

Public Switched Telephone Network (PSTN); Selection of a specific terminal or terminal function



Reference

DTR/ATA-002003 (jcc00ics.PDF)

Keywords

PSTN, protocol, service, MSN

ETSI

Postal address

F-06921 Sophia Antipolis Cedex - FRANCE

Office address

650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16
Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Internet

secretariat@etsi.fr
Individual copies of this ETSI deliverable
can be downloaded from
<http://www.etsi.org>
If you find errors in the present document, send your
comment to: editor@etsi.fr

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 1998.
All rights reserved.

Contents

Intellectual Property Rights.....	5
Foreword	5
1 Scope.....	6
2 References.....	6
3 Definitions.....	6
4 Abbreviations.....	7
5 Multiple Subscriber Number (MSN) service description	7
5.1 Description.....	7
5.2 Procedures	7
5.2.1 Provision and withdrawal.....	7
5.2.2 Normal procedures	7
5.2.2.1 Activation, deactivation and registration	7
5.2.2.2 Erasure.....	7
5.2.2.3 Invocation and operation	8
5.2.2.4 Interrogation	8
5.2.3 Exceptional procedures	8
5.2.3.1 Activation, deactivation and registration	8
5.2.3.2 Erasure.....	8
5.2.3.3 Invocation and operation	8
5.2.3.4 Interrogation	8
5.3 Interactions with other supplementary services.....	8
5.3.1 Advice of charge services.....	8
5.3.1.1 Charging information at call set-up time.....	8
5.3.1.2 Charging information during the call.....	8
5.3.1.3 Charging information at the end of the call	8
5.3.2 Call waiting	9
5.3.3 Number identification services.....	9
5.3.3.1 Calling line identification presentation	9
5.3.3.2 Calling line identification restriction	9
5.3.3.3 Completion of calls to busy subscriber.....	9
5.3.4 Diversion services	9
5.3.4.1 Call forwarding unconditional	9
5.3.4.2 Call forwarding busy	9
5.3.4.3 Call forwarding no reply.....	9
5.3.5 Freephone.....	9
5.3.6 Malicious call identification.....	10
5.3.7 Multiple Subscriber Number	10
5.3.8 Subaddressing	10
5.3.9 Connection Type Service	10
5.3.10 Three party	10
5.3.11 Message Waiting Indication.....	10
6 SUBaddressing (SUB) service description	10
6.1 Description.....	10
6.1.1 Size of subaddress	10
6.1.2 Size limitations of subaddress	10
6.2 Procedures	11
6.2.1 Provision and withdrawal.....	11
6.2.1.1 Calling subscriber.....	11
6.2.1.2 Called subscriber	11
6.2.2 Normal procedures.....	11
6.2.2.1 Activation, deactivation and registration	11

6.2.2.2	Erasure.....	11
6.2.2.3	Invocation and operation	11
6.2.2.3.1	Calling user side.....	11
6.2.2.3.2	Called user side.....	11
6.2.2.4	Interrogation	12
6.2.3	Exceptional procedures	12
6.2.3.1	Activation, deactivation and registration	12
6.2.3.2	Erasure.....	12
6.2.3.3	Invocation and operation	12
6.2.3.4	Interrogation	12
6.3	Terminal assignment.....	12
6.4	Intercommunication considerations	12
6.4.1	Interworking with non-PSTNs.....	12
6.5	Interaction with other supplementary services	12
6.5.1	Advice of charge services.....	12
6.5.1.1	Charge advice at call set-up.....	12
6.5.1.2	Charge advice during the call	13
6.5.1.3	Charge advice at the end of a call.....	13
6.5.2	Call waiting	13
6.5.3	Number identification services.....	13
6.5.3.1	Calling line identification presentation	13
6.5.3.2	Calling line identification restriction	13
6.5.4	Completion of calls to busy subscriber.....	13
6.5.5	Diversion services	13
6.5.5.1	Call forwarding unconditional	13
6.5.5.2	Call forwarding busy	13
6.5.5.3	Call forwarding no reply.....	13
6.5.6	Freephone.....	13
6.5.7	Malicious call identification.....	13
6.5.8	Multiple Subscriber Number.....	13
6.5.9	Subaddressing	14
6.5.10	Connection Type Service	14
6.5.11	Three party	14
6.5.12	Message Waiting Indication.....	14
7	Connection Type Service (CTS) service description.....	14
7.1	Description.....	14
7.2	Procedures	14
7.2.1	Provision and withdrawal.....	14
7.2.2	Normal procedures	14
7.2.2.1	Registration and erasure	14
7.2.2.2	Activation and deactivation	14
7.2.2.3	Invocation and operation	15
7.2.2.3.1	Calling user side.....	15
7.2.2.3.2	Called user side.....	15
7.2.2.4	Interrogation	15
7.2.3	Exceptional procedures	15
7.2.3.1	Registration and erasure	15
7.2.3.2	Activation and deactivation	15
7.2.3.3	Invocation and operation	15
7.2.3.4	Interrogation	15
7.3	Terminal assignment.....	15
Annex A (informative): Parameter coding.....		16
History		17

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available **free of charge** from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://www.etsi.org/ipr>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Technical Report (TR) has been produced by ETSI Project Analogue Terminals and Access (ATA).

The present document proposes some enhancements for the subscriber line protocol over the local loop to support selection of a specific terminal. The protocol is defined in ETS 300 659.

1 Scope

The present document defines some enhancements of the subscriber line protocol over the local loop to support selection of specific terminal(s) or specific function(s) on the same access.

The TEs at the subscriber premises shall react in appropriate ways depending on the received information.

The purpose of the present document is to specify the data link message and parameter coding required for new PSTN services, such as "Multiple Subscriber Number", "Subaddressing" and "Connection Type Service".

The present document includes service descriptions of the above mentioned services.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, subsequent revisions do apply.
- 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 T.50 (1992): "International Reference Alphabet (IRA) (Formerly International Alphabet No. 5 or IA5 - Information technology - 7 bit coded character set for information interchange".

[2] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[3] ETS 300 738: "Human Factors (HF); Minimum Man-Machine Interface (MMI) to public network based supplementary services".

[3] ETS 300 659 "Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services".

3 Definitions

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

PSTN number: a number conforming to the numbering plan and structure specified in ITU-T Recommendation E.164 [2].

Basic Call (procedure): the procedures by which a call (as an instance of a basic telecommunication service) is established and terminated.

Multiple Subscriber Number: service that provides the possibility to assign more than one PSTN number to a single PSTN access.

4 Abbreviations

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

CTS	Connection Type Service
MALSAN	Maximum Authorised Length of Subaddress Accepted by Network
MSN	Multiple Subscriber Number
PSTN	Public Switched Telephone Network
SUB	SUBaddressing
TC-HF	Technical Committee Human Factors
TE	Terminal Equipment

5 Multiple Subscriber Number (MSN) service description

5.1 Description

The Multiple Subscriber Number (MSN) supplementary service for PSTN shall apply to an analogue access.

The MSN supplementary service provides the possibility for assigning multiple numbers (not necessarily consecutive) to a single PSTN access. This enables the selection of one or more terminals attached to the same access.

The service provider shall fix the length of the numbers to be transmitted to the TE. It may comprise the least significant digit up to the full PSTN number.

The digit(s) significant for terminal differentiation shall be an integral part of the PSTN numbering scheme.

NOTE 1: More than one multiple subscriber number may be assigned to one terminal.

NOTE 2: The actual method of relating the PSTN number to a particular terminal is outside the scope of the present document.

5.2 Procedures

5.2.1 Provision and withdrawal

The MSN supplementary service shall be provided or withdrawn after prior arrangement with the service provider.

The service provider shall allocate a set of PSTN numbers (not necessarily consecutive) to one analogue line.

The maximum number of MSNs per access shall be a network option.

NOTE: The user can allocate one PSTN number to one or more terminals. Similarly, one terminal may allow the assignment of one or more than one PSTN numbers.

5.2.2 Normal procedures

5.2.2.1 Activation, deactivation and registration

Not applicable.

5.2.2.2 Erasure

Not applicable.

5.2.2.3 Invocation and operation

Call initiation procedure shall be the same as for basic calls. The calling and called user shall perceive the same completion procedures as for the basic calls.

If the called user subscribes to the MSN supplementary service, the LE shall send to the TE(s) the MSN information during call establishment.

NOTE: MSN for outgoing calls and services may be possible.

5.2.2.4 Interrogation

Not applicable.

5.2.3 Exceptional procedures

5.2.3.1 Activation, deactivation and registration

Not applicable.

5.2.3.2 Erasure

Not applicable.

5.2.3.3 Invocation and operation

Not applicable.

NOTE: In particular cases where terminals supporting the MSN supplementary service and terminals which do not are attached to the same interface, those terminals which do not support the MSN supplementary service or are not programmed will react to every incoming call.

5.2.3.4 Interrogation

Not applicable.

5.3 Interactions with other supplementary services

In case of interaction with other supplementary services, some services may, as a network option, be applicable to the individual multiple subscriber number rather than to the subscriber access.

5.3.1 Advice of charge services

5.3.1.1 Charging information at call set-up time

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

5.3.1.2 Charging information during the call

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

5.3.1.3 Charging information at the end of the call

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

5.3.2 Call waiting

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

5.3.3 Number identification services

5.3.3.1 Calling line identification presentation

If the MSN supplementary service is applicable to the public network access interface of the calling party, the network shall apply the default PSTN number of the calling party's access.

As a network operator option, the calling party may provide the appropriate calling party multiple subscriber number digits or full PSTN number on outgoing call requests. If no special arrangement has been made with the calling subscriber, then the network shall check the user provided calling party number information for validity on the corresponding access. If the check fails or if no calling number information is provided by the user, then the network shall apply the default PSTN number of the calling party's access.

If the MSN supplementary service is applicable to the public network access interface of the called party, then neither supplementary service shall affect the operation of the other supplementary service.

5.3.3.2 Calling line identification restriction

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

5.3.3.3 Completion of calls to busy subscriber

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

5.3.4 Diversion services

5.3.4.1 Call forwarding unconditional

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

When the call forwarding unconditional supplementary service applies on a per number basis, if the served user also subscribes to the MSN supplementary service, then in an activation, deactivation or interrogation request, the PSTN number to which the call forwarding unconditional supplementary service relates shall be included.

5.3.4.2 Call forwarding busy

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

When the call forwarding busy supplementary service applies on a per number basis, if the served user also subscribes to the MSN supplementary service, then in an activation, deactivation or interrogation request, the PSTN number to which the call forwarding busy supplementary service relates shall be included.

5.3.4.3 Call forwarding no reply

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

When the call forwarding no reply supplementary service applies on a per number basis, if the served user also subscribes to the MSN supplementary service, then in an activation, deactivation or interrogation request, the PSTN number to which the call forwarding no reply supplementary service relates shall be included.

5.3.5 Freephone

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

5.3.6 Malicious call identification

If the MSN supplementary service is provided to the served user of the malicious call identification supplementary service, malicious call identification invocation shall be provided either globally for the whole access or on a per multiple subscriber number basis, according to access arrangements.

5.3.7 Multiple Subscriber Number

Not applicable.

5.3.8 Subaddressing

Not applicable. The two services shall not be provided together.

5.3.9 Connection Type Service

Not applicable. The two services shall not be provided together.

5.3.10 Three party

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

5.3.11 Message Waiting Indication

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

6 SUBAddressing (SUB) service description

6.1 Description

The SUB supplementary service allows the called (served) user to expand his addressing capacity beyond the one given by the PSTN number. Only the served user shall define the significance of a subaddress, enabling the selection of a specific terminal or function.

Terminals on the same line are able to decide by themselves if and how to react depending on the received SUB information.

A subaddress, if inserted by a calling user, shall be delivered unchanged to the called analogue line.

The SUB information transmission takes place at call presentation.

6.1.1 Size of subaddress

The maximum size of the subaddress is 20 octets.

6.1.2 Size limitations of subaddress

Within certain networks or between certain networks, the size of a subaddress can be limited.

6.2 Procedures

6.2.1 Provision and withdrawal

6.2.1.1 Calling subscriber

For the calling subscriber, provision shall be without any prior arrangement with the service provider.

6.2.1.2 Called subscriber

For the called subscriber, provision may be general without any prior arrangement or by prior arrangement with the service provider.

Withdrawal shall be done by the service provider at the subscriber's request or for administrative reasons.

6.2.2 Normal procedures

6.2.2.1 Activation, deactivation and registration

Not applicable.

6.2.2.2 Erasure

Not applicable.

6.2.2.3 Invocation and operation

Subaddress information can be provided by the calling user in the call set-up phase. The SUB supplementary service shall be invoked when subaddress information is sent from the network to the called (served) user.

6.2.2.3.1 Calling user side

During the call-set up phase the calling user can insert the destination subaddress information which shall then be transported transparently by the network from the originating terminal to the destination terminal.

The invocation procedure for the SUB on the calling user side shall be "*89* SUB #". The service code "89" is defined in ETS 300 738 [3].

NOTE: With the PSTN SUB supplementary service the calling user cannot insert his own subaddress to complement the calling number identification.

6.2.2.3.2 Called user side

The subaddress that complements the called user's PSTN number shall be transferred transparently through the network and shall be sent from the destination network to the called user's terminal(s).

In the cases where the calling user does not include subaddress, the destination network shall always provide a normal call offering without subaddress information to the called user's terminal(s).

Delivery of this information from the network to the called user shall be provided during call establishment.

NOTE: If different kinds of terminals are attached to the same line, it cannot be guaranteed that the SUB supplementary service will be processed correctly in terms of terminal selection, especially in cases where terminals which support the SUB supplementary service as a terminal selection criterion and terminals which do not support this service are attached to the same line. In these cases those terminals that do not support the SUB supplementary service or are not programmed will normally react to every incoming call.

6.2.2.4 Interrogation

Not applicable.

6.2.3 Exceptional procedures

6.2.3.1 Activation, deactivation and registration

Not applicable.

6.2.3.2 Erasure

Not applicable.

6.2.3.3 Invocation and operation

If provision of the SUB supplementary service requires a prior arrangement with the service provider and if the called user has not subscribed to the SUB supplementary service, the network shall not send a called user's subaddress with the incoming call request.

The network shall discard every subaddress exceeding the MALSAN value. No indication shall be returned to the calling user.

If the subaddress cannot be transported to the called user, the calling user shall not be given an indication that this has occurred.

6.2.3.4 Interrogation

Not applicable.

6.3 Terminal assignment

Terminals that do not support the SUB supplementary service should ignore the Subaddress parameter.

Terminals that support the SUB supplementary service should compare the received SUB information with its own preselected SUB. If both SUB addresses match, the terminal shall react in an appropriate way.

6.4 Intercommunication considerations

If the subaddress cannot be transported to the called user due to different network capabilities, the calling user shall not be given an indication that this has occurred.

6.4.1 Interworking with non-PSTNs

The PSTN SUB supplementary service is compatible with the ISDN SUB supplementary service.

6.5 Interaction with other supplementary services

6.5.1 Advice of charge services

6.5.1.1 Charge advice at call set-up

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

6.5.1.2 Charge advice during the call

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

6.5.1.3 Charge advice at the end of a call

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

6.5.2 Call waiting

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

6.5.3 Number identification services

6.5.3.1 Calling line identification presentation

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

6.5.3.2 Calling line identification restriction

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

6.5.4 Completion of calls to busy subscriber

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

6.5.5 Diversion services

6.5.5.1 Call forwarding unconditional

The subaddress associated with the original called party number shall not be forwarded if the call is forwarded.

6.5.5.2 Call forwarding busy

The subaddress associated with the original called party number shall not be forwarded if the call is forwarded.

6.5.5.3 Call forwarding no reply

The subaddress associated with the original called party number is delivered to the original called party and shall not be forwarded if the call is forwarded.

6.5.6 Freephone

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

6.5.7 Malicious call identification

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

6.5.8 Multiple Subscriber Number

Not applicable. The two services shall not be provided together.

6.5.9 Subaddressing

Not applicable.

6.5.10 Connection Type Service

Not applicable. The two services shall not be provided together.

6.5.11 Three party

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

6.5.12 Message Waiting Indication

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service.

7 Connection Type Service (CTS) service description

7.1 Description

The "Connection Type Service" (CTS) supplementary service shall apply to an analogue access.

The CTS enables the calling user with the possibility of sending a Connection Type information to the called user.

The CTS provides the called user with the possibility of receiving a Connection Type information.

The network shall deliver the Connection Type information to the called user during call establishment.

With the possibility of the CTS the calling party, the subscriber or the terminal by itself, can choose the wanted CTS per call by sending a service code to the network prior the destination number.

At the called party the terminals on the same line are able to decide by themselves if and how to react depending on the received CT information.

7.2 Procedures

7.2.1 Provision and withdrawal

The CTS shall either be provided after prior arrangement with the service provider or generally available.

As a service provider option, the calling user can select a valid CTS as a default permanent value to be applied to the calling user's line or MSN.

The CTS shall be withdrawn by the service provider upon the request of the subscriber, or for service provider reasons.

7.2.2 Normal procedures

7.2.2.1 Registration and erasure

Not applicable

7.2.2.2 Activation and deactivation

Not applicable

7.2.2.3 Invocation and operation

7.2.2.3.1 Calling user side

During the call set-up the calling user can insert the CTS information which shall then be transported by the network from the calling user to the called user.

The invocation procedure for the CTS service on the calling user side shall be "*08* CTS #". The CTS codes are shown in table 7.1. The service code "08" is under study within ETSI TC-HF.

Table 7.1

Connection Type	CTS-Code
Connection Type not identified / Default CTS	0
Voice Call	1
Fax Call	2
Data Call	3
Video Call	4
Email Call	5
Telemetric Call	6
Text Call	7

7.2.2.3.2 Called user side

The network shall provide the called user with the Connection Type information.

7.2.2.4 Interrogation

Not applicable.

7.2.3 Exceptional procedures

7.2.3.1 Registration and erasure

Not applicable.

7.2.3.2 Activation and deactivation

Not applicable.

7.2.3.3 Invocation and operation

In some interworking situations in which the information is not supported by sufficient signalling capability, the called user may receive no CTS information.

If the CTS information cannot be transported to the user, the calling user shall not be given an indication that this has occurred.

7.2.3.4 Interrogation

Not applicable.

7.3 Terminal assignment

Specific TE has to be used.

Annex A (informative): Parameter coding

This annex describes the enhancements to the subscriber line protocol to support the MSN, SUB and CTS supplementary services over the PSTN.

The LE shall use the *Selection of Terminal Function* parameter, as specified in table A.1, to transmit the information related to the CTS, MSN and SUB services.

Table A.1

Octet number	Octet Binary-code	Octet Hex-code	Content
1	0100 0000	40H	Selection of Terminal Function
2	000X XXXX		Parameter length (2 to 21)
3	0000 0001 0000 0010 0000 0011	01H 02H 03H	Connection Type Service (CTS) Multiple Subscriber Number (MSN) Subaddress (SUB)
4			Connection Type code or MSN digit 1 or SUB digit 1
...
n+3	00XX XXXX		Digit n

Connection Type codes are defined in Table A.2

MSN and SUB digits (0 to 9) shall be coded according to CCITT Recommendation T.50 [1].

Table A.2

Octet Binary-code	Octet Hex-code	Connection Type codes
0000 0000	00H	Connection Type not identified / Default CTS
0000 0001	01H	Voice Call
0000 0010	02H	Fax Call
0000 0011	03H	Data Call
0000 0100	04H	Video Call
0000 0101	05H	E-mail Call
0000 0110	06H	Telemetric Call
0000 0111	07H	Text Call

History

Document history		
V1.1.1	December 1998	Publication