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SERIES Q: SWITCHING AND SIGNALLING

Signalling requirements and protocols for the NGN –
Resource control protocols

Requirements and protocol at the interface between the mobile location management physical entity used as a proxy and the central instance of the mobile location management physical entity (M9 interface)

Recommendation ITU-T Q.3314



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Recommendation ITU-T Q.3314

Requirements and protocol at the interface between the mobile location management physical entity used as a proxy and the central instance of the mobile location management physical entity (M9 interface)

Summary

Recommendation ITU-T Q.3314 provides the signalling requirements and protocol for the M9 interface between the mobile location management physical entity as proxy (MLM-PE(P)) and the MLM-PE as the central instance (MLM-PE(C)) specified in Recommendation ITU-T Y.2018. The M9 interface provides information from the MLM-PE(P) and the MLM-PE(C) to registration/update and query mobility location information in both host-based and network-based mobility cases.

History

Edition	Recommendation	Approval	Study Group
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M9 interface, MMCF, mobility control.

FOREWORD

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Recommendation ITU-T Q.3314

Requirements and protocol at the interface between the mobile location management physical entity used as a proxy and the central instance of the mobile location management physical entity (M9 interface)

1 Scope

This Recommendation defines the protocol for the M9 interface between the mobile location management physical entity as proxy (MLM-PE(P)) and the MLM-PE as the central instance (MLM-PE(C)) specified in [ITU-T Y.2018]. The M9 reference point provides the information flows to register and update mobility location information in both host-based and network-based mobility cases specified in [ITU-T Y.2018]. In the network-based mobility case, the MLM-PE(P) sends the location registration and/or update request to the MLM-PE(C). In the host-based mobility case, the user equipment (UE) sends the location registration and/or update request to the MLM-PE(P), which will forward it to the MLM-PE(C).

The M9 reference point also provides the information flows for retrieving the binding location information regarding UE's reachability. The MLM-PE(P) holds the binding information between mobile user ID (or persistent address) and temporary address (or lower tunnel end point address). The MLM-PE(C) holds the binding information between mobile user ID (or persistent address), and address of the MLM-PE(P). The MLM-PE(P) may identify the corresponding MLM-PE(C) by extracting the home domain from the mobile user ID. The MLM-PE(P) may initiate route optimization through this interface.

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 Y.2018] | Recommendation ITU-T Y.2018 (2009), <i>Mobility management and control framework and architecture within the NGN transport stratum</i> . |
| [ITU-T Y.2701] | Recommendation ITU-T Y.2701 (2007), <i>Security requirements for NGN release 1</i> . |
| [ETSI ES 283 034] | ETSI ES 283 034 (2008), <i>e4 interface based on the Diameter protocol</i> . |
| [ETSI ES 283 035] | ETSI ES 283 035 (2008), <i>e2 interface based on the Diameter protocol</i> . |
| [ETSI TS 129 229] | ETSI TS 129 229 (2010), <i>Cx and Dx interfaces based on the Diameter protocol; Protocol details (3GPP TS 29.229 version 9.3.0 Release 9)</i> . |
| [ETSI TS 129 272] | ETSI TS 129 272 v9.2.0 (2010), <i>Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol (3GPP TS 29.272 version 9.2.0 Release 9)</i> . |

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following term defined elsewhere:

3.1.1 authentication [b-ITU-T Y.2014]: A property by which the correct identifier of an entity or party is established with a required assurance. The party being authenticated could be a user, subscriber, home environment or serving network.

3.2 Terms defined in this Recommendation

3.2.1 location information (Based on the definition given in [b-ITU-T Q.1001]): Actual location of the mobile station (e.g., PLMN, MSC area, location area, as required).

3.2.2 location registration (Based on the definition given in [b-ITU-T Q.1741.3]): The procedure to register its presence in a registration area when the user equipment enters a new registration area.

3.2.3 nomadism (Based on the definition given in [b-ITU-T Q.1761]): Ability of the user to change his network access point after moving; when changing the network access point, the user's service session is completely stopped and then started again, i.e., there is no session continuity or hand-over possible.

NOTE – It is assumed that the normal usage pattern is that users shutdown their service session before moving to another access point.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

ATM	Asynchronous Transfer Mode
AVP	Attribute-Value Pair
FQDN	Fully Qualified Domain Name
GPRS	General Packet Radio Service
GTP	GPRS Tunnelling Protocol
HDC-PE	Handover Decision and Control Physical Entity
ID	Identification
MLM-FE	Mobile Location Management Functional Entity
MLM-PE	Mobile Location Management Physical Entity
MMCF	Mobility Management Control Functions
MLM-PE(C)	An instance of the MLM-PE performing the Central mobile location management role
MLM-PE(P)	An instance of the MLM-PE performing the Proxy mobile location management role
MPLS	Multiprotocol Label Switching
NACF	Network Attachment Control Function
NAT	Network Address Translation
NID-PE	Network Information Distribution Physical Entity
NIR-PE	Network Information Repository Physical Entity
PD-PE	Policy Decision Physical Entity

PPP	Point-to-Point Protocol
RACF	Resource Admission and Control Function
SCTP	Stream Control Transport Protocol
TLM-PE	Transport Location Management Physical Entity
UE	User Equipment
VCI	Virtual Circuit Identifier
VPI	Virtual Path Identifier

5 M9 interface

5.1 Overview

This Recommendation specifies the protocol for the M9 reference point.

The M9 reference point provides the information flows to register and update mobility location information via the M9 interface specified in [ITU-T Y.2018] in both the host-based and network-based mobility cases. The M9 reference point also provides the information flows for retrieving the binding location information regarding the UE's reachability.

Therefore, two operations may occur at the M9 interface as follows:

- mobility location binding registration and/or update
- mobility location query.

5.2 M9 reference model

Figure 5-1 describes the M9 reference architecture. This illustration can be used as the initial architecture.

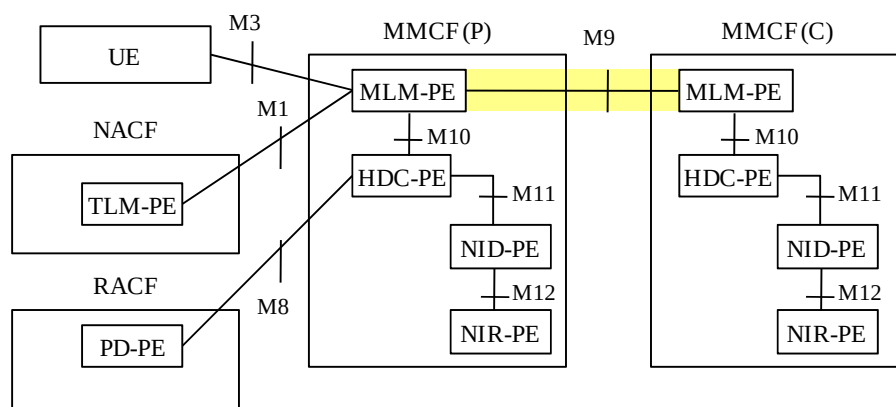


Figure 5-1 – M9 reference model

5.3 Physical entities and capabilities

5.3.1 Mobile location management physical entity (MLM-PE)

The MLM-PE has the following responsibilities:

- in the case of network-based mobility, initiating location registration on behalf of the UE;
- processing location registration messages sent from, or on behalf of the UE;
- optionally, maintaining the binding between the mobility service user ID and persistent IP address assigned to the UE;