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Annex F
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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Communication procedures

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Interworking of H-series multimedia terminals with H-series multimedia terminals and voice/voiceband terminals on GSTN and ISDN

Annex F: H.323-H.324 interworking

ITU-T Recommendation H.246 – Annex F

(Formerly CCITT Recommendation)

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ITU-T Recommendation H.246

Interworking of H-series multimedia terminals with H-series multimedia terminals and voice/voiceband terminals on GSTN and ISDN

ANNEX F

H.323-H.324 interworking

Summary

This new annex defines the interworking requirements of a H.323 to H.324 protocol conversion device called a H.323 to H.324 Gateway. This Gateway provides interworking by providing the conversion of protocols for control, audio, and data as specified in ITU-T H.323 and H.324. This annex is applicable to the interworking with H.324 endpoints over PSTN, ISDN and mobile network. This is also applicable to both monolithic gateways and decomposed gateways.

Source

Annex F to ITU-T Recommendation H.246 was prepared by ITU-T Study Group 16 (2001-2004) and approved under the WTSA Resolution 1 procedure on 29 July 2001.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. 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 Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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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As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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ANNEX F

H.323-H.324 interworking

F.1 Scope

This annex specifies the interworking requirements of a H.323 to H.324 protocol conversion device called a H.323 to H.324 Gateway. This Gateway provides interworking by providing the conversion of protocols for control, audio, video, and data as specified in H.323 and H.324 system specifications.

The H.323 standard is the system specification for multimedia communications in packet based networks and is the basis for many IP telephony applications. The H.324 standard is a system specification for multimedia terminals operating on circuit-switched networks including: terminals on the PSTN ("H.324/P"), terminals on wireless networks (Annex C/H.324, "H.324/M"), and terminals on the ISDN (Annex D/H.324, "H.324/I"). The scope of this annex covers a Gateway for interworking between H.323 endpoints and H.324 endpoints on PSTN, ISDN or mobile networks.

This annex is applicable to both monolithic gateways and decomposed gateways. A decomposed gateway that supports interworking according to this annex may use the H.248 packages defined in Annex M.4/H.248 to realize the procedures defined in this annex.

F.2 Definitions

This annex defines the following terms:

F.2.1 endpoint: An endpoint is a terminal, Gateway, or MCU. An endpoint can call and be called. It generates and/or terminates media streams.

F.2.2 gateway: A Gateway as defined in this annex is an endpoint on the network which provides for real-time, two-way communications between H.323 endpoints on the packet based network and H.324 Annex C terminals on the wireless network or the CSN.

F.3 Abbreviations

This annex uses the following abbreviations:

AL-SDU	Adaptation Layer – Service Data Unit
CLC	CloseLogicalChannel message
CSN	Circuit-switched network (mobile, GSTN/PSTN, or ISDN)
H.324	ITU-T H.324, including all of H.324/M, H.324/I, and H.324/P
H.324/I	Annex D/H.324 (ISDN)
H.324/M	Annex C/H.324 (mobile)
H.324/P	H.324 operating in the base PSTN mode using a V-series modem
MSD	Master Slave Determination
OLC	OpenLogicalChannel

F.4 Overview

A H.323 to H.324 Gateway shall support the mandatory functionality as specified in the H.324 system specifications (H.324/P, H.324/M, or H.324/I as appropriate), the mandatory functionality as specified in the H.323 system specifications, and the mechanism for interworking both the control protocols and the media streams.

In the case of call control, this requires interworking between H.225.0 and the call control protocol used by CSN network that the H.324 terminal is connected to. For the multiplex capability, the Gateway shall provide a mapping between the RTP ports and TCP ports of H.225.0 and the logical channels inside the H.223 multiplex stream. The Gateway which supports interworking with H.324/M endpoint may increase error robustness by utilizing higher H.223 levels (from level 0 to level 3) at the cost of progressively increased overhead and complexity.

For system control information, the Gateway should provide a mapping of the H.245 messages between the H.323 and the H.324 endpoints. The Gateway may use optional audio codecs, video codecs, and/or data application capabilities after negotiation through the H.245 control channel.

If the incoming call from one side (H.323 or H.324) is voice only call, the gateway should not initiate an audiovisual call on the other side. The identification of the type of incoming call is described in F.5.3.

Table F.1 summarizes the protocol requirements for a H.323 to H.324 Gateway.

Table F.1/H.246

Component	H.323	H.324/P	H.324/M	H.324/I
Call Control	H.225.0	(Note 1)	(Note 2)	(Note 1)
System Control	H.245	H.245	H.245	H.245
Multiplex	H.225.0	H.223	H.223	H.223
Audio	G.711	G.723.1 (If audio is supported)	G.723.1 (If audio is supported)	G.723.1 (If audio is supported)
Video (If video is supported)	H.261 QCIF	H.261 QCIF and H.263 SQCIF/QCIF	H.261 QCIF and H.263 SQCIF/QCIF	H.261 QCIF and H.263 SQCIF/QCIF
NOTE 1 – For H.324/P and H.324/I call control is per ITU-T H.324 and Annex D/H.324, respectively. NOTE 2 – The H.324 Annex C terminal uses the call set-up control protocol of the appropriate national standard.				

F.5 Mapping H.245 control

The following clauses describe the H.245 procedures that require appropriate conversions or can cause conflict situations, and describe the required interworking procedures in the gateway. The gateway should perform the conversions described in this clause to facilitate the interworking in a way that is transparent to the remote endpoints. However, there may be some implementations that treat the terminations as two independent calls, and in this case the following conversions may not be required.

F.5.1 Capability exchange

The terminalCapabilitySet message shall be the first message among the H.245 control messages that the gateway sends to each remote endpoint.

When the TerminalCapabilitySet message is received from the remote endpoint (H.323 or H.324), the gateway shall initiate the Capability Exchange procedure with the opposite remote endpoint if it has not yet done so.

If either remote endpoint (H.323 or H.324) dynamically adds or removes/modifies capability by sending revised TerminalCapabilitySet message during the session, the gateway should send an updated TerminalCapabilitySet message to the opposite remote endpoint.

As for audio, video and data application capabilities, if the gateway detects interoperability problems due to limited capability sets on each side, the gateway shall resolve such problems by making appropriate adjustments to the incoming capability sets based on its transcoding or data application translation functionalities before relaying them to the opposite side.

The gateway shall make appropriate adjustments to the multiplexCapability in the incoming TerminalCapabilitySet message (i.e. from h223Capability to h2250Capability, and vice versa) before relaying them to the opposite side.

F.5.2 Master slave determination

If the gateway completes Master Slave determination procedure with each side independently of the other side, it shall set the TerminalType in the Master Slave Determination (MSD) message to the value as specified in the Table 1/H.323 for the H.323 side, and shall set it to a value of 150 for the H.324 side.

F.5.3 Logical channel signalling

When OpenLogicalChannel (OLC) messages (either unidirectional or bidirectional) are received from the remote endpoint (H.323 or H.324), the gateway should initiate the OLC procedure at the opposite endpoint of the gateway. The Gateway may initiate the OLC procedure before receiving OLC messages.

The gateway shall indicate appropriate multiplexParameters in the outgoing OpenLogicalChannel messages, because the two remote endpoints use different multiplex Recommendations.

If the dataType of the incoming OLC message specifies a type which is not supported by the opposite remote endpoint, but which the gateway is able to transcode or translate, the dataType in the outgoing OLC to the opposite side should be replaced with the dataType, supported by the opposite endpoint.

If the maxBitRate of the incoming OLC message is higher than the available bit rate on the other side, it shall be changed to the value that can be allocated for the logical channel when the OLC message is relayed to the opposite side.

NOTE (Informative) – There may be cases where a logical channel on one side of the gateway does not have a corresponding logical channel on the other side of the gateway. For example, in a multipoint call the gateway might use security services only with one of the endpoints in the call.

F.5.4 Close logical channel

When CloseLogicalChannel (CLC) messages are received from the remote endpoint (H.323 or H.324), the gateway should initiate the CLC procedure at the opposite endpoint of the gateway.

F.5.5 Mode request

The gateway should reject the incoming RequestMode message without relaying to the opposite endpoint, if the gateway will not change its mode of transmission regardless of the response from the opposite endpoint. For example, if h2250ModeParameters requested by the remote endpoint is not available, the H.323 endpoint of the gateway should reject this message without relaying to the H.324 endpoint.

It is desirable for the gateway to transmit a mode that could reduce the transcoding overhead and delay. Therefore, if the mode indicated by the modeDescription of the incoming request message is supported in the other remote endpoint, the gateway should pass the RequestMode message.

If the mode indicated by the modeDescription of the incoming request is not supported in the other remote endpoint but can be used via appropriate transcoding or translation, the gateway should pass the RequestMode message to the endpoint after making appropriate changes to the ModeDescription, or may reject the incoming request.

If the gateway receives a RequestModeAck in response to this message, then the RequestModeAck is sent to the other endpoint without modifications. However, if the gateway receives a RequestModeReject in response, then it will decide an appropriate response to the original RequestMode message.

F.5.6 Round trip delay

When RoundTripDelayRequest messages are received from the remote endpoint, the gateway should relay the incoming message to the remote endpoint in the opposite side, and should relay the response from the remote endpoint to the originating endpoint.

F.5.7 Communications mode messages

If the gateway receives CommunicationModeCommand on the H.323 side, it should determine whether it requires reconfiguration of logical channels. In some cases, such as when the command causes a switch between a centralized and decentralized conference or when the gateway cannot transcode the new dataType specified in the CommunicationModeTable, the gateway may require closing some or all existing logical channel and opening new ones. In other cases the gateway may be able to switch to a new mode, in a way that is transparent to the H.324 terminal, such as when the gateway can transcode the new dataType specified in the CommunicationModeTable.

F.5.8 Logical channel bit rate change messages

If the gateway receives a LogicalChannelRateRequest message, it may relay the message to the opposite endpoint after making appropriate changes. The gateway should relay any response to the LogicalChannelRateRequest message to the other endpoint.

The gateway may directly respond to a LogicalChannelRateRequest without relaying it to the opposite side.

The gateway may send a LogicalChannelRateRequest message before receiving any LogicalChannelRateRequest messages.

F.5.9 Flow control command

The gateway shall comply with incoming **FlowControlCommand**, and may send an appropriate **FlowControlCommand** to the endpoint on the opposite side, if it needs to do so to comply with the command. If, however, the gateway receives a **FlowControlCommand** to which it cannot comply, it should respond by stopping transmission on the logical channel and closing the corresponding logical channel for the opposite side.

F.5.10 End session command

When the gateway receives an EndSessionCommand from a remote endpoint (H.323 or H.324), the gateway shall immediately initiate the end session procedures at both endpoints of the gateway.

The gateway may initiate the end session procedure before receiving an EndSessionCommand.

F.5.11 Miscellaneous command

The gateway should comply with incoming MiscellaneousCommand and may forward the command to the opposite side.

F.6 Mapping call control information

The Gateway shall conduct an appropriate mapping between the Q.931 Call Signalling Channel on the H.323 side and the call signalling channel (if any) on the H.324 side.

For H.324/M endpoints, call set-up and call disconnect following the procedures of A.6/H.246 may be applied only if the wireless network to which the H.324/M terminal is connected supports a call signalling protocol such as Q.931 or Q.2931, replacing CSN by wireless network.

F.6.1 H.323 originated calls

If the incoming call from the H.323 endpoint is an audiovisual call (see 7.2.2.1/H.225.0), the gateway should make a H.324 call to the CSN network.

F.6.1.1 For H.324/P endpoints

If the incoming call from the H.323 endpoint is an audiovisual call (see 7.2.2.1/H.225.0), or if either the gateway or the H.324/P endpoint do not support ITU-T V.8 *bis*, the gateway should make a H.324/P call to the CSN network, and attempt to enter the digital communication mode immediately upon connection using the procedures of ITU-T V.8 as specified in clause 7/H.324.

If the incoming call from the H.323 endpoint is an audio-only call and both the gateway and the H.324/P terminal support ITU-T V.8 *bis*, the gateway may initiate a normal analogue telephony voice mode call to the H.324/P terminal. If at a later time the H.323 side attempts to open a data or video channel, the gateway should switch the H.324 side into digital communication mode according to the procedures of clause 7/H.324.

F.6.1.2 For H.324/M endpoints

If the call signalling protocol supported by the wireless network is Q.931, the gateway should signal the "Recommendations H.223 and H.245" BC and LLC information elements as described in ITU-T Q.931.

F.6.1.3 For H.324/I endpoints

If the incoming call from the H.323 endpoint is an audiovisual call (see 7.2.2.1/H.225.0), the gateway should make a H.324/I call to the ISDN network, and attempt to enter the multimedia communication mode according to the procedures of Annex D/H.324.

If the incoming call from the H.323 endpoint is an audio-only call, the gateway should make a call to the H.324/I endpoint using the ISDN network, according to the procedures of Annex D/H.324. The gateway may choose to enter any of the jointly-supported modes, as described in Annex D/H.324. If the resulting connection is an ordinary ISDN voice call, and at a later time the H.323 side attempts to open a data or video channel, the gateway should switch the H.324/I side into multimedia communication mode according to the procedures of clause 7/H.324.

F.6.2 H.324 originated calls

If the incoming call is an audiovisual call, the gateway should make an audiovisual call to the H.323 side-by-setting the information element of the outgoing message as specified in 7.2/H.225.0.

There are several strategies that can be used to identify the address of the H.323 endpoint, the called party. Some example methods include Direct Inward Dialling (DID), Multiple Subscriber Number (MSN), and ISDN sub-addressing.

F.7 Communication procedure

This clause gives an example of the communication procedures when the connection is established without using fast connect, early H.245 control, or H.245 tunnelling.

F.7.1 Phase A – Call Set-up

When the gateway receives an incoming call from either of remote (H.323 or H.324) endpoints, it shall initiate call set-up procedures at the opposite side, using the procedures defined in F.6.

F.7.2 Phase B – Initial communication and capability exchange

For connections to H.324/P and H.324/I terminals only, there may be an initial period of voice communication according to clause 7/H.324 and Annex D/H.324, respectively. For these terminals, Phase B of this annex begins with entry into call set-up Phase D of ITU-T H.324 and Annex D/H.324.

After the establishment of the H.245 control channel, Capability Exchange shall be the first procedure initiated at both endpoints of the gateway. The gateway may wait for the remote endpoints to initiate the procedure, instead of itself initiating the capability exchange procedure. The gateway shall follow the procedures defined in F.5.1 for capability exchange.

The gateway shall complete MSD procedure with both remote endpoints using the procedures defined in F.5.2.

F.7.3 Phase C – Establishment of audiovisual communication

Following the exchange of capabilities and master slave determination, the procedures of F.5.3 and F.5.4 shall then be used to open logical channels for the various information streams.

During a session, the procedures for changing channel structure, capability, receive mode, etc. shall be carried out as defined in F.5.6.

The gateway shall follow the procedures of 8.4/H.323 for provision of call services on H.323 side. The procedures defined in this annex shall be followed where the provision of call services requires interworking with the H.324 terminal.

F.7.4 Phase D – Call termination

Either of the remote endpoints may terminate a call by sending a EndSessionCommand to the gateway, in which case the procedures defined in F.5.10 shall be followed by the gateway.

Also the gateway may terminate the call for reasons such as receiving a DRQ from the gatekeeper, in such case procedures defined in F.5.10 shall be followed.

F.8 Handling of fast connect

The gateway may support the Fast Connect procedures for in-bound calls from the H.323 endpoints. The gateway that uses Fast Connect in a call shall use H.245 tunnelling on the H.323 side when an H.245 Control Channel is required and shall always set the h245Tunneling field to TRUE. This clause describes an example of procedures for handling of Fast Connect.

F.8.1 Call establishment using fast connect procedures

F.8.1.1 Without initial voice conversation

The following procedure should be used with H.324/M endpoints. It may also be used with H.324/P and H.324/I endpoints when a period of initial voice communication before initiation of multimedia mode (Phase B of H.324 and Annex D/H.324) is not desired.

If the gateway receives a Setup message containing the fastStart element from the H.323endpoint, the following steps should be followed.

Step 1: The Gateway detects the information provided in OpenLogicalChannel structures in the fastStart element of the SETUP message sent by the H.323 endpoint, to generate

TerminalCapabilitySet and OpenLogicalChannel messages. The gateway should not send any media to either direction until the Connect message is sent.

Step 2: The gateway may send provisional (Call Proceeding, Progress or Alerting) Q.931 messages to the H.323 endpoint when appropriate.

Step 3: The Gateway establishes a digital communication channel with the H.324/M terminal.

Step 4: The gateway initiates the Capability Exchange procedure. If the gateway detects incompatibility in the TerminalCapabilitySet received from the H.324/M terminal and the dataType field of the OLC structures of fastStart element, and if the gateway has transcoding or protocol translation functionalities that are capable of resolving these incompatibilities, it makes adjustments to TerminalCapabilitySet message prepared in step 1. Then the gateway sends this TerminalCapabilitySet message for capability exchange with the H.324/M terminal.

Step 5: The gateway initiates the Master Slave Determination (MSD) procedure at the H.324/M endpoint of the gateway. The terminalType in the MSD message shall be set to 150.

Step 6: The Gateway initiates the OpenLogicalChannel procedure at the H.324/M endpoint of the gateway. If the gateway made any adjustments to the TerminalCapabilitySet in step 4, the dataType of the OpenLogicalChannel structure present in the fastStart element is changed accordingly.

Step 7: After completing the OLC procedure, the gateway sends a Q.931 CONNECT message containing a fastStart element accepted in step 6.

After establishment of a call using the Fast Connect procedure, the remote H.323 endpoint might determine that it is necessary to invoke call features that require the use of H.245 procedures. In this case, the GW shall follow the procedure as described in 8.1.7.2/H.323.

If the gateway receives parallelH245Control in the SETUP message in step 1, the gateway shall respond using the procedures defined in 8.2.4/H.323. If the gateway supports the H.245 tunnelling in parallel with fast connect, it shall follow the procedures defined in F.5.1 to generate a response (MasterSlaveDeterminationAck message) to the MasterSlaveDetermination message received in parallelH245Control**.** The gateway shall use the TerminalCapabilitySet received in the parallelH245Control field of the SETUP instead of generating it from OLC structures as defined in step 1 above, then the gateway shall complete steps 2-7 as described above. If the gateway supports the H.245 tunnelling in parallel with fast connect, it shall send the TerminalCapabilitySetAck (for the terminal capability set received in parallelH245Control), TerminalCapabilitySet received from the H.324/M terminal in step 4 and MasterSlaveDeterminationAck (see above) in the h245Control field of the CONNECT message in step 6 above. The gateway may alter the TerminalCapabilitySet (being sent in the h245Control) to remove any capability mismatch (see F.5.2 above).

If however the gateway does not support fast connect, but understands the parallelH245Control, it may still send the TerminalCapabilitySetAck, TerminalCapabiltySet, and MasterSlaveDeterminationAck in the h245Control field of the H.225.0 message with fastStartRefused. This eliminates the need for MSD and capability exchange procedures once the H.245 procedures are started (either on a separate logical channel or through H.245 tunnelling) with the H.323 endpoint. If the gateway does not support either of fast connect and parallelH245Control, it shall not include TerminalCapabilitySetAck in the h245Control field of the H.225.0 message with fastStartRefused (see 8.2/H.323 for details).

If the gateway does not understand (or does not want to use) the parallelH245Control, it shall follow the procedures defined in 8.2.4/H.323 to indicate this to the H.323 endpoint. The gateway may however use the TerminalCapabilitySet received in the parallelH245Control field of the SETUP message for capability exchange with the H.324/M terminal.

F.8.1.2 With initial voice conversation

The following procedure should be used with H.324/P and H.324/I endpoints when a period of initial voice communication before initiation of multimedia mode (Phase B of H.324 and Annex D/H.324) is desired.

If the gateway receives a Setup message containing the fastStart element from the H.323 endpoint, the following steps should be followed.

Step 1: The Gateway detects the information provided in OpenLogicalChannel structures in the fastStart element of the SETUP message sent by the H.323 endpoint. If the content of this information indicates that the H.323 endpoint is attempting to open an audio-only channel, the procedures of the remainder of this clause may be followed. Otherwise, the procedures of the previous clause should be followed.

The gateway should not send any audio to either direction until the Connect message is sent.

Step 2: The gateway may send provisional (Call Proceeding, Progress or Alerting) Q.931 messages to the H.323 endpoint when appropriate.

Step 3: The Gateway establishes a voice telephony communication channel with the H.324 terminal. Voice telephone mode may continue indefinitely until:

a) the H.323 endpoint attempts to open additional logical channels. In this case, the gateway should begin the H.324 procedure to transition to multimedia communication mode, according to clause 7/H.324 or Annex D/H.324 as appropriate. The procedures of step 4-7 and the remainder of the previous clause should then be followed; or

b) the H.324 endpoint begins the H.324 procedure to transition to multimedia communication mode. In this case the Gateway should respond according to clause 7/H.324 or Annex D/H.324, as appropriate. The procedures of step 4-7 and the remainder of the previous clause should then be followed.

If the gateway receives an audio-only call from the H.324 side, the following steps may be followed.

Step 1: The Gateway sends a Setup message containing the fastStart element to the remote H.323 endpoint. The gateway should not send any audio to either direction until the Connect message is received.

Step 2: The Gateway establishes a voice telephony communication channel with the H.324 terminal. Voice telephone mode may continue indefinitely until:

a) the H.323 endpoint attempts to open additional logical channels. In this case, the gateway should begin the H.324 procedure to transition to multimedia communication mode, according to clause 7/H.324 or Annex D/H.324, as appropriate. The procedures of step 4-7 and the remainder of the previous clause should then be followed; or

b) The H.324 endpoint begins the H.324 procedure to transition to multimedia communication mode. In this case the Gateway should respond according to clause 7/H.324 or Annex D/H.324, as appropriate. The procedures of step 4-7 and the remainder of the previous clause should then be followed.

F.8.2 Call termination from voice communication mode

If the connection with the H.323 side was established using Fast Connect procedures and no separate H.245 control channel was established in the duration of the connection, then on receipt of a H.225.0 Release Complete command from the H.323 endpoint, the Gateway shall terminate the call on the H.324 side according to the normal procedures for PSTN or ISDN telephony.

If the H.324 terminal terminates the voice call, the Gateway shall send a Q.931 Release Complete command on the call signalling channel to the H.323 endpoint.

F.8.3 Call termination from multimedia mode

If the connection with the H.323 side was established using Fast Connect procedures and no separate H.245 control channel was established in the duration of the connection, then on receipt of a H.225.0 Release Complete command from the H.323 endpoint, the Gateway shall send an EndSessionCommand to the H.324/M terminal using the procedures of clause 7.6/H.324.

If the H.324 terminal terminates the H.245 channel by sending a EndSessionCommand to the gateway, the Gateway shall send a Q.931 Release Complete command on the call signalling channel to the H.323 endpoint.

F.9 Handling of H.245 tunnelling

In order to conserve resources, synchronize call signalling and control, and reduce call set-up time, it may be desirable to convey H.245 messages within the Q.931 Call Signalling Channel instead of establishing a separate H.245 channel between the Gateway and the H.323 endpoint. The Gateway shall follow the H.245 tunnelling procedures specified in 8.2.1/H.323. However, since there is no mechanism of H.245 tunnelling in H.324, H.245 messages to/from the H.324 terminal are carried in a dedicated channel (logical channel 0) of the multiplex stream signal.

F.10 Security

For further study.

F.11 Mapping media channels

Since H.323 and H.324 are standards for multimedia systems, terminals that are compliant with these standards may support audio channel(s), video channel(s), or both audio and video channels. The number of audio and/or video channels and the codecs that are used is determined through the H.245 negotiation process. There are two distinct possibilities for each media channel:

– the H.323 endpoint and the H.324 terminal employ the same media codec; or

– the H.323 and the H.324 endpoint employ different media codecs.

In the case where the codecs are the same, the Gateway should provide a media channel mapping between the RTP port and a logical channel in the H.223 multiplex stream.

To support call scenarios where the media codecs of the two terminals are different, the Gateway may support media format conversion, such as audio transcoding, as well as the media channel mapping between the RTP port and logical channel.

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