SLOVENSKI STANDARD
SIST EN 300 286-1 V1.2.4:2005

01-april-2005

8][ ]HˇU bc ˙ca f Yÿ Y n]bhY[f]f U b a]ˇg hcf]hj U a]ˇf G8 BŁ ˙8 cdc b]ˇb U ˇg hcf]hj .
a YXi dcf U V b]ý _U ˇg][b U]n U Y U f I I GŁ ˙Dfchc _c X][ ]HˇU bY ˇb U c b]ý _Y g][b U]n U Y
ý H %fBGG%Ł %XY ˙GdYˇj_U Y dfchc _c U

Integrated Services Digital Network (ISDN); User-to-User Signalling (UUS) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification

Ta slovenski standard je istoveten z: **EN 300 286-1 Version 1.2.4**

ICS:

33.080	Digitalno omrežje z integriranimi storitvami (ISDN)	Integrated Services Digital Network (ISDN)

SIST EN 300 286-1 V1.2.4:2005   **en**

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EN 300 286-1 V1.2.4 (1998-06)

European Standard (Telecommunications series)

Integrated Services Digital Network (ISDN);
User-to-User Signalling (UUS) supplementary service;
Digital Subscriber Signalling System No. one (DSS1) protocol;
Part 1: Protocol specification

ETSI

Reference

REN/SPS-05145-T-1 (2nc90iqo.PDF)

Keywords

ISDN, UUS, DSS1, supplementary service

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Contents

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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) User-to-User Signalling (UUS) 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 ISDN:

- Stage 1: is an overall service description, from the user's standpoint;

- 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 the stage 3 aspects (signalling system protocols and switching functions) needed to support the UUS supplementary service. The stage 1 and stage 2 aspects are detailed in ETS 300 284 and ETR 285, 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

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1   Scope

This first part of EN 300 286 specifies the stage three of the User-to-User Signalling (UUS) 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 ITU-T Recommendation I.411 [4]) 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 telecommunication 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 telecommunication network that is not an ISDN.

The UUS supplementary service enables a user to send/receive a limited amount of information to/from another user over the signalling channel in association with a call to the other user.

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

Further parts of EN 300 286 specify the method of testing required to identify conformance to the present document.

The present document is applicable to equipment supporting the UUS supplementary service to be attached at either side of a T reference point or coincident S and T reference points 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]   ITU-T Recommendation I.112: "Vocabulary of terms for ISDNs".

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

   [3]   ITU-T Recommendation I.210: "Principles of telecommunication services supported by an ISDN and the means to describe them".

   [4]   ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - Reference configurations".

   [5]   CCITT Recommendation X.25 (1988): "Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit".

   [6]   CCITT Recommendation X.208 (1988): "Specification of Abstract Syntax Notation One (ASN.1)".

   [7]   CCITT Recommendation X.219 (1988): "Remote Operations: Model, Notation and Service definitions".

   [8]   CCITT Recommendation X.244 (1988): "Procedure for exchange of protocol identification during virtual call establishment on packet switched public data networks".

[9]   CCITT Recommendation Z.100 (1988): "Specification and description language (SDL)".

[10]   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]".

[11]   EN 300 403-2: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System
               No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 2:
               Specification and Description Language (SDL) diagrams".

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

[13]   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".

3   Definitions

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

call control message: A message as defined in EN 300 403-1 [10], subclause 3.1, which on sending or receipt causes a change of the call state at either the network or the user. Call control messages also include the PROGRESS message but not the INFORMATION message.

NOTE: For the purposes of other standards, the information message may be considered as a call control message.

called network: The network to which the called user is attached.

called user: A user that receives a call request which may include a request of the UUS supplementary service.

calling network: The network to which the calling user is attached.

calling user: A user that initiates a call and may include a request of the UUS supplementary service in the call request.

contention: Contention exists when the called user has a point-to-multipoint arrangement and multiple responses to an incoming call are sent to the network. These responses may carry different information related to the UUS supplementary service.

explicit request: An explicit request of a UUS supplementary service is one where the request is explicitly identified by including a Facility information element with an appropriate component in either the SETUP or FACILITY message sent by the served user. The explicit request requires an explicit response (acceptance or rejection).

explicit service 1: Service 1 explicitly requested.

implicit request: An implicit request of a UUS supplementary service is one where the request is implicitly identified by including a User-user information element in the SETUP message sent by the served user.

implicit service 1: Service 1 implicitly requested.

Integrated Services Digital Network (ISDN): See ITU-T Recommendation I.112 [1], definition 308.

invoke component: See EN 300 196-1 [13], subclause 8.2.2.1. Where reference is made to an "xxxx" invoke component, an invoke component is meant with its operation value set to the value of the operation "xxxx".

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

point-to-multipoint arrangement: In the context of the present document, a point-to-multipoint arrangement exists at the called user's interface, if the network has the knowledge that the point-to-multipoint layer 3 procedures shall be applied at the called user's interface. Consequently, responses from more than one terminal are accepted in case of an incoming call.

point-to-point arrangement: In the context of this standard, a point-to-point arrangement exists at the called user's interface, if the network has the knowledge that the point-to-point layer 3 procedures shall be applied at the called user's interface. Consequently, a response from only one user is accepted in case of an incoming call.

preferred request: A preferred request of a UUS supplementary service is one where the call setup shall continue even if the request for the UUS supplementary service cannot be accepted.

premature clearing: The calling or called user initiates call clearing before the call has reached the Active (N10, U10) call state.

receiving network: The network to which the receiving user is attached.

receiving user: The user receiving USER INFORMATION messages as part of service 2 or 3.

reject component: See EN 300 196-1 [13], subclause 8.2.2.4.

remote network: The network to which the remote user is attached.

remote user: The user who receives a request for service 3 in the Active (U10) call state.

required request: A required request of a UUS supplementary service is one where the call setup shall be rejected if the request for the UUS supplementary service cannot be accepted.

requesting network: The network to which the requesting user is attached.

requesting user: The user who sends a request for the UUS supplementary service 3 in the Active (U10) call state.

return error component: See EN 300 196-1 [13], subclause 8.2.2.3. Where reference is made to an "xxxx" return error component, a return error component is meant which is related to an "xxxx" invoke component".

return result component: See EN 300 196-1 [13], subclause 8.2.2.2. Where reference is made to an "xxxx" return result component, a return result component is meant which is related to an "xxxx" invoke component".

sending network: The network to which the sending user is attached.

sending user: The user sending USER INFORMATION messages as part of service 2 or 3.

served user: The user who is the requester of the UUS supplementary service. For service 1 and service 2, the served user is always at the originating side. For service 3, the served user may be at the originating or the destination side.

service; telecommunication service: See ITU-T Recommendation I.112 [1], definition 201.

service 1: A form of the UUS supplementary service where UUI can be sent and received as part of call control messages for originating and terminating calls.

service 2: A form of the UUS supplementary service where UUI can be sent and received independently of call control messages in the alerting phase of a call.

service 3: A form of the UUS supplementary service where UUI can be sent and received independently of call control messages once the connection has been established.

supplementary service: See ITU-T Recommendation I.210 [3], subclause 2.4.

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

user information: The information contained in octet 4 and onwards of the User-user information element.

User-To-User Information (UUI): The information transferred between users in the User-user information element by the UUS supplementary service.

4 Abbreviations

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

ASN.1	Abstract Syntax Notation one
DSS1	Digital Subscriber Signalling System No. one
ISDN	Integrated Services Digital Network
SDL	Specification and Description Language

UUI   User-to-User Information
UUS   User-to-User Signalling

5   Description

The UUS supplementary service enables a user to send/receive a limited amount of user-generated information (i.e. the User-user information element and, in addition for services 2 and 3, the More data information element) to/from another user. This information shall be passed transparently (i.e. without modification of content) through the network over the signalling channel in association with the call. The network shall not interpret or act upon this information.

The information is contained in either call control messages or in separate USER INFORMATION messages. The amount of information (i.e. the User-user information element content) is limited to 128 octets per message.

NOTE: During an interim period of time, some networks may support only the transfer of 32 octets of UUI per message on service 1.

Within the UUS supplementary service three different services may be provided by the network:

-    service 1: exchange of user-to-user information between users during the setup and clearing phases of a call, within call control messages;

-    service 2: exchange of user-to-user information between users in the alerting phase of a call, within USER INFORMATION messages;

-    service 3: exchange of user-to-user information between users in the active phase of a call, within USER INFORMATION messages.

Services 1, 2 and 3 may be used individually or in any combination in association with a single call.

Services 1, 2 and 3 are requested by the calling user. As a network option, service 3 can be requested by the called user during the active phase of a call.

Service 1 may be requested either implicitly or explicitly. Services 2 and 3 are always requested explicitly. Networks supporting the UUS supplementary service 1 shall support at least the service 1 implicitly requested.

In case of explicit request, the calling user shall, at call setup, specify whether the requested UUS supplementary service(s) is(are) required or preferred for the call (required request/preferred request).

The UUS supplementary service can be used in conjunction with the videotelephony teleservice. For videotelephony calls involving two connections, the procedures in the present document for activation and invocation (including flow control) apply independently for each connection.

5.1   Service 1

For this service, both users may exchange UUI during the setup and the clearing phases of a call by including UUI in basic call control messages.

In addition, if a point-to-multipoint arrangement exists at the called user's interface, the following applies:

-    in the network-to-called-user direction: in case of premature clearing by the calling user, UUI shall, if provided in the clearing request, be delivered to all terminals having confirmed the call at this time;

-    in the called user-to-network direction: if UUI is sent in the alerting indication, it is up to the called user to avoid contention. In case the call is cleared by the called user before the active phase by means of multiple clearing messages, the UUI (if any) received together with the selected rejection cause shall be sent to the calling user.

5.2   Service 2

For this service, both users may send UUI after the alerting indication has been sent/received and until the connect indication has been sent/received. As a network option, the network can deliver the UUI to the called user after the connection has been established.

The UUI is sent in USER INFORMATION messages and is limited to two messages in each direction.

Service 2 is only applicable if a point-to-point arrangement exists at the called user's interface.

5.3 Service 3

For this service, both users may send UUI in the active phase of a call using USER INFORMATION messages.

The network shall provide flow control limiting the number of messages exchanged in a certain period of time. The flow control of each direction shall be operated independently.

6 Operational requirements

6.1 Provision and withdrawal

The UUS supplementary service shall be provided to the user after prior arrangement with the network. No subscription is required for the remote user.

As a network option, one or any combination of the following possibilities can be provided separately or globally:

- service 1 implicit, or service 1 implicit together with service 1 explicit;

- service 2;

- service 3.

The UUS supplementary service shall be withdrawn by the network upon request of the subscriber or for network reasons.

As a network option, withdrawal can be done separately per service provided, or globally for all services provided to the served user.

6.2 Requirements on the originating network side

The originating network shall be able to receive UUI from the user and convey it towards the destination network; and to receive UUI from the destination network and convey it to the user.

For services 2 and 3, the network shall control the flow of UUI received from the local user.

The originating network shall check that the service has been activated; otherwise appropriate error handling shall take place.

6.3 Requirements on the destination network side

For the destination network the same requirements apply as for the originating network side.

7 Coding requirements

7.1 Coding of the Facility information element component

Table 1 shows the definition of the operation and errors required for the UUS supplementary service using ASN.1 as defined in CCITT Recommendation X.208 [6] and using the OPERATION and ERROR macro as defined in figure 4/X.219 of CCITT Recommendation X.219 [7].

The formal definition of the component types to encode these operations and errors is provided in EN 300 196-1 [13], annex D, subclause D.1.

The inclusion of components in Facility information elements is defined in EN 300 196-1 [13], subclause 11.2.2.1.

All components (invoke, return result, return error and reject) shall be included within a Facility information element. This Facility information element may be included in any appropriate message as specified in EN 300 196-1 [13], subclause 8.3.1.1, unless a more restrictive specification is given in clause 9.

Table 1: Operation and error definitions for the UUS supplementary service

```
User-To-User-Signalling-Operations {ccitt identified-organization etsi(0) 286
                                operations-and-errors(1)}

DEFINITIONS ::=
BEGIN

EXPORTS              UserUserService, RejectedByUser, RejectedByNetwork, Service, Preferred;

IMPORTS              OPERATION, ERROR
                     FROM Remote-Operation-Notation
                        {joint-iso-ccitt remote-operations(4) notation (0)};

UserUserService      ::= OPERATION
                            ARGUMENT SEQUENCE {
                                        [1] IMPLICIT Service,
                                        [2] IMPLICIT Preferred}
                            RESULT
                            ERRORS {rejectedByUser, rejectedByNetwork}
Service              ::= INTEGER {
                            service1 (1),
                            service2 (2),
                            service3 (3)}
                            (1..3)
Preferred            ::= BOOLEAN     -- True  = preferred request
                                     -- False = required request
RejectedByNetwork    ::= ERROR
RejectedByUser       ::= ERROR

userUserService UserUserService     ::= 1
rejectedByNetwork RejectedByNetwork ::= 1
rejectedByUser RejectedByUser       ::= 2

END -- of User-To-User-Signalling-Operations
```

7.2   Definition of messages

This subclause gives the message structure for the messages used in the UUS supplementary service. The general definition of the message structure and the key to the interpretation can be found in EN 300 403-1 [10], clause 3.

7.2.1   CONGESTION CONTROL

This message is sent by the network to indicate the establishment or termination of flow control on the transmission of USER INFORMATION messages. See table 2.

Table 2: Congestion control message content

Message type: CONGESTION CONTROL
Message type value: 01111001
Significance: local
Direction: network-to-user

Information Element	Reference	Direction	Type	Length
Protocol discriminator	4.2/EN 300 403-1	n → u	M	1
Call reference	4.3/EN 300 403-1	n → u	M	2 - 3
Message type	4.4/EN 300 403-1	n → u	M	1
Congestion level	7.3.1	n → u	M	1
Cause	4.5/EN 300 403-1	n → u	O (note 1)	2 - 32
Display	4.5/EN 300 403-1	n → u	O (note 2)	2 - 82
NOTE 1: Included if user-to-user information has been discarded as a result of flow control.				
NOTE 2: Included if the network provides information that can be presented to the user.				

7.2.2 USER INFORMATION

This message is sent by the user to the network to transfer information to the remote user. This message is also sent by the network to the user to deliver information from the other user. See table 3.

Table 3: User information

Message type: USER INFORMATION
Message type value: 0010 0000
Significance: access
Direction: both

Information Element	Reference	Direction	Type	Length
Protocol discriminator	4.2/EN 300 403-1	both	M	1
Call reference	4.3/EN 300 403-1	both	M	2 - 3
Message type	4.4/EN 300 403-1	both	M	1
More data	7.3.2	both	O (note)	1
User-user	7.3.3	both	M	3 - 131
NOTE: Included by the sending user to indicate that another USER INFORMATION message pertaining to the same message block will follow.				

7.3 Definition of information elements

This subclause gives the coding for the information elements used in the UUS supplementary service. The general definition of the information element structure can be found in EN 300 403-1 [10], clause 4.

7.3.1 Congestion level

The purpose of the Congestion level information element is to describe the congestion status of the call. It is a single octet information element coded as shown in figure 1 and table 4.

8	7	6	5	4	3	2	1	Octet
		Congestion level						
1	0	1	1		Congestion level			1
	Information element identifier							

Figure 1: Congestion level information element

Table 4: Congestion level information element

Congestion level (octet 1)
Bits
4 3 2 1
0 0 0 0   receiver ready
1 1 1 1   receiver not ready
All other values are reserved.

7.3.2 More data

The More data information element is sent by the user to the network in a USER INFORMATION message, and delivered by the network to the destination user in the corresponding USER INFORMATION message. The presence of the More data information element indicates to the destination user that another USER INFORMATION message will follow, containing information belonging to the same block.

The use of the More data information element is not supervised by the network.

The More data information element is coded as shown in figure 2.