# h323-standards

# H.323 Standards Overview

This page has not been updated for a while, but could be useful.

# Main standards

**H.310 - Broadband and audiovisual communication systems and terminals ** **H.320 - Framework for transmitting audio and video over circuit switched digital networks (primarily ISDN) H.321 - Adaptation of H.320 visual telephone terminals to B-ISDN environments H.322 - Visual Telephone Terminals over Guaranteed QoS LANs H.323 - Packet-based multimedia conferencing services H.324 - Terminal for low bit rate multimedia communication**

**H.323 Annexes**

- Annex A: H.245 messages used by H.323 endpoints
- Annex B: Procedures for layered video codecs
- Annex C: H.323 on ATM

**H.323 v2**

- Annex Dv1: Real-time fax over H.323
- Annex Dv2: Real-time fax over H.323 (H.323v4)
- Annex E: Framework and wire-protocol for multiplexed call signalling transport
- Annex F: Simple endpoint types (H.323v4)

**H.323 v3**

- Annex G: Text Simple Endpoint Type (removed from H323v4)

**H.323 v4 - includes Annexes A-F**

- Annex H: Mobility
- Annex I: Error prone channels (work in progress)
- Annex J: Security for H323 Annex F
- Annex K: HTTP-based service control transport channel in H323

- Annex L: Stimulus Control Protocol
- Annex M.1: Tunnelling of signalling protocols (QSIG) in H.323
- Annex M.2: Tunnelling of signalling protocols (ISUP) in H.323
- Annex M.3: Tunneling of DSS1 through H.323
- Annex N: QoS (work in progress)
- Annex O: Use of DNS (work in progess)
- Annex P: Transfer of Modem Signals over H.323
- Annex Q: Far End Camera Control and H.281/H.224
- Annex R: Robustness Methods for H.323 Entities
- Appendix I: Sample MC/terminal communications
- Appendix II: Usage of RSVP
- Appendix III: Gatekeeper based user location
- Appendix IV: Signalling prioritized alternative logical channels in H.245
- Appendix V: Use of E.164 and ISO/IEC 11571 numbering plans

# Call signaling and control

**H.221 - Frame structure for 64 to 1920K bit/s channel in audiovisual services (ISDN) H.222.0 - Information Technology - Generic Coding of Moving Pictures and Associated Audio H.222.1 - Multiplexing and synchronisation of multi-media information for audiovisual communications in ATM environment. H.223 - Multiplexing protocols for low bitrate multimedia communication H.224 - A real time control protocol for simplex applications using the H.221 LSD/HSD/MLP channels (ISDN) H.225.0 - Call signalling protocols and media stream packetization for packet-based multimedia communication systems.**

- H.225.0 describes how audio, video, data, and control information on a packet based network can be managed to provide conversational services in H.323 equipment. Specifies messages for call control including signaling, registration and admissions, and packetization/synchronization of media streams. Describes three signaling protocols (RAS, Call Signaling, and “Annex G”).
- Annexes and Appendices:
  - Annex A: RTP/RTCP (RFC 1889)
  - Annex B: RTP profile (RFC 1890)
  - Annex C: RTP payload for H.261
  - Annex D: RTP payload for H.261A
  - Annex E: Video packetization
  - Annex F: Audio and multiplexed packetization
  - Annex G: Communication between and within Administrative Domains
  - Annex H: H.225.0 message ASN.1 Syntax
  - Annex I: H.263+ video packetization
  - Appendix I: RTP/RTCP algorithms (reference to RFC 1889)
  - Appendix II: RTP profile (reference to RFC 1890)
  - Appendix III: H.261 packetization (reference to RFC 2032)
  - Appendix IV: TCP/IP/UDP usage

- Appendix V: ASN.1 usage

**H.226 - Channel aggregation protocol for multilink operation on circuit switched networks H.230 - Frame-synchronous Control and Indication signals for Audiovisual systems (ISDN) H.231 - Multi-point Control Unit for Audiovisual systems using Digital Channels up to 2M bit/s H.233 - Confidentiality system for audiovisual services H.234 - Encryption key management and authentication system for audiovisual services H.235 - Security and encryption for H-Series (H.323 and other H.245-based) multimedia terminals.**

- Annexes:
  - Annex A: H.235 ASN.1
  - Annex B: H.323 specific topics
  - Annex C: H.324 specific topics
  - Annex D: Baseline Security Profile
  - Annex E: Signature Profile
  - Annex F: Hybrid Security Profile

**H.242 - System for establishing communication between three or more audiovisual terminals using digital channels up to 2M bit/s (ISDN) H.243 - Procedures for establishing communications between three or more audiovisual terminals using digital channels up to 1920 kbit/s (ISDN) H.244 - Synchronized aggregation of ISDN B-channels (ISDN) H.245 - Control Protocol for multimedia communication. H.245 is line transmission of non-telephone signals. It includes receiving and transmitting capabilities as well as mode preference from the receiving end, logical channel signalling, and control and indication. Acknowledged signalling procedures are specified to ensure reliable audiovisual and data communication. Common to H.310, H.323, and H.324.**

- Main parts:
  1. Capability exchange
  2. Opening and closing of logical channels
  3. Flow control messages
  4. Other commands and messages
- Annexes:
  - Annex A: H.245 message ASN.1 syntax
  - Annex B: Semantic definition of messages
  - Annex C: Procedures
  - Annex D: Object identifier assignments
  - Annex E to M: Various “generic capability” definitions, including some codecs
  - Appendix I: Overview of ASN.1
  - Appendix II: Example of H.245 procedures
  - Appendix III: Timers and counters
  - Appendix IV: H.245 extension procedure
  - Appendix V: Using “replacementFor”
  - Appendix VI: Example H.263 capabilities

- Appendix VII: Procedures and template for generic capabilities
- Appendix VIII: List of generic capabilities for H.245 defined in other Recommendations
- Appendix IX: Usage of ASN.1 in H.245

**H.246 - Interworking of H-Series multimedia terminals with H-Series multimedia terminals and voice/voiceband terminals on GSTN and ISDN (H.323).**

- Annexes:
  - Annex C: ISDN User Part Function - H.225.0 Interworking
  - Annex E.1: IWF between Mobile Application Part and H.225.0
  - Annex E.2: IWF between IS41 and H.225.0
  - Annex F: H.323-H.324 Interworking

**H.248 - Gateway Control Protocol (derived from MEGACO RFC2885 -> RFC3015)**

- H.248.1: Gateway Control Protocol
- H.248.2: Facsimile, text conversation and call discrimination Packages
- H.248.3: User Interface elements and actions package
- H.248.4: Transport over SCTP
- H.248.5: Transport over ATM
- H.248.6: Dynamic Tone Definition Package
- H.248.7: Generic Announcement Package
- H.248.8: Error codes and Service Change Reason Description
- H.248.9: Advanced Audio Server Package
- H.248.10: Congestion Handling Package
- H.248.11: Media Gateway Overload Control Package
- H.248.12: H.248 Packages for H.323 and H.324 Interworking
- H.248.13: Quality Alert Ceasing Package
- H.248.14: Inactivity Timer Package
- H.248.15: SDP H.248 Package Attributes
- H.248.16: Enhanced Digit Collection Package
- H.248.17: Line Test Package
- H.248.18: Profile Package
- H.248.20: The use of Local and Remote Descriptors with H.221 & H.223 multiplexing

**H.262 - Information technology - Generic coding of moving pictures and associated video information H.281 - Far End Camera Control (FECC) using H.224 (ISDN) H.282 - Remote device control protocol for multimedia applications H.283 - Remote device control logical channel transport H.332 - H.323 extended for loosely-coupled conferences H.341 - Multimedia Management Information Base (SNMP) H.450**

- 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.x: Various H.323 protocol extensions**

- H.460.1: Guidelines for the use of the generic extensible framework
- H.460.2: Number Portability interworking between H.323 and SCN networks
- H.460.3: Circuit Status Map
- H.460.4: Call Priority Designation
- H.460.5: Transport of Multiple Q.931 IEs
- H.460.6: Extended Fast Connect
- H.460.7: Digit Maps
- H.460.8: Querying for Alternate Routes
- H.460.9: QoS Monitoring Reporting

**H.501 - Protocol for mobility management and inter/intra-domain communication H.510 - User, terminal, and service mobility H.530 - Symmetric Security Procedures for H.510**

# Audio codecs

**G.711 - Pulse Code Modulation (PCM) of voice frequencies PCM, 3.1 KHz at 64 Kbps (normal telephony), covers "A-law" and "μ-law" encoding G.722 - 7kHz audio-coding within 64 kbit/s ADPCM, 7 KHz at 48, 56, and 64 Kbps G.722.1 - 7kHz audio-coding at 24 and 32 kbit/s for hands free operation in systems with low frame loss G.723.1 - Dual rate speech coder for multimedia telecommunication transmitting at 5.3 and 6.3 kbit/s G.728 - Coding of speech at 16kbit/s using LD-CELP G.729 - Coding of speech at 8 kbit/s using Conjugate Structure Algebraic-Code-Excited Linear-Prediction (CS-ACELP)**

# Video codecs

**H.261 - Video codec for audiovisual services at P x 64 Kbps H.263 - Specifies a new video codec for video over POTS**

- Annexes v1 [H.263]:
  - Annex D: Unrestricted Motion Vector Mode
  - Annex E: Syntax-Based Arithmetic Coding Mode
  - Annex F: Advanced Prediction Mode
  - Annex G: PB-frames Mode

- Annexes v2 [H.263+]:
  - Annex D: Unrestricted Motion Vector Mode
  - Annex I: Advanced Intra Coding Mode
  - Annex J: Deblocking Filter Mode
  - Annex K: Slice Structured Mode
  - Annex L: Supplemental Enhancement Information Mode
  - Annex M: Improved PB-Frames Mode
  - Annex N: Reference Picture Selection Mode
  - Annex O: Temporal, SNR, and Spatial Scalability Mode
  - Annex P: Reference Picture Resampling Mode
  - Annex Q: Reduced Resolution Update Mode
  - Annex R: Independently Segmented Decoding Mode
  - Annex S: Alternative Inter VLC Mode
  - Annex T: Modified Quantization Mode
- Annexes v3 [H.263++]:
  - Annex U: Enchanced Reference Picture Selection
  - Annex V: Data Partitioning
  - Annex W: Enchanced Suplementary Info

# T.120 Family

**T.38 - The T.38 IP-based fax service maps the T.30 fax protocol onto an IP network. T.121 - Generic Application Template. Specifies a template for the development of data conferencing applications. T.123 - Network specific transport protocol, error detection, correction. T.124 - Generic Conference Control (GCC) protocol. This protocol facilitates the creation and management of conferences with features such as conference creation, terminal entry and exit from a conference, authentication security, service resource management, and information management. T.122 - Multipoint Communication Service (MCS) service T.125 - T.125 describes the Multipoint Communication Service protocol T.126 - Still image transfer T.127 - White Board T.128 - File Transfer T.134 - Text Chat**

# Standard usage by network protocols

| | Narrow Band (H.320) | Low Bitrate (H.324) | ISO-Ethernet (H.322) | Ethernet (H.323) | ATM (H.321) | High Res ATM (H.310) |
|---|---|---|---|---|---|---|
| Video | H.261 | H.261 H.263 | H.261 | H.261 H.263 | H.261 | MPEG-2 H.261 |
| Audio | G.711 | G.722 G.728 G.723 | G.711 G.722 G.723 G.728 | G.711 G.722 G.723 G.728 G.729 | G.711 G.722 G.728 | MPEG-1 MPEG-2 |

| | Narrow Band (H.320) | Low Bitrate (H.324) | ISO-Ethernet (H.322) | Ethernet (H.323) | ATM (H.321) | High Res ATM (H.310) |
|---|---|---|---|---|---|---|
| Data | T.120 | T.120 T.434 T.84 Others | T.120 | T.120 | T.120 H.281 (H.224) | T.120 |
| Multiplex | H.221 | H.223 | H.221 | H.221 | H.221 | H.222.1 H.221 |
| Signaling | H.230 H.242 | H.245 | H.230 H.242 | H.230 H.225.0 H.245 | H.230 H.242 | H.245 |
| Multi-point | H.243 | NA | H.243 | NA | H.243 | NA |
| Encryption | H.233 H.234 | H.233/324 H.234 | H.320 | TBD | H.233 H.234 | NA |

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