

H.323 Protocol Toolkit

For Developing Highly Scalable H.323 Entities

The award-winning RADVISION H.323 Protocol Toolkit implements all mandatory H.323 features and offers the most extensive implementation of optional capabilities. It is the most feature-rich, comprehensive implementation of the ITU standard and offers exceptional flexibility for building innovative IP-based communications products and services with unique value-added functionality. The current RADVISION release is H.323 version 4 compliant and is fully backward compatible.

The RADVISION H.323 product family also includes:

- **Gatekeeper Toolkit**
unique building blocks for developing H.323 network management control applications such as H.323 gatekeepers and softswitches
- **ProLab™ H.323 Test Manager**
a new and innovative testing tool simulating a real H.323 network for debugging and simulating numerous testing scenarios when developing H.323 products and services

Products benefiting from H.323 development solutions include:

- Softswitches
- Hand Held Devices
- Multipoint Conferencing Units (MCUs)
- Gateways
- IP Phones / Terminals
- Multiservice Application Servers
- Gatekeepers
- Chipsets
- Call Center Systems
- Voice Over Packet Processors
- Video Conferencing Systems
- Desktop Endpoints
- Communication Boards
- Voice-Enabled e-Commerce
- IP-PBXs

H.323 Basics

H.323 is the most widely deployed IP communications protocol suite for real-time V^oIP communication implemented in products ranging from video conferencing systems to chipsets. H.323 relies on other protocols and annexes to provide a broad range of functionality including H.245 and the H.225 suite of protocols (Q.931, RAS and RTP /RTCP) for call control functionality, H.26x family of protocols for video codec support and G.7xx family for audio codec support. H.323 defines four primary entities:

- Terminals – provide real-time, two-way communication
- Gateways – interface between circuit switch and packet networks
- Multipoint Conferencing Units (MCUs) – allows three or more endpoints to participate in a multi-location conference
- Gatekeeper – manages the network and provides call control functionality within an H.323 zone

RADVISION technology helps you:

- Improve your time to market
- Reduce your R&D costs
- Simplify your development
- Keep up-to-date with the latest standards
- Assure interoperability

feature	benefits
Fully compliant with H.323 version 4	All RADVISION H.323 development solutions are compliant with the latest version of the ITU-T H.323 standard.
Support for Enhanced Protocol Capabilities	Provides support for: <ul style="list-style-type: none"> ■ Annex M - tunneling QSIG, ISUP and DSS1 over H.323 networks ■ Q.931 Multiplexing - for carrying multiple concurrent calls through the same signalling channel.
Support for Enhanced Services	Provides enhanced features such as: <ul style="list-style-type: none"> ■ Annex K - HTTP-based service control ■ Annex L - MEGACO/H.248 message tunneling for supporting service creation methods, and enhanced billing services.
Proven Interoperability	RADVISION consistently verifies interoperability by attending all major industry-related interoperability events. RADVISION has become the champion of interoperability with over 80% of all H.323-standards based products developed using our H.323 Protocol Toolkit.
High Performance and Minimal Memory Consumption	RADVISION has developed a unique design to configure the H.323 stack in various modes to reduce the amount of memory per call and increase performance. As a result, the Toolkit can operate quickly and support large call capacities.
High Scalability	Addresses the development needs of both large and small scale applications.
Portability	<ul style="list-style-type: none"> ■ Available for all major platforms from native to embedded operating systems. ■ Can be easily ported to other platforms by altering the core layer, which is the only part that is platform dependent.
Layered API Model	<ul style="list-style-type: none"> ■ High-level, easy-to-use APIs hide protocol complexity ■ Low level, easy-to-use APIs adjust stack functionality and access all message parameters.



Specifications

Enhanced Protocol Capabilities

Annex M (General Infrastructure for Tunneling Signaling Protocols)

Annex M uses the defined generic tunneling mechanism to tunnel QSIG, ISUP and DSS1 over H.323 networks. The H.323 Protocol Toolkit contains API functions to allow for creating, sending and receiving Annex M tunneled messages.

Parallel H.245

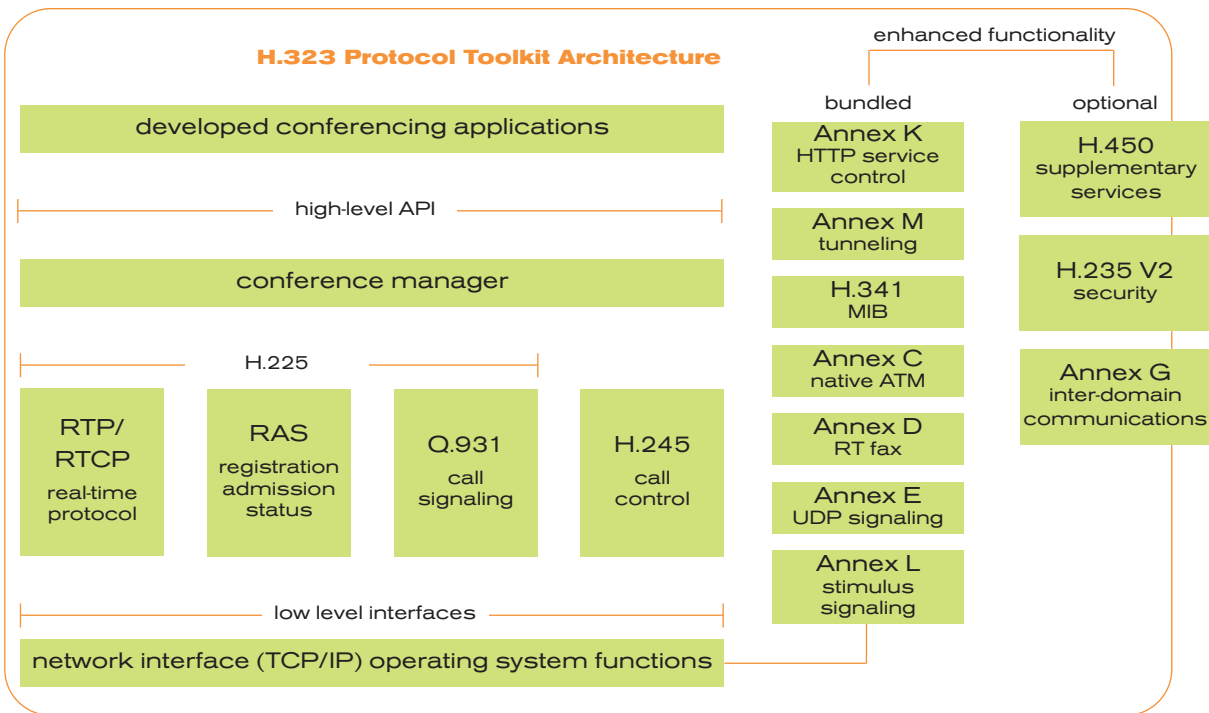
The Parallel H.245 feature allows H.245 to begin in parallel to Fast Connect by including H.245 messages in the Setup message. An endpoint can perform capabilities exchange to determine which features are supported. Additionally, this feature allows two endpoints to quickly establish an H.245 session in case the Fast Connect is not accepted by the called endpoint.

Additive Registration

The Additive Registration feature allows an endpoint to register with a gatekeeper and provide an initial list of aliases and then follow the RRQ request with additional RRQs to provide the gatekeeper with a complete list of alias addresses. Implementation of this feature now allows large endpoints with numerous alias addresses to register with a gatekeeper regardless of the size of the UDP packet.

Q.931 Multiplexing

The Q.931 Multiplexing feature supports carrying multiple concurrent calls through the same call signaling channel. This provides better network resource management for gateways and gatekeepers. Additionally, this feature overcomes operating system port limitations for greater call handling and higher performance.



Specifications

Service Creation Capabilities

Annex K (HTTP-based Service Control for H.323 Devices)

Annex K provides a generic and application-independent service control channel that complements the capabilities of H.450 Supplementary Services and supports the customization and branding of web-based VoIP services. The Toolkit supports the following services:

- Non-call related service control, where the service control channels are opened during registration
- Call-related service control, where service control channels are opened during call sessions

Annex L (Stimulus Signaling, Tunneled MEGACO messages)

Annex L provides stimulus signaling procedures between H.323 terminals and a feature server entity. The stimulus method allows the network service provider to implement new supplementary services for the terminals without changing the terminal software. RADVISION has implemented intuitive APIs to support the indication of Annex L and the encapsulation of MEGACO/H.248 messages in H.225.0 call signaling messages.

Advanced Billing-Related Capabilities:

Call Credit-Related Capabilities

Call credit-related capabilities allows users to dial a gateway to place a call, which is eventually charged to a pre-paid calling card or a user's account. The feature provides a means for communicating available funds. The Toolkit contains a unique API to allow the developer to build or check the relevant fields.

Call Linkage

Call linkage allows a call to link several call legs to associate the original caller when Call Transfer or another supplementary service is invoked. This feature provides more accurate billing-related information by locating the original caller to be billed.

Reporting Call Status

Particularly beneficial for large endpoints such as MCUs and gateways, reporting call status enables an endpoint to report call details to a gatekeeper in several distinct messages to avoid UDP packet size limitations.

Usage Information Reporting

Usage information reporting enables an endpoint to provide information regarding call start and end times, call termination cause, and any non-standard data the endpoint wishes to provide. The endpoint provides the usage information to a gatekeeper at various stages of a call. The Toolkit contains a unique API to allow the developer to build or check the relevant fields.

Tones and Announcements

Tones and announcements allow the indication of the presence of in-band tones and announcements such as when the destination number is incorrect or unreachable. The Toolkit contains a unique API to allow the developer to build or check the relevant fields.



Specifications

Optional Add-On Modules

H.235 Security

The H.235 Version 2 module implements authentication and integrity verification of H.323 messages per the ITU-T Recommendation for H.235 version 2. The authentication function assures the identity of a particular entity and the integrity verification function verifies that the data has not been altered in an unauthorized manner.

H.450 Supplementary Services

The H.450 module supports critical H.450.1-11 Supplementary Services such as FORWARD to forward incoming calls to another endpoint and TRANSFER to transfer calls to the first available terminal within a group of terminals. New H.450 Supplementary Services include Call Park and Pickup, Call Completion on Busy, Call Offer and Call Intrusion.

Annex G (Communication Between Administrative Domains)

The Annex G module enables creating and managing communication between border elements in different zones per the ITU-T H.225 Annex G Recommendation. Border elements are used for address resolution, pricing exchange, call authorization and authentication, and usage reporting.

Operating Systems

The H.323 Protocol Toolkit Version 4 supports the following operating systems:

- Windows NT 4.0 (Server and Workstation)
- Windows 95/98/2000/CE 2.11
- Solaris Sparc 2.6, 2.7, 2.8
- Solaris PC 2.6, 2.7, 2.8
- TRUE64 4.0E
- pSOS 2.2.7
- Linux RedHat 6.2 and 7
- HP-UX 11
- VxWorks 5.3.1
- Nucleus 4.3
- OSE 4.2.2

The H.323 Protocol Toolkit is delivered with:

- Source, Object or SDK
- Sample Application
- Release Notes
- Complete Documentation



About RADVISION

RADVISION is a leading provider of products and technology for real-time voice, video, and data communications over packet networks; this includes the Internet and other Internet Protocol (IP) based networks. Recognized universally as the experts in real-time Voice and Video over IP (V^oIP), RADVISION offers the broadest and most complete set of enabling technology and networking systems needed to enable enterprises and service providers to migrate their voice and video communications from traditional telephone networks to new converged networks. Today, hundreds of thousands of end-users around the world communicate over next-generation networks, using IP-centric products and solutions built around RADVISION products and technology. RADVISION's multi-protocol software toolkits for IP communications include: SIP, MEGACO, MGCP, and H.323; RADVISION's V^oIP networking products include: gateways, conferencing bridges, and gatekeeper applications. For more information, please visit our website at: www.radvision.com.



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