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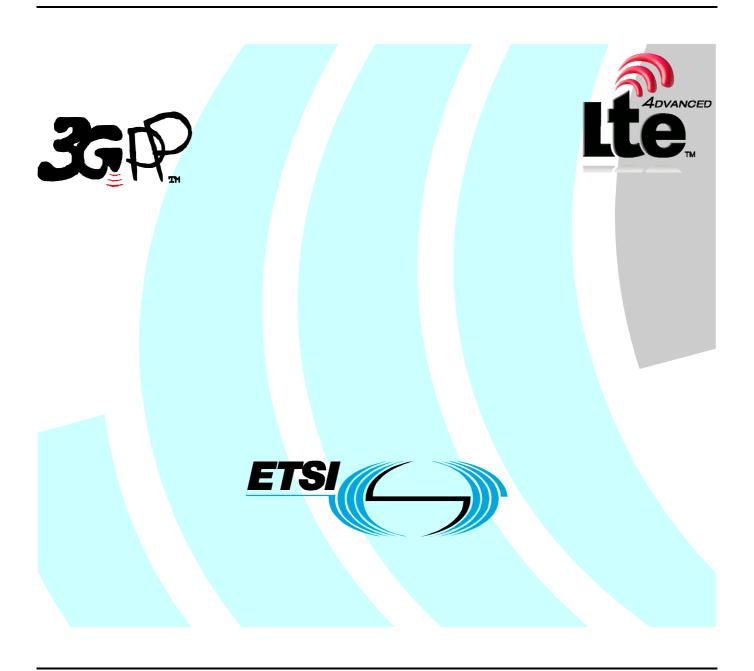
Technical Specification

Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Call Deflection (CD); Stage 1 (3GPP TS 22.072 version 10.0.0 Release 10)

Reference
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Keywords
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Foreword

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Contents

Foreword

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

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Version x.y.z

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x   the first digit:

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1 Scope

Call Deflection (CD) enables the served mobile subscriber to respond to an incoming call offered by the network by requesting redirection of this call to another number specified in the response. The CD supplementary service can only be invoked before the connection is established by the served mobile subscriber, i.e. in response to the offered call, or during the period that the served subscriber is being informed of the call. The served subscriber"s ability to originate calls is unaffected by the CD supplementary service.

2 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 21.905: "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 22.085: "Closed User Group (CUG) Supplementary Services - Stage 1

[5]   3GPP TS 22.078: "CAMEL Phase 3; Stage 1".

3 Definitions and Abbreviations

3.1 Definitions

served subscriber: The mobile subscriber to whom the CD supplementary service is provided.

subscriber A: The calling subscriber in a call which is subject to diversion. The subscriber A may be a subscriber of any network.

deflected-to subscriber: A subscriber to whom the call is redirected as a result of the CD supplementary service. The deflected-to subscriber may be a subscriber of any network.

(call) forwarding: A general term applied to any functionality whereby a call is redirected automatically by the network to another user. The forms of forwarding are: unconditional, busy, no reply and not reachable.

diversion: A general term which includes all forms of call forwarding and call deflection whereby calls are redirected by the user instead of being answered.

3.2 Abbreviations

For the purposes of this TS the following abbreviations apply, in addition, abbreviations used in this TS are listed in TR 21.905 [1].

CD   Call Deflection

4 Description

4.1 General Description

The CD Supplementary Service enables the served mobile subscriber to respond to an incoming call offered by the network by requesting redirection of this call to another number specified in the response. The CD supplementary service can only be invoked before the connection is established by the served mobile subscriber, i.e. in response to the offered call during the period that the served subscriber is being informed of the call. The served subscriber"s ability to originate calls is unaffected by the CD supplementary service.

A maximum number of diversions is permitted for each call with an upper limit of five diversions. When counting the number of diversions, all types of diversions are included. As an network operator option the maximum number of diversions shall be in the range of one to five diversions per call. If the limit of successive diversions of a call is already reached an unsuccessful call setup indication is sent backward to the network originating the call.

The invocation of Call Deflection can either be an automatic response from the mobile station to the offered call (use pre-programmed information) or may be the result of an action by the served subscriber. The mobile station related procedures to pre-program and display the deflected-to number is out of the scope of this specification.

If the CD service is provisioned and there is no service violation, the request will be accepted, the connection to the served mobile station will be released (with an appropriate notification) and a call towards the deflection-to subscriber will be established.

4.2 Applicability to telecommunication services

The applicability of this supplementary service is defined in TS 22.004 [2].

5 Normal Procedures with successful outcome

5.1 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 option:	Value
Calling subscriber receives notification that her call has been deflected	- Yes
	- No
MSISDN of the served subscriber can be presented to the deflected-to subscriber	- Yes
	- No

5.2 Withdrawal

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

5.3 Registration

Not applicable.

5.4 Erasure

Not applicable.

5.5 Activation

Within the network the service is activated for the whole subscription period. This supplementary service shall be activated by the service provider as a result of provision.

NOTE: No activation/deactivation procedure is needed at the user-network interface.

5.6 Deactivation

This supplementary service shall be deactivated by the service provider as a result of withdrawal.

5.7 Invocation

The CD supplementary service shall be invoked by the served mobile subscriber by use of a control procedure as described in TS 22.030 [3].

5.8 Interrogation

Not applicable.

5.9 Normal Operation

The network offers incoming calls to the served mobile subscriber according to the normal procedure.

The served subscriber can respond to the incoming call offered normally or by invoking the CD supplementary service with an appropriate message. This appropriate message will contain the call deflection request and the deflected-to number. This deflected-to number may be accompanied by a deflected-to subaddress.

Two different cases of the CD invocation can be distinguished:

- The invocation can be either an automatic response from the mobile station to the offered call (using pre-programmed information at the mobile station) or

- may be the result of an action by the served subscriber.

If the CD supplementary service is invoked and the served mobile subscriber has subscribed to the service, the network performs the call deflection towards the indicated deflected-to number and clears the call to the called (served) mobile subscriber with a positive acknowledgement.

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

The deflected-to subscriber shall receive an indication that the CD supplementary service has been invoked on the call, i.e. that call has been deflected. Depending on the value of the served subscribers subscription option, the deflected-to subscriber may also receive the MSISDN of the served subscriber.

When multiple diversions occurs the reason for diversion and the MSISDN given to the deflected-to subscriber should relate to the last diverting subscriber (e.g. the subscriber who has invoked the CD supplementary service).

When calls are diverted once, i.e. due to a single invocation of the CD supplementary service, the following information shall be given to subscriber A based on the value of the served mobile subscriber"s subscription option "calling subscriber receives notification that the call has been deflected":

- if the value of the subscription option is "no", then no information shall be sent to subscriber A;

- if the value of the subscription option is "yes ", then an indication that the call is being deflected shall be sent to subscriber A.

5.10 Charging requirements

The deflecting subscriber may be charged for the deflected part of the call.

6 Exceptional procedures or unsuccessful outcome

6.1 Invocation and operation

If a mobile subscriber tries to invoke the CD supplementary service while not subscribed to or the network operator cannot provide the CD supplementary service for some other reasons, an indication shall be provided to the mobile subscriber to notify her with the reason of failure.

Possible causes for rejection include:

- service not subscribed to;

- deflected-to number invalid;

- deflected-to number is barred;

- use of an operator access prefix;

- insufficient information;

- deflected-to number is a special service code (see note 1);

- deflected-to number is served mobile subscriber's number (see note 2);

- the number of diversions has reached the upper limit;

- supplementary services incompatibility;

NOTE 1: Network operators may prevent a served subscriber from invoking the CD supplementary service when the number specified for the deflected-to subscriber has special significance, e.g. emergency services, operator services. The identification of such numbers is outside the scope of this standard.

NOTE 2: The network can only check the deflected-to number against the Basic MSISDN of the served subscriber.

If the deflected call cannot be completed to the deflected-to subscriber the network shall clear the call towards the subscriber A and notify the subscriber A of the rejection.

7 Interactions with other supplementary services

7.1 Calling Line Identification Presentation (CLIP)

When a call has been deflected and the deflected-to subscriber has been provided with the CLIP supplementary service, the deflected-to subscriber shall receive the number of the subscriber A unless the CLIR supplementary service is invoked for the subscriber A.

7.2 Calling Line Identification Restriction (CLIR)

No impact, i.e. when the CLIR supplementary service is applicable and invoked for subscriber A, her line identity shall not be presented to the deflected-to subscriber unless the deflected-to subscriber has an override category.

7.3 Connected Line Identification Presentation (COLP)

If the served (deflecting) subscriber selects the option that the subscriber A is not notified of call deflection, then the subscriber A shall not receive the connected line identity when the call is answered, unless the subscriber A has override capability. Otherwise, no impact.

7.4 Connected Line Identification Restriction (COLR)

No impact.

7.5 Call Forwarding Unconditional (CFU)

No impact.

7.6 Call Forwarding on mobile subscriber Busy (CFB)

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

> NOTE: If the subscriber is not network determined user busy, then the CD supplementary service or the call forwarding on mobile subscriber busy supplementary service by indicating UDUB can be invoked, depending on the response from the served mobile subscriber.

7.7 Call Forwarding on No Reply (CFNRy)

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

> NOTE: If the network indicates the arrival of an incoming call to the served mobile subscriber, then the CD supplementary service, or the call forwarding on no reply supplementary service can be invoked, depending on the response, or lack of response, from the served mobile subscriber.

7.8 Call Forwarding on mobile subscriber Not Reachable (CFNRc)

No impact,

7.9 Call Deflection (CD)

Not applicable.

7.10 Call Waiting (CW)

When receiving the call waiting indication, the served mobile subscriber can invoke the CD supplementary service.

7.11 Call Hold (CH)

No impact

7.12 Multi-party (MPTY)

No impact

7.13 Closed User Group (CUG)

Same as the interaction between CUG and the call forwarding supplementary services as defined in TS 22.085 [4].

7.14 Advice of Charge (AoC)

No impact

> NOTE: The Advice of Charge service does not provide any information about the charge of the deflected leg of the call to the deflecting subscriber.

7.15 Barring of All Outgoing Calls (BAOC)

If the served subscriber has Barring of all outgoing calls active and operative the invocation of the CD supplementary service shall be rejected.

7.16 Barring of all Outgoing International Calls (BOIC)

If the served subscriber has barring of all outgoing international calls active and operative, any invocation of the CD supplementary service to a number not allowed by the barring program shall be rejected.

7.17 Barring of all Outgoing International Calls except those direct to the Home PLMN Country (BOIC-exHC)

If the served subscriber has barring of all outgoing international calls except those direct to the HPLMN Country active and operative, any invocation of the CD supplementary service to a number not allowed by the barring program shall be rejected.

7.18 Barring of All Incoming Calls (BAIC)

No impact.

7.19 Barring of Incoming Calls when roaming outside the home PLMN country (BIC-Roam)

No impact

7.20   Explicit Call Transfer (ECT)

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

> NOTE: Where a network supports the option to transfer a call for which the connection has been established, to a user to which the connection has not yet been established, the transferred call can be deflected if this second subscriber invokes the CD supplementary service.

7.21   Completion of Calls to Busy Subscriber (CCBS)

A recall resulting from the completion of calls to busy subscribers supplementary service shall not be deflected.

Subscriber A:

If a call to the called subscriber (served CD subscriber) is deflected (by the served CD subscriber) to another subscriber by the CD supplementary service and the deflected-to subscriber is busy, then subscriber A shall not receive any CCBS possible indication.

Served subscriber:

If the called subscriber (served CD subscriber) requests invocation of the CD supplementary service on a terminating call resulting from the completion of calls to busy subscribers supplementary service, then the CCBS call shall be deflected as a normal call.

7.22   Support of Private Numbering Plan (SPNP)

No impact, i.e. neither supplementary service shall affect the operation of the other supplementary service. The served subscriber shall be able to enter the deflected-to number according to the selected numbering plan.

7.23   Multiple Subscriber Profile (MSP)

If a subscriber is provisioned to both the MSP and the CD service, the CD service shall be provisioned on a per profile basis. If CD is provisioned in the profile used for the incoming call, the served subscriber may invoke the CD supplementary service in the normal way.

8   Interactions with Customized Applications for Mobile network Enhanced Logic (CAMEL);

The CD supplementary service shall, if invoked, take affect after the invocation of any terminating CAMEL based service. Any deflected call may cause invocation of any mobile originated CAMEL based services.

If the served subscriber is provided with a Translation Information Flag (TIF-CSI, see TS 22.078 [5]) and the VPLMN supports CAMEL phase 2, then when the CD supplementary service is invoked the network shall not check the validity of the deflected-to number and shall not apply the CD interactions with Barring of all Outgoing International Calls (BOIC) and Barring of all Outgoing International Calls except those direct to the Home PLMN Country (BOIC-exHC).

> NOTE: This behaviour may be used to deflect a call to a destination violating the BOIC or BOIC-exHC supplementary service. The HPLMN operator should take care to avoid problems that may arise because of this interaction.

9   Interworking Considerations

Non identified.

Annex A (informative):
Deviations to the ISDN service Call Deflection

1) If the call deflection request of a served subscriber is accepted and CD is invoked ISDN gives two network options:

   a) The call to the served user is retained until the network receives an indication that the deflected-to user is informed of the call.

   b) First the call is removed from the served subscriber and then the connection to the deflected-to subscriber is established.

   PLMNs only provide network option b.

2) The service CD does not provide the subscription option "the served user's ISDN number can be presented to the deflected-to user" to the served subscriber.

3) The interaction between CD and CCBS in the PLMN is different from the interaction between CD and CCBS in ISDN. The activation of the CCBS supplementary service will not be offered to the calling subscriber if the original call is deflected to a busy user. In ISDN the CCBS request applies to the original called party.

4) The handling of notifications to subscriber A in case of multiple diversion is not described in the way as ISDN this has been done. It is the intention of this service description to retain the same handling as it is used in present call forwarding implementations.

Annex B (informative):
Change history

TSG SA#	**SA Doc.**	**SA1 Doc**	**Spec**	**CR**	**Rev**	**Rel**	**Cat**	**Subject/Comment**	**Old**	**New**	**WI**
Jun 1999			GSM 02.72						7.2.0		
SA#04			22.072			R99		Transferred to 3GPP SA1		3.0.0	
SP-05	SP-99479	S1-99626	22.072	001		R99	D	Editorial changes for alignment	3.0.0	3.0.1	Editorial changes
SP-11	SP-010065	S1-010258	22.072			Rel-4		Transferred to 3GPP Release 4	3.0.1	4.0.0	
SP-16	SP-020267	S1-021043	22.072			Rel-5		Updated from Rel-4 to Rel5	4.0.0	5.0.0	
SP-26	SP-040744	S1-040997	22.072			Rel-6		Updated from Rel-5 to Rel-6	5.0.0	6.0.0	
SP-36			22.072			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	

History

Document history		
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