

H.323

H.323 PROTOCOL TOOLKIT

For Developing All Types of 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. The current RADVISION release is ITU-T H.323 version 5 compliant, supports the latest standards and is fully backward compatible.

Products developed with the H.323 Protocol Toolkit include:

- Softswitches
- Gateways
- IP-PBXs
- Desktop Endpoints
- Gatekeepers
- Web-Based VoIP Solutions
- Multipoint Conferencing Units (MCUs)
- IP Phones/Terminals/IADs
- Multiservice Application Servers
- VoIP Enabled Chipsets
- Call Center Systems
- Voice Over Packet Processors
- Videoconferencing Systems
- Communication Boards
- Voice-Enabled e-Commerce
- VoIP Management Systems
- Residential Gateways
- Interactive Voice Response (IVR)
- Session Border Controllers

H.323 Basics

H.323 is the most mature and widely deployed IP communications protocol suite for real-time voice and/or video communication and is implemented in products ranging from infrastructure videoconferencing systems to IP phone chipsets. H.323 relies on additional protocols and annexes to provide a broad range of functionality for multimedia communication, add-on managed services and smooth circuit switch network integration. H.323 defines four primary entities, which may be co-located:

- Terminals— provide user interface for real-time, two-way communication
- Gateways— interface between H.323 networks and other networks
- Multipoint Conferencing Units (MCUs)— allow three or more endpoints to participate in a multipoint conference
- Gatekeeper— provides call control functionality within an H.323 zone by managing the other entities as well as their authentication and usage of network resources and services

For more information: www.h323forum.org

Basic Functionality

Conference Manager API

The Conference Manager is a high level API that simplifies the use of the various H.323 sub-protocols (Q.931, RAS, H.245 and the bundled H.323 annexes). The Conference Manager API directs all conferencing activities, hides protocol complexity, assures proper initiation of call and channel setup, and manages resources.

RAS (Registration Admission and Status)

RAS enables well-managed service solutions for H.323 endpoints via the gatekeeper. The gatekeeper can monitor or control endpoint authentication, service authorization, network resource usage control, endpoint status queries, and call initiation and termination.

Q.931

Q.931 enables call setup (ringing, accept, reject) and teardown signaling, similar to the ISDN Q.931 signaling procedure. The functions can be performed either directly between endpoints or through a gatekeeper. The H.323 Protocol Toolkit also supports the latest ratified Q.931 timers including overlap sending timer, overlap receiving timer, incoming call proceeding timer and status timer.

H.245

H.245 is a call control protocol for initiation and management of multimedia sessions. Services such as capabilities exchange (e.g. codecs supported by each endpoint), RTP/RTCP channel opening, mixing and closing, multi-party and multimedia session management and control are provided.

Enhanced Functionality

Bundled With the Toolkit

Real-Time Fax (Annex D)

Annex D provides the capability to switch to fax (T.38) exchange in real-time during an active session.

UDP Signaling (Annex E)

Annex E allows Q.931 signaling over connectionless UDP channels.

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

Annex K provides a generic and application-independent service control channel using HTTP to support a combined suite of H.323 and HTTP-based services such as user friendly interfaces and personalized services.

Stimulus Signaling, Tunneled MEGACO Messages (Annex L)

Annex L allows an H.323 endpoint to operate as a Media Gateway where services can be defined and operate through external feature server rules as a Media Gateway Controller. MEGACO messages are transmitted through H.225.0 call signaling.

Telephony Signaling Tunneling Through H.323 (Annex M)

Annex M addresses an evolving need of hybrid circuit switch (CS) and H.323 networks to transport CS signaling through H.323 by defining a transport mechanism for QSIG, ISUP and DSS1 via H.323.

DNS Support for H.323 (Annex O)

Annex O allows an H.323 endpoint to search for its gatekeeper using a DNS name instead of an IP address. It also allows an H.323 gatekeeper to search for other gatekeepers and endpoints using a DNS name. DNS allows the use of a URL scheme that is especially important in large deployments.

Denial of Service (DOS) Protection

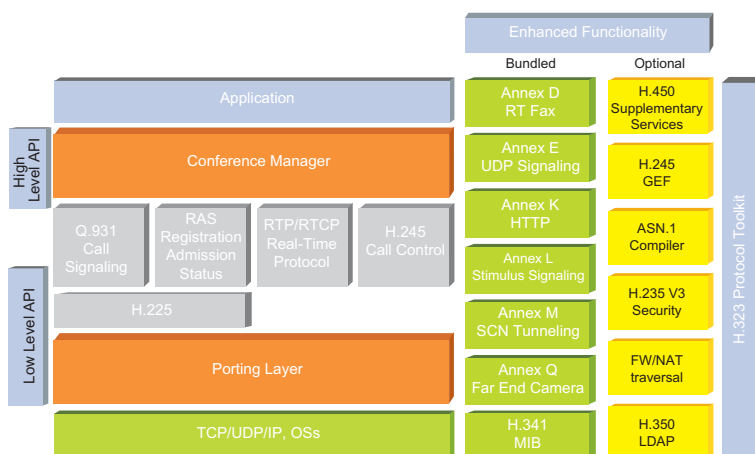
DOS attacks attempt to cause buffer overrun scenarios which can lead to server failure. By providing increased protection against DOS attacks, the H.323 Protocol Toolkit enables customers to develop solutions that recognize them and implement safeguards to maintain system integrity. The Toolkit has successfully passed the NISCC/PROTOS tests published during January 2004.

Optional Add-On Modules

H.450 Supplementary Services

The H.450 module supports the full suite of H.450.1-12 Supplementary Services such as FORWARD to forward incoming

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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. H.450 Supplementary Services are based on QSIG for smoother integration with PSTN networks. The module also enables function callback registrations in manual RAS operation mode.

H.245 GEF API

The H.245 General Extensibility Framework (GEF) API simplifies the setup of H.245 generic capabilities such as AMR, MPEG-4 and H.264. This unique module allows the developer to avoid the burden and risks of handling complex ASN.1 definitions and settings.

ASN.1 Compiler (SDK)

The ASN.1 Compiler provides efficient message encoding-decoding for additional ASN.1 definitions used by the Toolkit APIs. It is available on Windows platforms.

H.235 V3 Security

The H.235 V3 module supports H.235 V3 Annexes D, E and F Annex D support includes:

- Advanced user authentication during the signaling phase of Q.931 and RAS with a gatekeeper.
- Advanced user privacy using media encryption with a key negotiated during the signaling phase. This prevents a third party from auditing the multimedia session. RADVISION's Advanced RTP/RTCP Toolkit enables advanced user privacy.

Annex E is used for RAS/Q.931 signaling to authenticate the endpoint using digital signature and PKI (Public Key Infrastructure).

Annex F is a hybrid of Annex D and E procedures.

Additionally, the Toolkit addresses the threat of Trojan horse objects in an H.323 message by blocking abnormal message size.

H.350

The Lightweight Directory Access Protocol specifies a directory service framework that supports registration, admission, and security protocols. LDAP enables different systems to access a central directory data source.

The H.323 Protocol Toolkit is delivered with:

- Source Code
- Reference Application - H.323 Endpoint
- Release Notes
- Complete Documentation

H.460.17-19 NAT/FW Traversal

H.460.17, H.460.18 and H.460.19 enable standard NAT/FW traversal. This add-on fully supports all of these 3 standards, giving applications the most comprehensive and flexible solution available today for the development of endpoints, gatekeepers and border elements that are NAT/FW-aware

General Enhanced Protocol Capabilities Included with the Toolkit

High Capacity Call Setups (Q.931 Multiplexing)

Q.931 Multiplexing supports carrying multiple concurrent calls through the same call signaling channel. This provides better performance and reduces resource consumption by reusing the same call signaling channel resources.

Alternate Gatekeeper Procedure Support

The Alternate Gatekeeper Procedure allows for handling several alternate gatekeeper options when the primary gatekeeper becomes unresponsive. The H.323 stack automatically switches to the alternate gatekeeper when the current gatekeeper connection is lost.

Advanced Call Control- H.245 V12

Version 5.5 contains an enhanced H.245 service support such as broadcasting, conference chair control, flow control, terminal join and leave services, and terminal visibility to other participants. The H.245 V12 support enables developing H.239 support (multiple channels, applying operational roles) for high-end video conferencing systems.

Call Credit-Related Capabilities

Call credit-related capabilities allow users to dial a gateway charging the call to a pre-paid calling card or user account. The gatekeeper manages call credit related events such as usage countdown.

Multi-homed IP

Multi-homed IP allows for sending and receiving requests from different local IP addresses from various network cards in the same hardware device.

Operating Systems*

- Windows 2000/XP/2003
- Windows CE
- Solaris Sparc
- Linux RedHat/EL 3.0
- VxWorks
- Nucleus
- Embedded Linux (Monta Vista)

* Inquire about support for other operating systems that may be available.

Standards Supported

- H.323 version 5
- H.225.0 version 5
- H.245 version 12
- H.235 version 3 - With Annex D, E and F security procedures
- H.239 (HMAC)
- H.350 - LDAP support
- H.450.1 - Generic functional protocol for the support of supplementary services in H.323
- H.450.2 - Call transfer supplementary service for H.323
- H.450.3 - Call diversion supplementary service for H.323
- H.450.4 - Call hold supplementary service for H.323
- H.450.5 - Call park and call pickup supplementary services for H.323
- H.450.6 - Call waiting supplementary service for H.323
- H.450.7 - Message waiting indication supplementary service for H.323
- H.450.8 - Name identification supplementary service for H.323
- H.450.9 - Call completion supplementary services for H.323
- H.450.10 - Call offering supplementary services for H.323
- H.450.11 - Call intrusion supplementary services
- H.450.12 - Common Information Additional Network Feature for H.323
- H.460.6 - Extended Fast Connect
- H.460.17 - RAS over TCP
- H.460.18 - Traversal of H.323 signalling across NAT and FW
- H.460.19 - Traversal of H.323 media across NAT and FW
- H.323/Annex D - Real-time fax over H.323
- H.323/Annex E - Multiplexed Call Signaling over UDP
- H.323/Annex K - HTTP-based Service Control
- H.323/Annex L - Stimulus Control Protocol using MEGACO
- H.323/Annex M1 - Tunneling of signaling protocols (QSIG) in H.323
- H.323/Annex M2 - Tunneling of signaling protocols (ISUP) in H.323
- H.323/Annex M3 - Tunneling of DSS1 through H.323
- H.323/Annex O - Usage of URLs and DNS
- H.323/Annex Q - Far End Camera Control
- IETF RFC 2833 (DTMF)

H.323 Protocol Toolkit Features

- High-Level API
- RTP/RTCP Support
- IPv4/IPv6 Support
- Real-Time Fax (Annex D)
- UDP Signaling (Annex E)
- HTTP-Based Service Control for H.323 Devices (Annex K)
- Stimulus Signaling, Tunneled MEGACO Messages (Annex L)
- Telephony Signaling Tunneling Through H.323 (Annex M)
- Remote Camera Control (Annex Q)
- H.341 MIB Support
- Q.931 Multiplexing
- High Capacity Registration (Additive Registration)
- H.245 V11 Advanced Call Control
- Call Credit-Related Capabilities
- Multi-homed IP
- H.235V3 Security
- Full H.450 Supplementary Services
- H.245 GEF API
- H.350 LDAP support
- H.460.17-19 NAT/FW Traversal
- DNS support (Annex O)
- Support for AES encryption

The RADVISION H.323 Family also includes:

- **ProLab™ Test Management Suite**
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
- **Multimedia Videophone Framework**
a complete set of building blocks for developing SIP or H.323-based IP/video phone applications in RTOS or embedded environments
- **RTP/RTCP Toolkit**
a standalone RTP/RTCP stack providing IPv4/IPv6, security and advanced functionality
- **Professional Services**
a full range of design, integration and deployment consulting services

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