guide for Kerberos in Avaya Equinox Management	Install Kerberos in Avaya Equinox Management	Partners, Services, and Support personnel
Rack Mounting Guide for Avaya Scopia® Elite 6000 MCU	Install the Avaya Scopia® Elite 6000 MCU hardware	Partners, Services, and Support personnel
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 Application Server for Avaya Aura® Power Suite	Perform administration tasks for Avaya Equinox Application Server for Avaya Aura® Power Suite	System administrators
Administrator Guide for Avaya Equinox Streaming and Recording Server	Perform administration tasks for Avaya Equinox Streaming and Recording Server	System administrators

Table continues…

Title	Use this document to:	Audience
Administrator Guide for Avaya Scopia Desktop Server	Perform administration tasks for Avaya Scopia Desktop Server	System administrators
Administrator Guide for Avaya Scopia Desktop Server for Avaya Aura® Power Suite	Perform administration tasks for Avaya Scopia Desktop Server for Avaya Aura® Power Suite	System administrators
Quick Setup Guide for Avaya Scopia® XT5000 Codec Only	Perform administration tasks for the Avaya Scopia® XT5000 codec	System administrators
Avaya Scopia® XT5000 Codec Only	Perform administration tasks for the Avaya Scopia® XT5000 codec	System administrators
Avaya Scopia® XT Executive 240	Perform administration tasks for Avaya Scopia® XT Executive 240	System administrators
Avaya Scopia® XT5000 Server for IP Office	Perform administration tasks for Avaya Scopia® XT5000 Server for IP Office	System administrators
Avaya Scopia® XT Premium 3–way Microphone Pod	Perform administration tasks for Avaya Scopia® XT Premium 3–way Microphone Pod	System administrators
Avaya Scopia® XT4300	Perform administration tasks for Avaya Scopia® XT4300	System administrators
Avaya Scopia® XT4300 Codec Only	Perform administration tasks for the Avaya Scopia® XT4300 codec	System administrators
Avaya Scopia® XT7100 Codec Only	Perform administration tasks for the Avaya Scopia® XT7100 codec	System administrators
Avaya Scopia® XT Deluxe Camera	Perform administration tasks for Avaya Scopia® XT Deluxe Camera	System administrators
Avaya Scopia® XT Flex Camera	Perform administration tasks for Avaya Scopia® XT Flex Camera	System administrators
Quick Tips for Avaya Scopia® XT Series	Perform administration tasks for Avaya Scopia® XT Series	System administrators
Supporting		
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	System administrators, Customers, Partners,

Table continues…

Title	Use this document to:	Audience
	remote SNMP management client of its operational status	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
Purchasing Guide for AvayaLive™ Video	Understand how to purchase AvayaLive™ Video	System administrators, Customers, Partners, Services, and Support personnel
Using		
Using Avaya Equinox Unified Portal	Understand the features of and use Avaya Equinox Unified Portal	Customers
User Guide for Avaya Scopia® Elite 6000 MCU	Understand the features of and use Avaya Scopia® Elite 6000 MCU	Customers
Using Avaya Equinox Media Server	Understand the features of and use Avaya Equinox Media Server	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 Scopia® XT Series	Understand the features of and use Avaya Scopia® XT Series	Customers
User Guide for Avaya Equinox Management	Understand the features of and use Avaya Equinox Management	Customers
User Guide for Avaya Equinox Add-in for IBM Lotus Notes	Understand the features of and use Avaya Equinox Add-in for IBM Lotus Notes	Customers
User Guide for Avaya Equinox Add-in for Microsoft Outlook	Understand the features of and use Avaya Equinox Add-in for Microsoft Outlook	Customers
User Guide for Avaya Equinox Add-in for Microsoft Outlook for Avaya Aura® Power Suite	Understand the features of and use Avaya Equinox Add-in for Microsoft Outlook for Avaya Aura® Power Suite	Customers
User Guide for Avaya Scopia® Video Gateway for Microsoft Lync	Understand the features of and use Avaya Scopia® Video Gateway for Microsoft Lync	Customers
User Guide for Avaya Scopia® XT Desktop Client	Understand the features of and use Avaya Scopia® XT Desktop Client	Customers

Table continues…

Title	Use this document to:	Audience
User Guide for Avaya Scopia Mobile	Understand the features of and use Avaya Scopia Mobile	Customers
User Guide for Avaya Scopia® Control	Understand the features of and use Avaya Scopia® Control	Customers

Finding documents on the Avaya Support website

Procedure

1. Navigate to http://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 an appropriate release number.
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 displays the documents only from the selected category.
7. Click **Enter**.

Training

The following courses are available on the Avaya Learning website at http://www.avaya-learning.com. 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

Table continues…

Course code	Course title
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 http://support.avaya.com 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 102.
2CIF	2CIF describes a video resolution of 704 x 288 pixels (PAL) or 704 x 240 (NTSC). It is double the width of CIF, and is often found in CCTV products.
2SIF	2SIF describes a video resolution of 704 x 240 pixels (NTSC) or 704 x 288 (PAL). This is often adopted in IP security cameras.
4CIF	4CIF describes a video resolution of 704 x 576 pixels (PAL) or 704 x 480 (NTSC). It is four times the resolution of CIF and is most widespread as the standard analog TV resolution.
4SIF	4SIF describes a video resolution of 704 x 480 pixels (NTSC) or 704 x 576 (PAL). This is often adopted in IP security cameras.
720p	See HD on page 104.
AAC	AAC is an audio codec which compresses sound but with better results than MP3.
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 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.

Avaya Scopia Content Slider

See Content Slider on page 100.

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.

BFCP (Binary Floor Control Protocol)

BFCP is a protocol which coordinates shared videoconference features in SIP calls, often used by one participant at a time. For example, when sharing content to others in the meeting, one participant is designated as the presenter, and is granted the floor for presenting. All endpoints must be aware that the floor was granted to that participant and react appropriately.

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 109.

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 Scopia 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 100.

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, XT Executive. 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.

E.164 E.164 is an address format for dialing an endpoint with a standard telephone numeric keypad, which only has numbers 0 - 9 and the symbols: * and #.

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 XT Executive, software endpoints like Scopia Desktop Client, mobile device endpoints like Scopia Mobile, room systems like XT Series, and telepresence systems like XT Telepresence.

Endpoint Alias See Alias on page 98.

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 101.
FPS	See Frames Per Second on page 102.
Frame Rate	See Frames Per Second on page 102.
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 Equinox TIP Gateway, or the 100 Gateway.
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 103.

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 98.

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 104.

High Profile

See H.264 High Profile on page 103.

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 108.

KBps

Kilobytes per second (KBps) measures the bitrate in kilobytes per second, not kilobits, by dividing the number of kilobits by eight. Bitrate is normally quoted as kilobits per second (kbps) and then converted to kilobytes per second (KBps). Bitrate measures the throughput of data communication between two devices.

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).

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

Scopia Desktop's 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 might or might 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

An MCU, or Multipoint Control Unit, connects several endpoints to a single videoconference. It manages the audio mixing and creates the video layouts, adjusting the output to suit each endpoint's capabilities.

MCU service

See Meeting Type on page 106.

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 Control on page 100.

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. In Scopia Desktop Client, 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 Scopia Desktop Server, 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.

Multicast Streaming

Multicast streaming sends a videoconference to multiple viewers across a range of addresses, reducing network traffic significantly. Scopia Desktop Server multicasts to a single IP address, and streaming clients must tune in to this IP address to view the meeting. Multicasts require that routers, switches and other equipment know how to forward multicast traffic.

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.

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.

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 100.

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.
Q.931	Q.931 is a telephony protocol used to start and end the connection in H.323 calls.
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.
Quality of Service (QoS)	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.
Recordings	A recording of a videoconference can be played back at any time. Recordings include audio, video and shared data (if presented). Users can access recordings from the Scopia Desktop web portal or using a web link to the recording on the portal.
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.
Scalability	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.
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 106.
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 Scopia® 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 108.

SIP Server A SIP server is a network device communicating via the SIP protocol.

SIP URI See URI on page 112.

Slider See Content Slider on page 100.

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. For example, Scopia Desktop Client or Scopia Mobile.

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 109.

Standard Definition See SD on page 109.

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. There are two types of streaming supported in Equinox Solution: unicast which sends a separate stream to each viewer, and multicast which sends one stream to a range of viewers.

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 the Scopia Elite MCU and/or Equinox Media Server only by four times.

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.

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.

UC (Unified Communications)

UC, or unified communications deployments offer solutions covering a wide range of communication channels. These include audio (voice), video, text

(IM or chat), data sharing (presentations), whiteboard sharing (interactive annotations on shared data).

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 in Scopia Desktop Server. To save bandwidth, consider multicast 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 used to locate a SIP device on a network, 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. For example,*<endpoint name>@<server_domain_name>*. When dialing URI between organizations, the server might often be the Avaya Equinox H.323 Edge of the organization.

URI Dialing Accessing a device via its URI on page 112.

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 Scopia Desktop and Scopia Mobile functionality, and allowed bandwidth for calls.

VFU See Video Fast Update (VFU) on page 112.

VGA VGA defines a video resolution of 640 x 480 pixels.

Video Fast Update (VFU) Video Fast Update (VFU) is a request for a refreshed video frame, sent when the received video is corrupted by packet loss. In response to a VFU request, the broadcasting endpoint sends a new intra-frame to serve as the baseline for the ongoing video stream.

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 108.

Video Switching See Switched video on page 111.

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 Avaya Scopia Desktopuser portal. To access the Viewer Portal, you can select **Recordings and Events** on the main Scopia Desktop page. 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 in Scopia Desktop and Scopia Mobile 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 download Scopia Desktop or Scopia Mobile free 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 Scopia Desktop 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 Scopia Desktop 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.