TECHNICAL SPECIFICATION

Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
Call Forwarding (CF) Supplementary Services;
Stage 1
(3GPP TS 22.082 version 13.0.0 Release 13)

GLOBAL SYSTEM FOR
MOBILE COMMUNICATIONS

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

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y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

0 Scope

This specification describes the supplementary services belonging to the group CALL OFFERING SUPPLEMENTARY SERVICES.

The general aspects, including definitions and recommended provision, of the description of the supplementary services are given in specification 3TS 22.004.

The group of supplementary services CALL OFFERING SUPPLEMENTARY SERVICES is divided into four different supplementary services:

- Call forwarding unconditional (section 1);

- Call forwarding on mobile subscriber busy (section 2);

- Call forwarding on no reply (section 3);

- Call forwarding on mobile subscriber not reachable (section 4).

Indication of active Call forwarding supplementary service.

An indication that a Call forwarding service is currently active and operative on a number will be given to the forwarding party each time an outgoing call is made. There will be one indication for Unconditional call forwarding and another common indication for the Conditional call forwarding services.

Note on the use of the forwarded-to number at registration.

If the forwarded-to number is a number in the HPLMN country, it may be entered by the served mobile subscriber in three different formats, independent of her actual location, according to the schemes:

1) National (significant) number.

2) National (trunk) prefix plus national (significant) number.

3) International prefix*, country code, national (significant) number.

Scheme 3) Storage of numbers in this format is mandatory for all PLMN operators.

If the forwarded-to number is a number in a country other than the HPLMN country, it shall be entered by the served mobile subscriber, independent of her actual location, according to the following scheme:

- International prefix (NOTE), country code, national (significant) number.

   NOTE: The MMI for entering of international prefix is defined in 22.030.

The maximum forwarded-to number length is 28 digits.

Principles for interaction with the Barring of Outgoing Calls supplementary services.

Numbers allowed to call according to the Barring of Outgoing call service condition are allowed as forwarded-to numbers for the served mobile subscriber.

Numbers not allowed to call according to the Barring of Outgoing call service condition are not allowed as forwarded-to numbers for the served mobile subscriber.

For Unconditional Call Forwarding the forwarded leg is treated as an outgoing call from the HPLMN country.

For the Conditional Call Forwarding services the forwarded leg is treated as an outgoing call from the LPLMN (HPLMN or VPLMN) country.

Principles for interaction with the Barring of Incoming Calls supplementary services.

When Barring of all incoming calls is active for the served mobile subscriber - no Call forwarding services are allowed for her.

When Barring of all incoming calls when roaming outside the HPLMN country is active and operative - i.e. the served mobile subscriber is roaming outside the HPLMN country, the Conditional Call Forwarding services are not allowed.

0.1   References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   3GPP TR 22.905: "Vocabulary for 3GPP Specifications".

[2]   3GPP TS 22.004: General on supplementary services".

[3]   3GPP TS 22.030: Man-Machine Interface (MMI) of the Mobile Station (MS)".

[4]   3GPP TS 22.081: Line identification supplementary services - Stage 1".

[5]   3GPP TS22.083Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1".

[6]   3GPP TS 22.084MultiParty (MPTY) supplementary services - Stage 1".

[7]   3GPP TS 22.085Closed User Group (CUG) supplementary services - Stage 1".

[8]   3GPP TS 22.086: Advice of charge (AoC) supplementary services - Stage 1".

[9]   3GPP TS 22.088: 'Call Barring (CB) supplementary services – Stage 1'.

0.2   Definitions and abbreviations

Abbreviations used in this specification are listed in TR 22.905 [1].

1   Call Forwarding Unconditional

1.1   Definition

This service permits a called mobile subscriber to have the network send all incoming calls, or just those associated with a specific Basic service group, addressed to the called mobile subscriber's directory number to another directory number. The ability of the served mobile subscriber to originate calls is unaffected. If this service is activated, calls are forwarded no matter what the condition of the termination.

1.2   Description

1.2.1   Description

The served mobile subscriber can request a different forwarded-to number for each Basic service group containing a basic service to which she has subscribed.

1.2.2 Applicability to telecommunication services

The applicability of this supplementary service is defined in 3GPP TS 22.004.

1.2.3 Terminology

A served mobile subscriber is a mobile subscriber of a particular PLMN access who is requesting that calls to her number be forwarded. This subscriber may also be referred to as the forwarding subscriber or the called subscriber.

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

1.3 Normal procedures with successful outcome

1.3.1 Provision

The supplementary service will be provisioned for all Basic Services subscribed to and to which it is applicable.

The service can be offered with several subscription options. Options apply to all Basic services subscribed to. For each subscription option, only one value can be selected.

Subscription options	Value
Calling subscriber receives notification the call has been forwarded	No Yes
MSISDN of the served subscriber can be presented to the forwarded-to subscriber	No Yes

1.3.2 Withdrawal

The service will be withdrawn at the subscriber's request or for administrative reasons.

1.3.3 Registration

The following information has to be registered in the network:

1) the forwarded-to number, which may be accompanied by a forwarded-to sub-address;

2) information as to whether all calls or all calls of one (or several) specific Basic service groups should be forwarded.

If no Basic Service code is inserted by the user this is interpreted as All Basic Services.

Registration can take place either by the service provider or with an appropriate control procedure by the subscriber.

Verification, where possible, of the forwarded-to number should be accomplished before accepting the call forwarding request. This verification is done by a simple check of the forwarded-to number to see if the number is within the allowed number range.

When the mobile subscriber so registers call forwarding unconditional, the network will return notification of acceptance or rejection of the request. This notification will include the forwarded-to number to which call forwarding unconditional is registered.

1.3.4 Erasure

A previous registration can be erased in either of three ways:

Firstly, the subscriber can specifically erase a previous registration with an appropriate control procedure.

Secondly, the subscriber can register information for call forwarding unconditional for the specific Basic service group to another directory number, thus causing the previous registration of call forwarding unconditional to be overridden.

Thirdly, all information is erased as a result of withdrawal of the service.

1.3.5 Activation

The user shall be allowed to activate Call Forwarding Unconditional (CFU) by e.g. using the MMI command described in 3GPP TS 22.030. This activation request may include information of which Basic Service Group(s) it shall apply to. If no such information is included the Activation request applies to all Basic Service Groups.

When receiving an activation request the network shall activate CFU for the Basic Service Groups comprised in the BS group information given by the user against which a CFU forwarded-to-number is registered. The Activation(s) shall be in accordance with the rules set out in 3GPP TS 22.004.

When CFU is activated for Basic Service Group (Voice – MMI service code 11; Fax – MMI service code 13; Data – MMI service code 12) as defined in 3GPP TS 22.030 [3], a notification shall be sent to the user. Subsequently, when the UE is in idle mode, an indication may be given to the user to show that CFU for Basic Service Group Voice – MMI service code 11 is active.

The supplementary service is also activated for a Basic service group as a result of Registration for that Basic service group.

1.3.6 Deactivation

An active CFU can be deactivated in either of two ways;

- The user may deactivate CFU by means of an appropriate control procedure (e.g. as described in 3GPP TS 22.030). A deactivation request may contain information of which Basic Service Group(s) it shall apply to. If no such information is included the Deactivation request applies to all Basic Service Groups.

  When receiving a deactivation request the network shall deactivate CFU for the Basic Service Group(s) comprised in the BS group information given by the user against which a CFU forwarded-to-number is registered. However, the registered information shall not be erased. The Deactivation(s) shall be in accordance with the rules set out in 3GPP TS 22.004.

  Even if there is no data stored against a particular Basic Service group comprised in a deactivation request, the request shall be accepted by the network for the other Basic Service group(s) included in the information given by the user.

- The service is deactivated as a result of Erasure.

In the former case, and also in the latter if Erasure is user controlled, the user shall receive a notification of whether her request was accepted or rejected in accordance with the rules set out in 3GPP TS 22.004.

1.3.7 Invocation

If the supplementary service is activated for a Basic service incoming calls for the specified Basic service will be forwarded by network invocation.

1.3.8 Normal operation with successful outcome

When call forwarding unconditional is active and operative, incoming calls for the specified Basic Service(s) will be forwarded without being offered to the served mobile subscriber.

The forwarded-to subscriber will receive an indication that the call has been forwarded with the cause. The cause, when available, will be the appropriate forwarding condition. Depending on the value of the served subscribers subscription option, the forwarded-to subscriber may also receive the MSISDN of the served subscriber.

When multiple forwarding occurs the reason for forwarding and the MSISDN given to the forwarded-to subscriber should relate to the last forwarding subscriber in the chain.

When call forwarding unconditional is active and operative, the ability of the served mobile subscriber to originate calls is not affected. However, an indication that the call forwarding service is currently active and operative on a number will be given to the forwarding party each time an outgoing call is made.

As a subscription option, the served mobile subscriber can request that the calling subscriber receives a notification that the call has been forwarded.

> NOTE: In case the notification is implemented using intermediate tones or announcements, the tones and/or announcements to the calling party should not be provided <u>if </u>the information transfer capability is set to UDI.

1.3.11   Interrogation

Data request

The data request procedure enables the mobile subscriber to obtain information about the data stored in the PLMN. After having requested this procedure the network shall return the following information:

- in response to a general data request the served mobile subscriber should be given a list of all Basic service groups to which call forwarding unconditional is registered, including information whether or not it is active and operative, and the associated forwarded-to numbers;

- in response to a specific request concerning one particular Basic service group, the served mobile subscriber should be informed whether or not call forwarding unconditional is registered, including information whether or not it is active and operative for that Basic service group. If CFU is registered, the associated forwarded-to number shall be given.

1.3.12   Charging requirements

The forwarding subscriber may be charged for the forwarded part of the call.

1.4   Exceptional procedures or unsuccessful outcome

1.4.2   Registration

If the system cannot accept a registration request, the served mobile subscriber should receive a notification that call forwarding unconditional registration was not successful. Possible causes are:

- service not subscribed to;

- forwarded-to number is invalid directory number;

- use of an operator access prefix;

- insufficient information;

- forwarded-to number is a special service code (e.g. police);

- forwarded-to number is the directory number of the mobile subscriber herself;

- conflicting situation with other supplementary services (e.g. incoming call barring has been activated);

- no basic service provisioned within the basic service group(s).

The network is not required to validate information related to the forwarded-to number.

1.4.3   Erasure

If the network cannot accept a mobile subscriber's request for erasure, cause will be returned to the subscriber, such as:

- insufficient information;

- inconsistent with registration.

If the subscriber does not completely specify which call forwarding unconditional request is to be erased, the network will reject the erasure request with appropriate cause.

If no Basic Service Code is inserted by the user, CF will be erased from all Basic Services.

1.4.4 Activation

If there is no CFU forwarded-to-number registered against a Basic Service group, the activation request for that Basic Service group shall be denied.

Examples of causes for a not accepted activation request:

- service not provisioned;

- conflicting situation with other supplementary services;

- service not registered.

1.4.5 Deactivation

If the network cannot accept a deactivation request, an appropriate cause will be returned to the user, e.g. Service not Active.

1.4.6 Invocation

Within a PLMN or different PLMNs the number of tandem forwarding connections should be limited. The maximum number of tandem forwarding connections should be limited to a value between 1 and 5. This is to prevent infinite looping.

If the limit of successive forwardings of a call has already been reached, an unsuccessful call set up indication is sent backwards.

If the forwarded call cannot be completed to the forwarded-to destination, then the network will clear the forwarded part of the call and an unsuccessful call set up indication is sent backwards.

NOTE: Call forwarding unconditional applies only to the Basic services subscribed to. Calls to a directory number requesting a Basic service which is not subscribed to will never be forwarded.

1.5 Alternate procedures

None identified.

1.6 Interactions with other supplementary services

1.6.81.1 Calling line identification presentation

See 3GPP TS 22.081.

1.6.81.2 Calling line identification restriction

See 3GPP TS 22.081.

1.6.81.3 Connected line identification presentation

See 3GPP TS 22.02.81.

1.6.81.4 Connected line identification restriction

See 3GPP TS 22.02.81.

1.6.82.2 Call forwarding on mobile subscriber busy

If Call forwarding unconditional is active, activation of Call forwarding on mobile subscriber busy is rejected. The served mobile subscriber shall be informed of this supplementary service incompatibility.

If Call forwarding on mobile subscriber busy is active, activation of Call forwarding unconditional will be accepted. Call forwarding on mobile subscriber busy will be quiescent during the active period of Call forwarding unconditional. If Call forwarding unconditional is subsequently deactivated, Call forwarding on mobile subscriber busy becomes operative again (unless the interaction with another supplementary service requests that it remains quiescent).

If Call forwarding unconditional is active for one particular basic service, activation of Call forwarding on mobile subscriber busy for all basic services is rejected. The served mobile subscriber shall be informed of this supplementary service incompatibility.

If Call forwarding on mobile subscriber busy is active for one particular basic service, activation of Call forwarding unconditional for all basic services will be accepted. Call forwarding on mobile subscriber busy will be quiescent during the active period of Call forwarding unconditional. If Call forwarding unconditional is subsequently deactivated, Call forwarding on mobile subscriber busy becomes operative again (unless the interaction with another supplementary service requests that it remains quiescent).

1.6.82.3 Call forwarding on no reply

Same as interaction between Call forwarding unconditional and Call forwarding on mobile subscriber busy.

1.6.82.4 Call forwarding on mobile subscriber not reachable

Same as interaction between Call forwarding unconditional and Call forwarding on mobile subscriber busy.

1.6.83.1 Call waiting

See 3GPP TS 22.083.

1.6.84.1 Multi party

See 3GPP TS 22.084.

1.6.85.1 Closed user group

See 3GPP TS 22.085.

1.6.86.1 Advice of charge

See 3GPP TS 22.086.

1.6.88.1 Barring of all outgoing calls

Served mobile subscriber:

- If barring of all outgoing calls is active, the registration and/or activation of call forwarding unconditional is denied. The mobile subscriber requesting for this call forwarding service shall be informed of this supplementary service incompatibility.

- If Call forwarding unconditional is active, activation of Barring of all outgoing calls is denied. The mobile subscriber shall be informed of this supplementary service incompatibility.

1.6.88.2   Barring of outgoing international calls

Served mobile subscriber:

-    If barring of outgoing international calls is active, the registration of an international forwarded-to number (from the home PLMN country) for call forwarding unconditional, as well as the activation of call forwarding unconditional to such a forwarded-to number, is denied. The mobile subscriber shall be informed of this supplementary service incompatibility.

-    If Call forwarding unconditional is active to an international forwarded-to number (from the HPLMN country), activation of Barring of outgoing international calls is denied. The mobile subscriber shall be informed of this supplementary service incompatibility.

1.6.88.4   Barring of outgoing international calls except those directed to the home PLMN country

Same as interaction between Call forwarding unconditional and Barring of outgoing international calls.

1.6.88.6   Barring of all incoming calls

Calling subscriber: No interaction

Served mobile subscriber:

-    If barring of all incoming calls is active, the registration and/or activation of call forwarding unconditional is denied. The mobile subscriber shall be informed of this supplementary service incompatibility.

-    If Call forwarding unconditional is active, activation of Barring of all incoming calls is denied. The mobile subscriber shall be informed of this supplementary service incompatibility.

Forwarded-to subscriber: Calls forwarded to a subscriber having Barring of all incoming calls active, will be denied as any other incoming call to that subscriber.

1.6.88.7   Barring of incoming calls when roaming outside the home PLMN country

Served mobile subscriber:

-    If Barring of Incoming Calls when Roaming Outside the HPLMN Country is active, registration and/or activation of Call Forwarding Unconditional is permitted and Barring of Incoming Calls when Roaming Outside the HPLMN Country becomes quiescent.

-    If Call Forwarding Unconditional is active, activation of Barring of Incoming Calls when Roaming Outside the HPLMN Country is not permitted. The mobile subscriber shall be informed of this supplementary service incompatibility.

Forwarded to subscriber: Calls forwarded to a subscriber having Barring of incoming calls when roaming outside the HPLMN country active and operative, will be denied as any other incoming call to that subscriber.

1.6.88.8   Anonymous Call Rejection

See 3GPP TS 22.088 [9].

1.7   Interworking considerations

If the forwarded-to number is not a PLMN- or ISDN-number, 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. When interworking with non-PLMN or non-ISDN networks, tones and announcements will be required.

NOTE1:   The number of times a call has been forwarded once it has exited the PLMN or ISDN may not be limited.

NOTE2: Tones and/or announcements should not be provided to the calling party if the information transfer capability is set to UDI.

2 Call Forwarding on Mobile Subscriber Busy

2.1 Definition

This service permits a called mobile subscriber to have the network send all incoming calls, or just those associated with a specific Basic service group, addressed to the called mobile subscriber's directory number and which meet mobile subscriber busy to another directory number. The ability of the served mobile subscriber to originate calls is unaffected. If this service is activated, a call is forwarded only if the call meets mobile subscriber busy.

2.2 Description

2.2.1 Description

The served mobile subscriber can request a different forwarded-to number for each Basic service group containing a basic service to which she has subscribed.

2.2.2 Applicability to telecommunication services

The applicability of this supplementary service is defined in 3GPP TS 22.004.

2.2.3 Terminology

A served mobile subscriber is a mobile subscriber of a particular PLMN access who is requesting that calls to her number be forwarded. This subscriber may also be referred to as the forwarding subscriber or the called subscriber.

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

2.3 Normal procedures with successful outcome

2.3.1 Provision

The supplementary service will be provisioned for all Basic Services subscribed to and to which it is applicable.

The service can be offered with several subscription options. Options apply to all Basic services subscribed to. For each subscription option, only one value can be selected.

Subscription options are summarized below:

Subscription options	Value
Forwarding subscriber receives notification that the call has been forwarded	- No - Yes
Calling subscriber receives notification that the call has been forwarded	- No - Yes
MSISDN of the served subscriber can be presented to the forwarded-to subscriber	- No - Yes

In case of User Determined User Busy (UDUB) a notification towards the forwarding subscriber will not be given.

2.3.2 Withdrawal

The service will be withdrawn at the subscriber's request or for administrative reasons.

2.3.3 Registration

The following information has to be registered in the network:

1) the forwarded-to number, which may be accompanied by a forwarded-to sub-address;

2) information as to whether all calls or all calls of one (or several) specific Basic service group(s) should be forwarded.

If no Basic Service Code is inserted by the user this is interpreted as All Basic Services.

Registration can take place either by the service provider or with an appropriate control procedure by the subscriber. Verification, where possible, of the forwarded-to number should be accomplished before accepting the call forwarding request. This verification is done by a simple check of the forwarded-to number to see if the number is within the allowed number range.

When the mobile subscriber so registers call forwarding on mobile subscriber busy, the network will return notification of acceptance or rejection of the request. This notification will include the forwarded-to number to which call forwarding on mobile subscriber busy is registered.

2.3.4 Erasure

A previous registration can be erased in either of three ways:

Firstly, the subscriber can specifically erase a previous registration with an appropriate control procedure.

Secondly, the subscriber can register information for call forwarding on mobile subscriber busy for the specific Basic service group to another directory number, thus causing the previous registration of call forwarding on mobile subscriber busy to be overridden.

Thirdly, all information is erased as a result of withdrawal of the service.

2.3.5 Activation

The user shall be allowed to activate Call Forwarding on Busy (CFB) by e.g. using the MMI command described in 3GPP TS 22.030. This activation request may include information of which Basic Service Group(s) it shall apply to. If no such information is included, the Activation request applies to all Basic Service Groups.

When receiving an activation request the network shall activate CFB for the Basic Service Groups comprised in the BS group information given by the user against which a CFB forwarded-to-number is registered. The Activation(s) shall be in accordance with the rules set out in 3GPP TS 22.004.

The user shall receive a notification that CFB has been activated.

The supplementary service is also activated for a Basic service group as a result of registration for that Basic service group.

2.3.6 Deactivation

An active CFB can be deactivated in either of two ways:

- The user may deactivate CFB by means of an appropriate control procedure (e.g. as described in 3GPP TS 22.030). A deactivation request may contain information of which Basic Service Group(s) it shall apply to. If no such information is included, the Deactivation request applies to all Basic Service Groups.

When receiving a deactivation request the network shall deactivate CFB for the Basic Service Groups comprised in the BS group information given by the user against which a CFB forwarded-to-number is registered. However, the registered information shall not be erased. The Deactivation(s) shall be in accordance with the rules set out in 3GPP TS 22.004.

Even if there is no data stored against a particular Basic Service group comprised in a deactivation request, the request shall be accepted by the network for the other Basic Service group(s) included in the information given by the user.

- The service is deactivated as a result of Erasure.

In the former case, and also in the latter if Erasure is user controlled, the user shall receive a notification of whether her request was accepted or rejected in accordance with the rules set out in 3GPP TS 22.004.

2.3.7 Invocation

If the supplementary service is activated for a Basic service incoming calls for the specified Basic service that meet mobile subscriber busy will be forwarded by network invocation.

2.3.8 Normal operation with successful outcome

When call forwarding on mobile subscriber busy is active and operative, incoming calls for the specified Basic Service(s) that meet mobile subscriber busy with the condition UDUB (User Determined User Busy) will be forwarded. Incoming calls for the specified basic service(s) that meet mobile subscriber busy with the condition NDUB (Network Determined User Busy) will be forwarded without being offered to the served mobile subscriber.

When an incoming call is forwarded on mobile subscriber busy with the condition NDUB the served mobile subscriber can, as a subscription option, receive notification.

The forwarded-to subscriber will receive an indication that the call has been forwarded with the cause. The cause, when available, will be the appropriate forwarding condition. Depending on the value of the served subscribers subscription option, the forwarded-to subscriber may also receive the MSISDN of the served subscriber.

When multiple forwarding occurs the reason for forwarding and the MSISDN given to the forwarded-to subscriber should relate to the last forwarding subscriber in the chain.

When call forwarding on mobile subscriber busy is active and operative, the ability of the served mobile subscriber to originate calls is not affected. However, an indication that the call forwarding service is currently active and operative on a number will be given to the forwarding party each time an outgoing call is made.

As a subscription option, the served mobile subscriber can request that the calling subscriber receives a notification that the call has been forwarded.

NOTE: In case the notification is implemented using intermediate tones or announcements, the tones and/or announcements to the calling party should not be provided if the information transfer capability is set to UDI.

2.3.11 Interrogation

Data request

The data request procedure enables the mobile subscriber to obtain information about the data stored in the PLMN. After having requested this procedure the network shall return the following information:

- in response to a general data request the served mobile subscriber should be given a list of all Basic service groups to which call forwarding on mobile subscriber busy is registered, including information whether it is active and if so, whether it is operative or quiescent, and the associated forwarded-to numbers;

- in response to a specific request concerning one particular Basic service group, the served mobile subscriber should be informed whether or not call forwarding on mobile subscriber busy is registered, including information whether it is active and if so, whether it is operative or quiescent for that Basic service group. If CFB is registered, the associated forwarded-to number shall be given.

2.3.12 Charging requirements

The forwarding subscriber may be charged for the forwarded part of the call.

2.4 Exceptional procedures or unsuccessful outcome

2.4.2 Registration

If the system cannot accept a registration request, the served mobile subscriber should receive a notification that call forwarding on mobile subscriber busy registration was not successful. Possible causes are:

- service not subscribed to;

- forwarded-to number is invalid directory number;

- use of an operator access prefix;

- insufficient information;

- forwarded-to number is a special service code (e.g. police);

- forwarded-to number is the directory number of the mobile subscriber herself;

- conflicting situation with other supplementary services (e.g. incoming call barring has been activated);

- no basic service provisioned within the basic service groups.

The network is not required to validate information related to the forwarded-to number.

2.4.3 Erasure

If the network cannot accept a mobile subscriber's request for erasure, cause will be returned to the subscriber, such as:

- insufficient information;

- inconsistent with registration.

If the subscriber does not completely specify which call forwarding on mobile subscriber busy request is to be erased, the network will reject the erasure request with appropriate cause.

If no Basic Service Code is inserted by the user, CF will be erased from all Basic Services.

2.4.4 Activation

If there is no CFB forwarded-to-number registered against a Basic Service group, the activation request for that Basic Service group shall be denied.

Examples of causes for a not accepted activation request:

- service not provisioned;

- conflicting situation with other supplementary services;

- service not registered.

2.4.5 Deactivation

If the network cannot accept a deactivation request, an appropriate cause will be returned to the user, e.g. Service not Active.

2.4.6 Invocation

Within a PLMN or different PLMNs the number of tandem forwarding connections should be limited. The maximum number of tandem forwarding connections should be limited to a value between 1 and 5. This is to prevent infinite looping.

If the limit of successive forwardings of a call has already been reached, an unsuccessful call set up indication is sent backwards.

If the forwarded call cannot be completed to the forwarded-to destination, then the network will clear the forwarded part of the call and an unsuccessful call set up indication is sent backwards.

NOTE: Call forwarding on mobile subscriber busy applies only to the Basic services subscribed to. Calls to a directory number requesting a Basic service which is not subscribed to will never be forwarded.

2.5 Alternate Procedures

None identified.

2.6 Interactions with other supplementary services

2.6.81.1 Calling line identification presentation

See 3GPP TS 22.081.

2.6.81.2 Calling line identification restriction

See 3GPP TS 22.081.

2.6.81.3 Connected line identification presentation

See 3GPP TS 22.081.

2.6.81.4 Connected line identification restriction

See 3GPP TS 22.081.

2.6.82.1 Call forwarding unconditional

See section 1.6.82.2.

2.6.83.1 Call waiting

See 3GPP TS 22.083.

2.6.84.1 Multi party

See 3GPP TS 22.084.

2.6.85.1 Closed user group

See 3GPP TS 22.085.

2.6.86.1 Advice of charge

See 3GPP TS 22.086.

2.6.88.1 Barring of all outgoing calls

Same as the interaction between call forwarding unconditional and barring of all outgoing calls.

2.6.88.2 Barring of outgoing international calls

Served mobile subscriber:

- If barring of outgoing international calls is active, the registration of an international forwarded-to number (from the visited PLMN country) for call forwarding on mobile subscriber busy, as well as the activation of call forwarding on mobile subscriber busy to such a forwarded-to number, is denied. The mobile subscriber shall be informed of this supplementary service incompatibility.

- If Call forwarding on mobile subscriber busy is active to an international forwarded-to number (from the local PLMN country), activation of Barring of outgoing international calls is denied. The mobile subscriber shall be informed of this supplementary service incompatibility.

- If Barring of outgoing international calls and Call forwarding on mobile subscriber busy are simultaneously active (i.e. the forwarded-to number is a local number seen from the local PLMN country), Call forwarding on mobile subscriber busy will be made quiescent by the network as soon as the mobile subscriber updates in another PLMN country.

- If barring of outgoing international calls is subsequently deactivated, or if the mobile subscriber updates in a PLMN where the forwarded-to number is not considered as an international number, call forwarding on mobile subscriber busy is automatically made operative (unless the interaction with another supplementary service requests that it remains quiescent).

2.6.88.4 Barring of outgoing international calls except those directed to the home PLMN country

Served mobile subscriber:

- If Barring of outgoing international calls except those directed to the home PLMN country is active, the registration of an international forwarded-to number (from the local PLMN country) except to the HPLMN country, as well as the activation of call forwarding on mobile subscriber busy to such a forwarded-to number, is denied. The mobile subscriber shall be informed of this supplementary service incompatibility.

- If Call forwarding on mobile subscriber busy is active to an international forwarded-to number (from the local PLMN country) except to the HPLMN country, activation of Barring of outgoing international calls except those directed to the home PLMN country is denied. The mobile subscriber shall be informed of this supplementary service incompatibility.

- If Barring of outgoing international calls except those directed to the home PLMN country and Call forwarding on mobile subscriber busy are simultaneously active (i.e. the forwarded-to number is a local number seen from the local PLMN country or a number in the HPLMN country), Call forwarding on mobile subscriber busy will be made quiescent as soon as the mobile subscriber is updated in another PLMN country if the forwarded-to number is not a number in the HPLMN country.

- If Barring of outgoing international calls except those directed to the home PLMN country is subsequently deactivated, or if the mobile subscriber updates in a PLMN where the forwarded-to number is not barred, Call forwarding on mobile subscriber busy is automatically made operative (unless the interaction with another supplementary service requests that it remains quiescent).

2.6.88.6 Barring of all incoming calls

Same as the interaction between call forwarding unconditional and barring of all incoming calls.

2.6.88.7 Barring of incoming calls when roaming outside the home PLMN country

Served mobile subscriber:

- If Barring of incoming calls when roaming outside the home PLMN country is active and operative (i.e. the mobile subscriber is roaming outside the home PLMN country) then the registration and/or activation of Call forwarding on mobile subscriber busy is denied. The mobile subscriber shall be informed of this supplementary service incompatibility.

- If Barring of incoming calls when roaming outside the home PLMN country is active and quiescent (i.e. the mobile subscriber is in the home PLMN country), then the registration and/or activation of Call forwarding on mobile subscriber busy is not denied.

- If Barring of incoming calls when roaming outside the home PLMN country becomes operative after Call forwarding on mobile subscriber busy has been registered and/or activated, Call forwarding on mobile subscriber busy is made quiescent.

- If Barring of incoming calls when roaming outside the home PLMN country subsequently becomes quiescent, Call forwarding on mobile subscriber busy is automatically made operative (unless the interaction with another supplementary service requests that it remains quiescent).

- If Call forwarding on mobile subscriber busy is active and operative and the mobile subscriber is roaming outside the home PLMN country, activation of Barring of incoming calls when roaming outside the HPLMN country is denied. The mobile subscriber shall be informed of this supplementary service incompatibility.

- If call forwarding on mobile subscriber busy is active and quiescent and the mobile subscriber is roaming in the home PLMN country, activation of Barring of incoming calls when roaming outside the HPLMN country is not denied.

Forwarded to subscriber: Calls forwarded to a subscriber having Barring of incoming calls when roaming outside the HPLMN country active and operative, will be denied as any other incoming call to that subscriber.

2.6.88.8 Anonymous Call Rejection

See 3GPP TS 22.088 [9].

2.7 Interworking considerations

If the forwarded-to number is not a PLMN- or ISDN-number, 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. When interworking with non-PLMN or non-ISDN networks, tones and announcements will be required.

NOTE1: The number of times a call has been forwarded once it has exited the PLMN or ISDN may not be limited.

NOTE2: Tones and/or announcements should not be provided to the calling party if the information transfer capability is set to UDI.

3 Call Forwarding on No Reply

3.1 Definition

This service permits a called mobile subscriber to have the network send all incoming calls, or just those associated with a specific Basic service group, addressed to the called mobile subscriber's directory number and which meet no reply to another directory number. The ability of the served mobile subscriber to originate calls is unaffected. If this service is activated, a call is forwarded only if the call meets no reply.

3.2 Description

3.2.1 Description

The served mobile subscriber can request a different forwarded-to number for each Basic service group containing a basic service to which she has subscribed.

3.2.2 Applicability to telecommunication services

The applicability of this supplementary service is defined in 3GPP TS 22.004.

3.2.3 Terminology

A served mobile subscriber is a mobile subscriber of a particular PLMN access who is requesting that calls to her number be forwarded. This subscriber may also be referred to as the forwarding subscriber or the called subscriber.

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

3.3 Normal procedures with successful outcome

3.3.1 Provision

The supplementary service will be provisioned for all Basic Services subscribed to and to which it is applicable.

The service can be offered with several subscription options. Options apply to all Basic services subscribed to. For each subscription option, only one value can be selected.

Subscription options are summarized below:

Subscription options	Value
Forwarding subscriber receives notification that the call has been forwarded	- No - Yes
Calling subscriber receives notification that the call has been forwarded	- No - Yes
MSISDN of the served subscriber can be	- No
presented to the forwarded-to subscriber	- Yes

3.3.2 Withdrawal

The service will be withdrawn at the subscriber's request or for administrative reasons.

3.3.3 Registration

The following information has to be registered in the network:

1) the forwarded-to number, which may be accompanied by a forwarded-to sub-address;

2) information as to whether all calls or all calls of one (or several) specific Basic service group(s) should be forwarded;

   If no Basic Service Code is inserted by the user this is interpreted as All Basic Services.

3) the duration of the no reply condition timer.

Registration can take place either by the service provider or with an appropriate control procedure by the subscriber. If the duration of the no reply condition timer is not registered by the mobile subscriber then the previous value set by the mobile subscriber applies. If no previous value exists, a default value set by the service provider applies. The value is in between 5 and 30 seconds, in steps of 5 seconds.

Verification, where possible, of the forwarded-to number should be accomplished before accepting the call forwarding request. This verification is done by a simple check of the forwarded-to number to see if the number is within the allowed number range.

When the mobile subscriber so registers call forwarding on no reply, the network will return notification of acceptance or rejection of the request. This notification will include the forwarded-to number to which call forwarding on no reply is registered and the duration of the no reply condition timer.

3.3.4   Erasure

A previous registration can be erased in either of three ways:

Firstly, the subscriber can specifically erase a previous registration with an appropriate control procedure.

Secondly, the subscriber can register information for call forwarding on no reply for the specific Basic service group to another directory number, thus causing the previous registration of call forwarding on no reply to be overridden.

Thirdly, all information is erased as a result of withdrawal of the service.

3.3.5   Activation

The user shall be allowed to activate Call Forwarding on No Reply (CFNRy) by e.g. using the MMI command described in 3GPP TS 22.030. This activation request may include information of which Basic Service Group(s) it shall apply to. If no such information is included, the Activation request applies to all Basic Service Groups.

When receiving an activation request the network shall activate CFNRy for the Basic Service Groups comprised in the BS group information given by the user against which a CFNRy forwarded-to-number is registered. The Activation(s) shall be in accordance with the rules set out in 3GPP TS 22.004.

The user shall receive a notification that CFNRy has been activated.

The supplementary service is also activated for a Basic service group as a result of Registration for that Basic service group.

3.3.6   Deactivation

An active CFNRy can be deactivated in either of two ways:

- The user may deactivate CFNRy by means of an appropriate control procedure (e.g. as described in 3GPP TS 22.030). A deactivation request may contain information of which Basic Service Group(s) it shall apply to. If no such information is included the Deactivation request applies to all Basic Service Groups.

   When receiving a deactivation request the network shall deactivate CFNRy for the Basic Service Groups comprised in the BS group information given by the user against which a CFNRy forwarded-to-number is registered. However, the registered information shall not be erased. The Deactivation(s) shall be in accordance with the rules set out in 3GPP TS 22.004.

   Even if there is no data stored against a particular Basic Service group comprised in a deactivation request, the request shall be accepted by the network for the other Basic Service groups included in the information given by the user.

- The service is deactivated as a result of Erasure.

   In the former case, and also in the latter if Erasure is user controlled, the user shall receive a notification of whether her request was accepted or rejected in accordance with the rules set out in 3GPP TS 22.004.

3.3.7 Invocation

If the supplementary service is activated for a Basic service incoming calls for the specified Basic service that are not answered within the period defined by the no reply condition timer, will be forwarded by network invocation.

3.3.8 Normal operation with successful outcome

When call forwarding on no reply is active and operative, incoming calls for the specified Basic Service(s) that are not answered within the period defined by the no reply condition timer, will be forwarded without being offered to the served mobile subscriber.

When an incoming call is forwarded on no reply the served mobile subscriber can, as a subscription option, receive notification (but will not be able to answer the incoming call).

The forwarded-to subscriber will receive an indication that the call has been forwarded with the cause. The cause, when available, will be the appropriate forwarding condition. Depending on the value of the served subscribers subscription option, the forwarded-to subscriber may also receive the MSISDN of the served subscriber.

When multiple forwarding occurs the reason for forwarding and the MSISDN given to the forwarded-to subscriber should relate to the last forwarding subscriber in the chain.

When call forwarding on no reply is active and operative, the ability of the served mobile subscriber to originate calls is not affected. However, an indication that the call forwarding service is currently active and operative on a number will be given to the forwarding party each time an outgoing call is made.

As a subscription option, the served mobile subscriber can request that the calling subscriber receives a notification that the call has been forwarded.

NOTE: In case the notification is implemented using intermediate tones or announcements, the tones and/or announcements to the calling party should not be provided if the information transfer capability is set to UDI.

3.3.11 Interrogation

Data request

The data request procedure enables the mobile subscriber to obtain information about the data stored in the PLMN. After having requested this procedure the network shall return the following information:

- in response to a general data request the served mobile subscriber should be given a list of all Basic service groups to which call forwarding on no reply is registered, including information whether it is active and if so, whether it is operative or quiescent, the associated forwarded-to numbers and the duration of the no reply timer;

- in response to a specific request concerning one particular Basic service group, the served mobile subscriber should be informed whether or not call forwarding on no reply is registered, including information whether it is active and if so, whether it is operative or quiescent for that Basic service group. If CFNRy is registered, the associated forwarded-to number and the duration of the no reply timer shall be given.

3.3.12 Charging requirements

The forwarding subscriber may be charged for the forwarded part of the call.

3.4 Exceptional procedures or unsuccessful outcome

3.4.2 Registration

If the system cannot accept a registration request, the served mobile subscriber should receive a notification that call forwarding on no reply registration was not successful. Possible causes are:

- service not subscribed to;

- forwarded-to number is invalid directory number;

- use of an operator access prefix;

- insufficient information;

- forwarded-to number is a special service code (e.g. police);

- forwarded-to number is the directory number of the mobile subscriber herself;

- conflicting situation with other supplementary services (e.g. incoming call barring has been activated);

- no basic service provisioned within the basic service group(s).

The network is not required to validate information related to the forwarded-to number.

3.4.3   Erasure

If the network cannot accept a mobile subscriber's request for erasure, cause will be returned to the subscriber, such as:

- insufficient information;

- inconsistent with registration.

If the subscriber does not completely specify which call forwarding on no reply request is to be erased, the network will reject the erasure request with appropriate cause.

If no Basic Service Code is inserted by the user, CF will be erased from all Basic Services.

3.4.4   Activation

If there is no CFNRy forwarded-to-number registered against a Basic Service group, the activation request for that Basic Service group shall be denied. However, if there is CFNRy forwarded-to-numbers stored against other Basic Service groups contained in the same activation request, these will be activated.

Examples of causes for a not accepted activation request:

- service not provisioned;

- conflicting situation with other supplementary services;

- service not registered.

3.4.5   Deactivation

If the network cannot accept a deactivation request, an appropriate cause will be returned to the user, e.g. Service not Active.

3.4.6   Invocation

Within a PLMN or different PLMNs the number of tandem forwarding connections should be limited. The maximum number of tandem forwarding connections should be limited to a value between 1 and 5. This is to prevent infinite looping.

If the limit of successive forwardings of a call is reached and an attempt is made to forward the call an additional time, then the forwarded call shall be treated as in the following paragraph.

If the forwarded call cannot be completed to the forwarded-to destination, then the network will clear the call towards the calling user with an indication that the call cannot be completed. This indication shall not include information that the call has been forwarded.

NOTE 1: The alerting of the forwarding user shall have ceased on invocation of the CFNRy Service.

NOTE 2: The alerting of the calling subscriber should, if possible, not cease on invocation of CFNRy.

NOTE 3: Call forwarding on no reply applies only to the Basic services subscribed to. Calls to a directory number requesting a Basic service which is not subscribed to will never be forwarded.

3.5 Alternate procedures

None identified.

3.6 Interactions with other supplementary services

3.6.81.1 Calling line identification presentation

See 3GPP TS 22.081.

3.6.81.2 Calling line identification restriction

See 3GPP TS 22.081.

3.6.81.3 Connected line identification presentation

See 3GPP TS 22.081.

3.6.81.4 Connected line identification restriction

See 3GPP TS 22.081.

3.6.82.1 Call forwarding unconditional

See section 1.6.82.3.

3.6.83.1 Call waiting

See 3GPP TS 22.083.

3.6.84.1 Multi party

See 3GPP TS 22.084.

3.6.85.1 Closed user group

See 3GPP TS 22.085.

3.6.86.1 Advice of charge

See 3GPP TS 22.086.

3.6.88.1 Barring of all outgoing calls

Same as the interaction between call forwarding unconditional and barring of all outgoing calls.

3.6.88.2 Barring of outgoing international calls

Same as the interaction between call forwarding on mobile subscriber busy and barring of outgoing international calls.

3.6.88.4 Barring of outgoing international calls except those directed to the home PLMN country

Same as the interaction between call forwarding on mobile subscriber busy and barring of outgoing international calls except those directed to the home PLMN country.

3.6.88.6 Barring of all incoming calls

Same as the interaction between call forwarding unconditional and barring of all incoming calls.

3.6.88.7 Barring of incoming calls when roaming outside the home PLMN country

Same as the interaction between call forwarding on mobile subscriber busy and barring of incoming calls when roaming outside the home PLMN country.

3.6.88.8 Anonymous Call Rejection

See 3GPP TS 22.088 [9].

3.7 Interworking considerations

If the forwarded-to number is not a PLMN- or ISDN-number, 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. When interworking with non-PLMN or non-ISDN networks, tones and announcements will be required.

NOTE1: The number of times a call has been forwarded once it has exited the PLMN or ISDN may not be limited.

NOTE2: Tones and/or announcements should not be provided to the calling party if the information transfer capability is set to UDI.

4 Call Forwarding on Mobile Subscriber Not Reachable

4.1 Definition

This service permits a called mobile subscriber to have the network send all incoming calls, or just those associated with a specific Basic service group, addressed to the called mobile subscriber's directory number, but which is not reachable, to another directory number. The ability of the served mobile subscriber to originate calls is principally unaffected, but practically it is affected if the mobile subscriber is de-registered, if there is radio congestion or if the mobile subscriber for example is being out of radio coverage. If this service is activated, a call is forwarded only if the mobile subscriber is not reachable.

4.2 Description

4.2.1 Description

The served mobile subscriber can request a different forwarded-to number for each Basic service group containing a basic service to which he has subscribed.

4.2.2 Applicability to telecommunication services

The applicability of this supplementary service is defined in 3GPP TS 22.004.

4.2.3   Terminology

A served mobile subscriber is a mobile subscriber of a particular PLMN access who is requesting that calls to his number be forwarded. This subscriber may also be referred to as the forwarding subscriber or the called subscriber. A forwarded-to subscriber is a subscriber to whom the call shall be forwarded.

4.3   Normal procedures with successful outcome

4.3.1   Provision

The supplementary service will be provisioned for all Basic Services subscribed to and to which it is applicable.

The service can be offered with several subscription options. Options apply to all Basic service subscribed to. For each subscription option only one value can be selected.

Subscription options	Value
Calling subscriber receives	- No
notification that the call has been forwarded	- Yes
MSISDN of the served subscriber can be	- No
presented to the forwarded-to subscriber	- Yes

4.3.2   Withdrawal

The service will be withdrawn at the subscriber's request or for administrative reasons.

4.3.3   Registration

The following information has to be registered in the network:

1)   the forwarded-to number, which may be accompanied by a forwarded-to sub-address;

2)   information as to whether all calls or all calls of one (or several) specific Basic service group(s) should be forwarded.

   If no Basic Service Code is inserted by the user this is interpreted as All Basic Services.

Registration can take place either by the service provider or with an appropriate control procedure by the subscriber.

Verification, where possible, of the forwarded-to number should be accomplished before accepting the call forwarding request. This verification is done by a simple check of the forwarded to number to see if the number is within the allowed number range.

When the mobile subscriber so registers call forwarding on mobile subscriber not reachable the network will return notification of acceptance or rejection of the request. This notification will include the forwarded-to number to which call forwarding on mobile subscriber not reachable is registered.

4.3.4   Erasure

A previous registration can be erased in either of three ways:

Firstly, the subscriber can specifically erase a previous registration with an appropriate control procedure.

Secondly, the subscriber can register information for call forwarding on mobile subscriber not reachable for the specific Basic service group to another directory number, thus causing the previous registration of call forwarding on mobile subscriber not reachable to be overridden.

Thirdly, all information is erased as a result of withdrawal of the service.

4.3.5 Activation

The user shall be allowed to activate Call Forwarding on mobile not Reachable (CFNRc) by e.g. using the MMI command described in 3GPP TS 22.030. This activation request may include information of which Basic Service Group(s) it shall apply to. If no such information is included the Activation applies to all Basic Service Groups against which CFNRc data (forwarded-to-number) is registered.

When receiving an activation request the network shall activate CFNRc for the Basic Service Groups comprised in the BS group information given by the user and against which a CFNRc forwarded-to-number is registered. The Activation(s) shall be in accordance with the rules set out in 3GPP TS 22.004.

The user shall receive a notification that CFNRc has been activated.

The supplementary service is also activated for a Basic service group as a result of registration for that Basic service group.

4.3.6 Deactivation

An active CFNRc can be deactivated in either of two ways:

- The user may deactivate CFNRc by means of an appropriate control procedure (e.g. as described in 3GPP TS 22.030). An explicit deactivation request may contain information of which Basic Service Group(s) it shall apply to. If no such information is included the Deactivation applies to all Basic Service Groups.

  When receiving a deactivation request the network shall deactivate CFNRc for the Basic Service Groups comprised in the BS group information given by the user and against which a CFNRc forwarded-to-number is registered. However, the registered information shall not be erased. The Deactivation(s) shall be in accordance with the rules set out in 3GPP TS 22.004.

  Even if there is no data stored against a particular Basic Service group comprised in deactivation request, the request shall be accepted by the network for the other Basic Service groups included in the information given by the user.

- The service is deactivated as a result of Erasure.

In the former case, and also in the latter if Erasure is user controlled, the user shall receive a notification of whether her request was accepted or rejected in accordance with the rules set out in 3GPP TS 22.004.

4.3.7 Invocation

If the supplementary service is activated for a Basic service incoming calls for the specified Basic service when the mobile subscriber is not reachable, will be forwarded by network invocation.

4.3.8 Normal operation with successful outcome

When call forwarding on mobile subscriber not reachable is active and operative, all incoming calls for the specified Basic Service(s) when the mobile subscriber is not reachable, will be forwarded without being offered to the served mobile subscriber.

The forwarded-to subscriber will receive an indication that the call has been forwarded with the cause. The cause, when available, will be the appropriate forwarding condition. Depending on the value of the served subscribers subscription option, the forwarded-to subscriber may also receive the MSISDN of the served subscriber.

When multiple forwarding occurs the reason for forwarding and the MSISDN given to the forwarded-to subscriber should relate to the last forwarding subscriber in the chain.

When call forwarding on mobile subscriber not reachable is active and operative, the ability of the served mobile subscriber to originate calls is principally not affected, but practically it is affected if the mobile subscriber is de-registered, on radio congestion or on no paging response. However, an indication that the call forwarding service is currently active and operative on a number will be given to the forwarding party each time an outgoing call is made.

As a subscription option, the served mobile subscriber can request that the calling subscriber receives a notification that the call has been forwarded.

NOTE: In case the notification is implemented using intermediate tones or announcements, the tones and/or announcements to the calling party should not be provided if the information transfer capability is set to UDI.

4.3.11 Interrogation

Data request

The data request procedure enables the mobile subscriber to obtain information about the data stored in the PLMN. After having requested this procedure the network shall return the following information:

- in response to a general data request the served mobile subscriber should be given a list of all Basic service groups to which call forwarding on mobile subscriber not reachable is registered, including information whether it is active and if so, whether it is operative or quiescent, and the associated forwarded-to numbers;

- in response to a specific request concerning one particular Basic service group, the served mobile subscriber should be informed whether or not call forwarding on mobile subscriber not reachable is registered, including information whether it is active and if so, whether it is operative or quiescent for that Basic service group. If CFNRc is registered, the associated forwarded-to number shall be given.

4.3.12 Charging requirements

The forwarding subscriber may be charged for the forwarded part of the call.

4.4 Exceptional procedures or unsuccessful outcome

4.4.2 Registration

If the system cannot accept a registration request, the served mobile subscriber should receive a notification that call forwarding on mobile subscriber not reachable registration was not successful. Possible causes are:

- service not subscribed to;

- forwarded-to number is invalid directory number;

- use of an operator access prefix;

- insufficient information;

- forwarded-to number is a special service code (e.g. police);

- forwarded-to number is the directory number of the mobile subscriber herself;

- conflicting situation with other supplementary services (e.g. incoming call barring has been activated);

- no basic service provisioned within the basic service group(s).

The network is not required to validate information related to the forwarded-to number.

4.4.3 Erasure

If the network cannot accept a mobile subscriber's request for erasure, cause will be returned to the subscriber, such as:

- insufficient information;

- inconsistent with registration.

If the subscriber does not completely specify which call forwarding on mobile subscriber not reachable request is to be erased, the network will reject the erasure request with appropriate cause.

If no Basic Service Code is inserted by the user, CF will be erased from all Basic Services.

4.4.4 Activation

If there is no CFNRc forwarded-to-number registered against a Basic Service group, the activation request for that Basic Service group shall be denied.

Examples of causes for a not accepted activation request:

- service not provisioned;

- conflicting situation with other supplementary services;

- service not registered.

4.4.5 Deactivation

If the network cannot accept a deactivation request, an appropriate cause will be returned to the user, e.g. Service not Active.

4.4.6 Invocation

Within a PLMN or different PLMNs the number of tandem forwarding connections should be limited. The maximum number of tandem forwarding connections should be limited to a value between 1 and 5. This is to prevent infinite looping.

If the limit of successive forwardings of a call has already been reached, an unsuccessful call set up indication is sent backwards.

If the forwarded call cannot be completed to the forwarded-to destination, then the network will clear the forwarded part of the call and an unsuccessful call set up indication is sent backwards.

NOTE: Call forwarding on mobile subscriber not reachable applies only to the Basic services subscribed to. Calls to a directory number requesting a Basic service which is not subscribed to will never be forwarded.

4.5 Alternate procedures

None identified.

4.6 Interactions with other supplementary services

4.6.81.1 Calling line identification presentation

See 3GPP TS 02.081.

4.6.81.2 Calling line identification restriction

See 3GPP TS 02.081.

4.6.81.3 Connected line identification presentation

See 3GPP TS 02.081.

4.6.81.4 Connected line identification restriction

See 3GPP TS 02.081.

4.6.82.1 Call forwarding unconditional

See section 1.6.82.4.

4.6.83.1 Call waiting

See 3GPP TS 22.083.

4.6.84.1 Multi party

See 3GPP TS 22.084.

4.6.85.1 Closed user group

See 3GPP TS 22.085.

4.6.86.1 Advice of charge

See 3GPP TS 22.086.

4.6.88.1 Barring of all outgoing calls

Same as the interaction between call forwarding unconditional and barring of all outgoing calls.

4.6.88.2 Barring of outgoing international calls

Same as the interaction between call forwarding on mobile subscriber busy and barring of outgoing international calls.

4.6.88.4 Barring of outgoing international calls except those directed to the home PLMN country

Same as the interaction between call forwarding on mobile subscriber busy and barring of outgoing international calls except those directed to the home PLMN country.

4.6.88.6 Barring of all incoming calls

Same as the interaction between call forwarding unconditional and barring of all incoming calls.

4.6.88.7 Barring of incoming calls when roaming outside the home PLMN country

Same as the interaction between call forwarding on mobile subscriber busy and barring of incoming calls when roaming outside the home PLMN country.

4.6.88.8 Anonymous Call Rejection

See 3GPP TS 22.088 [9].

4.7 Interworking considerations

If the forwarded-to number is not a PLMN- or ISDN-number, 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.

When interworking with non-PLMN or non-ISDN networks, tones and announcements will be required.

   NOTE 1: The number of times a call has been forwarded once it has exited the PLMN or ISDN may not be limited.

   NOTE 2: Tones and/or announcements should not be provided to the calling party if the information transfer capability is set to UDI.

Annex A (informative): Change history

								Change history			
TSG SA#	**SA Doc.**	**SA1 Doc**	**Spec**	**CR**	**Rev**	**Rel**	**Cat**	**Subject/Comment**	**Old**	**New**	**WI**
Jun 1999			02.82					Transferred to 3GPP SA1	8.0.0		
SA#04			22.082							3.0.0	
SP-05	SP-99479	S1-99629	22.082	001		R99	D	Editorial changes for alignment	3.0.0	3.0.1	Editorial changes
SP-11	SP-010052	S1-010073	22.082	002		Rel-4	B	Notification of active CFU	3.0.1	4.0.0	CPHS
SP-12	SP-010259	S1-010438	22.082	003		Rel-4	C	Clarification of CPHS CFU Indication	4.0.0	4.1.0	UICC1-CPHS
SP-15	SP-020045	S1-020457	22.082	004	-	Rel-4	F	Editorial CR to correct terms and references	4.1.0	4.2.0	CORRECT
SP-16	SP-020267	S1-021043	22.082			Rel-5		Updated from Rel-4 to Rel5	4.2.0	5.0.0	
SP-26	SP-040744	S1-040997	22.082			Rel-6		Updated from Rel-5 to Rel-6	5.0.0	6.0.0	
SP-36			22.082			Rel-7		Updated from Rel-6 to Rel-7	6.0.0	7.0.0	
SP-42	-	-				Rel-8		Updated from Rel-7 to Rel-8	7.0.0	8.0.0	
SP-46	-	-	-	-	-	-	-	Updated to Rel-9 by MCC	8.0.0	9.0.0	
2011-03	-	-	-	-	-	-	-	Update to Rel-10 version (MCC)	9.0.0	10.0.0	
SP-52	SP-110376	S1-111407	22.082	0005	-	Rel-11	B	Addition of Anonymous Call Rejection as a SS	10.0.0	11.0.0	ACR_CS
2014-10	-	-	-	-	-	-	-	Update to Rel-12 version (MCC)	11.0.0	12.0.0	
2015-12	-	-	-	-	-	-	-	Updated to Rel-13 by MCC	12.0.0	13.0.0	

History

Document history		
V13.0.0	January 2016	Publication