LIAISON STATEMENT

Title:	**Applicability of TISPAN PSTN ISDN simulation service**
From:	
Organisation:	ETSI TISPAN WG1
Approval Date:	04 March 2005
Technical Contact:	Gert Öster, LM Ericsson (gert.oster@ericsson.com) Dick Knight, BT (dick.rr.knight@bt.com)
Reply to:	Christian Julien, TISPAN TO (Christian.julien@etsi.org)
Reply by (if required):	9 May, 2005
To:	
Organisation:	3GPP SA and SA2
Contact Person:	Magnus Olsson, SA2 Chairman and David Boswarthick, ETSI SA2 TO
e-mail:	Magnus.l.olsson@ersicsson.com David.boswarthick@etsi.org

For:

Action:	**X**
Information:	

Action/Decision Requested:

ETSI TISPAN wishes to express it appreciation to TSG SA and other Groups within 3GPP for your cooperation and assistance to us on our work on the NGN, and in particular on the re-use of the 3GPP IMS for the wired line environment.
The discussions and exchange of views and information at the previous and upcoming joint workshops between 3GPP and TISPAN, as well as the exchange of views and information by ordinary communications with different 3GPP groups, have been and still is of outmost importance for us during our work in defining the NGN-IMS.

One of the main objectives for TISPAN to base TISPAN NGN IP multimedia component on the 3GPP IMS specifications of Release 6, is to enable a common base for IP Multimedia communications such that services enablers and services defined for the 3GPP IMS can be reused in a fixed network environment, to enable full service interoperability between fixed and mobile operators networks.

In addition to the IP multimedia services that are already defined or being defined for the 3GPP IMS, TISPAN has identified the need to include a Telephony service as a part of an IP multimedia service offering. Therefore TISPAN is defining a Multimedia Telephony service, including “supplementary services”, that are similar but not identical to the Telephony service provided by traditional ISDNs and PSTNs. TISPAN has named this kind of service as PSTN/ISDN simulation Services

In the same manner as TISPAN has based its IP multimedia component on the 3GPP IMS to allow the reuse of services and enablers defined for the 3GPP IMS environment, TISPAN believes that it also would be useful if the IMS Telephony service including the “supplementary services”, defined by TISPAN as PSTN/ISDN simulation Services could be applicable to other networks than TISPAN NGNs (e.g. Mobile Networks). TISPAN has begun work on specifying the stage 1 requirements for the support of Supplementary Services (see attached extract from DTS TISPAN 01 025).

In addition, TISPAN has identified that 3GPP IMS Release 6 does not fulfil all requirements for the PSTN/ISDN simulation services. It was identified that 3GPP IMS Release7 could fulfil these requirements regarding PSTN/ISDN simulation Services but the Release 7 documents are not available till the approval of TISPAN NGN Release 1. TISPAN WG3 has begun work on defining the stage 3 protocol impacts for support of individual Supplementary Services under work items 03022 to 03030, 03035 and 03036.
Action:

SA Meeting#27, Tokyo Japan SP-050161

ETSI TISPAN#05bis *05bTD228r2*

Sophia Antipolis. 28 February-4 March 2005

TISPAN would like to provide 3GPP TSG SA with the status of the work and to consider if the IMS-based Telephony service being defined by TISPAN is applicable also to mobile networks and their users.

TISPAN would also appreciate feedback on the IMS based Telephony service to ensure that the service can also work in a mobile environment.

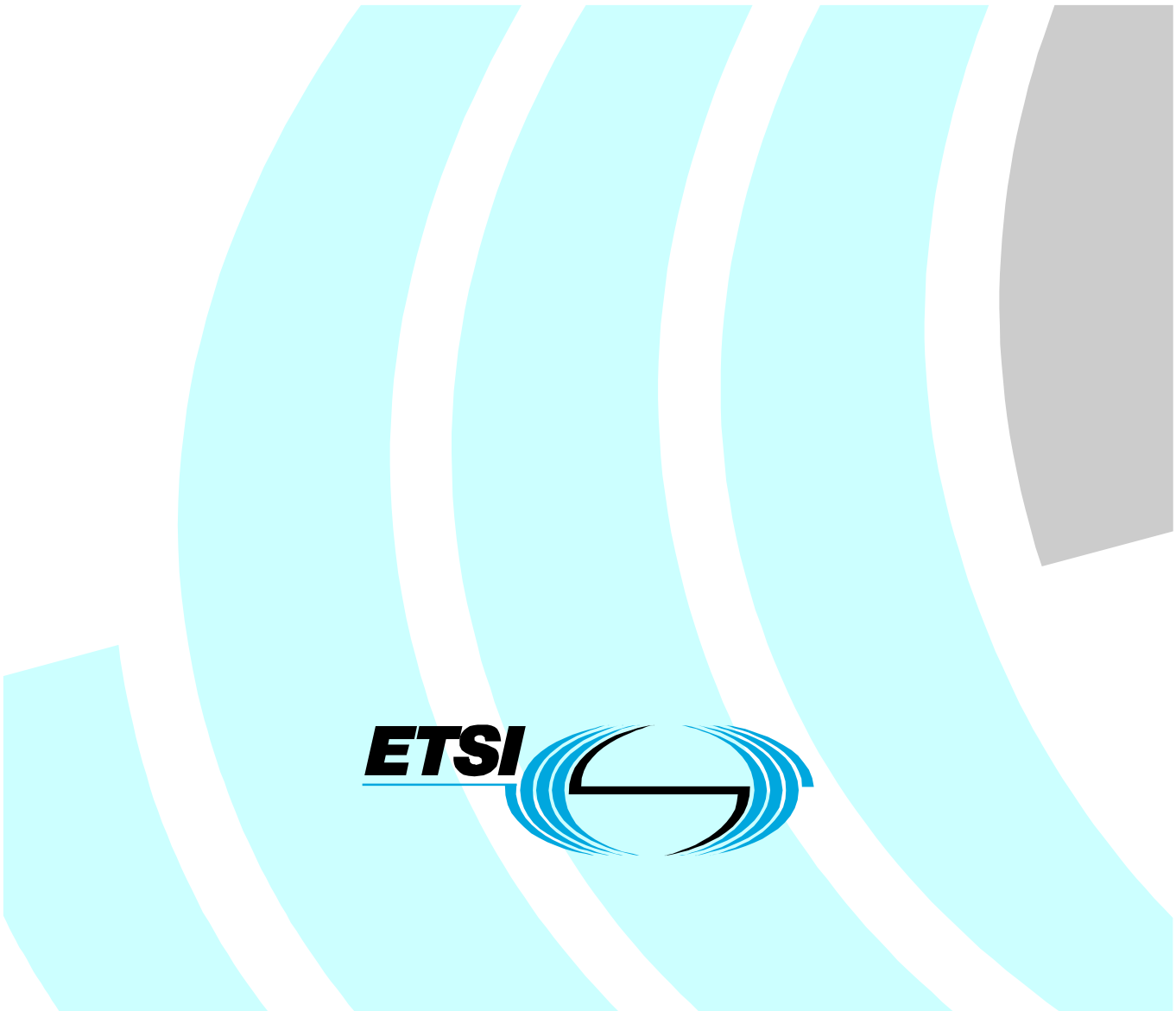
Attachments:

05bTD228a1r2 PSTN/ISDN Simulation extract from DTS TISPAN 01025-NGN, „Service and Capabilities Requirements for TISPAN NGN; Release 1”

05bTD128r3 DTS TISPAN-01002-NGN “Requirements for PSTN/ISDN simulation services”

DTS TISPAN-01002-NGN V0.1.7 (2005-0

Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); Requirements for PSTN/ISDN simulation services;



Reference
Draft ETSI DES TISPAN01-eNGN-0002

Keywords
NGN, services

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex – FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 – NAF 742 C
Association à but non lucrative enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Contents

1 Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

2 Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Telecoms & Internet converged Services & Protocols for Advanced Networks (TISPAN) WG1 NGN Services.

3 Introduction

On TISPAN NGN, two groups of services shall be considered:

- the Basic PSTN/ISDN Simulation Services (similar to Supplementary Services already provided on legacy networks),

- and the Multimedia Services (associated to new concepts as e.g. Nomadism, Profile management, Presence and Availability Management, etc).

This will allow the users to choose continuously the use of basic NGN PSTN/ISDN simulation services (accessible with basic terminals) or to use new generation services (associated to new concepts).

These two groups of services should also provide good interconnection between existing networks and NGN. This allows network operators / service providers to implement and provide step by step NGN and multimedia services to their users.

4 Scope

The purpose of the present document is to define a recommended set of basic PSTN/ISDN simulation services which will be supported by the TISPAN NGN Release 1 in connection with other networks as a basis for the definition of the network capabilities required.

This should allow to cover transition from PSTN/ISDN towards NGN. This also enables proper interconnection between the existing and coming networks.

From the user point of view, TISPAN NGN supports basic PSTN/ISDN simulation services in a manner which is transparent to the already existing PSTN/ISDN supplementary services using a TISPAN NGN PSTN/ISDN Emulation or a TISPAN NGN PSTN/ISDN Simulation.

The supplementary services provided on TISPAN PSTN/ISDN emulation access are defined in the PSTN / ISDN already existing documents. The present document concerns only simulation services provided on TISPAN simulation access.

Multimedia services (e.g. Multimedia Directory Service, Videotelephony, Multimedia Messaging, Nomadism services, Profile management using web interface, Presence and Availability Management, etc.) are out the scope of the present document and should be described in separate documents.

The described services are studied from the user point of view to make the phone services as most ergonomic as possible and to facilitate their usage. These descriptions do not take into account capabilities of the already existing protocols. If needed, evolutions inside these protocols should be foreseeing.

Some services can be implemented in the terminal or in the network. This document doesn't prescribe where they are implemented (this is service provider, network operator or subscription option).

5 References

[1] TR 101 041-1 V1.1.1 (1997-05): "Human Factors (HF); European harmonization of network generated tones; Part 1: A review and recommendations".

[2] TR 101 041-2 V1.1.1 (1997-05): "Human Factors (HF); European harmonization of network generated tones; Part 2: Listing and analysis of European, World and Standardized tones".

[3] ETS 300 738 Human Factors (HF); Minimum Man-Machine Interface (MMI) to public network based supplementary services.

[4] ETSI TR 102 083 (V1.1.1): "Human Factors (HF); Supplementary service codes for use in public network services ".

[5] ETSI EN 300 089 (V3.1.1): "Integrated Services Digital Network (ISDN); Calling Line Identification Presentation (CLIP) supplementary service; Service description".

[6] ETSI EN 300 090 (V1.2.1): "Integrated Services Digital Network (ISDN); Calling Line Identification Restriction (CLIR) supplementary service; Service description".

[7] ETSI ETS 300 200 (Edition 1): "Integrated Services Digital Network (ISDN); Call Forwarding Unconditional (CFU) supplementary service; Service description".

[8] ETSI EN 300 199 (V1.2.1): "Integrated Services Digital Network (ISDN); Call Forwarding Busy (CFB) supplementary service; Service description".

[9] ETSI EN 300 201 (V1.2.1): "Integrated Services Digital Network (ISDN); Call Forwarding No Reply (CFNR) supplementary service; Service description".

[10] ETSI ETS 300 202 (Edition 1): "Integrated Services Digital Network (ISDN); Call Deflection (CD) supplementary service; Service description".

[11] ETSI ETS 300 056 (Edition 1): "Integrated Services Digital Network (ISDN); Call Waiting (CW) supplementary service; Service description".

[12] ETSI ETS 300 139 (Edition 1): "Integrated Services Digital Network (ISDN); Call Hold (HOLD) supplementary service; Service description".

[13] ETSI ETS 300 128 (Edition 1): "Integrated Services Digital Network (ISDN); Malicious Call Identification (MCID) supplementary service; Service description".

[14] ETSI ETS 300 186 (Edition 1): "Integrated Services Digital Network (ISDN); Three-Party (3PTY) supplementary service; Service description".

[15] ETSI ETS 300 183 (Edition 1): "Integrated Services Digital Network (ISDN); Conference call, add-on (CONF) supplementary service; Service description".

[16] ETSI ETS 300 164 (Edition 1): "Integrated Services Digital Network (ISDN); Meet-Me Conference (MMC) supplementary service; Service description".

[17] ETSI EN 300 357 (V1.2.1): "Integrated Services Digital Network (ISDN); Completion of Calls to Busy Subscriber (CCBS) supplementary service; Service description".

[18] ETSI ETS 300 178 (Edition 1): "Integrated Services Digital Network (ISDN); Advice of Charge: charging information at call set-up time (AOC-S) supplementary service; Service description".

[19] ETSI ETS 300 179 (Edition 1): "Integrated Services Digital Network (ISDN); Advice of Charge: charging information during the call (AOC-D) supplementary service; Service description".

[20] ETSI ETS 300 180 (Edition 1): "Integrated Services Digital Network (ISDN); Advice of Charge: charging information at the end of the call (AOC-E) supplementary service; Service description".

[21] ETSI ETS 300 136 (Edition 1): "Integrated Services Digital Network (ISDN); Closed User Group (CUG) supplementary service; Service description".

[22] ETSI EN 300 650 (V1.2.1): "Integrated Services Digital Network (ISDN); Message Waiting Indication (MWI) supplementary service; Service description".

[23] ETSI EN 300 062: "Integrated Services Digital Network (ISDN);Direct Dialling In (DDI) supplementary service; Service Description".

[24] ETSI EN 300 367 (V1.2.1): "Integrated Services Digital Network (ISDN);Explicit Call Transfer (ECT) supplementary service; Service description".

[25] ETSI EN 301 798 (V1.1.1): "Services and Protocols for Advanced Networks (SPAN);Anonymous Call Rejection (ACR) Supplementary Service; Service description".

[26] ETSI DTR/AT-030031: "Simultaneous Voice and Text Announcements".

[27] ETS 300 648 (1997): "Public Switched Telephone Network (PSTN); Calling Line Identification Presentation (CLIP) supplementary service; Service description".

[28] EN 300 659-1 (V1.2): "Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 1: On-hook data transmission".

[29] EN 300 659-2 (V1.2): "Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 2: Off-hook data transmission".

[30] EN 300 659-3 (V1.2): "Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 3: Data link message and parameter codings".

[31] ETS 300 649 (1997): "Public Switched Telephone Network (PSTN); Calling Line Identification Restriction (CLIR) supplementary service; Service description".

[32] TS 101 818-1(2000-07): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1); Trunk Hunting (TH) supplementary service; Part 1: Protocol specification".

[33] ES 201 986 (2003-04): "Services and Protocols for Advanced Networks (SPAN); Short Message Service (SMS) for PSTN/ISDN; Service description".

[34] DES/TISPAN-01003-FMMS (2003-11): "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); Fixed Network Multimedia Messaging Service (F-MMS); Service description".

[35] DES/TISPAN-01004-FMMS (-): "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); Multimedia Messaging Services (MMS) for NGN; Service description".

[36] Draft TR 000 001: "TISPAN_NGN; Release 1: Release Definition".

[37] ETSI TR 101 480 V1.1.2: "Integrated Services Digital Network (ISDN); Public Switched Telephone Network (PSTN); Framework for the provision of calling party name information".

[38] ETSI EN 301 082 V2.1.1 (2000-07): "Integrated Services Digital Network (ISDN);Outgoing Call Barring-Fixed (OCB-F) supplementary service; Service description ".

[39] ETSI EN 301 084 V2.1.1 (2000-07): "Integrated Services Digital Network (ISDN);Outgoing Call Barring-User Controlled (OCB-UC) supplementary service; Service description ".

[40] CCITT Recommendation Q.9.

to be completed.

[41] ITU T Recommendation I.140

to be completed.

[42] ETSI TS 122 228 V6.7.0 (2005-01) "Digital cellular telecommunications system (Phase 2+);Universal Mobile Telecommunications System (UMTS);Service requirements for the Internet Protocol (IP) multimedia core network subsystem (IMS);Stage 1 (3GPP TS 22.228 version 6.7.0 Release 6) "

6 Definitions, symbols and abbreviations

6.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Address Identity: see Recommendation E.164 [yy] or/and see RFC 2806.
Contributor's note: it should be included in the WI01018 "NGN Terminology".

Asserted Identity: network generated user address information.

Contributor's note: it should be included in the WI01018 "NGN Terminology".

Busy tone: A tone informing the caller that the called party is on a busy state.

Busy state: A state where the user is already engaged in one or more connections and is not able to accept any further incoming communication.

Call: see CCITT Recommendation Q.9 [40], definition 2201.

Call establishment; connection establishment: see CCITT Recommendation Q.9 [40], definition 2207.

Call state: state as defined in subclause 2.1 of the present document, for either the user side or network side as appropriate. A communication state may exist for each communication reference value (and at the network side for each additional responding CEI in the incoming communication states).

Call waiting tone: A tone informing the user engaged on a communication, if he has subscribed to the communication waiting supplementary service, about an other incoming call.

Congestion tone: A tone informing the caller that the groups of lines or switching equipment necessary for the setting-up of the required communication or for the use of a specific service are temporarily engaged.

Connection: see CCITT Recommendation Q.9 [40], definition 0011. In the present document, the term is taken to include a bearer and its associated control signalling.

Dial tone: A tone informing that the exchange is ready to receive communication information and inviting the user to start sending communication information.

Identity information: includes all the information (RFC 2806//RFC2396/E.164) identifying a user, including asserted (network generated) and/or unasserted (user generated) addresses.
Contributor's note: it should be included in the WI01018 "NGN Terminology".

Idle: A user terminal is idle if there are no active connection, no calls on hold and no communication waiting for this terminal.

Incoming (communication): communication incoming to the user side of the interface.

Interface: see CCITT Recommendation Q.9 [40], definition 4001.

Intrusion tone: A tone during a communication informing participants in the communication that the privacy of the conversation has been breached, e.g. by intervention of an operator.

IP multimedia application: an application that handles one or more media simultaneously such as speech, audio, video and data (e.g. chat text, shared whiteboard) in a synchronised way from the user's point of view. A multimedia application may involve multiple parties, multiple connections, and the addition or deletion of resources within a single IP multimedia session. A user may invoke concurrent IP multimedia applications in an IP multimedia session.

IP multimedia service: an IP multimedia service is the user experience provided by one or more IP multimedia applications.

NGN Basic Supplementary Services: A minimum set of services that are needed to be able to interworking properly with PSTN/ISDN network users and/or users connected via PSTN/ISDN access nodes to the NGN network where services are provided".

On demand: see ITU-T Recommendation I.140 [41], annex A, clause A.2.

Outgoing (communication): communication outgoing from the user side of the interface.

PSTN/ISDN Emulation: Mimicing a PSTN/ISDN network from the point of view of a legacy terminal by an IP network, through a gateway. All PSTN/ISDN services remain available and identical (i.e. with the same ergonomics); such that end users are unaware that they are not connected to a TDM-based PSTN/ISDN.

PSTN Simulation: The provision of PSTN/ISDN-like services to advanced terminals such as IP-phones. There is no strict requirement to make all PSTN/ ISDN services available or identical, although end users expect to have access to the most popular ones, possibly with different ergonomics.

Ringing tone: A tone informing the originating party when the alerting procedure has been initiated on the destination side.

Service; telecommunication service: see ITU-T Recommendation I.112

Supplementary service: see ITU-T Recommendation I.210

Special dial tone: A tone informing that the exchange is ready to receive call information and inviting the user to start sending communication information, at the same time reminding the user that special conditions apply to the termination from which the communication is being made.

Special Information Tone (SIT): A tone informing the caller that the called number cannot be reached for reasons other than "user busy" or "congestion". The tone may also be used in conjunction with recorded announcements to signify that what the caller is about to hear is a recording. It should always be used to precede all call failure announcements.

Supplementary service: A supplementary service modifies or supplements a basic Telecommunication service.

Voice session: Existing voice connection between two terminal equipments e.g. via RTP.

6.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AoCC	Advice of Charge (Charging)
AoCI	Advice of Charge (Information)
CB	Communication session Barring
CCBS	Completion of Communication sessions to Busy Subscriber.
CD	Communication session Deflection
CFB	Communication session Forwarding Busy
CFNRd	Communication session Forwarding Not Registered
CFNL	Communication session Forwarding on No Logged-in
CFNRy	Communication session Forwarding No Reply
CFU	Communication session Forwarding Unconditional
CN	Core Network
TIP	Terminating IdentificationTerminating Identification Presentation
TIR	Terminating IdentificationTerminating Identification Restriction
CONF	**Conference**
CS	Circuit Switched
CUG	Closed User Group
CW	Communication session Waiting
DDI	Direct Dialling In
ECT	Explicit Communication session Transfer
FM	Follow Me
HOLD	Communication session Hold
IIFC	Inhibition of Incoming Forwarded Calls
IM	IP Multimedia
IMS	IP Multimedia Subsystem
IP	Internet Protocol
ISDN	Integrated Service Data Network
MCID	Malicious Call Identification
MPTY	MultiParty
MMS	Multimedia Messaging Service
MPTY	Multi Party Service
NGN	Next Generation Network
OIP	Originating Identification Presentation
OIR	Originating Identification Presentation Restriction
PLMN	Public Land Mobile Network
PSTN	Public Switch Telephone Network
QoS	Quality of Service
SIP	Session Initiation Protocol
SMS	Short Message Service
TH	Trunk Hunting
UE	User Equipment
UUS	User-to-User Signalling
VHE	Virtual Home Environment

7 Concepts associated with Supplementary Services

Note: service codes are described in document [3].

7.1 Provision

An action taken by a service provider to make a service available to a user. Provision may be general (where the service is made available to all users without prior arrangement with the service provider) or prearranged (where the service is made available to specific users only after prior arrangements are made with the service provider).

7.2 Withdrawal

An action taken by a service provider to make a service unavailable to a user. Withdrawal may be general (where the service is removed from all users previously provided with the service) or specific (where the service is removed from individual users previously provided with the service).

7.3 Registration

An action taken by a user or by a service provider to store specific data necessary to enable subsequent operation of a service. For example, the "forwarding-to number" in the Communication Forwarding Unconditional service.

This registration should not be confused with the registration for address binding described in RFC 3261.

7.4 Erasure

A previous registration of a particular service can be deleted by the network operator, service provider or the user.

7.5 Activation

An action taken by a user or by a service provider to change the state of a service from inactive to active. For example, to activate (switch on) communication waiting enables the communication waiting indication and service to be invoked by the service provider whenever a communication is presented to a busy terminal.

7.6 Deactivation

An action taken by a user or by a service provider to change the status of a service from active to inactive. For example, to deactivate (switch off) communication waiting means the communication waiting indication and service will not be invoked by the service provider whenever a communication is presented to a busy terminal.

7.7 Invocation

An action taken by a user or by a service provider to execute a specific service function within real time. For example, by a service provider forwarding an incoming communication for a user who has activated the communication forwarding service and registered a forwarding-to number; by a user invoking an active communication transfer service when the two current communication s are in the relevant states ; or by a user, on a per communication basis, to invoke (i.e. temporarily activate) a supplementary service, e.g. to switch on OIR and allow the restriction of Originating Identification information for the current communication, although Originating Identification Restriction is NOT normally active.

7.8 Normal operation with successful outcome

Description of the normal operation of the service, the normal served user's actions and the system response. Decision points, timing and communication progress signals would be some of the aspects defined for the service if they can be perceived by the user.

7.9 Interrogation

An action taken by a user to request information from a service provider relating to a particular service. For the purposes of this ETS, the interrogation function shall include Status Check, Data Request and enable Data Check.

7.10 Exceptional operation or unsuccessful outcome

Abnormal situations not described in "normal operation with successful outcome". Procedures on time-out, unexpected signalling response and other such events would be defined.

7.11 Interaction with other PSTN/ISDN simulation services

This section would identify and define the resolution of such situations as they affect user perception of the service. Special procedures may therefore be required, e.g. to allow, where possible, the simultaneous use of different supplementary services by one user.

8 Use of a password option in relation to Supplementary Services

8.1 Definition

Some Supplementary Services (e.g. Communication Session Barring) can be offered to a user with the subscription option of using a password to control the service. When this option is selected, every action (related to that Supplementary Service), such as registration, erasure, activation or deactivation is performed by the user with the concurrent entry of the password.

8.2 Description

When the subscription option "Control of a Supplementary Service by the user using a password" is provided, password handling is supported by the network.

The password shall consist of four digits in the range of 0000 to 9999. The default password should be “0000”.

8.3 Management – normal procedures and successful outcome

8.3.1 Provision of password option

Each Supplementary Service which requires a password by the user to control this service may be offered with the subscription option "Control of the Supplementary Service". The values of this option will be:

- by the user using a password;
- by the service provider.

NOTE: A service provider needs not to offer this option to its users. However, the support of the password facility is mandatory in the networks for visiting users.

8.3.2 Withdrawal of the password option

The password option may be withdrawn for administrative reasons or due to subscription modification.

8.3.3 Registration of password

If a user selects at provision time the option of using a password for any given Supplementary Service, the password have to be registered at the same time.

Furthermore, the user can change the password by an appropriate control procedure at any time.

8.3.4 Erasure of password

A password can be erased in two ways:

1) Registration of a new password erases the previous one; or

2) Withdrawal of the password option.

8.3.5 Password checking

If the user in an attempt to control a Supplementary Service requiring a password enters a correct password, the corresponding request is then executed by the network.

8.4 Management – exceptional procedures or unsuccessful outcome

If the user in an attempt to control a Supplementary Service requiring a password, or in an attempt to register a new password, enters an incorrect password, the corresponding request will be rejected by the network and the user will be notified.

If the user enters incorrect password more than three consecutive times, all control procedures related to the use of the password are made impossible until the service provider instructs the network to accept password-related requests from this user again.

9 Basic functions for NGN

This part describes basic functions, which should be taken into account in any NGN phone services. Some functions are not provided in the already existing PSTN/ISDN but allow to provide a better ergonomics and should be provided in any new service description.

9.1 Mandatory functions

9.1.1 Log in / log out

The procedure "Log in" corresponds to be registered in the network as being able to receive and initiate communications.

Note 1: It is important for the user to know if his/her terminal is well registered in the network, otherwise, no communication will be presented. Thus, when the terminal is registered in the network, a visual information on the terminal should confirm the state of the registration.

Note 2: If terminal is not connected (logged in), in order not to lose incoming communication s, the service "Communication Forwarding Not Registered" shall be automatically activated, if the user has been subscribed to.

Note 3: the list of services provided during a not logged in mode has to be defined.

9.1.2 Communication progress and related information

Indications of communication progress, such as ringing, engaged, unobtainable, may in principle be verbal message, tones, displayed text or graphical symbols. Which combination of these applies may depend on the message or the network operator. However, verbal announcements will generally be reserved for situations which are peculiar, where users may be unfamiliar with any tone chosen to indicate special conditions.

It may also be desirable to add comfort indications (e.g. tones, noise, music, clicks) while a communication is being connected, since silence may cause an unfamiliar user to believe that nothing is happening.

A tone allows the user to understand immediately (within 2 seconds) the message: busy state, ringing state, etc. Thus, these tones are very useful and it is not desirable to replace them by vocal messages because they need a longer time to be provided and understood.

Another advantage of these tones is to be understood independently of the language. This point leads naturally to adopt the ETSI recommendations concerning the tone characteristics. See [1] and [2].

It is also desirable to confirm the meaning of these tones by a written text on the screen of the terminal.

The most important tones are:

- Dial tone,
- Ringing tone,
- Busy tone,
- Release tone,
- Communication session waiting tone,
- Message Waiting tone,
- Special information tone,
- Special dial tone,
- Congestion tone,
- Intrusion tone,
- Off-Hook warning tone.

The complete list is available in [2].

9.1.3 Simple server / Answering machine

Many problems appear during communication s between servers. For example, during the communication of a server delivering a SMS message in a text-to-speech mode on an answering machine, it is essential to be able to prop up both systems to begin the liberation of the vocal message with the beginning of the recording.

It is thus necessary that during a communication, the server of origin of the communication identifies itself (as simple server or answering machine), also for the server which answers the communication (simple server or answering machine). It is also necessary to provide means to discover the beginning of a recording on an answering machine.

This information is also very useful in some service interactions and should allow providing the best behaviour in these cases.

9.1.4 Outgoing communications

9.1.4.1 Anonymous communication session

An Anonymous communication session is given when a user receiving a communication session cannot identify the originating user.

Anonymous communication sessions shall be supported in an NGN either in a permanent mode or in a temporary mode communication by call.

In this case the originating party identity shall not be presented to the destination party. The network to which the destination party is connected to is responsible to handle this service.

Nevertheless, in some specific cases where the destination party has an override right (e.g. emergency communication sessions), the originating party identity is provided to the destination party independent whether or not this communication session is anonymous.

With regard to anonymous communication session definition for NGN several levels are to be considered:

1. A communication session where the identity information is restricted
2. A communication session where the identity information cannot be delivered to the destination party

9.1.5 Incoming communications

9.1.5.1 Busy state

Some services, e.g. communication forwarding busy, are only relevant during the busy state.

However, from the user point of view, it is not possible to answer simultaneously dozens of communications. The ease and the possibility of accepting a new communication depends also on the type of terminal used. If the terminal possesses a big screen, it is much easier to switch from one communication to the other one and the screen can confirm the identity of the connected interlocutor. On a telephone without screen, the management of more than three communications becomes difficult.

It is thus necessary to define a value beyond which, any new communication presentation will be answered in busy state. This value can depend on the service or the capabilities of the used terminal.

NOTE: When the terminal is off-hook but not in communication (for example badly hung up), all incoming communications should be presented and associated to the ringing signal.

9.2 Optional functions

9.2.1 Audio / Visual information

To facilitate the use of services, the Voice / Data association should always be privileged.

Source Reference: DTR/AT-030031 [26]

It allows to reach a server by using only the vocal messages (thus, all the necessary information must be audible) or only in data mode written on the screen (thus, all the necessary information must be posted (shown) on the screen) or both.

This requires that any vocal message from the network (e.g.: acknowledgement after a service command, a consultation of a network messaging, etc.) should be associated to a text displayed on the screen of the terminal.

The audio/visual coupling brings an unmistakable comfort and allows the user to use the means of its choice according to the context: the data mode will be preferred in a noisy environment and the vocal mode will be useful if we do not wish to stay in front of the terminal screen.

The combination of these two modes allows, using the same service, to solve the problems with visually-impaired and hard of hearing people.

9.2.2 Terminal capabilities

The terminal should answer to an incoming communication with its screen capabilities.

This function should allow the network to adapt the contents of the transmitted information: a terminal possessing a small screen of some lines would then not receive so much information as a terminal having for example a large computer screen.

9.2.3 Status user state

It is useful to indicate the state of the user state, notably the activated state of those services which can lead to lose communications, as, for example, the CFU where no communication is presented.

Generally speaking any "not usual" state of a service should be indicated on the terminal: CFU activated, CW deactivated, OIR in permanent mode activated, ...

In case of services which can be controlled from another terminal or even remote controlled by a server, the terminal should receive this information from the network.

10 Basic PSTN/ISDN simulation services

This part describes basic functions, which should be taken into account in any NGN phone services. Some functions are not provided as services on the already existing PSTN/ISDN but allow to provide better ergonomics to the services.

Services have been split into 3 lists:

Mandatory services: services shall be provided according regulation concerning the processing of personal data and the protection of privacy in the electronic communications sector.

Strictly recommended services: services that should be provided by any services providers.

Optional services: other services

10.1 Mandatory services

10.1.1 Originating Identification Presentation (OIP)

10.1.1.1 Definition

The OIP simulation service provides the destination party with the possibility of receiving asserted identity information in order to identify the originating party.
In addition to the asserted identity information, the Originating Identity may include address identity information generated by the originating user and transparently transported by the network. The network cannot be responsible for the content of this user generated identity information.

The network shall deliver the Originating Identity to the destination party during communication session establishment, regardless of the terminal capability to handle the information.

Source Reference: ETS 300 089-1
ETS 300 648 [27]

10.1.1.2 Service interactions with other PSTN/ISDN simulation services (NGN)

10.1.1.2.1 Identification services

10.1.1.2.1.1 Originating Identification presentation

Not applicable.

10.1.1.2.1.2 Originating identification restriction

The OIR simulation service shall normally take precedence over the OIP simulation service.

The OIP simulation service can take precedence over the OIR simulation service when the destination user has an override right. This is a national matter, and is outside the scope of this document.

10.1.1.2.2 Diversion services

10.1.1.2.2.1 Communication forwarding unconditional

When a communication has been forwarded and the forwarded-to user has been provided with the OIP simulation service, the forwarded-to user shall receive the address of the original originating user, if this originating user has not subscribed to or invoked the OIR simulation service.

10.1.1.2.2.2 Communication forwarding busy

When a communication has been forwarded and the forwarded-to user has been provided with the OIP simulation service, the forwarded-to user shall receive the address of the original originating user, if this originating user has not subscribed to or invoked the OIR simulation service.

10.1.1.2.2.3 Communication forwarding no reply

When a communication has been forwarded and the forwarded-to user has been provided with the OIP simulation service, the forwarded-to user shall receive the address of the original originating user, if this originating user has not subscribed to or invoked the OIR simulation service.

10.1.1.2.2.4 Communication forwarding on Not Logged-In

When a communication has been forwarded and the forwarded-to user has been provided with the OIP simulation service, the forwarded-to user shall receive the address of the original originating user, if this originating user has not subscribed to or invoked the OIR simulation service.

10.1.1.2.2.5 Communication deflection

When a communication has been deflected and the deflected-to user has been provided with the OIP simulation service, the deflected-to user shall receive the number of the original originating user, if this originating user has not subscribed to or invoked the OIR simulation service.

Contributor's Note*: It depends how the communication diversion is defined, the interaction should be rewritten.*

10.1.1.3 Interoperability with PSTN/ISDN Networks

The Originating Identity information shall be conveyed from an NGN to a PSTN/ISDN and vice-versa.

To be completed.

10.1.2 Originating Identification Restriction (OIR)

10.1.2.1 Definition

The Originating Identification Restriction (OIR) simulation service enables the originating party to prevent presentation of its identity information to the destination party.

Source Reference: EN 300 090 [6]
ETS 300 649 [31]

10.1.2.2 Service interactions with other PSTN/ISDN simulation services (NGN)

10.1.2.2.1 Number identification services

10.1.2.2.1.1 Originating identification presentation

The OIR simulation service shall normally take precedence over the OIP simulation service.

The OIP simulation service can take precedence over the OIR simulation service when the destination user has an override right. This is a national matter, ands is outside the scope of the present document.

10.1.2.2.1.2 Originating identification restriction

Not applicable.

10.1.2.2.2 Diversion services

10.1.2.2.2.1 Communication forwarding unconditional

When the OIR simulation service has been invoked, the originating party's address shall not be presented to the forwarded-to user unless the forwarded-to user has an override right.

10.1.2.2.2.2 Communication forwarding busy

When the OIR simulation service has been invoked, the originating party's address shall not be presented to the forwarded-to user unless the forwarded-to user has an override right.

10.1.2.2.2.3 Communication forwarding no reply

When the OIR simulation service has been invoked, the originating party's address shall not be presented to the forwarded-to user unless the forwarded-to user has an override right.

10.1.2.2.2.4 Communication forwarding on No Logged-in (CFNL)

When the OIR simulation service has been invoked, the originating party's address shall not be presented to the forwarded-to user unless the forwarded-to user has an override right.

10.1.2.2.2.5 Communication deflection

When the OIR simulation service has been invoked, the originating party's address shall not be presented to the deflected-to user unless the deflected-to user has an override right.

Contributor's Note*: It depends how the communication diversion is defined, the interaction should be rewritten.*

10.1.2.3 Interoperability with PSTN/ISDN Networks

The Originating Identity Restriction information shall be conveyed from an NGN to a PSTN/ISDN and vice-versa. The network to which the called party is connected to is responsible to handle this service.

Contributors Note: where should we provide this issue??: "OI should be mapped with CLI"
To be Completed

10.1.3 Terminating Identification Presentation (TIP)

10.1.3.1 Definition

The TIP simulation service provides the originating party with the possibility of receiving asserted information in order to identify the connected party.

In addition to the asserted identity information, the Connected Identity may include address information generated by the connected user and transparently transported by the network. The network cannot be responsible for the content of this user generated address information.

The network shall deliver the Connected Identity to the originating party on *communication* acceptance regardless of the terminal capability to handle the information.

Source Reference: ETS 300 094

10.1.3.2 Service interactions with other ISDN/PSTN simulation services (NGN)

10.1.3.2.1 Number identification services

10.1.3.2.1.1 Terminating Identification presentation (TIP)

Not applicable.

10.1.3.2.1.2 8.5.4 Terminating Identification presentation restriction (TIR)

The TIR simulation service shall normally take precedence over the TIP simulation service. The TIP simulation service can take precedence over the TIR simulation service when the originating user has an override right.

10.1.3.2.2 Conference simulation service

Conference controller: no impact, i.e. neither simulation service shall affect the operation of the other simulation service.

Conferees: conferees shall not receive the TIP simulation service information of parties being added to the conference.

10.1.3.2.3 Diversion services

If the served (forwarding/deflecting) user selects the option that the originating user is not notified of *communication* diversion, then the originating user shall receive no diversion notification. In addition, the originating user shall not receive the connected user's identity when the communication is answered, unless the originating user has override capability.

If the served (forwarding/deflecting) user selects the option that the originating user is notified, but without the diverted-to address, then the originating user shall not receive the connected user's identity when the communication is answered, unless the originating user has override capability.

10.1.3.3 Interoperability with PSTN/ISDN Networks

To be completed

10.1.4 Terminating Identification Presentation Restriction (TIR)

10.1.4.1 Definition

The COPR is a simulation service offered to the connected party enables the connected party to prevent presentation of the connected identity information to originating party.

Source Reference: ETS 300 095

10.1.4.2 Service interactions with other PSTN/ISDN simulation services (NGN)

10.1.4.2.1 Number identification services

10.1.4.2.1.1 Terminating Identification presentation

The TIR simulation service shall normally take precedence over the TIP simulation service.

The TIP simulation service can take precedence over the TIR simulation service when the originating user has an override right.

10.1.4.2.1.2 Terminating Identification presentation restriction

Not applicable.

10.1.4.2.2 Communication diversion

If a diverted-to user subscribes to the TIR simulation service "permanent mode", then the diverted-to user's number shall not be provided with the notification that the communication has been diverted.

If a diverted-to user subscribes to the TIR simulation service "temporary mode", then the diverted-to user's number shall not be provided until negotiation with the user has taken place and a positive indication from the user has been received.

In each of the above situations, a originating user that subscribes to the TIP simulation service and who has override capability will not receive the diverted-to user's number as part of the diverting notification information, but can use the override capability in order to receive the connected identity when the communication is answered.

10.1.4.3 Interoperability with PSTN/ISDN Networks

To be completed

10.1.5 Malicious Communication Identification (MCID)

10.1.5.1 Definition

The MCID simulation service enables an incoming communication to be identified and registered. The following communication information shall be registered:
- Destination Party Identity Information;
- Originating Party Identity Information;
- local time and date of the invocation in the network serving the called user;

The information shall not be available to the terminal equipment under the control of the called user nor the originating user. The information shall be stored at a location(s) under the control of the network operator.

The MCID simulation service can either be invoked during a period of time after the alerting phase, during the active phase of the communication, or after the active phase for a limited period.

Source Reference: ETS 300 128 [13]

10.1.5.2 Service interactions with other PSTN/ISDN simulation services (NGN)

10.1.5.2.1 Diversion Services

The MCID simulation service can be invoked for a diverted communication. In addition to the normal operation of the MCID simulation service, the identity of the first diverting user shall be registered and, as a network option, the last diverting user can be registered.

10.1.5.2.1.1 Communication forwarding unconditional (CFU)

If the served user has activated CFU, once forwarding has taken place, the forwarding user cannot invoke the MCID simulation service.

10.1.5.2.1.2 Communication forwarding busy (CFB)

If the served user has activated CFB, once forwarding has taken place, the forwarding user cannot invoke the MCID simulation service.

10.1.5.2.1.3 Communication forwarding no replay (CFNR)

If the served user has activated CFNR, once forwarding has taken place, the forwarding user (served user) cannot invoke the MCID simulation service.

The MCID simulation service shall not be automatically invoked when an alerting communication is terminated due to the invocation of the communication forwarding no reply simulation service.

10.1.5.2.1.4 Communication forwarding Not Logged-in (CFNL)

If the served user has activated CFNL, once forwarding has taken place, the forwarding user (served user) cannot invoke the MCID simulation service even after a log-in procedure.

The MCID simulation service shall not be automatically invoked when an alerting communication is terminated due to the invocation of the communication forwarding not logged in simulation service.

10.1.5.2.1.5 Communication Deflection

If the served user has activated communication deflection, once deflection has taken place, the deflecting user cannot invoke the MCID simulation service.

The MCID simulation service shall not be automatically invoked when an alerting communication is terminated due to the invocation of the communication deflection simulation service.

Contributor's Note*: It depends how the communication diversion is defined, the interaction should be rewritten.*

10.1.5.3 Interoperability with PSTN/ISDN Networks

The MCID service shall be possible for communication s from a PSTN/ISDN to an NGN and vice-versa. The registered information shall be stored in the served user's network and may be stored in the network of the originating party, too.

To be completed

10.1.6 Anonymous Communication Rejection (ACR)

10.1.6.1 Definition

The Anonymous Communications Rejection (ACR) simulation service allows the served user to reject incoming communication s from users or subscribers who have restricted the presentation of their originating identity according to the OIR simulation service [xx].

ACR will reject all communication s with CLI marked "presentation restricted" according to OIR. The communications are rejected regardless of the current state (e.g. free or busy) of the served user's access. The ACR simulation service shall not reject communications with an OIR marked "presentation restricted by network". The served user's ability to originate communication s is unaffected by the ACR simulation service.

Note: the definition of "presentation restricted" and " presentation restricted by network" is an open issue.

The originating user shall be given an appropriate indication that the communication has been rejected due to the application of the ACR simulation service.

10.1.6.2 Service interactions with other PSTN/ISDN simulation services (NGN)

10.1.6.2.1 Communication Waiting

If the called user has activated the ACR simulation service, then the ACR simulation service shall take precedence over the Communication Waiting simulation service. The ACR simulation service can be activated while a communication is waiting without changing the state of the waiting communication session.

10.1.6.2.2 Number Identification Services

10.1.6.2.2.1 Originating identification presentation

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

If the called user has subscribed to the override right according to the OIP simulation service, then the ACR simulation service shall not apply.

10.1.6.2.2.2 Originating identification restriction

If the called user has activated the ACR simulation service, then the OIR simulation service causes the execution of the ACR simulation service in accordance with the procedures in subclause 10.1.5.2.

10.1.6.2.3 Closed user group

If the called user has activated the ACR simulation service, then if a closed user group communication is offered to the called user, the closed user group simulation service shall take precedence over the ACR simulation service. If the called user also has the incoming access capability within the closed user group simulation service, and if the offered communication to the called user is a non-closed user group communication, the ACR simulation service shall take precedence over the closed user group simulation service.

10.1.6.2.4 Completion of communications

10.1.6.2.4.1 Completion of communications to busy subscriber

NOTE 1: A CCBS recall (from the network to the originating user) resulting from the completion of communications to busy subscribers shall not be rejected due to the application of the ACR simulation service.

Assume the originating user connects to the called user and the called user activates the ACR simulation service (or has activated the ACR simulation service):

a) The ACR simulation service was activated by the called user before the originating user originates a communication**:**

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

NOTE 2: If the originating subscriber has restricted its OI due to the OIR simulation service and if the called user is busy, the originating user will receive no busy indication, and the completion of communications to busy subscriber simulation service will not apply. Instead the communication session attempt shall be rejected according to the normal procedures of the ACR simulation service.

b) The ACR simulation service is activated by the called user after the originating user has activated the completion of communication**s to busy subscriber simulation service on the called user:**

If the called user activates the ACR simulation service after the originating user has activated the completion of communications to busy subscriber simulation service on the called user, then the communication resulting from the completion of communications to busy subscriber simulation service shall be rejected if the originating subscriber has restricted its CLI due to the OIR simulation service.

10.1.6.2.4.2 Completion of communications on no reply

NOTE: A CCNR recall (from the network to the originating user) resulting from the completion of communications on no reply shall not be rejected due to the application of the ACR simulation service.

a) The ACR simulation service was activated by the called user before the originating user originates a communication**:**

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

b) The ACR simulation service is activated by the called user after the originating user has activated the completion of communication**s on no reply simulation service on the called user:**

If the called user activates the ACR **simulation** service after the **originating** user has activated the completion of communications on no reply **simulation** service on the called user, then the communication resulting from the completion of communications on no reply **simulation** service shall be rejected if the **originating** subscriber has restricted its OI due to the OIR **simulation** service.

10.1.6.2.5 Communication Diversion services

NOTE: The precedence that ACR takes over the communication diversion services does not exclude the usage of forwarding functionality in the ACR functionality itself. As an example: forwarding of anonymous communications (e.g. to a voice mailbox), as part of the ACR functionality is possible.

If the diverted-to user has activated the ACR **simulation** service, then the ACR **simulation** service shall take precedence over the communication diversion **simulation** service i.e. the communication shall be rejected according to the ACR **simulation** service.

10.1.6.2.5.1 Communication forwarding unconditional

If the served (forwarding) user has activated the ACR **simulation** service, then the ACR **simulation** service shall take precedence over the communication forwarding unconditional **simulation** service i.e. the communication shall be rejected according to the ACR **simulation** service.

10.1.6.2.5.2 Communication forwarding busy

If the served (forwarding) user has activated the ACR **simulation** service, then the ACR **simulation** service shall take precedence over the communication forwarding busy supplementary service i.e. the communication shall be rejected according to the ACR simulation service.

10.1.6.2.5.3 Communication forwarding no reply

If the served (forwarding) user has activated the ACR simulation service:

- no impact, i.e. neither simulation service shall affect the operation of the other simulation service.

NOTE: If the **originating** subscriber has restricted its OI due to the OIR simulation service the communication will not be presented.

Contributor's Note*: It depends how the communication diversion is defined, the interaction should be rewritten.*

10.1.6.2.6 Incoming Communication Session Barring

The ICB takes precedence over ACR. ICB shall operate normally on communications with active ACR. In particular, ICB shall continue to bar communications irrespective of CLI status.

10.1.6.3 Interoperability with PSTN/ISDN

To be completed

10.2 Strictly recommended services

10.2.1 Communication Diversion

10.2.1.1 Definition

The service description of the following Communication Services CFU, CFB, CFNR and CD are based on the PSTN/ISDN Simulation Services.

Generally the following requirements should be fulfilled:

- It shall be possible for the user or the network to identify an alternative destination for an IP multimedia session or individual media of an IP multimedia session.
- It shall be possible for redirection to be initiated at various stages of an IP Multimedia session. For example:
    - Prior to the set up of an IP Multimedia session,
    - During the initial request for an IP Multimedia session (CFU),
    - During the establishment of an IP Multimedia session (CD),
    - While the IP Multimedia session is ongoing (CD advanced).
- Redirection can be applied for all Multimedia sessions unconditionally or it can be caused by any of a set list of events or conditions. Typical causes could be:
    - Identity of the originating user,
    - Location or presence of the originating or destination party,
    - If the destination party is already in a session (CFB),
    - If the destination party is unreachable or unavailable in some other way (CFNL; CFNR),
    - If the destination party does not respond (CFNR),
    - After a specified alerting interval (CFNR),
    - User’s preference on routing for specific IP Multimedia session based on the capabilities of multiple UEs sharing the same IMS service subscription.
- It shall be possible a user who receives diverted communications can restrict this communication due to the fact that this communication was diverted.
- The sending party, receiving party or the network on their behalf, may initiate redirection to alternative destinations.

The following services describe applications based on a subset of the above-mentioned requirements to provide user different possibilities to divert a communication. The services will be extended due to the possibility

Communication Forwarding Unconditional (CFU)
The CFU service enables a served user to have the network redirect to another user communications which are addressed to the served user’s address. The CFU service may operate on all communication, or just those associated with specified services. The served user's ability to originate communications is unaffected by the CFU simulation service. After the CFU service has been activated, communications are forwarded independent of the status of the served user.

As a service provider option, a subscription option can be provided to enable the served user to receive an indication that the CFU service has been activated. This indication shall be provided when the served user originates a communication if the CFU service has been activated for the served user's address and for the service requested for the communication.

The maximum number of diversions permitted for each communication is a service provider option. The service provider shall define the upper limit of diversions. When counting the number of diversions, all types of diversion are included.

Source Reference: ETS 300 200 [7]

Communication Forwarding on Busy user (CFB)

The CFB service enables a served user to have the network redirect to another user communications which are addressed to the served user's address and meet busy. The CFB service may operate on all communications, or just those associated with specified services. The served user's ability to originate communications is unaffected by the CFB simulation service.

As a service provider option, a subscription option can be provided to enable the served user to receive an indication that the CFB service has been activated. This indication shall be provided when the served user originates a communication if the CFB service has been activated for the served user's address and for the service requested for the communication.

The maximum number of diversions permitted for each communication is a service provider option. The service provider shall define the upper limit of diversions. When counting the number of diversions, all types of diversion are included.

Source Reference: EN 300 199 [8]

Communication Forwarding on no Reply (CFNR)

The CFNR service enables a served user to have the network redirect to another user communications which are addressed to the served user's address, and for which the connection is not established within a defined period of time. The CFNR service may operate on all communications, or just those associated with specified services. The served user's ability to originate communications is unaffected by the CFNR simulation service.

The CFNR service can only be invoked by the network after the communication has been offered to the served user and an indication that the called user is being informed of the communication has been received.

As a service provider option, a subscription option can be provided to enable the served user to receive an indication that the CFNR service has been activated. This indication shall be provided when the served user originates a communication if the CFNR service has been activated for the served user's address and for the service requested for the communication.

The maximum number of diversions permitted for each communication is a service provider option. The service provider shall define the upper limit of diversions. When counting the number of diversions, all types of diversion are included.

Source Reference: EN 300 201 [9]

Communication Deflection (CD)

The CD service enables the served user to respond to an incoming communication by requesting redirection of that communication to another user. The CD service can only be invoked before the connection is established by the served user, i.e. in response to the offered communication, or during the period that the served user is being informed of the communication. The served user's ability to originate communications is unaffected by the CD simulation service.

The maximum number of diversions permitted for each communication is a service provider option. The service provider shall define the upper limit of diversions. When counting the number of diversions, all types of diversion are included.

Source Reference: ETS 300 202 [10]

Communication Forwarding on Not Logged-in (CFNL)

The Communication Forwarding on Not Logged-in (CFNL) service enables a served user to redirect incoming communications which are addressed to the served user's address, to another user (forwarded-to address) in case the served user is not registered (logged-in). The CFNL service may operate on all communications, or just those associated with specified basic services.

As a service provider option, a subscription option can be provided to enable the served user to receive an indication that the CFNL service has been activated. This indication shall be provided when the served user logs out according to procedures described in RFC 3261.

The maximum number of diversions permitted for each communication is a service provider option. The service provider shall define the upper limit of diversions. When counting the number of diversions, all types of diversion are included.

Service interactions with other PSTN/ISDN simulation services (NGN)

10.2.1.1.1 Charging information at the end of the communication

Original originating user:

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

Forwarding user:

When a communication is forwarded and the forwarding user is charged for the forwarded part of the communication, then as a network option, the charging information can be transferred to the forwarding user when the communication is terminated provided that the served user has subscribed to the advice of charge: charging information at the end of the communication simulation service with the value of the subscription option set to "for all communications automatically".

10.2.1.1.2 Number identification services

10.2.1.1.2.1 Originating identification presentation

When a communication has been diverted and the diverted-to user has been provided with the originating identification presentation simulation service, the diverted-to user shall receive the number of the original originating user, if this originating user has not subscribed to or invoked the originating identification restriction simulation service.

10.2.1.1.2.2 Originating identification restriction

When the originating identification restriction simulation service has been invoked, the originating user's address shall not be presented to the diverted-to user unless the diverted-to user has an override capability.

10.2.1.1.2.3 Terminating Identification presentation

If the served (diverting) user selects the option that the originating user is not notified of communication diversion, then the originating user shall receive no diverting notification. In addition, the originating user shall not receive the connected user's identity when the communication is answered, unless the originating user has an override capability.

If the served (diverting) user selects the option that the originating user is notified, but without the diverted-to number, then the originating user shall not receive the connected user's identity when the communication is answered, unless the originating user has an override capability.

10.2.1.1.2.4 Terminating Identification presentation restriction

If a diverted-to user subscribes to the Terminating Identification presentation restriction simulation service "permanent mode", then the diverted-to user's address shall not be provided with the notification that the communication has been diverted.

If a diverted-to user subscribes to the Terminating Identification presentation restriction simulation service "temporary mode", then the diverted-to user's address shall not be provided until negotiation with the user has taken place and a positive indication from the user has been received (i.e. the default value shall not be used).

In each of the above situations, a originating user that subscribes to the Terminating Identification presentation simulation service and who has override capability will not receive the diverted-to user's address as part of the diverting notification information, but can use the override capability in order to receive the connected identity when the communication is answered.

10.2.1.1.3 Closed user group

Closed user group restrictions shall be checked and met for the communication between the originating user and the diverting user. The parameters of a closed user group applied by the network on the original communication shall be used for the diverted part of the communication, and by this means closed user group restrictions shall be checked and met for the communication between the originating user and the diverted-to user.

The outgoing Communication Session Barring attribute of the diverting user's closed user group simulation service shall not be used to determine if the communication can be diverted.

10.2.1.1.4 Communication completion services

10.2.1.1.4.1 Completion of communication s to busy subscriber

CCBS recalls shall never be diverted. They shall be given to user A at user A's original location.

Communication Forwarding Unconditional (CFU):

a) CFU activated by B before A requests CCBS on B:

If the communication to destination B is forwarded to C by CFU and C is busy, then a CCBS request, if made by user A, shall be activated. User A shall be informed that CCBS has been activated. If user A activates CCBS and subsequently activates CFU, the CCBS recall shall be given to user A at his original location.

b) CFU activated by B after A requests CCBS on B:

If destination B activates CFU after user A has requested CCBS, then the CCBS request shall be cancelled and a notification “CCBS cancelled” shall be sent to the user A.

Communication Forwarding on Busy subscriber (CFB):

a) CFB activated by B before A requests CCBS on B:

If user B has activated the CFB and is busy, and the forwarded-to user C is also busy, then a request by user A to activate the CCBS simulation service shall be applied to user B.

b) CFB activated by B after A requests CCBS on B:

If user B activates CFB after user A has activated CCBS on user B, the communication resulting from CCBS shall be treated as follows:

- user B shall be considered as being busy and the procedures of CCBS shall apply; or
- the communication shall be forwarded as a normal communication.

Communication **Forwarding No Replay (CFNR):**

a) CFNR activated by B before A requests CCBS on B:

If user A connects to user B and the communication is forwarded on no reply to user C and user C is then busy, then any request by user A for CCBS shall be applied to user C.

b) CFNR activated by B after A requests CCBS on B:

If user B activates the CFNR after user A has activated the CCBS simulation service on user B, then the **communication** resulting from the CCBS simulation service shall be given to user B. After the no reply timer has expired at user B, the **communication** shall be forwarded as a normal **communication**.

Communication Forwarding on No Logged-in (CFNL):

a) CFNL activated by B before A requests CCBS on B:

If the communication to user B is forwarded to user C by CFNL and user C is busy, then a request by user A to activate the CCBS shall be applied to user C.

b)CFNL activated by B after A requests CCBS on B:

If user B activates the CFNL simulation service after user A has activated CCBS, then the CCBS request shall be cancelled and a notification "CCBS cancelled" shall be sent to the user A.

Communication Deflection (CD):

Originating user (user A):

If a communication to the called user (destination B) is deflected to C user by the CD and C user is busy, then a request by user A to activate CCBS shall be applied to destination C and CCBS recall shall be given to user A at his original location.

Called user (destination B):

If the called user (destination B) requests invocation of CD on a communication resulting from CCBS, then the following actions shall result:

- if the request was made prior to the network receiving an indication that the user is being informed of the communication, then the request shall be rejected; or
- if the request was made after the network has received an indication that the user is being informed of the communication, then the request shall be accepted. The communication shall be deflected as a normal communication.

10.2.1.1.4.2 Completion of communications on no reply

Communication Forwarding No Replay (CFNR):

a) CFNR activated by B before A requests CCNR on B:

If user A connects to user B and the communication is forwarded on no reply to user C and user C does not answer the communication (No Reply), then a request by user A to CCNR shall apply to the originally called destination B.

b) CFNR activated by B after A requests CCNR on B:

If user B has activated CFNR and does not answer the communication (No Reply) resulting from CCNR, then according to a network option, the communication shall be treated as follows:

- the procedures of CCNR shall apply; or
- the communication shall be forwarded as a normal communication.

10.2.1.1.5 Diversion services

10.2.1.1.5.1 Communication forwarding unconditional

Communication Forwarding Unconditional (CFU):

Not applicable.

Communication forwarding on Busy subscriber (CFB):

Invocation of the communication forwarding unconditional **simulation** service shall take precedence over the CFB **simulation** service.

Communication forwarding No Replay (CFNR):

Invocation of the communication forwarding unconditional **simulation** service shall take precedence over the CFNR **simulation** service.

Communication forwarding on No Logged-in (CFNL):

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

Communication Deflection (CD):

Invocation of the communication forwarding unconditional simulation service shall take precedence over the CD simulation service.

10.2.1.1.5.2 Communication forwarding busy

Communication Forwarding Unconditional (CFU):

Invocation of the CFU simulation service shall take precedence over the communication forwarding busy simulation service.

Communication Forwarding on Busy subscriber (CFB):

Not applicable.

Communication Forwarding No Replay (CFNR):

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

Communication Forwarding on No Logged-in (CFNL)

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

Communication Deflection (CD):

If the user is not network determined user busy, then the CD simulation service or the communication forwarding busy simulation service can be invoked, depending on the response from the served user.

10.2.1.1.5.3 Communication forwarding no reply

Communication Forwarding Unconditional (CFU):

Invocation of the CFU simulation service shall take precedence over the communication forwarding no reply simulation service.

Communication Forwarding on Busy subscriber (CFB):

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

Communication Forwarding No Replay (CFNR):

Not applicable.

Communication Forwarding on No Logged-in (CFNL):

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

Communication Deflection (CD):

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

NOTE: If the network indicates the arrival of an incoming communication to the user, then the CD simulation service, or the communication forwarding no reply simulation service can be invoked, depending on the response, or lack of response, from the served user.

10.2.1.1.5.4 Communication forwarding on No Logged-in:

Communication Forwarding Unconditional (CFU):

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

Communication Forwarding on Busy subscriber (CFB):

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

Communication Forwarding No Replay (CFNR):

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

Communication Forwarding on No Logged-in (CFNL):

Not applicable.

Communication Deflection (CD):

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

10.2.1.1.5.5 Communication deflection

Communication Forwarding Unconditional (CFU):

Invocation of the CFU simulation service shall take precedence over the communication deflection simulation service.

Communication Forwarding on Busy subscriber (CFB):

If the user is not network determined user busy, then the communication deflection simulation service or the CFB simulation service can be invoked, depending on the response from the served user.

Communication Forwarding No Replay (CFNR):

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

NOTE: If the network indicates the arrival of an incoming communication to the user, then the communication deflection simulation service, or the CFNR simulation service can be invoked, depending on the response, or lack of response, from the served user.

Communication Forwarding on No Logged-in (CFNL):

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

Communication Deflection (CD):

Not applicable.

***Contributor's Note**: It depends how the communication diversion is defined, the interaction should be rewritten.*

10.2.1.1.6 Malicious communication identification

The malicious communication identification simulation service can be invoked for a diverted communication. In addition to the normal operation of the malicious communication identification simulation service, the identity of the first diverting user shall be registered and, as a network option, the last diverting user can be registered.

Once diverting has taken place, the diverting user cannot invoke the malicious communication identification simulation service.

The malicious communication identification simulation service shall not be automatically invoked when a communication is terminated due to the invocation of the CFNR and CD simulation service.

Special interactions with other PSTN/ISDN simulation services only applicable to the CFRN:

10.2.1.1.7 Communication barring services

10.2.1.1.7.1 Outgoing communication barring-fixed

If the outgoing communication barring-fixed simulation service has already been activated, a request to activate the CFNR simulation service shall be rejected if the served user's communication to the forwarded-to user would be barred by the outgoing communication barring-fixed simulation service at the time of the activation attempt of the communication forwarding service.

If the CFNR simulation service was activated before the activation of the outgoing communication barring-fixed simulation service, the CFNR simulation service shall not be affected.

10.2.1.1.7.2 Outgoing communication barring-user controlled

If the outgoing communication barring-user controlled simulation service has already been activated, a request to activate the CFNR simulation service shall be rejected if the served user's communication to the forwarded-to user would be barred by the outgoing communication* barring-user controlled simulation service.

If the CFNR simulation service was activated before the activation of the outgoing communication barring-user controlled simulation service, the CFNR simulation service shall not be affected.

10.2.1.1.8 Communication Waiting:

If user B has activated the CFNR simulation service, then a waiting communication shall still be offered. If the CFNR timer expires before an answer is received then the CFNR simulation service shall be invoked and the communication shall be forwarded and communication waiting ceased.

If the forwarding user subscribes to the value "No" for the subscription option "**Originating** user receives notification that the communication has been forwarded", no notification of communication waiting shall be sent to the originating user from the forwarded-to user.

In case of multiple diversions, a notification of communication waiting shall only be sent to the originating user if all diverting users allow notification that the communication has been forwarded.

A forwarded communication can invoke the communication waiting simulation service.

10.2.1.2 Interoperability with PSTN/ISDN

The CD services shall be possible for communication s from a PSTN/ISDN to an NGN and vice-versa. The CLI information of the originating party as well as further CLI information (first redirected address, last redirected address) may be provided to the final called party, if the PSTN/ISDN allows this.

To be completed.

10.2.2 Communication Waiting (CW)

10.2.2.1 Definition

The Communication Waiting service enables a user to be informed at the time a communication is coming in, that no resources are available for that incoming communication.

The user has then the choice of accepting, rejecting or ignoring the incoming communication.

10.2.2.2 Service interactions with simulationother PSTN/ISDN simulation services (NGN)

10.2.2.2.1 Completion of communication s to busy subscriber

If a subscriber to the completion of communication s to busy subscriber simulation service places a communication to a user B who has subscribed to the CW simulation service, and user B is given the communication waiting indication, then invocation of completion of communication s to busy subscriber simulation service cannot occur.

10.2.2.2.2 Diversion services

10.2.2.2.2.1 Communication forwarding unconditional

If subscriber B has activated the communication forwarding unconditional simulation service, then the execution of the communication forwarding unconditional simulation service shall take precedence over the CW simulation service. The communication forwarding unconditional simulation service can be activated while a communication is waiting without changing the state of the waiting communication.

A forwarded communication can invoke the CW simulation service.

10.2.2.2.2.2 Communication forwarding busy

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

A forwarded communication can invoke the CW simulation service.

10.2.2.2.2.3 Communication forwarding no reply

If subscriber B has the communication forwarding no reply simulation service activated, then a waiting communication shall still be offered as described in this document. If the communication forwarding no reply timer expires before an answer is received then the communication forwarding no reply simulation service becomes invoked and the communication is forwarded and communication waiting ceases.

A forwarded communication can invoke the CW simulation service.

10.2.2.2.2.4 Communication forwarding on No Logged-in

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

10.2.2.2.2.5 Communication deflection

When receiving the communication waiting indication, user B can invoke the communication deflection simulation service.

A deflected communication can invoke the CW simulation service.

Contributor's Note*: It depends how the communication diversion is defined, the interaction should be rewritten.*

10.2.2.3 Interoperability with PSTN/ISDN

To be completed

10.2.3 Communication Hold (HOLD)

10.2.3.1 Definition

The Communication Hold simulation service enables a user to suspend an IP multimedia session, and resume that IP multimedia session at a later time.

Source Reference: TS 22.228, § 7.7.2 [42].

10.2.3.2 Service interactions with other PSTN/ISDN simulation services (NGN)

10.2.3.2.1 Communication hold (HOLD)

If the HOLD simulation service is provided to both users involved in one communication, each of these users can hold and retrieve the communication independently from these operations having been carried out by the other user.

10.2.3.2.2 Conference

Any party involved in an active conference (i.e. the conference controller or a conferee) can place their connection to the conference on hold and later retrieve it.

10.2.3.3 Interoperability with PSTN/ISDN

To be completed

10.2.4 Communication Barring (CB)

10.2.4.1 Definition

The group of Communication Restriction Services includes two simulation services:

- Outgoing Communication s Barring (OCB)

  This service makes it possible for a user to have barring of certain categories of outgoing communication s according to a barring program which is selected from a set of one or more barring programs chosen at provision time and is valid for all outgoing communication s, or just those associated with a specific basic service group.

  The ability of the served user to receive communication s and to set-up emergency communication s remains unaffected.

  Source Reference: EN 301 082 [38], EN 301 084 [39]

  - Selective Outgoing Communication s Barring (SOCB)

    This service makes it possible for a served user to have barring of outgoing communication s depending on user defined addresses or addressing ranges. Barring of an outgoing communication for a very specific address or a range of addresses depends on the completely or partly concurrent with an entry in a SOCB address list in the network. This list may be used as a “black list” or “white list”. In case of “black list” the contained addresses or addressing ranges in this list will be barred by the network for outgoing communication s. In case of “white list” the contained addresses or addressing ranges in this list will not be barred by the network for outgoing communication s, but all others.

- Incoming Communication s Barring (ICB)

  This service makes it possible for a user to have barring of certain categories of incoming communication s according to a barring program which is selected from a set of one or more barring programs chosen at provision time and is valid for all incoming communication s, or just those associated with a specific basic service group.

  The ability of the served user to set-up outgoing communication s remains unaffected.

10.2.4.2 Service interactions with simulation other PSTN/ISDN simulation services (NGN)

10.2.4.2.1 Communication completion services

10.2.4.2.1.1 7.7.1 Completion of communication s to busy subscriber

When the OCB simulation service is activated after the served user activates the CCBS simulation service, the CCBS communication shall be treated as a normal communication.

10.2.4.2.1.2 7.7.2 Completion of communication s on no reply

When the OCB simulation service is activated after the served user activates the CCNR simulation service, the CCNR communication shall be treated as a normal communication.

10.2.4.2.2 Diversion services

10.2.4.2.2.1 Communication forwarding unconditional

If the OCB simulation service has already been activated, a request to activate the communication forwarding unconditional simulation service shall be rejected if the served user's communication to the forwarded-to user would be barred by the OCB simulation service at the time of the activation attempt of the communication forwarding simulation service.

If the communication forwarding unconditional simulation service was activated before the activation of the OCB simulation service, the communication forwarding unconditional simulation service shall not be affected.

10.2.4.2.2.2 Communication forwarding busy

If the OCB simulation service has already been activated, a request to activate the communication forwarding busy simulation service shall be rejected if the served user's communication to the forwarded-to user would be barred by the OCB simulation service at the time of the activation attempt of the communication forwarding simulation service.

If the communication forwarding busy simulation service was activated before the activation of the OCB simulation service, the communication forwarding busy simulation service shall not be affected.

10.2.4.2.2.3 Communication forwarding no reply

If the OCB simulation service has already been activated, a request to activate the communication forwarding no reply simulation service shall be rejected if the served user's communication to the forwarded-to user would be barred by the OCB simulation service at the time of the activation attempt of the communication forwarding simulation service.

If the communication forwarding no reply simulation service was activated before the activation of the OCB simulation service, the communication forwarding no reply simulation service shall not be affected.

10.2.4.2.2.4 Communication forwarding on No Logged-in:

If the OCB simulation service has already been activated, a request to activate the communication forwarding no registration simulation service shall be rejected if the served user's communication to the forwarded-to user would be barred by the OCB simulation service at the time of the activation attempt of the communication forwarding simulation service.

If the communication forwarding on no logged-in simulation service was activated before the activation of the OCB simulation service, the communication forwarding not registered simulation service shall not be affected.

10.2.4.2.2.5 Communication deflection

If the OCB simulation service has been activated, a request to invoke the communication deflection simulation service shall be rejected if the served user's communication to the deflected-to user would be barred by the OCB simulation service at the time of the invocation attempt of the communication deflection simulation service.

Contributor's Note*: It depends how the communication diversion is defined, the interaction should be rewritten.*

10.2.4.3 Interoperability with PSTN/ISDN

To be completed.

10.2.5 Completion of Communications to Busy Subscriber (CCBS)

10.2.5.1 Definition

The CCBS simulation service enables user A, encountering a busy destination B, to have the communication completed without having to make a new communication attempt when the destination B becomes not busy.

When user A requests the CCBS simulation service, the network will monitor for destination B becoming not busy.

When destination B becomes not busy then the network will wait a short time in order to allow the resources to be re-used for originating a communication. If the resources are not re-used by destination B within this time, then the network will automatically recall user A.

When user A accepts the CCBS recall, then the network will automatically generate a CCBS communication to destination B.

NOTE: A simulation service provided to destination B which prevents the registration of CCBS requests is outside the scope of the present document.
Source Reference: EN 300 357 [17]

10.2.5.2 Service interactions with other PSTN/ISDN simulation services (NGN)

10.2.5.2.1 Advice of charge services

Charging information can be given for the original communication, and for the resulting CCBS communication.

10.2.5.2.2 Communication waiting

NOTE 1: For a waiting communication, destination B is not considered as busy.

If the communication waiting indication cannot be given at the destination B, user A will receive busy indication and can invoke the CCBS simulation service to destination B.

CCBS requests in the destination B CCBS queue shall only be processed if there are no communication s waiting.

10.2.5.2.3 Communication hold

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

NOTE 1: When receiving a CCBS recommunication indication, user A may invoke the communication hold simulation service in order to make interface resources available for the establishment of the CCBS communication.

NOTE 2: When user A is busy or CCBS busy and is notified that destination B is not busy, invocation of the communication hold simulation service will not result in the CCBS communication being established.

10.2.5.2.4 Completion of communication s to busy subscriber

A user can be both a "user A" and a "destination B" simultaneously, i.e. that user can have activated the CCBS simulation service and have CCBS requests outstanding whilst at the same time that user can be the destination of CCBS requests from other users.

If a user receives a CCBS recall while that user's destination B CCBS queue is being processed, then the CCBS recall shall take priority over the handling of the destination B CCBS queue. The handling of CCBS requests activated by this user shall have priority over the handling of CCBS requests activated by other users on this user.

If one of the user's CCBS requests matures as a result, then the user shall be given a CCBS recall or notification. The served user's destination B idle guard timer, if running, shall be cancelled.

10.2.5.2.5 Communication diversion

CCBS recalls shall never be diverted. They shall be given to user A at user A's original location.

10.2.5.2.5.1 Communication Forwarding Unconditional

a) CFU activated by B before A requests CCBS on B:

If the communication to destination B is forwarded to C by CFU and C is busy, then a CCBS request, if made by user A, shall be activated. User A shall be informed that CCBS has been activated. If user A activates CCBS and subsequently activates CFU, the CCBS recall shall be given to user A at his original location.

b) CFU activated by B after A requests CCBS on B:

If destination B activates CFU after user A has requested CCBS, then the CCBS request shall be cancelled and a notification “CCBS cancelled” shall be sent to the user A.

10.2.5.2.5.1.1 Communication forwarding busy

a) CFB activated by B before A requests CCBS on B:

If user B has activated the CFB and is busy, and the forwarded-to user C is also busy, then a request by user A to activate the CCBS simulation service shall be applied to user B.

b) CFB activated by B after A requests CCBS on B:

If user B activates CFB after user A has activated CCBS on user B, the communication resulting from CCBS shall be treated as follows:

- user B shall be considered as being busy and the procedures of CCBS shall apply; or
- the communication shall be forwarded as a normal communication.

10.2.5.2.5.1.2 Communication forwarding no reply

a) CFNR activated by B before A requests CCBS on B:

If user A connects to user B and the communication is forwarded on no reply to user C and user C is then busy, then any request by user A for CCBS shall be applied to user C.

b) CFNR activated by B after A requests CCBS on B:

If user B activates the CFNR after user A has activated the CCBS simulation service on user B, then the communication resulting from the CCBS simulation service shall be given to user B. After the no reply timer has expired at user B, the communication shall be forwarded as a normal communication.

10.2.5.2.5.1.3 Communication forwarding not registered

a) CFNL activated by B before A requests CCBS on B:

If the communication to user B is forwarded to user C by CFNL and user C is busy, then a request by user A to activate the CCBS shall be applied to user C.

b) CFNL activated by B after A requests CCBS on B:

If user B activates the CFNL simulation service after user A has activated CCBS, then the CCBS request shall be cancelled and a notification "CCBS cancelled" shall be sent to the user A.

10.2.5.2.5.1.4 Communication deflection (CD)

Originating user (user A):

If a communication to the called user (destination B) is deflected to C user by the CD and C user is busy, then a request by user A to activate CCBS shall be applied to destination C and CCBS recall shall be given to user A at his original location.

Called user (destination B):

If the called user (destination B) requests invocation of CD on a communication resulting from CCBS, then the following actions shall result:

- if the request was made prior to the network receiving an indication that the user is being informed of the communication, then the request shall be rejected; or
- if the request was made after the network has received an indication that the user is being informed of the communication, then the request shall be accepted. The communication shall be deflected as a normal communication.

***Contributor's Note**: It depends how the communication diversion is defined, the interaction should be rewritten.*

10.2.5.3 Interoperability with PSTN/ISDN

To be completed

10.2.6 Follow Me (FM)

10.2.6.1 Definition

Note: With the toolkit defined in the IMS 3GPP specifications the definition of FM is included as possible implementation by using service capabilities offered by the IMS. It should be identified if this description given by 3GPP is enough for the purpose of TISPAN NGN Communication diversion supplemantary service. If this is the case, a new definition is not needed and therefore this subsection should only reference to the 3GPP document/s.

To be completed.

10.2.6.2 Service interactions

To be completed.

10.2.7 Message Waiting Indication (MWI)

10.2.7.1 Definition

The MWI simulation service enables the network, upon the request of a controlling user to indicate to the receiving user, that there is at least one message waiting. The indication is delivered to the receiving user:

- when the MWI simulation service is activated for a certain service and the receiving user makes an outgoing call attempt; and/or
- as soon as the MWI simulation service has been activated or deactivated.

NOTE: Having received this indication, the receiving user can subsequently access the mail box, to have the mail delivered. The means by which the receiving user accesses and manages the mail box are outside the scope of the present document.
Source Reference: EN 300 650 [22]

10.2.7.2 Service interactions with other services (NGN)

10.2.7.2.1 Diversion services

Comment: It is proposed to delete this dependencies, because it is wishful to have also the MWI diverted. Within EN-300195-1 also no impacts to other PSTN/ISDN simulation services are seen.

10.2.7.2.1.1 Communication forwarding unconditional

The MWI shall never be diverted. The indication shall be given to the receiving user at the receiving user's original location.

10.2.7.2.1.2 Communication forwarding busy

The MWI shall never be diverted. The indication shall be given to the receiving user at the receiving user's original location.

10.2.7.2.1.3 Communication forwarding no reply

The MWI shall never be diverted. The indication shall be given to the receiving user at the receiving user's original location.

10.2.7.2.1.4 Communication forwarding on No Logged-in

The MWI shall never be diverted. The indication shall be given to the receiving user at the receiving user's original location when he subscribes again.

10.2.7.2.1.5 Communication deflection

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

***Contributor's Note**: It depends how the communication diversion is defined, the interaction should be rewritten.*

10.2.7.3 Interoperability with PSTN/ISDN

There is no interoperability with PSTN/ISDN because MWI is a local service.

10.3 Optional services

10.3.1 Conference (CONF)

10.3.1.1 Definition

The CONF simulation service enables a user to participate in and control a simultaneous communication involving a number of users.

When the CONF simulation service is invoked, conference resources are allocated to the served user. In the case of invocation from an active communication, this communication will be connected to the conference resources.

Source Reference: ETS 300 183 [15], ETS 300 164 [16]

10.3.1.2 Service interactions with other PSTN/ISDN simulation services (NGN)

10.3.1.2.1 Advice of charge services

10.3.1.2.1.1 Charging information at communication set-up time

10.3.1.2.1.1.1 Conference controller

Invocation of the CONF simulation service from the idle state:

The conference controller can invoke AOC-S at the same time as CONF is invoked. Updated charging rate information for the whole conference shall be given to the conference controller if the charging rate for the conference is changed, i.e. each time the rate changes, the new charge rate shall be given by means of a single indication which shall apply to the whole conference.

Invocation of the CONF simulation service from an active communication:

If AOC-S has been invoked for the initial communication, then it shall be invoked automatically for the whole conference.

If AOC-S has not been invoked for the initial communication, then the conference controller can invoke AOC-S at the same time as CONF is invoked.

Addition of a conferee to a conference:

For communication s between the conference controller and potential conferees which are outside the conference, the normal procedures for AOC-S shall apply. When a communication for which AOC-S has been invoked, is added to the conference, then further charging rate information shall not be given for this communication.

NOTE: Further charging rate information for communication with the new conferee is considered to be part of the charging rate information for the conference.

Other operation on the conference:

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

10.3.1.2.1.1.2 Conferees

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

10.3.1.2.1.2 Charging information at the end of a communication

10.3.1.2.1.2.1 Conference controller

Invocation of the CONF simulation service from the idle state:

If AOC-E is automatically invoked on all communication s, or if the conference controller invokes AOC-E at the same time as CONF is invoked, then charging information shall be given for the whole conference when the conference is terminated.

Invocation of the CONF simulation service from an active communication:

If AOC-E has been invoked for the initial communication, then it shall be invoked automatically for the conference.

If AOC-E has not been invoked for the initial communication, then the conference controller can invoke AOC-E at the same time as the CONF simulation service is invoked.

Addition of a conferee to a conference:

For communication s between the conference controller and potential conferees which are outside the conference, the normal procedures for AOC-E shall apply. When a communication, for which AOC-E has been invoked, is added to the conference, then charging information shall be given as if the communication was terminated at the moment it was added to the conference.

NOTE: Further charges resulting from the communication with the new conferee are considered to be part of the charging for the conference.

Destination the conference:

When the conference is terminated and AOC-E has been invoked for the conference, then the overall charges for the conference shall be sent to the conference controller. If the CONF simulation service was invoked from an active communication and AOC-E has been invoked for that communication, then the charging information shall include charges for the initial communication.

Other operations on the conference:

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

10.3.1.2.1.2.2 Conferees

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

10.3.1.2.2 Communication hold

Any party involved in a conference (i.e. the conference controller or a conferee) can place their connection to the conference on hold and later retrieve it.

10.3.1.2.3 Terminating Identification presentation

Conference controller:

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

Conferees:

Conferees shall not receive the identity of a party when that party is added to the conference.

10.3.1.2.4 Closed user group

When the communication involving the first conferee is added to the conference, then the conference shall assume the closed user group of that communication.

In order to add a subsequent communication to the conference, the closed user group of that communication shall be checked against the closed user group of the conference.

10.3.1.2.5 Conference

A user can be involved as the conference controller separately in two conferences. However, the user cannot add either of these conferences to the other conference.

To be completed.

10.3.1.3 Interoperability with PSTN/ISDN

To be completed

10.3.2 Advice of Charge (AOC)

10.3.2.1 Definition

The group of simulation services Charging Simulation Services comprises two services:

- Advice of Charge: charging information at communication set-up time (AOC-S);

  The advice of charge at communication set-up simulation service provides the served user with information about the charging rates at the time of communication establishment or durting the communication in the case of charging rates changes. The charge information given relates to the charges incurred on the network to which the served user is attached.
  Source Reference: ETS 300 178 [18]

- Advice of Charge: charging information at the end of the communication (AOC-E)

  The advice of charge at end of communication simulation service provides the served user with charging information for a communication when the communication is terminated. Dependent on the option chosen at the time of subscription, the information can be sent for all communication s, or on a per communication basis. The charge information given relates to the charges incurred on the network to which the served user is attached.

  Source Reference: ETS 300 180 [20]

10.3.2.2 Service interactions with other PSTN/ISDN simulation services (NGN)

10.3.2.2.1 Conference (CONF)

10.3.2.2.1.1 Charging information at communication set-up time (AOC-S)

10.3.2.2.1.1.1 Conference controller

Invocation of the CONF simulation service from the idle state:

The conference controller can invoke AOC-S at the same time as CONF is invoked. Updated charging rate information for the whole conference shall be given to the conference controller if the charging rate for the conference is changed, i.e. each time the rate changes, the new charge rate shall be given by means of a single indication which shall apply to the whole conference.

Invocation of the CONF simulation service from an active communication:

If AOC-S has been invoked for the initial communication, then it shall be invoked automatically for the whole conference.

If AOC-S has not been invoked for the initial communication, then the conference controller can invoke AOC-S at the same time as CONF is invoked.

Addition of a conferee to a conference:

For communication s between the conference controller and potential conferees which are outside the conference, the normal procedures for AOC-S shall apply. When a communication for which AOC-S has been invoked, is added to the conference, then further charging rate information shall not be given for this communication.

NOTE: Further charging rate information for communication with the new conferee is considered to be part of the charging rate information for the conference.

Other operation on the conference:

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

10.3.2.2.1.1.2 Conferees

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

10.3.2.2.1.2 Charging information at the end of a communication (AOC-E)

10.3.2.2.1.2.1 Conference controller

Invocation of the CONF simulation service from the idle state:

If AOC-E is automatically invoked on all communication s, or if the conference controller invokes AOC-E at the same time as CONF is invoked, then charging information shall be given for the whole conference when the conference is terminated.

Invocation of the CONF simulation service from an active communication:

If AOC-E has been invoked for the initial communication, then it shall be invoked automatically for the conference.

If AOC-E has not been invoked for the initial communication, then the conference controller can invoke AOC-E at the same time as the CONF simulation service is invoked.

Addition of a conferee to a conference:

For communication s between the conference controller and potential conferees which are outside the conference, the normal procedures for AOC-E shall apply. When a communication, for which AOC-E has been invoked, is added to the conference, then charging information shall be given as if the communication was terminated at the moment it was added to the conference.

NOTE: Further charges resulting from the communication with the new conferee are considered to be part of the charging for the conference.

Destination the conference:

When the conference is terminated and AOC-E has been invoked for the conference, then the overall charges for the conference shall be sent to the conference controller. If the CONF simulation service was invoked from an active communication and AOC-E has been invoked for that communication, then the charging information shall include charges for the initial communication.

Other operations on the conference:

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

10.3.2.2.1.2.2 Conferees

10.3.2.2.2 No impact, i.e. neither simulation service shall affect the operation of the other simulation service. Communication diversion

Original originating user:

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

Diverting user:

AOC-S:

Not applicable.

AOC-E

When a communication is diverted and the diverting user is charged for the diverted part of the communication, then as a network option, the charging information can be transferred to the diverting user when the communication is terminated, provided that the served user has subscribed to the AOC-E simulation service with the value of the subscription option set to "for all communication s automatically".

10.3.2.3 Interoperability with PSTN/ISDN

To be completed.

10.3.3 Closed User Group (CUG)

10.3.3.1 Definition

To be completed.

10.3.3.2 Service interactions with other PSTN/ISDN simulation services (NGN)

To be completed.

10.3.3.3 Interoperability with PSTN/ISDN

To be completed

10.3.4 Fixed destination communication

10.3.4.1 Definition

To be completed.

10.3.4.2 Service interactions with other PSTN/ISDN simulation services (NGN)

To be completed.

10.3.4.3 Interoperability with PSTN/ISDN

To be completed

10.3.5 Inhibition of Incoming Forwarded Communication s (IIFC)

10.3.5.1 Definition

To be completed.

10.3.5.2 Service interactions with other PSTN/ISDN simulation services (NGN)

To be completed.

10.3.5.3 Interoperability with PSTN/ISDN

To be completed

10.3.6 Direct Dialling In (DDI)

10.3.6.1 Definition

To be completed.

10.3.6.2 Service interactions with other PSTN/ISDN simulation services (NGN)

To be completed.

10.3.6.3 Interoperability with PSTN/ISDN

To be completed

10.3.7 Explicit Communication Transfer (ECT)

10.3.7.1 Definition

To be completed.

10.3.7.2 Service interactions with other PSTN/ISDN simulation services (NGN)

To be completed.

10.3.7.3 Interoperability with PSTN/ISDN

To be completed

10.3.8 Trunk Hunting (TH)

10.3.8.1 Definition

To be completed.

10.3.8.2 Service interactions with other PSTN/ISDN simulation services (NGN)

To be completed.

10.3.8.3 Interoperability with PSTN/ISDN

To be completed

11 Service requirements

IP multimedia sessions provide the ability for users to invoke IP multimedia applications to send and receive (where applicable) voice and data communications, even when roaming. This includes interworking with existing voice and data networks for both fixed (e.g. PSTN, ISDN, internet etc.) and mobile users.

The IM CN subsystem shall support interworking with existing fixed and mobile voice and IP data networks, including PSTN, ISDN, Mobile and Internet.

It shall be possible to have basic voice communications between IMS users and users in CS domain/PSTN-style networks. When an IM session originates or terminates in a CS telephony call, the experience of the CS telephony network user should not substantially differ from that of a communication between two CS telephony network users in terms of aspects such as the delay to set-up communications and the total permissible delay in transporting speech between the end users. The IM CN subsystem does not necessarily have to support all services offered by the CS telephony network.

Visited network provided services give the opportunity for the visited network to offer services of a local nature to the visiting user and gain additional revenue from their usage by inbound roamers.

11.1 Identifying IP multimedia application subscriptions

There is no requirement to support standardised subscription mechanisms for IP multimedia applications.

IP multimedia applications may require to be provisioned and configured by users and operators. Since the source and variety of IP multimedia applications are not standardised, the specific feature codes to provision, enable and configure

IP multimedia applications cannot be standardised either. Thus there are no requirements on the network capabilities to support provisioning and configuration for specific IP multimedia applications.

Note: The standardised service capabilities, personalised Internet web pages and evolving IP mechanisms may be used to allow user (self) provisioning, configuration and enabling of IP multimedia applications.

11.2 Access to the IM CN subsystem

11.2.1 Access control

The IM CN subsystem shall be able to verify at any time that the user is entitled to use the resources of the IM CN subsystem.

11.3 Capability negotiation

The IP multimedia applications shall be able to negotiate their capabilities to identify and select the available media components, QoS etc. of IP multimedia sessions. It shall be possible for the capability negotiation to take place on invocation, acceptance and during an IP multimedia session (e.g. following a change in UE capabilities, change in media types etc.). Capability negotiation may be initiated by the user, operator or an application on behalf of them.

In order to support the user's preferences for IP multimedia applications, the capability negotiation shall take into account the information in the user profile whenever applicable. This includes the capability to route the IP multimedia session to a specific UE, when multiple UEs share the same IMS service subscription.

11.4 Redirecting of IP Multimedia sessions

It shall be possible for the user or the network to identify an alternative destination for an IP multimedia session or individual media of an IP multimedia session. Redirection to alternative destinations may be initiated by the sending party, receiving party or the network on their behalf. It shall be possible for redirection to be initiated at various stages of an IP Multimedia session. For example:

- Prior to the set up of an IP Multimedia session
- During the initial request for an IP Multimedia session
- During the establishment of an IP Multimedia session
- While the IP Multimedia session is ongoing

Redirection can be applied for all Multimedia sessions unconditionally or it can be caused by any of a set list of events or conditions. Typical causes could be:

- Identity of the caller
- Location or presence of the originating or called party
- If the called party is already in a session
- If the called party is unreachable or unavailable in some other way
- If the called party does not respond
- After a specified alerting interval
- User’s preference on routing for specific IP Multimedia session based on the capabilities of multiple UEs sharing the same IMS service subscription.

There are other causes that could be applied that do not require standardisation (e.g. time of day).

11.5 Invoking an IP multimedia session

The user shall be able to invoke one or more IP multimedia sessions. The user shall also be able to activate concurrent IP multimedia applications within each IP multimedia session.

11.5.1 Identification of entities

Both telecom and internet numbering and addressing schemes shall be supported as public identities. IP multimedia communication establishment (both mobile originating and destination) depending on originator shall be able to be based on E.164/TEL URL (e.g. tel:+4412345678) or SIP URL (sip:my.name@company.org). It shall be possible to assign several public identities for one subscription.

Public identities shall be administered by the network operator and shall not be changeable by the user.

It shall be possible for the network operator to guarantee the authenticity of a public identity presented for an incoming communication to a user where the communication is wholly within that operator's network (i.e. originating and destination parties are subscribers to, and resident in, a single PLMN). This is equivalent to the situation for OIP with today's telephony networks.

It shall be possible for the network operator to use

- the same E.164 number for IP multimedia sessions and CS speech telephony (TS11)

- a different E.164 number if desired for IP multimedia sessions

This allows customers who originally had only an E164 MSISDN to retain the same number for receiving communications in the IM domain and also in the CS domain when outside IM coverage.

11.5.2 Negotiation at IM session invocation

It shall be possible for the capability negotiation to take place at the time of the IP multimedia session invocation.

11.5.3 Emergency communications

See [??] for further details.

11.6 Handling of an incoming session (by the destination entity)

11.6.1 Presentation of session originator identity

It shall be possible to present the identity of the session originator subject to it not being suppressed by the session originator.

11.6.2 Negotiation of an incoming session

Interaction with the user profile shall be supported, and additionally direct interaction with the user may be required.

11.6.3 Accepting or rejecting an incoming session

It shall be possible for the user to either accept or reject an incoming IP multimedia session. Further, it shall also be possible for the user to accept only a subset of the offered media, not have any of the media offered to him at all etc.

11.7 Handling of an ongoing session

11.7.1 User modification of media in an ongoing session

The user shall be able to negotiate the addition or deletion of media components of IP multimedia applications during an IP multimedia session.

11.7.2 Suspending and resuming of an ongoing session

It shall be possible for the user to suspend an IP multimedia session, and resume that IP multimedia session at a later time.

11.7.3 Presentation of identity of connected-to party of a session

It shall be possible to present to the originator of a session the identity of the party to which she is connected.

However, the connected-to party shall be able to request that her identity is not revealed to the originator of the session.

11.8 Ending a session

The user shall be able to end an IP multimedia session at any time during the session.

11.9 Local services

When users roam outside the Home Environment, as well as being able to access VHE features with a similar look and feel to the home network, they should also be able to access services of a local nature offered to them by the visited network.

Such services offered by the visited network could include, for example:

- Access to local numbering plans;
- Address translation;
- Services dependent on the geographical location of the user, e.g. traffic information.

Visited network offered services would probably be non-subscription services, although they may be chargeable, with charges collected via the Home Environment according to the usual arrangements for roaming.

11.10 Handling of conferences

Conferences allow users participating in the conference to communicate with all other participants simultaneously. A conference has a "conference focus", that controls the conference.

Note that a user, participating in the conference, depending on the conference policy may be allowed to communicate with the focus (e.g. to request invitation of another user into the conference).

The following minimum user requirements for conferences exist:

- A user shall be able to request the creation of a conference.
- A user shall be able to request to join an existing conference.
- A user participating in the conference shall be able to request modification of the conference (e.g. add/remove media, manipulation of data streams, add/remove participants) depending on the conference policy.
- A user participating in the conference shall be able to request termination of the conference, depending on the conference policy.

- A user participating in the conference shall be able to receive information from the conference focus (e.g. participants in conference, participants joining or leaving the conference)

12 Interworking considerations

12.1 Interworking with PSTN / ISDN network

The NGN phone services shall interwork with PSTN / ISDN network.

To allow right interconnections, same services information shall be available in both PSTN/ISDN and NGN network (e.g. First Called Line Identity, Visual Indicator, etc…)

12.2 Interworking with the mobile network

The NGN phone services shall interwork with the mobile network UMTS R5.

12.3 Interworking with other networks

12.3.1 WI-FI

This radio interface (named 802.11) allows a quite unlimited bit rate. The NGN phone services shall interwork with WI-FI network.

12.3.2 BLUE TOOTH

This radio interface allows a maximum of 856 kb/s (approx.).

The basic phone simulation NGN services shall interwork with Blue Tooth network.

12.3.3 Cable Network

To be completed

13 History

Document history		
V0.0.1	December 2002	1st Draft.
V0.0.2	December 2002	Comments from SPAN#9
V0.0.3	March 2003	
V0.0.4	March 2003	Result of SPAN#10
V0.0.5	June 2003	SPAN#11
V0.0.6	September 2003	TISPAN#1
V0.0.7	December 2003	TISPAN#2
V0.0.8	February 2004	TISPAN#2bis
V0.0.9	April 2004	TISPAN#3
V0.0.10	April 2004	Output from TISPAN#3
V0.1.0	April 2004	Output from TISPAN#3
V0.1.1	June 2004	Input for TISPAN#3bis
V0.1.2	November 2004	Input for TISPAN#04bis according TISPAN#04 results
V0.1.3	November 2004	Output from TISPAN#04bis
V0.1.4	January 2005	Input for TISPAN#05
V0.1.5	January 2005	TISPAN#05 output
V0.1.6	March 2005	TISPAN#05bis output

ETSI TISPAN#05bis **05bTD228a1**

Sophia Antipolis

28 February-4 March 2005

Extract from DTS TISPAN 01 025-NGN

Service and Capabilities Requirements for TISPAN NGN; Release 1

---

5 IP Multimedia Services

5.2.1 General Services Requirements

IP multimedia sessions shall be able to support a variety of different media types. A set of media types shall be identified to ensure interoperability (e.g. default codec selection).

Within each IP multimedia session, one or more IP multimedia applications shall be supported.

The user shall be able to invoke one or more IP multimedia sessions. Where more than one application is supported within a multimedia session the user shall also be able to activate concurrent IP multimedia applications within each IP multimedia session.

The TISPAN NGN shall be able to identify the condition of Network Defined User Busy (NDUB).

Editor's Note: The definition of Network Determined User Busy condition shall be provided in [1].

Editor's Note: Some of the general requirements don't apply to Simulation.

The network shall be able to provide applications with information about the state (e.g. attached/non-attached) of a user's access connection for non-nomadic, nomadic and roaming users.

The network shall be able to provide applications with user location information for non-nomadic, nomadic and roaming users.

Editor's Note: The 2 last sentences related to Location requires some work to ensure that this is aligned with the EMTEL requirements.

5.2.2 PSTN/ISDN Simulation Service

The TISPAN NGN shall support PSTN/ISDN simulation that provides the user with an experience that may or may not differ to an existing PSTN/ISDN experience.

The TISPAN NGN shall support the ability for a service operator to simulate one or more of their PSTN/ISDN services.

The TISPAN NGN shall support PSTN/ISDN like service capabilities. The way in which PSTN/ISDN services are delivered should not impact on the delivery of new NGN services.

- The following PSTN/ISDN Simulation Service shall be supported in TISPAN NGN R1:
- Originating Identification Presentation (OIP)
- Originating Identification Restriction (OIR)
- Terminating Identification Presentation (TIP)
- Terminating Identification Presentation Restriction (TIR)
- Malicious Communication Identification (MCID)
- Anonymous Communication Rejection (ACR)
- Communication Diversion
- Communication Waiting (CW)
- Communication Hold (HOLD)
- Communication Completion Services (Completion of Communications to Busy Subscriber (CCBS))
- Message Waiting Indication (MWI)
- Conference (CONF)
- Advice of Charge (AOC)

The specific requirements for the PSTN/ISDN simulation service are described in [2].

5.2.8 Redirecting of IP Multimedia sessions

It shall be possible for the user or the network to identify an alternative destination for an IP multimedia session or individual media of an IP multimedia session. The sending party, receiving party or the network on their behalf, may initiate redirection to alternative destinations. It shall be possible for redirection to be initiated at various stages of an IP Multimedia session. For example:

- Prior to the set up of an IP Multimedia session
- During the initial request for an IP Multimedia session
- During the establishment of an IP Multimedia session
- While the IP Multimedia session is ongoing

Redirection can be applied for all Multimedia sessions unconditionally or it can be caused by any of a set list of events or conditions. Typical causes could be:

- Identity of the caller
- Location or presence of the calling or called party
- If the called party is already in a session

- If the called party is unreachable or unavailable in some other way
- If the called party does not respond
- After a specified alerting interval
- User's preference on routing for specific IP Multimedia session based on the capabilities of multiple UEs sharing the same IMS service subscription.
- Time of day.