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

IPCablecom

IPCablecom2 architecture framework

**Amendment 1: New Appendix IV –
Home subscriber server (HSS)**

ITU-T Recommendation J.360 (2006) – Amendment 1



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IPCablecom2 architecture framework

Amendment 1

New Appendix IV – Home subscriber server (HSS)

Summary

Appendix IV to ITU-T Recommendation J.360 provides an overview of the reference points for the home subscriber server (HSS) and related components. In addition, this appendix describes the specific HSS related enhancements to the 3GPP IMS Release 6 specifications to support the IPCablecom2 requirements.

Source

Amendment 1 to ITU-T Recommendation J.360 (2006) was agreed on 20 June 2007 by ITU-T Study Group 9 (2005-2008).

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ITU-T Recommendation J.360

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New Appendix IV – Home subscriber server (HSS)

(This appendix does not form an integral part of this Recommendation)

IV.1 Introduction and purpose

This appendix provides an overview of the reference points for the home subscriber server (HSS) and related components. In addition, this appendix describes the specific HSS related enhancements to the 3GPP IMS Release 6 specifications to support the IPCablecom2 requirements.

IV.1.1 Scope

The IPCablecom2 architecture framework [ITU-T J.360] describes the overall document organization plan for IPCablecom2. Since the IPCablecom2 HSS is closely aligned with 3GPP Release 6 IMS, the IPCablecom2 HSS normative requirements are defined in the delta specifications, which are enhanced versions of 3GPP specifications and accommodate cable-specific requirements.

The IPCablecom2 HSS requirements are documented in the following IMS Delta specifications: [ITU-T J.366.1], [ITU-T J.366.6], [ITU-T J.366.5] and [ITU-T J.366.10].

NOTE 1 – The IMS Delta specifications listed above may also contain requirements related to other portions of the IPCablecom2 architecture.

NOTE 2 – In the presence of any contradictions, the IPCablecom2 specifications take precedence over this technical report.

IV.1.1.1 Relationship to IPCablecom2 features and services

This appendix and its associated IMS delta specifications serve as a base for the handling of subscriber related data within IPCablecom2. This foundation provides for the support of a wide variety of communication services, ranging from legacy telephony features to new and enhanced communication applications and services.

This foundation is service independent and, therefore, requirements specific to each IPCablecom2 service and feature are out-of-scope for this appendix, and defined separately in IPCablecom2 service specifications. Any requirements that are deemed to be non-service specific are included and are addressed within this appendix.

IV.1.1.2 Relationship to other IPCablecom2 documents

The IPCablecom2 HSS specifications together define the generic HSS requirements for the following general capabilities:

- identification handling;
- user profile management (Cx and non-transparent data);
- application specific user profile management (transparent data);
- service profile provisioning;

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- call/session establishment support;
- user security support;
- registration state management.

The IP-Cablecom2 architecture uses these general capabilities, and, to fulfil service specific requirements, may document additional capabilities in IP-Cablecom2 service specifications.

IV.1.2 Organization

Clause IV.5 describes the IP-Cablecom2 HSS architecture, including the main functional elements and reference points.

Clause IV.6 describes the IP-Cablecom2 HSS enhancements to the 3GPP Release 6 IMS specifications motivated by the IP-Cablecom2 architecture or service requirements.

Clause IV.7 summarizes requirements considered that do not impact the HSS.

IV.2 References

IV.2.1 Informative references

This appendix uses the following additional informative references:

[ITU-T E.164]	ITU-T Recommendation E.164 (2005), <i>The international public telecommunication numbering plan</i> .
[ITU-T J.360]	ITU-T Recommendation J.360 (2006), <i>IP-Cablecom2 architecture framework</i> .
[ITU-T J.366.1]	ITU-T Recommendation J.366.1 (2007), <i>Organization of subscriber data specification (3GPP TS 23.008)</i> .
[ITU-T J.366.5]	ITU-T Recommendation J.366.5 (2007), <i>IP multimedia (IM) subsystem Cx and Dx interfaces; signalling flows and message contents specification (3GPP TS 29.228)</i> .
[ITU-T J.366.6]	ITU-T Recommendation J.366.6 (2007), <i>Cx/Dx interfaces based on the Diameter protocol specification (3GPP TS 29.229)</i> .
[ITU-T J.366.9]	ITU-T Recommendation J.366.9 (2006), <i>IP-Cablecom2 IP Multimedia Subsystem (IMS); generic authentication architecture specification (3GPP TS 33.220)</i> .
[ITU-T J.366.10]	ITU-T Recommendation J.366.10 (2007), <i>Zh and Zn interfaces based on the Diameter protocol; Stage 3 specification (3GPP TS 29.109)</i> .
[IETF RFC 2617]	IETF RFC 2617 (1999), <i>HTTP Authentication: Basic and Digest Access Authentication</i> .
[IETF RFC 3261]	IETF RFC 3261 (2002), <i>SIP: Session Initiation Protocol</i> .
[IETF RFC 3310]	IETF RFC 3310 (2002), <i>Hypertext Transfer Protocol (HTTP) Digest Authentication Using Authentication and Key Agreement (AKA)</i> .
[IETF RFC 3966]	IETF RFC 3966 (2004), <i>The tel URI for Telephone Numbers</i> .
[IETF RFC 4740]	IETF RFC 4740 (2006), <i>Diameter Session Initiation Protocol (SIP) Application</i> .
[ID GRUU]	IETF draft, <i>Obtaining and Using Globally Routable User Agent (UA) URIs (GRUU) in the Session Initiation Protocol (SIP)</i> , draft-ietf-sip-gruu-10, July 2006.

IV.2.2 Reference acquisition

- Internet Engineering Task Force (IETF), Internet: <http://www.ietf.org>

IV.3 Terms and definitions

This appendix introduces no additional new terms.

IV.4 Abbreviations and acronyms

This appendix uses the following additional abbreviations and acronyms:

AKA	Authentication and Key Agreement
AVP	Attribute-Value Pair
BSF	Bootstrapping Server Function
CNAM	Calling NAME
GBA	Generic Bootstrapping Architecture
GUSS	GBA User Security Setting
IM CN	IP Multimedia Core Network
IMPI	IM Private Identity
IMPU	IM Public Identity
ISIM	IMS Subscriber Identity Module
MAA	Multimedia-Auth-Answer
MAR	Multimedia-Auth-Request
SAA	Server-Assignment-Answer
SAR	Server-Assignment-Request
SIM	Subscriber Identity Module
UAR	User-Authorization-Request
UICC	Universal Integrated Circuit Card
XML	eXtensible Markup Language

IV.5 IP-Cablecom2 home subscriber server (HSS)

The home subscriber server (HSS) is the master database containing the subscription related information for a particular user. There may be one or more HSSs in the network. When multiple HSSs are in the network, a subscription locator function (SLF) is used to locate the proper HSS.

IV.5.1 IP-Cablecom2 HSS architecture and reference points

The reference points associated with the HSS are illustrated in Figure IV.1. These reference points are as defined in the 3GPP IMS, with appropriate enhancements identified by IP-Cablecom2.

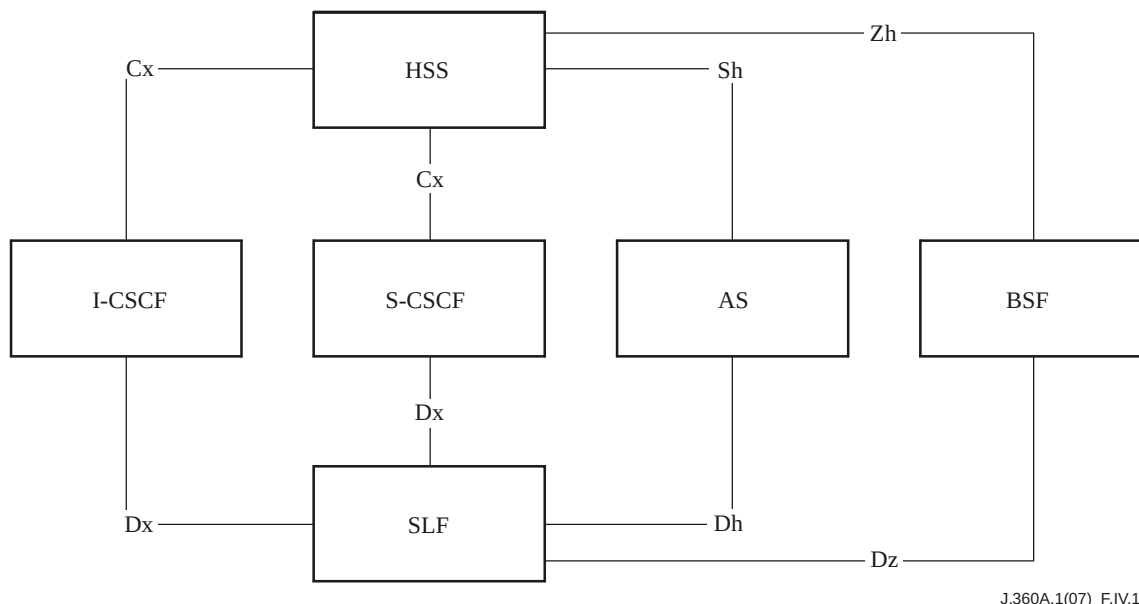


Figure IV.1 – HSS reference points

The HSS provides several logical functions needed by the various entities throughout the network in order to support session handling. Here is a list of some of the logical functions provided by the HSS:

- **Registration state management:** This function supports the management of the user's registration state.
- **Session establishment support:** The HSS supports the session establishment procedures in the IP multimedia core network (IM CN) subsystem. For terminating traffic, it provides information on which session control entity currently hosts the user.
- **User security information generation:** The architecture supports the storage and generation of user security credentials and parameters required for authentication. This task may be handled by the HSS or other elements in the network depending on the authentication method and network architecture being used.
- **User security support:** The HSS supports the authentication procedures to access the IM CN subsystem services by storing the generated data for authentication, integrity, and ciphering, and by providing these data to the appropriate entity in the CN.
- **User identification handling:** The HSS provides the appropriate relations among all the identifiers that uniquely determine the user in the system (private identity and public identities for IM CN subsystem).
- **Access authorization:** The HSS authorizes the user for access when requested by the call session control function (CSCF) by checking that the user is allowed to roam in a given visited network.
- **Service authorization support:** The HSS provides basic authorization for terminating call/session establishment and service invocation. The HSS updates the appropriate serving entities (i.e., CSCF) with the relevant information related to the services to be provided to the user.
- **Service profile provisioning support:** The HSS provides access to the service profile data for use within the IM CN subsystem.

IV.5.1.1 HSS functional components

IV.5.1.1.1 Home subscriber server (HSS)

The HSS is the master database for a given user. It is the entity containing the subscription-related information to support the network entities managing sessions.

A home network may contain one or more HSSs depending on the number of subscribers, the capacity of the network elements, and the organization of the network.

The HSS provides support to the call control servers in order to complete the routing/roaming procedures by solving authentication, authorization, naming/addressing resolution, location dependencies, etc.

The HSS is responsible for holding the following user related information:

- User identification, numbering and addressing information.
- User security information: Network access control information for authentication and authorization.
- User location information at inter-system level: The HSS supports the user registration, and stores inter-system location information, etc.
- User profile information.

The HSS may generate user security information for mutual authentication, communication integrity check and ciphering, depending on the authentication mechanism and the chosen architecture being used.

IV.5.1.1.2 Subscription locator function (SLF)

When more than one independently addressable HSS is utilized by a network operator, there is a need to associate a given subscriber with the HSS that contains the subscriber's data. This functionality is provided by the SLF, which is a Diameter redirect agent.

The SLF is:

- Queried by the interrogating call session control function (I-CSCF) during the registration and session setup to retrieve the address of the HSS that contains the subscriber specific data. Furthermore, the SLF is also queried by the S-CSCF during registration.
- Queried by the AS in conjunction with the Sh interface operation to retrieve the address of the HSS that contains the subscriber specific data.
- Accessed via the Dx interface by the CSCF and via the Dh interface by the AS.

A single HSS environment can still be achieved when there are physically multiple HSSs by using techniques such as server farms or clustering. The SLF is not required when such techniques are used to provide a logical single HSS environment.

IV.5.1.2 HSS reference points

The reference points depicted in Figure IV.1 are described in Table IV.1. All reference points are DIAMETER-based.