



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Q.953

(03/93)

DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 1 STAGE 3 DESCRIPTION FOR SUPPLEMENTARY SERVICES USING DSS 1

STAGE 3 DESCRIPTION FOR CALL COMPLETION SUPPLEMENTARY SERVICES USING DSS 1 CLAUSE 2: CALL HOLD

ITU-T Recommendation Q.953

(Previously "CCITT Recommendation")

FOREWORD

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

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

ITU-T Recommendation Q.953, clause 2, was prepared by the ITU-T Study Group XI (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms “CCITT, CCIR or IFRB” or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

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

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STAGE 3 DESCRIPTION FOR CALL COMPLETION SUPPLEMENTARY SERVICES USING DSS 1

(Helsinki 1993)

2 Call Hold

2.1 Definition

This clause provides the Stage 3 description to be applied to the ISDN access for the Call Hold supplementary service.

The Stage 1 description, i.e. the service description as seen from the user, can be found in Recommendation I.253.2.

The Stage 2 description, i.e. the information flows for the service, can be found in 2/Q.83.

Only functional protocols (based upon procedures from 6.2/Q.932 and messages from 7/Q.932 are addressed.

A B-channel may or may not be reserved after a communication is interrupted by a call hold to allow the origination or possible completion of other calls. B-channel reservation is provided by the service provider as a user defined subscription option.

The Call Hold supplementary service includes the retrieve function that re-establishes communication on a B-channel between the served ISDN user and the held party.

2.2 Description

2.2.1 General description

When the Call Hold supplementary service is invoked, communication on a B-channel is interrupted, the B-channel is released and depending on a user subscription option, a B-channel is reserved for use by the given terminal used to invoke the Call Hold service.

When a user (as identified by a CEI) places a call on hold and reservation applies, the network shall attempt to have a B-channel available on that user's interface for the user to retrieve that call from hold; or set-up, retrieve, or connect to another call. One B-channel shall be kept available for the user as long as the user has

- i) one or more calls on hold with reservation; and
- ii) is not currently connected to any other call.

That is, the network shall not reserve more than one B-channel for a user, regardless of how a user is defined (e.g. as identified by a CEI).

When the served user wishes to re-establish communications with a held call, the retrieve function is requested. The success of the retrieve function depends upon whether or not a B-channel was reserved, and whether a B-channel is currently available to the served user.

2.2.2 Specific terminology

Figure 2-1 below shows a model of the Functional Entities (FEs) that may be involved in holding a call. The model presented is consistent with Stage 2 work that defines FEs and scenarios for information flows between FEs.



FIGURE 2-1/Q.953

Call hold model

The model in Figure 2-1 is used as follows:

- 1) *User A* – This is an ISDN TE that is connected to an ISDN service provider A. User A is a terminal where a party invokes the Call Hold service.
- 2) *Service provider A* – Service provider A is the ISDN connection between user A and either an NT2 or a public ISDN which is capable of supporting ISDN Call Hold supplementary service requests from user A.
- 3) *Network B* – The “network” connection for user B. Network B may or may not be an ISDN network.
- 4) *User B* – This is a terminal involved in a call with user A who is to be held. If user A initiated a call to user B, then the call must be in at least the Outgoing Call Proceeding state (U3) before user A can successfully invoke the Call Hold supplementary service.

User B does not have to be in an ISDN network for user A to be able to invoke the ISDN Call Hold supplementary service. This Recommendation describes the optional notification information that may be delivered to user B when user B is also an ISDN TE.

Service provider A may be the same as network B if user A and user B are both served by service provider A. The “networks” shown in Figure 2-1 may be either public or private networks or combinations thereof.

The processing of operations of the Call Hold supplementary service is local between user A and service provider A. Network B and user B are relevant in the above model only for the optional notification to user B that the A-B call has either been placed on hold or been retrieved. It is thus not necessary for either network B or user B to support the Call Hold supplementary service: it is only necessary that service provider A support the Call Hold supplementary service and for user A to have subscribed to the service.

2.2.3 Qualifications on the applicability to telecommunication services

The Call Hold supplementary service may be supplied with the services as identified in 2.3.

2.2.4 State definitions

The call states, as defined in Recommendation Q.931, shall be utilized in the operation of Call Hold supplementary service, as appropriate.

Additionally, the six auxiliary states for this service shall be utilized as identified in 6/Q.932 as applicable.

Table 2-1 shows the states which shall be used on the user side and network side for the HOLD supplementary service. These states are specified for the purpose of the protocol definition; the states need not be provided in an implementation.

2.3 Operation requirements

2.3.1 Provision/withdrawal

2.3.1.1 Network option

As a network option, the Call Hold supplementary service shall be valid after transmitting the call proceeding message.

TABLE 2-1/Q.953

States for the HOLD supplementary service

	User A states
HOLD Idle	The HOLD supplementary service has not been activated.
HOLD Hold Requested	The call hold part of the HOLD supplementary service has been requested by the user.
HOLD Call Held	The HOLD supplementary service has been activated.
HOLD Retrieve Requested	The call retrieve part of the HOLD supplementary service has been requested by the user.
	Network states
HOLD Idle	The HOLD supplementary service has not been activated.
HOLD Call Held	The HOLD supplementary service has been activated.

For the operation of the Call Hold supplementary service, the network shall

- 1) reserve a B-channel when the user subscribes to the reservation option;
- 2) when a B-channel has been reserved, always keep a B-channel available for
 - i) the retrieval of a held call;
 - ii) use with an incoming call; or
 - iii) use with an outgoing call, if the user has subscribed to the reservation option;
- 3) reserve one B-channel for a user when there are one or more calls on hold; and
- 4) optionally provide remote notification of call holds and retrievals by either of the notification options as described in 2.5.2.1.

2.3.1.2 Terminal subscription

A user, as identified by a terminal, has the choice of the following option for the Call Hold supplementary service:

- 1) Reservation option, meaning reservation of a B-channel when a call is placed on hold (yes/no).

2.3.2 Requirements on the originating network side

Not applicable.

2.3.3 Requirements at the terminating network side

Not applicable.

2.4 Coding requirements

The hold and retrieve family of messages that will be used for the invocation and control of the Call Hold supplementary service, as defined in 7.1/Q.932, follows:

- 1) HOLD
- 2) HOLD ACKNOWLEDGE
- 3) HOLD REJECT
- 4) RETRIEVE
- 5) RETRIEVE ACKNOWLEDGE
- 6) RETRIEVE REJECT

The codepoints of the notification information element, as defined in Recommendation Q.932, shall be utilized in the Call Hold supplementary service operation, as appropriate.