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Series I

Supplement 1
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SERIES I: INTEGRATED SERVICES DIGITAL NETWORK

Service capabilities – Supplementary services in ISDN

Generic service descriptions for ten supplementary services defined in I.250 – Series Recommendations

Supplement 1 to
ITU-T I – Series Recommendations

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SUPPLEMENT 1 TO ITU-T I-SERIES RECOMMENDATIONS

GENERIC SERVICE DESCRIPTIONS FOR TEN SUPPLEMENTARY SERVICES DEFINED IN I.250-SERIES RECOMMENDATIONS

Source

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

INTELLECTUAL PROPERTY RIGHTS

The ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. The ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, the ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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Supplement 1 to I-Series Recommendations

GENERIC SERVICE DESCRIPTIONS FOR TEN SUPPLEMENTARY SERVICES DEFINED IN I.250 SERIES RECOMMENDATIONS

(Geneva, 1998)

0   Generic service description

1   Call Forwarding service

1.1   Definition

The **call forwarding service** enables a called user to have incoming call to be forwarded to another user without being offered. Calls may be forwarded dependent of the status of the called user (e.g. busy, no reply) or unconditionally.

1.2   Specific terminology

1.2.1   calling user: The originator of the call that is subjected to diversion.

1.2.2   called user: A user that has activate the call forwarding.

1.2.3   forwarded-to user: A user to whom the call is redirected as a result of forwarding(s).

1.3   Service description

The service is offered to a called user to forward incoming calls. The call may be forwarded:

–   unconditionally; or

–   when the called user is busy; or

–   when the called user doesn't answer to the incoming call.

The called user may receive an indication when the call is originated that the service has been activated, and when the network originates the call to the forwarded-to user that a call has been forwarded.

The calling user may receive an indication that the call has been forwarded.

The forwarded-to user receiving a forwarded call may have an indication informing that the incoming call is a forwarded call.

The called user's ability to originate calls is unaffected by this service.

A call may be diverted several times. In case of multiple diversions, information may be provided to the called user or forwarded-to user as follows:

–   the number of the originally called user;

–   the number of the last calling user;

–   the reason of diversions (e.g. busy, no reply).

1.4 Operation of the service from the users' perspectives

1.4.1 Calling party

1.4.1.1 Normal operation

No action is required on behalf of the calling party.

1.4.1.2 Optional feature operation

There is no optional feature operation for the calling party.

1.4.2 Called party

1.4.2.1 Normal operation

The called user has to provide the number of the forwarded-to user when the service is activated. If the request of activation has been accepted, the called user may be informed with the indication of the address of the forwarded-to user.

1.4.2.2 Optional feature operation

There is no optional feature operation for the called party.

1.4.2.3 Exceptional procedures

If the limit on the number of diversions has been reached, then the subsequent attempt to invoke the service shall be rejected.

1.4.3 Forwarded-to party

1.4.3.1 Normal operation

No action is required on behalf of the forwarded-to party.

1.4.3.2 Optional feature operation

There is no optional feature operation for the forwarded-to party.

1.5 Implementation considerations

Some aspects need to be considered when implementing this service:

a) What is the maximum number of diversions authorised for a call? For example, 5.

b) Should any indication be provided to the called user? For example, an indication on the service activation, an indication that the call is forwarded.

c) What information should be included in the indication? For example, the identity of the calling user, the reason for diversion, etc.

d) Should any indication be provided to the calling user? For example, an indication that the call is going to be forwarded.

e) Should any indication be provided to the forwarded-to user? For example, an indication informing that the incoming call is a forwarded call.

f) Should any indication be provided when the maximum number of diversions is reached?

g) Will the network check the validity of the forwarding-to number provided by the called user?

h)   Will the maximum number of diversions apply through dissimilar networks?

i)   Under what conditions shall a call be forwarded? For example, busy, no reply, etc.

j)   What is the timer value after which the call is forwarded when the called user does not answer the call?

2   Call Hold service

2.1   Definition

The **call hold service** allows a user to interrupt communications on an existing call and then, subsequently, if desired, re-establish communications. The Call Hold service includes the retrieve operation that re-establishes the call between the served user and the held party.

2.2   Specific terminology

No terminology specific to this Supplement has been identified.

2.3   Service description

When the Call Hold service is invoked, communication on a call is interrupted and the call is released from use.

Depending on the implementation, a path may or may not be reserved after the communication is interrupted to allow the origination or possible termination of other calls. Reservation may be provided by the service provider as a user option.

When the served user wishes to re-establish communications, the retrieve operation is requested. The success of the retrieve operation depends on whether a path was reserved and whether a path is currently available to the served user.

NOTE – Figures 2-1 and 2-2 provide examples of the normal procedures of the Call Hold supplementary service. They are not intended to cover all possible normal scenarios. The terminal representations in these figures are used for graphic purposes only and are not intended to suggest that other end user equipment is not applicable.

A-B Call
1) Answered
2) Served user requests for Call Hold
3) A-B communication is suspended

T0207020-98

User A   Call held   User B
(Served user)

Figure 2-1 – Example scenario during invocation of Call Hold

A-B Call

1) Served user A requests retrieval of a held call
2) If path is available, the connection is re-established

| User A | Connection re-established | User B |

T0207030-98

User A
(Served user)

Connection re-established

User B

Figure 2-2 – Example scenario during retrieval of Held Call

2.4 Operation of the service from the users' perspectives

2.4.1 Served user

2.4.1.1 Normal operation

The served user indicates to the network that the current call is to be interrupted. A call may be placed on hold by either the calling or called served user.

The communication on the interface is then interrupted. The network acknowledges this action, and the associated path is made available for other uses.

If at any time a call is in the held state, either party may disconnect from the call.

2.4.1.2 Optional feature operation

2.4.1.2.1 Reserved path operation

If path reservation is subscribed to, a connection path is reserved for use by the given terminal used to invoke the Call Hold service.

When a user (as identified by a terminal) places a call on hold and reservation applies, a connection path should always be available to that user so that the user may retrieve that call from hold, or establish, retrieve or connect to another call. One connection path should be kept available for the user as long as the user:

i)   has one or more calls on hold with reservation; and

ii)   is not currently connected to any other call.

Hence, the network should not reserve more than one path for the terminal used to invoke the Call Hold service.

In some implementations, the served user may optionally indicate a path selection parameter in the retrieve request. The parameter may indicate:

1)   any path acceptable;

2)   specified path is preferred; or

3)   specified path is required exclusively.

If the network can satisfy the request, the call will be reconnected; if it cannot, the request will be rejected with an appropriate reason returned to the user.

2.4.1.3 Exceptional procedures

If the user tries to hold a call while not subscribed to the service or if, for some other reason, the network cannot hold the call, an indication shall be provided to the user for the reason of failure, if possible.

If the service provider cannot retrieve a previously held call, the user shall be informed of the reason for failure, if possible. (For example, there may not be any path available, or the call may be in the process of being cleared.)

2.4.2 Held user

2.4.2.1 Normal operation

When Call Hold is invoked by the served user, the connection between the connection between the served user and the held user will be suspended. The held user shall be able to disconnect from the held call.

2.4.2.2 Optional feature operation

2.4.2.2.1 Notification of hold option

As an option, the network may send a notification to the held party indicating that the call has been placed on hold.

2.4.2.3 Exceptional procedures

No exceptional procedures have been identified.

2.5 Implementation considerations

a) What specific conditions exist on a connections before the Call Hold service can be successfully invoked? For example, if a connection is held by the calling user while the call is still notifying the called user of the incoming call, (e.g. ringing, alerting) the called party could answer a call that has already been placed on hold.

b) What specific equipment features are required to support the different possibilities of the Call Hold service? For example, display support may be desirable to fully exploit the various hold, retrieval, and failure indications of the service.

c) For implementations that include multiple channels to a single user, how many reserved channels will be guaranteed, in the event that the served user wishes to hold several connections with path reservation?

3 Call Waiting supplementary service

3.1 Definition

The **call waiting service** is a supplementary service which permits a subscriber to be notified of an incoming call with an indication that no connection path is available. The user then has the choice of accepting, rejecting or ignoring the waiting call.

3.2 Specific terminology

3.2.1 **subscriber B**: The subscriber who is provided by the network with the Call Waiting service on a particular interface.

3.2.2 **user B**: The user who reacts to the call waiting at B.

3.2.3   user C: The user who has originated a call to subscriber B which causes the Call Waiting service to be invoked.

3.2.4   user A: Represents a user who is engaged in a call with user B (this call can be in any state).

3.2.5   user response timer T1: This timer specifies the period the network will wait for a positive response, from a terminal at B, to the offered call. The timer T1 normally has a value of a few seconds.

3.2.6   no answer timer T2: This optional timer specifies the period the network will wait for a response (answer), from user B, to the offered call from user C. The value of this timer T2 is normally between 0.5 and 2 minutes.

3.3   Service description

When an incoming call from user C arrives at the access of subscriber B and encounters that no connection path(s) is/(are) available, then the Call Waiting service will be invoked and the call will be offered to subscriber B with an indication that no free connection path(s) was/(were) available.

NOTE – Figure 3-1 provides one example of the normal procedures of the Call Waiting supplementary service. It is not intended to cover all possible normal scenarios. The terminal representations in the figure are used for graphic purposes only and are not intended to suggest that other end user equipment is not applicable. This example shows the call waiting indication being displayed on the user B's terminal equipment. This is shown solely as an example; actual implementations will vary as to how the call waiting indication is presented to the user.
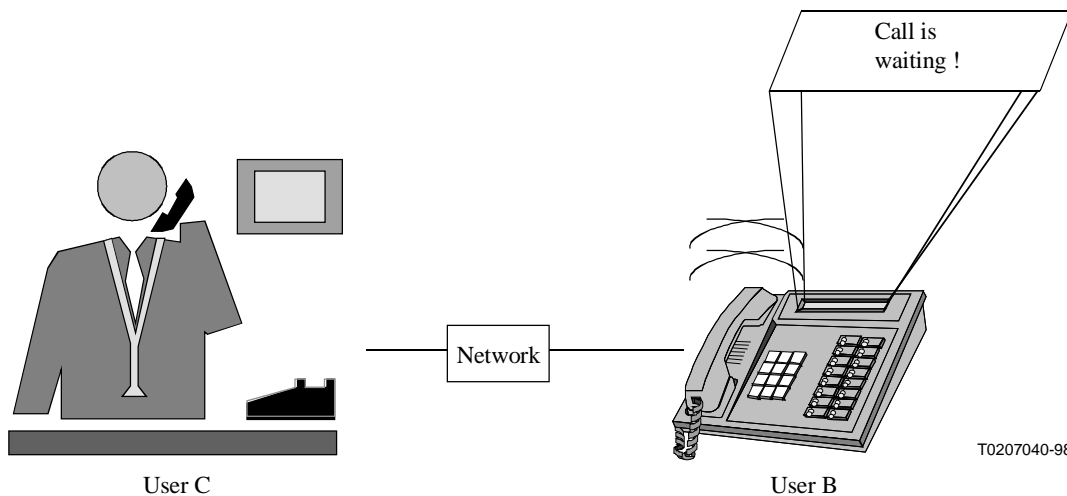

Figure 3-1 – Example scenario

3.4   Operation of the service from the users' perspectives

3.4.1   User A

3.4.1.1   Normal operation

User A is the user that is engaged with user B and which enables the Call Waiting supplementary service to be invoked when user C then calls user B and encounters that no connection path(s) towards B is/(are) available.

3.4.1.2 Exceptional operation

None identified.

3.4.2 User C and user B

3.4.2.1 Normal operation

If user B responds to the offered call (with the call waiting indication) before expiry of timer T1 (User Response timer T1), then user C will be given an indication that user B is being informed about the incoming call. This indication may also, dependent of network implementation, indicate that call waiting is in operation.

If an information channel at the interface of user B is being free before the expiry of timer T2 (No Answer timer T2), then user B may be able to accept the waiting call from user C.

3.4.2.2 Exceptional operation

If there is no positive response from user B before expiry of timer T1 (User Response timer T1), then the call attempt from user C is to be considered as unsuccessful and the network will release user C with an indication of the reason.

If timer T2 (No Answer timer T2) expires without any acceptance from user B of the incoming call, then the network may indicate to user B that no call is longer waiting, and also inform user C that the call cannot be established.

If the incoming call is rejected by all the existing terminals at user B, then the network may inform user C that the call cannot be connected.

If user C for some reason wishes to release the call attempt to user B, then the network may clear the call attempt and inform user B that no call is any longer waiting.

3.5 Implementation considerations

When implementing the Call Waiting service, the following points may be considered:

a)   What type of indication should be given to user B when a call is waiting?

b)   Should user C receive an indication that the call is subject to call waiting, and

c)   What type of indication will then be given to user C?

d)   If the described timer(s) is to be used for the Call Waiting service, what should the value of those timers be?

e)   What responses/indications is to be given to user B and user C if exceptional procedures occur?

f)   If interworking between network occurs (user C is on another network than user B), how may the indication to user C, if implemented, be transferred, or rejected if not supported by the other network?

g)   Depending on implementation, a limit of maximum number of waiting calls may be set, and any incoming calls exceeding that limit may be treated as e.g. busy.

4 Calling Line Information service

4.1 Definition

The **calling line information service** provides the served user with the possibility of receiving calling line identity of the calling party when a call arrives. The calling party may choose to restrict the availability of this information.

4.2 Specific terminology

4.2.1 calling line identity: A number identifying the calling party. The maximum length is at least 15 digits.

The exact length, format of the calling line identity to be delivered is a service provider option. The delivery mechanism depends on the network technology and the capabilities of the called party's equipment.

4.2.2 line information: The calling line identity, if available, or an indication of unavailability.

4.3 Service description

This service consists of two parts: a presentation service available to a called party and a restriction service offered to a calling party. When a call arrives, the called party is offered calling line information if subscribed to the calling line information presentation service. The arrival of the calling line information may be before the user is informed of the call or whilst the user is being informed of the call dependent on the network capabilities and interworking considerations. If the calling line information arrives after the call has been answered, it may be discarded. The calling party may have the ability to restrict the sending of calling line information either on a call by call basis or permanently, dependent on implementation and subscription options available. If the calling party has "permanent" restriction active it may be possible for the calling party to deactivate this or to release the calling line information on a call-by-call basis.

NOTE – Figure 4-1 provides one example of the normal procedures of the Calling Line Identification Presentation service. It is not intended to cover all possible normal scenarios. The terminal representations in the figure are used for graphic purposes only and are not intended to suggest that other end user equipment is not applicable. This example shows the calling line information being displayed on the called party's terminal equipment. This is shown solely as an example, actual implementations will vary as to how the calling line information is presented to the user.
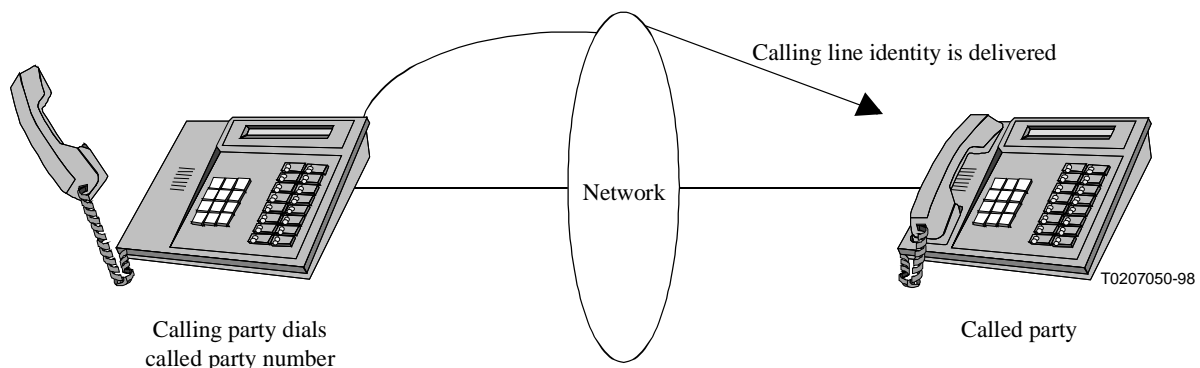

Calling line identity is delivered

Network

T0207050-98

Calling party dials
called party number

Called party

Figure 4-1 – Example scenario

4.4 Operation of the service from the users' perspectives

4.4.1 Calling party

4.4.1.1 Normal operation

No action is required on behalf of the calling party to release the calling line identity.

4.4.1.2 Optional feature operation

4.4.1.2.1 When the calling party has permanent restriction active

If the calling party has permanent restriction active then as a service provider option it may be possible for the calling party to override the permanent restriction and indicate to the network that the release of the calling line identity is requested either permanently or just for this call.

4.4.1.2.2 When the calling party does not have permanent restriction active

If the calling party does not have permanent restriction active then as a service provider option it may be possible for the calling party to restrict the sending of the calling line identity and indicate to the network that the restriction of the calling line identity is requested either permanently or just for this call.

4.4.1.3 Exceptional procedures

No exceptional procedures have been identified.

4.4.2 Called party

4.4.2.1 Normal operation

Dependent on the capabilities of the called party's network and equipment, the calling line information may be delivered before the called party has been informed of the call or whilst the called party is being informed of the call.

4.5 Implementation considerations

Depending on implementation, the called party's service provider may need special equipment to send the calling line identity, and the called party may also need special equipment to receive calling line identity – for example, a modem and a display terminal. Hence, in some cases, specific arrangements may need to be made between the called party and the called party's service provider to ensure compatibility of the service with the equipment.

Other aspects need to be considered when implementing this service concerning interworking with similar and dissimilar networks. For example:

a)   What is the maximum length of calling line information? For example, 15.

b)   Will enough digits be transmitted to enable the called party to return the call?

c)   Will the network check calling line identity validity? For example, this validity check may determine whether the digits are within an allocated range.

d)   Will the network deliver more calling line identities? For example, some network may deliver two calling line identities.

e)   At what stage during call establishment will the calling line information be available?

f)   How will any indication concerning the restriction of the calling line information be handled?

g)   What classes of user, if any, are allowed to override a presentation restricted request?

5 Calling Name Information Service

5.1 Definition

The **calling name information service** is a service whereby a called party is offered name information associated with the calling party when a call arrives. The calling party may choose to restrict the availability of this information.

5.2 Specific terminology

5.2.1 calling name: Information associated with the calling party number. The maximum length is at least 15 characters. The exact length, format and character set of the calling name to be delivered is a service provider option. The delivery mechanism depends on the network technology and the capabilities of the called party's equipment.

5.2.2 name information: The calling name, if available, or an indication of unavailability. In addition to the name, the character set used shall be identified to enable the correct presentation of special characters etc. to the user.

5.3 Service description

This service consists of two parts: a presentation service available to a called party and a restriction service offered to a calling party. When a call arrives, the called party is offered name information if subscribed to the name information presentation service. The arrival of the name information may be before the user is informed of the call or whilst the user is being informed of the call dependent on the network capabilities and interworking considerations. If the name information arrives after the call has been answered, it may be discarded. The calling party may have the ability to restrict the sending of name information either on a call-by-call basis or permanently, dependent on implementation and subscription options available. If the calling party has "permanent" restriction active, it may be possible for the calling party deactivate this or to release the name information on a call-by-call basis.

NOTE – Figure 5-1 provides one example of the normal procedures of the Calling Name Identification Presentation Service. It is not intended to cover all possible normal scenarios. The terminal representations in the figure are used for graphic purposes only and are not intended to suggest that other end user equipment is not applicable. This example shows the name information being displayed on the called party's terminal equipment. This is shown solely as an example, actual implementations will vary as to how the name information is presented to the user.
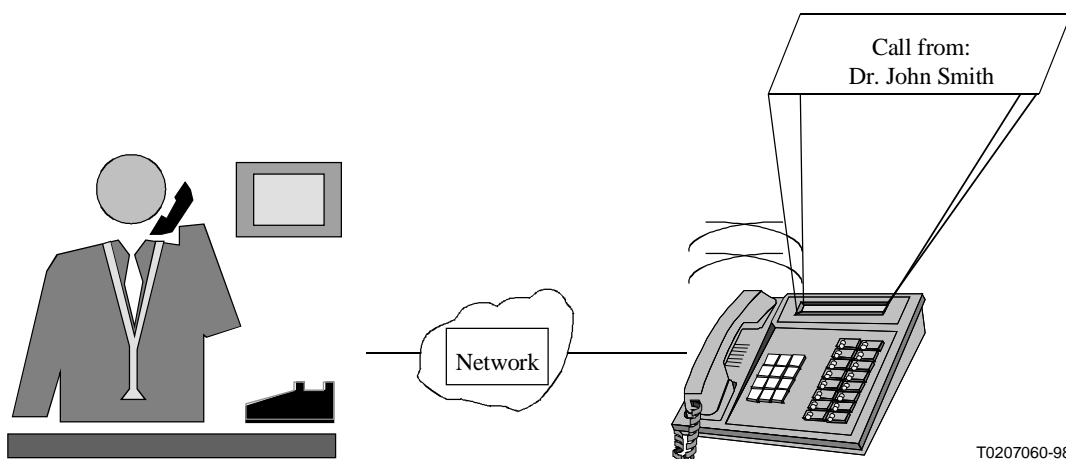

Call from:
Dr. John Smith

Network

T0207060-98

Figure 5-1 – Example scenario

5.4 Operation of the service from the users' perspectives

5.4.1 Calling party

5.4.1.1 Normal operation

No action is required on behalf of the calling party to release the calling name.

5.4.1.2 Optional feature operation

5.4.1.2.1 When the calling party has permanent restriction active

If the calling party has permanent restriction active, then, as a service provider option, it may be possible for the calling party to override the permanent restriction and indicate to the network that the release of the name information is requested either permanently or just for this call.

5.4.1.2.2 When the calling party does not have permanent restriction active

If the calling party does not have permanent restriction active, then, as a service provider option, it may be possible for the calling party to restrict the sending of the name information and indicate to the network that the restriction of the name information is requested either permanently or just for this call.

5.4.1.3 Exceptional procedures

No exceptional procedures have been identified.

5.4.2 Called party

5.4.2.1 Normal operation

Depending on the capabilities of the called party's network and equipment, the name information may be delivered before the user has been informed of the call or whilst the user is being informed of the call.

5.5 Implementation considerations

Depending on implementation, the called party's service provider may need special equipment to send the name information, and the called party may also need special equipment to receive name information – for example a modem and a display terminal. Hence, in some cases, specific arrangements may need to be made between the called party and the called party's service provider to ensure compatibility of the service with the equipment.

Other aspects need to be considered when implementing this service concerning interworking with similar and dissimilar networks, for example:

a)   What is the maximum length of name informations? For example, 15.

b)   What are the rules to be applied when the maximum length of the name information in the sending network is greater than that of the receiving network? A possible solution is to truncate the name information in which case the called party will receive an incomplete name.

c)   What is the character set used and what, if any, translation is to be performed if they are different in the sending and receiving networks?

d)   At what stage in the call set-up will the name information be available?

e)   How will differences in timing be handled? For example, will the user be delayed in being informed of a call until the name information is available, or will the name information be sent after the user has started to be informed?

f)   How will any indication concerning the restriction of the name information be handled?

g)   What classes of user, if any, are allowed to override a presentation restricted request?

6   Conference call, meet-me

6.1   Definition

The meet-me conference service provides a user with the ability to arrange for a conference call between more than two participants, where each participant has to dial a special number to access the conference.

6.2   Specific terminology

6.2.1   served user: The user that booked the conference.

6.2.2   conferees: All the other users are called conferees.

6.2.3   participant: The served user or a conferee.

6.2.4   special number: Number allocated for accessing the conference.

6.3   Service description

The Meet-Me Conference service is activated for a specified period booked in advance by the served user.

Each participant in the conference has to dial a special number which has been attached to the booked conference, in order to access the conference.

The access to a conference is allowed for the duration of the conference, as long as the maximum number of simultaneous participants has not been reached.

When two or more participants are connected to the conference, information may be sent to the other participants each time a new participant is about to be connected to the conference. When the new participant has been added to the conference, then the existing participants are able to communicate with the new participant.

The identification, if available, of new participants may be provided to the already connected ones.

NOTE – Figure 6-1 provides one example of the normal procedures of the Meet-Me Conference service. It is not intended to cover all possible normal scenarios. The terminal representations in the figure are used for graphic purposes only and are not intended to suggest that other end user equipment is not applicable.
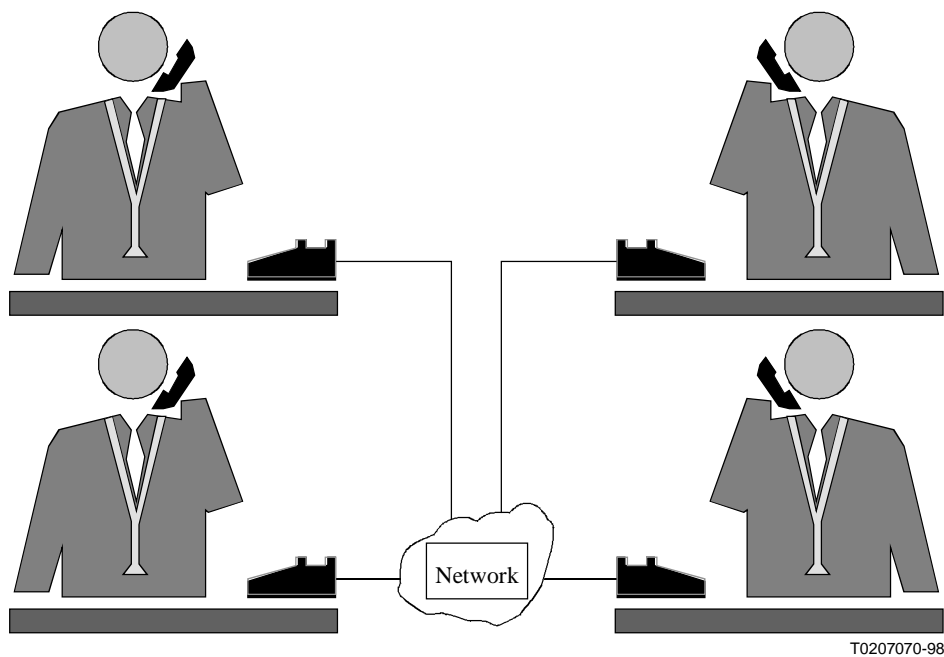
Figure 6-1 – Four persons involved in a Meet-me conference

The Meet-Me Conference service is activated for a specified period booked in advance by the served user.

At the end of the scheduled time of the conference, the conference is released, every participant still connected being automatically released. Before the release operation, information is sent to the participants in order to inform them of the approaching end of the conference.

6.4 Operation of the service from the users' perspectives

6.4.1 Served user

6.4.1.1 Normal operation

The served user must make prior arrangements with a service provider to book the conference call.

During the conference, the served user may be able to ask the service provider to modify some conference parameters (e.g. end time of the conference, maximum number of simultaneous participants.)

6.4.1.2 Exceptional procedures

There are no exceptional procedures identified with this service.

6.4.2 Participants

6.4.2.1 Normal operation

Each participant has to dial the special number attached to the booked conference to access the conference.

The service is invoked by the first participant dialling the special number of the conference. Information may be given to the calling participant before connection to the conference. This information may proceed for the first participant until a second one has been connected.

At any time, each participant shall be able to leave the conference by terminating the call to the conference.

6.4.2.2 Exceptional procedures

When the maximum number of simultaneous participants has been reached, every new call using the special number shall be rejected as a call to a busy destination. If a participant subsequently leaves the conference, then normal procedures shall apply.

6.4.3 Service provider

6.4.3.1 Normal operation

At any time, the service provider shall have the possibility to be connected to the conference in progress or to each individual participant by means of a specific procedure.

This will allow the service provider, for example:

– to check the transmission quality;

– to remove a participant by clearing the access;

– to contact the served user for administration reasons.

Information may be sent to inform the participants of the incoming of the service provider.

6.4.3.2 Exceptional procedures

No exceptional procedures have been identified.

6.5 Implementation considerations

a) Shall information be sent to participants in-band, out-band, or both?

b) Shall there be a limit between the time of booking and activation of the conference?

c) Shall there be a predefined time period after booking before activation is allowed?

d) What is the maximum number of participants that the network will support?

e) What conference parameters may be modified after the conference has started?

7 Explicit Call Transfer service

7.1 Definition

the **explicit call transfer service** enables a user who has two calls, each of which can be an incoming or an outgoing call, to connect the other parties in the two calls.

7.2 Specific terminology

7.2.1 served user: The user who subscribes to and invokes the Explicit Call Transfer service. This user is also referred to as "user A".

7.2.2 the other parties associated with the Explicit Call Transfer service are defined as follows:

7.2.2.1 user B: The other party in one (the answered) call;

7.2.2.2 user C: The other party in the second call. This user can also be referred to as "the third party".

7.2.3 held call: A call on which the Call Hold service is currently in operation.

7.2.4   call not held: A call on which the Call Hold service is not currently in operation.

7.3   Service description

The Explicit Call Transfer service enables a user to transform two of that user's calls, each of which can be an incoming or an outgoing call, into a new call between the other parties in the two calls. Prior to transfer, one of the two calls shall be answered, the other call can be either notifying the called party of the incoming call, (e.g. ringing, alerting) or answered, depending on a network option. Calls incoming to the served user must have been answered.

On successful invocation of the Explicit Call Transfer supplementary service, the two calls between user A and user B and between user A and user C respectively, shall be removed from user A's access and shall be transformed into a call between user B and user C, as shown in Figure 7-2.

If user C is being informed of the call at the time of transfer, user C shall continue to be informed of the call, and on answer shall be connected to user B.

NOTE – Figures 7-1 and 7-2 provide examples of the normal procedures of the Explicit Call Transfer service. They are not intended to cover all possible normal scenarios. The terminal representations in these figures are used for graphic purposes only and are not intended to suggest that other end user equipment is not applicable.
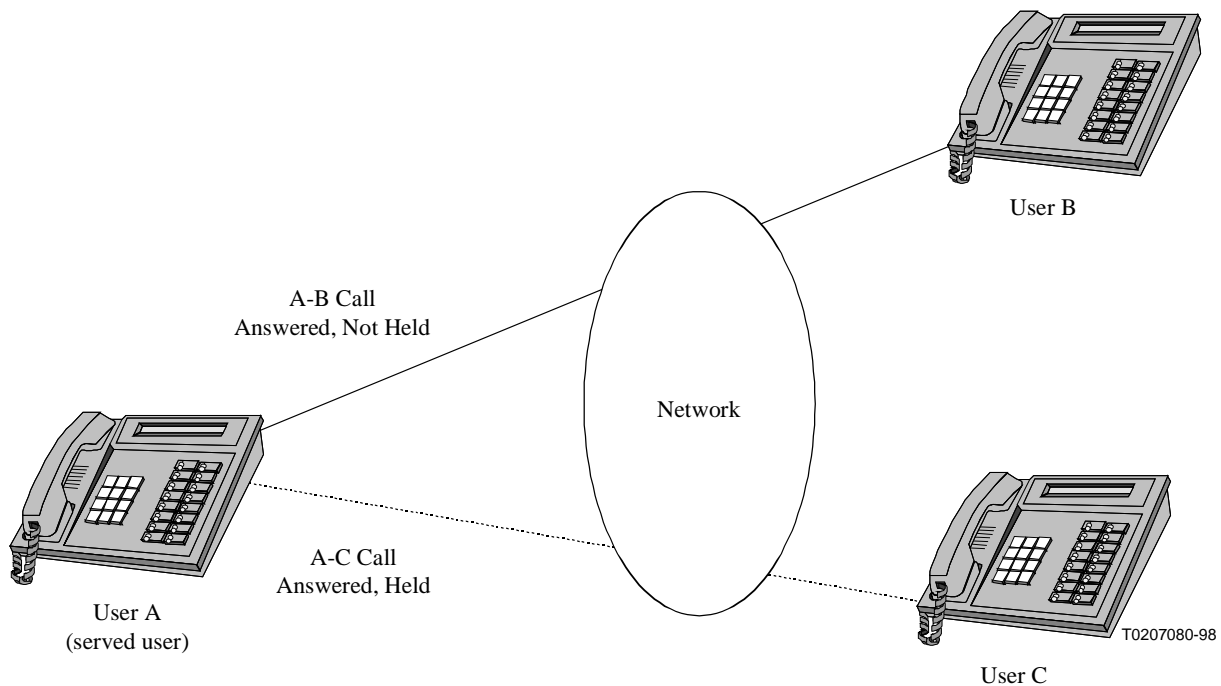

Figure 7-1 – Example scenario before invocation of Explicit Call Transfer
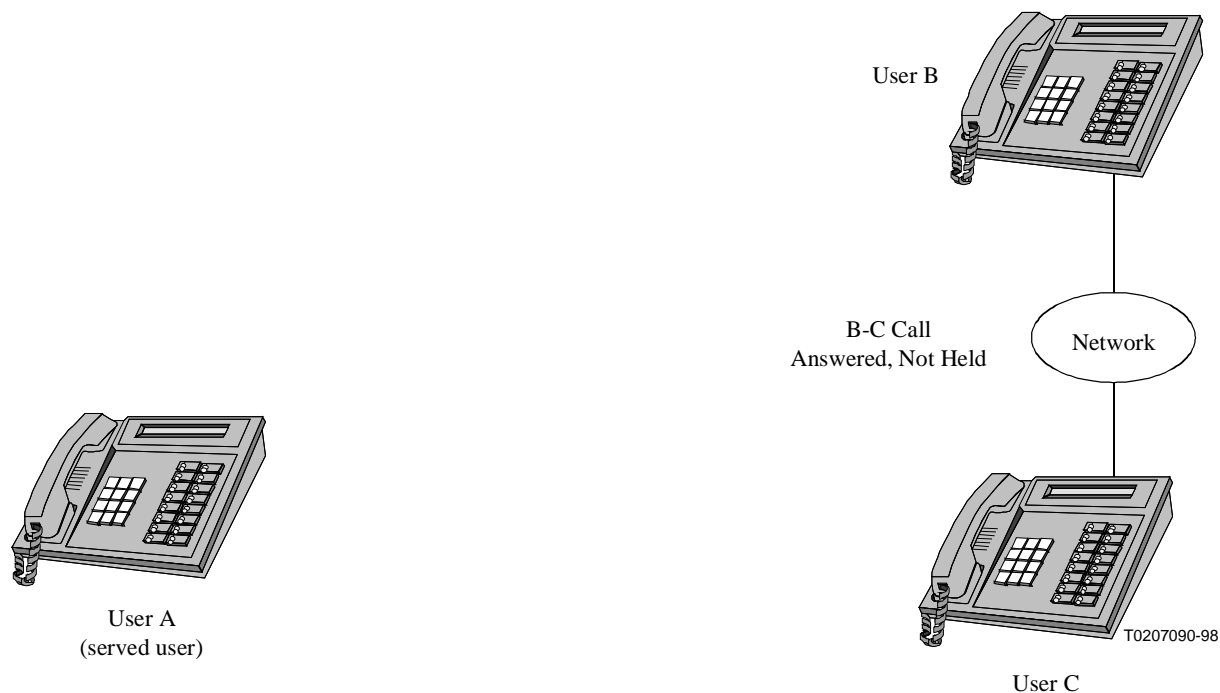
Figure 7-2 – Example scenario after successful invocation of Explicit Call Transfer

7.4 Operation of the service from the users' perspectives

7.4.1 Served user

7.4.1.1 Normal operation

The served user (user A) who has two calls (with user B and user C), each of which can be an incoming or an outgoing call, can request the invocation of the Explicit Call Transfer supplementary service with respect to the two calls.

When the Explicit Call Transfer service is invoked, the following conditions apply with respect to the two calls (see example in Figure 7-1):

–   one of the calls (referred to as the call between user A and user B) shall have been answered;

–   neither call is notifying of an incoming call at user A.

7.4.1.2 Optional feature operation

As a network option, the Explicit Call Transfer service can be invoked either:

a)   after the notification of the incoming call has commenced at user C, or after user C has answered; or

b)   only after user C has answered.

7.4.1.3 Exceptional procedures

The Explicit Call Transfer supplementary service request shall be rejected if the network is unsuccessful in connecting user B and user C (e.g. when user C is busy, when there is network congestion, when transfer restrictions are violated, or if both calls to user B and user C are unanswered).

User A may be notified of the cause for rejection, and the two calls between user A and user B and user A and user C shall remain in the states they were in before the Explicit Call Transfer service was requested.

7.4.2 Users B and C

7.4.2.1 Normal operation

7.4.2.2 Optional feature operation

7.4.2.2.1 Notification of transfer

The network may notify users B and C of the transfer and indicate to user B the state of the third party (user C). In the case where a network supports the service provider option in 7.4.1.2 a) above, then the transferred notifying call is answered; user B may again receive an indication that the call has been answered.

7.4.2.3 Exceptional procedures

No exceptional procedures have been identified.

7.5 Implementation considerations

a)   Should this service require subscription to the call hold service or shall the functionality be included in this service?

8   Multi-level Precedence and Preemption Service

8.1   Definition

The **Multi-Level Precedence and Preemption (MLPP) service** provides prioritized call handling service. This service has two parts – precedence and preemption. Precedence involves assigning a priority level to a call. Preemption involves the seizing of resources, which are in use by a call of a lower precedence, by a higher precedence call in the absence of idle resources. Users in networks that do not support this service will not be affected by this service.

8.2   Specific terminology

8.2.1   precedence: The priority associated with a call.

8.2.2   precedence call: A call with precedence level higher than the lowest level of precedence.

8.2.3   MLPP Call: A call that has a precedence level established and is either being offered or answered.

8.2.4   user A: A party of the MLPP call with user B.

8.2.5   user B: The other party of the MLPP call with user A. User B is the called party of the precedence call.

8.2.6   user C: The party who initiates the precedence call to user B.

8.2.7   active call: A call that has the path established, and the calling and called parties are active on the call.

8.2.8   response timer: A timer which is started when the service provider notifies the called user of a precedence call (for example, this would be the preemption notification if preemption occurs at the user interface). This timer establishes the time that user B has to accept the precedence call from user C.

8.2.9   alternate party: The party to which a precedence call will be diverted. Diversion will occur either when the Response Timer expires, when the called party is on a call of equal or higher precedence, or when the called party is busy with resources non-preemptable. Alternate party diversion is an optional feature.

8.3   Service description

The MLPP service is provided as a network provider's option to a domain of a network. The domain can be the whole network or a subset of the network. The MLPP service applies to all network resources in the domain that are in common use. The maximum precedence level of an MLPP user is set by the service provider based on the user's need. The MLPP user may select a precedence level up to and including the user's maximum precedence level on a per-call basis.

Precedence calls (MLPP calls that have a higher precedence than the lowest level of precedence) that are not responded to by the called party (e.g. call unanswered and/or unacknowledged, called party busy with a call of equal or higher precedence, or called party busy and non-preemptable) may be diverted to a predetermined alternate party. The diversion to an alternate party is an option. This alternate party may be another MLPP user or a network operator position.

Preemption may take one of two forms. First, the called party may be busy with a lower precedence call which must be preempted in favour of completing the higher precedence call from the calling party. Second, the network resources may not be available due to calls (e.g. network congestion), some of which are of lower precedence than the call requested by the calling party. One or more of these lower precedence calls must be preempted to complete the higher precedence call. There are three characteristics of preemption:

– Any party whose connection was terminated (whether that resource is reused or not) shall receive a distinctive preemption notification.

– Any called party of an active call that is being preempted by a higher precedence call may be required to acknowledge the preemption before being connected to the new calling party.

– When there are no idle resources, preemption of the lowest lower level of precedence resources shall occur.

A call may be preempted any time after the precedence level of the call has been established and before clearing has begun.

If a common network facility is preempted, both existing parties concerned are notified of the preemption and the existing path is immediately released. The new call is established using the preempted facility in the normal manner without any special notification to the new called party (user B).

If a called user is to be preempted, both the called and the non-called parties (users B and A, respectively) shall be notified and the existing MLPP call shall be immediately cleared. The called party is then notified that a new MLPP call is available.

Figures 8-1 and 8-2 show an example of MLPP invocation involving three MLPP users where an established call is preempted by a user with a higher precedence level.

NOTE – Figures 8-1 and 8-2 provide examples of the normal procedures of the MLPP service. They are not intended to cover all possible normal scenarios. The terminal representations in these figures are used for graphic purposes only and are not intended to suggest that other end user equipment is not applicable.
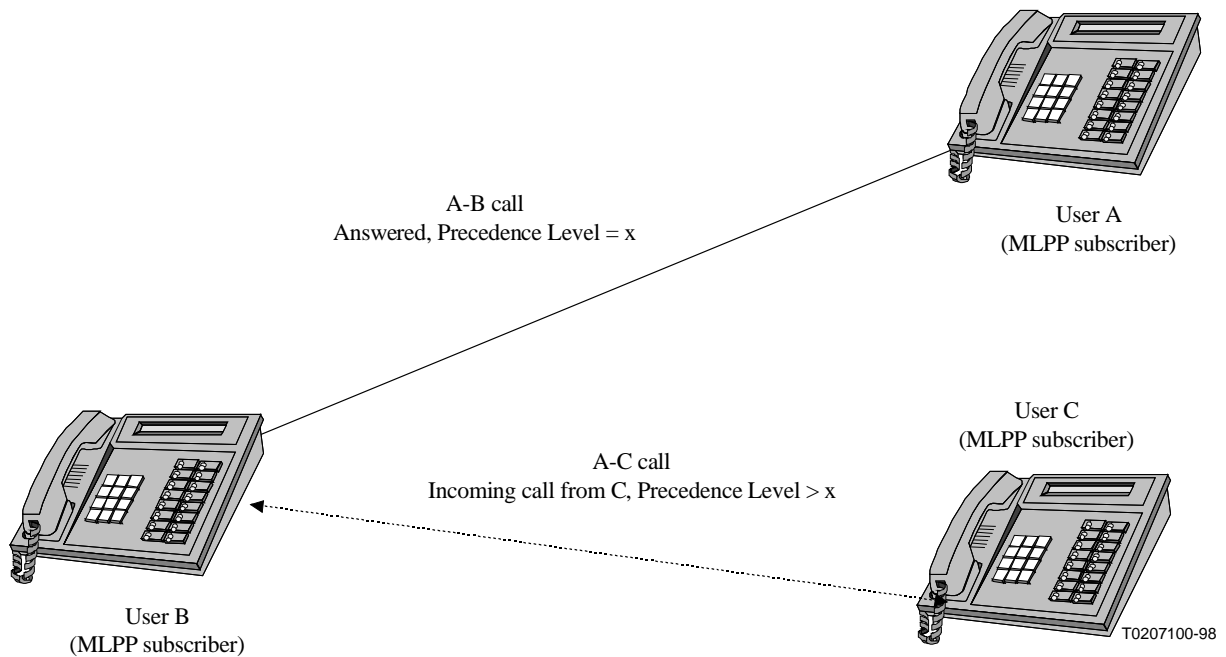
**Figure 8-1 – Example scenario before invocation of
Multi-Level Precedence and Preemption**

A-B call
Answered, Precedence Level = x

User A
(MLPP subscriber)

User C
(MLPP subscriber)

A-C call
Incoming call from C, Precedence Level > x

User B
(MLPP subscriber)

T0207100-98

A-B call
1) Call is cleared; Both users A and
   B are notified

User A
(MLPP subscriber)

User C
(MLPP subscriber)

B-C call
2) User A sends acknowledgement of higher
   precedence call
3) A-C call is established

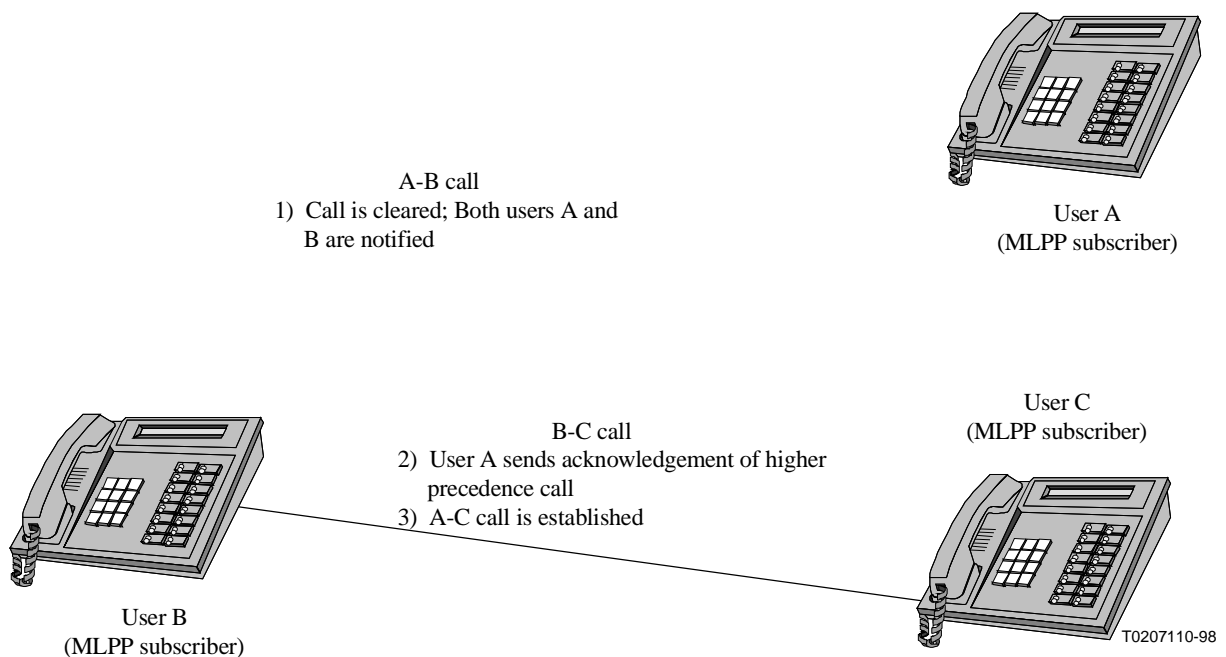User B
(MLPP subscriber)

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**Figure 8-2 – Example scenario during invocation of
Multi-Level Precedence and Preemption**

The MLPP service is not intended to provide preemption of users that are outside the MLPP domain. The service provides for preemption of calls within the MLPP domain, which consists of the resources belonging to the users that subscribe to the MLPP service. In other words, calls that are originated by or made to non-MLPP users will not be preempted. Calls that are originated by MLPP subscribers may be preempted by calls of higher precedence only.

8.4 Operation of the service from the users' perspectives

8.4.1 Calling party

8.4.1.1 Normal operation

The calling party shall select the precedence level for an MLPP call on a per-call basis. The MLPP user may select any precedence level up to and including his maximum authorized precedence level. Once set for a call, this precedence level cannot be changed. In a preemption situation (i.e. calling party = user C), no special notification is given to the calling party if resources are preempted.

8.4.1.2 Optional feature operation

No optional feature operation has been identified.

8.4.1.3 Exceptional procedures

If the service provider cannot comply with a precedence call request, the calling party may receive a notification that the precedence call is unsuccessful

8.4.2 Called party

No action is required by the called user.

8.5 Implementation considerations

In networks that support the MLPP service, the network shall ensure that only MLPP calls from the same domain are subject of preemption and the connections of non-MLPP users are not preempted. The precedence level of a call may not be changed when interworking with other MLPP networks.

A network that does not support the MLPP service is required, if bilaterally agreed, to convey the parameters of MLPP service intact. If the parameters are received from another network, the network should pass them on with no action taken, if bilaterally agreed, and with no effect on the network that does not support the MLPP service.

What is the length of the response timer?

Should the called party (User B) have to acknowledge the preemption before the higher precedence call is completed?

How many alternate party diversion attempts should be made, for example, to avoid infinite loops?

What should happen if this limit is reached?

9 Reverse Charging (REV) supplementary service

9.1 Definition

9.1.1 reverse charging is a supplementary service allowing the called party to be charged for the entire call or part of the call.

If the request is accepted the charging of the basic call will be done in the terminating network according to the tariffs applied there.

9.2 Specific terminology

No specific terms

9.3   Service description

There are four different variants of this service described as cases A to D.

Case A: Reverse charging requested by the calling party when the call arrives

This service allows a calling party, on a per-call basis, to request reverse charging when the call is made and the called party to accept or reject the charges.

If the called party accepts, the network starts charging the called party and the network also notifies the calling party of acceptance of reverse charging and proceeds with the call.
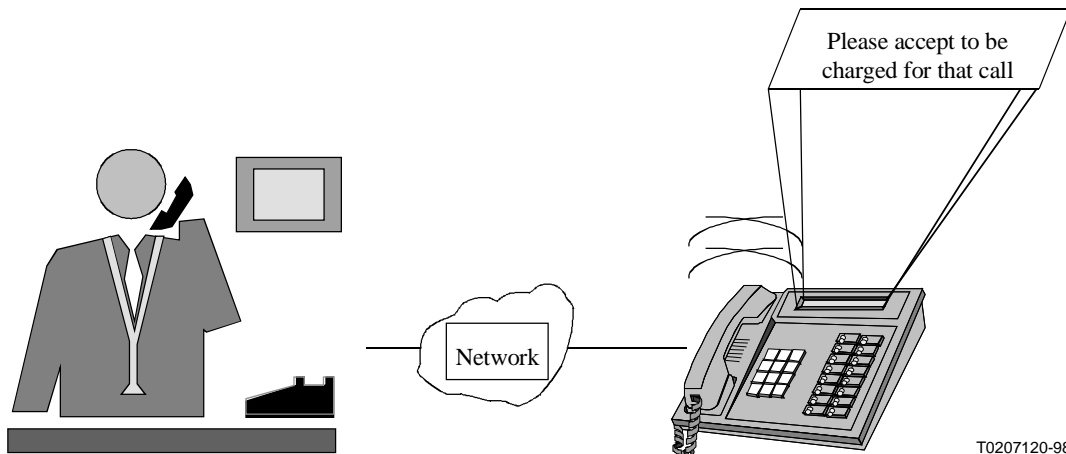
If the called party does not accept the request for reverse charging and rejects the request, the network notifies the calling party and terminates the call.

If the called party ignores the request for reverse charging, but attempts to accept the incoming call, it is assumed that he also rejects the request for reverse charging and the call is cleared.

When a calling party does not explicitly request reverse charging, the calling party is charged as normal.

In order to use this service, the originating terminal needs to have the capability for requesting reverse charging.

NOTE – The following figures provide examples of the normal procedures of the Reverse Charging service. They are not intended to cover all possible normal scenarios. The terminal representations in these figures are used for graphic purposes only and are not intended to suggest that other end user equipment is not applicable. These examples shows the reverse charging request being displayed on the called party's terminal equipment. This is shown solely as an example, actual implementations will vary as to how the reverse charging request is made, presented and accepted.

Please accept to be charged for that call

Network

T0207120-98

Case B: Reverse charging for the rest of the call, requested by the calling party or the called party during the active phase of the call
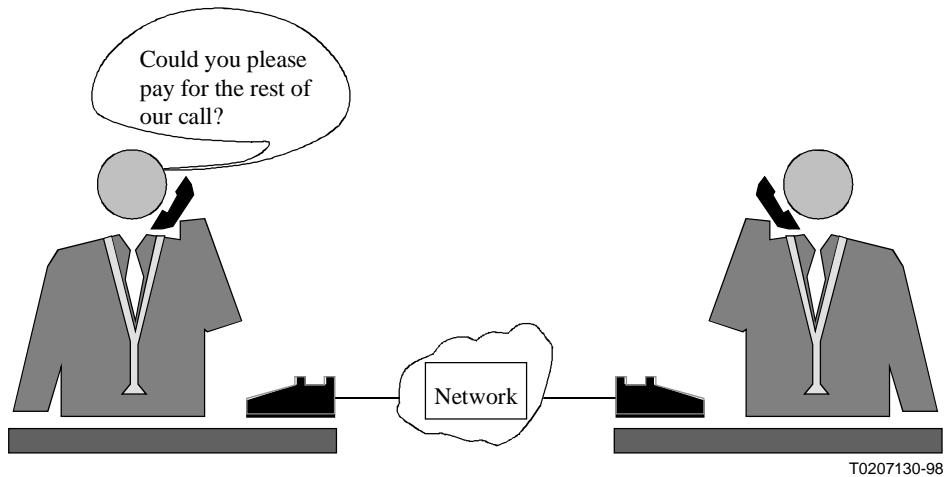
Request by the calling party

This service allows a calling party, during the active phase of the call, to request reverse charging for the rest of the call. The called party may accept or reject this request.

If the called party accepts, the network starts charging the called party from that very moment on. The network also notifies the calling party of acceptance, stops charging the calling party and proceeds with the call.

If the called party does not accept the request for reverse charging and rejects the request, the network notifies the calling party. The existing call remains unaffected and the calling party is charged continuously.

If the called party ignores the request for reverse charging, upon expiry of the ignore timer the network notifies the calling party. The existing call remains unaffected and the calling party is charged continuously. (The guideline of the ignore timer is 15 seconds.)

In order to use this service, the originating terminal needs to have the capability for requesting reverse charging.

T0207130-98

Request by the called party

This service allows a called party, during the active phase of the call, to request reverse charging for the rest of the call.

A called party requests for reverse charging during an existing call. The network starts charging the called party from that very moment on. The network also stops charging the calling party, notifies the calling party and confirms to the called party.


T0207140-98
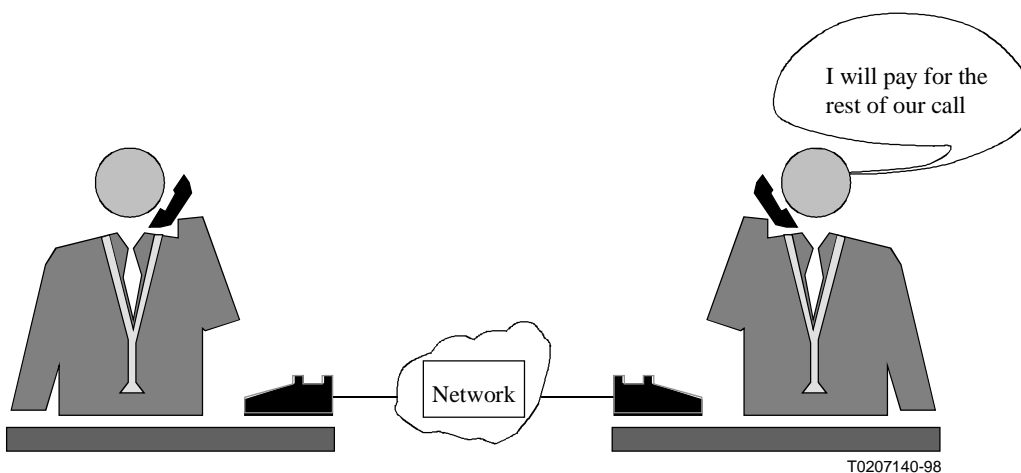
Case C: Reverse charging for the entire call requested by the called party during the active phase of the call

This service allows a called party, before terminating the call, to request reverse charging for the entire call.

A called party requests for reverse charging before termination of the call. The network subsequently charges all usage-based charges for the entire call to the called party, notifies the calling party and confirms to the called party.

When a called party does not explicitly request reverse charging, the calling party is charged as normal.

I will pay for the entire call

Network

T0207150-98
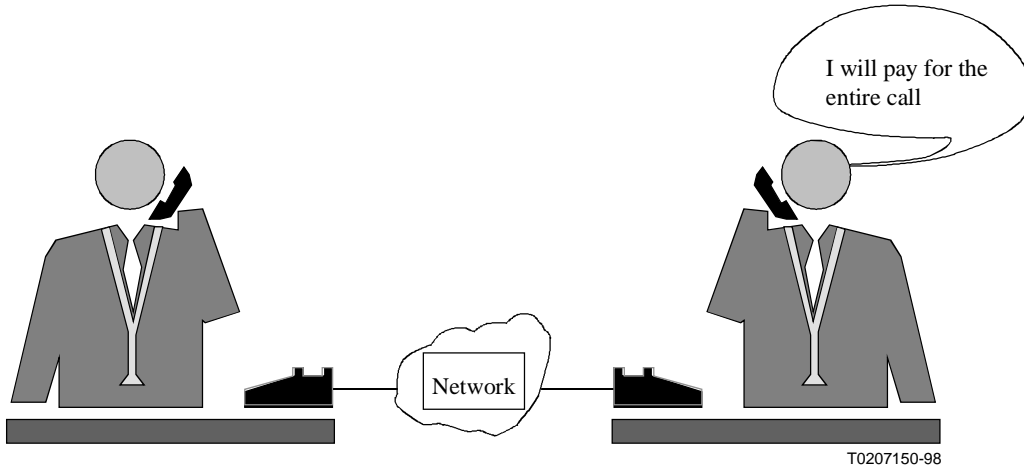
Case D: Reserve charging unconditional

This service allows the called party to be charged for all incoming calls, or all incoming calls for a predefined set of basic services. No user request is required.

When a call is received by a user who has subscribed to this service, the network sends the reverse charging information to notify the called party. When the called party accepts the call, the network connects the call and starts charging the called party. The network also notifies the calling party.

The called party is charged for all incoming calls

Network

T0207160-98
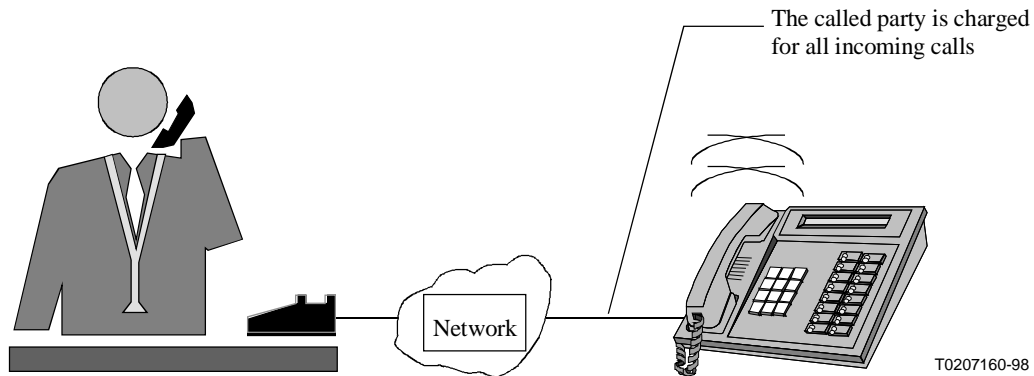
9.4   Operation of the service from the user's perspective

9.4.1   Calling Party

Case A, B

On each call the calling party may request reverse charging.

Case C, D

No action is required by the calling party

9.4.2 Called Party

Case A, B

The called party who receives a reverse charging request may accept, reject or ignore request for reverse charging.

Case B, C

The called party may request for reverse charging.

Case D

No action is needed

9.5 Implementation considerations

Depending on implementation, the calling party may need special equipment to send the reverse charging request and the called party may also need special equipment to be able to accept or reject a reverse charging call.

Hence, in some cases, specific arrangements may need to be made between the called party and the called party's service provider to ensure compatibility of the service with the equipment.

If this service shall be supported between networks, either of the same type but operated by different network operators, or between different types of networks, agreements need to be in place.

The service may not lead to the normally experienced results if the service is operated between networks, either of the same type but operated by different network operators where the service is not supported within all related networks.

10 Three-party service

10.1 Definition

The **three-party service** enables a user to establish a three-way conversation, i.e. a simultaneous communication between the served user and two other parties.

10.2 Specific terminology

10.2.1 served user: During the invocation and the active phase, the service is under the control of the "served user", i.e. the user that invoked the service. This user is also referred to as user A.

10.2.2 remote parties (user B and user C): The parties involved in the two calls that are joined together into a three-way conversation (user A with user B, user A with user C, user B with user C).

10.3 Service description

To establish a three-party call, the served user (user A) who is involved in at least two calls – each of which may be an incoming or outgoing call – can join these calls together into a three-way conversation by requesting the three-party service. Both calls shall have been answered prior to the invocation of the Three-Party supplementary service.

During an active three-way conversation, the served user shall be able to:

a)   disconnect one party;

b)   disconnect the entire three-way conversation;

c)   explicitly choose one party to have a private communication with that party.

The three-party supplementary service shall be cancelled by the user actions listed above.

All participants of a three-way conversation may receive a notification at the invocation and cancellation of this supplementary service.

10.4 Operation of the service from the users' perspectives

10.4.1 Served user

10.4.1.1 Normal operation

The served user (user A) who is involved in at least two calls, can request that the service provider join the calls together into a three-way conversation. Both calls shall have been answered prior to the invocation of the three-party supplementary service.

Managing the three-way conversation:

During an active three-way conversation, the served user shall be able to:

a) disconnect one of the parties. This shall result in a single active call between the served user and the other party. The three-party supplementary service shall automatically be terminated;

b) disconnect the entire three-way conversation. Both calls shall be cleared;

c) explicitly choose one party to have a private communication with that party. This shall result in the termination of the three-party supplementary service (i.e. the release of the resources allocated for the three-way conversation). The served user shall be able to explicitly indicate the party which shall remain active afterwards.

There shall remain a single active call between the served user and the other party.

10.4.1.2 Exceptional procedures

If the served user attempts to invoke the three-party supplementary service and the service provider cannot accept that request, the service provider shall reject the request.

Possible reasons for rejection are:

– resources cannot be allocated;

– subscriber restrictions are not met;

– calls are not in an appropriate state.

If the request is rejected, the calls shall remain in the same state as they were in before the attempt to invoke the three-party supplementary service.

10.4.2 Remote parties

10.4.2.1 Normal operation

Managing the three-way conversation:

Either of the remote parties (users B or C) shall be able to disconnect from the three-way conversation which shall result in the three-party service being terminated.

10.4.2.2 Exceptional procedures

None identified.

10.5 Implementation considerations

– Should this service require subscription to the Call Hold service or shall the functionality be included within this service?

APPENDIX I

Informative references

– CCITT Recommendation I.251.3 (1992), *Number identification supplementary services: Calling line identification presentation*.

– CCITT Recommendation I.251.4 (1992), *Number identification supplementary services: Calling line identification restriction*.

– CCITT Recommendation I.251.9 (1996), *Number identification supplementary services: Calling name identification presentation*.

– CCITT Recommendation I.251.10 (1996), *Number identification supplementary services: Calling name identification restriction*.

– CCITT Recommendation I.252.2 (1992), *Call offering supplementary services: Call forwarding busy*.

– CCITT Recommendation I.252.3 (1992), *Call offering supplementary services: Call forwarding no reply*.

– CCITT Recommendation I.252.4 (1992), *Call offering supplementary services: Call forwarding unconditional*.

– ITU-T Recommendation I.252.7 (1997), *Call offering supplementary services: Explicit call transfer*.

– CCITT Recommendation I.253.1 (1990), *Call completion supplementary services: Call Waiting (CW) supplementary service*.

– CCITT Recommendation I.253.2 (1992), *Call completion supplementary services: Call hold*.

– CCITT Recommendation I.254.2 (1992), *Multiparty supplementary services: Three-party supplementary service*.

– CCITT Recommendation I.255.3 (1990), *Community of interest supplementary services: Multi-Level Precedence and Preemption Service (MLPP)*.

– CCITT Recommendation I.256.3 (1992), *Charging supplementary services: Reverse charging*.

– ISO/IEC 13864:1995, Information technology – *Telecommunications and information exchange between systems – Private Integrated Services Network – Specification, functional model and information flows – Name identification supplementary services*.

– ANSI T1.619-1992, *Multi-level Precedence and Preemption (MLPP) Service, ISDN Supplementary Service Description*.

– Supplement ANSI T1.619a-1994.

– ANSI T1.641-1995, *Calling Name Identification Presentation*.

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