ISDN
Supplementary Services

ISDN
POCKET GUIDE
No. **1**

Edition 3

Wavetek
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Communications Test Solutions

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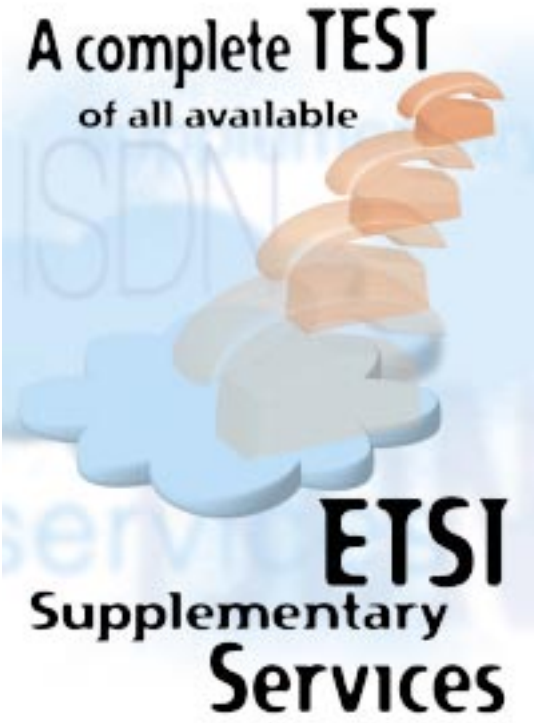
A complete TEST
of all available
ETSI
Supplementary
Services

Edition 3

Availability/Automatic
The availability of the supplementary service is tested at the local exchange, the objective being to easily verify that the service is provisioned. This test is performed in self-call mode.
An automatic test procedure allows the user to test the availability of all supplementary services: The user is able to customize the test by selecting the supplementary services to be taken into account for the test.

Benefits: Allows you to define a "one-button test" (quick and easy), and reduces the test duration by selecting only a subset of supplementary services (adapts the test procedure to your network configuration!).

Functional
The supplementary service can be demonstrated/used with the tester, in exactly the same way as with an ISDN telephone/ equipment.

	IBT-5		IBT-10 / IBT-20	
SERVICE	**Availability/ Automatic**	**Functional**	**Availability/ Automatic**	**Functional**
MSN	YES	YES	YES	YES
DDI	YES	YES	YES	YES
SUB	YES	YES	YES	YES
CLIP	YES	YES	YES	YES
CLIR	YES	YES	YES	YES
COLP	YES	YES	YES	YES
COLR	YES	YES	YES	YES
MCID (case 1)	YES	-	YES	YES
MCID (case 2)	YES	-	YES	YES
TP	YES[1]	-	YES[1]	YES
CFU	YES	YES	YES	YES
CFB	YES	YES	YES	YES
CFNR	YES	YES	YES	YES
CD	N/A	N/A	N/A	YES
ECT	N/A	N/A	N/A	YES
CW	YES	YES	YES	YES
HOLD	YES	-	YES	YES
CCBS	N/A	N/A	N/A	YES
CONF	N/A	N/A	N/A	YES
3PTY	N/A	N/A	N/A	YES
CUG	YES	-	YES	YES
AOC-S	YES	-	YES	YES
AOC-D	YES	YES	YES	YES
AOC-E	YES	YES	YES	YES
UUS1	YES	-	YES	YES
UUS2	YES	-	YES	YES
UUS3	YES	-	YES	YES

N/A (Not Applicable): For some supplementary services (CD, CCBS, CONF, ECT, 3PTY) the test for the availability of the supplementary service cannot be achieved/performed without using a second piece of equipment (IBT[2] or an ISDN terminal). In this case the functional test is the only possibility for testing the supplementary service on the access undergoing test.

[1] The TP supplementary service is not applicable in the particular case of the PRA access.

[2] It should be noted that the WWG IBT-10 V9.02 and WWG IBT-20 V5.02 both provide call-back capabilities.

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Introduction

Three types of services are defined by the CCITT : bearer services, teleservices, and supplementary services.
Bearer services provide the means of conveying information (speech, data, video etc.) between users in real time without altering the content of the message. These services correspond to the lower three layers of the OSI model.
Teleservices combine the transportation function with the information-processing functions, which correspond to OSI layers 4 through 7. Example of teleservices are telephony, teletex and videotex.
Both bearer services and teleservices may be enhanced by supplementary services.
A supplementary service is used in conjunction with one or more of the bearer services or teleservices. It cannot be used alone. Each supplementary service is used in a uniform fashion, regardless of the bearer service or teleservice that it supports. The following table sums up the main supplementary services that have been defined so far. All of these originated in the telephone world. However, most of them can also be applied to packet-mode services and to some teleservices.

This guide has been made to help users understand the main supplementary services used today and the test principle proposed by WWG with the IBT range (WWG IBT-5, IBT-10/-10U and IBT-20). The WWG SSE-100 provides a similar solution based on the IBT principle to test the supplementary services. WWG always try to give the best solution for a complete and safe test. This is why the IBT range is regularly updated with new and advanced tests on the described or future supplementary services. Each IBT product is easily upgradable in the field in order to ensure that each user always has the best solution.

Number Identification Services

MSN Multiple Subscriber Number	Allows multiple ISDN numbers to be assigned to a single interface (e.g. multiple phone numbers at the same location).
DDI Direct-Dialling-In	Enables the user to call another user direct on an ISDN-compatible PBX (Private Branch Exchange) or Centrex (Central Exchange), without operator intervention, or to call a terminal selectively on a passive bus.
SUB SUB-addressing	Allows the called party (user) to expand his addressing capacity beyond the one given by the ISDN number.
CLIP Calling-Line Identification Presentation	Called-party service that provides the ISDN number of the calling party.
CLIR Calling-Line Identification Restriction	Calling-party service that restricts disclosure of the calling party's ISDN number to the called party.
COLP COnnected-Line identification Presentation	Calling-party service that provides the ISDN number of the party to whom the caller is connected.
COLR COnnected-Line identification Restriction	Connected-party service that restricts disclosure of the connected party's number to the calling party.
MCID Malicious Call IDentification	Enables an incoming call to be identified and registered.

Call Offering Services

TP Terminal Portability	A user engaged in an active call can adjourn and resume the call at a later time, for instance to move a terminal from one socket to another.
CFU Call Fowarding Unconditional	Enables a served user to have the network send all incoming calls addressed to the served user's ISDN number to another number.
CFB Call Fowarding Busy	Enables a served user to have the network send incoming calls addressed to the served user's ISDN number to another number when this user's line is busy.
CFNR Call Fowarding No Reply	Enables a served user to have the network send incoming calls addressed to the served user's ISDN number to another number when there is no answer on the user's line.
CD Call Deflection	Enables a user to transfer an established call to a third party by requesting redirection before the connection.
ECT Explicit Call Transfer	Enables a user who has two calls to connect together the other users in the two calls, into one call.

Call Completion Services

CW Call Waiting	Enables a piece of terminal equipment that is already active in a communication to notify its user of an incoming call. The user then has the choice of accepting, rejecting, or ignoring the waiting call.
HOLD Call HOLD	Allows a user to interrupt communications on an existing call and then subsequently re-establish the connection.
CCBS Completion of Calls to Busy Subscriber	Enables a user, encountering a busy destination, to have the call completed without having to make a new call attempt when the destination becomes not busy.

Multiparty

CONF CONFerence calling	Allows multiple users to communicate with one another simultaneously.
3TPY Three-PartY service	Allows a subscriber to hold an existing call and make a call to a third party. It will then be possible to switch between the two calls, to introduce a common speech path between the three parties, and to interconnect the other two parties.

Community of Interest and Call Restriction Services

CUG Closed User Group	Allows a group of users to communicate only among themselves, or if necessary, one or more users may be provided with incoming/outgoing access to users outside the group.

Charging Services

AOC Advice Of Charge	Provides the user paying for a call with usage-based charging information.

Additional Transfer Information Services

UUS User-to-User Signaling	Allows an ISDN user to send/receive a limited amount of information to/from another ISDN user over the signaling channel in association with a call to the other ISDN user.

MSN
Multiple Subscriber Number

Description

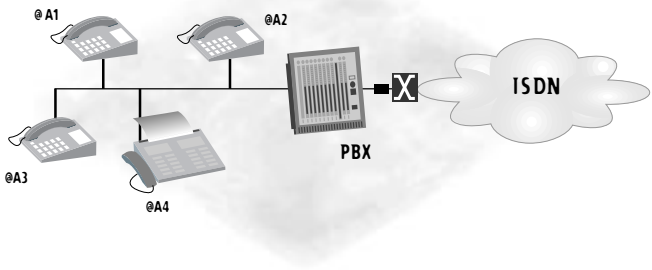
The MSN supplementary service is used to assign multiple (but not necessary consecutive) numbers to a single public or private access. This enables the selection of one or more distinct terminals linked to the same access with different subscriber parameters.
The maximum number of MSNs per access is a network option.

Set-up and operation

The call initiation procedure is the same as for basic services. The calling and called users perceive the same completion procedures as for the basic service.

Provision and cancellation as per the standards

The MSN service is provided or cancelled by prior arrangement with the service provider who allocates a set of ISDN numbers to the user interface.



IBT range test principle (IBT-5, IBT-10 and IBT-20)

A self-call is initiated for each number assigned to the access. Each outgoing SETUP contains the current called address in the “Cld” Information Element. The self-call is considered successful when the incoming SETUP contains a called address which is compatible with the called address sent in the outgoing SETUP. The IBT-10 and IBT-20 provide an advanced automatic test.

DDI
Direct Dialling In

Description

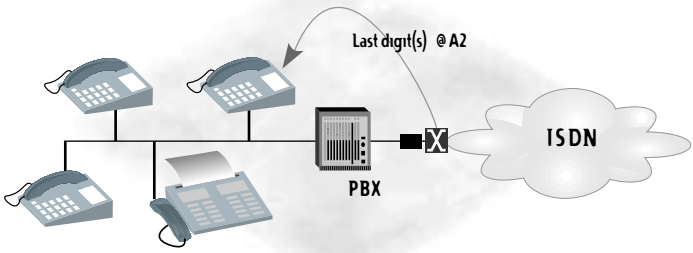
The DDI supplementary service enables the user to call a user on a private ISDN direct via a public ISDN by means of the public numbering plan.
The network sends all or part of the ISDN number. If only part of the ISDN number is sent, it is the last part of this ISDN number. If only part of the ISDN number is sent by the network, this part is either a fixed number of digits applicable to all subscribers or, as a network option, a number of digits defined on a “per subscriber” basis.
Subscription to the DDI and MSN services is mutually exclusive.

Set-up and operation

Call initiation procedure is the same as for basic services. The calling and called users perceive the same completion procedures as for the basic service.

Provision and cancellation as per the standards

The DDI service is provided or cancelled by prior arrangement with the service provider who allocates a set of ISDN numbers to the user interface.



IBT range test principle (IBT-5, IBT-10 and IBT-20)

A self-call is initiated for the ISDN numbers assigned to the access. Each outgoing SETUP contains the number to be called in the “Cld” Information Element. The self-call is considered successful when the incoming SETUP contains a called address which is compatible with the called address sent in the outgoing SETUP. The IBT-10 and IBT-20 provide an advanced automatic test.

SUB

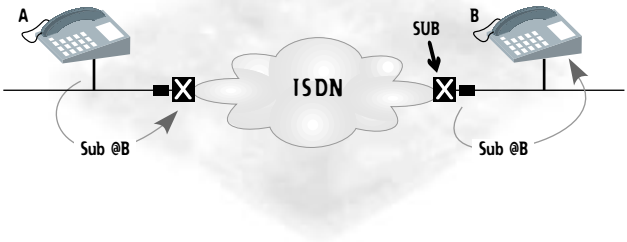
SUB-addressing

Description

The SUB supplementary service allows the called party (user) to expand his addressing capacity beyond the one given by the ISDN number.
If presented by the calling user, a sub-address is delivered unchanged to the called (served) user.
Among possible applications are:
- Selection of, or declaration of a preference for, a specific terminal at the called customer's termination
- Initiation of a specific process in a terminal at a called customer's termination.

Set-up and operation

Sub-address information can be provided by the calling user during the call setup phase. The SUB supplementary service is initiated when sub-address information is sent from the network to the called user.



IBT range test principle (IBT-5, IBT-10 and IBT-20)

The SUB test involves verifying that an incoming SETUP message is properly presented to the called party with the right sub-address.
An automatic test makes a self-call with an outgoing SETUP message containing a fixed sub-address. The result of the test depends on the decoding of the incoming SETUP (analysis of the "Called Sub-address" Information).

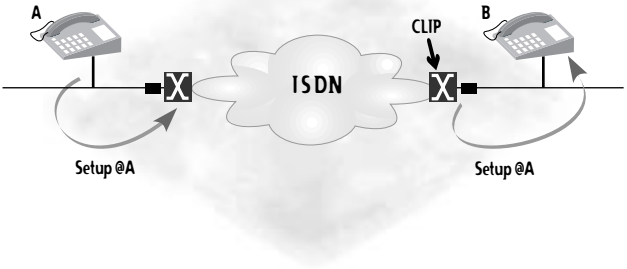
CLIP
Calling Line Identification Presentation

Description

The CLIP supplementary service provides the called party with a means of receiving calling party identification. In addition to the ISDN number, the calling line identity may include a sub-address generated by the calling user and transported transparently by the network.
The network delivers the calling line identity to the called party during call set-up regardless of the terminal's ability to handle the information.

Activation, de-activation and registration

The CLIP supplementary service is activated and de-activated by the service provider. As per the standards, this supplementary service requires no registration.



IBT range test principle (IBT-5, IBT-10 and IBT-20)

The CLIP test involves verifying that the calling address is properly presented to the called party. Upon reception of a SETUP message, the IBT displays the number of the calling party.
An automatic test makes a self-call with an outgoing SETUP containing a calling address, a numbering plan and a type of number. The result of the test depends on the decoding of the incoming SETUP (analysis of the "Clg" Information Element).

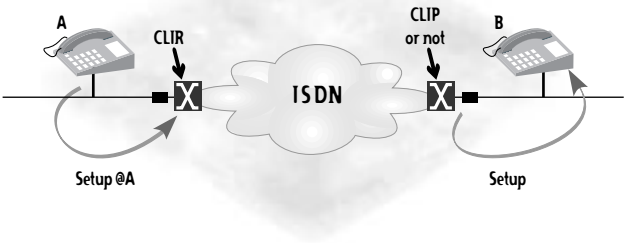
CLIR
Calling Line Identification Restriction

Description

The CLIR supplementary service is a service offered to the calling party. It restricts presentation of the calling party's ISDN number and sub-address information (if any) to the called party. As a network option, the CLIR can be offered with several options: permanent mode (activated for all calls) or temporary mode (specified by the user on a call-by-call basis, with a restricted or not restricted presentation as a default mode).

Activation, de-activation and registration

The CLIR supplementary service is activated on provision and de-activated on cancellation. As per the standards, this supplementary service requires no registration.



IBT range test principle (IBT-5, IBT-10 and IBT-20)

The CLIR test involves verifying the SETUP contents. Upon reception of a SETUP message, the result of the test depends on the decoding of the Presentation Indicator (PI) included in the Calling address Information Element.
The IBT-10 and IBT-20 both call up the CLIR service (PI not implemented, presentation restricted or allowed).

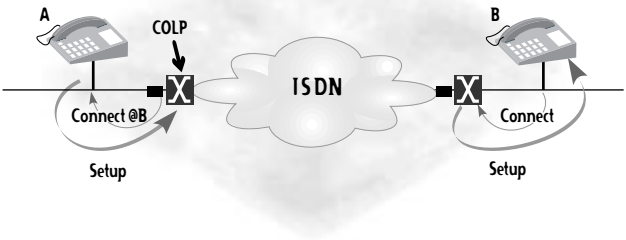
COLP
COnnected Line identification Presentation

Description

The COLP supplementary service provides the calling party with a means of receiving connected party identification.
The network delivers the connected line identity to the calling party on call acceptance regardless of the terminal's ability to handle the information.

Activation, de-activation and registration

The COLP supplementary service is activated and de-activated by the service provider. As per the standards, this supplementary service requires no registration.



IBT range test principle (IBT-5, IBT-10 and IBT-20)

The COLP test involves the decoding of an incoming CONNECT message in order to analyze the connected party number Information Element. Upon reception of a connect message, the IBTs display the number of the connected party.
An automatic test makes a self-call with an outgoing CONNECT message containing a connected address, a numbering plan and a type of number. The result of the test depends on the decoding of the incoming CONNECT (analysis of the "Cnd" Information Element).

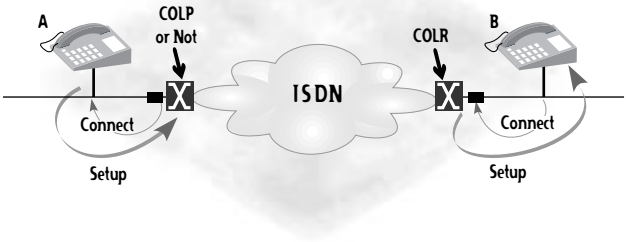
COLR
COnnected Line identification Restriction

Description

The COLR supplementary service is a service offered to the connected party to prevent presentation of the connected party's ISDN number and sub-address information (if any) to the calling party. As a network option, the COLR can be offered with several options: permanent mode (activated for all calls) or temporary mode (specified by the user on a call-by-call basis, with a restricted or not restricted presentation as a default mode).

Activation, deactivation and registration

The COLR supplementary service is activated on provision and de-activated on cancellation. As per the standards, this supplementary service requires no registration.



IBT range test principle (IBT-5, IBT-10 and IBT-20)

The COLR test involves verifying the received CONNECT contents. Upon reception of a CONNECT message, the result of the test depends on the decoding of the Presentation Indicator included in the Connected Address Information Element.
The IBT-10 and IBT-20 both enable dynamic implementation of the COLR service (PI not implemented, presentation restricted or allowed).

MCID
Malicious Call IDentification

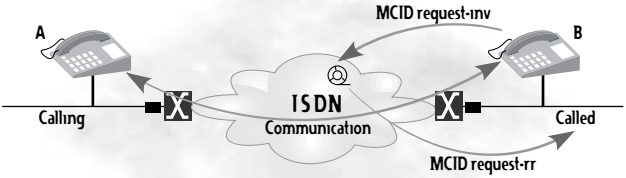
Description

The MCID supplementary service enables an incoming call to be identified and registered. The following call information is registered:
- Called party number,
- Calling party number,
- Local time and date of the set-up in the network serving the called user,
- Calling party sub-address (service option).

The information is not available to the terminal equipment (called and calling users), but is stored at a location under the control of the network operator.
The MCID can either be set up during the active phase of the call, or for a limited period after the active phase (but never after call termination by the served user).

Provision and cancellation as per the standards

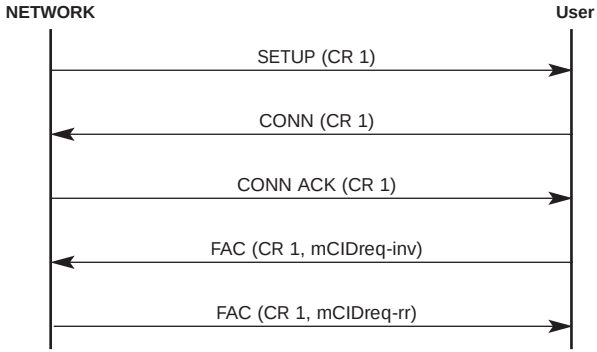
The MCID supplementary service is available by prior arrangement with the service provider. Cancellation is at the request of the subscriber or for service provider reasons. As a network option, a subscription option may be provided to enable automatic set-up of the MCID supplementary service on unanswered calls to the served user.



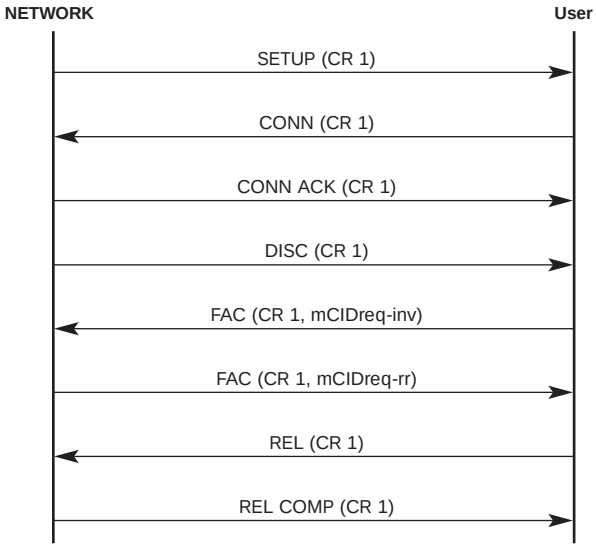
IBT range test principle (IBT-5, IBT-10 and IBT-20)

All IBT products offer a complete solution by providing a test of the availability of the MCID supplementary service as well as a functional test (the service can be used by emulating/replacing an ISDN phone). Using the monitor mode together with the Windows™ PC Detailed Decoder, the following User/Network exchanges are analyzed.

MCID
Malicious Call IDentification



Successful MCID supplementary service invocation during the Active state.



Successful MCID supplementary service invocation during the Disconnect Indication state.

Terminal Portability

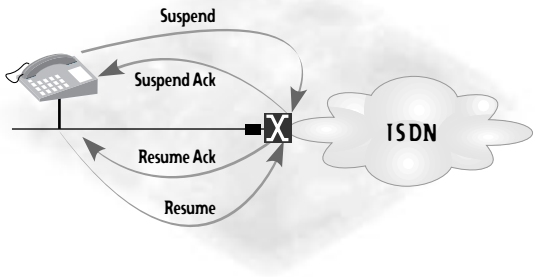
Description

A user can adjourn an active call through an appropriate signaling procedure and resume the call later on. The TP supplementary service allows a user to implement the following actions during the active phase of a call :

- Replace one terminal by another compatible terminal at the same socket,
- Move from one terminal to another compatible terminal within a basic access,
- Suspend the call and subsequently resume it at the same terminal and at the same socket,
- Move a terminal from one socket to another one.

Set-up and operation

A user wishing to call up the TP service sends an appropriate request. The network must store the call identity value, preserve the relevant B channel, maintain the connection and send an acknowledgement. To resume the call, the user sends a request containing the call identity (if any). The network then re-establishes the call and sends an acknowledgement.



IBT range test principle (IBT-5, IBT-10 and IBT-20)

An automatic test makes a self-call followed by a SUSPEND message and a RESUME message. The result of the test depends on the reception of the incoming SUSPEND ACK and RESUME ACK messages. The IBT-10 provides a functional test of the supplementary service (the service can be used by emulating/replacing an ISDN phone).

CFU
Call Forwarding Unconditionnal

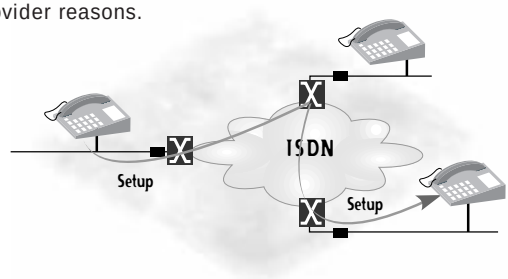
Description

The CFU supplementary service enables a served user to have the network send all incoming calls or calls associated with a specified basic service and addressed to the served user's ISDN number, to another number. The maximum number of diversions (CFB, CFU, CFNR, CD) of a single call is a network option with an upper limit of 5.

Provision and cancellation as per the standards

The CFU supplementary service is available by prior arrangement with the service provider. The service can be offered with four subscriber options:
- The served user receives notification that the call has been forwarded;
- The calling user receives notification that the call has been forwarded;
- The served user receives notification that CFU is currently activated;
- The served user releases his/her number to "forwarded-to user".

Cancellation is at the request of the subscriber or for service provider reasons.



IBT range test principle (IBT-5, IBT-10 and IBT-20)

During the automatic test, the service is activated and de-activated, then the network response is analyzed. The test is considered as successful if both activation and de-activation have been satisfactorily completed. To activate (or de-activate) a call diversion supplementary service, a facility IE containing an activation (or de-activation) implementation component is included in a facility message. This component specifies that CFU is required.
In addition, through the "Generic Functional Protocol", the IBT products enable users to activate and de-activate CFU and interrogate the access configuration for this Call Forwarding service.

CFB
Call Forwarding Busy

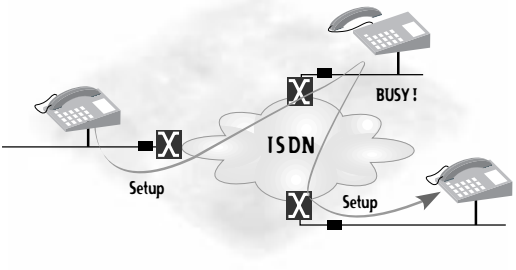
Description

The CFB supplementary service enables a served user to have the network send all incoming calls or calls associated with a specified basic service to another number if the served user's ISDN number is engaged. The maximum number of diversions (CFB, CFU, CFNR, CD) of a single call is a network option with an upper limit of 5.

Provision and cancellation as per the standards

The CFB supplementary service is available by prior arrangement with the service provider. The service can be offered with four subscriber options:
- The served user receives notification that the call has been forwarded;
- The calling user receives notification that the call has been forwarded;
- The served user receives notification that CFB is activated;
- The served user releases his/her number to "forwarded-to user".

Cancellation is at the request of the subscriber.



IBT range test principle (IBT-5, IBT-10 and IBT-20)

During the automatic test, the service is activated and de-activated, then the network response is analyzed. The test is considered as successful if both activation and de-activation have been satisfactorily completed. To activate (or de-activate) a call diversion supplementary service, a facility IE containing an activation (or de-activation) implementation component is included in a facility message. This component specifies that CFB is required.
In addition, through the "Generic Functional Protocol" the IBT products enable users to activate and de-activate CFB and interrogate the access configuration for this Call Forwarding service.

CFNR
Call Forwarding No Reply

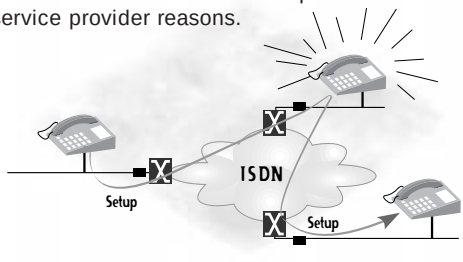
Description

The CFNR supplementary service enables a served user to have the network send all incoming calls or calls associated with a specified basic service to another number if there is no reply at the served user's ISDN number. The maximum number of diversions (CFB, CFU, CFNR, CD) of a single call is a network option with an upper limit of 5.

Provision and cancellation as per the standards

The CFNR supplementary service is available by prior arrangement with the service provider. The service can be offered with four subscriber options:
- The served user receives notification that the call has been forwarded;
- The calling user receives notification that the call has been forwarded;
- The served user receives notification that CFNR is currently activated;
- The served user releases his/her number to "forwarded-to user".

The value for the "no reply" timer is fixed or changed by the service provider. Cancellation is at the request of the subscriber or for service provider reasons.



IBT range test principle (IBT-5, IBT-10 and IBT-20)

During the automatic test, the service is activated and de-activated, then the network response is analyzed. The test is considered as successful if both activation and de-activation have been successfully completed. To activate (or de-activate) a call diversion supplementary service, a facility IE containing an activation (or de-activation) implementation component is included in a facility message. This component specifies that CFNR is required.
In addition, through the "Generic Functional Protocol" the IBT products enable users to activate and de-activate CFNR and interrogate the access configuration for this Call Forwarding service.

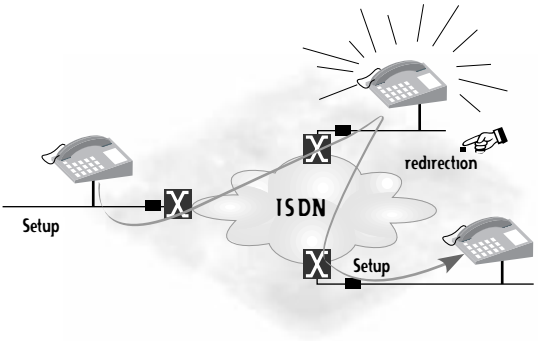
Call Deflection

Description

The CD supplementary service enables the served user to respond to an incoming call by requesting redirection of that call to another user. The CD supplementary service can only be invoked before the connection is established by the served user. The maximum number of diversions (CFB, CFU, CFNR, CD) of a single call is a network option with an upper limit of 5.

Provision and cancellation as per the standards

The CD supplementary service is available by prior arrangement with the service provider. The service can be offered with one or both of two subscriber options: the calling user receives notification that the call has been deflected and the served user's ISDN number can be presented to the "deflected-to user". Cancellation is at the request of the subscriber or for service provider reasons.



IBT range test principle (IBT-10 and IBT-20)

The IBT-10 and IBT-20 provide a functional test of the CD supplementary service (the service can be used by emulating/replacing an ISDN phone). Using the monitor mode together with the Windows™ PC Detailed Decoder, the network's answer to a Call Deflection request is analyzed. The result depends on the decoding of the Facility message (CallDeflection component).

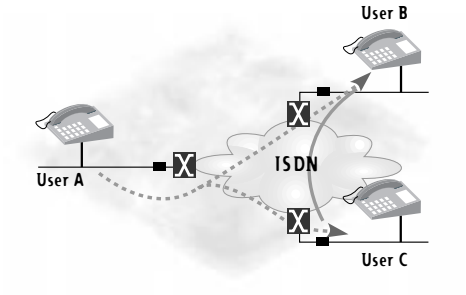
ECT
Explicit Call Transfer

Description

The ECT supplementary service enables a user who has two calls, each of which can be an incoming or an outgoing call, to connect together the other users in the two calls, into one call. The ECT supplementary service is applicable to all circuit-switched basic telecommunications services. This supplementary service can be available to users who are connected to the network via a basic or a primary rate access.

Provision and cancellation as per the standards

The ECT supplementary service is available by prior arrangement with the service provider. User A, who has two calls, (one with user B and one with user C), each of which can be an incoming or an outgoing call, can request the invocation of the ECT supplementary service with respect to the two calls.



IBT range test principle (IBT-10 and IBT-20)

The IBT-10 and IBT-20 offer the capability to test the availability the ECT supplementary service and to perform a functional test (to demonstrate that the service can be used by emulating/replacing an ISDN phone).

CW

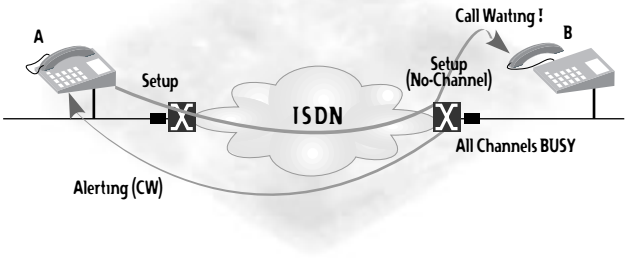
Call Waiting

Description

The CW supplementary service enables a user to be informed of an incoming call with an indication that no channel is available. The user then has the choice of accepting, rejecting or ignoring the waiting call.
The CW supplementary service operates when all appropriate B channels in the subscriber terminal access are engaged.
The network does not provide the subscriber with an audible in-band tone but the terminal may generate an audible in-band indication locally.
The maximum number of waiting calls is a network option.

Provision and cancellation as per the standards

The CW supplementary service is available by prior arrangement with the service provider. Cancellation is at the request of the subscriber or for service provider reasons.

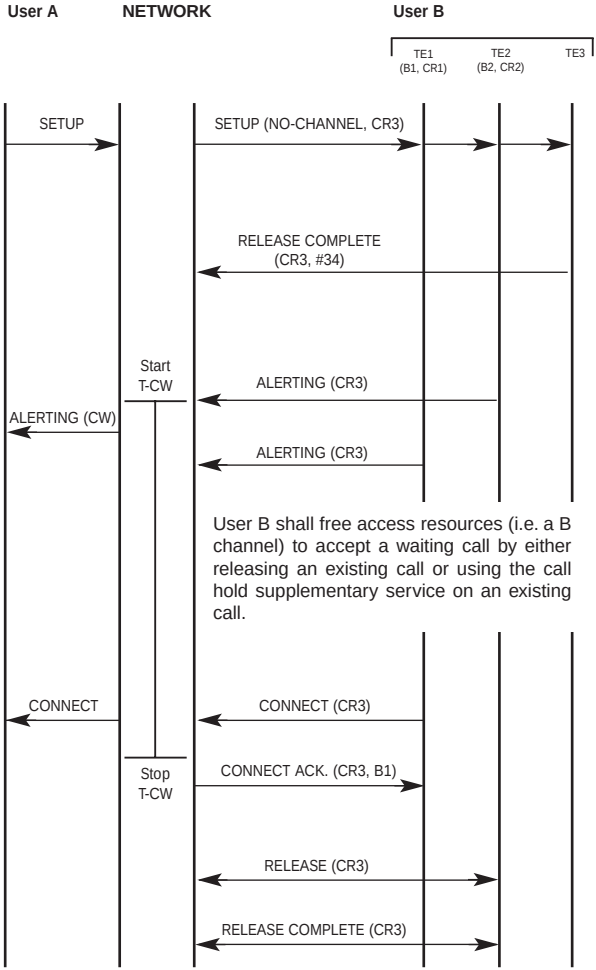


IBT range test principle (IBT-5, IBT-10 and IBT-20)

The indication of a CW is displayed on the screen. Then the user will has the possibility to accept or reject the incoming call.

CW

Call Waiting



Waiting Call acceptance. No B channel available.

HOLD

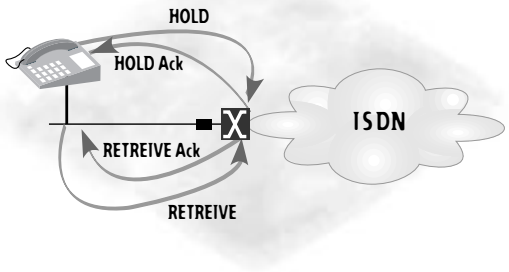
Call HOLD

Description

The HOLD supplementary service enables a user to interrupt an existing call and then, if desired, re-establish the call.
When the HOLD service is implemented, communication on a B channel is interrupted and the B channel is released from use by the existing call. A B channel is always available to the terminal used to hold the call in order to retrieve the call from hold, originate a new call, retrieve another call or set up a connection to an incoming call (waiting call).

Provision and cancellation as per the standards

The HOLD supplementary service is available by prior arrangement with the service provider or may generally be available. The HOLD service is a prerequisite for certain supplementary services such as Call Waiting or Three PartY supplementary services. Cancellation is at the request of the customer or for administrative reasons.



IBT range test principle (IBT-5, IBT-10 and IBT-20)

An automatic test makes a self-call followed by a HOLD message and a RETRIEVE message (sent on HOLD ACK). The result of the test depends on the reception of the incoming HOLD ACK and RETRIEVE ACK messages or on the REJECT cause decoding. The IBT-10 and IBT-20 provide a functional test of the CW supplementary service (the service can be used by emulating/replacing an ISDN phone).

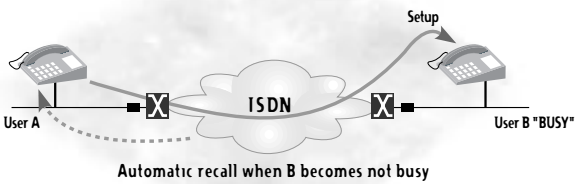
CCBS
Completion of Calls to Busy Subscriber

Description

The CCBS supplementary service enables a user A, encountering a busy destination B, to have the call completed without having to make a new call attempt when the destination B becomes not busy. This supplementary service can be available to users who are connected to the network via a basic or a primary rate access.

Provision and cancellation as per the standards

The CCBS supplementary service is available by prior arrangement with the service provider or shall be generally available. The service is offered with one subscription option called “Recall mode”: either Global (i.e. CCBS recall offered to all terminals) or Specific (i.e. CCBS recall offered to the terminal which activated the CCBS supplementary service).



IBT range test principle (IBT-10 and IBT-20)

The IBT-10 and IBT-20 offer the capability to test the availability the CCBS supplementary service and to perform a functional test (to demonstrate that the service can be used by emulating/replacing an ISDN phone).

CONF

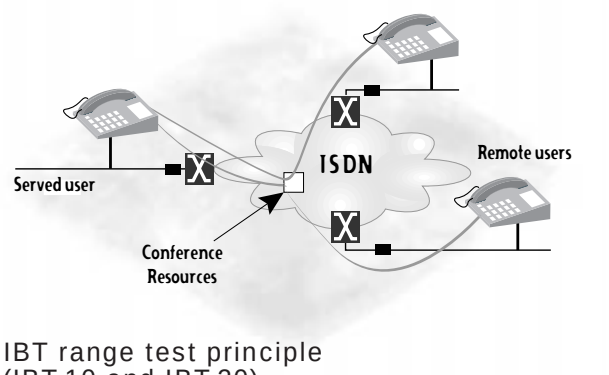
CONFerence calling

Description

The CONF supplementary service allows several users to communicate with one another simultaneously.
When the CONF supplementary service is implemented, conference resources (e.g. a “bridge“) are allocated to the served user. If set up from an active call, the CONF call will be automatically connected to the conference resources by the network.
Once a conference is active, remote users may be added, dropped, isolated (i.e. prevented from communicating with the conference), reattached or split (i.e. removed from the conference but still connected to the conference controller).

Provision and cancellation as per the standards

The CONF supplementary service is available by prior arrangement with the service provider. Cancellation is at the request of the subscriber or for service provider reasons. The CONF supplementary service can be implemented from the Null call state or, additionally, as a network option from an existing call in the Active call state.

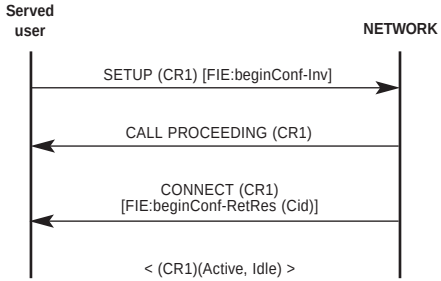


IBT range test principle (IBT-10 and IBT-20)

Using the monitor mode together with the Windows™ PC Detailed Decoder, the following User/Network exchanges are analyzed. The IBT-10 and IBT-20 provide a functional test of the CONF supplementary service (the service can be used by emulating/replacing an ISDN phone).

CONF

CONFerence calling



Beginning a conference from the Null call sate.

3TPY

Three-PartY service

Description

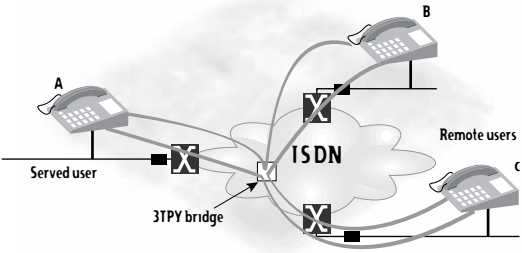
The 3TPY supplementary service enables the user to establish, participate in and control a three-way conversation (simultaneous communication involving the served user and two remote users). During the three-way conversation, the served user can request that the network disconnects one of the remote users, terminates the three-way conversation or creates a private communication with one of the remote users.
Either remote user can request that the network disconnects the connection.

Set-up and operation

To activate a 3TPY supplementary service, the served user needs two calls with the same CEI (Connection Endpoint Identifier) value. The first call has to be in Active-Held state and the second call in Active-Idle state. A “Begin3TPY“ implementation component is included in a facility message sent to the network. When the network accepts the 3TPY, it allocates a 3TPY bridge to provide the service and sends back a “Begin3TPY“ result component within a facility message.

Provision and cancellation as per the standards

The 3TPY supplementary service is provided to the user by prior arrangement with the network provider. Cancellation is at the request of the subscriber or for service provider reasons.

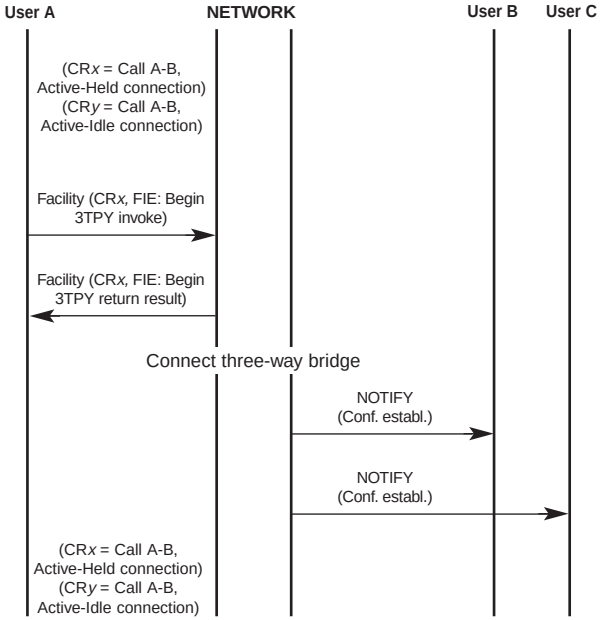


IBT range test principle (IBT-10 and IBT-20)

Using the monitor mode together with the Windows™ PC decoder, the following User/Network exchanges are analyzed. The IBT-10 and IBT-20 provide a functional test of the 3PTY supplementary service (the service can be used by emulating/replacing an ISDN phone).

3TPY

Three-PartY service



CUG
Closed User Group

Description

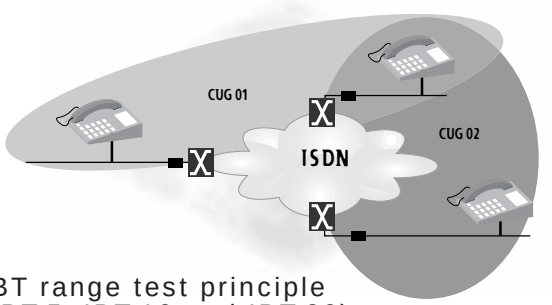
The CUG supplementary service is used to form groups with restricted access. A specific user may be a member of one or more closed user groups. Members of a specific closed user group can communicate with each other but not, in general, with users outside the group.
Closed User Group members can, with special restrictions, make calls outside the group (Outgoing Access) and receive calls from outside the group (Incoming Access).

Set-up and operation

Normal call establishment procedures apply to all calls on which the CUG service has been implemented. In addition, the network carries out internal checks to determine whether or not a particular call is allowed between the two users concerned.

Provision and cancellation as per the standards

As a network option the CUG service can be offered with several subscriber options (calls only, incoming access, outgoing access, incoming and outgoing access).



IBT range test principle (IBT-5, IBT-10 and IBT-20)

The CUG service is implemented and the network response is analyzed. To activate the CUG supplementary service, a facility IE containing a “CUGCall” implementation component is included in the outgoing SETUP message.
The result of the test depends on the decoding of the incoming SETUP (analysis of the “CUGcall” Information Element).

AOC

Advice Of Charge

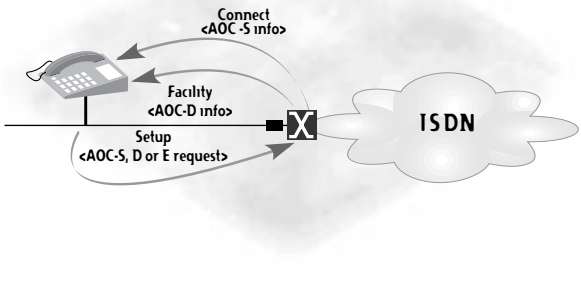
Description

If subscribed to by the served user, charging information for any of the following three supplementary services may be provided either for all calls or for any call (after a user request to provide charging information).

- Charging information at the call set-up time (AOC-S) :
  Information is provided at the call establishment or connection (SETUP or CONNECT).
- Charging information during the call (AOC-D) :
  The cumulative charge is provided during the active phase.
- Charging information at the end of the call (AOC-E) :
  The recorded charge is provided when the call is completed.

Activation, de-activation and registration

The AOC supplementary service may be activated on a per-call basis (active for the length of the call) or for all calls (in this case, the network automatically activates the subscribed AOC service at each call setup).



IBT range test principle (IBT-5, IBT-10 and IBT-20)

The AOC test involves verifying all Charging Info in a facility IE received after activation of AOC services for S, D and E. The result of the test depends on the decoding of the Charging Info received.
The IBT-10 and IBT-20 both enable dynamic selection of the charge type per call. They then analyze the network answer (AOC type, charge type, granularity value, cost, units and type of payment).

UUS

User-to-User Signaling

Description

The UUS supplementary service enables the user to send/receive a limited amount of user-generated information to/from another user. This information is carried transparently through the network over the signaling channel corresponding to the call. The network does not interpret or act upon this information. The information is contained in either call control messages or in separate USER INFORMATION messages. The amount of information is limited to 128 bytes per message (32 in some networks).

Provision and cancellation as per the standards

The UUS supplementary service is provided to users by prior arrangement with the network provider. No subscription is required for the remote user. Cancellation can be implemented separately for each service provided (UUI during setup and clearing, UUI in User Information messages during alerting or an active call phase), or globally for all the services.

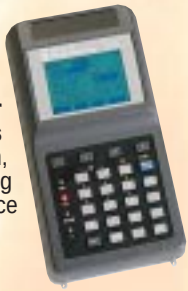
IBT range test principle (IBT-5, IBT-10 and IBT-20)

The IBT can send User-to-User Information and display the received message. A simple trace on a self-call provides a very easy means of testing the availability of the UUS supplementary service. The IBT-10 and IBT-20 provide an advanced automatic test for UUS1, UUS2 and UUS3.

For ISDN Testing, we've got the best solutions.

WWG IBT-5

ISDN Tester for Basic Rate Access
For installation, first level of commissioning and maintenance



WWG IBT-10/-10U

ISDN Tester/Analyzer for Basic Rate Access
For installation, commissioning and maintenance

WWG IBT-20

ISDN Tester/Analyzer for Primary Rate Access
For installation, commissioning and maintenance

- **Basic Rate Access**
  Primary Rate Access
- **U and S/T interface**
- **Protocol analysis**
  Windows™ PC Detailed Decoder
- **Network simulation**
  Terminal simulation
  Error rate measurements (BERT)
  Trace
- **Test of services**
- **Supplementary services test**
- **Test of the B-channel availability**
- **X.25 in D channel**
  X.25 in B channel
- **U monitoring (with the IUM-10)**
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