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H.246
Annex C
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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Communication procedures

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

Annex C: ISDN User Part function – H.225.0 interworking

ITU-T Recommendation H.246 – Annex C

ITU-T H-SERIES RECOMMENDATIONS

AUDIOVISUAL AND MULTIMEDIA SYSTEMS

For further details, please refer to the list of ITU-T Recommendations.

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 C

ISDN User Part function – H.225.0 interworking

Summary

This annex describes the interworking between ISUP (ISDN User Parts of Signalling System No. 7) and H.225.0 Multimedia Call Control protocol. It specifies the necessary mapping an interworking function would utilize to achieve connectivity and functionality between an H.323 network and an ISDN User Part network.

This annex describes an interworking function when it is in a H.323 to PSTN gateway. The interworking function could reside in other elements of a H.323 network; this is for further study. The mapping described in this annex relates to a H.323 call to Circuit Switched Network Phone.

This annex does NOT attempt to define functionality in ISUP or Q.931 networks but seeks to show how the ISUP services and functions would interwork with ITU-T Rec. H.225.0. H.225.0 messages contain Q.931 information elements and as such parts of this annex have been derived from ITU-T Rec. Q.699. This annex does NOT show the mapping between H.320 and H.323.

This revision of Annex C incorporates changes identified by the H.323 Implementors' Guide as well as further enhancing the number of features that can be interworked between ISUP and H.323. Of particular note is the inclusion of text to support interworking of the International Emergency Preference Scheme (IEPS).

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.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g. interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

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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C.1 Methodology

C.1.1 General

The procedures and elements of information that are not carried over the international interface (i.e., are defined for national use) are not described in this Recommendation, except for the interworking cases of the calling party number, connected number, generic digits and redirection number when the national number can be used.

The elements of information (parameters, information elements, and messages) that are of local significance only (i.e., are not mapped onto elements of information in the other signalling system) are not mentioned.

Moreover, only the parameters and indicators being a matter of interworking are described. Hence, no information is given concerning, for example, the satellite indicator, continuity check indicator, echo control device indicator, or propagation delay counter parameter.

In the same way, information to be sent in case of local fallback or local rejection of Supplementary Services is not relevant to interworking and therefore is not mentioned.

C.1.2 ISUP segmentation

Some ISUP messages may indicate that they are followed by a Segmentation Message (SGM). The actions described in this Recommendation on receipt of such messages take place only after the completion of the segmentation procedure specified in 2.1.12/Q.764 [1].

Regarding statements in this text that a parameter is received in an ISUP message, in case of segmentation, that parameter could be received in the segmentation message (SGM) as well.

The ISUP messages, which can be segmented, and the ISUP parameters, which can be conveyed in a segmentation message (SGM), are described in 2.1.12/Q.764 [1].

C.1.3 H.225.0 segmentation

Segmentation is not supported in ITU-T Rec. H.225.0.

C.1.4 Handling of the cause and location fields

NOTE – ITU-T Rec. Q.850 [2] does not mention ITU-T Rec. H.225.0. However as it is based on Q.931/DSS1, the coding in ITU-T Rec. Q.850 is relevant.

When a cause parameter or information element is to be sent by the exchange, only the cause value is given in the text; the location indication is coded according to [2].

When a progress indicator information element is to be sent by the exchange, only the progress description is given in the text; the location indication is coded according to [2].

The handling of the diagnostic received in a cause parameter or in a cause information element is described in [2].

C.1.5 Services interactions

Impacts of services interactions on interworking are not described.

C.1.6 Reference model

Reference points S and T are described in ITU-T Rec. I.411. The T reference point best represents the interworking function. A coincident S and T reference best describe the functionality where an MCU and interworking function are involved in a call.

C.2 References

The following ITU-T 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; 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. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[1]   ITU-T Recommendation Q.764 (1999), *Signalling System No. 7 – ISDN User Part signalling procedures, plus* Amendment 2 (2002), *Support for the International Emergency Preference Scheme.*

[2]   ITU-T Recommendation Q.850 (1998), *Usage of cause and location in the Digital Subscriber Signalling System No. 1 and the Signalling System No. 7 ISDN user part.*

[3]   ITU-T Recommendation Q.931 (1998), *ISDN user-network interface layer 3 specification for basic call control.*

[4]   ITU-T Recommendation Q.732.2-5 (1999), *Stage 3 description for call offering supplementary services using Signalling System No. 7 – Call diversion services*:

    –   Q.732.2, *Call forwarding busy* (CFB).

    –   Q.732.3, *Call forwarding no reply* (CFNR).

    –   Q.732.4, *Call forwarding unconditional* (CFU).

    –   Q.732.5, *Call deflection* (CD).

[5]   ITU-T Recommendation Q.733, *Stage 3 description for call completion supplementary services using Signalling System No. 7*:

    –   Q.733.2 (1993), *Call Hold (HOLD).*

    –   Q.733.4 (1993), *Terminal Portability (TP).*

[6]   ITU-T Recommendation H.323 (2000), *Packet-based multimedia communications systems.*

[7]   ITU-T Recommendation H.225.0 (2000), *Call signalling protocols and media stream packetization for packet-based multimedia communication system*s.

[8]   ITU-T Recommendation H.450.1 (1998), *Generic functional protocol for the support of supplementary services in H.323.*

[9]   ITU-T Recommendation H.450.2 (1998), *Call transfer supplementary service for H.32*3.

[10]   ITU-T Recommendation H.450.3 (1998), *Call diversion supplementary service for H.323.*

[11]   ITU-T Recommendation H.450.4 (1999), *Call hold supplementary service for H.323.*

[12]   ITU-T Recommendation H.450.5 (1999), *Call park and call pickup supplementary services for H.323.*

[13] ITU-T Recommendation H.450.6 (1999), *Call waiting supplementary service for H.323*.

[14] ITU-T Recommendation H.450.7 (1999), *Message waiting indication supplementary service for H.323*.

[15] ITU-T Recommendation H.450.8 (2000), *Name identification supplementary service for H.323*.

[16] ITU-T Recommendation I.411 (1993), *ISDN user-network interfaces – Reference configurations*.

[17] ITU-T Recommendation Q.953.4 (1995), *Stage 3 description for call completion supplementary services using DSS1: Terminal Portability (TP)*.

[18] ITU-T Recommendation Q.731.1 (1996), *Stage 3 description for number identification supplementary services using Signalling System No. 7: Direct-Dialling-In (DDI)*.

[19] ITU-T Recommendations Q.951.x, *Stage 3 description for number identification supplementary services using DSS1*.

[20] ITU-T Recommendation H.460.5 (2002), *H.225.0 transport of multiple Q.931 information elements of the same type*.

[21] ITU-T Recommendation H.460.4 (2002), *Call priority designation for H.323 calls*.

[22] ITU-T Recommendation E.106 (2000), *Description of an international emergency preference scheme (IEPS)*.

C.3   Abbreviations

This Recommendation uses the following abbreviations:

3PTY   Three-Party Service

ACM   Address Complete Message

ANM   Answer Message

ATP   Access Transport Parameter

BC   Bearer Capability information element

CGB   Circuit Group Blocking message

CLIP   Calling Line Identification Presentation

CLIR   Calling Line Identification Restriction

COLP   Connected Line Identification Presentation

COLR   Connected Line Identification Restriction

CON   Connect message

CPAP   Connected Party Address Presentation

CPG   Call Progress message

CUG   Closed User Group

CW   Call Waiting

DDI   Direct-Dialling-In

FAA   Facility Accept message

FAR   Facility Request message

FRJ   Facility Reject message

GRS	Circuit Group Reset message
HLC	High Layer Compatibility information element
HOLD	Call HOLD
IAM	Initial Address Message
IE	Information Element
IEPS	International Emergency Preference Scheme
ind.	indicator
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
MLPP	Multi-Level Precedence and Pre-emption
MSN	Multiple Subscriber Number
p.i.	progress indicator information element
REL	Release message
RES	Resume message
RSC	Reset Circuit message
SAM	Subsequent Address Message
SGM	Segmentation Message
SUB	Subaddressing
SUS	Suspend message
TMR	Transmission Medium Requirement parameter
TMU	Transmission Medium Used parameter
TP	Terminal Portability
USI	User Service Information parameter
USR	User-to-user information message
UUS	User-to-User signalling

C.4 Conventions

ISUP messages appear in lower case. H.225.0 messages appear in upper case.

C.5 ISUP to H.225.0 mapping

C.5.1 Messages

See Table C.1.

Table C.1/H.246 – Mapping of external ISUP messages to internal H.225.0 messages

ISUP message	H.225.0 message
Initial address message (IAM)	SETUP
Address complete (ACM)	CALL PROCEEDING
	PROGRESS
	ALERTING
	FACILITY
Call Progress (CPG)	PROGRESS
	ALERTING
	NOTIFY
	FACILITY
Subsequent Address (SAM)	INFORMATION
Answer (ANM)	CONNECT
Connect (CON)	
Facility (FAC)	NA
Facility request (FAR)	
Facility accept (FAA)	
Facility reject (FRJ)	
Information (INF)	
Confusion	
Information request (INR)	NA (see C.6.1.14)
Identification request (IDR)	NA (see C.6.1.15)
Release (REL)	RELEASE COMPLETE
Release Complete (RLC)	NA
Suspend (SUS)	NA
Resume (RES)	NA

C.5.2 Parameters

NOTE – NA (not available) in Table C.2 indicates that ITU-T Rec. H.225.0 does not support the parameter or the functionality the parameter provides.

Table C.2/H.246 – Mapping of ISUP parameters to H.225.0 information elements

| ISUP parameter	H.225.0 information element
Access delivery information	NA
Access transport	May contain H.225.0 parameters: Progress Indicator Called party subaddress Calling party subaddress Connected subaddress
Automatic congestion level	NA
Backward call indicators	NA
Call diversion information	Notification indicator (non-H.450.3 endpoint) divertingLegInformation1 (H.450.3 endpoint) – see Tables C.29, C.30, C.31
Call history information	NA
Call reference	NA
Called party number	Called party number
Calling party's category	Call Priority Designation Parameter (ITU-T Rec. H.460.4)
Calling party number	Calling party number or sourceAddress
Circuit state indicator	NA
Circuit group supervision message type indicator	NA
Closed user group interlock code	NA
Connected number	Connected number
Connection request	NA
Continuity indicators	NA
Echo control information	NA
End of optional parameters	NA
Event information	NA
Facility indicator	NA
Forward call indicators	FFS
Generic digits	NA
Generic notification indicator	Notification indicator (non-H.450.3 endpoint) divertingLegInformation1 (H.450.3 endpoint) – see Tables C.29, C.30
Generic number – Additional Calling Party Number	Calling Party Number
Hop counter	NA
Information indicators	NA
Information request indicators	NA
Location number	NA

Table C.2/H.246 – Mapping of ISUP parameters to H.225.0 information elements

ISUP parameter	H.225.0 information element
MCID request indicator	NA
MCID response indicator	NA
Message compatibility information	NA
MLPP precedence	NA
Nature of connection indicators	NA
Network-specific facilities	NA
Optional backward indicators	NA
Optional forward indicators	NA
Original called number	divertingLegInformation2 (H.450.3 endpoint)
Origination ISC point code	NA
Parameter compatibility information	NA
Propagation delay counter	NA
Range and status	NA
Redirecting number	divertingLegInformation2 (H.450.3)
Redirection information	divertingLegInformation2 (H.450.3 endpoint)
Redirection number	divertingLegInformation2 (H.450.3 endpoint) – see Table C.31
Redirection number restriction	divertingLegInformation1 (H.450.3 endpoint) – see Table C.31
Remote operation	FFS
Service Activation	NA
Signalling point code	NA
Subsequent number	Called party number
Suspend/Resume indicators	FFS
Transit network selection	NA
Transmission medium requirement	NA
Transmission medium requirement prime	NA
Transmission medium used	NA
User Service Information	Bearer capability
User Service Information prime	NA
User Teleservice Information	FFS
User-to-user Indicators	NA
User-to-user Information	User Data

C.6   Outgoing call – Interworking from H.225.0 to ISUP

In traditional telephone networks, through-connect occurs very early in the call (before the called party answers) to provide tones or announcements, and to eliminate clipping on answer while the voice channel is being connected end-to-end. Clause 8.1.7.4/H.323 describes the behaviour for early through-connect (that is, through-connect before the H.225.0 CONNECT message).

For calls from the packet network to the circuit network, the best behaviour would be to through-connect in the backward direction on IAM, and on the forward direction on answer (to avoid fraud):

H.246ANN.C_FC.6
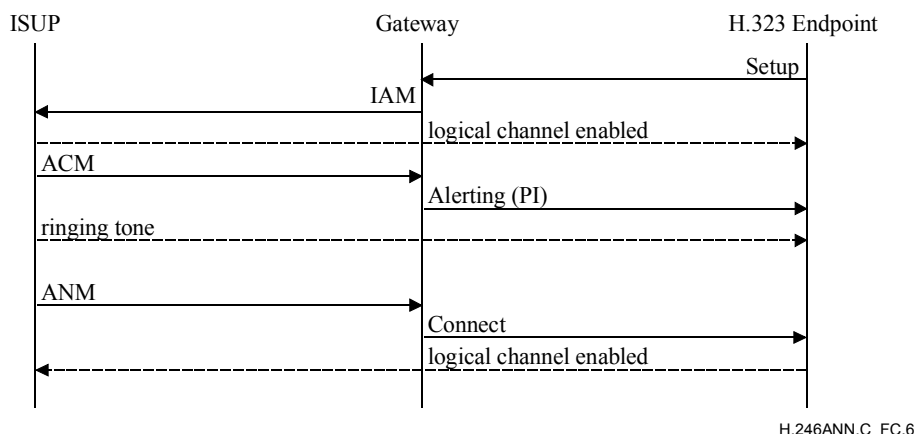
The notation "Alerting (PI)" indicates the presence of the progress indicator as described in 8.1.7.4/H.323.

C.6.1 Basic call

C.6.1.1 Sending of the Initial Address Message (IAM)

When the interworking function has received from the calling user in a SETUP message (possibly followed by other H.225.0 messages) enough information to determine that the call is to be routed over the SS7 network, the gateway shall select a suitable, free, inter-exchange circuit and send an Initial Address Message (IAM).

The coding of the Initial Address Message (IAM) according to the SETUP message is described hereafter.

NOTE – The coding of the Initial Address Message (IAM) sent by a forwarding exchange is described in 2.5.2.5/Q.732.2-5 [4]. The parameters used in such a case are not mentioned hereafter.

C.6.1.1.1 Mandatory parameters

Forward call indicators

bit   A   National/international call indicator

       0   *call to be treated as a national call*.

       This bit may be set to "1" for international calls in the case where the H.323 network component routes a call across a national boundary.

bit   D   Interworking indicator

       0   *no interworking encountered (No. 7 signalling all the way). Set for H.323 terminated or originated calls. Set when originating endpoint type is NOT a gateway*

       1   *interworking encountered. Set for H.323 trunked calls set; when originating endpoint type indicates a gateway*

If bit D set to "0", then bits FHGI should be set as below:

bit   F   ISDN User Part indicator

       1   *ISDN User Part used all the way*

bits   HG   ISDN User Part preference indicator

        1 0   *ISDN User Part required all the way* if required by the invoked telematic teleservices or Supplementary Services or by ITU-T Rec. E.172

        0 0   *ISDN User Part preferred all the way otherwise*

bit   I   ISDN access indicator

        1   *originating access ISDN*

ITU-T Rec. H.225.0 does not support the transmission of the Forward Call Indicators and as such the interworking function shall decide what to send in the IAM message.

Calling party's category

Coded according to internal data of the interworking unit, except when the H.460.4 [21] Call Priority designation parameter is included in the SETUP message and it indicates a priority value of emergencyAuthorized. In this case, one of the following scenarios applies:

a)   For an internal national gateway: If an internal national gateway receives a Call Priority designation parameter set to emergencyAuthorized, call establishment proceeds with priority. The CPC parameter in the outgoing IAM message should be set to the IEPS call marking value (0000 1110 [14]) or to a nationally assigned emergency call value. The actions taken on the ISUP side are described in 2.1.1.4 e/Q.764 [1] except that the ACM would be replaced by a Call Proceeding on the H.323 side.

b)   For an outbound international gateway: If an outgoing international gateway receives a Call Priority designation parameter set to emergencyAuthorized, call establishment proceeds with priority. The CPC parameter in the outgoing IAM message should be set to the IEPS call marking value (0000 1110 [14]) or to a nationally assigned emergency call value. The actions taken on the ISUP side are described in 2.1.1.3 e/Q.764 [1] except that the ACM would be replaced by a Call Proceeding on the H.323 side.

c)   For an inbound international gateway: If an inbound international gateway receives a Call Priority designation parameter set to emergencyAuthorized, and if there is a bilateral agreement between governmental authorities to support IEPS, then call establishment proceeds with priority. The CPC parameter in the outgoing IAM message should be set to the IEPS call marking value (0000 1110 [14]) or to a nationally assigned emergency call value. The actions taken on the ISUP side are described in 2.1.1.5 e/Q.764 [1] except that the ACM would be replaced by a Call Proceeding on the H.323 side.

d)   For an intermediate international gateway: If an intermediate international exchange receives a Call Priority designation parameter set to emergencyAuthorized, call establishment proceeds with priority. The CPC parameter in the outgoing IAM message should be set to the IEPS call marking value (0000 1110 [14]) or to a nationally assigned emergency call value. The actions taken on the ISUP side are described in 2.1.1.4 e/Q.764 [1] except that the ACM would be replaced by a Call Proceeding on the H.323 side.

Transmission medium requirement

The transmission medium requirement parameter is coded as described in Table C.3.

**Table C.3/H.246 – Coding of the transmission medium requirement
parameter (TMR) One BC received**

SETUP→		IAM→
Bearer capability information element		Transmission medium requirement parameter
Information transfer capability	Information transfer rate	
Speech	Value non-significant	*Speech*
3.1 kHz audio	Value non-significant	*3.1 kHz audio*
Restricted digital information	For further studies	For further studies
Unrestricted digital information	*64 kbit/s unrestricted*	*FFS*
	2 × 64 kbit/s unrestricted	*2 × 64 kbit/s*
	384 kbit/s unrestricted	*384 kbit/s*
	1536 kbit/s unrestricted	*1536 kbit/s*
	1920 kbit/s unrestricted	*1920 kbit/s*
	Multirate: 6 × 64 kbit/s	*384 kbit/s*
	Multirate: 24 × 64 kbit/s	*1536 kbit/s*
	Multirate: 30 × 64 kbit/s	*1920 kbit/s*
NOTE – For a call originated from an H.323 endpoint, the Rate Multiplier shall be used to indicate the bandwidth to be used for this call. If a gateway is involved, then this value shall reflect the number of external connections to be set up. The bandwidth needed for the call is the bandwidth needed on the SCN side, and may or may not match the bandwidth allowed on the packet-based network by the ACF H.225.0 RAS messages.		

Called party number

–   Nature of address indicator:

According to the type of number field in the called party number information element and internal data of the originating exchange.

–   Internal network number indicator:

1   *routing to internal network number not allowed*

–   Numbering plan indicator:

001   *ISDN (telephony) numbering plan (ITU-T Rec. E.164)*

–   Address signal:

According to the called number information received in the SETUP, INFORMATION or H.225.0 ACF messages.

NOTE – When the *Numbering plan identification* information element is received and it indicates "1001" (Private Numbering Plan) in a packet-based network originated call, this indicates that:

1)   the E.164 address is not present in SETUP; and

2)   the call will be routed via an alias address in the user-to-user information which must be a public number, otherwise the call must be cleared.

User-to-user information

The user-to-user information element contains the Setup-UUIE defined in the H.225.0 Message Syntax. The Setup-UUIE may include the following (see Table C.4):

Table C.4/H.246 – User-to-user information received from H.225.0

SETUP→	IAM→
Content	
User Data	**User-to-user**

C.6.1.1.2 Optional parameters

Calling party number

See Table C.5.

Table C.5/H.246 – Calling party number

SETUP →	IAM →
Source Address	**If aliasaddress is E.164 or party number, copy to Calling Party Number**

See C.6.2.1.1 and C.6.2.1.2.

Optional forward call indicators

bits	BA	Closed user group call indicator:
	0	(Not applicable)
bit	H	Connected line identity request indicator:

Shall be set to "0" unless it can be determined that the User has Connected Party Address Presentation. See C.6.2.3.

Closed user group interlock code

Not applicable.

Connection request

Not applicable.

Access transport

If progress indicator is present in a SETUP message, the Access transport contains this progress indicator.

The High layer compatibility and Low layer compatibility is FFS.

Called Party subaddress and Calling Party subaddress may be mapped to the IAM Access Transport parameter.

User service information

See Table C.6.

Table C.6/H.246 – Coding of the user service information parameter (USI)

SETUP→	IAM→
Content	User service information parameter
BC	BC (Note)
NOTE – The BC should be the same as that received in the SETUP with the exception of when the BC is 1×64 k. 1×64 k BC is for further study.	

User-to-user indicators

NA.

Generic number

See C.6.2.1.

User service information prime

This parameter is present only if two bearer capability information elements are received and if no fallback occurs in the originating exchange. H.225.0 cannot generate 2 bearer capabilities therefore USI prime will not be generated.

User teleservice information

FFS.

Generic notification

See C.6.2.6.

Transmission medium requirement prime

This parameter is present only if two bearer capability information elements are received and if no fallback occurs in the originating exchange. H.225.0 cannot generate 2 BCs, therefore TMR prime is not supported.

MLPP precedence

NA.

C.6.1.2   Sending of the Subsequent Address Message (SAM)

If the initial address message has already been sent, and if the originating endpoint or Gatekeeper has not determined that the called number information received was complete, the receipt of an INFORMATION message containing additional digits causes the sending of a Subsequent Address Message (SAM).

C.6.1.3   Receipt of the Address Complete Message (ACM)

C.6.1.3.1 ACM with a cause parameter

See Table C.7.

Table C.7/H.246 – Receipt of ACM with a cause parameter

←PROGRESS	←ACM
Cause information element (Note 1)	Cause parameter
Progress indicator No. 8 (Note 2)	Optional backward call indicators parameter
	In-band information ind. *In-band info…*
NOTE 1 – If the cause value received in the Address Complete Message (ACM) is unknown in H.225.0, the unspecified cause value of the class is sent.	
NOTE 2 – The progress indicator No. 8 (*in-band information or an appropriate pattern is now available*) is only sent if the BC received in the SETUP message is coded *speech or 3.1 kHz audio*.	
NOTE 3 – If a bearer is available, then end interwork should apply the far-end tone/announcement.	

C.6.1.3.2 ACM without the cause parameter

Upon receiving an address complete message, the interworking function shall send a message across the H.323 network to the calling user, as described in Table C.8.

Table C.8/H.246 – Message sent to the H.225.0 upon receipt of ACM

←Message sent to the H.225.0	←ACM
	Backward call indicators parameter Called party's status indicator
CALL PROCEEDING when not sent before (Note 1), otherwise: – PROGRESS if a progress indicator information element is to be sent (Note 2) – No message if no progress indicator information element is to be sent (Note 2)	00 *No indication*
ALERTING	01 *Subscriber free* (Note 3)
NOTE 1 – The receipt from the network of an Address Complete Message (ACM) without the *subscriber free* indication is interpreted by the network as a sending complete indication, in the case where the network could not determine it before. NOTE 2 – The sending of a progress indicator information element is described below. NOTE 3 – The FACILITY message may be used anyway by the interworking function to transfer H.225.0 internal information, e.g., the fastStart parameter. For the coding of the FACILITY message, see Table 16/H.225.0 [7].	

The backward message sent to the calling user (ALERTING, CALL PROCEEDING or PROGRESS message) is coded as follows.

Bearer capability

When an ACM will not contain a bearer capability, the interworking function may generate an appropriate bearer capability in case there is a terminal involved in the call.

Progress indicator

Progress indicator information elements possibly present in the access transport parameter of the Address Complete Message (ACM) are transferred into the message sent to the calling user. If the calling user is an H.323 end system, it need not interpret this information element.

In addition, progress indicator information elements are created by the Interworking function according to the coding of the Address Complete Message (ACM). Table C.9 shows the sending criteria of each value.

By performing the conversion specified in ITU-T Rec. H.460.5 [20], every message sent to the access (ALERTING, CALL PROCEEDING or PROGRESS) can contain two or more progress indicator information elements.

See Table C.9.

**Table C.9/H.246 – Sending criteria of the progress indicator
information elements created by the interworking function**

←H.225.0 Message sent (See Table C.8)	←ACM
Progress indicator information element	Content
No. 1 (*Call is not end-to-end ISDN: further call progress information may be available in-band*)	Backward call indicators parameter ISDN User Part indicator 0 *ISDN User Part not used all the way*

No. 2
 	
(*Destination address is non-ISDN*)
	Backward call indicators parameter
	
	ISDN User Part indicator
	
	    1 *ISDN User Part used all the way*
	
	ISDN access indicator
	
	    0 *Terminating access non-ISDN*

No. 8 (Note) (*In-band information or an appropriate pattern is now available*)	Optional backward call indicators parameter In-band information indicator 1 *In-band info...*
NOTE – The progress indicator No. 8 (*in-band information or an appropriate pattern is now available*) is only sent if the BC received in the SETUP message is coded *speech* or *3.1 kHz audio*.	

High layer compatibility

FFS.

Notification indicator

NA.

Call diversion information

See C.6.2.6.

Redirection number restriction

See C.6.2.6

Redirection number

See C.6.2.6.

Facility

See C.6.2.

User-to-user

The user-to-user information element contains the CallProceeding-UUIE defined in the H.225.0 Message Syntax.

This information element is mandatory in the CALL PROCEEDING message.

The user-to-user information element contains the Alerting-UUIE defined in the H.225.0 Message Syntax.

Handling of fallback information

Fallback procedures are not defined in ITU-T Rec. H.225.0. An ACM should not be received with TMU as H.323 network will not send it in the forward direction.

C.6.1.4   Receipt of the Call Progress message (CPG)

C.6.1.4.1 CPG with a cause parameter

See Table C.10.

Table C.10/H.246 – Receipt of CPG with a cause parameter

←PROGRESS	←CPG
Cause information element (Note 1)	Cause parameter

Progress indicator No. 8
(Note 2)
	Event information parameter
	    Event indicator *In-band info…*
	or
	Optional backward call indicators parameter
	    In-band information ind. *In-band info…*

NOTE 1 – If the cause value received in the Call Progress Message (CPG) is unknown in ITU-T Rec. H.225.0, the unspecified cause value of the class is sent. NOTE 2 – The progress indicator No. 8 (*in-band information or an appropriate pattern is now available*) is only sent if the BC received in the SETUP message is coded *speech* or *3.1 kHz audio*. NOTE 3 – If the bearer is established, the interwork function should initiate far-end tone/announcement.	

User-to-user

The user-to-user information element contains the ReleaseComplete-UUIE defined in the H.225.0 Message Syntax.

C.6.1.4.2 CPG without the cause parameter

Upon receiving a Call Progress message (CPG), the exchange shall send a message across the user-network interface to the calling user, as described in Table C.11.

Table C.11/H.246 – Message sent to the H.225.0 upon receipt of CPG

←H.225.0 Message sent	←CPG
	Event information parameter Event indicator
ALERTING when not sent before, otherwise: – PROGRESS if a progress indicator information element is to be sent (Note) – No message if no progress indicator information element is to be sent (Note)	000 0001 (*alerting*)
– PROGRESS if a progress indicator information element is to be sent (Note) – No message if no progress indicator information element is to be sent (Note)	000 0010 (*progress*) or 000 0011 (*in-band information or an appropriate pattern is now available*)
NOTE – The sending of a progress indicator information element is described below.	

The backward message sent to the calling user (ALERTING or PROGRESS message) is coded as follows.

Bearer capability

When a CPG will not contain a bearer capability, the interworking function may generate an appropriate bearer capability in case there is a terminal involved in the call.

Progress indicator

Progress indicator information elements possibly present in the access transport parameter of the Call Progress Message (CPG) are transferred into the message sent to the calling user. If the calling user is an H.323 end system, it need not interpret this information element.

In addition, progress indicator information elements are created by the interworking function according to the coding of the Call Progress Message (CPG). Table C.12 shows the sending criteria of each value.

By performing the conversion specified in ITU-T Rec. H.460.5 [20], every message sent to the access (ALERTING or PROGRESS) can contain two or more progress indicator information elements.

**Table C.12/H.246 – Sending criteria of the progress indicator
information elements created by the interworking function**

←**H.225.0 Message sent** (See Table C.11)	←**CPG**
Progress indicator information element	Content (Note 2)
No. 1 (*Call is not end-to-end ISDN: further call progress information may be available in-band*)	Backward call indicators parameter ISDN User Part indicator 0 *ISDN User Part not used all the way*

No. 2
(*Destination address is non-ISDN*)
	Backward call indicators parameter
	ISDN User Part indicator
	   1 *ISDN User Part used all the way*
	ISDN access indicator
	   0 *Terminating access non-ISDN*

No. 4
(*Call has returned to the ISDN*)
	Backward call indicators parameter
	ISDN User Part indicator
	   1 *ISDN User Part used all the way*
	ISDN access indicator
	   1 *Terminating access ISDN* whereas the last indication received was "0", *Terminating access non-ISDN*

No. 8 (Note 1) (*In-band information or an appropriate pattern is now available*)	Event information parameter Event indicator 000 0011 *In-band info ...*

**Table C.12/H.246 – Sending criteria of the progress indicator
information elements created by the interworking function**

←H.225.0 Message sent (See Table C.11)	←CPG
No. 8 (Note 1) (*In-band information or an appropriate pattern is now available*)	Optional backward call indicators parameter In-band information indicator 1 *In-band info ...*
NOTE 1 – The progress indicator No. 8 (*in-band information or an appropriate pattern is now available*) is only sent if the BC received in the SETUP message is coded *speech* or *3.1 kHz audio*. NOTE 2 – The mapping of the contents in the CPG message is only relevant if the information received in the message is different compared to earlier received information, e.g., in the ACM message or a CPG message received prior to this message.	

High layer compatibility

FFS.

Notification indicator

NA.

Call diversion information

See C.6.2.6.

Redirection number restriction

See C.6.2.6.

Redirection number

See C.6.2.6.

Facility

See C.6.2.

User-to-user

The user-to-user information element contains the Alerting-UUIE defined in the H.225.0 Message Syntax.

The user-to-user information element contains the Progress-UUIE defined in the H.225.0 Message Syntax.

Handling of fallback information

Fallback procedures are not defined in ITU-T Rec. H.225.0. A CPG should not be received with TMU, as H.323 network will not send it in the forward direction.

C.6.1.5 Receipt of the Answer Message (ANM)

Upon receipt of an Answer Message (ANM), the interworking function shall send a CONNECT message across the H.225.0 interface to the calling user.

The CONNECT message is coded as follows.

Bearer capability

When an ANM will not contain a bearer capability, the interworking function may generate an appropriate bearer capability in case there is a terminal involved in the call.

Progress indicator

Progress indicator information elements possibly present in the access transport parameter of the Answer Message (ANM) are transferred into the CONNECT message sent to the calling user. If the calling user is an H.323 end system, it need not interpret this information element.

In addition, progress indicator information elements are created by the interworking function according to the coding of the backward call indicators parameter possibly received in the Answer Message (ANM). Table C.13 shows the sending criteria of each value.

By performing the conversion specified in ITU-T Rec. H.460.5 [20], the CONNECT message sent to the access can contain two or more progress indicator information elements.

Table C.13/H.246 – Sending criteria of the progress indicator information elements created by the interworking function

←CONNECT	←ANM
Progress indicator information element	Content
No. 1 (*Call is not end-to-end ISDN: further call progress information may be available in-band*)	Backward call indicators parameter ISDN User Part indicator 0 *ISDN User Part not used all the way*
No. 2 (*Destination address is non-ISDN*)	Backward call indicators parameter ISDN User Part indicator 1 *ISDN User Part used all the way* ISDN access indicator 0 *terminating access non-ISDN*
No. 4 (*Call has returned to the ISDN*)	Backward call indicators parameter ISDN User Part indicator 1 *ISDN User Part used all the way* ISDN access indicator 1 *terminating access ISDN* whereas the last indication received was "0" *terminating access non-ISDN*

High layer compatibility

FFS.

Low layer compatibility

FFS.

Notification indicator

NA.

Call diversion information

See C.6.2.6.

Redirection number restriction

See C.6.2.6.

Redirection number

See C.6.2.6.

Facility

See C.6.2.

User-to-user

The user-to-user information element contains the Connect-UUIE defined in the H.225.0 Message Syntax.

Connected number

See C.6.2.3.

Connected subaddress

See C.6.2.3.

Handling of fallback information

Fallback procedures are not defined in ITU-T Rec. H.225.0. An ANM should not be received with TMU as H.323 network will not send it in the forward direction.

C.6.1.6   Receipt of the Connect message (CON)

Upon receiving a Connect message (CON), the interworking function shall send a CONNECT message across H.225.0 interface to the calling user.

The CONNECT message is coded as follows.

Bearer capability

When a CON will not contain a bearer capability, the interworking function may generate an appropriate bearer capability in case there is a terminal involved in the call.

Progress indicator

Progress indicator information elements possibly present in the access transport parameter of the Connect message (CON) are transferred into the CONNECT message sent to the calling user. If the calling user is an H.323 end system, it need not interpret this information element.

By performing the conversion specified in ITU-T Rec. H.460.5 [20], the CONNECT message sent to the access can contain two or more progress indicator information elements.

High layer compatibility

FFS.

Low layer compatibility

FFS.

Notification indicator

NA.

Call diversion information

See C.6.2.6.

Redirection number restriction

See C.6.2.6.

Redirection number

See C.6.2.6.

Facility

See C.6.2.

User-to-user

The user-to-user information element contains the Connect-UUIE defined in the H.225.0 Message Syntax.

Connected number

See C.6.2.3.

Connected subaddress

See C.6.2.3.

Handling of fallback information

Fallback procedures are not defined in ITU-T Rec. H.225.0. A CON should not be received with TMU as H.323 network will not send it in the forward direction.

C.6.1.7   Receipt of the Release message (REL)

Cause

See Table C.14.

Table C.14/H.246 – Receipt of the Release message (REL)

←RELEASE COMPLETE (Note 1)	←REL
Cause information element	Cause parameter
Cause value No. x (Note 2)	Cause value No. x
NOTE 1 – If the cause value received in the Release message (REL) is unknown in ITU-T Rec. H.225.0, the unspecified cause value of the class is sent.	
NOTE 2 – Mapping the Cause Value to ReleaseCompleteReason is not required as packet-based network entities are required to decode the Cause IE.	

User-to-user

The user-to-user information element contains the ReleaseComplete-UUIE defined in the H.225.0 Message Syntax. The handling of the other parameters is described in C.6.2.

C.6.1.8   Sending of the Release message (REL)

See Table C.15.

Table C.15/H.246 – Call clearing from the user

RELEASE COMPLETE→	REL→
Cause information element	Cause parameter
Cause value No. x	Cause value No. x
ReleaseCompleteReason	Cause parameter
noBandwidth	34 – No circuit/channel available
gatekeeperResources	47 – Resource unavailable, unspecified
unreachableDestination	3 – No route to destination
destinationRejection	16 – Normal call clearing
invalidRevision	88 – Incompatible destination
noPermission	127 – Interworking, unspecified
unreachableGatekeeper	38 – Network out of order
gatewayResources	42 – Switching equipment congestion
badFormatAddress	28 – Invalid number format
adaptiveBusy	41 – Temporary failure
inConf	17 – User busy
undefinedReason	31 – Normal, unspecified
facilityCallDeflection	16 – Normal call clearing
securityDenied	31 – Normal, unspecified
calledPartyNotRegistered	20 – Subscriber absent
callerNotRegistered	31 – Normal, unspecified
newConnectionNeeded	47 – Resource Unavailable
nonStandardReason	127 – Interworking, unspecified
replaceWithConferenceInvite	31 – Normal, unspecified
genericDataReason	31 – Normal, unspecified
neededFeatureNotSupported	31 – Normal, unspecified
tunnelledSignallingRejected	127 – Interworking, unspecified
invalidCID	3 – No route to destination
NOTE – If the cause value received in the H.225.0 message is unknown in ISUP, the unspecified cause value of the class is sent.	

User-to-user

The user-to-user information element contains the ReleaseComplete-UUIE defined in the H.225.0 Message Syntax.

C.6.1.9   Receipt of Reset Circuit message (RSC), Circuit Group Reset message (GRS) or Circuit Group Blocking message (CGB) with the indication *hardware failure oriented*

Table C.16 shows the message sent to the calling user upon receipt of either a RSC message, GRS message or CGB message with the indication *hardware failure oriented*, when at least one backward message relating to the call has already been received.

Table C.16/H.246 – Receipt of RSC, GRS or CGB messages

←RELEASE COMPLETE Cause information element	←Message received from ISUP
Cause value No. 31 *Normal, unspecified*	Reset Circuit message (RSC)
Cause value No. 31 *Normal, unspecified*	Circuit Group Reset message (GRS)
Cause value No. 31 *Normal, unspecified*	Circuit Group Blocking message (CGB) with the type indicator of the circuit group supervision message type indicator parameter coded "01" (*hardware failure oriented)*

User-to-user Information

See C.6.1.8.

C.6.1.10   H.225.0 Transport level reset and Transport level failure procedures

The data link reset and data link failure procedures are respectively described in 5.8.8/Q.931 and 5.8.9/Q.931 [3]. See Table C.17.

Table C.17/H.246 – H.225.0 Transport level reset and Transport level failure procedures

←RELEASE COMPLETE Cause information element	Trigger event	REL→ Cause parameter
AdaptiveBusy **call is dropping due to LAN crowding**	Transport level reset in overlap sending state	Cause value No. 41 (*temporary failure*)
(Note 1)	Transport level failure in a state other than active state. (Note 2).	Cause value No. 27 (*destination out of order*)
(Note 1)	Failure of the transport level re-establishment procedure after a transport level failure in active state. (Note 2).	Cause value No. 27 (*destination out of order*)
NOTE 1 – The call is cleared internally. No DISCONNECT message is sent on the access.		
NOTE 2 – These errors correspond to the H.225.0 Release reason *unreachableDestination*.		

C.6.1.11   Receipt of the Suspend message (SUS) network initiated

The actions taken on the ISUP side upon receipt of the Suspend message (SUS) are described in 2.4.1/Q.764 [1].

There is no support for Suspend message (SUS) network initiated on the H.225.0 side, so the actions taken should be the actions as described in Q.764 for the controlling exchange.

C.6.1.12   Receipt of the Resume message (RES) network initiated

The actions taken on the ISUP side upon receipt of the Resume message (RES) are described in 2.4.1/Q.764 [1].

There is no support for Resume message (RES) network initiated on the H.225.0 side, so the actions taken should be the actions as described in Q.764 for the controlling exchange.

C.6.1.13 Release by the interworking function

See Table C.18.

<p align="center">Table C.18/H.246 – Release from the interworking function</p>

←RELEASE COMPLETE	Trigger event	REL→
Cause information element		Cause parameter
Cause value No. 28 *Invalid number format (address incomplete)*	Determination that the called number information received is incomplete, after an IAM message has already been sent	Cause value No. 28 *Invalid number format (address incomplete)*
Cause value No. 31 *normal, unspecified*	Failure of the automatic repeat attempt procedure	No action
Cause value No. 16 *normal call clearing*	T6 expiry (Note 1)	Cause value No. 102 *recovery on timer expiry*
Cause value No. 97 or No. 99	Call release due to the ISUP compatibility procedure	Cause value No. 97 or No. 99
Same cause value as in the REL message (Note 2)	Other cases of failure on the ISUP side	Cause value coded according to [1]
Cause value coded according to 7.2.2.8/H.225.0	Other cases of failure on the H.225.0 side	Same cause value as in the Release Complete message (Note 3)

NOTE 1 – T6: awaiting resume message (RES) timer. T6 start, stop, and expiry are described in 2.4/Q.764 and Annex A/Q.764 [1].

NOTE 2 – If the cause value sent in the REL message is unknown in H.225.0, the unspecified cause value of the class is sent.

NOTE 3 – If the cause value sent in the Release Complete message is unknown in ISUP, the unspecified cause value of the class is sent.

User-to-user Information

See C.6.1.8.

C.6.1.14 Receipt of INR

On reception of INR, the interworking function should respond with INF with the appropriate information.

C.6.1.15 Receipt of IDR

On reception of IDR, the interworking function should respond with IDS with the appropriate information.

C.6.2 ISUP supplementary services and H.323 services

C.6.2.1 Calling Party Name Presentation (H.450.8)/Calling Line Identification Presentation (CLIP)

The mapping shown in C.6.2.1.1 forms part of basic call.

C.6.2.1.1 Special arrangement applies

Setup Received from a Terminal or Gateway

The interworking function does not validate the Calling Line Identity when special arrangement applies. Table C.19 applies:

Table C.19/H.246 – CLIP – Special arrangement applies

SETUP→		IAM→			
Calling party number IE		Coding of the calling party number and generic number parameters			
Type of number	Numbering plan identification	Address signals	Numbering plan indicator	Nature of address indicator	Screening indicator (Note 3)
No or invalid (Note 1) calling party number information element		Calling party number parameter			
		Default number	001 *ISDN numbering plan*	000 0011 *National number*	11 *Network provided*
		No generic number parameter indicating *additional calling party number* is sent			
National number	*ISDN/telephony numbering plan* or *Unknown*	Calling party number parameter			
		Default number	001 *ISDN numbering plan*	000 0011 *National number*	11 *Network provided*
		Generic number parameter (Note 2)			
		Number provided by the user	001 *ISDN numbering plan*	000 0011 *National number*	00 *User provided, not verified*
International number	*ISDN/telephony numbering plan* or *Unknown*	Calling party number parameter			
		Default number	001 *ISDN numbering plan*	000 0011 *National number*	11 *Network provided*
		Generic number parameter (Note 2)			
		Number provided by the user	001 *ISDN numbering plan*	000 0100 *International number*	00 *User provided, not verified*

NOTE 1 – Validity conditions of the calling party number information element are defined in 3.5.2.1/Q.951.x [19].

NOTE 2 – The generic number parameter contains the number qualifier indicator coded "00000110" (*additional calling party number*).

NOTE 3 – In the case of an IAM message sent by a interworking function to the ISDN, the interworking function shall copy the Calling Party Number IE from the Setup message from the packet network, or if this IE is not present, the gateway shall form the Calling Party Number IE using the sourceAddress (assuming it is one of the telephone number alias types). If the presentation indicator in the Calling party number IE is in conflict with the presentationIndicator, the presentation indicator of the Calling party number IE shall be used. The screening indicator of the Calling Party Number IE shall be set according to the table. Network provided relates to the Gatekeeper and User Provided relates to the endpoint.

Setup Received from Gatekeeper

Table C.20 applies:

Table C.20/H.246 – Calling Party Number

SETUP→	IAM→
Calling Party Number	Calling Party Number or **Generic Number** **(– additional Calling Party number)**
sourceAddress	Calling Party Number
NOTE – If a Calling Party number is included in the **sourceAddress**, then the Calling party number should be sent in the Generic Number.	

The address presentation restricted indicator of the calling party number and generic number parameters shall be set according to the CLIR supplementary service. The H.225.0 Setup IE **presentationIndicator** – indicates whether presentation of the sourceAddress should be allowed or restricted. If both **presentationIndicator** and the presentation indicator of the Calling Party Number IE are present and are in conflict, the presentation indicator of the Calling Party Number IE shall be used.

The calling party number incomplete indicator of the calling party number and the generic number parameters shall be set to "0" (*complete*).

Calling party subaddress

If provided, the calling party subaddress is transported transparently in the access transport parameter.

User-to-user information

See C.6.1.1.

C.6.2.1.2 Special arrangement does not apply

SETUP received from Terminal or Gateway

The Calling Line Identity information should be discarded unless the interworking function can validate it. If the information is valid, then Table C.21 applies:

Table C.21/H.246 – CLIP – Special arrangement does not apply

SETUP→			IAM→			
Calling party number information element			Coding of the calling party number and generic number parameters			
Type of number	Numbering plan identification	Number digits	Address signals	Numbering plan indicator	Nature of address indicator	Screening indicator (Note 2)
No or invalid (Note 1) calling party number information element			Calling party number parameter			
			Default number	001 *ISDN numbering plan*	000 0011 *National number*	11 *Network provided*
			No generic number parameter indicating *additional calling party number* is sent			
Failure of the screening function			Calling party number parameter			
			Default number	001 *ISDN numbering plan*	000 0011 *National number*	11 *Network provided*
			No generic number parameter indicating *additional calling party number* is sent			
Subscriber number or *National number* or *International number*	*ISDN/telephony numbering plan* or *Unknown*	Correct complete number	Calling party number parameter			
			Number provided by the user	001 *ISDN numbering plan*	000 0011 *National number*, or 000 0100 *International Number*	01 *User provided, verified and passed*
			No generic number parameter indicating *additional calling party number* is sent			
Unknown	*ISDN/telephony numbering plan* or *Unknown*	Incomplete number	Calling party number parameter			
			Completion of the number provided by the user	001 *ISDN numbering plan*	000 0011 *National number*	01 *User provided, verified and passed*
			No generic number parameter indicating *additional calling party number* is sent			

NOTE 1 – Validity conditions of the calling party number information element are defined in 3.5.2.1/Q.951.x [19].

NOTE 2 – In the case of an IAM message sent by an interworking function to the ISDN, the interworking function shall copy the Calling Party Number IE from the Setup message from the packet network, or if this IE is not present, the gateway shall form the Calling Party Number IE using the sourceAddress (assuming it is one of the telephone number alias types), and presentationIndicator from Setup-UUIE. If the presentation indicator in the Calling party number IE is in conflict with the presentationIndicator, the presentation indicator of the Calling party number IE shall be used. The screening indicator of the Calling Party Number IE shall be set according to the result of the validation function. Network provided relates to the Gatekeeper and User Provided relates to the endpoint.

SETUP received from Gatekeeper

Table C.22 applies:

Table C.22/H.246 – Connected Party Number

SETUP→	IAM→
Calling Party Number	Calling Party Number or (Note) **Generic Number** **(– additional Calling Party number)**
sourceAddress	Calling Party Number
NOTE – If a Calling Party number is included in the sourceAddress, then the Calling party number should be sent in the Generic Number.	

The address presentation restricted indicator of the calling party number parameter shall be set according to the CLIR supplementary service. The H.225.0 Setup IE **presentationIndicator** – indicates whether presentation of the sourceAddress should be allowed or restricted. If both **presentationIndicator** and the presentation indicator of the Calling Party Number IE are present and are in conflict, the presentation indicator of the Calling Party Number IE shall be used.

The calling party number incomplete indicator of the calling party number parameters shall be set to "0" (*complete*).

Calling party subaddress

If provided, the calling party subaddress is transported transparently in the access transport parameter.

C.6.2.2 Calling Party Name Restriction (H.450.8)/Calling Line Identification Restriction (CLIR)

The address presentation restricted indicator of the calling party number and of the generic number parameters is coded as described in Table C.23.

NOTE – If the calling user does not have the Calling Party Name Restriction, the address presentation restricted indicator of the calling party number parameter is set to presentation allowed (see 4.10/Q.951.x [19]).

**Table C.23/H.246 – Coding of the address presentation restricted indicator
of the calling party number and generic number parameters**

Internal data (User profile data)		SETUP→	IAM→
Permanent mode	Temporary mode default setting	Calling party number information element/ User-to-user information element	Calling party number/ generic number parameter
		Presentation indicator	Address presentation restricted indicator
Yes	Value non-significant	Value non-significant	Presentation restricted
No	Restricted	Presentation restricted	Presentation restricted
		Absent	Presentation restricted
		Presentation allowed	Presentation allowed
	Allowed	Presentation allowed	Presentation allowed
		Absent	Presentation allowed
		Presentation restricted	Presentation restricted
NOTE – The presentationIndicator field in Setup-UUIE carries information identical to the presentation indicator found in the Calling Party Number IE. If both **presentationIndicator** and the presentation indicator of the Calling Party Number IE are present and are in conflict, the presentation indicator of the Calling Party Number IE shall be used. The meaning and use of the presentation indicator is defined in ITU-T Rec. Q.951.x.			

C.6.2.3 Connected Party Name Presentation (H.450.8)/Connected Line Identification Presentation (COLP)

If the calling user has the Connected Party Name Presentation, the connected line identity request indicator of the optional forward call indicators parameter in the Initial Address Message (IAM) is coded to *requested*.

If the calling user has the Connected Party Name Presentation, only one connected number information element is sent in the CONNECT message.

CONNECT sent to a Terminal or Gateway

Tables C.24, C.25, C.26 and C.27 apply.

Table C.24/H.246 – COLP information sent to the calling user

←CONNECT	←ANM/CON	
COLP information sent to the calling user	Connected number parameter	Generic number parameter with number qualifier set to additional connected number
	Address presentation restricted indicator	
Connected number IE (see Table C.25)	*Presentation allowed*	Absent
Connected number IE (see Table C.26)	*Presentation allowed*	Present

Table C.24/H.246 – COLP information sent to the calling user

←CONNECT		←ANM/CON	
Connected number IE Option 1:		*Presentation restricted* (Note)	Value non-significant
Type of number	As received		
Numbering plan	As received		
Presentation ind.	*Presentation restricted*		
Screening ind.	As received		
Number digits	No digit		
Option 2:			
Type of number	*Unknown*		
Numbering plan	*Unknown*		
Presentation ind.	*Presentation restricted*		
Screening ind.	*Network provided*		
Number digits	No digit		
Connected number IE		*Address not available* or No connected number parameter	Value non-significant
Type of number	*Unknown*		
Numbering plan	*Unknown*		
Presentation ind.	*Not available due to interworking*		
Screening ind.	*Network provided*		
Number digits	No digit		

NOTE 1 – As a national option, the presentation restriction indication received in the connected number parameter can be overridden for specific calling access categories. In such a case, the same actions are taken as if *presentation allowed* was received, except for the presentation restriction indication, which is passed transparently into the connected number information element.

NOTE 2 – When address information represents a telephone number, the relevant information can appear in the Connected Number IE, including the presentation indicator and screening indicator. This is the recommended mode of operation for the case where a gateway sends a Connect message on the packet network.

Alternatively, connected party information may appear in the connectedAddress, presentationIndicator, and screeningIndicator fields of Connect-UUIE. This mode of operation is required when connectedAddress is not in any form of telephone number (IE, connectedAddress is not type e164 or partyNumber).

NOTE 3 – The presentationIndicator field in Connect-UUIE carries information identical to the presentation indicator found in the Connected Number IE. The meaning and use of the presentation indicator is defined in ITU-T Rec. Q.951.x.

NOTE 4 – The screeningIndicator field in Connect-UUIE carries information identical to the screening indicator found in the Connected Number IE.

The meaning and use of the screening indicator is defined in ITU-T Rec. Q.951.x.

**Table C.25/H.246 – Coding of the connected number information element
according to the connected number parameter**

←CONNECT	←ANM/CON
Connected number IE	Connected number parameter
Type of number (Note) *National number* *International number*	Nature of address indicator *National number* *International number*
Numbering plan identification *ISDN/Telephony numbering plan*	Numbering plan indicator *ISDN/Telephony numbering plan*
Presentation indicator *Presentation allowed*	Address presentation restricted indicator *Presentation allowed*
Screening indicator *User provided, verified and passed* *Network provided*	Screening indicator *User provided, verified and passed* *Network provided*
Number digits	Address signals
NOTE – As a network option, the type of number may be coded *unknown* when a prefix is added to the number.	

**Table C.26/H.246 – Coding of the connected number information element
according to the generic number parameter**

←CONNECT	←ANM/CON
Connected number IE	Generic number parameter with number qualifier set to *additional connected number*
Type of number (Note) *National number* *International number*	Nature of address indicator *National number* *International number*
Numbering plan identification *ISDN/Telephony numbering plan*	Numbering plan indicator *ISDN/Telephony numbering plan*
Presentation indicator *Presentation allowed*	Address presentation restricted indicator *Presentation allowed*
Screening indicator *User provided, not verified*	Screening indicator *User provided, not verified*
Number digits	Address signals
NOTE – As a network option, the type of number may be coded *unknown* when a prefix is added to the number.	

Connected subaddress

See Table C.27.

Table C.27/H.246 – Sending of the connected subaddress

←CONNECT	←ANM/CON	
Content	Access transport parameter	Address presentation restricted indicator of the connected number parameter
Connected subaddress information element	Connected subaddress information element	*Presentation allowed*
No connected subaddress information element	Connected subaddress information element	*Presentation restricted* (Note) or *Address not available* or No connected number parameter
NOTE – As a national option, the presentation restriction indication received in the connected number parameter can be overridden for specific calling access categories. In such a case, the same actions are taken as if *presentation allowed* was received.		

CONNECT sent to a Gatekeeper

See Table C.28.

Table C.28/H.246 – Connected Party Number

←CONNECT	←ANM/CON
Connected Number	**Connected Number** or (Note) **Generic Number** **(– additional Connected number)**
connectedAddress	**Connected Number**
NOTE – If an additional Connected number is included in the Generic Number, then the additional Connected number should be sent in the Connected number.	

C.6.2.4   Connected Name Address restriction (H.450.8)/ Connected Line Identification Restriction (COLR)

See Table C.24.

C.6.2.5   Subaddressing (SUB)

The called party subaddress information element received from the H.323 network in the SETUP message is transferred transparently in the access transport parameter of the IAM.

C.6.2.6   Call diversion

Hereafter are only described the handling of notifications received from a public or private network at the interworking function. That is the Call forwarding service is provided by the ISUP network. The actions taken in the forwarding exchange/H.323 elements are described in ITU-T Recs Q.732.2-5 [4] and H.450.3 [10].

C.6.2.6.1 Interworking at the calling user's interworking function

C.6.2.6.1.1   Reception of a "call diversion may occur" notification

According to [4], the Address Complete Message (ACM), or the Call Progress Message (CPG) may be received with the optional backward call indicators parameter including the "call diversion may occur indicator" set to "call diversion may occur". No specific interworking action is required.

C.6.2.6.1.2   Reception of a "call is diverting" notification

According to [4], the Address Complete message (ACM) or the Call Progress message (CPG) may be received with:

–   the call diversion information parameter;

–   the generic notification indicators parameter coded *call is diverting*; and

–   the redirection number parameter.

At least the call diversion information and generic notification indicators parameters should be available in the Address Complete (ACM) or Call Progress (CPG) message.

First diversion

The number information contained in the redirection number parameter is stored.

A notification of diversion is sent to the calling user as shown in Table C.29 applicable to standard or H.450.3 capable endpoint.

Table C.29/H.246 – First diversion: notification of diversion sent to the calling user

	←ACM/CPG	
←H.225.0 message	Call diversion information parameter	Generic notification indicator parameter
	Notification subscription option	
Standard end point (Note) Notification indicator IE *Call is diverting* or H.450.3 Capable endpoints FACILITY diversionReason cfr	*Presentation allowed with redirection number* or *Presentation allowed without redirection number*	*Call is diverting*
Not sent	*Unknown* or *Presentation not allowed*	
NOTE – The determination of the H.225.0 message sent upon the Address Complete (ACM) or Call Progress (CPG) message is described in C.6.1.3 and C.6.1.4. If no message is to be sent, the notification indicator information element is sent in a NOTIFY message.		

Subsequent diversion

The number information contained in the redirection number parameter is stored (i.e., the latest received diverted-to number replaces the one received previously).

If it has been previously determined (i.e., through subscription option) that notification of diversion is not allowed, no specific interworking action is required towards the calling user: see C.6.1.

If it has been previously determined (i.e., through subscription option) that notification of diversion is allowed, Table C.30 is applicable. Table C.30 is applicable to standard or H.450.3 capable endpoint.

Table C.30/H.246 – Subsequent diversion: notification of diversion sent to the calling user

←H.225.0 message	←CPG		Generic notification indicator parameter
	Call diversion information parameter		
	Redirecting reason	Notification subscription option	
No notification sent		*Unknown* or *Presentation not allowed*	*Call is diverting*
Standard end point (Note 1) Notification indicator IE *Call is diverting* or H.450.3 Capable endpoints FACILITY diversionReason cfr	*Deflection during alerting* or *No reply*	*Presentation allowed with redirection number* or *Presentation allowed without redirection number*	
No notification sent	Other reason		
NOTE 1 – The determination of the H.225.0 message sent upon Call Progress message (CPG) is described in C.6.1.3 and C.6.1.4. If no message is to be sent, the notification indicator information element is sent in a NOTIFY message.			
NOTE 2 – The latest received diverted-to number replaces the one received previously.			

C.6.2.6.1.3   Reception of the redirection number restriction parameter

If a backward message (ACM, CPG, ANM or CON) is received containing the redirection number restriction parameter:

−   if it has been determined that the notification of diverted-to number is not allowed, no specific interworking action are required: see C.6.1;

−   if it has been determined that the notification of diverted-to number is allowed, a redirection number information element is sent to the calling user as shown in Table C.31. Table C.31 describes the signalling that a H.450.3 capable interworking function would generate and H.450.3 endpoint would receive.

Table C.31/H.246 – Notification of the diverted-to number

←H.225.0 FACILITY divertingLegInformation1.ind	Redirection number parameter stored in the interworking function node	←ACM, CPG, ANM or CON Presentation restriction parameter

NominatedNr
 	
Type of number
According to the nature of address indicator (Note)
 	
Numbering plan identification ISDN (telephony) numbering plan
 	
Number of digits
 	
Digits received in the address signal
 	
SubscriptionOption
 	
NotificationWithDivertedNoNr
	Nature of address indicator
	   National number, or
	   International number
	
	Numbering plan indicator
	   ISDN (telephony) numbering plan
	
	Address signal
		Presentation allowed

NominatedNr
 	
Type of number
   Unknown
 	
Numbering plan identification
   Unknown
 	
Number digits
   Not included
 	
SubscriptionOption
 	
NotificationWithoutDivertedToNr
	Nature of address indicator
	   National number, or
	   International number
	
	Numbering plan indicator
	   ISDN (telephony) numbering plan
	
	Address signal
		Presentation restricted

NominatedNr
 	
Type of number
   Unknown
 	
Numbering plan identification
   Unknown
 	
Number digits
   Not included
 	
SubscriptionOption
   noNotification
	No redirection number stored	Value non-significant

NOTE – As a network option, the type of number may be coded *unknown*.		

C.6.2.7 Call Waiting (CW)

See Table C.32.

Table C.32/H.246 – Mapping of ACM, CPG for CW procedure in H.323 access

←ALERTING	←ACM, CPG
callWaiting	Generic notification indicator parameter
	Notification indicator
Invoke	110 0000 *Call is a waiting call*
NOTE – See ITU-T Rec. H.450.6 for a description of Call Waiting in a H.323 network.	

C.6.2.8   Call Hold (HOLD)

NOTE – ITU-T Rec. H.225.0 does not support the HOLD, HOLD ACKNOWLEDGE, HOLD REJECT, RETRIEVE, RETRIEVE ACKNOWLEDGE or RETRIEVE REJECT messages. This service uses the FACILITY UU-IE for Hold and Retrieve.

C.6.2.8.1 Notification received from the network

See Table C.33.

Table C.33/H.246 – Receipt of HOLD notification from the network

← FACILITY	←CPG
	Generic notification indicator parameter
	Notification indicator
holdNotific *invoke*	111 1001 *Remote hold*
retrieveNotific *invoke*	111 1010 *Remote retrieval*
NOTE – See ITU-T Rec. H.450.4 for a description of Call Hold in a H.323 network.	

C.6.2.8.2 Notification received at the T reference point

See Table C.34.

Table C.34/H.246 – Receipt of HOLD notification from the H.323 access

FACILITY→	CPG→
	Generic notification indicator parameter
	Notification indicator
RemoteHold *invoke* **HoldNotific** invoke	111 1001 *Remote hold*
RemoteRetrieve *invoke* **retrieveNotific**	111 1010 *Remote retrieval*
NOTE – See ITU-T Rec. H.450.4 for a description of Call Hold in a H.323 network.	

C.6.2.9   Terminal Portability (TP)

Terminal Portability is not explicitly supported in a H.323 network and is not described in H.323 or H.450.x-series Recommendations. However the messages and IEs to support Terminal Portability exist in ITU-T Rec. H.225.0.

C.6.2.9.1 Notification received from the ISDN network

See Table C.35.

Table C.35/H.246 – Receipt of TP notification from the network

←NOTIFY	← Message received from the ISUP
Notification indicator IE Notification description	
000 0000 *User suspended*	SUS message Suspend/resume indicator *ISDN subscriber initiated*
000 0001 *User resumed*	RES message Suspend/resume indicator *ISDN subscriber initiated*
000 0000 *User suspended*	CPG message Generic notification indicator *User suspended*
000 0001 *User resumed*	CPG message Generic notification indicator *User resumed*

ITU-T Rec. H.225.0 does not support the sending of SUSPEND or RESUME messages. See ITU-T Rec. Q.953.4 for a description of the Terminal Portability service on the access side.

The actions taken on the ISUP side upon sending of the Suspend (SUS) and Resume (RES) messages are described in 4.5.2.1/Q.733 [5].

Upon the T2 or T307 expiry (see Note), a Release message (REL) is sent with the cause value No. 102, *recovery on timer expiry*. No action is taken on the H.225.0 side.

NOTE – T2 start, stop, and expiry are described in 4.5.2.1/Q.733 [5] and Annex A/Q.764 [1]. T307 start, stop and expiry are described in 5.6/Q.931.

C.6.2.9.2 Notification received at T reference point

See Table C.36.

Table C.36/H.246 – Receipt of a TP notification from a private network

NOTIFY→	CPG→	
Notification indicator information element	Generic notification indicator parameter	Event information parameter
Notification description	Notification indicator	Event indicator
000 0000 *User suspended*	000 0000 *User suspended*	000 0010 *Progress*
000 0001 *User resumed*	000 0001 *User resumed*	000 0010 *Progress*

C.6.2.10   Conference calling (CONF)

Establishing a conference call in H.323 is described in 8.4.3/H.323 [6].

NOTIFY messages are optional for conference calling notification. ITU-T Recs Q.954.1 and Q.734.1 describe the operation of Conferencing calling in ISDN networks. The NOTIFY message is optional in H.323 networks.

The tables in this subclause describe the notifications sent to and received from terminal lying in the ISDN network when a Conference Calling supplementary service is active.

The Conferencing device may reside in the H.323 network in the form of an endpoint containing MC functionality or a stand-alone MCU. Alternatively the Conferencing may be implemented in the ISDN network.

The following terminology is used:

served user: The user that requests the conference call. The served user will be the user controlling the conference call. The served user may also be referred to as user A.

conferee: The users involved in the conference not controlling the conference, i.e., all participants except the served user are referred to as conferees or parties. The conferees may also be known as users B, C, etc.

isolate: An action at the access that restricts communication in both directions with a participant of the conference. (Call Hold.)

reattach: An action at the access that re-establishes the communication with a participant of the conference. (Call Retrieve.)

split: An action at the access that creates a private communication between the served user and a remote user. The private communication is a normal "two-party" call.

drop: An action at the access that clears the connection to a remote party.

floating: The situation where the conference calling supplementary service exists without the served user.

C.6.2.10.1   Notification received from the network

Table C.37 represents the backwards indication received from the conference calling device located on the ISUP network side.

Table C.37/H.246 – Conference calling notification

Message to H.323 Endpoint ←NOTIFY (Note 1)	←CPG
	Generic notification indicator parameter
	Notification indicator
Not applicable (Note 2)	100 0010 *Conference established*
Not applicable	100 0011 *Conference disconnected*
Not applicable (Note 3)	100 0100 *Other party added*
Not applicable (Note 4)	100 0101 *Isolated*
Not applicable (Note 5)	100 0110 *Reattached*

Table C.37/H.246 – Conference calling notification

Message to H.323 Endpoint ←NOTIFY (Note 1)	←CPG
	Generic notification indicator parameter
	Notification indicator
Not applicable	100 0111 *Other party isolated*
Not applicable	100 1000 *Other party reattached*
Not applicable	100 1001 *Other party split*
Not applicable (Note 6)	100 1010 *Other party disconnected*
Not applicable	100 1011 *Conference floating*

NOTE 1 – The format values below represent the 'Notification indicator information element' and the 'Notification description'.

NOTE 2 – **H.245 ConferenceIndication.***TerminalNumberAssign* may also be used to indicate the establishment of a conference.

NOTE 3 – **H.245 ConferenceIndication.***TerminalJoinedConf* may also be used to indicate that a terminal has joined the conference.

NOTE 4 – H.225.0 FACILTY indicating **holdNotific**.*invoke* may also be used to indicate 'remote hold'.

NOTE 5 – H.225.0 FACILTY indicating **retrieveNotific**.*invoke* may also be used to indicate 'remote retrieve'.

NOTE 6 – **H.245 ConferenceIndication.***TerminalLeftConf* may also be used to indicate that a terminal has left the conference.

C.6.2.10.2 Invocation at coincident S and T reference point

Tables C.38 and C.39 show procedures, which may be attempted in an SCN conference call, and how these map to procedures that may be achieved through a H.323 conference.

The served user resides in a H.323 network (i.e., The MCU [conference device] is in the H.323 network). The tables also show the notifications that may be sent to users in the ISDN network.

User B and the other remote user reside in the SCN network.

The resulting Notification Message sent to B shall be generated by the interworking function. The notification message sent to all other remote users in ISDN network shall be generated by the interworking function.

Table C.38/H.246 – Conference calling

Procedure	Message received from served user →	Resulting notification message sent to B →	Notification message sent to all other remote users in ISDN network →
Beginning the conference from an active call (with B)	H.225.0 SETUP ConferenceGoal = Create	CPG Generic notification indicator parameter *Conference established*	Not applicable
Adding a remote user (B)	H.225.0 SETUP ConferenceGoal = Invite	CPG Generic notification indicator parameter *Conference established*	Not applicable
	H.245 terminalJoinedConf	Not applicable	CPG Generic notification indicator parameter *Other party added*
Isolate a remote user (B)	H.225.0 FACILITY *HoldNotific.inv*	CPG Generic notification indicator parameter *Remote hold* (Note 1)	(Note 2)
Reattach a remote user (B)	H.225.0 FACILITY *retrieveNotific.inv*	CPG Generic notification indicator parameter *Remote Retrieval* (Note 3)	(Note 4)
Splitting a remote user (B) (Note 5)	Not applicable	Not applicable	Not applicable
Disconnect a remote user (B)	H245 conferenceRequest *DropTerminal*	REL	Not applicable
	H245 conferenceRequest *terminalLeftConf*	Not applicable	CPG Generic notification indicator parameter *Other party disconnected*
Terminate the conference	H245 conferenceCommand *dropConference*	REL	
Disconnect the served user (Note 6)	Not applicable	Not applicable	

Table C.38/H.246 – Conference calling

Procedure	Message received from served user →	Resulting notification message sent to B →	Notification message sent to all other remote users in ISDN network →
Call clearing by served user	RELEASECOMPLETE	REL	

NOTE 1 – H.323 (H.450.4) does not allow the indication of '*isolated*' when placing a user on hold. Therefore a CPG message is generated indicating '*remote hold*'.

NOTE 2 – In ISUP-based conferencing a CPG message indicating '*other party isolated*' would be sent to remote users. However, as H.323 (H.450.4) does not support this, no message is sent.

NOTE 3 – H.323 (H.450.4) does not allow the indication of '*reattached*' when retrieving a user from hold. Therefore a CPG message is generated indicating '*remote retrieve*'.

NOTE 4 – In ISUP-based conferencing a CPG message indicating '*other party isolated*' would be sent to remote users. However, as H.323 (H.450.4) does not support this, no message is sent.

NOTE 5 – Procedure not supported in H.323.

NOTE 6 – H.323 does not support the functionality to indicate that a 'Conference Chair' is floating.

Table C.39/H.246 – Conference calling: a remote user clears

Procedure	Message sent to served user ←	Message received from B ←
Remote user clears	H.245 ConferenceIndication *TerminalLeftConf*	REL

C.6.2.10.3 Notification received at T reference point

Table C.40 represents the situation where the conferencing device belongs to the H.323 network.

Table C.40/H.246 – Receipt of a conference calling notification from a private H.323 Network

Message from H.323 Endpoint → (Note 4)	CPG→	
	Generic notification indicator parameter	Event information parameter
	Notification indicator	Event indicator
H.225.0 SETUP ConferenceGoal = Invite	100 0010 *Conference established*	000 0010 *Progress*
H.245 ConferenceIndication *TerminalJoinedConf*	100 0100 *Other party added*	000 0010 *Progress*
H.225.0 FACILITY *HoldNotific.inv* (Note 2)	111 1001 *Remote hold*	000 0010 *Progress*
H.225.0 FACILITY *RetrieveNotific.inv* (Note 3)	111 1010 *Remote Retrieval*	000 0010 *Progress*

**Table C.40/H.246 – Receipt of a conference calling
notification from a private H.323 Network**

Message from H.323 Endpoint → (Note 4)	CPG→	
	Generic notification indicator parameter	Event information parameter
	Notification indicator	Event indicator
H.245 ConferenceIndication *TerminalLeftConf*	100 1010 *Other party disconnected*	000 0010 *Progress*

NOTE 1 – 'Conference Disconnection' results from when a conference chair initiates a 'conference out of consultation' with one of the conferees. H.323 does not identify this situation and thus no indication of '*conference disconnected*' is generated toward the ISUP network.

NOTE 2 – H.323 does not support the indication of 'isolated'. The equivalent is FACILITY indicating '*holdNotific*'.

NOTE 3 – H.323 does not support the indication of 'reattached'. The equivalent is FACILITY indicating '*retrieveNotific*'.

NOTE 4 – H.323 (H.450.4) does not support the indication of '*other party isolated*', '*other party reattached*', '*other party split*' or '*conference floating*'; therefore, these indications are not generated toward the ISUP network.

C.6.2.11   Three-party (3PTY)/Conference out of Consultation

Establishing a Conference out of Consultation call in H.323 is described in 8.4.3.8/H.323 [6].

NOTIFY messages are optional for 3PTY calling notifications. ITU-T Recs Q.954.2 and Q.734.2 describe the operation of 3PTY service in ISDN networks. The NOTIFY message is optional in H.323 networks.

The tables in this subclause describe the notifications sent to and received from terminal lying in the ISDN network when a 3PTY supplementary service is active.

The 3PTY Conferencing device may reside in the H.323 network in the form of an endpoint containing MC functionality or a stand-alone MCU. Alternatively the Conferencing may be implemented in the ISDN network.

Tables C.41, C.42, C.43 and C.44 show procedures which may be attempted in a 3PTY call and how these may be signalling when the serving user resides in a H.323 network. The tables also show the notifications, which may be sent to users in the ISDN network.

The following terminology is used:

served user: The user that requests the conference call. The served user will be the user controlling the conference call. The served user may also be referred to as user A.

conferee: The users involved in the conference not controlling the conference, i.e., all participants except the served user are referred to as conferees or parties. The conferees may also be known as users B, C, etc.

C.6.2.11.1   Notification received from the ISDN network

Table C.41 represents the backward indication received from a 3PTY conference where the conference lies on the ISUP network side.

Table C.41/H.246 – 3PTY notification

Message to H.323 Endpoint ←NOTIFY (Note 1)	←CPG
	Generic notification indicator parameter
	Notification indicator
Not applicable (Note 2)	100 0010 *Conference established*
Not applicable	100 0011 *Conference disconnected*
Not applicable (Note 3)	111 1011 *Remote hold*
NOTE 1 – The format values below represent the 'Notification indicator information element' and the 'Notification description'.	
NOTE 2 – **H.245 ConferenceIndication.***TerminalNumberAssign* may also be used to indicate the establishment of a conference.	
NOTE 3 – H.225.0 FACILTY indicating **holdNotific**.*invoke* may also be used to indicate 'remote hold'.	

If the call progress message (CPG) contains two generic notification indicator parameters, one with the notification indicator coded *conference disconnected*, the other with the notification indicator coded *remote hold*,

− either a NOTIFY message is sent containing:

• a notification indicator information element with the notification description *conference disconnected;* and

• a notification indicator information element with the notification description *remote hold*;

− or:

• a NOTIFY message is sent containing a notification indicator information element with the notification description *conference disconnected*; and

• a subsequent NOTIFY message is sent containing a notification indicator information element with the notification description *remote hold*.

C.6.2.11.2 Invocation at coincident S and T reference point

Tables C.42 and C.43 show procedures that may be attempted in an SCN-based Conference out of Consultation call and how these map to procedures that may be achieved through a H.323 Conference out of Consultation Conference calls.

The served user (b) resides in a H.323 network (i.e., the MCU [conference device] is in the H.323 network). The tables also show the notifications that may be sent to users in the ISDN network.

Users B and C reside on the ISUP network side.

The resulting Notification Message sent to B shall be generated by the interworking function. The notification message sent to all other remote users in ISDN network shall be generated by the interworking function.

Table C.42/H.246 – Three-party (3PTY)

Procedure (Note 2)	Message received from served user →	Call A-B: Active-held connection message sent to B →	Call A-C: Active-idle connection message sent to C →
Beginning the 3PTY	(Note 1)	CPG→ Generic notification indicator parameter *Conference established*	CPG→ Generic notification indicator parameter *Conference established*
Creation of a private communication with B	FACILITY→ HoldNotific *invoke* Sent to B	CPG→ Generic notification indicator parameter *Remote hold*	No message sent
	FACILITY→ HoldNotific *invoke* Sent to C	No message sent	CPG→ Generic notification indicator parameter *Remote hold*
	FACILITY→ RetrieveNotific *invoke* Sent to B	CPG→ Generic notification indicator parameter *Remote Retrieve*	No message sent
Creation of a private communication with C	FACILITY→ HoldNotific *invoke* Sent to B	CPG→ Generic notification indicator parameter *Remote hold*	No Message sent
Disconnect the remote user B	H.245 conferenceRequest DropTerminal Sent to B	REL→	No Message sent
Disconnect the remote user C	H.245 conferenceRequest DropTerminal Sent to B	No Message sent	REL→
	FACILITY→ RetrieveNotific *invoke* Sent to B	CPG→ Generic notification indicator parameter *Remote Retrieve*	Not applicable

NOTE 1 – Clause 8.4.3.8/H.323 [6] Conference out of Consultation discusses the various methods to achieve the establishment of a 3-party conference.

NOTE 2 – As the conference is performed by the H.323 network, no indication of 'conference disconnected' is generated.

Table C.43 describes the actions taken when user B or user C disconnects.

Table C.43/H.246 – Three-party (3PTY): user B or user C disconnects

Messages sent to or received from served user (Note)	Call A-B: Active-held connection messages sent to B or received from B	Call A-C: Active-idle connection message sent to C or received from C	Procedure
←RELEASECOMPLETE received from B	←REL	No message sent	**User B disconnects**
←RELEASECOMPLETE received from C	No message sent	←REL	**User C disconnects**
FACILITY→ RetrieveNotific *invoke* Sent to B	CPG→ Generic notification indicator parameter *Remote Retrieve*	Not applicable	

NOTE – As the conference is performed by the H.323 network, no indication of 'conference disconnected' is generated.

C.6.2.11.3 Notification received at T reference point

Table C.44 represents the situation where the conferencing device belongs to the H.323 network.

Table C.44/H.246 – Receipt of a 3PTY notification from a private H.323 network

Message from H.323 Endpoint →	CPG→	
	Generic notification indicator parameter	Event information parameter
	Notification indicator	Event indicator
H.245 ConferenceIndication→ *TerminalNumberAssign*	100 0010 *Conference established*	000 0010 *Progress*
FACILITY→ HoldNotific *invoke*	111 1011 *Remote hold*	000 0010 *Progress*

NOTE – As the conference is performed by the H.323 network, no indication of 'conference disconnected' is generated.

C.6.2.12 Closed User Group (CUG)

Not supported in H.323 network.

C.6.2.13 User-to-User Signalling (UUS)

User-to-user Services 1, 2 and 3 are not supported in a H.323 network. Whilst H.225.0 contains User Data to carry the UUS signalling, there is no definition of the User-to-user Service information.

C.7 Incoming call – Interworking from ISUP to H.225.0

In general, operation with an SS7 network where the call is from the circuit network to the packet network would be best if media is through-connect in both directions on the IAM (that is, through-connect occurs on the first response to a Setup in the H.323 network) as shown in the following diagram:

H.246ANN.C_FC.7
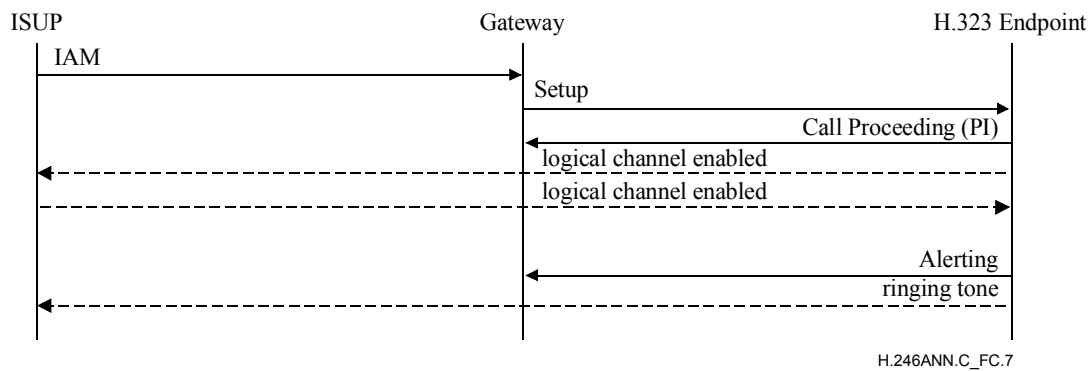
The notation "Call Proceeding (PI)" indicates the presence of the progress indicator as described in 8.1.7.4/H.323.

C.7.1   Basic call

C.7.1.1   Sending of the SETUP message

The call information is received in the Initial Address Message (IAM), possibly followed by one or several Subsequent Address Messages (SAM) (see C.7.1.2).

If the continuity check indicator of the nature of connection indicators is coded 01, *continuity check required on this circuit,* or 10, *continuity check required on a previous circuit,* the setting up of the call must be prevented until the receipt of the result of the continuity check procedure. The method describing how this is done is out of scope of this annex.

When the interworking function has received all the information required to go on with the call, and performed the various checks to determine that the call is allowed, a SETUP message is sent to the called user.

The information elements carried in the access transport parameter of the Initial Address Message (IAM) are taken into account whatever the order of receipt. The sending of some information elements (like the calling party number, the calling or called party subaddress) may depend on other checks: see C.7.2.

Only the information elements involved in the interworking are described hereafter.

The information elements used for the supplementary services are described in C.7.2.

Bearer capability

See Table C.45.

Table C.45/H.246 – Coding of the Bearer Capability information element (BC)

IAM→		SETUP→	
Content		Bearer capability information element	
No USI present TMR *Speech*		Coding standard	*ITU-T standardized coding*
		Information transfer capability	*Speech*
		Transfer mode	*Circuit mode*
		Information transfer rate	*64 kbit/s*
No USI present TMR *3.1 kHz audio*		Coding standard	*ITU-T standardized coding*
		Information transfer capability	*3.1 kHz audio*
		Transfer mode	*Circuit mode*
		Information transfer rate	*64 kbit/s*
No USI present TMR *64 kbit/s unrestricted*		Coding standard	*ITU-T standardized coding*
		Information transfer capability	*Unrestricted digital information*
		Transfer mode	*Circuit mode*
		Information transfer rate	*64 kbit/s*
USI present No USI prime		BC = USI (Note 1)	
USI *Speech*, or *3.1 kHz audio* USI prime *Unrestricted digital information with tones and announcements*		BC = USI (Notes 1 and 2)	

NOTE 1 – Octet 1 (information element identifier) and octet 2 (length) are recreated.

NOTE 2 – In case USI prime is received, the interworking function must perform fallback as described in 5.11.2/Q.931 [3].

NOTE 3 – For a call originating from an ISDN endpoint, the interworking function shall simply pass on the *Information Transfers Capability* and *Rate Multiplier* information that it receives from the ISDN.

NOTE 4 – If the called system is another H.323 endpoint, the Rate Multiplier value may reflect the bandwidth to be used on the packet-based network but the receiving terminal is not required to follow this information. The bandwidth needed for the call is the bandwidth needed on the SCN side, and may or may not match the bandwidth allowed on the packet-based network by the ACF H.225.0 RAS messages.

Facility

NA.

Sending complete

This information element is included, in case of *en bloc* sending used, to indicate that the SETUP message contains all the information required by the called user to process the call. This is indicated by the presence of ST in the Called Party Number.

Calling Party's Category

Coded according to the internal data of the interworking unit, except when the IAM contains a CPC value set to the IEPS call marking (0000 1110 [14]) or a nationally assigned emergency call value. In this case, the interworking function should include the Call Priority Designation parameter in the outgoing ARQ and SETUP messages. This parameter should be set to a priority value of emergencyAuthorized and the call establishment proceeds with priority. The priority extension coding is for future study. See ITU-T Rec. H.460.4 [21] for specific procedures.

Progress indicator

See Table C.46.

Table C.46/H.246 – Coding of the progress indicator information element

IAM→			SETUP→
Forward call indicators parameter		Access transport parameter	Progress indicator information element
ISDN User Part indicator	ISDN access indicator		
0 (*ISDN User Part not used all the way*)	Value non-significant	Value non-significant	No. 1
1 (*ISDN User Part used all the way*)	0 (*originating access non-ISDN*)	Value non-significant	No. 3
1 (*ISDN User Part used all the way*)	1 (*originating access ISDN*)	p.i. No. x	No. x
NOTE 1 – Coding Standard in the SETUP shall indicate ITU-T standardized coding.			
NOTE 2 – Location in the SETUP only 'user', 'private network serving the local user', and 'private network serving the remote user' are permitted.			

Calling party number

In the case of GK routed call, the interworking function should send the Calling Party number as received from the ISUP from Calling Party number parameter or from H.225.0 ACF.

In the case of Direct Routed call, for interworking function, see C.7.2.3.

Calling party subaddress

In the case of GK routed call, the interworking function should send the Calling Party Subaddress as received from the ISUP in the Access Transport Parameter.

In the case of Direct Routed call, for interworking function, see C.7.2.3.

Called party number

In the case of GK routed call, the interworking function should send the Called Party number as received from the ISUP.

Called party subaddress

In the case of GK routed call, the interworking function should send the Called Party Subaddress as received from the ISUP in the Access Transport Parameter.

Low layer compatibility

FFS.

High layer compatibility

FFS.

User-to-user

The user-to-user information element contains the Setup-UUIE defined in the H.225.0 Message Syntax.

C.7.1.2 Receipt of the Subsequent Address Message (SAM)

If *en bloc* sending is used on the H.225.0 side, the SETUP message shall contain all the information required by the called user to process the call (see C.7.1.1).

If overlap sending is used as indicated by 'canoverlapsend', and if the SETUP message has already been sent and the SETUP ACKNOWLEDGE message received, an INFORMATION message is sent upon receipt of each Subsequent Address Message (SAM).

C.7.1.3 Sending of the Address Complete Message (ACM)

C.7.1.3.1 ACM with cause parameter

The following cases are possible trigger conditions of sending the address complete message (ACM) with cause parameter:

a) It has been determined, in case of call failure, that a special in-band tone or announcement has to be returned to the calling party from the destination exchange.

Table C.46a/H.246 – Sending of ACM with a cause parameter

PROGRESS→	ACM→
Cause information element Progress indicator No. 8	Cause parameter (Note 1) Optional backward call indicators parameter In-band information ind. *In-band info…* (Note 2)

NOTE 1 – If the cause value received in the H.225.0 message is unknown in ISUP, the unspecified cause value of the class is sent.

NOTE 2 – Even when the progress indicator No. 8 *(in-band information or an appropriate pattern is now available)* in a PROGRESS message is received, In-band information indicator is sent only when the BC received in the IAM is coded *speech or 3.1 kHz audio*.

NOTE 3 – If a bearer is available, then end interwork should apply the far-end tone/announcement.

C.7.1.3.2 ACM without cause parameter

The following cases are possible trigger conditions of sending the address complete message (ACM) without cause parameter:

a) The destination has determined independently of access indications that the complete called party number has been received.

b) Overlap receiving is used on the H.225.0 side and a CALL PROCEEDING is received.

c) *En bloc* receiving is used on the H.225.0 side and a Progress indicator information element (except with value No. 8, *in-band information or an appropriate pattern is now available*, No. 3, *originating address is non-ISDN*, or No. 4, *call has returned to the ISDN*) is received in a CALL PROCEEDING message or in a PROGRESS message.

d) The first ALERTING message is received.

On *speech* or *3.1 kHz* calls, the awaiting answer indication (e.g., ring tone) is sent to the calling party upon receipt of the first ALERTING message.

NOTE 1 – In all cases, it is assumed that no Address Complete Message (ACM) has already been sent.

NOTE 2 – The case of the sending of the Address Complete Message (ACM) when the call is forwarded is not described hereafter: see C.7.2.

C.7.1.3.2.1 Mandatory parameters

Backward call indicators

bits	DC	Called party's status indicator
	0 1	*subscriber free* if the ALERTING message has been received
	0 0	*no indication* otherwise

bits	FE	Called party's category indicator
	0 0	*no indication* if the user's characteristics (internal data) have not been analysed, or
	0 1	*ordinary subscriber*, or
	1 0	*payphone* according to the user's characteristics

bit	I	Interworking indicator
	0	no interworking encountered. Set for H.323 terminated or originated calls. Set when endpoint type is NOT a gateway
	1	*interworking encountered. Set for H.323 trunked calls; set when Endpoint type indicates a gateway*

If bit I is 0 then:

| bit | K | ISDN user part indicator |
| | 1 | *ISDN user part used all the way* |

| bit | M | ISDN access indicator |
| | 1 | *terminating access ISDN* |

C.7.1.3.2.2 Optional parameters

Optional backward call indicators

bit	A	In-band information indicator
	1	*in-band information or an appropriate pattern is now available. (See C.7.1.3.1)*
	0	*no indication otherwise*

| bit | B | Call diversion may occur indicator |
| | | See C.7.2. |

| bit | D | MLPP user indicator |
| | | NA |

User-to-user indicators

NA.

User-to-user information

User-to-user Information is carried in H.225.0 User Data.

NOTE – User-to-user information is MANDATORY in H.225.0 messages.

Access transport

This parameter carries the progress indicator information element possibly received from the called user (except the value No. 8).

It may carry other information element as well: see C.7.1.2 and Table C.47.

Generic notification indicator

NA.

Transmission medium used

See handling of fallback information at the end of this clause.

Access delivery information

NA.

Redirection number

FFS.

Call diversion information

FFS.

Redirection number restriction parameter

FFS.

Handling of fallback information

As H.323 does not perform bearer selection procedures, the interworking function must perform fallback as described in Table C.47.

When the terminating exchange has knowledge that the fallback capability was requested in the Initial Address Message (IAM), and if no progress indicator No. 1 or No. 2 has been received from the H.225.0 side, Table C.47 is applicable.

Table C.47/H.246 – Handling of BC fallback information

←ACM	
Transmission medium used parameter	Access transport parameter
Value received in the TMR prime of the IAM message (*speech* or *3.1 kHz audio*)	BC low (*speech* or *3.1 kHz audio*) p.i. No. 5

C.7.1.4 Sending of the Call Progress message (CPG)

C.7.1.4.1 CPG with cause parameter

If the Address Complete Message (ACM) has already been sent, the following cases are possible trigger conditions of sending the Call Progress message (CPG) with cause parameter:

a)   It has been determined, in case of call failure that an in-band tone or announcement has to be returned to the calling party from the destination interworking function.

Table C.47a/H.246 – Sending of CPG with a cause parameter

PROGRESS→	CPG→
Cause information element	Cause parameter (Note 1)

Progress indicator No. 8	Event information parameter
	
	    Event indicator *In-band info…*
	or
	Optional backward call indicators parameter
	
	    In-band information ind. *In-band info…*
	
	                      (Note 2)

NOTE 1 – If the cause value received in the H.225.0 message is unknown in ISUP, the unspecified cause value of the class is sent.

NOTE 2 – Even when the progress indicator No. 8 *(in-band information or an appropriate pattern is now available)* in a PROGRESS message is received, In-band information indicator is sent only when the BC received in the IAM is coded *speech or 3.1 kHz audio*.

NOTE 3 – If the bearer is established, the interwork function should initiate far-end tone/announcement.

C.7.1.4.2 CPG without cause parameter

If the Address Complete Message (ACM) has already been sent, the following cases are possible trigger conditions of sending the Call Progress message (CPG) without cause parameter:

a)   Receipt of a progress indicator information element in a CALL PROCEEDING message (except with value No. 8, *in-band information or an appropriate pattern is now available*, No. 3, *originating address is non-ISDN*, or No. 4, *call has returned to the ISDN*) or in a PROGRESS message (except with value No. 8, *in-band information or an appropriate pattern is now available* or No. 3 *originating address is non-ISDN*).

b)   Receipt of the first ALERTING message.

NOTE – The case of the sending of the Call Progress message (CPG) when the call is forwarded is not described hereafter: see C.7.2.

C.7.1.4.2.1 Mandatory parameters

Event information

bits   G-A   Event indicator

        0000001   *alerting* in case b) (see Note in C.7.1.4.2);

        0000010   *progress* in case a);

        0000011   *in-band information or an appropriate pattern is now available* (see C.7.1.4.1).

C.7.1.4.2.2 Optional parameters

User-to-user information

User-to-user Information is carried in H.225.0 User Data.

NOTE – User-to-user information is MANDATORY in H.225.0 messages.

C.7.1.4.2.3 Other parameters

The other parameters may have already been sent in a previous backward message. In this case they are not repeated unless new information is now available.

The coding of these parameters is described in C.7.1.3.

NOTE – If cases b) occur simultaneously, the event indicator of the event information parameter is coded *alerting* and the in-band information indicator of the optional backward call indicators parameter *in-band information or an appropriate pattern is now available* (for further study).

C.7.1.5 Sending of the Answer Message (ANM)

Upon receipt of the CONNECT message, if the address complete message has already been sent, the destination exchange shall:

–   stop the sending of the awaiting indication (if any);

–   send the Answer Message (ANM) to the preceding exchange.

The Answer Message (ANM) is coded as follows:

C.7.1.5.1 Optional parameters

Connected number

See C.7.2.5.

Connected subaddress

See C.7.2.5.

Generic number

See C.7.2.5.

Access transport

See Table C.48.

Table C.48/H.246 – Contents of the access transport parameter

←ANM	←Message received from the access
Access transport	Information elements
Progress indicator	Progress indicator

It may carry other information elements as well: See C.7.1.2 and Table C.48.

Transmission medium used

This parameter is only present in case where fallback occurs (see the end of this clause).

User-to-user information

User-to-user Information is carried in H.225.0 User Data.

NOTE – User-to-user information is MANDATORY in H.225.0 messages.

C.7.1.5.2 Other parameters

The other parameters may have already been sent in a previous backward message. In this case, they are not repeated unless new information is now available.

The coding of these parameters is described in C.7.1.3.

Handling of fallback information

Fallback is handled on the first backward message; see C.7.1.3.

C.7.1.6 Sending of the Connect message (CON)

Upon receipt of the first CONNECT message, if the Address Complete Message (ACM) has not yet been sent, the destination interworking function shall send the Connect message (CON) to the preceding exchange.

The Connect message (CON) is coded as follows.

C.7.1.6.1 Mandatory parameters

Backward call indicators

See C.7.1.3.

C.7.1.6.2 Optional parameters

Optional backward call indicators

See C.7.1.3.

Connected number

See C.7.2.5.

Access transport

See Table C.49.

Table C.49/H.246 – Contents of the access transport parameter

←CON	←CONNECT
Access transport parameter	Information elements
Connected subaddress	Connected subaddress
Progress indicator	Progress indicator

It may carry other information elements as well: see C.7.2 and Table C.51.

Access delivery information

bit   A   Access delivery indicator

         0   *SETUP message generated*

Generic number

See C.7.2.5.

Generic notification indicator

NA.

Transmission medium used

This parameter is only present in case where fallback occurs (see the end of this clause).

User-to-user indicators

NA.

User-to-user information

User-to-user Information is carried in H.225.0 User Data.

NOTE – User-to-user information is MANDATORY in H.225.0 messages.

Handling of fallback information

As H.323 does not perform bearer selection procedures, the interworking function must perform fallback as described in Table C.50.

When the terminating interworking function has knowledge that the fallback capability was requested in the Initial Address Message (IAM), and if no progress indicator No. 1 or No. 2 has been received from the H.225.0 side, Table C.50 is applicable.

Table C.50/H.246 – Handling of BC fallback information
T reference point

←CON		←CONNECT
Transmission medium used parameter	Access transport parameter	Content
No TMU	BC (*unrestricted digital information with tones and announcements*)	BC (*unrestricted digital information with tones and announcements*)
Value received in the TMR prime of the IAM message (*speech* or *3.1 kHz audio*)	BC (*speech* or *3.1 kHz audio*)	BC (*speech* or *3.1 kHz audio*)
Value received in the TMR prime of the IAM message (*speech* or *3.1 kHz audio*)	BC (*speech* or *3.1 kHz audio*) p.i. No. 5	BC (*speech* or *3.1 kHz audio*) p.i. No. 5
Value received in the TMR prime of the IAM message (*speech* or *3.1 kHz audio*)	BC received in the USI of the IAM message (*speech* or *3.1 kHz audio*) p.i. No. 5	No BC
NOTE – Progress Indicator (p.i.) No. 5 indicates '*interworking has occurred*'.		

C.7.1.7 Receipt of the Release message (REL)

Cause

See Table C.51.

Table C.51/H.246 – Receipt of the Release message (REL)

REL→	RELEASE COMPLETE→ (Note 1)
Cause parameter	Cause information element
Cause value No. x	Cause value No. x (Note 2)
NOTE 1 – If the cause value received in the Release message (REL) is unknown in H.225.0, the unspecified cause value of the class is sent.	
NOTE 2 – Mapping the Cause Value to ReleaseCompleteReason is not required as packet-based network entities are required to decode the Cause IE.	

User-to-user information

The user-to-user information element contains the ReleaseComplete-UUIE defined in the H.225.0 Message Syntax.

The handling of the other parameters is described in C.7.2.

The receipt of the Release message (REL) during the user suspend/resume procedure is described in C.7.2.

C.7.1.8   Sending of the Release message (REL)

See Table C.52.

Table C.52/H.246 – Call clearing during call establishment

←REL	←RELEASE COMPLETE
Cause parameter	Cause information element
Cause value No. x (Note)	Cause value No. x
Cause parameter	ReleaseCompleteReason
34 – No circuit/channel available	noBandwidth
47 – Resource unavailable, unspecified	gatekeeperResources
3 – No route to destination	unreachableDestination
16 – Normal call clearing	destinationRejection
88 – Incompatible destination	invalidRevision
127– Interworking, unspecified	noPermission
38 – Network out of order	unreachableGatekeeper
42 – Switching equipment congestion	gatewayResources
28 – Invalid number format	badFormatAddress
41 – Temporary failure	adaptiveBusy
17 – User busy	inConf
31 – Normal, unspecified	undefinedReason
16 – Normal call clearing	facilityCallDeflection
31 – Normal, unspecified	securityDenied
20 – Subscriber absent	calledPartyNotRegistered
31 – Normal, unspecified	callerNotRegistered
47 – Resource Unavailable	newConnectionNeeded
127– Interworking, unspecified	nonStandardReason
31 – Normal, unspecified	replaceWithConferenceInvite
31 – Normal, unspecified	genericDataReason
31 – Normal, unspecified	neededFeatureNotSupported
127– Interworking, unspecified	tunnelledSignallingRejected
3 – No route to destination	invalidCID
NOTE – If the cause value received in the H.225.0 message is unknown in ISUP, the unspecified cause value of the class is sent.	

The Release message (REL) contains the access delivery information parameter coded to *Setup message generated* if this information has not been sent before.

The handling of the other parameters possibly present in the Release message (REL) is described in C.7.2.

User-to-user information

User-to-user information is carried in H.225.0 User Data.

NOTE – User-to-user information is MANDATORY in H.225.0 messages.

C.7.1.9 Receipt of the Reset Circuit message (RSC), Circuit Group Reset message (GRS) or Circuit Group Blocking message (CGB) with the indication *hardware failure oriented*

See Table C.53.

Table C.53/H.246 – Receipt of RSC, GRS or CGB messages

Message received from ISUP→	RELEASE COMPLETE→
	Cause information element
Reset Circuit message (RSC)	Cause value No. 31 *Normal, unspecified*
Circuit Group Reset message (GRS)	Cause value No. 31 *Normal, unspecified*
Circuit Group Blocking message (CGB) with the type indicator of the circuit group supervision message type indicator parameter coded "01" (*hardware failure oriented)*	Cause value No. 31 *Normal, unspecified*

User-to-user information

See C.7.1.7.

C.7.1.10 H.225.0 Transport Level reset and Transport Level failure procedures

The data link reset and data link failure procedures are respectively described in 5.8.8/Q.931 and 5.8.9/Q.931 [3]. See Table C.54.

Table C.54/H.246 – H.225.0 Transport level reset and Transport level failure procedures

←REL	Trigger event	RELEASE COMPLETE→
Cause parameter		Cause information element
Cause value No. 41 (*temporary failure*)	Transport level reset in overlap receiving state	AdaptiveBusy *call is dropping due to LAN crowding*
Cause value No. 27 (*destination out of order*)	Transport Level failure in another state than active state	(Note 1)
Cause value No. 27 (*destination out of order*)	Failure of the transport level re-establishment procedure after a transport level failure in active state. (Note 2)	(Note 1)
NOTE 1 – The call is cleared internally. No RELEASECOMPLETE message is sent on the access.		
NOTE 2 – These errors correspond to the H.225.0 Release reason *unreachableDestination*.		

C.7.1.11   Release by the interworking function

See Table C.55.

Table C.55/H.246 – Release from the destination interworking Function

←Message sent to the ISUP	Trigger event	Message sent to the H.225.0 →
REL Cause value No. 18 *No user responding*	No response to the SETUP message (T303 expiry)	RELEASE COMPLETE Cause value No. 102 *Recovery on timer expiry*
REL Cause value No. 18 *No user responding*	No ALERTING, CONNECT after CALL PROCEEDING (T310 expiry)	RELEASE COMPLETE Cause value No. 102 *Recovery on timer expiry*
REL Cause value No. 19 *No answer from user (user alerted)*	No CONNECT after ALERTING (T301 expiry)	RELEASE COMPLETE Cause value No. 102 *Recovery on timer expiry*
REL Cause value No. 97 or No. 99	Call release due to the ISUP compatibility procedure	RELEASE COMPLETE Cause value No. 97 or No. 99
REL Cause value coded according to [1]	Other cases of failure on the ISUP side	RELEASE COMPLETE Same cause value as in the REL message (Note 1)
REL Same cause value as in the RELEASE COMPLETE message (Note 2)	Other cases of failure on the H.225.0 side	RELEASE COMPLETE Cause value coded according to Table C.53

NOTE 1 – If the cause value sent in the REL message is unknown in H.225.0, the unspecified cause value of the class is sent.

NOTE 2 – If the cause value sent in the RELEASE COMPLETE message is unknown in ISUP, the unspecified cause value of the class is sent.

Access Delivery Information

NA.

If the SETUP message has been sent, the Release message (REL) contains the access delivery information parameter coded to *Setup message generated* if this information has not been sent before.

The handling of the other parameters possibly present in the Release message (REL) is described in C.7.2.

C.7.2   ISUP supplementary services and H.323 services

C.7.2.1   Direct-Dialling-In (DDI)

There is no specific interwork relating to the DDI supplementary service. For an indication of the actions taken in the ISUP network, see ITU-T Rec. Q.731.1. FFS.

C.7.2.2   Multiple Subscriber Number (MSN)

There is no specific interwork relating to the MSN supplementary service. For an indication of the actions taken in the ISDN network, see ITU-T Rec. Q.951.x. FFS.

C.7.2.3   Calling Line Identification Presentation (CLIP)/Calling Party Name Presentation (H.450.8)

If the called user has CLIP, one or two calling party number information elements are sent in the SETUP message by performing the conversion specified in ITU-T Rec. H.460.5 [20].

SETUP message sent to Terminal or Gateway

See Table C.56.

Table C.56/H.246 – CLIP information sent to the called user

IAM→		SETUP→
Calling party number parameter Address presentation restricted indicator	Generic number parameter with number qualifier set to *additional calling party number*	CPAP information sent to the calling user
Presentation allowed	Absent	sourceAddress or Calling party number IE (see Table C.57)
Presentation allowed	Present	sourceAddress or Calling party number IE (Notes 1 and 2) (see Table C.57) Calling party number IE (Notes 1 and 2) (see Table C.58)
Presentation restricted (Note 3)	Value non-significant	sourceAddress or Calling party number IE Option 1: Type of number As received Numbering plan As received Presentation ind. *Presentation restricted* Screening ind. As received Number digits No digit Option 2: Type of number *Unknown* Numbering plan *Unknown* Presentation ind. *Presentation restricted* Screening ind. *Network provided* Number digits No digit

Table C.56/H.246 – CLIP information sent to the called user

IAM→		SETUP→
Address not available or No calling party number parameter	Value non-significant	sourceAddress or Calling party number IE

IAM→		SETUP→	
		Type of number	*Unknown*
		Numbering plan	*Unknown*
		Presentation ind.	*Not available due to interworking*
		Screening ind.	*Network provided*
		Number digits	No digit

NOTE 1 – If the "two calling party number delivery option" does not apply:

– only one calling party number information element is sent on H.225.0 side. The generic number is used (see Table C.58).

If the "two calling party number delivery option" applies:

– By performing the conversion specified in ITU-T Rec. H.460.5 [20], two calling party number information elements are sent on H.225.0 side: one coded according to the generic number parameter (see Table C.58), one according to the calling party number parameter (see Table C.57). The order in which the calling party number information elements appear in the SETUP message is a network option.

NOTE 2 – As a national option, the presentation restriction indication received in the calling party number parameter can be overridden for specific calling access categories. In such a case, the same actions are taken as if *presentation allowed* was received, except for the presentation restriction indication, which is passed transparently into the calling party number information element.

Table C.57/H.246 – Coding of the calling party number information element according to the calling party number parameter

IAM→	SETUP→
Calling party number parameter	sourceAddress or Calling party number IE
Nature of address indicator *National number* *International number*	Type of number (Note 1) *National number* *International number*
Numbering plan indicator *ISDN/Telephony numbering plan*	Numbering plan identification *ISDN/Telephony numbering plan*
Address presentation restricted indicator *Presentation allowed* *Presentation restricted*	Presentation indicator (Note 2) *Presentation allowed* *Presentation restricted*

**Table C.57/H.246 – Coding of the calling party number information element
according to the calling party number parameter**

IAM→	SETUP→
Screening indicator *User provided, verified and passed* *Network provided*	Screening indicator (Note 3) *User provided, verified and passed* *Network provided*
Address signals	Number digits
NOTE 1 – As a network option, the type of number may be coded *unknown* when a prefix is added to the number. NOTE 2 – The Presentation Indicator may be coded as part of the Calling Party Number or as a H.225.0 presentationIndicator IE. NOTE 3 – The Screening Indicator may be coded as part of the Screening Indicator or as a H.225.0 screeningIndicator IE.	

**Table C.58/H.246 – Coding of the calling party number information element
according to the generic number parameter**

IAM→	SETUP→
Generic number parameter with number qualifier set to *additional calling party number*	sourceAddress or Calling party number IE
Nature of address indicator *National number* *International number*	Type of number (Note 1) *National number* *International number*
Numbering plan indicator *ISDN/Telephony numbering plan*	Numbering plan identification *ISDN/Telephony numbering plan*
Address presentation restricted indicator *Presentation allowed* *Presentation restricted*	Presentation indicator (Note 2) *Presentation allowed* *Presentation restricted*
Screening indicator *User provided, not verified*	Screening indicator (Note 3) *User provided, not verified*
Address signals	Number digits
NOTE 1 – As a network option, the type of number may be coded *unknown* when a prefix is added to the number. NOTE 2 – The Presentation Indicator may be coded as part of the Calling Party Number or as a H.225.0 presentationIndicator IE. NOTE 3 – The Screening Indicator may be coded as part of the Screening Indicator or as a H.225.0 screeningIndicator IE.	

Calling party subaddress

See Table C.59.

Table C.59/H.246 – Sending of the calling party subaddress

IAM→		SETUP→
Address presentation restricted indicator of the Calling party number parameter	Access transport parameter	Content
Presentation allowed	Calling party subaddress information element	Calling party subaddress information element
Presentation restricted (Note) or *Address not available* or No calling party number parameter	Calling party subaddress information element	No calling party subaddress information element
NOTE – As a national option, the presentation restriction indication received in the calling party number parameter can be overridden for specific calling access categories. In such a case, the same actions are taken as if *presentation allowed* was received.		

SETUP Message sent to Gatekeeper

See Table C.60.

Table C.60/H.246 – Calling Party Number

←SETUP	←IAM
Calling Party Number	**Calling Party Number** or (Note) **Generic Number** (– additional Calling Party number)
sourceAddress	**Calling Party Number**
NOTE – If an additional Calling Party number is included in the Generic Number, then the additional Calling party number should be sent in the Calling Party Number.	

C.7.2.4   Calling Line Identification Restriction (CLIR)/Calling Party Name Restriction (H.450.8)

See Table C.56.

C.7.2.5   Connected Line Identification Presentation (COLP)/ Connected Party Name Presentation (H.450.8)

If the connected line identity request indicator of the optional forward call indicators parameter in the Initial Address Message (IAM) is received coded to *requested*, then the connected number and possibly the generic number parameter and the connected subaddress are sent in the answer or connect message as described in Tables C.57 and C.58.

C.7.2.5.1 Special arrangement applies

CONNECT received from Terminal or Gateway

See Table C.61.

Table C.61/H.246 – COLP – Special arrangement applies

←ANM, CON				←CONNECT	
Coding of the connected number and generic number parameters				Connected number IE	
Address signals	Numbering plan indicator	Nature of address indicator	Screening indicator	Numbering plan identification	Type of number
Connected number parameter				No or invalid (Note 1)	
Default number	001 *ISDN numbering plan*	000 0011 *National number*	11 *Network provided*	connected number information element	
No generic number parameter indicating *additional connected number* is sent				*ISDN/telephony numbering plan* or *unknown*	*National number*
Connected number parameter					
Default number	001 *ISDN numbering plan*	000 0011 *National number*	11 *Network provided*		
Generic number parameter (Note 2)					
Number provided by the user	001 *ISDN numbering plan*	000 0011 *National number*	00 *User provided, not verified*		
Connected number parameter				*ISDN/telephony numbering plan* or *unknown*	*International number*
Default number	001 *ISDN numbering plan*	000 0011 *National number*	11 *Network provided*		
Generic number parameter (Note 2)					
Number provided by the user	001 *ISDN numbering plan*	000 0100 *International number*	00 *User provided, not verified*		
NOTE 1 – Validity conditions of the connected number information element are defined in 5.5.2.3/Q.951.x [19].					
NOTE 2 – The generic number parameter contains the number qualifier indicator coded "0000 0101" (*additional connected number*).					

The address presentation restricted indicator of the connected number and generic number parameters shall be set according to the COLR supplementary service.

The number incomplete indicator of the generic number parameter shall be set to "0" (*complete*).

Connected subaddress

If provided, the connected subaddress is transported transparently in the access transport parameter of the Answer (ANM) or Connect (CON) message.

CONNECT received from a Gatekeeper

See Table C.62.

Table C.62/H.246 – Connected Party Number

CONNECT →	ANM/CON →
Connected Party Number	Connected Party Number or (Note) Generic Number (– additional Connected Party number)
connectedAddress	Connected Party Number
NOTE – If a Connected Party number is included in the **connectedAddress**, then the Calling party number should be sent in the Generic Number.	

C.7.2.5.2 Special arrangement does not apply

CONNECT received from Terminal or Gateway

See Table C.63.

Table C.63/H.246 – COLP – Special arrangement does not apply

←ANM, CON				←CONNECT		
Coding of the connected number and generic number parameters				Connected number information element		
Address signals	Numbering plan indicator	Nature of address indicator	Screening indicator	Type of number	Numbering plan identification	Number digits
Connected number parameter				No or invalid (Note) connected number information element		
Default number	001 *ISDN numbering plan*	000 0011 *National number*	11 *Network provided*			
No generic number parameter indicating *additional connected number* is sent						
Connected number parameter				Failure of the screening function		
Default number	001 *ISDN numbering plan*	000 0011 *National number*	11 *Network provided*			
No generic number parameter indicating *additional connected number* is sent						
Connected number parameter				*Subscriber number*		
Number provided by the user	001 *ISDN numbering plan*	As received	01 *User provided, verified and passed*	*National number* or	*ISDN/telephony numbering plan* or	Correct complete number
No generic number parameter indicating *additional connected number* is sent				*International number*	*Unknown*	

Table C.63/H.246 – COLP – Special arrangement does not apply

←ANM, CON					←CONNECT	
Connected number parameter						
Completion of the number provided by the user	001 *ISDN numbering plan*	000 0011 *National number*	01 *User provided, verified and passed*	*Unknown*	*ISDN/telephony numbering plan* or	Incomplete number
No generic number parameter indicating *additional connected number* is sent					*Unknown*	
NOTE – Validity conditions of the connected number information element are defined in 5.5.2.3/Q.951.x [19].						

The address presentation restricted indicator of the connected number parameter shall be set according to the COLR supplementary service.

CONNECT received from a Gatekeeper

See Table C.64.

Table C.64/H.246 – Connected Party Number

CONNECT →	ANM/CON →
Connected Party Number	**Connected Party Number** or (Note) **Generic Number** **(– additional Connected Party number)**
connectedAddress	**Connected Party Number**
NOTE – If a Connected Party number is included in the **connectedAddress**, then the Calling party number should be sent in the Generic Number.	

Connected subaddress

If provided, the connected subaddress is transported transparently in the access transport parameter of the Answer (ANM) or Connect (CON) message.

C.7.2.6 Connected Line Identification Restriction (COLR)/Connected Party Name Restriction (H.450.8)

CONNECT received from a Terminal or Gateway

The address presentation restricted indicator of the connected number and of the generic number is coded as described in Table C.65.

NOTE – If the called user has not subscribed to the COLR supplementary service, the address presentation restricted indicator of the connected number parameter is set to *presentation allowed* (see 6.10/Q.951.x [19]).

**Table C.65/H.246 – Coding of the address presentation restricted indicator of
the connected number and generic number parameters**

←ANM/CON	←CONNECT	Internal data (User profile data)	
Connected number/ generic number parameter Address presentation restricted indicator	Connected number information element Presentation indicator	Temporary mode default setting	Permanent mode
Presentation restricted	Value non-significant	Value non-significant	Yes
Presentation restricted	Presentation restricted	Restricted	No
Presentation restricted	Absent		
Presentation allowed	Presentation allowed		
Presentation allowed	Presentation allowed	Allowed	
Presentation allowed	Absent		
Presentation restricted	Presentation restricted		

CONNECT received from a Gatekeeper

See Table C.66.

Table C.66/H.246 – Calling Party Number

CONNECT →	ANM/CON →
Connected Party Number	**Connected Party Number** or (Note) **Generic Number** **(– additional Connected Party number)**
connectedAddress	**Connected Party Number**
NOTE – If an additional Connected Party number is included in the **connectedAddress**, then the additional Connected party number should be sent in the GenericNumber.	

C.7.2.7 Subaddressing (SUB)

The called party subaddress information element received in the access transport parameter of the Initial Address Message (IAM) is transferred transparently in the SETUP message.

C.7.2.8 Call diversion

C.7.2.8.1 Interworking at the interworking function where a call is diverted within or beyond the H.323 network

For further study.

C.7.2.8.2 Interworking at the coincident S and T reference point where a diverted call is presented

For further study.

C.7.2.8.3 Interworking at the exchange where a diverted call is presented to a H.323 network

C.7.2.8.3.1 Gateways supporting H.450.3

If a PSTN to H.323 gateway receives an IAM message containing redirecting number and redirection information parameters, it forwards a H.225 SETUP message that includes an H.450.3 divertingLegInformation2 invoke APDU. The gateway is to operate as a combined H.450.3 rerouting endpoint and H.450.3 calling endpoint. The original called number may also be present in the IAM message.

Table C.67/H.246 – Mapping ISUP redirecting parameters to H.450.3 APDU

IAM →	SETUP →
	divertingLegInformation2
Redirecting number	divertingNr
Redirection information	
Redirecting reason	diversionReason
Redirection counter	diversionCounter
Original redirection reason	originalDiversionReason
Original called number	originalCalledNr

If the gateway receives an ALERTING, CONNECT or FACILITY message that contains a divertingLegInformation3 invoke APDU, it sends an ISUP message to the calling party.

Table C.68/H.246 – Mapping of H.450.3 APDU fields to ISUP parameters

← ACM, CPG, ANM	← ALERTING, FACILITY, CONNECT
	divertingLegInformation3
Generic notification indicator *Call is diverting*	
Redirection number	redirectionNr
Redirection number restriction	presentationAllowedIndicator

C.7.2.8.3.2 Gateways not supporting H.450.3

If a gateway that does not support H.450.3 procedures receives an IAM message containing redirecting number and redirection information parameters, it maps these parameters to a H.225.0 SETUP message that includes a redirecting number information element as shown in Table C.69. In the case of multiple diversions within the PSTN an original called number parameter may be present in the IAM message. In this case two redirecting number information elements are included in the SETUP message as shown in Table C.70: the first redirecting number information element is for the first diversion and the second redirecting number information element is for the last diversion.

**Table C.69/H.246 – Mapping of ISUP redirecting parameters
for a non-H.450.3 gateway – Single diversion**

IAM →	SETUP →

Redirecting number parameter
 	
    Nature of address (1)
 	
    Numbering plan (2)
 	
    Address signal (3)
	Redirecting number information element
	
	    Type of number (1)
	
	    Numbering plan (2)
	
	    Reason for diversion (4)
	
	    Number digits (3)

Redirection information parameter Redirecting reason (4)	
The numbers in parentheses show the mapping of individual fields	

**Table C.70/H.246 – Mapping of ISUP redirecting parameters
for a non-H.450.3 gateway – Multiple diversions**

IAM →	SETUP →

Redirecting number parameter
 	
    Nature of address (1)
 	
    Numbering plan (2)
 	
    Address signal (3)
	Redirecting number information element
	
	    Type of number (6)
	
	    Numbering plan (7)
	
	    Reason for diversion (5)
	
	    Number digits (8)

Redirection information parameter Redirecting reason (4) Original redirection reason (5)	

Original called number parameter
 	
    Nature of address (6)
 	
    Numbering plan (7)
 	
    Address signal (8)
	Redirecting number information element carried as H.460.5 [20] information
	
	    Type of number (1)
	
	    Numbering plan (2)
	
	    Reason for diversion (4)
	
	    Number digits (3)

The numbers in parentheses show the mapping of individual fields	

C.7.2.8.4 Interworking at the exchange where partial rerouting is requested from a private ISDN

For further study.

C.7.2.9 Call Waiting (CW)

C.7.2.9.1 Procedure at the T reference point

If the call is presented with indication *no channel* in the information channel selection field of the channel identification information element in the SETUP message, and depending on the subscription options offered by the network, a notification is sent in the network upon receipt of the alerting indication. See Table C.71.

Table C.71/H.246 – Sending of CW notification

←ACM, CPG	←ALERTING
Generic notification indicator parameter	**callWaiting**
Notification indicator	
110 0000 *Call is a waiting call*	Invoke
NOTE – See ITU-T Rec. H.450.6 for a description of Call Waiting in a H.323 network.	

C.7.2.10   Call Hold (HOLD)

NOTE – H.225.0 does not support the HOLD, HOLD ACKNOWLEDGE, HOLD REJECT, RETRIEVE, RETRIEVE ACKNOWLEDGE or RETRIEVE REJECT messages. This service uses the FACILITY UU-IE for Hold and Retrieve.

C.7.2.10.1   Notification received from the network

See Table C.72.

Table C.72/H.246 – HOLD notification

CPG→	FACILITY→
Generic notification indicator parameter	
Notification indicator	
111 1001 *Remote hold*	**holdNotific** *invoke* APDU
111 1010 *Remote retrieval*	**retrieveNotific** *invoke* APDU

C.7.2.10.2   Notification received at T reference point

A HOLD notification may be received at T reference point in the active phase of the call. See Table C.73.

Table C.73/H.246 – Receipt of a HOLD notification from a H.323 network

←CPG		←FACILITY
Event information parameter	Generic notification indicator parameter	
Event indicator	Notification indicator	
000 0010 *Progress*	111 1001 *Remote hold*	**holdNotific** *invoke* APDU
000 0010 *Progress*	111 1010 *Remote retrieval*	**retrieveNotific** *invoke* APDU

C.7.2.11   Terminal Portability (TP)

Terminal Portability is not explicitly supported in a H.323 network and is not described in ITU-T Rec. H.323 or in H.450.x-series Recommendations. However, the messages and IEs to support Terminal Portability exist in ITU-T Rec. H.225.0.

C.7.2.11.1   Notification received from the network

See Table C.74.

Table C.74/H.246 – TP notification

Message received from the ISUP →	NOTIFY→
	Notification indicator IE Notification description
SUS message Suspend/resume indicator *ISDN subscriber initiated*	000 0000 *User suspended*
RES message Suspend/resume indicator *ISDN subscriber initiated*	000 0001 *User resumed*
CPG message Generic notification indicator *User suspended*	000 0000 *User suspended*
CPG message Generic notification indicator *User resumed*	000 0001 *User resumed*

C.7.2.11.2 Invocation at coincident S and T reference point

The sending of SUSPEND and RESUME is not supported in a H.323 network.

C.7.2.11.3 Notification received at T reference point

A TP notification may be received at T reference point in the active phase of the call. See ITU-T Rec. Q.953.4 for a description of the Terminal Portability service on the access side. See Table C.75.

Table C.75/H.246 – Receipt of a TP notification from a private network

←CPG		←NOTIFY
Event information parameter	Generic notification indicator parameter	Notification indicator information element
Event indicator	Notification indicator	Notification description
000 0010 *Progress*	000 0000 *User suspended*	000 0000 *User suspended*
000 0010 *Progress*	000 0001 *User resumed*	000 0001 *User resumed*

C.7.2.12 Conference calling (CONF)

Establishing a conference call in H.323 is described in 8.4.3/H.323 [6].

NOTIFY messages are optional for conference calling notification. ITU-T Recs Q.954.1 and Q.734.1 describe the operation of Conferencing calling in ISDN networks. The NOTIFY message is optional in H.323 networks.

The tables in this clause describe the notifications sent to and received from terminal lying in the ISDN network when a Conference Calling supplementary service is active.

The Conferencing device may reside in the H.323 network in the form of an endpoint containing MC functionality or a stand-alone MCU. Alternatively the Conferencing may be implemented in the ISDN network.

The following terminology is used:

served user: The user that requests the conference call. The served user will be the user controlling the conference call. The served user may also be referred to as user A.

conferee: The users involved in the conference not controlling the conference, i.e., all participants except the served user are referred to as conferees or parties. The conferees may also be known as users B, C, etc.

isolate: An action at the access that restricts communication in both directions with a participant of the conference. (Call Hold.)

reattach: An action at the access that re-establishes the communication with a participant of the conference. (Call Retrieve.)

split: An action at the access that creates a private communication between the served user and a remote user. The private communication is a normal "two-party" call.

drop: An action at the access that clears the connection to a remote party.

floating: The situation where the conference calling supplementary service exists without the served user.

C.7.2.12.1 Notification received from the network

Table C.76 represents the backwards indication received from the conference calling device located on the ISUP network side.

Table C.76/H.246 – Conference calling notification

CPG→	Message to H.323 Endpoint
Generic notification indicator parameter	NOTIFY→
Notification indicator	(Note 1)
100 0010 *Conference established*	Not applicable (Note 2)
100 0011 *Conference disconnected*	
100 0100 *Other party added*	Not applicable (Note 3)
100 0101 *Isolated*	Not applicable (Note 4)
100 0110 *Reattached*	Not applicable (Note 5)
100 0111 *Other party isolated*	Not applicable
100 1000 *Other party reattached*	Not applicable
100 1001 *Other party split*	Not applicable
100 1010 *Other party disconnected*	Not applicable

Table C.76/H.246 – Conference calling notification

CPG→	Message to H.323 Endpoint
100 1011 *Conference floating*	Not applicable
NOTE 1 – The format values below represent the 'Notification indicator information element' and the 'Notification description'. NOTE 2 – **H.245 ConferenceIndication.***TerminalNumberAssign* may also be used to indicate the establishment of a conference. NOTE 3 – **H.245 ConferenceIndication.***TerminalJoinedConf* may also be used to indicate that a terminal has joined the conference. NOTE 4 – H.225.0 FACILITY indicating **holdNotific**.*invoke* may also be used to indicate 'remote hold'. NOTE 5 – H.225.0 FACILITY indicating **retrieveNotific**.*invoke* may also be used to indicate 'remote retrieve'. NOTE 6 – **H.245 ConferenceIndication.***TerminalLeftConf* may also be used to indicate that a terminal has left the conference.	

C.7.2.12.2 Invocation at coincident S and T reference point

Tables C.77 and C.78 show procedures that may be attempted in an SCN conference call and how these map to procedures that may be achieved through a H.323 conference.

The served user resides in a H.323 network (i.e., The MCU [conference device] is in the H.323 network). The tables also show the notifications that may be sent to users in the ISDN network.

User B and the other remote user reside in the SCN network.

The resulting Notification Message sent to B shall be generated by the interworking function. The notification message sent to all other remote users in ISDN network shall be generated by the interworking function.

Table C.77/H.246 – Conference calling

Message sent to all other remote users ←	Message sent to B ←	Message received from served user ←	Procedure
Not applicable	CPG Generic notification indicator parameter *Conference established*	H.225.0 SETUP ConferenceGoal = Create	**Beginning the conference from an active call (with B)**
Not applicable	CPG Generic notification indicator parameter *Conference established*	H.225.0 SETUP ConferenceGoal = Invite	**Adding a remote user (B)**
CPG Generic notification indicator parameter *Other party added*	Not applicable	H.245 *terminalJoinedConf*	

Table C.77/H.246 – Conference calling

Message sent to all other remote users ←	Message sent to B ←	Message received from served user ←	Procedure
(Note 2)	CPG Generic notification indicator parameter *Remote Hold* (Note 1)	H.225.0 FACILITY *HoldNotific.inv*	**Isolate a remote user (B)**
(Note 4)	CPG Generic notification indicator parameter *Remote Retrieve* (Note 3)	FACILITY *RetrieveNotific.inv*	**Reattach a remote user (B)**
Not applicable	Not applicable	Not applicable	**Splitting a remote user (B)** (Note 5)
Not applicable	REL	H.245 conferenceRequest *dropTerminal*	**Disconnect a remote user (B)**
CPG Generic notification indicator parameter *Other party disconnected*	Not applicable	H.245 conferenceRequest *terminalLeftConf*	
REL		H.245 conferenceCommand *dropTerminal*	**Terminate the conference**
Not applicable		Not applicable	**Disconnect the served user** (Note 6)
REL		RELEASECOMPLETE	**Call clearing by served user**

NOTE 1 – H.323 (H.450.4) does not allow the indication of '*isolated*' when placing a user on hold. Therefore a CPG message is generated indicating '*remote hold*'.

NOTE 2 – In ISUP-based conferencing, a CPG message indicating '*other party isolated*' would be sent to remote users. However as H.323 (H.450.4) does not support this, no message is sent.

NOTE 3 – H.323 (H.450.4) does not allow the indication of '*reattached*' when retrieving a user from hold. Therefore a CPG message is generated indicating '*remote retrieve*'.

NOTE 4 – In ISUP-based conferencing, a CPG message indicating '*other party isolated*' would be sent to remote users. However as H.323 (H.450.4) does not support this, no message is sent.

NOTE 5 – Procedure not supported in H.323.

NOTE 6 – H.323 does not support the functionality to indicate that a 'Conference Chair' is floating.

Table C.78/H.246 – Conference calling: a remote user clears

Message received from B →	Message sent to served user →	Procedure
REL	H.245 ConferenceIndication *terminalLeftConf*	Remote user clears

C.7.2.12.3   Notification received at T reference point

Table C.79 represents the situation where the conferencing device belongs to the H.323 network.

Table C.79/H.246 – Receipt of a conference calling notification from a private network

←CPG		←Message from H.323 endpoint (Note 4)
Event information parameter	Generic notification indicator parameter	
Event indicator	Notification indicator	
000 0010 *Progress*	100 0010 *Conference established*	H.225.0 SETUP ConferenceGoal = invite
000 0010 *Progress*	100 0100 *Other party added*	H.245 ConferenceIndication *terminalJoinedConf*
000 0010 *Progress*	111 1001 *Remote Hold*	H.225.0 FACILITY *HoldNotific.inv* (Note 2)
000 0010 *Progress*	111 1010 *Remote Retrieve*	H.225.0 FACILITY *RetrieveNotific.inv* (Note 3)
000 0010 *Progress*	100 1010 *Other party disconnected*	H.245 ConferenceIndication *terminalLeftConf*

NOTE 1 – 'Conference Disconnection' results from when a conference chair initiates a 'conference out of consultation' with one of the conferees. H.323 does not identify this situation and thus no indication of '*conference disconnected*' is generated toward the ISUP network.

NOTE 2 – H.323 does not support the indication of 'isolated'. The equivalent is FACILITY indicating '*holdNotific*'.

NOTE 3 – H.323 does not support the indication of 'reattached'. The equivalent is FACILITY indicating '*retrieveNotific*'.

NOTE 4 – H.323 (H.450.4) does not support the indication of '*other party isolated*', '*other party reattached*', '*other party split*' or '*conference floating*', therefore these indications are not generated toward the ISUP network.

C.7.2.13   Three-party (3PTY)

Establishing a Conference out of Consultation call in H.323 is described in 8.4.3.8/H.323 [6].

NOTIFY messages are optional for 3PTY calling notifications. ITU-T Recs Q.954.2 and Q.734.2 describe the operation of 3PTY service in ISDN networks. The NOTIFY message is optional in H.323 networks.

The tables in this clause describe the notifications sent to and received from terminal lying in the ISDN network when a 3PTY supplementary service is active.

The 3PTY Conferencing device may reside in the H.323 network in the form of an endpoint containing MC functionality or a stand-alone MCU. Alternatively the Conferencing may be implemented in the ISDN network.

Tables C.80, C.81 and C.82 show procedures that may be attempted in a 3PTY call and how these may be signalling when the serving user resides in a H.323 network. The tables also show the notifications that may be sent to users in the ISDN network.

The following terminology is used:

served user: The user that requests the conference call. The served user will be the user controlling the conference call. The served user may also be referred to as user A.

conferee: The users involved in the conference not controlling the conference, i.e., all participants except the served user are referred to as conferees or parties. The conferees may also be known as users B, C, etc.

C.7.2.13.1 Notification received from the network

Table C.80 represents the backward indication received from a 3PTY conference where the conference lies on the ISUP network side.

Table C.80/H.246 – 3PTY notification

CPG→	Message to H.323 Endpoint→ (Note 1)
Generic notification indicator parameter	
Notification indicator	
100 0010 *Conference established*	Not applicable
100 0011 *Conference disconnected*	Not applicable
111 1001 *Remote hold*	Not applicable
NOTE 1 – The format values below represent the 'Notification indicator information element' and the 'Notification description'.	
NOTE 2 – **H.245 ConferenceIndication.***TerminalNumberAssign* may also be used to indicate the establishment of a conference.	
NOTE 3 – H.225.0 FACILITY indicating **holdNotific**.*invoke* may also be used to indicate 'remote hold'.	

If the Call Progress Message (CPG) contains two generic notification indicator parameters, one with the notification indicator coded *conference disconnected,* the other with the notification indicator coded *remote hold,*

– either a NOTIFY message is sent containing:

  • a notification indicator information element with the notification description *conference disconnected*; and

  • a notification indicator information element with the notification description *remote hold;*

– or:

  • a NOTIFY message is sent containing a notification indicator information element with the notification description *conference disconnected*; and

  • a subsequent NOTIFY message is sent containing a notification indicator information element with the notification description *remote hold*.

C.7.2.13.2 Invocation at coincident S and T reference point

Tables C.81 and C.82 show procedures that may be attempted in an SCN-based Conference out of Consultation call and how these map to procedures that may be achieved through a H.323 Conference out of Consultation Conference calls.

The served user (B) resides in a H.323 network (i.e., The MCU [conference device] is in the H.323 network). The tables also show the notifications that may be sent to users in the ISDN network.

Users B and C reside on the ISUP network side.

The resulting Notification Message sent to B shall be generated by the interworking function. The notification message sent to all other remote users in ISDN network shall be generated by the interworking function.

Table C.81/H.246 – Three-Party (3PTY)

Call A-B: Active-held connection message sent to B ←	Call A-C: Active-idle connection message sent to C ←	Message received from served user ←	Procedure
←CPG Generic notification indicator parameter *Conference established*	←CPG Generic notification indicator parameter *Conference established*	(Note 1)	**Beginning the 3PTY**
←CPG Generic notification indicator parameter *Remote hold*	No message sent	←FACILITY *HoldNotific.inv* Sent to B	**Creation of a private communication with B**
No message sent	←CPG Generic notification indicator parameter *Remote hold*	←FACILITY *HoldNotific.inv* Sent to C	
←CPG Generic notification indicator parameter *Remote Retrieve*	No message sent	←FACILITY *retrieveNotific.inv* Sent to B	
No message sent	←CPG Generic notification indicator parameter *Remote Retrieve*	←FACILITY *holdNotific.inv* Sent to B	**Creation of a private communication with C**
←REL	No message sent	H.245 conferenceRequest *dropTerminal* Sent to B	**Disconnect the remote user B**

Table C.81/H.246 – Three-Party (3PTY)

Call A-B: Active-held connection message sent to B ←	Call A-C: Active-idle connection message sent to C ←	Message received from served user ←	Procedure
←CPG Generic notification indicator parameter *Remote hold*	←REL	H.245 conferenceRequest *dropTerminal* Sent to C	**Disconnect the remote user C**
←CPG Generic notification indicator parameter *Remote Retrieve*	Not applicable	←FACILITY *retrieveNotific.inv* Sent to B	
NOTE 1 – Clause 8.4.3.8/H.323 [6] Conference out of Consultation discusses the various methods to achieve the establishment of a 3-party conference. NOTE 2 – As the conference is performed by the H.323 network, no indication of 'conference disconnected' is generated.			

Table C.82 describes the actions taken when user B or user C disconnects.

Table C.82/H.246 – Three-party (3PTY): user B or user C disconnects

Procedure	Call A-C: Active-idle connection message sent to C or received from C	Call A-B: Active-held connection messages sent to B or received from B	Messages sent to or received from served user (Note)
User B disconnects	←CPG Generic notification indicator parameter *Conference disconnected*	REL→	RELEASECOMPLETE→ Received from B
User C disconnects	REL→	←CPG Generic notification indicator parameter *Remote hold*	RELEASECOMPLETE→ Received from C
	Not applicable	←CPG Generic notification indicator parameter *Remote Retrieve*	←FACILITY *retrieveNotific.inv* Sent to B
NOTE – As the conference is performed by the H.323 network, no indication of 'conference disconnected' is generated.			

Upon receipt from a remote user of a Release message (REL), that call is released according to normal call release procedure and a Call Progress message (CPG) is sent through the network to the other remote user with the event information parameter coded *progress* and the generic notification indicator coded *conference disconnected*.

C.7.2.13.3 Notification received at T reference point

Table C.83 represents the situation where the conferencing device belongs to the H.323 network.

Table C.83/H.246 – Receipt of a 3PTY notification from a private network

←CPG		←Message from H.323 Endpoint
Generic notification indicator parameter	Event information parameter	
Notification indicator	Event indicator	
100 0010 *Conference established*	000 0010 *Progress*	H.245 ConferenceIndication *terminalNumberAssign*
111 1001 *Remote hold*	000 0010 *Progress*	FACILITY *HoldNotific.inv*

C.7.2.14 Closed User Group (CUG)

Not supported in a H.323 network.

C.7.2.15 User-to-User Signalling (UUS)

User-to-user Services 1, 2 and 3 are not supported in a H.323 network. Whilst H.225.0 contains User Data to carry the UUS signalling, there is no definition of the User-to-user Service information. When the *user-to-user indicators* is received with one of the B-C, D-E, or F-G bits set to 'request, essential', the call shall be cleared by the interworking function.

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