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Mobility and Collaboration procedures – Mobility for
H-Series multimedia systems and services

Mobility for H.323 multimedia systems and services

ITU-T Recommendation H.510

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ITU-T Recommendation H.510

Mobility for H.323 multimedia systems and services

Summary

The purpose of this Recommendation is to define services and procedures for the support of mobility in H.323 multimedia systems.

Source

ITU-T Recommendation H.510 was prepared by ITU-T Study Group 16 (2001-2004) and approved under the WTSA Resolution 1 procedure on 29 March 2002.

Keywords

H.323, multimedia systems, terminal mobility, user mobility.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. 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.

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ITU-T Recommendation H.510

Mobility for H.323 multimedia systems and services

1 Scope

This Recommendation deals with mobility aspects for H.323 systems above the transport layer. H.510 applies new functions defined in support of mobility management to H.323-compliant systems.

The main focus is on the support of terminal mobility, although support of user mobility in the context of H.323 is covered as well. This version of this Recommendation does not cover handover procedures where active calls can be maintained during location changes.

Interworking with other networks to support mobility across networks of different types is outside the scope of this Recommendation.

2 References

2.1 Normative 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.

- [1] ITU-T Recommendation H.323 (2000), *Packet-based multimedia communications systems*.
- [2] ITU-T Recommendation H.225.0 (2000), *Call signalling protocols and media stream packetization for packet-based multimedia communication systems*.
- [3] ITU-T Recommendation H.225.0 Annex G (1999), *Communication between administrative domains*.
- [4] ITU-T Recommendation H.501 (2002), *Protocol for mobility management and intra/inter-domain communication in multimedia systems*.
- [5] ITU-T Recommendation H.530 (2002), *Symmetric security procedures for H.510 (Mobility for H.323 multimedia systems and services)*.

2.2 Informative references

- IETF RFC 2486 (1999), *The Network Access Identifier*.

3 Definitions

For the purposes of this Recommendation, the definitions given in ITU-T Rec. H.323 shall apply, with the following additions.

3.1 administrative domain: Defined as in H.225.0 Annex G. An administrative domain consists of one or more zones.

3.2 callable user identity: A user identity that can be used by a calling user to make a call to the user identified by this user identity. It may be announced e.g. in a phonebook as the identity by which a user can be reached.

- 3.3 H.323 point of attachment:** A network point of attachment that allows the H.323 terminal to register with a gatekeeper or to directly communicate with another H.323 terminal.
- 3.4 home domain:** The administrative domain that is related by subscription to the mobile user. The home domain contains user-specific data including location, authentication, and service profile information related to the mobile user.
- 3.5 home gatekeeper (Home GK):** A gatekeeper in the home domain of a user.
- 3.6 home service provider:** The service provider or administrator in charge of the home domain of a user; i.e. the user is related to the home service provider by a subscription contract.
- 3.7 location:** The network point of attachment through which the user/terminal is currently accessing the H.323 system.
- 3.8 H.323 mobile terminal:** A terminal that may change H.323 point of attachment.
- 3.9 mobility management:** The set of functions needed to provide user, terminal and service mobility.
- 3.10 network point of attachment:** The network interface that is used by an endpoint in order to access the H.323 system. Each network point of attachment is associated with a network address (e.g. IP address) by which packets sent to the endpoint reach the endpoint.
- 3.11 online:** State of a mobile user or terminal that has "logged on", i.e. is currently registered at a gatekeeper, as opposed to **absent** or "logged off".
- 3.12 primary user identity:** The user identity allocated permanently to a user at subscription time, which stays the same as long as the subscription exists. There is only one primary user identity for a user.
- 3.13 service mobility:** The ability of a user to use the particular (subscribed) service irrespective of the location of the user and the terminal that is used for that purpose.
- 3.14 serving domain:** The (visited or home) administrative domain that is serving an online mobile user/terminal.
- 3.15 serving gatekeeper:** The (visited or home) gatekeeper where an online mobile user/terminal is currently registered.
- 3.16 temporary user identity:** A user identity allocated to a user on a temporary basis which is intended to be used in place of the primary user identity, for example because of security reasons.
- 3.17 terminal identity:** A code or string uniquely identifying a terminal.
- NOTE – One possible use is to authenticate the terminal during the user registration. The terminal authentication permits to verify whether or not the user is allowed to use the terminal (for instance if the H.323 mobile terminal is "black-listed" by the home service provider – e.g. after having been stolen – the mobile user cannot register in the H.323 network with this terminal).
- 3.18 terminal mobility:** The ability of a terminal to change location (i.e. network point of attachment and H.323 point of attachment) and still be able to communicate.
- 3.19 discrete terminal mobility (terminal roaming):** The ability of a terminal to make discrete changes of location, i.e. to change location while no media streams are active.
- 3.20 continuous terminal mobility (handover):** The ability of a terminal to change location while media streams are active. Handover is further called *seamless* when the terminal location change does not result in delay or loss of data that would be perceived by the user as degradation of quality of service (note that seamless handovers may depend on many factors, including service type and service presentation robustness against data loss at the terminal).
- 3.21 user:** A person or other entity authorized to use H.323 communication services.

3.22 user identity: A code or string uniquely identifying a user across a multi-user, multi-service infrastructure.

3.23 user mobility (personal mobility): The ability of a user to maintain the same user identity irrespective of the terminal used and its network point of attachment. Terminals used may be of different types.

3.24 discrete user mobility (user roaming): The ability of a user to change location or terminals while no media streams are active.

3.25 continuous user mobility (session mobility): The ability of a user to change location or terminals while media streams are active.

NOTE – A similar feature is provided in the SCN by the supplementary service Terminal Portability.

3.26 user service profile: User-specific information indicating which services a user is subscribed to and personal configuration data for the respective services.

3.27 visited domain: The administrative domain that is not the home domain and is serving a mobile user.

3.28 visited gatekeeper (Visited GK): A gatekeeper in a visited domain.

4 Symbols and abbreviations

This Recommendation uses the following abbreviations:

A	Address (as a DNS record/query type)
AuF	Authentication Function
BE	Border Element
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
e164	Address type "phone number" (according to ITU-T Rec. E.164)
EP	Endpoint
GK	Gatekeeper
HLF	Home Location Function
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
MT	Mobile Terminal
NAI	Network Access Identifier
NPoA	Network Point of Attachment
RAS	Registration, Admission and Status protocol (ITU-T Rec. H.225.0)

The following RAS messages are used in this Recommendation:

ACF	AdmissionConfirm
ARJ	AdmissionReject
ARQ	AdmissionRequest
GCF	GatekeeperConfirm
GRJ	GatekeeperReject

GRQ	GatekeeperRequest
LCF	LocationConfirm
LRQ	LocationRequest
RCF	RegistrationConfirm
RIP	RequestInProgress
RRJ	RegistrationReject
RRQ	RegistrationRequest
SLA	Service Level Agreement
SRV	Service (as a DNS record/query type)
TSAP	Transport Service Access Point
TXT	Text (as a DNS record/query type)
UCF	UnregistrationConfirm
UIM	User Identification Module
URL	Universal Resource Locator
URQ	UnregistrationRequest
VLF	Visitor Location Function

5 H.323 mobility service description

The following clauses define the services the H.323 system provides for terminal and user mobility. These are overall service descriptions from a user's point of view without dealing with the user interface aspects themselves.

5.1 General description

5.1.1 H.323 user mobility

This Recommendation deals with the support of mobile users that belong to an H.323 network.

NOTE – General user mobility is described in other Recommendations.

In a network supporting user mobility there exists a dynamic association between mobile users and terminals. Any mobile user can register at any terminal with access to the network, within the limits of applicable permissions. Registration enables the mobile user to obtain the services permitted by the applicable user service profile and supported at the currently used terminal. A change of location results in a new registration of the mobile user and the corresponding de-registration from the previous location (if there was one).

A mobile user belongs permanently to exactly one administrative domain, the home domain of that user. User mobility may be restricted to the home domain, or may be permitted across multiple administrative domains subject to service agreements between those domains and the user's home domain.

The applicable user service profile for a mobile user depends on the current location and on the service agreements mentioned above. After having registered properly, a mobile user shall be able to initiate and/or receive calls at the current location. However, restrictions may apply regarding permitted use of resources, available quality of service, etc.

With regard to ITU-T Rec. H.323, two distinct aspects have to be considered for inter-domain mobility:

- a) A mobile user registers at an H.323 terminal. The user is treated like a native H.323 user irrespective of whether his home domain is an H.323 system or not. In the latter case, the home domain will redirect calls destined for the mobile user to an H.323 ingress gateway.
- b) A mobile user whose home domain is an H.323 system roams into another network. In this case the H.323 home domain will redirect calls destined for the mobile user to an H.323 egress gateway.

5.1.2 H.323 terminal mobility

Terminal mobility means that an H.323 terminal can change its location, i.e. its network point of attachment, and maintain the ability to communicate. In this Recommendation, terminal mobility is formulated in terms of mobility of the user currently associated with the terminal. Only where considerations apply specifically to terminals rather than users, terminal mobility is treated separately.

It is possible to have no user registered on a specific terminal. Which services are possible on a terminal without a registered user is implementation dependent. In order to provision services on a terminal where no mobile user is registered, such a terminal may be associated with a "default" user registered "by administration". In this way, there is no need to care about terminals directly; they can be treated in terms of their default user.

5.1.3 Service mobility

In the context of this Recommendation, service mobility is limited to applying the mobile user's service profile when making or receiving calls.

NOTE – Further service mobility aspects will be described in other Recommendations.

5.2 H.323 requirements

5.2.1 Requirements for H.323 user mobility

H.323 user mobility implies the following services:

- 1) **Identification and authentication of mobile user:** Enables a serving domain to validate the user identity of the mobile user.
- 2) **Authentication of the serving domain:** Enables a mobile user to verify the authenticity of the serving domain, so as to ascertain that the domain is indeed the one of which services are expected.
- 3) **Mobile user registration/de-registration:** Enables a mobile user to associate with any wired or wireless H.323 terminal in order to make or receive calls. This can be done on a permanent (without ever de-registering) or temporary basis (with de-registration at the end of a period of registration).

NOTE – Permanent registration could be activated "by administration" without any actual user involvement. This may have many useful applications, such as service provisioning on public terminals, or the administration of a "default" terminal at a user's personal desk.

- 4) **Mobile user call handling:** Enables a mobile user to make and/or receive calls, typically after registration, on the basis of the user identity at any suitable H.323 terminal. This ability should only be limited by terminal and network capabilities and possibly the restrictions imposed by the service level agreements (SLAs) between service providers of the involved administrative domains. This service consists of two parts (which may be supported independently of each other), incoming call handling and outgoing call handling: