



INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

I.252.4

(11/1988)

SERIES I: INTEGRATED SERVICES DIGITAL
NETWORK (ISDN)

Service capabilities – Supplementary services in ISDN

**CALL OFFERING SUPPLEMENTARY SERVICES:
CALL FORWARDING UNCONDITIONAL**

Reedition of CCITT Recommendation I.252.4 published in
the Blue Book, Fascicle III.7 (1988)

NOTES

1 CCITT Recommendation I.252.4 was published in Fascicle III.7 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

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

Recommendation I.252.4

CALL OFFERING SUPPLEMENTARY SERVICES: CALL FORWARDING UNCONDITIONAL

(Melbourne, 1988)

4 I.252.4 – Call Forwarding Unconditional

4.1 Definition

Call Forwarding Unconditional (CFU) permits a “served user” (see § 4.2.2) to have the network send to another number all incoming calls for the served user's ISDN number (or just those associated with a specified basic service). The served user's originating service is unaffected. If this service is activated, calls are forwarded no matter what the condition of the termination. Other Call Forwarding services provide for call forwarding based on condition e.g. Call Forwarding Busy (CFB) and Call Forwarding No Reply (CFNR).

Note – In normal situations, the CFU service is provided on a per access basis. (In these situations, there is a one-to-one relationship between ISDN number and access.) However, the network may recognize multiple numbers on a single interface; in addition, it may not understand a complete ISDN number (e.g. DDI). In these cases, the CFU service is offered on the basis of the part of the ISDN number which the network can recognize.

4.2 Description

4.2.1 General description

For a given ISDN number, this service (including options) may be subscribed to for each basic service to which the user(s) of the number subscribes, or collectively for all the basic services to which the user(s) subscribes. Since subscription is on an ISDN number basis, the same Call Forwarding subscriptions will apply to all terminals using this number.

Note – In this service description, it is assumed that a single ISDN number is not shared across multiple interfaces. A single ISDN number may, however, be shared by multiple terminals on the same interface. Procedures permitting an ISDN number to be shared across multiple interfaces are for further study. For multiple access installations, it may be possible for the user to specify, on activation, if the service is applicable to a specific access or all accesses associated with that installation.

The served user can request a different forwarded-to number for each basic service subscription parameter value to which he has subscribed.

An indication that the CFU service is activated on a number may, as an option, be given to the user who has Forwarding activated, each time an outgoing call is made. This may take the form of a special indication in the proceed response.

4.2.2 Specific terminology

A *served user* is a user of a particular ISDN number who is requesting that calls to his number be forwarded. This user may also be referred to as the forwarding user or the called user.

A *forwarded-to user* is a user to whom the call shall be forwarded.

4.2.3 Qualifications on the applicability to telecommunication services

No restrictions identified.

4.3 Procedures

4.3.1 Provision/withdrawal

CFU shall be provided after pre-arrangement with the service provider.

The service can be offered with three subscription options. Options apply separately to each basic service subscribed to on each ISDN number. For each subscription option, only one value can be selected. Subscription options are summarized below:

<i>Subscription options</i>	<i>Value</i>
Served user receives notification that call has been forwarded	<ul style="list-style-type: none"> – No – Yes, with call offering information (see § 4.3.2.2)
Calling user receives notification that his call has been forwarded	<ul style="list-style-type: none"> – No – Yes, with or without forwarded-to user number
Served user receives notification that CFU is currently activated	<ul style="list-style-type: none"> – No – Yes

4.3.2 *Normal procedures*

4.3.2.1 *Activation/deactivation/registration*

If the served user has subscribed to CFU, the served user will use the activation procedure.

To activate CFU, the served user must supply:

- 1) the forwarded-to number;
- 2) information as to whether all calls or all calls of a specified basic service should be forwarded;
- 3) possibly the ISDN number for which CFU should apply.

As a network option, verification of the forwarded-to number should be accomplished, if possible, before accepting the call forwarding request.

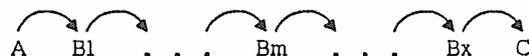
When the served user so activates CFU, the service provider will return notification of acceptance or rejection of the request (see Exceptional procedures, § 4.3.3, for a list of possible causes for rejection).

This notification will include the number of the forwarded-to user to whom the call forwarding is active. If a single number can be used by more than one terminal, activation of CFU will be possible from any terminal which uses this number. As a service option, activation/deactivation may be restricted to selected terminals (users) (e.g. by use of a password).

CFU can be deactivated in either of two ways. The user can specifically deactivate the CFU activation. The user can activate CFU for the specified basic service to another number, thus causing the previous invocation of CFU to be overridden.

4.3.2.2 *Invocation and operation*

The following illustration clarifies the CFU procedures. Assume that A calls B1, who forwards the call to B2, . . . , Bm, . . . , Bx. The final receiver of the call is C.



4.3.2.2.1 *Served user Bm's perspective*

When CFU is active, all incoming calls will be forwarded without being offered to the served user Bm. When an incoming call is forwarded without being offered to the served user, the served user, as a subscription option, may receive notification of the call forwarding (but will not be able to answer the incoming call). This notification is given as soon as the forwarding attempt is started.

This notification includes the following information (on the call that has been forwarded):

- 1) indication that a call has been forwarded;
- 2) telecommunication service information (e.g. bearer capability, higher layer compatibility);
- 3) user-to-user information;
- 4) Bm's number;
- 5) calling party's number A (if CLIP applicable).

If multiple forwardings have occurred and the served user is authorized to receive additional information, he may also receive:

- 6) originally called number B1;
- 7) cause for original forwarding;
- 8) last forwarding number B(m – 1);
- 9) cause for last forwarding.

4.3.2.2.2 *Forwarded-to user C's perspective*

The forwarded-to User C will receive an indication that call has been forwarded.

As an option he may also receive:

- 1) originally called number B1;
- 2) cause for original forwarding;
- 3) last forwarding number Bx;
- 4) cause for last forwarding.

(Depending on the use of other supplementary services, the forwarded-to user C may also receive information such as the calling party A number and user-to-user signalling. See the descriptions of interactions with other supplementary services.)

4.3.2.2.3 *Calling user A's perspective*

As a subscription option, the served user Bm can request that the calling user receive a notification that the call has been forwarded and, as an additional subscription option, that notification can include the forwarded-to number B(m+1). Transfer of the forwarded-to user number will not take place if number restrictions at the forwarded-to user exist.

4.3.3 *Exceptional procedures*

4.3.3.1 *Activation/deactivation/registration*

4.3.3.1.1 Call Forwarding Unconditional for all basic services and Call Forwarding of particular basic services cannot be activated simultaneously.

If the system cannot accept an activation request, the served user should receive a notification that Call Forwarding activation was unsuccessful. Possible causes are:

- i) service not subscribed;
- ii) forwarded-to invalid ISDN number;
- iii) use of an operator access prefix;
- iv) forwarded-to ISDN number's telecommunication services violate subscribed constraints (e.g. group restrictions);
- v) forwarded-to ISDN number is of a free number within the same office (i.e. a number to which no call is chargeable);
- vi) insufficient information;
- vii) requested telecommunication service is not provided to the forwarded-to ISDN number;
- viii) forwarded-to number is a special service code (e.g. police);
- ix) forwarded-to number is served user's number.

However, the network is not required to validate information related to the forwarded-to user.

4.3.3.1.2 *Deactivation*

If the user does not specify completely which CFU request is to be deactivated (e.g. the basic service and/or the originator's number), the network will reject the deactivation request with appropriate cause.

If the network cannot accept a user's request for deactivation, the cause will be returned to the user, e.g. incorrect origination ISDN number used.

If the network deactivates CFU without the served user having requested deactivation (e.g. when an exceptional condition occurs), the served user will receive notification along with the cause.

4.3.3.2 *Invocation and operation*

Call forwarding applies only to subscribed basic services. Calls to an ISDN number requesting a basic service which is not subscribed to, will never be forwarded.

Within an ISDN, or tandem ISDNs, the total number of all forwardings for each call should be limited. The maximum number of such connections should be limited to a value between 3 and 5 for each call. This is to prevent infinite looping.

If the limit is reached and an attempt is made to forward the call an additional time, then the forwarded call shall be treated as follows:

If the forwarded call cannot be completed to the forwarded-to destination, then the network will clear the forwarded leg of the call. Specifically, if CFU has been invoked, then the call would be cleared back towards the calling user. If the call has not previously undergone CFNR, the call will be cleared all the way back to the calling user and the calling user will be informed that no user is responding. If the call has previously undergone CFNR the call will only be cleared back as far as the CFNR exchange and the calling user will, in case of a telephony call, continue to receive inband ringing tone.

4.3.4 *Alternative procedures*

4.3.4.1 *Activation/deactivation/registration*

None identified.

4.3.4.2 *Invocation and operation*

None identified.

4.4 *Network capabilities for charging*

This Recommendation does not cover charging principles. Future Recommendations in the D-Series are expected to contain that information.

It shall be possible to charge the subscriber accurately for the service.

4.5 *Interworking requirements*

If the forwarded-to number is not within the ISDN, then an interworking situation is said to exist.

If a forwarded call meets an interworking situation, then an interworking indication should be sent to the calling party.

Note – The number of times a call has been forwarded once it has exited the Common Channel Signalling (CCS) network, cannot be limited by the CCS network.

4.6 *Interaction with other supplementary services*

4.6.1 *Call Waiting*

Calling user: No impact i.e. neither supplementary service affects the operation of the other supplementary service.

Called user: If a called user has activated CFU, then execution of that forwarding condition takes precedence over Call Waiting. CFU can be activated while a call is waiting without changing the state of the waiting call.

Forwarded-to user: A forwarded call can invoke Call Waiting.

4.6.2 *Call Transfer*

4.6.2.1 *Transfer of a Forwarded Call*

Calling user: A call which has been forwarded can be transferred by the calling user.

Called user: No impact i.e. neither supplementary service affects the operation of the other supplementary service.

Forwarded-to user: A call that has been transferred will be forwarded if the transferred-to user has CFU active and the appropriate forwarding conditions are met. A call which has been forwarded can be transferred by the forwarded-to user.

4.6.2.2 *Forwarding of a Call During Transfer*

A call which is being transferred can be forwarded by the party to whom the call is being transferred.

4.6.3 *Connected Line Identification Presentation*

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

4.6.4 *Connected Line Identification Restriction*

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

4.6.5 *Calling Line Identification Presentation*

Called user: If subscribed to, the called user can receive the Calling Line Identification of all calls which have been forwarded.

Forwarded-to user: Forwarded-to users having subscribed to CLIP may receive the calling user's number. If subscribed to by the called user, the forwarded-to user may receive the called user's number when a call has been forwarded.

Forwarded-to users who have subscribed to CLIP may receive the calling user's number if the calling user has not subscribed/invoked CLIR. In addition, forwarded-to users subscribing to CLIP may also receive the original called user's number and the last forwarding user's number if neither has subscribed/invoked CLIR (e.g. if A calls B1 who forwards A to B2 who forwards A to B3 who forwards A to C, then C will receive A, B1 and B3's number, unless A, B1 and B3 have restricted delivery).

4.6.6 *Calling Line Identification Restriction*

Calling user: When the CLIR is applicable and activated, the Calling Line Identification will not be presented to the forwarded-to user unless both the forwarding and forwarded-to users are in the override category. In addition, if the forwarding user is in an override category, the calling party's number will be provided in the call offering information. The latter is a national option.

4.6.7 *Closed User Group*

CUG restrictions must be met on each leg of the call. In addition, CUG restrictions must be met end-to-end. In the case of multiple forwarding, CUG restrictions have to be met in addition at each intermediate forwarding point.

Called user/forwarded-to user: When a call is forwarded, a new check of the CUG restrictions is made at the "forwarded-to" destination. The CUG information sent to the "forwarded to" destination is the same CUG information that was sent from the originating network.

Forwarding (i.e. called) user: Call forwarding can only be activated if CUG restrictions between the forwarding user and the forwarded-to user are met.

4.6.8 *Conference Calling*

Calling user: If a conference controller attempts to establish a conference call and calls a user with call forwarding active, the forwarded-to user will be alerted and can be added to the conference.

Called user: No impact i.e. neither supplementary service affects the operation of the other supplementary service.

Forwarded-to user: A forwarded-to user can establish a conference using an existing forwarded call as one of the conference connections.

A call, which has been forwarded, can be added to an existing conference by the forwarded-to user.

4.6.9 *Direct-Dialling-In*

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

4.6.10 *Call Diversion (i.e. Call Forwarding) services*

4.6.10.1 *Call Forwarding Busy*

The invocation of CFU takes precedence over CFB.

4.6.10.2 *Call Forwarding No Reply*

The invocation of CFU takes precedence over CFNR.

4.6.10.3 *Call Forwarding Unconditional*

Not applicable.

4.6.11 *Line Hunting*

Calling user: No impact i.e. neither supplementary service affects the operation of the other supplementary service.

Called user: Call Forwarding may be assignable to all or part of the hunting group. When forwarding is only required on part of the hunting group the forwarding customer must specify, at activation, which access the service is to be invoked from. Procedures for the operation of this service in association with part of a hunt group need to be completed. In general, CFU takes precedence over Line Hunting.

Forwarded-to user: Forwarded calls will be treated as normal calls when completing to a multi-line group user.

4.6.12 *Three-Party Service*

Refer to Recommendation I.254, § 2.6.10, interaction with CFU.

4.6.13 *User-to-User Signalling (UUS)*

Call originated by a user with CFU activated: Since CFU does not affect the forwarding user's ability to make outgoing calls, a user with CFU activated can send and receive user-to-user information (UUI) in association with an ongoing call or at the set-up of a new call.

Call incoming to a user with CFU activated:

During forwarding: Any UUI which accompanies the set-up of the call will be forwarded along with the forwarded call if both the calling and forwarding (i.e. called) parties have subscribed to service 1.

After forwarding: If the calling party has requested UUS service(s) 1, 2 and/or 3 in his initial call set-up, and if the forwarding (i.e. called) party has subscribed to the same service(s), then that service (those services) will automatically be extended so that they are available for use between the calling party and the forwarded-to party. If the forwarding party does not subscribe to the same service (set of services), the calling party will be informed that he can no longer employ the service(s) on this call.

4.6.14 *Multiple Subscriber Number*

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

4.6.15 *Call Hold*

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

4.6.16 *Advice of Charge*

Refer to Recommendation I.256, §§ 2.1.6.10, 2.2.6.10, 2.3.6.10.

4.7 *Dynamic description*

Refer to CFB dynamic description (which covers CFB, CFNR and CFU) in § 2.

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