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ITU-T J.366.3

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SERIES J: CABLE NETWORKS AND TRANSMISSION OF TELEVISION, SOUND PROGRAMME AND OTHER MULTIMEDIA SIGNALS

IPCablecom

IPCablecom2 IP Multimedia Subsystem (IMS): Stage 2 Specification

Recommendation ITU-T J.366.3

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IPCablecom2 IP Multimedia Subsystem (IMS): Stage 2 specification

Summary

Recommendation ITU-T J.366.3 defines the stage-2 service description for the IP Multimedia Core Network Subsystem (IMS), which includes the elements necessary to support IP multimedia (IM) services. Recommendation ITU-T I.130 describes a three-stage method for the characterization of telecommunication services, and Recommendation ITU-T Q.65 defines Stage 2 of the method.

The Third Generation Partnership Project (3GPP) has developed the specification in a form optimized for the wireless environment. Recommendation ITU-T J.366.3 references the ETSI version of the 3GPP specification (ETSI TS 123 228 V6.12.0 (2005-12)) and specifies only the modifications necessary to optimize it for the cable environment.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T J.366.3	2010-08-29	9

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

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

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

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IPCablecom2 IP Multimedia Subsystem (IMS): Stage 2 Specification

1 Scope

This Recommendation defines the stage-2 service description for the IP Multimedia Core Network Subsystem (IMS), which includes the elements necessary to support IP Multimedia (IM) services. [ITU-T I.130] describes a three-stage method for the characterization of telecommunication services, and [ITU-T Q.65] defines stage-2 of the method.

The Third Generation Partnership Project (3GPP) has developed the specification in a form optimized for the wireless environment. This Recommendation references the ETSI version of the 3GPP specification and specifies only the modifications necessary to optimize it for the cable environment.

It is an important objective of this work that interoperability between IPCablecom 2.0 and 3GPP IMS is provided. IPCablecom 2.0 is based upon 3GPP IMS, but includes additional functionality necessary to meet the requirements of cable operators. Recognizing developing converged solutions for wireless, wireline, and cable, it is expected that further development of IPCablecom 2.0 will continue to monitor and contribute to IMS developments in 3GPP, with the aim of alignment of 3GPP IMS and IPCablecom 2.0.

Because ITU-T Recommendation indicates modifications from the ETSI specification [ETSI TS 123 228], the structure of the Recommendation does not follow normal ITU-T practice, to ease the task of the reader to correlate the two documents. The modifications are shown in clause 6.

2 References

[ITU-T I.130] Recommendation ITU-T I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN.*

[ITU-T Q.65] Recommendation ITU-T Q.65 (2000), *The unified functional methodology for the characterization of services and network capabilities including alternative object-oriented techniques.*

[ETSI TS 123 228] ETSI TS 123 228 V6.12.0 (2005), *IP Multimedia Subsystem (IMS); Stage 2.*

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the terms defined in [ETSI TS 123 228].

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the abbreviations provided in [ETSI TS 123 228].

5 Conventions

This Recommendation uses the conventions provided in [ETSI TS 123 228].

6 Modifications to [ETSI TS 123 228]

Modifications introduced by this Recommendation are shown in revision marks. Unchanged text is replaced by ellipsis (…). Some parts of unchanged text (section numbers, etc.) may be kept to indicate the correct insertion points.

2 References

…

~~[3] Recommendation ITU-T Q.65: *"Methodology – Stage 2 of the method for the characterisation of services supported by an ISDN"*.~~

~~[4] Recommendation ITU-T I.130: *"Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN"*.~~

[3] Recommendation ITU-T Q.65 (2000), *The unified functional methodology for the characterization of services and network capabilities including alternative object-oriented techniques.*

[4] Recommendation ITU-T I.130 (1988), *Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN.*

…

[45] Recommendation ITU-T J.360 (2006), Appendix V; *IPCablecom2 NAT and firewall traversal overview*.

[46] Recommendation ITU-T J.360 (2006), *Appendix II; Quality of service architecture technical overview.*

[47] IETF RFC 5627 (2009), *Obtaining and Using Globally Routable User Agent URIs (GRUUs) in the Session Initiation Protocol (SIP).*

[48] IETF RFC 5628 (2009), *Registration Event Package Extension for Session Initiation Protocol (SIP) Globally Routable User Agent URIs (GRUUs).*

[49] Recommendation ITU-T J.365 (2006), *IPCablecom2 application manager interface*.

3 Definitions, symbols and abbreviations

…

3.3 Abbreviations

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GMLC Gateway Mobile Location Centre

GUP Generic User Profile

GRUU Globally Routable User Agent URI

…

TrGW Translation Gateway

TSG Technical Specification Group

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4.3.3.2 Public user identities

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– Public User Identities are not authenticated by the network during registration.

– Public User Identities may be used to identify the user's information within the HSS (for example during mobile terminated session set-up).

4.3.3.2a Globally Routable User Agent URIs (GRUUs)

Each Public User Identity may have one or more Globally Routable User Agent URIs (GRUUs). Each GRUU is associated with one Public User Identity and one UE.

– The assignment and use of GRUUs conforms to the specifications of IETF RFC 5627 [47].

– For purposes of establishing the association, a UE is identified by an Instance ID. An Instance ID is only assigned to one UE at any given time.

– The GRUU serves as a URI that may be used from any domain and will route only to one UE possessing the associated Instance ID, and only if the UE is at that time registered to the associated Public User Identity.

– GRUUs are assigned by the S-CSCF.

– Requests addressed to a GRUU are routed for termination processing to the S-CSCF responsible for the Public User Identity to which the GRUU is associated.

– When doing termination processing for a request addressed to a GRUU, an S-CSCF shall use the IMS service profile for the Public User Identity to which the GRUU is associated.

– The services applied to a request addressed to a GRUU may differ from those applied to a request addressed to the associated Public User Identity. This shall be controlled by conditional specifications in the IMS service profile.

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4.3.3.4 Relationship of Private and Public User Identities

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All Service Profiles of a user shall be stored in the same HSS, even if the user has one or more shared Public User Identities.

4.3.3.5 Relationship of Public User Identities, GRUUs and UEs

Each GRUU is associated with one Public User Identity and one UE. This relationship is depicted in Figure 4.6a. If a UE registers (explicitly or implicitly) with multiple Public User Identities, a separate GRUU is associated with each. If different UEs register with the same Public User Identity, a separate GRUU is associated with each.

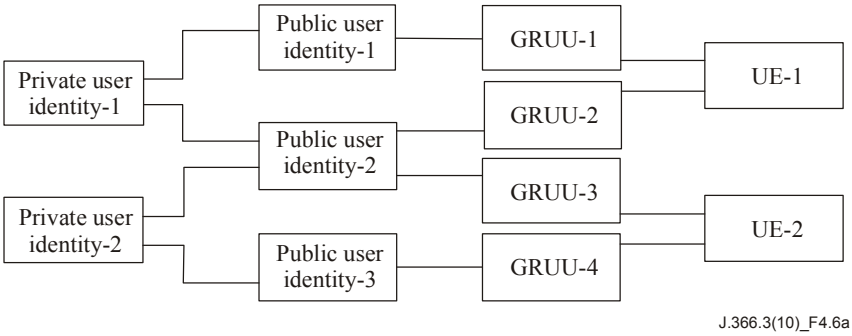

Figure 4.6a – The relationship of Public User Identities, GRUUs, and UEs

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4.6.1 Proxy-CSCF

The Proxy-CSCF (P-CSCF) is the first contact point within the IM CN subsystem. Its address is discovered by UEs using the mechanism described in section "Procedures related to Local CSCF Discovery". The P-CSCF behaves like a Proxy (as defined in RFC 3261 [12] or subsequent versions), i.e., it accepts requests and services them internally or forwards them on. The P-CSCF shall not modify the Request URI in the SIP INVITE message. The P-CSCF may behave as a User Agent (as defined in the RFC 3261 [12] or subsequent versions), i.e., in abnormal conditions it may terminate and independently generate SIP transactions.

The Policy Decision Function (PDF) may be a logical entity of the P-CSCF or a separate physical node. If the PDF is implemented in a separate physical node, the interface between the PDF and the P-CSCF is the Gq interface standardised in TS 23.207 [9].

When providing service to a UE residing in a cable-based access network, the interface between the IPCablecom Application Manager and the P-CSCF is defined by the IPCablecom Application Manager Interface specification [49].

The functions performed by the P-CSCF are:

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4.6.3 Serving-CSCF

The Serving-CSCF (S-CSCF) performs the session control services for the UE. It maintains a session state as needed by the network operator for support of the services. Within an operator's network, different S-CSCFs may have different functionalities. The functions performed by the S-CSCF during a session are:

Registration

– May behave as a Registrar as defined in RFC 3261 [12] or subsequent versions, i.e., it accepts registration requests and makes its information available through the location server (e.g., HSS).

– When a registration request includes an instance id with the contact being registered, the S-CSCF assigns a unique GRUU to the combination of Public User Identity and Instance ID.

– If a registration request indicates support for GRUU, the S-CSCF will return the GRUU assigned to each currently registered Instance ID.

– Notify subscribers about registration changes, including the GRUUs assigned to registered instances.

Session-related and session-unrelated flows

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4.11 Relationship to 3GPP Generic User Profile (GUP)

It shall be possible to apply the mechanisms and format of the 3GPP Generic User Profile (GUP) to IM CN Subsystem user related data. The 3GPP Generic User Profile (GUP) is described in TS 23.240 [31].

4.12 Network Address Translation traversal in access network

It shall be possible to support the scenario where a NAT(-PT)/NAPT(-PT) residing between the IMS functionality in the UE and the P-CSCF has to be traversed for IMS communication. This shall include at least the types of NATs that are commonly deployed. The NAT traversal methodology is based on IETF best practices and described in [45].

NOTE 1 – The UE may be one piece of equipment, or it may be a network of elements located on end-user's physical premises.

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5.4.4 Requirements for IP multi-media session control

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5. The IP-Connectivity Access Network service ~~shall~~ should be able to notify the IP multimedia session control when the IP-Connectivity Access Network service has either modified or suspend\ed or released the bearer(s) of a user associated with a session (because, e.g., the user is no longer reachable).

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5.4.7.0 General

At IP-CAN bearer activation the user shall have access to either IP-CAN services without service-based local policy, or IP-CAN services with service-based local policy. It is operator choice whether to offer both or only one of these alternatives for accessing the IM Subsystem.

When using IP-CAN without service-based local policy, the bearer is established according to the user's subscription, local operator's IP bearer resource based policy, local operator's admission control function and roaming agreements.

When using IP-CAN with service-based local policy, Service-Based Local Policy decisions (e.g., authorization and control) are also applied to the bearer.

The description in this clause and the following subclauses (subclauses 5.4.7.1 – 5.4.7.7) is applicable for the case when service-based local policy is employed.

For the case where IPCablecom Multimedia is employed, the applicable procedures are documented in [46].

The IP-Connectivity Access Network contains a Policy Enforcement Function (PEF) that has the capability of policing packet flow into the IP network, and restricting the set of IP destinations that may be reached from/through an IP-CAN bearer according to a packet classifier. This service-based policy 'gate' function has an external control interface that allows it to be selectively 'opened' or 'closed' on the basis of IP destination address and port. When open, the gate allows packets to pass through (to the destination specified in the classifier) and when closed, no packets are allowed to pass through. The control is performed by a PDF, which maybe a logical entity of the P-CSCF, or a separate physical node. (NOTE – If the PDF is implemented in a separate physical node, the interface between the PDF and the P-CSCF is he Gq interface standardized in TS 23.207 [9]).

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Annex F
(informative)
Routing subsequent requests through the S-CSCF

This annex provides some background information related to subclause 5.4.5.3.

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– Network initiated session release: The S-CSCF may generate a network-initiated session release, e.g., for administrative reasons. For that purpose a S-CSCF needs to be aware of ongoing sessions. In particular it must be aware of hard state dialogs that are required to be terminated by an explicit SIP request.

– GRUU: If a UE registered to the S-CSCF uses a Globally Routable User Agent URI (gruu) assigned by the S-CSCF as a contact address when establishing a dialog, then the S-CSCF must remain in the signalling path in order to translate mid-dialog requests addressed to that contact address.

The above criteria are particularly important for "multimedia telephony" type peer-to-peer communication.

– Media parameter control guarantees that the user does not use services he or she did not pay for.

– For telephony type services the session charging component is the most important one.

– If a subscriber is administratively blocked, the network shall have the possibility to terminate ongoing communication.

More generally, all ~~the~~these tasks are needed; thus they need to be provided elsewhere if the S-CSCF does not record-route.

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