

EN 301 134 V1.1.1 (1998-10)

European Standard (Telecommunications series)

**Integrated Services Digital Network (ISDN);
Completion of Calls on No Reply (CCNR)
supplementary service;
Service description**



Reference

DEN/NA-010027 (ai000ico.PDF)

Keywords

ISDN, stage 1, supplementary service, CCNR

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
<http://www.etsi.org>

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
2.1 Normative references	7
2.2 Informative references	7
3 Definitions and abbreviations	7
3.1 Definitions	7
3.2 Abbreviations.....	8
4 Description	9
5 Procedures.....	9
5.1 Provision and withdrawal.....	9
5.2 Normal procedures.....	10
5.2.1 Activation, deactivation and registration.....	10
5.2.1.1 Activation	10
5.2.1.2 Deactivation.....	10
5.2.1.3 Registration.....	11
5.2.2 Erasure	11
5.2.3 Invocation and operation.....	11
5.2.4 Interrogation.....	12
5.3 Exceptional procedures.....	12
5.3.1 Activation, deactivation and registration.....	12
5.3.1.1 Activation	12
5.3.1.2 Deactivation.....	12
5.3.1.3 Registration.....	13
5.3.2 Erasure	13
5.3.3 Invocation and operation.....	13
5.3.3.1 Exceptional situation at destination B's side.....	13
5.3.3.2 Exceptional situation at user A's side.....	13
5.3.3.3 Network congestion	14
5.3.4 Interrogation.....	14
6 Intercommunication considerations	14
6.1 Interworking with non-ISDNs.....	14
6.2 Interworking with private ISDNs.....	14
7 Interaction with other supplementary services.....	15
7.1 Advice of charge services	15
7.1.1 Advice of charge at call set-up.....	15
7.1.2 Advice of charge during the call	15
7.1.3 Advice of charge at the end of a call	15
7.2 Call waiting.....	15
7.3 Call hold	15
7.4 Explicit call transfer.....	15
7.5 Number identification services	16
7.5.1 Calling line identification presentation.....	16
7.5.2 Calling line identification restriction.....	16
7.5.3 Connected line identification presentation	16
7.5.4 Connected line identification restriction.....	16
7.6 Closed user group	16
7.7 Completion of calls services	16
7.7.1 Completion of calls to busy subscriber.....	16
7.7.2 Completion of calls on no reply	17
7.8 Conference services	17

7.8.1	Conference call, add-on.....	17
7.8.2	Meet-me conference.....	17
7.9	Direct dialling in.....	17
7.10	Diversion services.....	17
7.10.1	Call forwarding unconditional.....	17
7.10.2	Call forwarding busy.....	18
7.10.3	Call forwarding no reply.....	18
7.10.4	Call deflection.....	19
7.10.5	Selective call forwarding.....	19
7.11	Freephone.....	19
7.12	Malicious call identification.....	19
7.13	Multiple subscriber number.....	19
7.14	Subaddressing.....	19
7.15	Terminal portability.....	20
7.16	Three party.....	20
7.17	User-to-user signalling.....	20
7.18	Outgoing call barring.....	20
7.18.1	Outgoing call barring: fixed.....	20
7.18.2	Outgoing call barring: user controlled.....	20
7.19	Message waiting indication.....	20
Annex A (normative): Determination of the existence of compatible terminals		21
History.....		22

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.fr/ipr> or <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 European Standard (Telecommunications series) has been produced by ETSI Technical Committee Network Aspect (NA).

In accordance with CCITT Recommendation I.130 [1], the following three level structure is used to describe the supplementary telecommunications 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 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 1 aspects (overall service description) for the Completion of Calls on No Reply (CCNR) supplementary service. The stage 3 aspects are detailed in EN 301 065-1 (1998) and EN 300 356-20 (1998).

National transposition dates	
Date of adoption of this EN:	9 October 1998
Date of latest announcement of this EN (doa):	31 January 1999
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 July 1999
Date of withdrawal of any conflicting National Standard (dow):	31 July 1999

1 Scope

The present document defines the stage one of the Completion of Calls on No Reply (CCNR) supplementary service for the pan-European Integrated Services Digital Network (ISDN) as provided by European public telecommunications operators. Stage one is an overall service description from the user's point of view (see CCITT Recommendation I.130 [1]), but does not deal with the details of the human interface itself.

The present document defines the interworking requirements of private ISDNs with the public ISDN.

In addition, the present document specifies the base functionality where the service is provided to the user via a private ISDN.

The present document does not specify the additional requirements where the service is provided to the user via a telecommunications network that is not an ISDN but does include interworking requirements of other networks with the public ISDN.

Interactions with supplementary services not listed in clause 7 are outside the scope of the present document.

Charging principles are outside the scope of the present document.

The CCNR supplementary service enables user A, encountering a destination B which does not answer the call (No Reply), to have the call completed without having to make a new call attempt when the destination B becomes not busy after having initiated an activity.

The CCNR supplementary service is applicable to all circuit-switched telecommunications services with the following exceptions:

- a) call 2 of the videotelephony teleservice (see ETS 300 264 [8]);
- b) call 2 of the audiographic conference teleservice (see ETS 300 675 [10]);
- c) call 2 and subsequent calls of videoconference teleservice (see ETS 300 678 [11]);
- d) all other circuit-switched telecommunication services requiring the use of more than one B-channel.

The present document is applicable to the stage two and stage three standards for the ISDN CCNR supplementary service. The terms "stage two" and "stage three" are also defined in CCITT Recommendation I.130 [1]. Where the text indicates the status of a requirement (i.e. as strict command or prohibition, as authorization leaving freedom, or as a capability or possibility), this shall be reflected in the text of the relevant stage two and stage three standards.

Furthermore, conformance to the present document is met by conforming to the stage three standard with the field of application appropriate to the equipment being implemented. Therefore, no method of testing is provided for the present document.

2 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.

2.1 Normative references

- [1] CCITT Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".
- [2] ITU-T Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".
- [3] ITU-T Recommendation I.210 (1993): "Principles of telecommunication services supported by an ISDN and the means to describe them".
- [4] ITU-T Recommendation E.164 (1997): "The international public telecommunication numbering plan".
- [5] CCITT Recommendation Q.9 (1988): "Vocabulary of switching and signalling terms".
- [6] ITU-T Recommendation I.221 (1993): "Common specific characteristics of services".
- [7] ETS 300 345: "Integrated Services Digital Network (ISDN); Interworking between public ISDNs and private ISDNs for the provision of telecommunication services; General aspects".

2.2 Informative references

- [8] ETS 300 264: "Integrated Services Digital Network (ISDN); Videotelephony teleservice; Service description".
- [9] ETS 300 357: "Integrated Services Digital Network (ISDN); Completion of Calls to Busy Subscriber (CCBS) supplementary service; Service description".
- [10] ETS 300 675: "Integrated Services Digital Network (ISDN); Audiographic conference teleservice; Service description".
- [11] ETS 300 678: "Integrated Services Digital Network (ISDN); Videoconference teleservice; Service description".

3 Definitions and abbreviations

3.1 Definitions

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

Integrated Services Digital Network (ISDN): see ITU-T Recommendation I.112 [2], subclause 2.3, definition 308.

service; telecommunications service: see ITU-T Recommendation I.112 [2], subclause 2.2, definition 201.

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

ISDN number: a number conforming to the numbering plan and structure specified in ITU-T Recommendation E.164 [4].

busy: see ITU-T Recommendation I.221 [6], clause 3.

user A: the user who originated the call and to whom the CCNR supplementary service is provided.

destination B: the entity addressed in the original call.

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

retention timer: this timer specifies the amount of time the network retains all of the information supplied by the calling user if the call is terminated while destination B is being informed of the call. Although this timer is optional for the basic call procedures it is needed for the operation of the CCNR supplementary service. The minimum value of the timer shall be 15 seconds.

CCNR service duration timer: the maximum time the CCNR supplementary service will remain activated for user A within the network. The value of this timer shall be a minimum of 60 minutes and a maximum of 180 minutes.

CCNR recall timer: the maximum time the network will wait for user A to respond to a CCNR recall. The value of this timer shall be a minimum of 10 seconds and a maximum of 20 seconds.

destination B idle guard timer: the time the network will wait after destination B has become not busy, after having initiated an activity before informing user A. The value of this timer shall be a maximum of 15 seconds.

CCNR busy: any one of the following conditions will cause user A to be considered as CCNR busy:

- maximum number of calls reached at user A;
- no B-channels available at user A;
- CCNR recall pending on user A.

CCNR call: a call generated by the network from user A to destination B resulting from user A's acceptance of a CCNR recall.

CCNR recall: an indication informing user A that the network is ready to initiate a CCNR call to destination B and that the network is awaiting a response to this indication.

suspended CCNR request: a CCNR request which cannot be served even if destination B is not busy after having initiated an activity, because user A is busy or CCNR busy.

service provider: the entity which offers the CCNR supplementary service.

subaddress: see ITU-T Recommendation E.164 [4], subclause 11.2.

compatible terminal: a terminal which can support the bearer service or teleservice requested for the original call to destination B and which can accept calls to the ISDN number and subaddress identifying the called user in the original call to destination B.

basic access: see CCITT Recommendation Q.9 [5], clause 1, definition 1551.

primary rate access: see CCITT Recommendation Q.9 [5], clause 1, definition 1552.

CCNR request: an instance of an activation of the CCNR supplementary service which is held in a queue pending the correct conditions for the CCNR supplementary service to be completed.

activity: answering an incoming call or originating an outgoing call or clearing of an established call or clearing of an outgoing call.

3.2 Abbreviations

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

CCBS	Completion of Calls to Busy Subscriber
CCNR	Completion of Calls on No Reply
ISDN	Integrated Services Digital Network

4 Description

The CCNR supplementary service enables user A, encountering a destination B which does not answer the call (No Reply), to have the call completed without having to make a new call attempt when the destination B becomes not busy after having initiated an activity.

When user A encounters a destination B which does not answer the call (No Reply), user A can request the CCNR supplementary service.

When user A requests the CCNR supplementary service, the network will monitor for destination B becoming not busy after having initiated an activity.

When destination B becomes not busy (i.e. access resources, e.g. at least one B-channel, are not busy) after having initiated an activity, then the network will wait a short time (as defined by the destination B idle guard timer) in order to allow the resources to be re-used for originating a call. If the resources are not re-used by destination B within this time, then the network will automatically recall user A.

When user A accepts the CCNR recall, then the network will automatically generate a CCNR call to destination B.

The CCNR supplementary service shall be available to users who are connected to the network via a basic access or a primary rate access.

NOTE: A supplementary service provided to destination B which prevents the registration of CCNR requests is outside the scope of the present document.

5 Procedures

5.1 Provision and withdrawal

The CCNR supplementary service shall be provided to user A after prior arrangement with the service provider or shall be generally available.

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

As a service provider option, the CCNR supplementary service can be offered with a subscription option which shall apply to the whole access of user A. The subscription option is detailed in table 1.

Table 1: Subscription option

Subscription option	Values
Recall mode	<ul style="list-style-type: none"> - Global, i.e. CCNR recall offered to all terminals on the access. - Specific, i.e. CCNR recall offered to the terminal that has activated the CCNR supplementary service.

If the subscription option is not offered, one of the two values shall be chosen by the service provider.

5.2 Normal procedures

5.2.1 Activation, deactivation and registration

5.2.1.1 Activation

When the network encounters a destination B which does not answer the call (No Reply) and the CCNR supplementary service can be requested against this destination B, the network shall retain call information. User A can activate the CCNR supplementary service during the time, the called user is being informed of the call and after the call is terminated, but before the retention timer expires.

NOTE 1: Some restrictions on activation of the CCNR supplementary service may exist due to technical constraints, e.g. when numbers have been ported or translated.

If destination B's network supports the CCNR supplementary service, then upon receipt of a request for the activation of the CCNR supplementary service the network shall stop informing destination B of the call and shall register the CCNR request. User A shall be informed that the activation was successful. User A can then originate calls and receive calls as normal.

Multiple requests against destination B shall be queued.

When the activation of the CCNR supplementary service is accepted the CCNR service duration timer shall be started. The value of this timer shall be a minimum of 60 minutes and a maximum of 180 minutes. The network shall monitor destination B for becoming not busy after having initiated an activity.

User A can have a limited number of CCNR requests outstanding. This limit shall apply in general for all users and its value shall be a network provider option with a maximum value of 5. The requests can be to different destinations, or can be to the same destination B with different service requirements (e.g. bearer service and teleservice requirements), or as a network option, the same service requirements.

Destination B can have a limited number of incoming CCNR requests outstanding. This limit shall apply in general for all users and its value shall be a destination network option with a maximum value of 5.

As a further destination network option, the size of the destination B CCNR queue can be reduced for individual users. The reduced size can have zero length.

NOTE 2: Reducing the queue length allows a service provider to balance the interaction between the CCNR supplementary service and other supplementary services (e.g. the call waiting supplementary service and the freephone supplementary service).

NOTE 3: As a consequence of the queue having zero length, the CCNR supplementary service will be unavailable to users calling destination B.

5.2.1.2 Deactivation

User A can send any of the following deactivation requests:

- a) deactivate all outstanding CCNR requests; or
- b) deactivate a specific CCNR request. This request shall contain enough information to correlate with the initial activation.

Upon successful deactivation, the corresponding CCNR request shall be discarded.

User A shall be informed that the deactivation is successful. If a specific CCNR request is deactivated, the network shall indicate which specific CCNR request has been deactivated.

If the value of the subscription option "recall mode" is "specific" then the user can deactivate only those outstanding CCNR requests made from that terminal.

If the value of the subscription option "recall mode" is "global", then from any of user A's terminals, user A can deactivate any outstanding CCNR request stored for that user.

5.2.1.3 Registration

Not applicable.

5.2.2 Erasure

Not applicable.

5.2.3 Invocation and operation

When destination B becomes not busy after having initiated an activity, then the destination B CCNR queue shall be processed, provided that an entry in the destination B CCNR queue is not currently being processed. Entries shall not be processed in parallel.

The first request which is not suspended shall be selected and the network shall reserve on destination B's interface the resources (e.g. a B-channel) which are necessary to complete the CCNR call. Destination B can use the reserved access resources or other free resources, in order to originate a call. An incoming call shall not use these reserved resources.

A check for a compatible terminal which is not busy at destination B shall be performed (see annex A). If such a terminal does not exist, further requests which are not suspended shall be examined. When a terminal is found, the network shall start the destination B idle guard timer. The value of this timer shall be a maximum of 15 seconds.

NOTE: This timer enables destination B to initiate a call before any CCNR request is processed.

When the destination B idle guard timer expires, then provided that interface resources are still available at destination B, and a compatible terminal at destination B is still not busy, user A shall be informed.

If user A is neither busy nor CCNR busy, user A shall be recalled with an indication that it is a CCNR recall and with an indication of which CCNR request it applies to, and the CCNR recall timer shall be started. The value of this timer shall be a minimum of 10 seconds and a maximum of 20 seconds.

If user A accepts the recall before the CCNR recall timer expires, then the network shall initiate the CCNR call to destination B. When the network receives an indication that the destination B is being informed of the CCNR call, the corresponding CCNR request shall be considered as completed.

Whilst the idle guard timer is running, and also whilst awaiting the CCNR call to destination B, a new incoming call shall not be offered to destination B if it has service requirements and destination selection information identical to the (not suspended) request which is currently being processed in the destination B CCNR queue.

For such incoming calls, the called user shall be considered as being busy and the calling user shall be informed as for basic call procedures.

The CCNR requests in the destination B CCNR queue shall be processed in the order they are received, although the actual mechanism for processing the queue is outside the scope of the present document. During the processing of the destination B CCNR queue, CCNR requests which are currently suspended shall be ignored.

If, for any reason, no CCNR call results from the processing of a CCNR request, then provided that access resources are still available at destination B, the next request in the destination B CCNR queue shall be selected for processing. This procedure shall be repeated until the processing of the destination B CCNR queue is complete.

If, for any reason, no CCNR call results from the processing of a CCNR request and the access resources are no longer available at destination B, then the resources reserved for the CCNR supplementary service shall be released and the network shall monitor for destination B becoming not busy after having initiated an activity.

If all of destination B's CCNR queue has been processed and no CCNR call results, then processing is complete and the resources reserved for the CCNR supplementary service shall be released. If requests which are not suspended exist in the destination B CCNR queue, then:

- if destination B is busy, the network shall monitor for destination B becoming not busy; or,
- if destination B is not busy, then destination B's CCNR queue shall be processed when another call is terminated;
or

- if destination B is not busy when a CCNR request becomes not suspended, then that CCNR request shall be processed. If no CCNR call results in this case, then processing of the queue shall be considered complete.

5.2.4 Interrogation

User A can request the status of the CCNR supplementary service. In response to the request the following information shall be provided:

- a) in response to a general request user A shall be given a list of the addresses against which CCNR requests are outstanding; or
- b) in response to a specific request concerning one particular address, user A shall be informed whether or not user A has a CCNR request outstanding against that address.

NOTE: In both cases, the network provides information relating to CCNR requests and it is a matter for terminal implementation whether or not the user is given information about CCNR requests which are not compatible with the terminal.

5.3 Exceptional procedures

5.3.1 Activation, deactivation and registration

5.3.1.1 Activation

The activation of the CCNR supplementary service shall be rejected if the CCNR supplementary service is not provided to the user.

If user A activates the CCNR supplementary service and at the same time destination B is answering the call, the CCNR request shall be accepted.

If the network cannot accept user A's request to activate the CCNR supplementary service, the network shall inform user A and give one of the following reasons:

- a) **short term denial:** the network temporarily cannot accept user A's request to activate the CCNR supplementary service. A later attempt to activate the CCNR supplementary service for the same destination B may succeed. This reason will be given e.g.:
 - if user A has reached the limit of CCNR requests outstanding;
 - if there are already the maximum number of requests queued against destination B;
 - if there is an interaction with a supplementary service which temporarily prevents the activation of the CCNR supplementary service.
- b) **long term denial:** the network cannot accept user A's request to activate the CCNR supplementary service and a later attempt to activate the CCNR supplementary service for the same destination B will also be rejected. An example of long term denial is where destination B's network does not support the CCNR supplementary service.

5.3.1.2 Deactivation

A CCNR request shall be automatically deactivated by the network(s) and user A informed if:

- a) the CCNR service duration timer expires; or
- b) user A does not accept the CCNR recall before the CCNR recall timer expires; or
- c) destination B invokes a service that conflicts with the existing CCNR request and deactivation becomes necessary.

The user shall only be given information about deactivation of a CCNR request if that user would have been given the CCNR recall associated with that CCNR request.

5.3.1.3 Registration

Not applicable.

5.3.2 Erasure

Not applicable.

5.3.3 Invocation and operation

5.3.3.1 Exceptional situation at destination B's side

The following situations can occur at the destination B's side:

- a) resources or compatible terminal at destination B no longer available when the destination B idle guard timer expires.

If, when the destination B idle guard timer expires, no access resources are available at destination B, then processing of the destination B CCNR queue shall cease. The network shall monitor for destination B becoming not busy and the procedures of subclause 5.2.3 shall apply.

If, when the destination B idle guard timer expires, all compatible terminals (see annex A) at destination B are busy then the next request in the destination B CCNR queue shall be selected for processing;

- b) destination B is busy upon arrival of the CCNR call.

If destination B is busy when the network attempts to make the CCNR call, then as a service provider option, either:

- the corresponding CCNR request shall be deactivated; or
- the original CCNR request shall retain its position in the queue, and the CCNR service duration timer shall not be restarted.

- c) destination B does not answer the CCNR call, then user A may activate the CCNR supplementary service again.

- d) destination B rejects the CCNR call.

If destination B does reject the CCNR call, then the CCNR request shall be deleted and the processing of the queue shall continue. User A is informed according to the basic call procedures.

5.3.3.2 Exceptional situation at user A's side

The following situations can occur at user A's side:

- a) non-acceptance or rejection of CCNR recall:

if user A rejects the CCNR recall or the CCNR recall timer expires, then the CCNR request shall be deactivated;

- b) user A is found to be busy or CCNR busy:

if user A is found to be busy or CCNR busy at the time of a recall then user A shall be notified and the CCNR request shall be suspended until user A becomes neither busy nor CCNR busy. The network shall expect no response from user A to this notification.

When a CCNR request becomes not suspended due to user A becoming neither busy nor CCNR busy, then user A's CCNR requests associated with the bearer services and/or teleservices for which user A is considered not busy shall become not suspended and the procedures of subclause 5.2.3 shall apply;

c) user A reinitiates the CCNR supplementary service:

if user A does not wait for the CCNR recall to a particular destination B, but makes another call to that destination B which does not answer the call (No Reply), and requests the CCNR supplementary service again then, as a network option, one of the following shall occur:

- the network shall check if an identical CCNR request already exists:
 - if so, then the original request shall be retained with the current request being discarded and user A shall be informed that the request has not been accepted because a CCNR request had already been stored against the requested destination B;
 - if not, then the network shall treat this as a new CCNR request.

In order to determine that two CCNR requests are identical, the network shall only compare the basic call information, i.e. the bearer service and teleservice requirements, the destination selection information and calling user identity (if any); or

- the network shall not check if an identical CCNR request already exists and the procedures of subclause 5.2.1.1 shall apply for this new request;

d) no resources available at user A when user A accepts the CCNR recall.

If user A accepts the CCNR recall but there are insufficient resources for the CCNR call available at user A's access, then user A shall be informed and the CCNR request shall be suspended until user A becomes not busy again.

5.3.3.3 Network congestion

If the CCNR call encounters network congestion, then user A shall be informed as for the basic call procedures. In addition, the CCNR request shall be deactivated and user A shall be informed accordingly.

NOTE: Some networks may take action to reduce the probability of network congestion on the CCNR call.

5.3.4 Interrogation

If there are no CCNR requests outstanding when user A requests a general interrogation, user A shall be explicitly informed.

6 Intercommunication considerations

When user A and destination B belong to different networks, then the CCNR supplementary service can operate successfully only if all networks involved support the CCNR supplementary service along the communication path between the two users.

6.1 Interworking with non-ISDNs

If destination B resides within a non-ISDN which supports CCNR service functionality, then the CCNR supplementary service may be supported.

6.2 Interworking with private ISDNs

Interworking with private ISDNs shall include the requirements given in ETS 300 345 [7].

Where the CCNR supplementary service involves users attached to the public ISDN and private ISDN then, for the CCNR supplementary service to be successful, these networks need to interwork on a co-operative basis. This interworking needs to take account of the fact that one network cannot directly monitor a user attached to the other network.

Where a private ISDN supports the CCNR supplementary service, then this information shall be registered with the public network in order to support destination B's who are attached to the private ISDN.

In order to request the activation of the CCNR supplementary service in the public ISDN, subscription will be necessary as normal.

NOTE: The subscription option "recall mode" does not apply at the interface between the public ISDN and the private ISDN.

7 Interaction with other supplementary services

Interactions with any supplementary services not listed below can be found in the standards containing the service descriptions for those supplementary services.

Unless stated otherwise below, the supplementary services requested for the original call shall be used in association with the CCNR call.

7.1 Advice of charge services

Charging information can be given for the original call, and for the resulting CCNR call.

7.1.1 Advice of charge at call set-up

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

7.1.2 Advice of charge during the call

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

7.1.3 Advice of charge at the end of a call

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

7.2 Call waiting

CCNR requests in the destination B CCNR queue shall only be processed if there are no calls waiting.

In other situations there is no impact between the call waiting and the CCNR supplementary service.

7.3 Call hold

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

NOTE 1: When receiving a CCNR recall indication, user A may invoke the call hold supplementary service in order to make interface resources available for the establishment of the CCNR call.

NOTE 2: When user A is busy or CCNR busy and is notified that destination B is not busy, invocation of the call hold supplementary service will not result in the CCNR call being established.

7.4 Explicit call transfer

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

7.5 Number identification services

7.5.1 Calling line identification presentation

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

NOTE: If user A accepts a CCNR recall, the resulting CCNR call is a basic call and destination B can receive calling line identification presentation.

7.5.2 Calling line identification restriction

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

NOTE: If user A has invoked calling line identification restriction and user A accepts a CCNR recall, then the resulting CCNR call is a basic call and destination B will not receive the calling line identification of user A.

7.5.3 Connected line identification presentation

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

7.5.4 Connected line identification restriction

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

7.6 Closed user group

Closed user group information from the original call shall also be included in the CCNR call.

NOTE: Closed user group information is not included in the check for a compatible terminal.

If a terminal performs an internal closed user group check and uses the closed user group information provided on a call to determine whether, or not, to inform the user of the incoming call, then such a terminal may react positively to the check for a compatible terminal due to the absence of closed user group information, but due to the internal closed user group check such a terminal may then not inform the user of the arrival of the resulting CCNR call.

7.7 Completion of calls services

7.7.1 Completion of calls to busy subscriber

A user can be both a "user A" and a "destination B" simultaneously, i.e. that user can have activated the CCNR supplementary service or the completion of calls to busy subscriber (CCBS) supplementary service and have CCNR requests or CCBS requests outstanding whilst at the same time that user can be the destination of CCNR requests or CCBS requests from other users.

CCBS requests and CCNR requests against the same destination B shall be queued in the same queue.

If a user receives a CCNR recall or CCBS recall (i.e. as user A) while that user's destination B queue is being processed, then the CCNR recall or CCBS recall shall take priority over the handling of that user's destination B queue. The handling of CCNR requests and CCBS requests activated by this user (i.e. as user A) shall have priority over the handling of CCNR requests and CCBS requests activated by other users on this user (i.e. as destination B).

If one of the user's CCNR requests can be processed, then this user (see first paragraph) shall be given a CCNR recall or notification as in clause 5. The served user's destination B idle guard timer, if running, shall be cancelled. The processing of CCBS requests shall be according to the requirements of the CCBS supplementary service [9].

If a network supports the option to retain CCNR requests (see subclause 5.3.3.1 b)), then CCBS requests shall be retained when a CCBS call encounters a busy destination.

If the network checks for identical requests in user A's queue, the check shall include both CCNR requests and CCBS requests.

If user A has a CCBS recall pending on arrival of a CCNR recall, this should be treated in the same way as in the case where user A is CCNR busy (see subclause 5.2.3 and subclause 5.3.3.2 b)).

7.7.2 Completion of calls on no reply

A user can be both a "user A" and a "destination B" simultaneously, i.e. that user can have activated the CCNR supplementary service and have CCNR requests outstanding whilst at the same time that user can be the destination of CCNR requests from other users.

If a user receives a CCNR recall while that user's destination B CCNR queue is being processed, then the CCNR recall shall take priority over the handling of the destination B's CCNR queue. The handling of CCNR requests activated by this user shall have priority over the handling of CCNR requests activated by other users on this user.

If one of the user's CCNR requests can be processed as a result, then this user (see first paragraph) shall be given a CCNR recall or notification as in clause 5. The served user's destination B idle guard timer, if running, shall be cancelled.

7.8 Conference services

7.8.1 Conference call, add-on

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

7.8.2 Meet-me conference

An attempt to activate the CCNR supplementary service on a call to a meet-me conference shall be rejected.

7.9 Direct dialling in

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

7.10 Diversion services

CCNR recalls shall not be diverted. They shall be given to user A at user A's original location.

7.10.1 Call forwarding unconditional

Assume user A calls user B and user B activates the call forwarding unconditional supplementary service (or has activated the call forwarding unconditional supplementary service) to user C:

The call forwarding unconditional supplementary service was activated by user B before user A requests the CCNR supplementary service on user B:

If the call to user B is forwarded to user C by the call forwarding unconditional supplementary service and user C does not answer the call (No Reply), then a request by user A to activate the CCNR supplementary service shall be rejected. User A shall be informed that the request has been rejected with "short term denial" as the reason;

The call forwarding unconditional supplementary service is activated by user B after user A has activated the CCNR supplementary service on user B:

If user B activates the call forwarding unconditional supplementary service after user A has activated the CCNR supplementary service, then outstanding queued requests shall remain in the user B CCNR queue until expiry of the duration timer for the CCNR supplementary service. If user B deactivates the call forwarding unconditional supplementary service before the expiry of the duration timer for the CCNR supplementary service and subsequently becomes not busy, the outstanding queued requests shall be processed again.

If user B activates the call forwarding unconditional supplementary service between the expiry of the user B idle guard timer and the arrival of the CCNR call, the CCNR call shall be forwarded as a normal call.

7.10.2 Call forwarding busy

Assume user A calls user B, and user B activates the call forwarding busy supplementary service or has activated the call forwarding busy supplementary service to user C.

The call forwarding busy supplementary service was activated by user B before user A requests the CCNR supplementary service on user B:

If user B has activated the call forwarding busy supplementary service and is busy, and the forwarded-to user C does not answer the call (No Reply), then a request by user A to activate the CCNR supplementary service shall be rejected. User A shall be informed that the CCNR request has been rejected with "short term denial" as the reason;

The call forwarding busy supplementary service is activated by user B after user A has activated the CCNR supplementary service on user B:

If user B activates the call forwarding busy supplementary service after user A has activated the CCNR supplementary service on user B, the call forwarding busy supplementary service shall not be invoked for the CCNR call.

7.10.3 Call forwarding no reply

Assume that user A calls user B and that user B activates the call forwarding on no reply supplementary service or has activated the call forwarding on no reply supplementary service to user C.

The call forwarding on no reply supplementary service was activated by user B before user A requests the CCNR supplementary service on user B:

If user A calls user B and the call is forwarded on no reply to user C and user C does not answer the call (No Reply), then a request by user A to activate the CCNR supplementary service shall apply to the originally called destination B.

The call forwarding on no reply supplementary service is activated by user B after user A has activated the CCNR supplementary service on user B:

If user B activates the call forwarding on no reply supplementary service after user A has activated the CCNR supplementary service on user B, then the CCNR call shall be given to user B. After the no reply timer has expired at user B, the call shall be forwarded as a normal call.

Arrival of the CCNR call after the call forwarding on no reply supplementary service has been activated:

If user B has activated the call forwarding on no reply supplementary service and does not answer the call (No Reply) upon the arrival of the CCNR call, then according to a network option, the call shall be treated as follows:

- the procedures of the CCNR supplementary service shall apply; or
- the call shall be forwarded as a normal call.

7.10.4 Call deflection

Assume, user A calls destination B and destination B activates the call deflection supplementary service or has activated the call deflection supplementary service to user C. Using these assumptions the following situations may occur:

Calling user (user A):

If user A calls destination B and the call is deflected to user C and user C does not answer the call (No Reply), then a request by user A to activate the CCNR supplementary service shall be applied to destination B.

Called user (destination B):

If the served user requests invocation of the call deflection supplementary service on a CCNR call, then the following actions shall result:

- if the request was made before the network receives an indication that the user is being informed of the call, then the request from destination B to deflect a CCNR call shall be rejected; or
- if the request was made after the network has received an indication that the user is being informed of the call, then the request shall be accepted. The call shall be deflected as a normal call.

7.10.5 Selective call forwarding

When the selective call forwarding supplementary service has been activated unconditionally and if an incoming call matches the selection conditions then the interaction described in subclause 7.10.1 shall apply.

When the selective call forwarding supplementary service has been activated on busy and if an incoming call matches the selection conditions then the interaction described in subclause 7.10.2 shall apply.

When the selective call forwarding supplementary service has been activated on no reply and if an incoming call matches the selection conditions then the interaction described in subclause 7.10.3 shall apply.

7.11 Freephone

As a network option, a request for the CCNR supplementary service on a call to a freephone number may be accepted.

As a further network option, freephone calls may take precedence over requests for the CCNR supplementary service.

7.12 Malicious call identification

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

7.13 Multiple subscriber number

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

NOTE: The limit of entries in the destination B CCNR queue applies per multiple subscriber number. Entries are processed in the order that they are received for the whole access. The service provider may limit the maximum number of entries in the combined destination B CCNR queue for the access.

7.14 Subaddressing

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

NOTE: The calling user's subaddress (if any) which was supplied in the original call request, can be included when notifying or recalling the calling user.

7.15 Terminal portability

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

NOTE: In the case of disconnected terminals a CCNR recall will be treated as not accepted upon expiry of the CCNR recall timer.

7.16 Three party

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

7.17 User-to-user signalling

The network shall not store any information related to the user-to-user signalling supplementary service provided by user A in the original call.

User A can request the activation of the user-to-user signalling supplementary service and provide the user-to-user information, as required, when accepting the CCNR recall. If the resulting CCNR call contains information related to the user-to-user signalling supplementary service, this shall be handled as for the normal operation of the user-to-user signalling supplementary service.

NOTE: The original call request information, excluding any user-to-user information, is retained by the network.

7.18 Outgoing call barring

7.18.1 Outgoing call barring: fixed

When the outgoing call barring: fixed supplementary service is activated after the served user activates the CCNR supplementary service the CCNR call shall be barred according to the barring program which is active at the served user's access or ISDN number, and the associated basic service for the call.

7.18.2 Outgoing call barring: user controlled

When the outgoing call barring: user controlled supplementary service is activated after the served user activates the CCNR supplementary service the CCNR call shall be barred according to the barring program which is active at the served user's access or ISDN number, and the associated basic service for the call.

7.19 Message waiting indication

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

Annex A (normative): Determination of the existence of compatible terminals

Some terminals supporting the bearer capabilities 3,1 kHz audio, speech, or 64 kbit/s unrestricted, may not be able to co-operate in the process of determining that there is a compatible terminal present at destination B. Networks can take measures to identify situations where such terminals are involved.

If the network cannot unambiguously determine that a compatible terminal does exist at destination B, then it shall be assumed that a compatible terminal does exist.

History

Document history				
V1.1.1	December 1997	Public Enquiry	PE 9815:	1997-12-12 to 1998-04-10
V1.1.1	August 1998	Vote	V 9840:	1998-08-04 to 1998-10-02
V1.1.1	October 1998	Publication		