



Technical Training and Consultancy to the NEW Communications Era

About H.323

What is H.323?

H.323 is a globally accepted ITU standard for audio/video/data communication. It specifically describes how multimedia communications occur between user terminals, network equipment, and assorted services on Local and Wide Area Internet Protocol (IP) networks.

What is the H.323 Standard?

H.323 is sometimes referred to as an "umbrella" specification, meaning that underneath the standard itself, there are references to other recommendations.

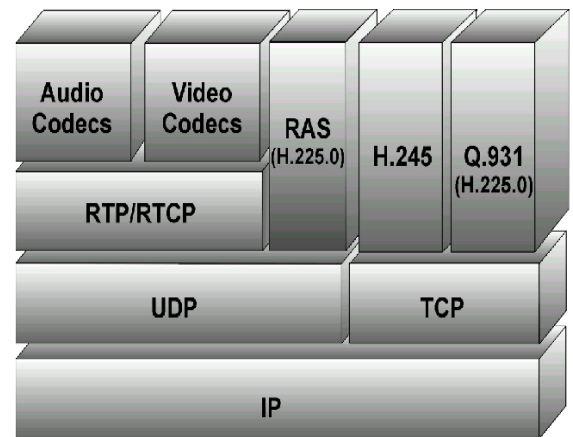
Other recommendations in the H.323 series include H.225.0 for packet and synchronization, H.245 for media capability and control, H.261 and H.263 video codecs, G.711, G.722, G.728, G.729, and G.723 audio codecs, and the T.120 series of multimedia communications protocols. (see opposite diagram for H.323 stack and OSI detail)

The H.323 specification was approved in 1996 by the ITU's Study Group 16, and has been through a number of 'versions', seeing the latest (version 4) being approved late 2000, early 2001.

H.323 'entities' – we briefly described the underlying recommendations within H.323 above, however, H.323 has a comprehensive series of 'entities' as follows:

- **Gatekeeper** - Gatekeeper is the 'brains' to any solution, providing control and signalling to endpoints, gateways and conference units as well as providing registration, administration, status and authentication (RAS).
- **Gateway** - The H.323 Gateway receives instructions for use from the Gatekeeper to allow for 'transitions' from IP and the 'data network' to TDM based telephony services such as the PSTN.
- **Multi-point Conference Unit (MCU)** - The MCU works with the Gatekeeper to provide the focal for conference based services.
- **Endpoints** - H.323 endpoints are those such as an IP Telephone, that register for service with the Gatekeeper and communicate with other H.323 IP communications devices/endpoints. H.323 endpoints can take numerous forms such as physical IP telephones, an array of softphone clients (PC's, PDA's & Wireless).

H.323, Features and Services – H.323 has many well defined telephony features and services for vendor and endpoint support, extending this range to 'supplementary services' under specifications H.450 and H.460.



H.323 and the Network

As an application, H.323 sits above the routing, transport and delivery layers.

Transport Layer: H.323 control, messaging and signalling (gatekeeper) is almost always made with TCP, with the media (voice / video), being sent via UDP. UDP is primarily selected over TCP for media transport, as there is little point controlling real time media with possible re-transmission. There are also some significant header overhead savings made.

Delivery Layer: Session upwards – H.323 uses RTP, to provide some event and timing handles. RTCP (a companion to RTP) is sometimes used to provide performance metrics.

H.323 'Ports':

- H.323 uses TCP port 1718 for Gatekeeper discovery
- H.323 uses TCP port 1719 for Gatekeeper RAS
- H.323 uses TCP port 1720 for call setup and call signalling
- H.323 uses 'Dynamic' UDP ports 1024-65535 for media streams (RTP and RTCP)

'Key' H.323 Benefits

Comprehensive standards suite : As we have seen, H.323 has all the right components (standards and entities) to allow for comprehensive, interoperable design and solutions

Proven specifications & technology : The first multi-media standards suite with many successful solutions and implementations

Vendor adoption : Still the most widely understood, developed and deployed specifications suite.

H.323, Development & Applications

As we have seen, H.323 has many inherent features and functionality. However, we see that somewhat conversely, vendors choosing to 'pull back' the call or request for functionality to an applications server and provide a proprietary service / function. We see this primarily by the historic 'voice' vendors, as they try to offer consistent features and services to their 'core' telephony software suites.

H.323 in action: Example H.323 based uses, applications and services:

Call & Contact Centres, Internet Telephony Gateways (IP to TDM Gateways across the industry SP to Enterprise), MS's Netmeeting and multimedia communications.

H.323 in action.....

(MS's Netmeeting, probably the most recognisable H.323 based application)



What's the status & future for H.323?

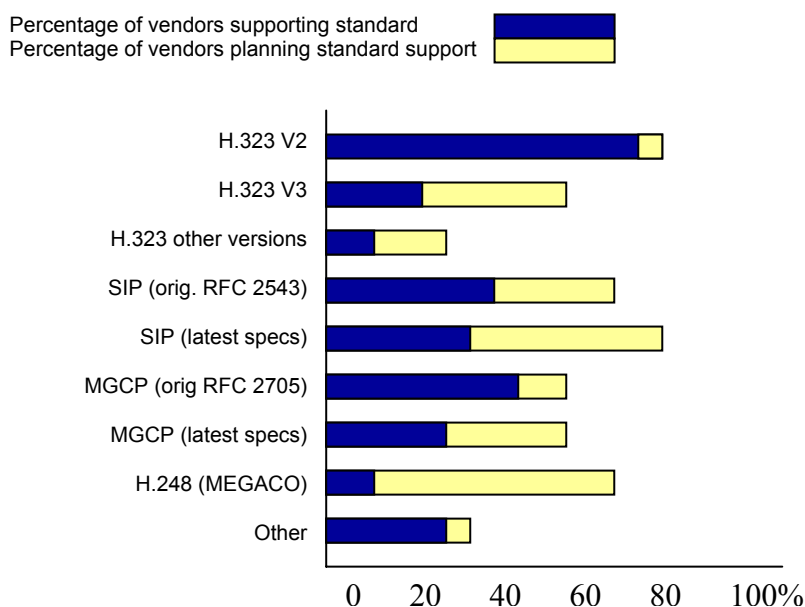
Two standards currently compete for the dominance of IP telephony signalling: the H.323 protocol suite by the ITU-T, and Session Initiation Protocol (SIP) by the IETF. Both of these signalling protocols provide mechanisms for call establishment and teardown, call control and supplementary services, and capability exchange.

With the existence, use and development of H.323 within the video industry, the VoIP industry latched on to H.323 as a 'ready made' option to further its progression, development and adoption for VoIP. With the first version of H.323 approximately six years old now, few (if any) vendors or products can claim compliant, standards based, featureful solutions (namely - encryption, advanced call control and network-based call management).

Whilst there has been some shortening of H.323 call-setup dialogue, we believe that H.323 makes for good voice calling in the same way that Sumo wrestlers make good jockeys - H.323 is not flawed architecturally, but is often over specific, is complex, and produces 'bloated' products and solutions as a result.

To bring advanced voice support into the data networking age, protocols must be targeted directly at actual user services. Products should easily integrate into a real network with little modification to its underlying infrastructure. The protocols should be easily extensible without breaking existing implementations or relying on a factious standards body for approval.

Based on these criteria, the IETF's SIP (Session Initiation Protocol) looks like the winner in the voice over packet service creation race.



Note: Numerous source information points were used to create this graph.

Collectively, this graph is intended to demonstrate the relative standards adoption (and expected) within the industry.