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INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS
AND NEXT-GENERATION NETWORKS

Next Generation Networks – Service aspects: Service
capabilities and service architecture

IMS-based real-time conversational multimedia services over NGN

ITU-T Recommendation Y.2211

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ITU-T Recommendation Y.2211

IMS-based real-time conversational multimedia services over NGN

Summary

NGN release 1 makes provision for a category of services which are referred to as real-time conversational multimedia services, as shown in Supplement 1 to the ITU-T Y.2000-series Recommendations. These include PSTN/ISDN simulation services and other services. When these real-time conversational multimedia services are provided by using an IMS-based service environment, the implementations will use SIP protocol between the application/service support functions and the service control functions within the service stratum of the NGN architecture. IMS-based NGNs which meet these service requirements will be capable of supporting real-time conversational multimedia services with enhanced service features, as well as allowing for enhanced implementation scenarios. This Recommendation defines the service requirements, service features, service architecture and implementation scenarios of IMS-based real-time conversational multimedia services.

Source

ITU-T Recommendation Y.2211 was approved on 7 October 2007 by ITU-T Study Group 13 (2005-2008) under the ITU-T Recommendation A.8 procedure.

Keywords

Implementation scenarios, IMS, real-time conversational multimedia services, service feature.

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ITU-T Recommendation Y.2211

IMS-based real-time conversational multimedia services over NGN

1 Scope

This Recommendation defines the service requirements, service features, service architecture and implementation scenarios of IMS-based real-time conversational multimedia services.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T M.3050.1] ITU-T Recommendation M.3050.1 (2007), *Enhanced Telecom Operations Map (eTOM) – The business process framework*.

[ITU-T Q.1290] ITU-T Recommendation Q.1290 (1998), *Glossary of terms used in the definition of intelligent network*.

[ITU-T Y.2012] ITU-T Recommendation Y.2012 (2006), *Functional requirements and architecture of the NGN release 1*.

[ITU-T Y.2021] ITU-T Recommendation Y.2021 (2006), *IMS for Next Generation Networks*.

[ITU-T Y.2201] ITU-T Recommendation Y.2201 (2007), *NGN release 1 requirements*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 customer [ITU-T M.3050.1]: The customer buys products and services from the enterprise or receives free offers or services. A customer may be a person or a business.

3.1.2 service feature [ITU-T Q.1290]: A reusable part of one or more service capabilities forming all or part of a service.

3.1.3 subscriber [ITU-T M.3050.1]: The person or organization responsible for concluding contracts for the services subscribed to and for paying for these services.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 IMS-based real-time conversational multimedia services: Multimedia services provided in real time by using an IMS-based service environment.

NOTE – These services may involve two or several parties using various media resources and are usually bidirectional.

3.2.2 served user: The user who subscribes to and, possibly, invokes a service.

3.2.3 service: A selection from the portfolio of offerings made available by a service provider, characterized by one or more service features, which the user may subscribe to and be optionally charged for.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

3PCC	Third Party Communication Control
AC	Authorization Code
ACB	Automatic Communication Back
ACR	Anonymous Communication Rejection
AGC-FE	Access Gateway Control Functional Entity
AOC	Advice of Charge
AOC-D	Advice of Charge: Charging information during the communication
AOC-E	Advice of Charge: Charging information at the end of the communication
AOC-S	Advice of Charge: Charging information at communication set-up time
AS-FE	Application Server Functional Entity
BGC-FE	Breakout Gateway Control Functional Entity
CA	Customized Announcement
CB	Communication Barring
CBM	Customized Background Music
CCBS	Completion of Communication to Busy Subscriber
CD	Communication Deflection
CDIST	Communication DISTribution
CDIV	Communication DIVersion
CDIVN	Communication DIVersion Notification
CF	Communication Forwarding
CFB	Communication Forwarding Busy
CFNL	Communication Forwarding on Not Logged in
CFNR	Communication Forwarding No Reply
CFNRc	Communication Forwarding on subscriber Not Reachable
CFU	Communication Forwarding Unconditional
CL	Communication Logging
CLI	Calling Line Identification
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
COLP	COConnected Line identification Presentation
COLR	COConnected Line identification Restriction
CONF	CONFeRence

CR	Customized Routing
CRBT	Customized Ring-Back Tone
CRG	Customized Ringing
CTD	Click-To-Dial
CW	Communication Waiting
DMTQ	Destination-associated Message Type Query
ECT	Explicit Communication Transfer
FE	Functional Entity
FMD	Follow-Me Diversion
GC	Group Communication
GSM	Global System for Mobile communications
HOLD	Communication HOLD
ICB	Incoming Communication Barring
IMS	IP Multimedia Subsystem
ISDN	Integrated Services Digital Network
MCID	Malicious Communication IDentification
MGC-FE	Media Gateway Control Functional Entity
MPC	Multi-Party Communication
MRC-FE	Media Resource Control Functional Entity
MRP-FE	Media Resource Processing Functional Entity
MW	Message Waiting
MWI	MW Indication
NR	No Reply
OCB	Outgoing Communication Barring
OCS	Originating Communication Screening
OFLC	Off-Line Charging
OIP	Originating Identification Presentation
OIR	Originating Identification Restriction
ONLC	On-Line Charging
P-CSC-FE	Proxy Call Session Control Functional Entity
PI	Personal Identifier
PSTN	Public Switched Telecommunication Network
QoS	Quality of Service
RC	Reverse Charging
RP	Ring Pattern
SC	Split Charging
S-CSC-FE	Serving Call Session Control Functional Entity

SIP	Session Initiation Protocol
SUP-FE	Service User Profile Functional Entity
TCS	Terminating Communication Screening
TIP	Terminating Identification Presentation
TIR	Terminating Identification Restriction
UCN	Unsuccessful Communication Notification
UE	User Equipment
UIPR	User Identification Presentation and Restriction
UMTS	Universal Mobile Telecommunication System
UPM	User Profile Management
UPT	Universal Personal Telecommunication
URL	Uniform Resource Locator

5 Conventions

This Recommendation deals with a transition to the NGN. As a result, terms that were used in the PSTN have to be transformed to apply to the new environment. Additionally, some terms have been ingrained over time and in some instances a number of terms have the same meaning. For readability, sometimes one term is given preference and hence is used over the others.

Specifically:

- the terms "end user", "party" and "user" are used interchangeably depending on context,
- the terms "served user" and "subscriber" are used interchangeably depending on context,
- the PSTN/ISDN term "call" is replaced in most instances with the term "communication" when used in the context of NGN,
- in this Recommendation, when the term "real-time service" is used, it is intended that it applies to at least the voice, video and text media types.

In some instances there is a need to talk about users who originate communication, users who receive communication, and users who have subscribed to services that provide information in addition to the original communication. For these situations, the following conventions are used:

- When dealing with situations where a user is invoking a service, the user is referred to as the user or user A.
- When dealing with situations where a communication involves a number of users, the following convention is used: the user for whom the service was subscribed is referred to as "user A", "user B" would be the second user associated with the communication, "user C" would be the third user associated with the communication, etc. For example, user A calls user B and then calls user C.
- A served user is the user who subscribes to and, possibly, invokes a service, and need not have originated the communication. For example, a user who subscribes to the authorization code service feature would be referred to as the served user and the user that originates the communication for which the served user receives information would be referred to as user A or the calling party. As a second example, if a served user subscribes to calling line identification, then the served user, i.e., the called party or terminating party, will receive the calling line identification of the calling or originating party.

6 General requirements for IMS-based real-time conversational multimedia services

NGN release 1 is required to support provisioning of real-time conversational multimedia services within an IMS-based service environment. This clause describes general requirements which are required to be supported to enable IMS-based real-time conversational multimedia services [ITU-T Y.2201]. This clause also describes general objectives which would enable IMS-based real-time conversational multimedia services [ITU-T Y.2201].

- NGN is required to support various media resources during sessions to enable a wide range of IMS-based real-time conversational multimedia services, including voice, video, real-time text, data, etc.
- NGNs offering IMS-based real-time conversational multimedia services are required to be able to support identical media types in both directions.
- NGNs offering IMS-based real-time conversational multimedia services are required to support the addition and removal of individual media to/from a multimedia service communication.
- NGN is required to support QoS for IMS-based real-time conversational multimedia services, from the point of view of users.
- NGN is required to allow priority for some services, e.g., emergency telecommunication, over other services.
- NGN is required to support end-to-end negotiation of codecs, to reduce the need for transcoding and thus not needlessly degrade the quality of real-time sessions.
- NGN is required to use SIP between service control functions and application/service support functions within the service stratum to support the IMS-based real-time conversational multimedia services [ITU-T Y.2012].
- NGN is required to use appropriate security mechanisms to meet the security needs of users and of the IMS-based real-time conversational multimedia services.
- NGN is required to support the use of both legacy and intelligent terminals for the provision of IMS-based real-time conversational multimedia services. Subscribers who use intelligent terminals may have access to more service features.
- NGNs are required to support flexible service trigger mechanisms to allow for creation of real-time conversational multimedia services.
- NGN is required to provide service features for IMS-based real-time conversational multimedia services that are equivalent to the services features available in legacy networks, or equivalent services.
- NGN is required to support interworking of the IMS-based real-time conversational multimedia services with the existing fixed and mobile networks, including PSTN, ISDN, GSM/UMTS and Internet.

7 IMS-based real-time conversational multimedia services architecture details

Figure 1 below depicts a functional architecture, based on the NGN architecture [ITU-T Y.2012], which can be used to support IMS-based real-time conversational multimedia services. Application support functions and service support functions contain a variety of service features for real-time conversational multimedia services. These service features may be used to implement different services in response to different requirements. Application support functions and service support functions will interact with S-CSC-FE, MRC-FE, SUP-FE and end-user functions using A-S₄, A-S₃, A-S₆ and A-U₁ respectively to deliver various service-related information.

- A-S₄ is used to deliver information related to service control, including service triggering information and call control-related information. This is identified as the ISC reference point in [ITU-T Y.2021].
- A-S₃ is used by application/service support functions to notify the MRC-FE of media resources control information.
NOTE – A-S₃ is shown within NGN environment [ITU-T Y.2012]. This is used for media resources control. A set of implementation scenarios including information flow on A-S₃ is shown in Appendix IV.
- A-S₆ is used to transfer user profile information from SUP-FE to the application/service support functions, e.g., user service-related information. This is identified as the Sh reference point in [ITU-T Y.2021].
- A-U₁ is used for self-management of service profiles by subscribers. This is identified as the Ut reference point in [ITU-T Y.2021].

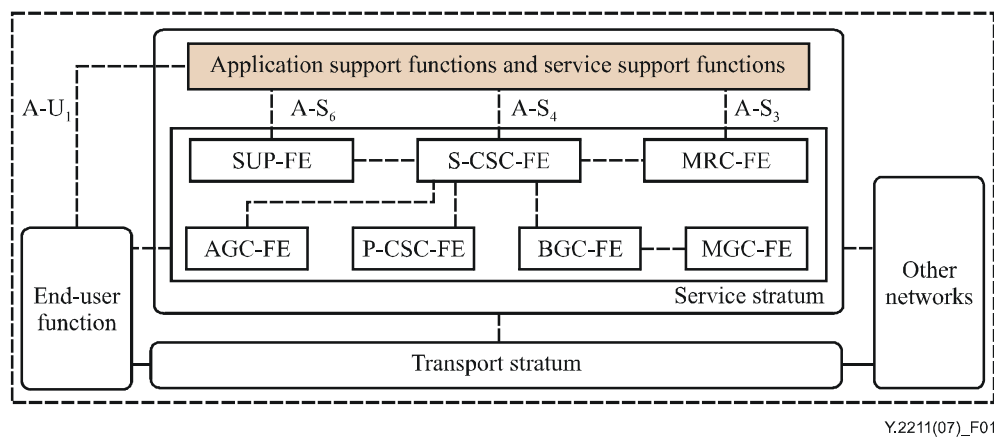


Figure 1 – IMS-based real-time conversational multimedia services functional architecture

8 Service features for IMS-based real-time conversational multimedia services

This clause describes service features of IMS-based real-time conversational multimedia services. A service feature is a key aspect of communication services and forms a general and primitive component to compose specific communication services. Specific communication services characterized by service features are described in clauses 9 through 12.

Authorization code (AC)

This service feature allows the served user to override calling restrictions of the terminal from which the communication is made. Different sets of calling privileges can be assigned to different authorization codes and a given authorization code can be shared by multiple users.

Automatic communication back (ACB)

This service feature allows the called party to automatically initiate a communication back to the calling party of the most recent communication directed to the called party.

Customized announcement (CA)

This service feature allows a served user to send customized announcements during the establishment of a communication session or during an established communication session, for example, to explain the reason for rejecting a communication request, to notify of a diversion or a hold, to indicate a message waiting, or to provide a ring-back tone or media in place of a ring-back

tone. The announcement may use any type of media, e.g., it may be an audio announcement, a video clip or a text message.

Customized background music (CBM)

This service feature allows playing background music during a communication, e.g., music.

The background music could be configured in advance by the user. The user could insert a song during a communication.

Communication distribution (CDIST)

This service feature allows the served user to specify the percentage of calls to be distributed among two or more destinations. Other criteria may also apply to the distribution of calls to each destination.

Communication forwarding (CF)

This service feature allows the called party to forward his incoming communication to another party depending on conditions specified by the called party, including busy, no reply, not logged in or unconditional. A notification of diversion may be provided to the calling party and the diverting user. As part of this service feature, when a served user attempts to initiate the call forwarding feature, the system will review the proposed "forwarded to identifier" against a disallowed forwarded to identifier database. If the identifier is found, the request to call forward to that party will be rejected (i.e., the emergency service identifier could not be set as the forwarded to identifier).

Communication hold (HOLD)

This service feature allows the user to suspend one or more media within a session, and resume that/those media at a later time. A notification may be provided to the held party.

Communication logging (CL)

This service feature allows for a communication detail record to be prepared each time a communication is received to a specified communication number.

Customized routing (CR)

This service feature enables the subscriber to accept or reject a call and, in case of acceptance, to route this call, according to a set of rules which may be based on: the calling party geographical location, the time of day, the day, and/or presence information.

When this feature is applied, the service (e.g., UPT service) queries the subscriber's routing rule to obtain an appropriate terminating identifier, and routes the communication to the appropriate terminal.

Customized ringing (CRG)

This service feature allows the user to set the media provided by the media server for ringing which may be different depending on the called party, special day, etc. When the user equipment receives a communication, it detects whether the ringing is networked or local. If the ringing is networked, the user equipment activates the service by initiating a request to connect to the media server and then the user equipment plays the media stream received from the media server. The customized ringing media could be a specific song, an image, or a multimedia stream.

Communication transfer (CT)

This service feature enables a user to transfer an established (i.e., active) communication to a third party.

Click-to-dial (CTD)

This service feature allows the user to initiate a request to establish a communication conveniently by clicking on a web page icon or button. The use of this service feature alone is not sufficient to establish a communication, this service feature needs to combine with the third party communication control service feature.

Communication waiting (CW)

This service feature allows the called party to receive a notification that another party is trying to reach his number while he is busy communicating to another party.

Destination-associated message type query (DMTQ)

This service feature allows the user to pre-define possible message types, with this information being accessible by other users. When this feature is applied, the user is able to access this information by querying the application server to obtain a destination terminal address and the associated pre-defined message types.

Follow-me diversion (FMD)

With this service feature, a user may register for incoming calls to any terminal access. When registered to a terminal access, all incoming calls to the user will be presented to that terminal access. A registration for incoming calls will cancel any previous registration. Several users may register for incoming calls to the same terminal access simultaneously. The user may also explicitly de-register for incoming calls.

Group communication (GC)

This service feature allows the user to request pre-defined group information stored in the network when establishing multiple simultaneous communication with other parties. The use of this service feature alone is not sufficient to establish the communication. Different users are added to the communication according to their pre-defined privileges.

Multi-party communication (MPC)

This service feature allows the user to establish multiple simultaneous communication with other parties.

Message waiting (MW)

This service feature enables a user to be informed that messages for his attention are waiting.

Originating communication screening (OCS)

This service feature allows the subscriber to specify that outgoing calls be either restricted or allowed, according to a screening list and, optionally, by time of day control. This can be overridden on a per-communication basis by anyone with the proper authorization code.

Off-line charging (OFLC)

This service feature allows for off-line charging for services where delayed charging is acceptable.

ON-line charging (ONLC)

This service feature allows applying on-line charging for services where real-time charging and control are critical and required.

Personal identifier (PI)

This service feature allows the user to hold a unique identifier as personal identification while communicating with others. The user can use a personal identifier as his/her unique identification to communicate with others. All of the user's terminal devices could be bound with a personal

identifier. The service capabilities would be defined with respect to a personal identifier. No matter whether a binding fixed terminal or a binding mobile terminal is used, the user could enjoy the same service experience.

Reverse charging (REVC)

This service feature allows the service subscriber (e.g., free phone) to accept receipt of calls at its expense and be charged for the entire cost of the communication.

Ring pattern (RP)

This service feature supports various ring patterns of destination number, i.e., parallel ring, sequential ring, combination ring of the previous two.

Split charging (SC)

This service feature allows for the separation of charges for a specific communication, the calling and called party each being charged for one part of the communication.

Terminating communication screening (TCS)

Terminating calls may be controlled by the terminating communication screening capability. This allows the called party to specify that incoming calls be either restricted or allowed, according to a screening list of identifiers of the calling parties and, optionally, by time of day control.

Typical scenarios include:

- 1) Calling user A attempts to make a communication to B. The communication is screened via the screening list assigned to B. The communication is allowed to complete and A is connected to B.
- 2) Calling user A attempts to make a communication to B. The communication is screened via the screening list assigned to B. The communication is not allowed to complete and A is connected to an announcement.

Third party communication control (3PCC)

This service feature allows a user to set up, release and control a communication between parties when the user is different from the parties directly involved in the communication.

Unsuccessful communication notification (UCN)

This service feature allows the subscriber to be informed of the unsuccessful incoming calls in a preset way, e.g., e-mail message, etc.

User identification presentation and restriction (UIPR)

This service feature allows the user to receive user identification information from the other party or prevent presentation of his user identification information to the other party within a communication. The user could be either a calling party or a called party. As government policy or operator policy, this feature is sometimes forced to be supported.

User profile management (UPM)

This service feature allows the served user to manage his service profile, e.g., terminating destinations, announcements to be played, communication forwarding, and so on.

9 PSTN/ISDN simulation services

9.1 Introduction

An important aspect of the PSTN/ISDN simulation service is to provide PSTN/ISDN-like services. Nevertheless, the requirements are independent of the media that is used during the communication.

This clause covers part of the transition from PSTN/ISDN to an NGN. Interconnection between the existing networks and an NGN is also covered.

9.2 General

There is no mandatory requirement to offer PSTN/ISDN simulation services in a particular network deployment.

The PSTN/ISDN simulation services support interworking with existing fixed and mobile networks, including PSTN, ISDN, GSM/UMTS and Internet. Services not interoperated across the different network types should be declined in a graceful and consistent manner.

In addition to the capabilities to establish a bidirectional point-to-point communication between two parties, a selected number of PSTN/ISDN simulation services, corresponding to perceived popular PSTN/ISDN supplementary services, are included in this Recommendation. PSTN/ISDN simulation services are described from a user's perspective and are similar, and in some instances almost identical, to the corresponding PSTN/ISDN supplementary services. The services described are not limited to the voice media as in PSTN/ISDN, but are intended to be generally applicable regardless of the media used (voice, video, text, etc.).

However, from a functionality distribution perspective, this clause places no particular requirements on the functionality distribution between the network and terminals. Further, the need to preserve the split of functionality, between the network and terminals, provided for supplementary services in an ISDN or PSTN is not a requirement with regard to the NGN.

This clause only deals with services using IMS. Services provided by an NGN to support legacy terminals and interfaces (PSTN/ISDN emulation) are defined in existing PSTN/ISDN documents. Requirements for PSTN/ISDN emulation are out the scope of this Recommendation and are described in other Recommendations (e.g., [b-ITU-T Y.2271] and [b-ITU-T Y.2031]).

Provision, withdrawal, registration, erasure, activation, deactivation and invocation are defined in [b-ITU-T I.210].

The remaining subclauses within this clause provide the description of the PSTN/ISDN simulation services.

For each PSTN/ISDN simulation service, the following is provided:

- a short service definition;
- a description of the normal operation with successful outcome.

And, when applicable, also:

- a description of exceptional operation or unsuccessful outcome;
- descriptions on interaction with other PSTN/ISDN simulation services; and
- considerations for interworking with the PSTN/ISDN.

If one simulation service is not mentioned within the interaction clause, then there is no impact or the interaction is described in the clause related to that simulation service.

9.3 Interworking considerations

9.3.1 Interworking with existing PSTN/ISDN networks

An NGN supports the interoperability of the PSTN/ISDN simulation services with PSTN/ISDN services and vice versa. This includes interworking PSTN/ISDN supplementary services with the services defined in this Recommendation and vice versa. The scope of this interworking may result in a limited service capability.

9.3.2 Interworking with other NGNs

An NGN supports the interoperability of the simulation services defined in this Recommendation with other NGNs if the services are supported by both NGNs.

9.3.3 Interworking with emulation services

An NGN supports the interoperability of the PSTN/ISDN simulation services with the services provided by the NGN PSTN/ISDN emulation subsystems where both are deployed. The scope of this interworking may result in the same limited service capability as interworking with an existing PSTN/ISDN network.

9.4 Originating identification presentation (OIP)

9.4.1 Description

The OIP simulation service provides the terminating party with the asserted identification information of the originating party.

9.4.2 OIP service interactions with other PSTN/ISDN simulation services

Originating identification restriction: The OIR service shall have precedence over OIP.

NOTE – The requirements for support of emergency telecommunication may override the user request for suppression.

Communication forwarding unconditional (CFU): When a communication has been forwarded and the forwarded-to party has subscribed to the OIP simulation service, the forwarded-to party receives the identification information of the original originating party, if the original originating party has not subscribed to or invoked the OIR simulation service.

Communication forwarding busy (CFB): When a communication has been forwarded and the forwarded-to party has been provided with the OIP simulation service, the forwarded-to party receives the identification information of the original originating party, if this original originating party has not subscribed to or invoked the OIR simulation service.

Communication forwarding no reply (CFNR): When a communication has been forwarded and the forwarded-to party has been provided with the OIP simulation service, the forwarded-to party receives the identification information of the original originating party, if this original originating party has not subscribed to or invoked the OIR simulation service.

Communication forwarding on not logged in (CFNL): When a communication has been forwarded and the forwarded-to party has been provided with the OIP simulation service, the forwarded-to party receives the identification information of the original originating party, if this original originating party has not subscribed to or invoked the OIR simulation service.

Communication deflection (CD): When a communication has been deflected and the deflected-to party has been provided with the OIP simulation service, the deflected-to party receives the identification information of the original originating party, if this original originating party has not subscribed to or invoked the OIR simulation service.

Communication forwarding on subscriber not reachable (CFNRc): When a communication has been forwarded and the forwarded-to party has been provided with the OIP simulation service, the forwarded-to party receives the identification information of the original originating party, if this originating party has not subscribed to or invoked the OIR simulation service.

Communication diversion notification (CDIVN): When a communication diversion is being notified to a served user (who has subscribed for CDIV notification) and the served user has been provided with the OIP simulation service, then the served user receives the identification information of the originating party, if:

- this originating party has not subscribed to or invoked the OIR simulation service; and
- the served user has not disabled delivery of originating party identification within the CDIV notification.

Communication waiting (CW): If a party has the OIP service active and is notified that an incoming communication is waiting, then this party receives the identification information of the originating party, if this originating party has not subscribed to or invoked the OIR simulation service.

9.4.3 OIP interoperability with PSTN/ISDN networks

The NGN supports the interoperability of the OIP service with the PSTN/ISDN supplementary service CLIP and vice versa. The scope of this interworking may result in a limited service capability (only E.164 numbers can be used in the PSTN/ISDN).

9.5 Originating identification restriction (OIR)

9.5.1 Description

The originating identification restriction (OIR) simulation service enables the originating party to withhold the presentation of its identification information to the terminating party.

NOTE – The requirements for support of emergency telecommunication may override the user request for suppression, i.e., a properly authorized terminating party may invoke an override capability.

9.5.2 OIR service interactions with other PSTN/ISDN simulation services

Originating identification presentation: The OIR service shall have precedence over OIP.

NOTE – The requirements for support of emergency telecommunication may override the user request for suppression.

Communication forwarding unconditional (CFU), communication forwarding busy (CFB), communication forwarding no reply (CFNR), communication forwarding on not logged in (CFNL), communication deflection (CD), communication forwarding on subscriber not reachable (CFNRc): When the OIR simulation service has been invoked, the originating party's identification information is not presented to the forwarded-to party unless the forwarded-to party has invoked an override capability.

Communication diversion notification (CDIVN): When the OIR simulation service has been invoked, the originating party's identification information shall not be notified to the user who has subscribed for the CDIVN service.

Explicit communication transfer (ECT): Originating party's restriction requirements from the original communication are used in order to restrict the presentation of that party's identification information to any party in a transferred communication, unless the forwarded-to party has invoked an override capability.

9.5.3 OIR interoperability with PSTN/ISDN networks

An NGN supports the interoperability of OIR service with the PSTN/ISDN supplementary service CLIR and vice versa. The scope of this interworking may result in a limited service capability. The originating party's identification restriction information is conveyed from an NGN to a PSTN/ISDN and vice versa. The network to which the terminating party is connected to is responsible to handle this service.

In case of limited interoperability, OIR/CLIR shall have precedence over OIP/CLIP.

9.6 Terminating identification presentation (TIP)

9.6.1 Description

The TIP simulation service provides the originating party with the asserted identification information of the terminating party.

9.6.2 TIP service interactions with other ISDN/PSTN simulation services (NGN)

Terminating identification restriction (TIR): TIR shall have precedence over TIP.

Communication diversion (CDIV): If forwarding party B chooses to restrict the presentation of the forwarded-to party, i.e., C's identification information, the originating party A does not receive the terminating party C's identification information, irrespective of whether the terminating party C has TIR activated or not.

9.6.3 TIP interoperability with PSTN/ISDN networks

The NGN supports the interoperability of the TIP services with the PSTN/ISDN supplementary service COLP and vice versa. The scope of this interworking may result in a limited service capability.

9.7 Terminating identification restriction (TIR)

9.7.1 Description

The terminating identification restriction (TIR) enables the terminating party to withhold presentation of its asserted identification information to the originating party.

NOTE – The requirements for support of emergency telecommunication may override the user request for suppression.

9.7.2 TIR service interactions with other PSTN/ISDN simulation services

Terminating identification presentation (TIP): TIR shall have precedence over TIP.

9.7.3 TIR interoperability with PSTN/ISDN networks

The NGN supports the interoperability of the TIR services with PSTN/ISDN supplementary service COLR and vice versa. The scope of this interworking may result in a limited service capability.

In case of limited interoperability, TIR/COLR shall have precedence over TIP/COLP.

9.8 Malicious communication identification (MCID)

9.8.1 Description

The malicious communication identification (MCID) simulation service enables an incoming communication to be identified and registered.

The service is required for all communications, irrespective of which network originated the communication. It is normally provided following a request from the customer concerned, and may be subject to authorization before being invoked.

9.8.2 MCID service interactions with other PSTN/ISDN simulation services

Communication diversion (CDIV): The MCID simulation service can be invoked for a diverted communication. In addition to the normal operation of the MCID simulation service, the identifier of the first diverting party is registered and, as a network option, the last diverting party may be registered.