

Videoconferencing Standards

Videoconferencing requires many different components to be compatible to enable effective transmission. When videoconferencing equipment is compatible it is termed *interoperable* or *compliant*.

International Standards Organisations

The main bodies responsible for defining standards to ensure that equipment is interoperable are the:

- International Telecommunications Union (ITU)
- International Standards Organisation (ISO)
- International Electro-technical Commission (IEC)
- Internet Engineering Task Force (IETF)

Videoconferencing Systems

A videoconferencing link requires transmitting/receiving equipment at each participating site plus an intervening network to transport the signals. The network may use one of several methods for transmission but the two most common are the packet based network, which uses Internet Protocol (IP) and the Integrated Services Digital Network (ISDN), which transmits signals over dial-up switched telephone circuits. The IP system is defined by ITU standard H.323 and the ISDN system by ITU standard H.320.

H.323 and H.320 are overall or umbrella standards that include several different lower level (sub) standards. Each component of conferencing such as the audio, video and data transmission has its own standards. For example, H.225.0 defines call signalling within H.323 (IP), whereas H.242 is the equivalent in H.320 (ISDN). Some individual standards are common across both networks: for example, H.263 defines one method of coding video signals within both H.323 and H.320 systems.

More detailed explanations can be found in the factsheets *H.323 Videoconferencing Components* and *H.323 Terminals for Videoconferencing* at <http://www.ja.net/services/publications/factsheets/>

Mandatory, Optional and Proprietary Standards

The two main degrees of standards enforcement are *mandatory* and *optional*.

The mandatory standards ensure interoperability between equipment from different manufacturers, albeit at a basic level. An example is H.261 video coding. This is the most rudimentary level of coding vision signals and all H.323 and H.320 systems must provide it as a minimum requirement.

In practice most manufacturers will also offer more advanced video coding algorithms such as H.263 or H.264, but these are *optional* recommendations.

Some manufacturers go a step further and include features above the optional level, termed *proprietary*. For example, Polycom® Siren™ Audio extends the audio bandwidth up to 14 KHz. This produces improved audio performance between Polycom® products that incorporate it, but does not extend to other manufacturers' equipment. Videoconferences frequently include more than two sites by using a Multipoint Control Unit (MCU), or need to cross between different networks, i.e. from IP to ISDN networks via a Bridge or gateway. These interface devices are seldom capable of passing proprietary coded signals.

Other Standards

In addition to the ITU standards outlined above, the IEC and ISO standards bodies have formed two committees: the Joint Picture Experts Group (JPEG) and the Moving Picture Expert Group (MPEG). While these standards are more likely to be met in multimedia and broadcasting, some are in use within videoconferencing.

- **JPEG**, also defined under ITU-T T.81, is a widely used standard for still image transmission and storage.
- **MPEG-1** is the familiar compression standard applicable to CD-ROM.
- **MPEG-2** is widely used in broadcasting to distribute signals but is also seen in high quality videoconferencing. Both MPEG-1 and MPEG-2 are family standards incorporating several different levels of quality for different applications.
- **MPEG-4 AVC** video coding is the result of collaboration between the IEC/ISO and the ITU, also known as H.264. It is an advanced method of video coding, economical in bandwidth and incorporating a format that allows integration across many platforms including fixed IP, wireless IP, broadcast and Asymmetric Digital Subscriber Line (ADSL). ADSL is the technology widely employed to supply broadband IP to the home.

Guaranteed Quality of Service (GQOS)

Videoconferencing over H.323 IP networks is gaining wide popularity in education due to its lower cost of connection compared to the dial-up H.320 ISDN methods. However, in its basic configuration the IP network is unable to guarantee reliable conferences as videoconference data has to compete with other traffic on the network. To remedy this, many enhancements are available to give reliable, consistent conferences. The Internet Engineering Task force (IETF) has been particularly active in developing standards in this area.

Further Information

Video Technology Advisory Service (VTAS): <http://www.ja.net/>