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Digitalno omrežje z integriranimi storitvami (ISDN) - Dopolnilna storitev: zadržanje klica (HOLD) - Protokol digitalne naročniške signalizacije št. 1 (DSS1) - 1. del: Specifikacija protokola

Integrated Services Digital Network (ISDN); Call Hold (HOLD) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Signalling Protocols and Switching (SPS).

The present document is part 1 of a multi-part standard covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Call Hold (HOLD) supplementary service, as described below:

Part 1: "Protocol specification";

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";

Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user";

Part 5: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network";

Part 6: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network".

In accordance with CCITT Recommendation I.130, the following three level structure is used to describe the supplementary telecommunication services as provided by European public telecommunications operators under the pan-European Integrated Services Digital Network (ISDN):

- Stage 1: is an overall service description, from the user's stand-point;
- Stage 2: identifies the functional capabilities and information flows needed to support the service described in stage 1; and
- Stage 3: defines the signalling system protocols and switching functions needed to implement the service described in stage 1.

The present document details stage 3 aspects (signalling system protocols and switching functions) needed to support the Call Hold (HOLD) supplementary service. The stage 1 and stage 2 aspects are detailed in ETS 300 139 and ETS 300 140, respectively.

The present version updates the references to the basic call specifications.

National transposition dates	
Date of adoption of this EN:	19 June 1998
Date of latest announcement of this EN (doa):	30 September 1998
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 1999
Date of withdrawal of any conflicting National Standard (dow):	31 March 1999

1 Scope

This first part of EN 300 141 specifies the stage three of the Call Hold supplementary (HOLD) supplementary service for the pan-European Integrated Services Digital Network (ISDN) as provided by European public telecommunications operators at the T reference point or coincident S and T reference point (as defined in CCITT Recommendation I.411 [1]) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunications service (see CCITT Recommendation I.130 [2]).

In addition the present document specifies the protocol requirements at the T reference point where the service is provided to the user via a private ISDN.

The present document does not specify the additional protocol requirements where the service is provided to the user via a telecommunications network that is not an ISDN.

The HOLD supplementary service allows a user to interrupt communications on an existing call and then subsequently, if desired, re-establish communications.

The HOLD supplementary service is applicable to all circuit-switched telecommunication services.

Further parts of the present document specify the method of testing required to identify conformance to the present document.

The present document is applicable to equipment, supporting the HOLD supplementary service, to be attached at either side of a T reference point or coincident S and T reference point when used as an access to the public ISDN.

2 Normative references

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] CCITT Recommendation I.411 (1988): "ISDN user-network interfaces - Reference configurations".

[2] CCITT Recommendation I.130 (1988): "Method for the characterisation of telecommunication services supported by an ISDN and network capabilities of an ISDN".

[3] CCITT Recommendation I.112: "Vocabulary of terms for ISDNs".

[4] EN 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

[5] EN 300 196-1: "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[6] EN 300 195-1: "Integrated Services Digital Network (ISDN); Supplementary service interactions; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[7] CCITT Recommendation Z.100 1988): "Functional Specification and Description Language (SDL)".

[8] CCITT Recommendation I.210: "Principles of telecommunication services supported by an ISDN and the means to describe them".

3 Definitions

For the purposes of the present document, the following definitions apply:

basic service: A bearer service or teleservice. The terms bearer service and teleservice are defined in CCITT Recommendation I.112 [3], § 2.2, definitions 202 and 203, respectively.

Integrated Services Digital Network (ISDN): See CCITT Recommendation I.112 [3], § 2.3, definition 308.

network: The DSS1 protocol entity at the network side of the user-network interface.

service; telecommunication service: See CCITT Recommendation I.112 [3], § 2.2, definition 201.

supplementary service: See CCITT Recommendation I.210 [8], § 2.4.

user A: The user which invokes the HOLD supplementary service for a given call. User A is the served user.

user B: The user engaged in the given call with user A. User B is the non-served user.

user: The DSS1 protocol entity at the user side of the user-network interface.

4 Abbreviations

For the purposes of the present document, the following abbreviations apply:

DSS1	Digital Subscriber Signalling System No. one
HOLD	Call Hold
ISDN	Integrated Services Digital Network

5 Description

When the HOLD supplementary service is invoked, communication on a B-channel shall be interrupted, the B-channel shall be released, a B-channel shall be reserved by the network for subsequent reuse by user A.

6 Operational requirements

6.1 Provision and withdrawal

The HOLD supplementary service may be available by prior arrangement with the service provider or it may be generally available. Withdrawal shall be at the request of the customer or for administrative reasons.

NOTE: As the HOLD supplementary service can often be used together with other supplementary services (e.g. call transfer and three party supplementary services) a service provider may choose to make the subscription to the HOLD supplementary service implied by the subscription of these supplementary services.

6.2 Requirements on the originating network side

Not applicable.

6.3 Requirements on the destination network side

Not applicable.

7 Coding requirements

The HOLD and RETRIEVE family of messages that shall be used for the invocation and control of the HOLD supplementary service, as defined in subclause 11.1.1 of EN 300 196-1 [5], are as follows:

- HOLD;
- HOLD ACKNOWLEDGE;
- HOLD REJECT;
- RETRIEVE;
- RETRIEVE ACKNOWLEDGE;
- RETRIEVE REJECT.

Table 1 contains the additional codepoints for the HOLD supplementary service which shall be employed in octet 3 of the Notification indicator information element (to be conveyed in the NOTIFY message) for remote hold and remote retrieval.

Table 1: Additional codepoints in the Notification indicator information element

Bits	
7 6 5 4 3 2 1	**Meaning**
1 1 1 1 0 0 1	Remote hold
1 1 1 1 0 1 0	Remote retrieval

8 State definitions

The call states, as defined in EN 300 403-1 [4], subclause 2.1, shall be utilised in the HOLD supplementary service operation, as appropriate.

The auxiliary states to support the Hold function and the Retrieve function, as defined in EN 300 196-1 [5], subclause 7.1.2, shall be used.

Table 2 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.

Table 2: 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.

9 Signalling procedures at the coincident S and T reference point

User A at the originating side can hold a call in the Active state (U10) (after receiving the CONNECT message) and additionally, as a network option, in the Call Delivered state (U4) (after receiving the ALERTING message). User A shall check the call states accordingly. User A shall not request to hold a call in any other state.

User A at the destination side can hold a call in the Active state (U10) (after receiving the CONNECT ACKNOWLEDGE message). User A shall check the call states accordingly. User A shall not request to hold a call in any other state.

A call can be retrieved after being held, i.e. communication on a B-channel between user A and user B can be re-established.

9.1 Holding a call - procedures at the interface of user A

9.1.1 Normal operation

User A shall initiate the call hold part of the HOLD supplementary service by requesting the Hold function according to subclauses 7.2.1.1, 7.2.2.1 and 7.3 of EN 300 196-1 [5], utilising the call reference indicating the call for which the HOLD supplementary service is to apply.

The network, on receipt of the Hold function request shall:

- check whether the basic service is valid;
- check whether there is a valid user subscription for the HOLD supplementary service; and
- check whether the network is in the Active state (N10) or as a network option in the Call Delivered state (N4).

If the checks are successful, the network shall perform the Hold function.

On performing the Hold function, the implicit channel reservation function defined in subclause 10.1.1 of EN 300 196-1 [5] shall be used.

NOTE: The implicit channel reservation function is regarded as the normal reservation function. Instead of the implicit channel reservation function the explicit channel reservation function can be used as defined in subclause 10.1.2 of EN 300 196-1 [5]. The explicit channel reservation function is optional for both the user and the network and its application is subject to a bilateral agreement between the subscriber and the network provider.

Subsequent basic call procedures, and use of the Hold function and the Retrieve function, may also require operation of the reservation procedures of the Reservation function.

9.1.2 Exceptional procedures

Failure of the call hold part of the HOLD supplementary service shall be indicated by rejection of the Hold function request. Table 3 shows the cause values which shall be used in the Cause information element in a HOLD REJECT message, in addition to those specified in subclauses 7.2.1.2 and 7.2.2.2 of EN 300 196-1 [5].