

- ■ ■ Location in SIP/IP Core (LOCSIP)

Location Conveyance with IMS:
the OMA LOCSIP Service Enabler

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- ■ ■ **Location in SIP/IP Core (LOCSIP)**
Topics
 - **General Background Material**
 - LOCSIP – Objectives / General / Terminology
 - Open Mobile Alliance (OMA) LOCSIP Enabler Release Package
 - Overview of related documents
 - LOCSIP status
 - **LOCSIP Technical Discussion**
 - General Capabilities
 - Architecture
 - Illustrative Flows
 - Specific Capabilities supported in LOCSIP Specifications
 - **Conclusions / Next Steps**

■ ■ ■ LOCSIP – Objectives

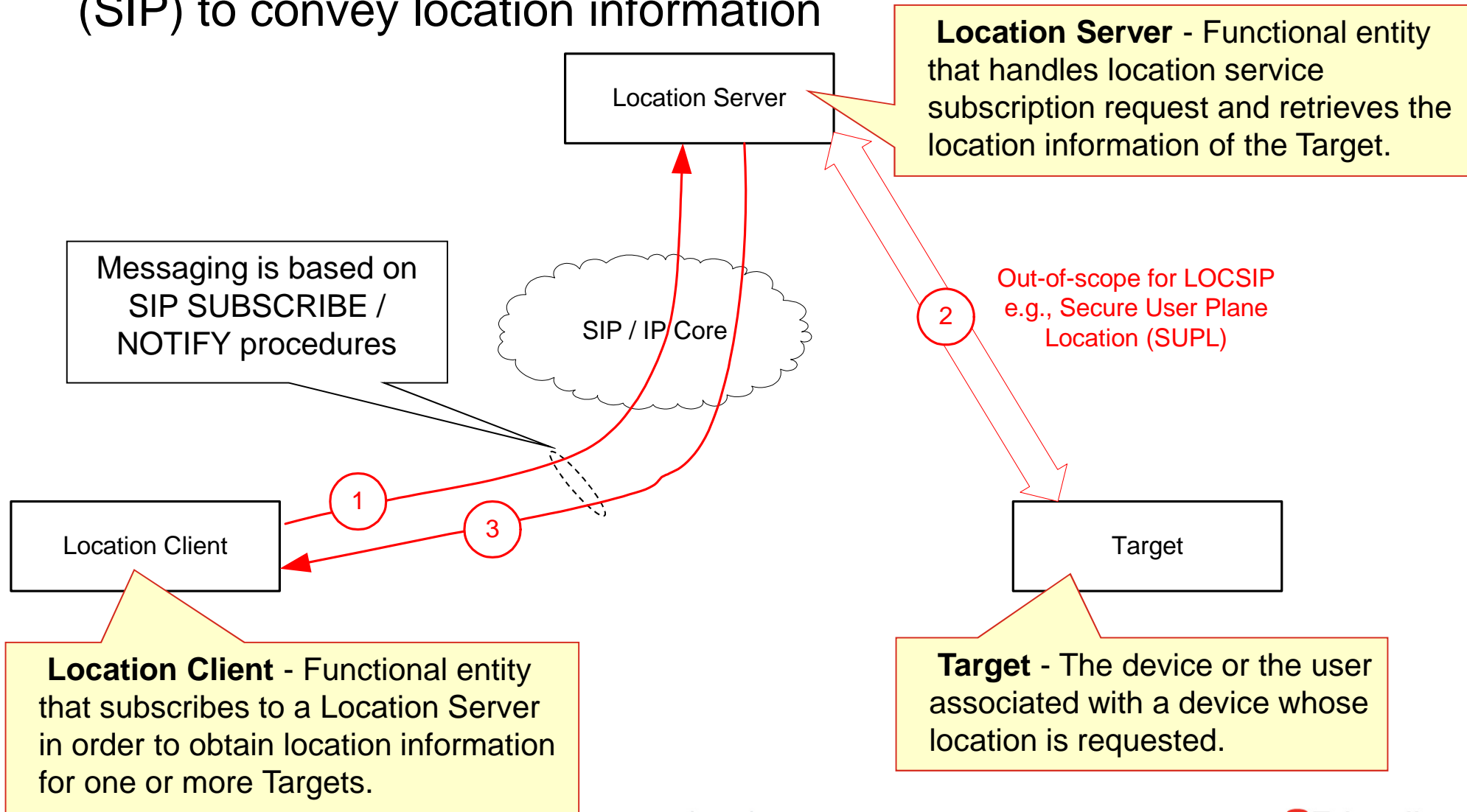
- Create a service enabler to convey location information to applications via a SIP/IP core network (e.g., an IP Multimedia Subsystem [IMS])
- Out-of-scope: Positioning determination functions
 - May interwork with applicable positioning determination functions in access networks and/or in User Equipment
 - Position determination functionality specified elsewhere (e.g., OMA Secure User Plane Location [SUPL])
- Reuse capabilities in a SIP/IP core network, for location retrieval via a standardised SIP-based interface
 - Benefit from existing functionality (e.g., registrations / security associations) in the SIP/IP core
 - SIP Applications Servers can avoid additional interface types
- Synergy with other OMA enablers (e.g., Presence SIMPLE and PoC) that potentially use location information
- Apply available IETF (e.g., Geopriv) specifications

SIMPLE: SIP for Instant Messaging and Presence Leveraging Extensions

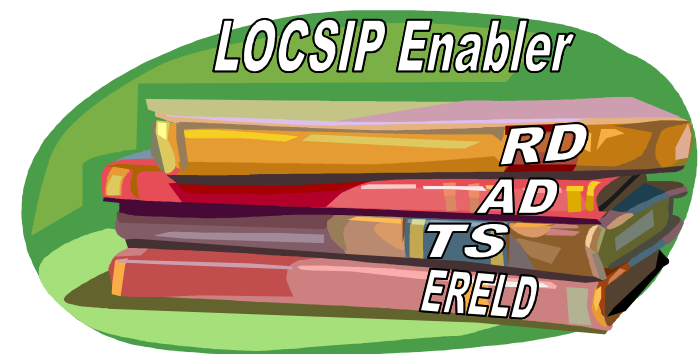
PoC: Push to talk Over Cellular

LOCSIP – General / Terminology

- LOCSIP specifies how to use Session Initiation Protocol (SIP) to convey location information



- **Open Mobile Alliance (OMA)**
LOCSIP Status
 - OMA Location (LOC) Working Group (WG) completed LOCSIP Enabler Release Package (ERP) as a Candidate Enabler in August 2009
 - ERELD - Enabler Release Definition
 - RD – Requirements Document
 - AD – Architecture Document
 - TS - Technical Specifications



■ ■ ■ LOCSIP Requirements Document (RD)



- Candidate version:
http://member.openmobilealliance.org/ftp/Public_documents/LOC/Permanent_documents/OMA-RD-LOCSIP-V1_0-20090818-C.zip,
Location in SIP/IP core Requirements, Candidate Version 1.0 – 18 Aug 2009
- LOCSIP RD defines four use cases (informative):
 - Immediate Location Delivery
 - Fetch current location (e.g., location-based charging)
 - Periodic Location Delivery
 - Obtain location updates periodically
 - Illustrates reporting for group of Targets (“buddy list”)
 - Area Trigger Location Delivery
 - Report location updates if certain filter criteria satisfied (e.g., movement within or outside a certain geographic area)
 - Find Friends
 - Report location updates if a member of a secondary Target group moves within a certain distance from a primary Target
 - Illustrates location request by Location Client in a Terminal

■ ■ ■ LOCSIP Requirements Document (RD)

- LOCSIP RD defines high-level functional requirements

Examples:

- Support for “Immediate”, “Periodic” and “Area Trigger” Location Delivery
- Support filtering of location notifications (accuracy, response time, age)
- Support for Location Client in a SIP Application Server or in a terminal
- Location Client able to request location information for a group of Targets, based on referenced list or request-contained list
- Format of location information to be compliant with:
 - [RFC4119] - “Presence-based GEOPRIV Location Object Format”
 - [RFC5491] - “GEOPRIV Presence Information Data Format Location Object (PIDF-LO) Usage Clarification, Considerations, and Recommendations”
 - [RFC5139] - “Revised Civic Location Format for Presence Information Data Format Location Object (PIDF-LO)”
- Additional requirements covering Security, Charging, Administration and Configuration, Privacy aspects, Emergency Services

■ ■ ■ LOCSIP Architecture Document (AD)



■ Candidate version:

http://member.openmobilealliance.org/ftp/Public_documents/LOC/Permanent_documents/OMA-AD-LOCSIP-V1_0-20090818-C.zip,

Location in SIP/IP core Architecture, Candidate Version 1.0 – 18 Aug 2009

■ Key Contents:

- Defines Overall Architecture
- Defines Architectural Components and Interfaces / Reference Points
- Describes Flows
- Discusses Security Considerations

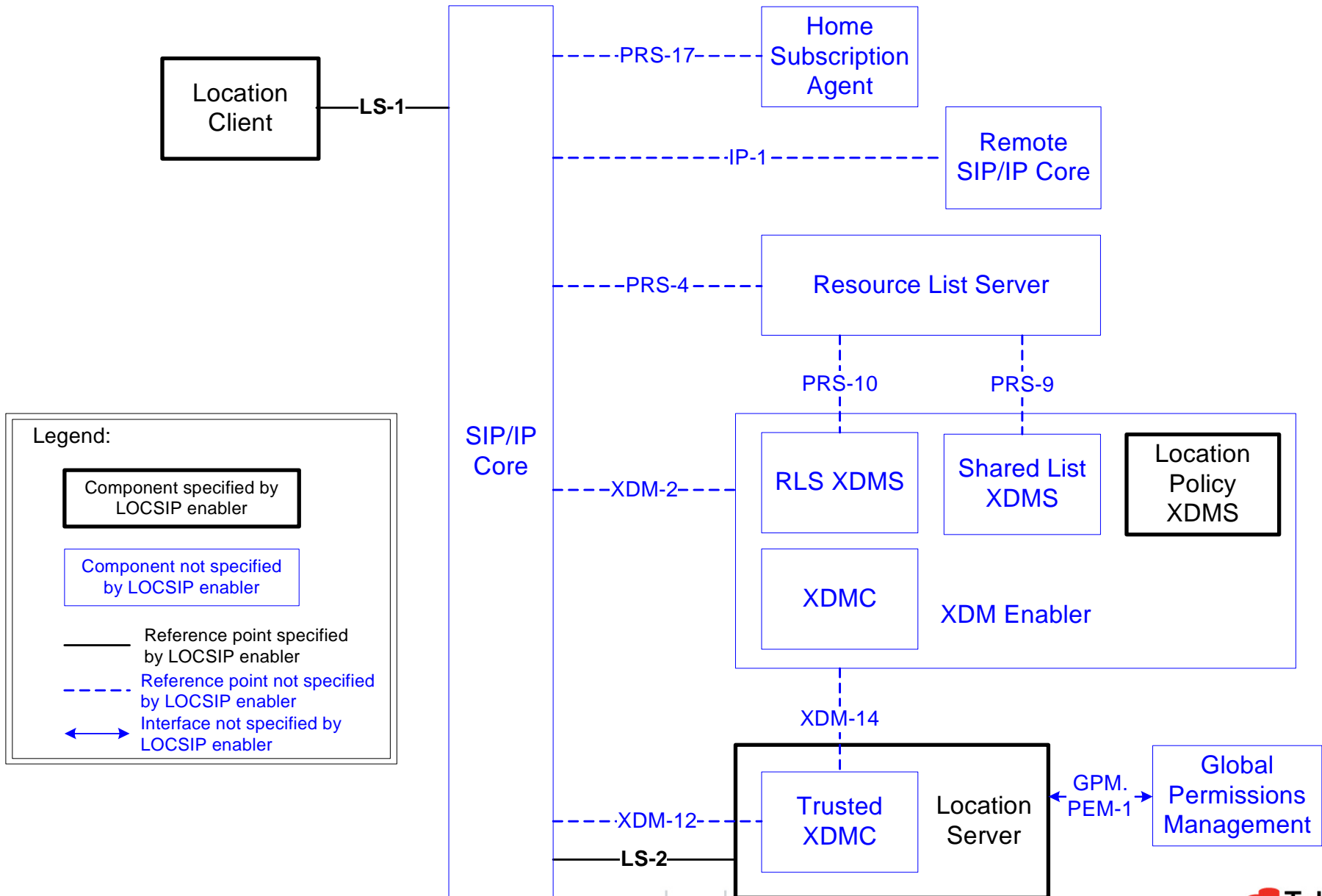
■ ■ ■ LOCSIP Architecture Document (AD)

- LOCSIP Reuse of Other OMA Enablers
 - OMA Presence SIMPLE
 - OMA XML Document Management (XDM)
 - IMS in OMA Architecture
- Functional Components
 - **Location Client (LC)**
 - **Location Server (LS)**
 - Home Subscription Agent
 - Resource List Server (RLS)
 - XDM Client (XDMC)
 - XDM Server (XDMS)
 - Shared List XDMS
 - RLS XDMS
 - **Location Policy XDMS**
 - Global Permissions Management (GPM)

SIMPLE: SIP for Instant Messaging and Presence Leveraging Extensions

IMS: IP Multimedia Subsystem

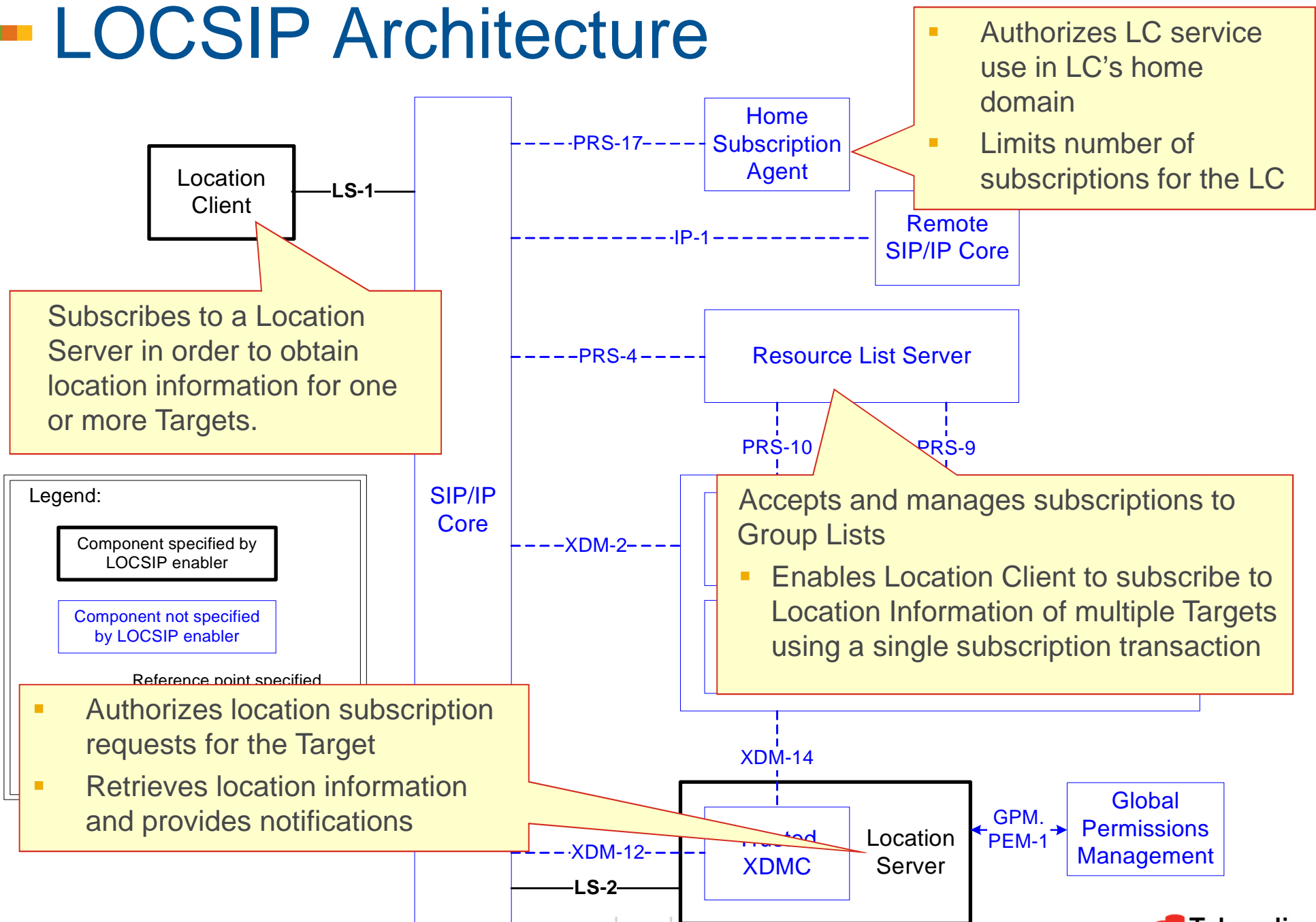
LOCSIP Architecture



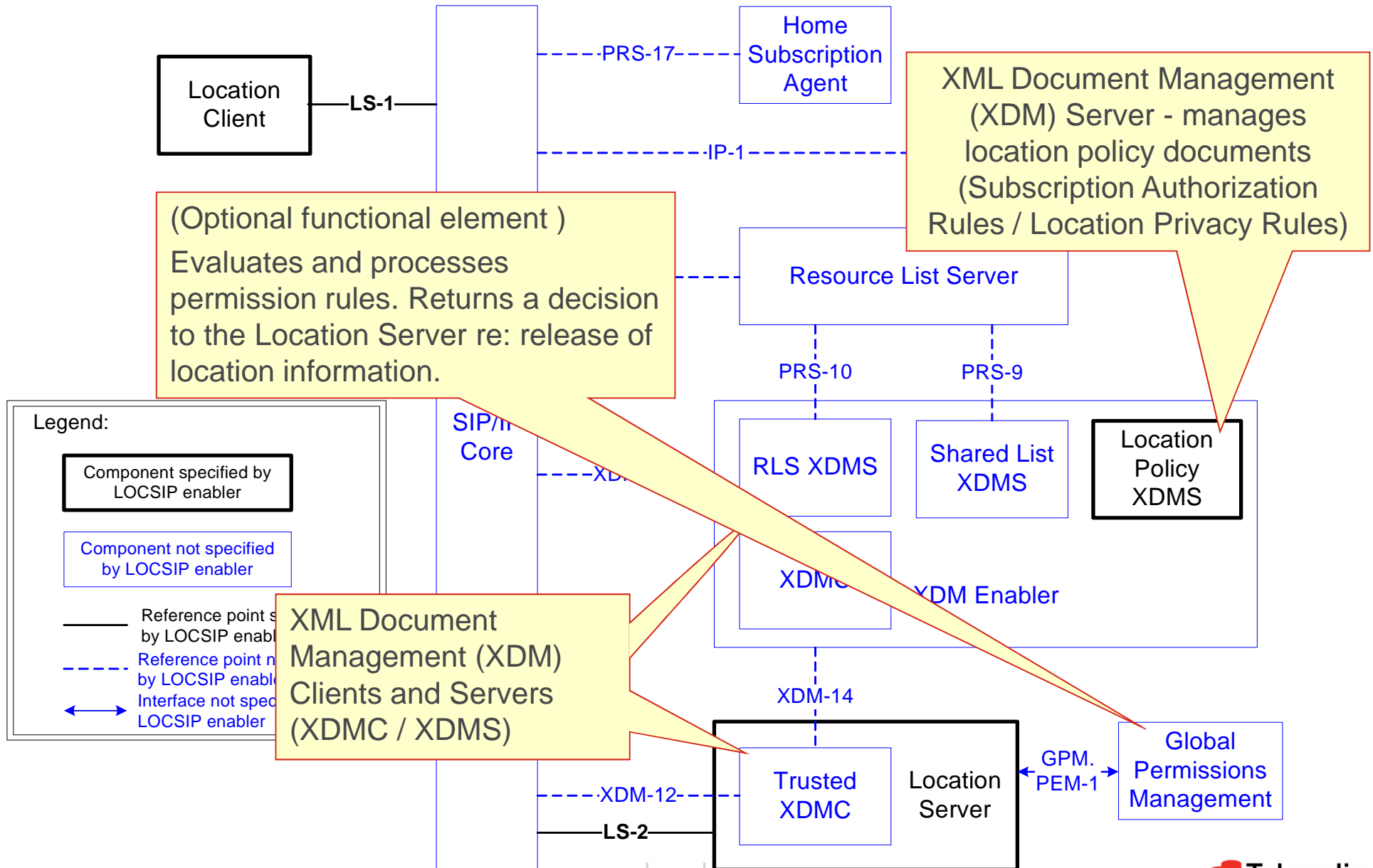
Legend:

- Component specified by LOCSIP enabler
- Component not specified by LOCSIP enabler
- Reference point specified by LOCSIP enabler
- Reference point not specified by LOCSIP enabler
- Interface not specified by LOCSIP enabler

LOCSIP Architecture



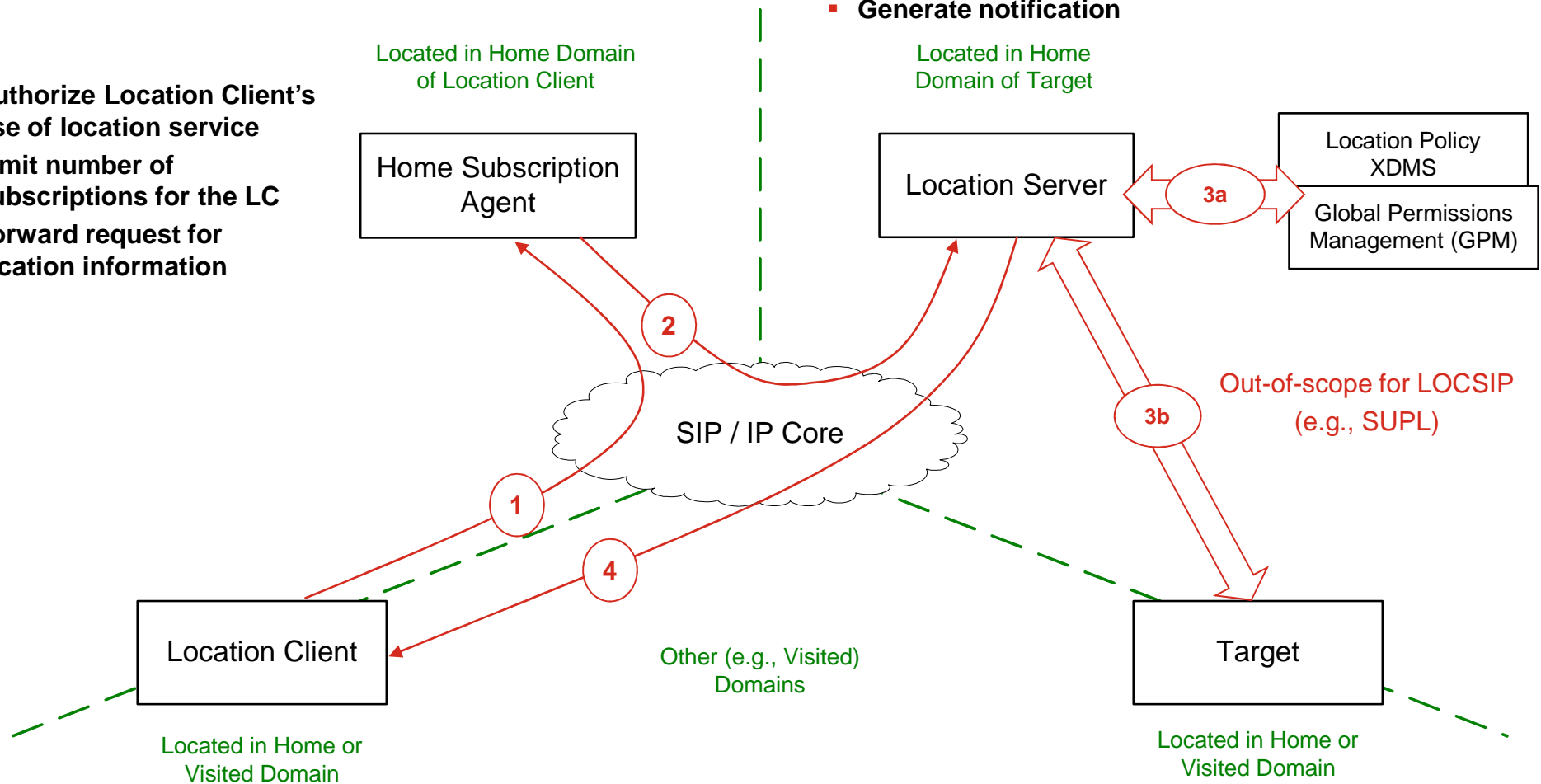
LOCSIP Architecture



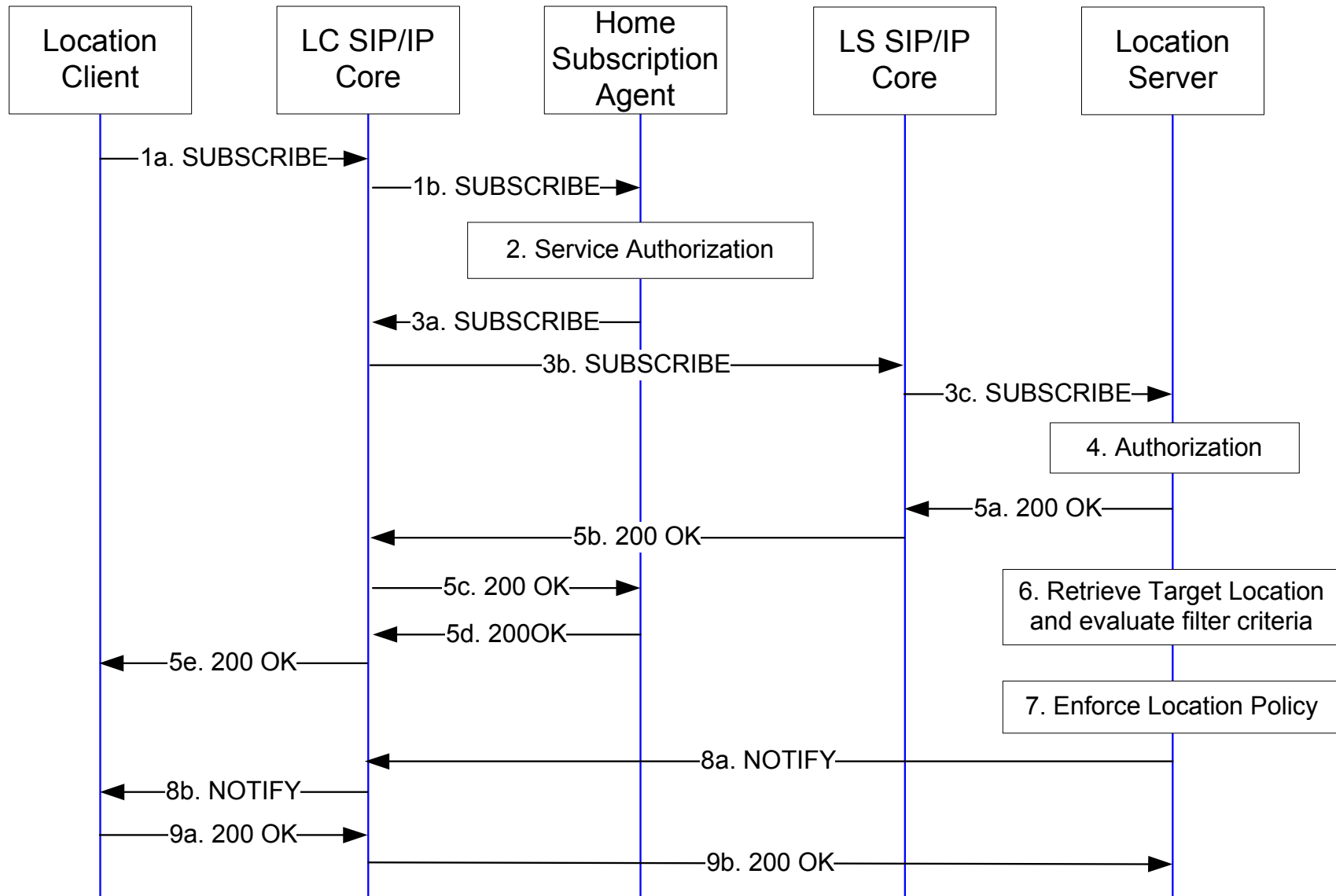
Immediate Location Delivery (“Location Fetch”) High-Level Flow

- Authorize Location Client’s use of location service
- Limit number of subscriptions for the LC
- Forward request for location information

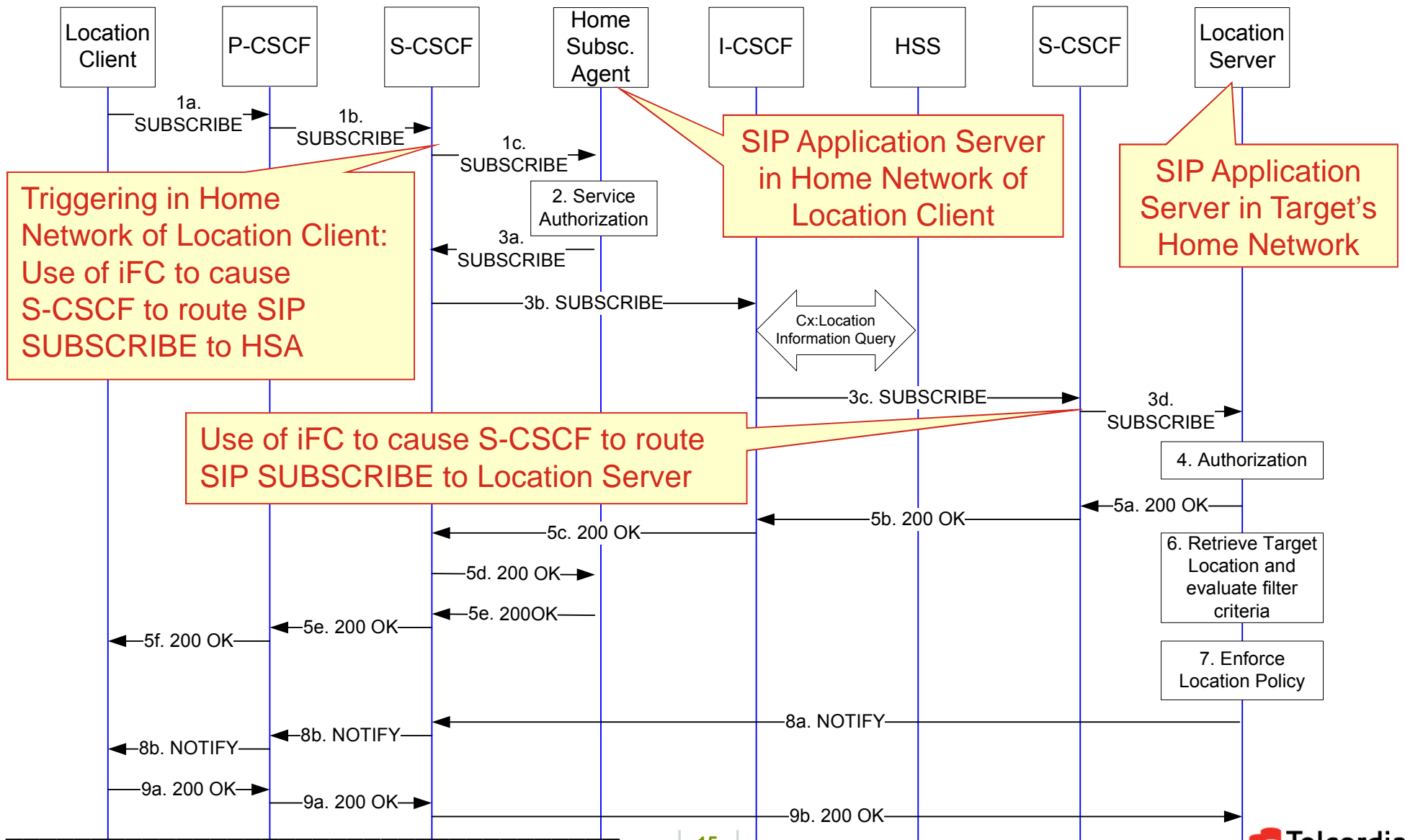
- Fetch documents from XDMS
- Authorize Location Client’s subscription to Target’s location info
- Retrieve location information
- Generate notification



Immediate Location Delivery (“Location Fetch”) SIP Messaging



Immediate Location Delivery (“Location Fetch”) SIP Messaging (Potential IMS-based Realization)

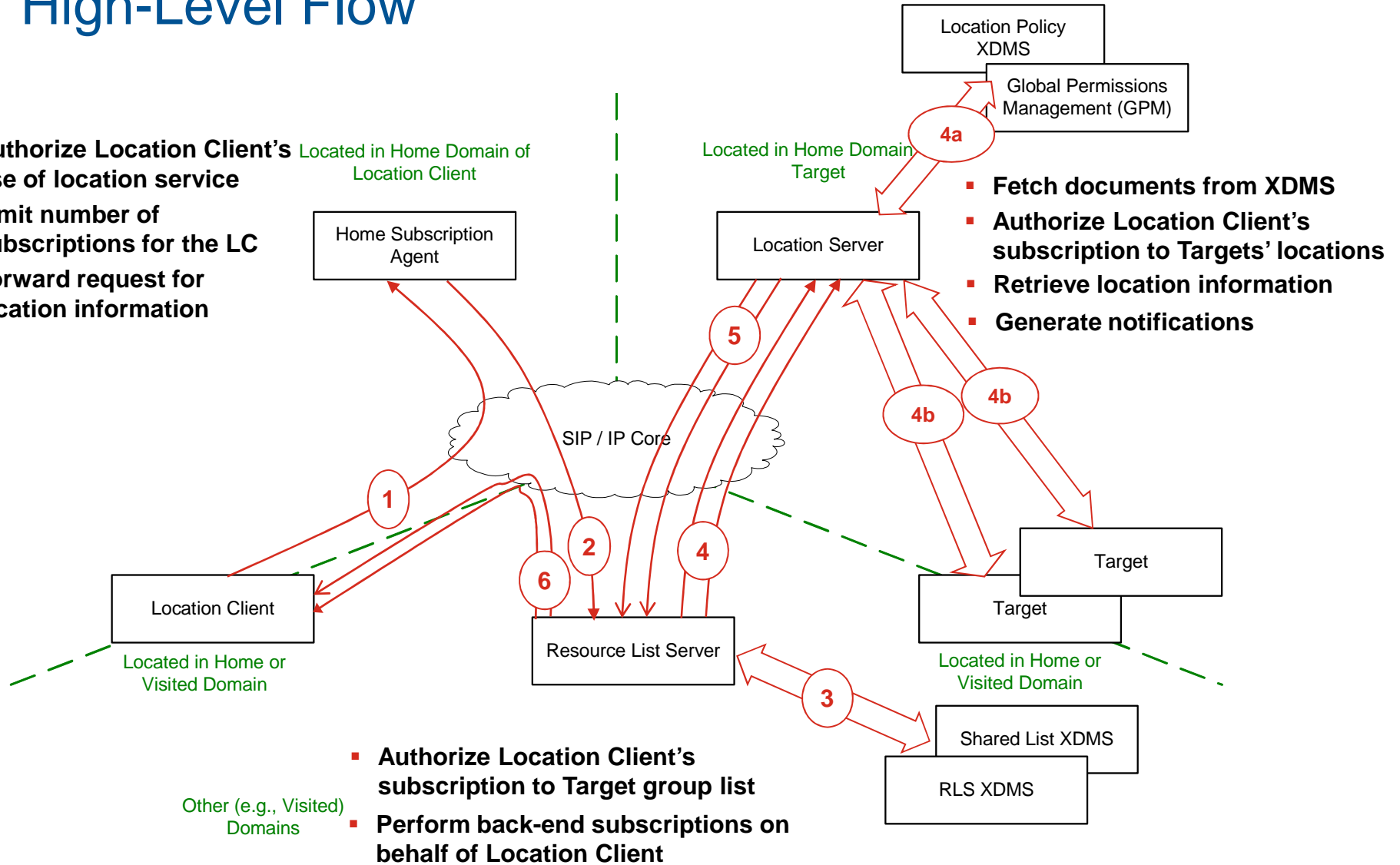


■ ■ ■ Additional LOCSIP Capabilities

- LOCSIP supports additional extensions beyond Immediate Location Delivery:
 - Periodic Location Delivery
 - Location Server provides SIP NOTIFY messages (with updated location) periodically
 - Area Trigger Location Delivery
 - Location Server provides SIP NOTIFY message whenever Target's location satisfies filter criteria
 - Location Retrieval for Multiple Targets
 - Targets identified via referenced list or request-contained list

Location Retrieval – Target List High-Level Flow

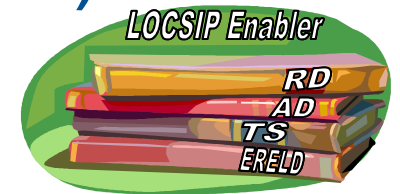
- **Authorize Location Client's use of location service**
- **Limit number of subscriptions for the LC**
- **Forward request for location information**



- **Fetch documents from XDMS**
- **Authorize Location Client's subscription to Targets' locations**
- **Retrieve location information**
- **Generate notifications**

- **Authorize Location Client's subscription to Target group list**
- **Perform back-end subscriptions on behalf of Location Client**

■ ■ ■ LOCSIP Technical Specification (TS)



■ Candidate version:

http://member.openmobilealliance.org/ftp/Public_documents/LOC/Permanent_documents/OMA-TS-LOCSIP-V1_0-20090818-C.zip, *Location in SIP/IP core Specification*, Candidate Version 1.0 – 18 Aug 2009

■ Contents include:

- Specifications for LOCSIP Functional Entities
- Specifications related to Security, Charging, and Registration
- Specifications for related Location (Information / Filter / QoS) documents

- ■ ■ **LOCSIP Technical Specification (TS)**
LOCSIP Capabilities
- **Reuse of basic SIP SUBSCRIBE / NOTIFY Capabilities**
 - [RFC 3265] - Session Initiation Protocol (SIP)-Specific Event Notification
 - [RFC 3856] - A Presence Event Package for the Session Initiation Protocol (SIP)
- **LOCSIP extends above to support location conveyance**
 - **Include feature tag in SIP SUBSCRIBE**
 - Distinguish location requests from Presence requests
 - Allow proper routing to HSA and Location Server
 - **Use of Expires (=0) header to designate one-time location requests**
 - **Specification of format for location information in body of SIP NOTIFY**

■ ■ ■ Additional LOCSIP Capabilities

- Event Notification Rate Control
 - Indicate the minimum / maximum time period between two consecutive notifications
- Request Location Information Satisfying Certain Criteria
 - Location type (civic and/or geodetic)
 - Maximum uncertainty
 - Maximum response time
 - Maximum age
 - Required civic elements
- Specification of Location-Event Notification Filters
 - Horizontal and vertical movement
 - Enter or exit a particular region
 - Speed
 - Value Changes
 - Relative positioning (inRange & outOfRange)
- Conditional Event Notification
 - Send event notifications only when state has changed since the previous notification
 - Suppress entire notification message or the body of the location event notification

Many of the above capabilities are based on IETF draft specifications: draft-ietf-sipcore-event-rate-control, draft-thomson-geopriv-location-quality, draft-ietf-geopriv-loc-filters, draft-ietf-sip-subnot-etags

■ ■ ■ Conclusions / Next Steps

- LOCSIP specifications have attained candidate enabler status (August 2009)
 - Editorial comments and bug fixes applied in recent drafts
 - Incorporation of updated IETF draft materials
- Upcoming LOCSIP efforts: Focus on Interoperability Testing
 - Candidate LOCSIP Enabler Test Requirements (ETR):
http://member.openmobilealliance.org/ftp/Public_documents/LOC/Permanent_documents/OMA-ETR-LOCSIP-V1_0-20090818-C.zip,
Enabler Test Requirements for Location in SIP/IP core, Candidate Version 1.0 – 18 Aug 2009
 - Test Plans to be developed based on LOCSIP ETR material

■ ■ ■ Abbreviations

3GPP	Third Generation Partnership Project	P-CSCF	Proxy CSCF
3GPP2	Third Generation Partnership Project	PEEM	Policy Evaluation, Enforcement and Management
AD	Architecture Document	PEM-1	PEEM specified callable interface
AS	Application Server	PIDF	Presence Information Data Format
CSCF	Call Session Control Function	PIDF-LO	Presence Information Data Format, Location Object
ERELD	Enabler Release Definition	PoC	Push to talk Over Cellular
ERP	Enabler Release Package	RD	Requirements Document
ETR	Enabler Test Requirements	RLS	Resource List Server
GEOPRIV	Geographical Location / Privacy	S-CSCF	Serving CSCF
GML	Geography Markup Language	SIMPLE	SIP for Instant Messaging and Presence Leveraging Extensions
GPM	Global Permissions Management	SIP	Session Initiation Protocol
HSA	Home Subscription Agent	SUPL	Secure User Plane Location
HSS	Home Subscriber Server	TS	Technical Specifications
I-CSCF	Interrogating CSCF	URI	Uniform Resource Identifier
IETF	Internet Engineering Task Force	XDM	XML Document Management
IMS	IP Multimedia Subsystem	XDMC	XDM Client
LOCSIP	Location in SIP/IP core	XDMS	XDM Server
LC	Location Client	XML	eXtensible Markup Language
LS	Location Server		
OMA	Open Mobile Alliance		