



INTERNATIONAL TELECOMMUNICATION UNION

**ITU-T**

TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

**H.322**

(03/96)

## **TRANSMISSION OF NON-TELEPHONE SIGNALS**

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# **VISUAL TELEPHONE SYSTEMS AND TERMINAL EQUIPMENT FOR LOCAL AREA NETWORKS WHICH PROVIDE A GUARANTEED QUALITY OF SERVICE**

## **ITU-T Recommendation H.322**

(Previously "CCITT Recommendation")

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## FOREWORD

The ITU-T (Telecommunication Standardization Sector) is a permanent organ of the International Telecommunication Union (ITU). The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation H.322 was prepared by ITU-T Study Group 15 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 19th of March 1996.

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## NOTE

In this Recommendation, the expression “Administration” is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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## **SUMMARY**

This Recommendation covers the technical requirements for narrow-band visual telephone services defined in H.200/AV.120-series Recommendations, in those situations where the transmission path includes one or more Local Area Networks (LAN), each of which is configured and managed to provide a guaranteed Quality of Service (QOS) equivalent to that of N-ISDN such that no additional protection or recovery mechanisms beyond those mandated by Recommendation H.320 need be provided in the terminals. It is noted that projected Recommendation H.323 addresses the use of some other LANs which are unable to provide the underlying performance assumed by this Recommendation.

## **VISUAL TELEPHONE SYSTEMS AND TERMINAL EQUIPMENT FOR LOCAL AREA NETWORKS WHICH PROVIDE A GUARANTEED QUALITY OF SERVICE**

*(Geneva, 1996)*

The ITU-T,

*considering*

the widespread adoption of and the increasing use of the H.320 Recommendation for videophony and videoconferencing services over networks conforming to the N-ISDN characteristics specified in the I-Series Recommendations,

*appreciating*

the desirability and benefits of enabling the above services to be carried, wholly or in part, over Local Area Networks while also maintaining the capability of interworking with H.320 terminals,

*and noting*

the characteristics and performances of the many types of Local Area Network which are of potential interest,

*recommends*

that systems and equipment meeting the requirements of the H.322 or H.323 Recommendations are utilized to provide these facilities.

### **1 Scope**

This Recommendation covers the technical requirements for narrow-band visual telephone services defined in H.200/AV.120-Series Recommendations, in those situations where the transmission path includes one or more Local Area Networks (LAN), each of which is configured and managed to provide a guaranteed Quality of Service (QOS) equivalent to that of N-ISDN such that no additional protection or recovery mechanisms beyond those mandated by Recommendation H.320 need be provided in the terminals. Pertinent parameters are the data error and loss properties and variation of transit delay this Recommendation also requires that the ISDN clock is available at the terminals. An example of a suitable LAN is:

IEEE Std 802.9a-1995, IEEE Standard for Local and Metropolitan Area Networks – Supplement to Integrated Services (IS) LAN Interface at the Medium Access Control (MAC) and Physical (PHY) Layers: Specification of ISLAN16-T.

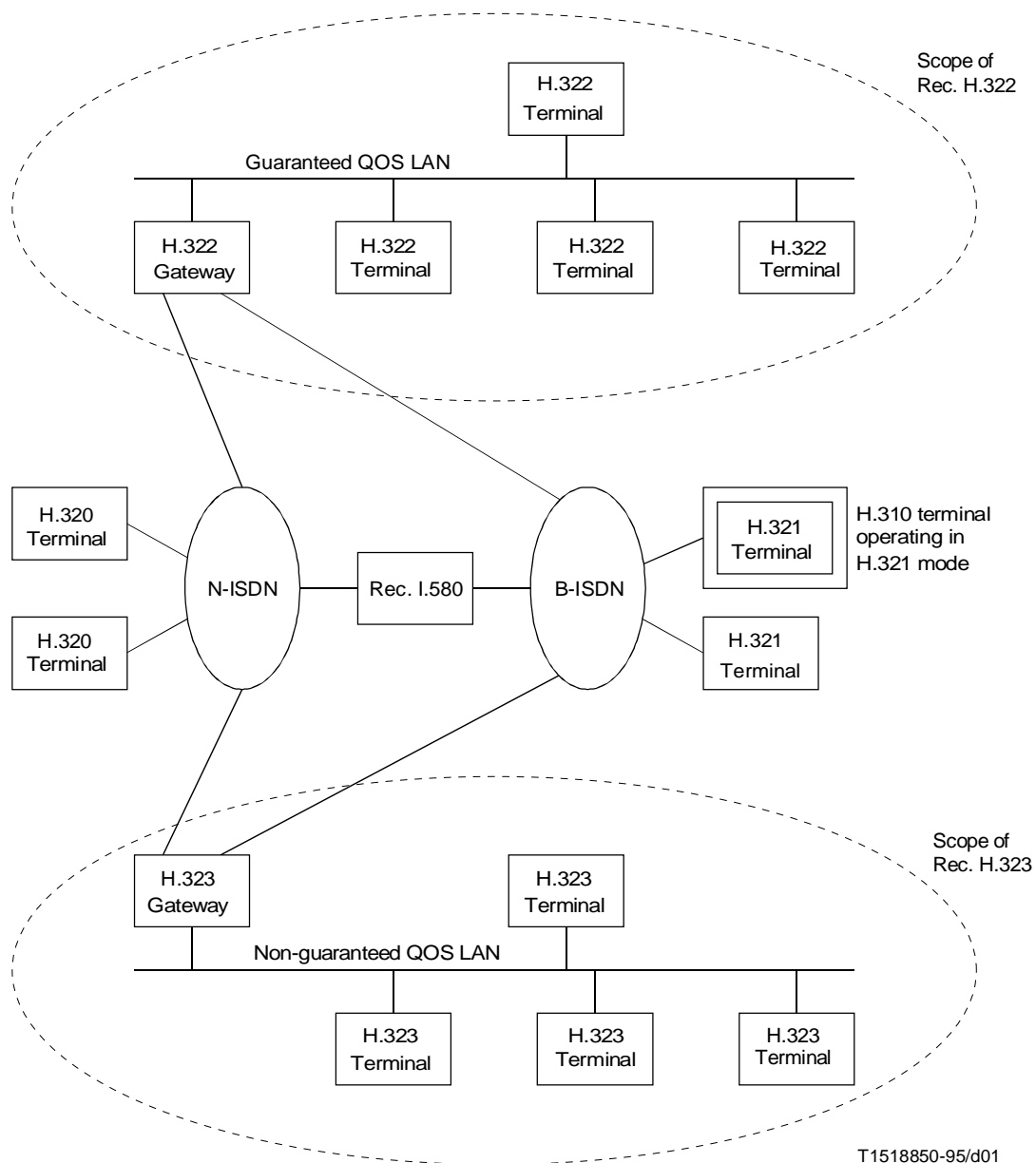
Recommendation H.323 addresses the use of some other LANs which are unable to provide the underlying performance assumed by this Recommendation.

Although some LANs offer satisfactory QOS to support this Recommendation, they do not themselves provide standardized means of identifying the intended called terminal. For such LANs the procedures for terminal addressing defined in Recommendation H.323 shall apply in addition to the provisions of this Recommendation.

This Recommendation does not encompass ATM LANs because they are within the scope of Recommendation H.321.

Systems and terminal equipment complying with this Recommendation are able to interwork with each other and with those complying with Recommendations H.320, H.321 and H.323. The concept is shown in Figure 1 in which any terminal can be connected to any other. The H.322 gateway unit provides an interconnection between the LAN and the Wide Area Network (WAN) which may be N-ISDN or B-ISDN or both. An H.322 terminal communicates with another H.322 terminal on the same LAN directly. The gateway may be connected via N-ISDN or B-ISDN to other gateways and LANs to provide communication between H.322 or H.323 terminals which are not on the same LAN.

Although this Recommendation specifically addresses visual telephone systems, the methods used do not depend on the content of the signals carried. Consequently this Recommendation has more general applicability to connecting terminals, originally designed for N-ISDN, over LAN or hybrid LAN and ISDN networks.



NOTE – A gateway may support only the N-ISDN or B-ISDN connection.

FIGURE 1/H.322  
Scope and interworking capabilities of Recommendation H.322

## 2 References

The following Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

- Recommendation E.164 (1991), *Numbering plan for the ISDN era* (same as Recommendation I.331).
- ITU-T Recommendation H.221 (1995), *Frame structure for a 64 to 1920 kbit/s channel in audiovisual teleservices*.
- ITU-T Recommendation H.230 (1995), *Frame-synchronous control and indication signals for audiovisual systems*.
- ITU-T Recommendation H.231 (1996), *Multipoint control units for audio-visual systems using digital channels up to 1920 kbit/s*.
- ITU-T Recommendation H.242 (1996), *System for establishing communication between audiovisual terminals using digital channels up to 2 Mbit/s*.
- ITU-T Recommendation H.261 (1996), *Video codec for audiovisual services at  $p \times 64$  kbit/s*.
- ITU-T Recommendation H.320 (1996), *Narrow-band visual telephone systems and terminal equipment*.
- ITU-T Recommendation H.321 (1996), *Adaptation of H.320 visual telephone terminals to B-ISDN environments*.
- ITU-T Recommendation H.323<sup>1)</sup>, *Visual telephone systems and terminal equipment for local area networks which provide a guaranteed quality of service*.
- ITU-T Recommendation H.331 (1993), *Broadcasting type audiovisual multipoint systems and terminal equipment*.
- ITU-T Recommendation I.430 (1995), *Basic user-network interface – Layer 1 specification*.
- ITU-T Recommendation I.431 (1993), *Primary rate user-network interface – Layer 1 specification*.
- ITU-T Recommendation I.432 (1993), *B-ISDN user-network interface – Physical layer specification*.
- ITU-T Recommendation I.580 (1995), *General arrangements for interworking between B-ISDN and 64 kbit/s based ISDN*.

## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of this Recommendation, the following definitions apply.

**3.1.1 local area network (LAN):** A shared or switched medium peer-to-peer communications network that broadcasts information for all stations to receive within a moderate-sized geographic area, such as a single office building or a campus. The network is generally owned, used and operated by a single organization. It provides services including those of the physical layer, the MAC layer, and the transport layer.

**3.1.2 wide area network (WAN):** A communication network which covers a wide geographical area and accommodates terminals and LANs. It may typically be an N-ISDN or a B-ISDN.

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<sup>1)</sup> Presently at the stage of draft.

## 3.2 Abbreviations

For the purposes of this Recommendation, the following abbreviations are used:

|         |  |
|---------|--|
| ATM     | Asynchronous Transfer Mode                             |
| B-ISDN  | Broadband ISDN   |
| CSMA/CD | Carrier sense multiple access with collision detection |
| LAN     | Local Area Network                                     |
| MAC     | Media access control                                   |
| MCU     | Multipoint control unit                                |
| N-ISDN  | Narrow-band Integrated Services Digital Network        |
| QOS     | Quality of Service                                     |
| WAN     | Wide Area Network                                      |

## 4 Terminal equipment

Figure 2 is a block diagram of the H.322 terminal. All elements are identical to those specified in Recommendation H.320 except for the LAN interface.

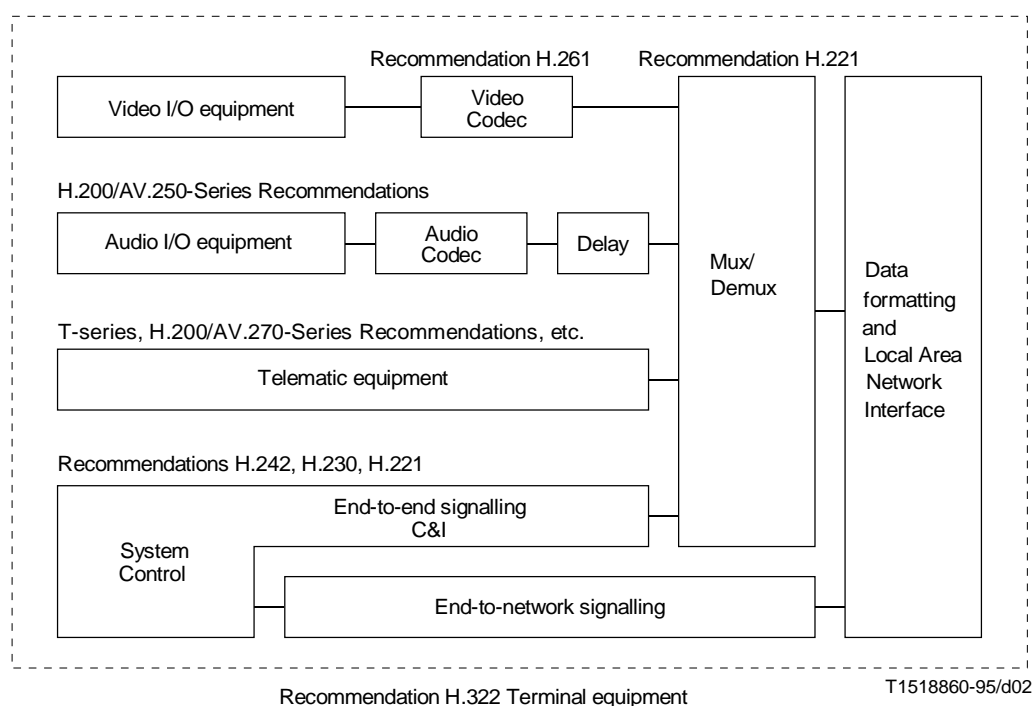


FIGURE 2/H.322  
Block diagram of H.322 terminal elements



As illustrated in Figure 3, an H.322 terminal may be implemented as an integrated unit or as the combination of an H.320 terminal and an adapter unit.

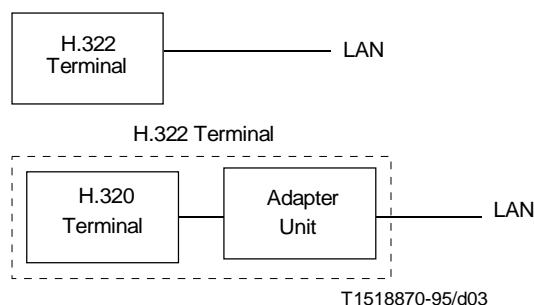


FIGURE 3/H.322  
**Alternative H.322 terminal implementations**

NOTE – The Adapter Unit of Figure 3 and the H.322 Gateway of Figure 1 perform no function which is specific to the audiovisual nature of the signals they handle. The same Adapter Unit and Gateway may support the connection of other N-ISDN terminals in place of the H.320 terminal in Figure 3, but such use is outside the scope of this Recommendation.

## 5 H.322 gateway

Some LANs have a star topology in which the central hub may be connected to the WAN as a normal feature. In such circumstances, for example IEEE 802.9a LANs, the H.322 gateway is the central hub. For other LANs the H.322 gateway may be an additional device connecting the LAN to the WAN. This is the case shown in Figure 1.

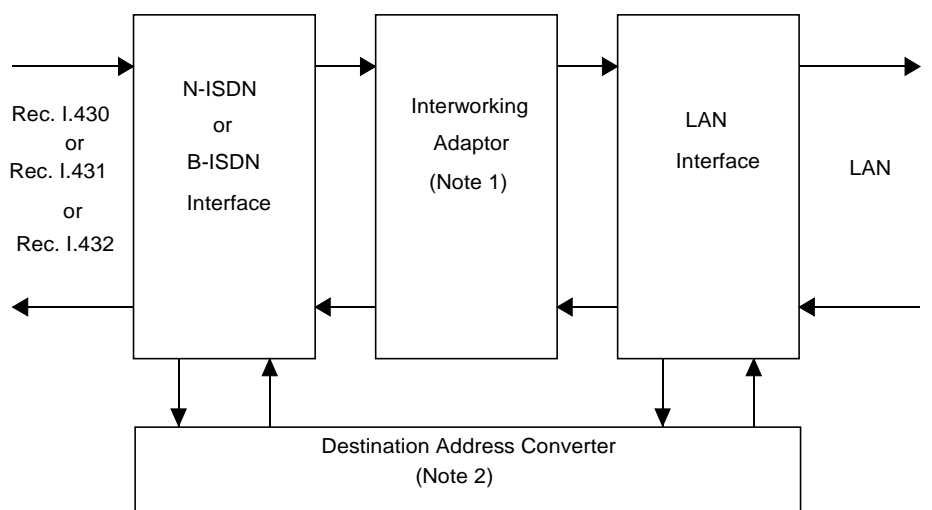
A block diagram of the H.322 gateway device is shown in Figure 4. There are four principal functions:

- Interface to the LAN.
- Interface to the WAN (Recommendation I.430 or I.431 for N-ISDN or Recommendation I.432 for B-ISDN).
- Conversion of the destination address of the called H.322 terminal. This is required only if the LAN does not support Recommendation E.164.
- Interworking Adapter if the WAN is B-ISDN. The basic functions required are essentially those specified in Recommendation I.580 for interworking between N-ISDN and B-ISDN.

The number of simultaneous connections which the H.322 gateway is able to provide is not subject to standardization.

An H.322 gateway may also contain the functionality of a Multipoint Control Unit (MCU) as specified in Recommendation H.231. This is not a mandatory requirement of this Recommendation.

An H.322 gateway may also contain the functionality specified in Recommendation H.331 to simultaneously broadcast to a number of terminals. This is not a mandatory requirement of this Recommendation.



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#### NOTES

- 1 Not present in some gateways.
- 2 Required only if LAN does not directly support Recommendation E.164.

FIGURE 4/H.322  
Block diagram of H.322 gateway elements

## 6 Dependency on Recommendation H.320

All the provisions of all clauses subsequent to and including subclause 3.2 of Recommendation H.320 are an integral part of this Recommendation.