

INTERNATIONAL STANDARD

ISO/IEC 13866

First edition
1995-11-15

Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Call completion supplementary services

*Technologies de l'information — Télécommunications et échange
d'information entre systèmes — Réseau privé à intégration de
services — Spécification, modèle fonctionnel et débit d'informations —
Services supplémentaires de complément d'appel*



Reference number
ISO/IEC 13866:1995(E)

AVA Documents
Document Sharing Hub

Contents

	Page
Foreword	vi
Introduction	vii
1 Scope	1
2 Conformance	1
3 Normative references	2
4 Definitions	2
4.1 External definitions	2
4.2 Other definitions	3
5 List of acronyms	4
6 SS-CCBS Stage 1 specification	5
6.1 Description	5
6.1.1 General description	5
6.1.2 Qualifications on applicability to telecommunication services	5
6.2 Procedures	5
6.2.1 Provision / Withdrawal	5
6.2.2 Normal procedures	6
6.2.2.1 Activation/deactivation/registration/Interrogation	6
6.2.2.2 Invocation and operation	6
6.2.2.3 Cancellation	7
6.2.3 Exceptional Procedures	7
6.2.3.1 Activation/deactivation/registration/interrogation	7
6.2.3.2 Invocation and Operation	7
6.2.3.2.1 Rejection of SS-CCBS Service request	7
6.2.3.2.2 User A is busy on SS-CC recall	8
6.2.3.2.3 Network congestion	8
6.2.3.2.4 User B becomes busy after successful SS-CC recall	8
6.2.3.2.5 User B becomes busy during path reservation	8
6.2.3.2.6 Duplicate SS-CCBS requests	9
6.2.3.2.7 Other failure situations	9
6.2.3.3 Cancellation	9
6.3 Interactions with other supplementary services	9
6.3.1 Calling Line Identification Presentation (SS-CLIP)	9
6.3.2 Connected Line Identification Presentation (SS-COLP)	9
No interaction.	9

© ISO/IEC 1995

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

ISO/IEC Copyright Office • Case postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

6.3.3	Calling/Connected Line Identification Restriction (SS-CLIR)	9
6.3.4	Calling Name Identification Presentation (SS-CNIP)	9
6.3.5	Connected Name Identification Presentation (SS-CONP)	9
6.3.6	Calling/Connected Name Identification Restriction (SS-CNIR)	10
6.3.7	Completion of Calls on No Reply (SS-CCNR)	10
6.3.8	Call Transfer (SS-CT)	10
6.3.9	Call Forwarding Unconditional (SS-CFU)	10
6.3.10	Call Forwarding Busy (SS-CFB)	10
6.3.11	Call Forwarding on No Reply (SS-CFNR)	11
6.3.12	Path Replacement (ANF-PR)	11
6.4	Interworking considerations	11
6.5	SS-CCBS overall SDL	11
7	SS-CCNR Stage 1 description	13
7.1	Description	13
7.1.1	General description	13
7.1.2	Qualifications on applicability to telecommunication services	13
7.2	Procedures	14
7.2.1	Provision/Withdrawal	14
7.2.2	Normal Procedures	14
7.2.2.1	Activation/deactivation/registration/interrogation	14
7.2.2.2	Invocation and operation	14
7.2.2.3	Cancellation	15
7.2.3	Exceptional procedures	15
7.2.3.1	Activation/deactivation/registration and Interrogation	15
7.2.3.2	Invocation and operation	15
7.2.3.2.1	Rejection of SS-CCNR service request	15
7.2.3.2.2	User A is busy on SS-CC recall	15
7.2.3.2.3	Network congestion	15
7.2.3.2.4	User B becomes busy after successful SS-CC recall	15
7.2.3.2.5	User B becomes busy during path reservation	16
7.2.3.2.6	Duplicate SS-CCNR requests	16
7.2.3.2.7	Other failure situations	16
7.2.3.3	Cancellation	16
7.3	Interaction with other supplementary services	16
7.3.1	Calling Line Identification Presentation (SS-CLIP)	16
7.3.2	Connected Line Identification Presentation (SS-COLP)	17
7.3.3	Calling/Connected Line Identification Restriction (SS-CLIR)	17
7.3.4	Calling Name Identification Presentation (SS-CNIP)	17
7.3.5	Connected Name Identification Presentation (SS-CONP)	17
7.3.6	Calling/Connected Name Identification Restriction (SS-CNIR)	17
7.3.7	Completion of Calls to Busy Subscribers (SS-CCBS)	17
7.3.8	Call Transfer (SS-CT)	17
7.3.9	Call Forwarding Unconditional (SS-CFU)	17
7.3.10	Call Forwarding Busy (SS-CFB)	17
7.3.11	Call Forwarding on No Reply (SS-CFNR)	18
7.3.12	Path Replacement (ANF-PR)	18
7.4	Interworking considerations	18
7.5	SS-CCNR Overall SDL	18
8	SS-CC Stage 2 specification	20
8.1	Functional model	20

8.1.1	Functional model description	20
8.1.2	Description of the functional entities	20
8.1.2.1	Originating SS-CC agent FE, FE1	20
8.1.2.2	Originating SS-CC controlling FE, FE2	20
8.1.2.3	Terminating SS-CC controlling FE, FE3	20
8.1.2.4	Terminating SS-CC agent FE, FE4	20
8.1.3	Relationship to basic call functional model	20
8.2	Information flows	21
8.2.1	Definition of Information flows	21
8.2.1.1	ra_CC_cancellation_access	21
8.2.1.2	ra_CC_cancelled	21
8.2.1.3	ra_CC_failed	22
8.2.1.4	ra_CC_list	23
8.2.1.5	ra_CC_recall_accepted	23
8.2.1.6	ra_CC_rem_user_free	23
8.2.1.7	ra_CC_request	24
8.2.1.8	ra_CC_status_req	25
8.2.1.9	ra_CC_stop_recall	25
8.2.1.10	ra_CC_user_B_free	26
8.2.1.11	rb_CC_call	26
8.2.1.12	rb_CC_call_reject	26
8.2.1.13	rb_CC_cancellation	27
8.2.1.14	rb_CC_free_notification	27
8.2.1.15	rb_CC_monitor	27
8.2.1.16	rb_CC_path_reserve	28
8.2.1.17	rb_CC_resume_completion	29
8.2.1.18	rb_CC_suspend_completion	29
8.2.1.19	rb_CC_suspend_path_reservation	29
8.2.1.20	rc_CC_status_req	29
8.2.2	Relationship of Information flows to Basic Call Information flows	30
8.2.3	Examples of information flow sequences	32
8.2.3.1	Successful invocation of SS-CC	33
8.2.3.1.1	Successful invocation of SS-CCBS	33
8.2.3.1.2	Successful Invocation of SS-CCNR	34
8.2.3.2	Status request procedure, User A	35
8.2.3.3	Status request procedure, User B	35
8.2.3.4	Cancellation of previously invoked SS-CC request by User A	36
8.2.3.5	Remote cancellation of previously invoked SS-CC request for service reasons	36
8.2.3.6	Local cancellation of previously invoked SS-CC request for service reasons	37
8.2.3.7	List of SS-CC request status	37
8.2.3.8	Successful completion of SS-CC (without reservation)	38
8.2.3.9	Successful completion of SS-CC (path reservation successful)	39
8.2.3.10	Successful completion of SS-CC (path reservation attempted, fall back to non-reservation)	40
8.2.3.11	Local rejection of SS-CC by PISN	41
8.2.3.12	Remote rejection of SS-CC by PISN	41
8.2.3.13	User A busy when User B becomes not busy (without reservation, request suspended)	41
8.2.3.14	User A busy when User B becomes not busy (path reservation successful)	43
8.2.3.15	User A busy when User B becomes not busy (path reservation attempted, fall back to non-reservation)	44
8.2.3.16	No response by User A to SS-CC Recall (without reservation)	45

8.2.3.17	No response by User A to SS-CC Recall (path reservation successful)	46
8.2.3.18	No response by User A to SS-CC recall (path reservation attempted, fall back to non-reservation)	47
8.2.3.19	Successful SS-CC recall, User B busy (without reservation)	48
8.2.3.20	Successful SS-CC recall, User B busy (path reservation successful)	49
8.2.3.21	Successful SS-CC recall, no path to User B (without reservation)	50
8.2.3.22	Failure of path reservation due to network congestion	51
8.2.3.23	Failure of path reservation due to busy User B	52
8.3	Functional entity actions	52
8.3.1	Functional entity actions of FE1	52
8.3.2	Functional entity actions of FE2	53
8.3.3	Functional entity actions of FE3	56
8.3.4	Functional entity actions of FE4	57
8.4	Functional entity Behaviour	57
8.4.1	Behaviour of FE1	57
8.4.2	Behaviour of FE2	59
8.4.3	Behaviour of FE3	63
8.4.4	Behaviour of FE4	66
8.5	Allocation of functional entities to physical locations	67
8.6	Interworking considerations	67
Annex A		68

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to the national bodies for voting. Publication as an International Standard requires approval by at least 75% of the national bodies casting a vote.

International Standard ISO/IEC 13866 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*.

Annex A of this International Standard is for information only.

Introduction

This International Standard is one of a series of standards defining services and signalling protocols applicable to Private Integrated Services Networks (PISN). The series uses ISDN concepts as developed by ITU-T and conforms to the framework of Standards for Open Systems Interconnection as defined by ISO/IEC.

This particular International Standard specifies the Call Completion supplementary services.

This page intentionally left blank

Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Call completion supplementary services

1 Scope

This International Standard, specifies supplementary services Call Completion (SS-CC), which are applicable to various basic services supported by Private Integrated Services Network (PISN). Basic services are specified in ISO/IEC 11574.

SS-CC consists of two Supplementary services: the Completion of Calls to Busy Subscribers supplementary service (SS-CCBS) and the Completion of Calls on No Reply supplementary service (SS-CCNR). SS-CCBS allows completion of a call to a subscriber that was unsuccessful because of a busy condition and SS-CCNR allows completion of a call to a subscriber that was unsuccessful because the subscriber, although alerted, did not answer.

Supplementary service specifications are produced in three stages, according to the method described in CCITT Recommendation I.130. This International Standard specifies the stage 1 and stage 2 specifications of SS-CC. The stage 1 specifications (clauses 6 and 7) specify the supplementary services as seen by the users of PISNs. The stage 2 specification (clause 8) specifies the functional entities involved in the supplementary services and the information flows between them.

2 Conformance

In order to conform to this International standard, a Stage 3 Standard shall specify signalling protocols and equipment Behaviour that are capable of being used in a PISN which supports the supplementary services specified in this International Standard. This means that, to claim conformance a Stage 3 Standard is required to be adequate for the support of those aspects of

the stage 1 and stage 2 clauses which are relevant to the interface or equipment to which the stage 3 standard applies. The stage 1 and stage 2 clauses which a stage 3 standard for the Completion of Calls to Busy Subscribers (CCBS) supplementary service shall support are clauses 6 and 8 respectively. The stage 1 and stage 2 clauses which a stage 3 Standard for the Completion of Calls on No Reply (CCNR) supplementary service shall support are clauses 7 and 8 respectively.

3 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 11574:1994, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit-mode 64 kbit/s bearer services- Service description, functional capabilities and information flows*.

ISO/IEC 11579-1:1994, *Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Part 1: Reference configuration for PISN Exchanges (PINX)*.

CCITT Rec. I.112(1988), *Vocabulary of terms for ISDNs (Blue Book)*.

CCITT Rec. I.130(1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN (Blue Book)*.

CCITT Rec. I.210(1988), *Principles of telecommunications services supported by an ISDN and the means to describe them (Blue Book)*.

CCITT Rec. I.221(1988), *Common specific characteristics of services (Blue Book)*.

CCITT Rec. Z.100(1988), *Specification and Description Language (Blue Book)*.

4 Definitions

For the purposes of this International Standard, the following definitions apply.

4.1 External definitions

This International Standard uses the following terms defined in other documents:

- | | |
|---|--------------------|
| - Basic Service | (CCITT Rec. I.210) |
| - Private Integrated Services Network (PISN) | (ISO/IEC 11579-1) |
| - Private Integrated Services Network Exchange (PINX) | (ISO/IEC 11579-1) |
| - Service | (CCITT Rec. I.112) |
| - Signalling | (CCITT Rec. I.112) |
| - Supplementary Service | (CCITT Rec. I.210) |

- User (ISO/IEC 11574)

This International Standard refers to the following basic call functional entity (FEs) defined in ISO/IEC 11574:

- Call Control (CC)
- Call Control Agent (CCA)

This International Standard refers to the following basic call inter-FE relationships defined in ISO/IEC 11574:

- r1
- r2
- r3

This International Standard refers to the following basic call information flows defined in ISO/IEC 11574:

- r1_setup request/indication/response/confirmation
- r1_setup_reject request/indication
- r1_report request/indication
- r1_disconnect request/indication
- r2_setup request/indication/response/confirmation
- r2_report request/indication
- r2_release request/indication
- r3_setup request/indication/response/confirmation
- r3_setup_reject request/indication
- r3_report request/indication

This International Standard refers to the following basic call information flow elements defined in ISO/IEC 11574.

- Connection Type (CT)
- Destination Number (DN)
- Destination Subaddress (DS)
- Originating Number (ON)
- Originating Subaddress (OS)

4.2 Other definitions

4.2.1 additional network feature: A capability, over and above that of a basic service, provided by a PISN, but not directly to a User.

4.2.2 busy : A property of a User for whom either a “network determined user busy” or “user determined user busy” condition (see clause 3.1 of CCITT Rec. I.221) exists.

4.2.3 call, basic call: An instance of the use of a basic service.

4.2.4 call completion: The successful presentation of a previously unsuccessful Call to a destination user (User B) which occurs when the call has entered an alerting phase or has been answered.

4.2.5 free: A property of a User who can accept any attempt by the PISN to present a call to that User (i.e. allow the call to reach the alerting or answered state).

4.2.6 path reservation: The reservation of resources prior to SS-CC Recall in order that a connection path through the PISN is available when User A accepts the SS-CC Recall.

NOTE - Path Reservation does not guarantee that User B will be free when User A accepts the SS-CC Recall.

4.2.7 recall timer: This timer specifies the length of time the network shall wait for a response from user A to a CC Recall.

4.2.8 retention timer: This timer specifies the period of time the network retains the originating call information after a valid call attempt is released.

4.2.9 SS-CC recall: An indication informing User A that User B is no longer busy (in the case of SS-CCBS) or has just completed a period of activity (in the case of SS-CCNR). Acceptance of this indication by User A will cause the call to be completed by the PISN.

4.2.10 SS-CC service duration timer: This timer specifies the length of time that the service shall be active within the network.

4.2.11 User A: The specific User that originated the call and requested the supplementary service.

4.2.12 User B: The User that was initially addressed in the original call set up.

5 List of acronyms

ANF	Additional Network Feature
CC	Call Control (functional entity)
CCA	Call Control Agent (functional entity)
CCBS	Completion of Calls to Busy Subscribers
CCI	Call Control Identifier
CCNR	Completion of Calls on No Reply
CD	Call Completion De-registered
CR	Cancellation Reason
CT	Connection Type
DN	Destination Number
FC	Failure Cause
FE	Functional Entity
FEA	Functional Entity Action

ISDN	Integrated Services Digital Network
MT	Monitor Type
NDUB	Network Determined User Busy
ON	Originating Number
PINX	Private Integrated Services Network Exchange
PISN	Private Integrated Services Network
RC	Reject Cause
RL	Request List
RM	Request Maintained
RVC	Reservation Capability
SDL	Specification and Description Language
SI	Status Indicator
SS-CC	Supplementary Service Call Completion

NOTE - This is a generic term, used to describe aspects common to both SS-CCBS and SS-CCNR.

SS-CCBS	Supplementary Service Completion of Calls to Busy Subscribers
SS-CCNR	Supplementary Service Completion of Calls on No Reply
TE	Terminal Equipment
UDUB	User Determined User Busy

6 SS-CCBS stage 1 specification

6.1 Description

6.1.1 General description

Completion of Calls to Busy Subscribers (SS-CCBS) is a supplementary service which is offered to a calling User A. On encountering a busy called User B, it allows User A to request that the PISN monitors User B and notifies User A when User B becomes free. On response by User A to that notification, the PISN shall attempt to complete the call to User B.

6.1.2 Qualifications on applicability to telecommunication services

This supplementary service is applicable to all basic services defined in ISO/IEC 11574.

6.2 Procedures

6.2.1 Provision / Withdrawal

SS-CCBS may be provided after pre-arrangement with the service provider (by means of service profile control), or may be available generally to all Users. SS-CCBS may be withdrawn on request of the User or for administrative reasons.

The subscription parameters and values offered by a PISN shall be an implementation matter. A PISN may offer more or less parameters and values than those specified below.

Possible subscription options are summarized in table 1.

Table 1 - SS-CCBS Subscription parameters

Subscription option	Values:
Recall mode	- SS-CC Recall offered to all compatible terminals (NOTE) - SS-CC Recall offered to the terminal which has invoked SS-CCBS

NOTE - If the user has more than one compatible terminal (e.g., passive bus arrangement), this option will result in SS-CC Recall being offered simultaneously to all those terminals, thereby allowing acceptance by any one of those terminals.

6.2.2 Normal procedures

6.2.2.1 Activation/deactivation/registration/Interrogation

SS-CCBS is permanently activated. No information needs to be registered with the PISN for this supplementary service, and therefore interrogation is not applicable.

6.2.2.2 Invocation and operation

When a call from User A fails because the destination User, User B, is busy, the PISN shall retain the call information provided by User A, as described in 9.2.1 of ISO/IEC 11574, for a period during which User A shall be able to request SS-CCBS. On receipt of a request for SS-CCBS during that period, the PISN shall check whether it is possible to initiate the service, and if so shall send an acknowledgment to User A, start monitoring User B and start the SS-CCBS Service Duration Timer. The acknowledgment means that User A can expect to receive a SS-CC Recall if User B becomes free within the period of the SS-CCBS Service Duration Timer.

NOTES

- 1 The fact that User B is already being monitored, as a result of a call completion request from another user, need not cause rejection of the request from User A. The handling of multiple requests against the same User B is an implementation matter, typically involving some sort of queue arranged in chronological or priority order.
- 2 The fact that User A has already invoked call completion against another user need not cause rejection of any further requests for call completion from User A. The handling of multiple requests by the same User A is an implementation matter.
- 3 The period during which SS-CCBS can be invoked and the value of the SS-CCBS Service Duration timer are implementation specific.

After the SS-CCBS request has been acknowledged, User A shall be able to receive and initiate other calls.

A PISN may provide User A with the ability to request a list of outstanding SS-CC-requests that User A has invoked. If the Recall mode is "SS-CC Recall offered to all compatible terminals", details of all requests made by that user should be provided. If the Recall mode is "SS-CC Recall offered to the terminal which has invoked SS-CCBS", only details of requests made by the user

from that terminal should be provided. The list will be empty if there are no outstanding SS-CC requests.

When the monitoring of User B indicates that User B has become free, and if User A is also free, the PISN shall provide SS-CC Recall, and start the SS-CC Recall timer.

If User A accepts the SS-CC Recall, the PISN shall attempt to complete the call between User A and User B. If the call is successfully presented to User B and enters an alerting phase or is answered, SS-CCBS shall be regarded as complete.

6.2.2.3 Cancellation

The PISN shall provide User A with the ability to request cancellation of at least one of the following:

- all outstanding SS-CC requests for which a SS-CC Recall is still expected;
- the most recent SS-CC request for which a SS-CC Recall is still expected; and,
- a specific SS-CC request for which a SS-CC Recall is still expected.

If the Recall mode is "SS-CC Recall offered to all compatible terminals", requests made by that user should be cancelable. If the Recall mode is "SS-CC Recall offered to the terminal which has activated SS-CCBS", requests made by the user from that terminal should be cancellable.

User A shall be informed of successful cancellation.

6.2.3 Exceptional Procedures

6.2.3.1 Activation/deactivation/registration/interrogation

Not applicable.

6.2.3.2 Invocation and Operation

6.2.3.2.1 Rejection of SS-CCBS Service request

If User A is not permitted to request SS-CCBS, the PISN shall reject the SS-CCBS request with an indication of whether denial is short or long term.

Short term denial shall be used for temporary conditions where a later request for SS-CCBS might be successful. Examples of conditions that may result in a short term denial are:

- limit of requests by User A already reached;
- no call information retained;
- limit of requests against User B already reached; or,
- duplicate request (see 6.2.3.2.5),

Long term denial shall be used when later requests will also be rejected. Examples of conditions that may result in a long term denial are:

- SS-CCBS not provided to User A; or,
- interworking with a network which does not support SS-CCBS;
- SS-CCBS not allowed against User B (note).

NOTE - This is an implementation option that can apply to certain classes of users.

6.2.3.2.2 User A is busy on SS-CC recall

If User A is found to be busy when User B becomes free, the PISN shall wait for both Users to become free before providing SS-CC Recall and starting the SS-CC Recall timer. As an option, the PISN can notify User A that the PISN is attempting to complete a call.

NOTE - On receipt of such a notification, User A can either:

- ignore the notification, thereby causing the SS-CC Recall to be delayed;
- cancel the SS-CCBS request; or,
- free resources by disposing of an existing call, thereby allowing the SS-CC Recall to proceed.

6.2.3.2.3 Network congestion

If path reservation is used by the PISN, network congestion can delay the SS-CC Recall, which will not occur until a path has been reserved and both Users are free.

If the PISN does not use path reservation, or interworks with a network which does not allow path reservation, the call completion attempt can fail after User A has accepted the SS-CC Recall because of network congestion. In this case, User A shall be informed of the failure and whether the SS-CCBS request has been maintained by the PISN and a further SS-CC Recall can be expected.

NOTE - Alternative (implementation specific) procedures can also be provided, but are beyond the scope of this Standard

6.2.3.2.4 User B becomes busy after successful SS-CC recall

If User B is busy for the call resulting from a successful SS-CC Recall of User A, the PISN shall either:

- abandon SS-CCBS and release reserved path if path reservation has been performed, indicating the reason for the failure to User A and that the SS-CCBS request has been canceled. In such a case the PISN may allow User A, as an implementation option, the option to re-invoke SS-CCBS if call completion to User B is still required; or,

NOTE - The method used in the PISN to allow User A to re-invoke SS-CCBS is outside the scope of this International Standard.

- resume monitoring of User B, indicating the reason for the failure to User A and that the SS-CCBS request has been maintained. In such a case, User A may, as a User option, request cancellation of the SS-CCBS request, if call completion to User B is no longer required.

As a PISN option, if User B makes an outgoing call after SS-CC Recall has been started, but before User A has accepted the SS-CC Recall, then User B may be notified that the PISN is attempting to complete a call.

NOTE - This gives User B the opportunity to abandon call initiation in order to allow the SS-CCBS call to complete.

6.2.3.2.5 User B becomes busy during path reservation

If user B is found to be busy when path reservation is performed, the path shall be released and the PISN shall wait for User B to become not busy before reattempting path reservation.

6.3.6 Calling/Connected Name Identification Restriction (SS-CNIR)

If User A requests override of the SS-CNIR default value for a call, and the call encounters a busy User B, the request to override the default value shall be retained by the network and shall apply to a call resulting from the use of SS-CCBS.

6.3.7 Completion of Calls on No Reply (SS-CCNR)

If User A has SS-CCNR activated on User B, and User A requests SS-CCBS on User B, this request shall be treated as a duplicate SS-CCBS request in accordance with 6.2.3.2.5.

NOTE - When User B is busy (the pre-requisite for invocation of SS-CCBS by User A) before SS-CC Recall has been started relating to a previous SS-CCNR request, the pending SS-CCNR request has effectively become an SS-CCBS request, as it is awaiting a free User B in order to recall User A. If an SS-CCBS request is then received from User A, relating to User B, this is therefore effectively a duplicate SS-CCBS request and is treated as such by the PISN.

6.3.8 Call Transfer (SS-CT)

No interaction.

6.3.9 Call Forwarding Unconditional (SS-CFU)**a) SS-CFU activated by user B before user A requests SS-CCBS**

If the call to User B is diverted to User C by SS-CFU and User C is busy, then a SS-CCBS request from User A shall be applied to the diverted-to User C.

b) SS-CFU activated by user B after user A requests SS-CCBS

If User B activates SS-CFU after User A has requested SS-CCBS and whilst the SS-CC Recall has not yet been accepted by User A, the SS-CCBS request shall either continue to be applied to User B or be canceled.

c) SS-CFU activation by user A

If User A invokes SS-CCBS whilst SS-CFU is activated, or User A invokes SS-CCBS and subsequently activates SS-CFU, SS-CC Recall shall still be given to User A.

6.3.10 Call Forwarding Busy (SS-CFB)**a) SS-CFB activated by user B before user A requests SS-CCBS**

If the call from User A to User B is diverted to User C by SS-CFB and User C is busy, then a SS-CCBS request made by User A shall be applied either to the diverted-to User C or to the originally called User B.

b) SS-CFB activated by user B after user A requests SS-CCBS

If User B activates SS-CFB after User A has requested SS-CCBS and whilst the SS-CC Recall has not yet been accepted by User A, the SS-CCBS request shall continue to be applied to User B.

c) SS-CFB activation by user A

If User A invokes SS-CCBS whilst SS-CFB is activated, or User A invokes SS-CCBS and subsequently activates SS-CFB, this shall not affect the provision of the SS-CC Recall to User A

6.3.11 Call Forwarding on No Reply (SS-CFNR)

If User B activates SS-CFNR after User A has requested SS-CCBS and whilst the SS-CC Recall has not yet been accepted by User A, then the SS-CCBS request shall continue to be applied to User B.

NOTE - In such a case, the call resulting from successful completion of SS-CCBS can be subject to SS-CFNR if not answered.

If User A invokes SS-CCBS whilst SS-CFNR is activated, or User A invokes SS-CCBS and subsequently activates SS-CFNR, this shall not affect the provision of the SS-CC Recall to User A.

6.3.12 Path Replacement (ANF-PR)

No interaction.

6.4 Interworking considerations

Where Users A and B are on a different network, the availability of SS-CCBS to User A will be limited by the capabilities of the other network and the interworking functions between the PISN and the other network.

If User B is connected to a public ISDN and the public ISDN version of the SS-CCBS service is available at the network interworking point, User A shall be able to request SS-CCBS on public ISDN User B. In addition, a User A served by the Public ISDN shall be able to request SS-CCBS on a PISN User B.

NOTE - This assumes peer cooperation between the public and private ISDN in provision of the SS-CCBS service

6.5 SS-CCBS overall SDL

Figure 1 contains the dynamic description of SS-CCBS using the Specification and Description Language (SDL) defined in CCITT Rec. Z.100. The SDL process represents the behaviour of the network in providing SS-CCBS. The relationship of this process to the basic call process is indicated in the annotations.

Input signals from the left and output signals to the left represent primitives from and to User A. Input signals from the right represent internal stimuli.

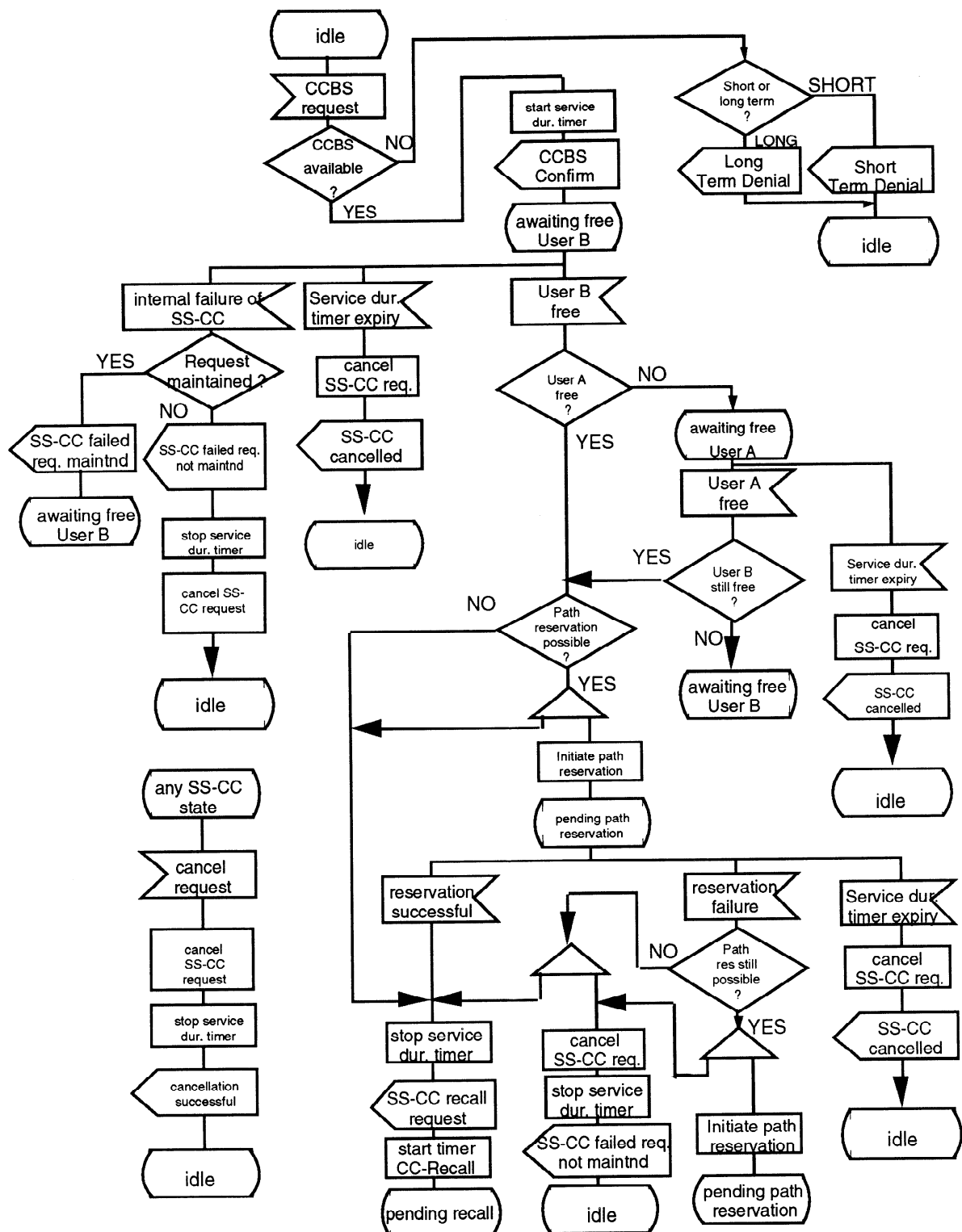
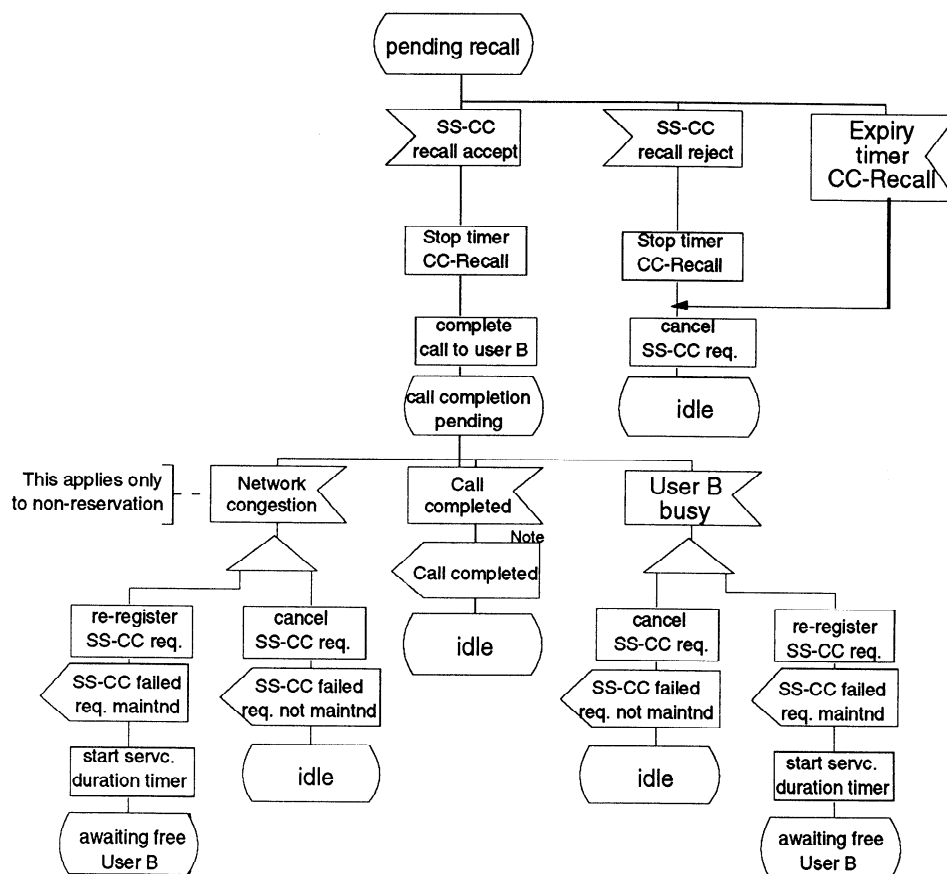


Figure 1- (sheet 1 of 2): SS-CCBS, Overall SDL



NOTE - These notifications may be the same as the basic call notification of call completion and need not be specific to SS-CCBS.

Figure 1 - (sheet 2 of 2): SS-CCBS, Overall SDL

7 SS-CCNR stage 1 description

7.1 Description

7.1.1 General description

Completion of Calls on No Reply (SS-CCNR) is a supplementary service which is offered to a calling User A. On encountering a called User B which does not answer, it allows User A to request that the PISN monitors User B and notifies User A when User B becomes free after a subsequent period of activity. On response by User A to that notification, the PISN shall attempt to complete the call to User B.

NOTE - User activities that constitute a subsequent period of activity are implementation specific and beyond the scope of this Standard.

7.1.2 Qualifications on applicability to telecommunication services

This supplementary service is applicable to all basic services defined in ISO/IEC 11574.

7.2 Procedures

7.2.1 Provision/Withdrawal

SS-CCNR may be provided after pre-arrangement with the service provider (by means of service profile control), or may be available generally to all Users. SS-CCNR may be withdrawn on request of the User or for administrative reasons.

The subscription parameters and values offered by a PISN shall be an implementation matter. A PISN may offer more or less parameters and values than those specified below.

Possible subscription options are summarised in Table 2, which shall apply to the whole access of the served user.

Table 2 - SS-CCNR Subscription parameters

Subscription option	Values:
Recall mode	- SS-CC Recall offered to all compatible terminals - SS-CC Recall offered to the terminal which has activated SS-CCNR

7.2.2 Normal Procedures

7.2.2.1 Activation/deactivation/registration/interrogation

Subclause 6.2.2.1 shall apply, with the exception that 'SS-CCBS' shall be replaced by 'SS-CCNR'.

7.2.2.2 Invocation and operation

When a call from User A fails because the destination User, User B, does not answer, the PISN shall retain the call information provided by User A, as described in 9.2.1 of ISO/IEC 11574, for a period during which User A shall be able to request SS-CCNR. User A shall also be able to request SS-CCNR whilst User B is alerting.

On receipt of a request for SS-CCNR, the PISN shall check whether it is possible to initiate the service, and if so shall send an acknowledgment to User A, start monitoring User B and start the SS-CCNR Service Duration Timer. The acknowledgment means that User A can expect to receive a SS-CC Recall if User B becomes free, after a subsequent period of activity, within the period of the SS-CCNR Service Duration Timer.

NOTES

- 1 The fact that User B is already being monitored, as a result of a call completion request from another user, need not cause rejection of the request from User A. The handling of multiple requests against the same User B is an implementation matter, typically involving some sort of queue arranged in chronological or priority order.
- 2 The fact that User A has already invoked call completion against another user need not cause rejection of any further requests for call completion from User A. The handling of multiple requests by the same User A is an implementation matter.
- 3 The period during which SS-CCNR can be invoked and the value of the SS-CCNR Duration timer are implementation specific.

After the SS-CCNR request has been acknowledged, User A shall be able to receive and initiate other calls.

A PISN may provide User A with the ability to request a list of outstanding SS-CC requests that User A has invoked. If the Recall mode is "SS-CC Recall offered to all compatible terminals", details of all requests made by that user should be provided. If the Recall mode is "SS-CC Recall offered to the terminal which has activated SS-CCNR", only details of requests made by the user from that terminal should be provided. The list will be empty if there are no outstanding SS-CC requests.

When the monitoring of User B indicates that User B has become free after a period of activity (related to the same basic service as the original call to User B), and if User A is also free, the PISN shall provide SS-CC Recall, and start the SS-CC Recall timer.

If User A accepts the SS-CC Recall, the PISN shall attempt to complete the call between User A and User B. If the call is successfully presented to User B and enters an alerting phase or is answered, SS-CCNR shall be regarded as complete.

7.2.2.3 Cancellation

Subclause 6.2.2.3 shall apply, with the exception that 'SS-CCBS' shall be replaced by 'SS-CCNR'

7.2.3 Exceptional procedures

7.2.3.1 Activation/deactivation/registration and Interrogation

Not applicable.

7.2.3.2 Invocation and operation

7.2.3.2.1 Rejection of SS-CCNR service request

Subclause 6.2.3.2.1 shall apply, with the exception that 'SS-CCBS' shall be replaced by 'SS-CCNR'.

7.2.3.2.2 User A is busy on SS-CC recall

If User A is found to be busy when User B becomes free after a period of activity, the PISN shall wait for both Users to become free before providing SS-CC Recall and starting the SS-CC Recall timer. As an option, the PISN can notify User A that the PISN is attempting to complete a call.

NOTE - On receipt of such a notification, User A can either:

- ignore the notification, thereby causing the SS-CC Recall to be delayed;
- cancel the SS-CCNR request; or,
- free resources by disposing of an existing call, thereby allowing the SS-CC Recall to proceed.

7.2.3.2.3 Network congestion

Subclause 6.2.3.2.3 shall apply, with the exception that 'SS-CCBS' shall be replaced by 'SS-CCNR'.

7.2.3.2.4 User B becomes busy after successful SS-CC recall

If User B is busy for the call resulting from a successful SS-CC Recall of User A, the PISN shall either:

- abandon SS-CCNR indicating the reason for the failure to User A and that the SS-CCNR request has been cancelled. In such a case, User A may, as a User option, invoke SS-CCBS if call completion to User B is still required; or,
- automatically invoke SS-CCBS monitoring of User B, indicating the reason for the failure to User A and that SS-CCBS has been invoked. In such a case, User A may, as a User option, request cancellation of the SS-CCBS request, if call completion to User B is no longer required.

As a PISN option, if User B makes an outgoing call after SS-CC Recall has been started, but before User A has accepted the SS-CC Recall, then User B may be notified that the PISN is attempting to complete a call.

NOTE - This gives User B the opportunity to abandon call initiation in order to allow the SS-CCBS call to complete.

7.2.3.2.5 User B becomes busy during path reservation

If user B is found to be busy when path reservation is performed, the path shall be released and the PISN shall wait for User B to become not busy before reattempting path reservation.

7.2.3.2.6 Duplicate SS-CCNR requests

Sub-clause 6.2.3.2.5 shall apply, with the exception that 'SS-CCBS' shall be replaced by 'SS-CCNR'

7.2.3.2.7 Other failure situations

A particular request for the service shall be automatically cancelled by the PISN, and User A shall be notified if:

- User B has still had no period of activity before the SS-CCNR Service Duration Timer expires;
- User B and/or User A are still busy (after a period of activity by User B) when the SS-CCNR Service Duration Timer expires;
- User A does not accept the SS-CC Recall before the SS-CC Recall timer expires;
- User B invokes or activates a service that conflicts with the existing SS-CCNR invocation;
- for any reason, the PISN is unable to continue with the CCNR invocation.

7.2.3.3 Cancellation

Sub-clause 6.2.3.3 shall apply, with the exception that 'SS-CCBS' shall be replaced by 'SS-CCNR'

7.3 Interaction with other supplementary services

Interactions with other supplementary services and ANFs for which PISN Standards were available at the time of publication of this Standard are specified below.

NOTE - Annex A anticipates interactions with future supplementary services and ANFs.

7.3.1 Calling Line Identification Presentation (SS-CLIP)

No interaction.

7.3.2 Connected Line Identification Presentation (SS-COLP)

No interaction.

7.3.3 Calling/Connected Line Identification Restriction (SS-CLIR)

If User A requests override of the SS-CLIR default value for a call, and the call is not answered by User B, the request to override the default value shall be retained by the network and shall apply to a call resulting from the use of SS-CCNR.

7.3.4 Calling Name Identification Presentation (SS-CNIP)

No interaction.

7.3.5 Connected Name Identification Presentation (SS-CONP)

No interaction

7.3.6 Calling/Connected Name Identification Restriction (SS-CNIR)

If User A requests override of the SS-CNIR default value for a call, and the call is not answered by User B, the request to override the default value shall be retained by the network and shall apply to a call resulting from the use of SS-CCNR.

7.3.7 Completion of Calls to Busy Subscribers (SS-CCBS)

Sub-clause 6.3.12 shall apply.

7.3.8 Call Transfer (SS-CT)

No interaction.

7.3.9 Call Forwarding Unconditional (SS-CFU)

a) SS-CFU activated by user B before user A requests SS-CCNR

If the call to User B is diverted to User C by SS-CFU and User C does not answer, then a SS-CCNR request from User A shall be applied to the diverted-to User C.

b) SS-CFU activated by user B after user A requests SS-CCNR

If User B activates SS-CFU after User A has requested SS-CCNR and whilst the SS-CC Recall has not yet been accepted by User A, the SS-CCNR request shall either continue to be applied to User B or be cancelled.

c) SS-CFU activation by user A

If User A invokes SS-CCNR whilst SS-CFU is activated, or User A invokes SS-CCNR and subsequently activates SS-CFU, SS-CC Recall shall still be given to User A.

7.3.10 Call Forwarding Busy (SS-CFB)

a) SS-CFB activated by user B before user A requests SS-CCNR

If the call from User A to User B is diverted to User C by SS-CFB and C does not answer, then a SS-CCNR request made shall be applied to the diverted-to User C.

b) SS-CFB activated by user B after user A requests SS-CCNR

If User B activates SS-CFB after User A has requested SS-CCNR and whilst the SS-CC Recall has not yet been accepted by User A, the SS-CCNR request shall continue to be applied to User B.

c) SS-CFB activation by user A