



CDMA Mobile Station LBS Requirements - V2

CDG Document 101

Version 1.0

22 August 2005

CDMA Development Group
575 Anton Boulevard, Suite 560
Costa Mesa, California 92626
PHONE +1 888 800-CDMA
+1 714 545-5211
FAX +1 714 545-4601
<http://www.cdg.org>
cdg@cdg.org

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Contents

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30

1. Introduction	1
1.1 Scope	1
1.2 Organization	1
1.3 Reference Documents	1
1.4 Acronyms and Abbreviations	4
1.5 Terms and Definitions	5
2. LBS Introduction	6
2.1 Device Capabilities.....	6
3. User Plane Requirements	7
3.1 Reference Model	7
3.2 User Plane Specific Requirements	8
3.2.1 Protocol	8
3.2.2 User Plane Bearers	13
3.2.3 DNS Resolution	15
3.2.4 Teleservice 65001 NI Call Flows.....	15
3.2.5 Notification and Verification.....	15
3.2.6 Quality of Service(QOS)	15
3.2.7 User plane operation mode	16
3.2.8 Provision PDE and MPC address	17
3.2.9 Out of CDMA service support.....	17
4. Control Plane Requirements.....	19
4.1 Reference Model	19
4.2 Control Plane Specific Requirements	19
4.2.1 Protocol	20
5. Functional Requirements.....	21
5.1 Global Privacy Settings Requirements.....	21
5.2 Visual Indicators requirement.....	21
5.3 Emergency Call Service Interaction requirement.....	22
5.4 Simultaneous IS-801-1 sessions.....	23

1	6. Testability Requirements	24
2	7. Standalone mode requirement	27
3	8. Appendix A: System Parameter Info Message	28

4

5

Tables

6

Table 1-1: Acronyms and Abbreviations	4
---	---

7

Figures

8

Figure 3-1: User Plane Location Services Network Architecture	7
---	---

9

Figure 4-1: Control Plane Location Services Network Architecture	19
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10

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Revision History

Date	Version	Description
25 Jan 2005	0.91	Preliminary draft.
10 February 2005	0.92	Formatting update
14 February 2005	0.93	Formatting update
22 February 2005	0.94	Content updates based on pre-review discussions with suppliers
11 April 2005	0.95	Content updates based on feedback from GHRC meeting in Vancouver.
16 May 2005	0.96	Content updates based on conference call on 04/14/05. Also included comments from Nokia and CRs from Vivo and Telus.
09 June 2005	0.97	Content updates based on conference call on 06/01/05. Included review comments from Qualcomm, Nokia, Telus, Kyocera, Vivo, Via telecom, Nextel.
01 July 2005	0.98	Added Out of service requirements from Nokia, and added requirements for provisioning MPC IP/Port and PDE IP/Port via PRI in section 3.
22 August 2005	1.0	Final approved version



1. Introduction

1.1 Scope

The objective of this document is to provide detailed functional requirements for a basic CDMA mobile station that provides Location based services (LBS). This document specifies a nominal set of features that define a commercially viable and usable terminal, which correctly and optimally interoperates in compliant LBS markets, and which provides a nominal set of services and features to the user.

1.2 Organization

This document describes the LBS requirements that a current CDMA mobile should support. This document is organized in sections.

Section 1 defines the scope of this document,

Section 2 is the introduction to LBS,

Section 3 describes the specific requirements for User Plane (UP) method,

Section 4 describes the specific requirements for Control plane (CP) method,

Section 5 describes the Functional requirements that are common to both User Plane and Control Plane,

Section 6 describes the testability requirements.

Section 7 describes the standalone mode requirement.

Section 8 is Appendix A and it describes the details of system parameters information message.

1.3 Reference Documents

3GPP2 reference documents can be found at
http://www.3gpp2.org/Public_html/specs/index.cfm.

CDG reference documents can be found at <http://www.cdg.org>.

QUALCOMM reference documents can be found at <http://www.cdg.org>.

BREW related documents can be found at
<http://brew.qualcomm.com/brew/en/developer/resources/ds/okb.html>.

Java API related documents can be found at www.jcp.org.

Ref	Document Title	Author	Version	Date
1.	Mobile Station - Base Station Compatibility Standard for Dual-Mode Wideband Spread Spectrum Cellular System		TIA/EIA/IS-95-A	
2.	Mobile Station - Base Station Compatibility Standard for Dual-Mode Wideband Spread Spectrum Cellular System		TIA/EIA/IS-95-B	
3.	cdma2000 High Rate Packet Data Air Interface Specification- (TIA/EIA/IS-856-2)		3GPP2, C.S0024-2	March 2004
4.	Data Service Options for Spread Spectrum Systems- addendum 2(TIA/EIA/IS-707-A-2)		3GPP2, C.S00017-0-2	March 2001
5.	Data Service Options for Spread Spectrum Systems: addendum 3, high speed packet data service option 33. (TIA/EIA/IS-707-A-3)		3GPP2, C.S00017-0-3	February 2003
6.	Short Message Services for Wideband Spread Spectrum Cellular Systems(TIA/EIA/IS-637-A)		3GPP2, C.S0015-A	September 1999
7.	Over-the-Air Service Provisioning of Mobile Stations in Wideband Spectrum Cellular Systems (TIA-683-C)		3GPP2, C.S0016-B	March 2003
8.	Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Stations.(TIA-98-E)		3GPP2, C.S0011-B	February 2003
9.	Position Determination Service Standards for Dual Mode Spread Spectrum Systems, Addendum 1(TIA/EIA/IS-801-1)		3GPP2, C.S0022-0-1	February 2001
10.	Recommended Minimum Performance Specification for C.S0022-0 Spread Spectrum Mobile Stations Release 0. (TIA-916)		3GPP2 C.S0036-0 v1.0	March 2002
11.	Wireless Enhanced Emergency Services, Phase II		TIA/EIA J-STD-036-B	2005
12.	Location Services Enhancements (TIA-881)		3GPP2, X.S0002	March 2004
13.	TIA/EIA-41-D Enhancements for Circuit-Switched Call Precedence Over CDMA Packet Data Session (CPOP)		TIA-935	June 2003
14.	OMA Mobile Location Protocol (MLP)		3.0.0	April 2002
15.	SMPP protocol specification		Ver.3.4	October 1999

Ref	Document Title	Author	Version	Date
16.	JAVA specification, Location API for J2ME		JSR 179	September 2003
17.	gpsOne™ Mobile Station Sensor Interface Application TCP/IP Wrapper Interface Specification	Qualcomm1	CL93-V2246-1 Rev B	
18.	gpsOne™ User Plane MS-MPC Protocol Specification	Qualcomm	80-V5456-1NP F	
19.	gpsOne™ User Plane MS-MPC Protocol Specification	Qualcomm	80-V5456-2NP C	
20.	Location-Based Services System Specification (V1)	Qualcomm	80-V6410-1NP D	
21.	Location-Based Services System Specification (V2)	Qualcomm	80-V6410-2NP F	
22.	gpsOne™ User Plane E5' Protocol Specification(V1)	Qualcomm	80-V5458-1NP E	
23.	gpsOne™ User Plane E5' Protocol Specification(V2)	Qualcomm	80-V5458-2NP E	
24.	gpsOne™ User Plane Handset Specification(V1)	Qualcomm	80-V6114-1NP Rev D	
25.	gpsOne™ User Plane Handset Specification(V2)	Qualcomm	80-V6114-2NP B	
26.	Location Based Services Roaming Support (Non-proprietary)	Qualcomm	80-V8470-1NP B	
27.	Location Based Services V2 Roaming Support (Non-proprietary)	Qualcomm	80-V8470-2NP A	
28.	Mobile Positioning Center (MPC) V1, (Non-proprietary)	Qualcomm	80-V6195-1NP B	
29.	Mobile Positioning Center (MPC) V2, (Non-proprietary)	Qualcomm	80-V6195-2NP B	
30.	BREW developers guide for LBS IPOSDet API	Qualcomm		
31.	DNS RFC		RFC 1035	
32.	IS-801-1 call flows document		CDG 111	

1.4 Acronyms and Abbreviations

Table 1-1: Acronyms and Abbreviations

Acronym / Abbreviation	Description
AFLT	Advanced Forward-Link Trilateration
A-GPS	Assisted GPS
ANSI	American National Standards Institute
API	Applications Programming Interface
BREW	Binary Runtime Environment for Wireless
BS/BTS	Base Station
BSC	Base Station Controller
CDMA	Code Division Multiple Access
DBM	Data Burst Message
DNS	Domain Name Server
GPS	Global Positioning System
HLR	Home Location Register
HTTP	Hyper Text Transfer Protocol
IMSI	International Mobile Subscriber Identity
IWF	Interworking Function
LBS	Location Based Services
LCS	Location Services
MC	Message Center
MDN	Mobile Directory Number
MLP	Mobile Location Protocol
MPC	Mobile Positioning Center
MO	Mobile-Originated
MS	Mobile Station
MSC	Mobile-Switching Center
MSID	Mobile Station Identifier
OMA	Open Mobile Alliance
PDE	Position Determination Entity
PDSN	Packet Data Service Node

Acronym / Abbreviation	Description
QNC	Quick Net Connect
SMDPP	Short Message Delivery Point-to-Point Bearer Service
SMPP	Short Message Peer-To-Peer Protocol
SMS	Short Message Service
URL	Universal Resource Locator

1 **1.5 Terms and Definitions**

2 Four categories of requirements are established:

(M) Mandatory	The handset must support that characteristic in order to achieve approval.
(HD) Highly Desirable	It is highly desirable and recommended that the handset supports this characteristic. This feature may become Mandatory in subsequent versions of the document. Supporting this characteristic will be valued in the commercial promotion of the terminal.
(O) Optional	It is left up to the manufacturer whether or not the terminal supports this characteristic. The handset may support this characteristic.
(D) Discard	The manufacturer shall not support this feature or function.



2. *LBS Introduction*

The Location Based Service (LBS) encompasses a range of services that are enabled when the mobile is aware of its own position or when the wireless network is aware of the location of mobile devices operating on it.

The location based services can be provided by downloadable applications(BREW or JAVA) or browser applications (WAP) that may be *device initiated*, meaning that the subscriber invokes location aware application from the mobile device; or they may be *network initiated*, meaning that an entity outside the carrier's network attempts to locate the mobile device.

2.1 Device Capabilities

The mobile station shall be capable of supporting position location services based on one of the following technologies:

- AFLT only
- MS-assisted hybrid of AFLT and AGPS
- MS-assisted hybrid of AFLT and AGPS and MS-based AGPS

For position location services based on the above technologies, there are two configurations: user plane and control plane.

The MS shall support position location based on both the User Plane method and the Control Plane method.

3. User Plane Requirements

In User plane, the position location operation is based on TCP/IP method and the Mobile station (MS) communicates with the network over an IS-2000 packet data session or IS-2000 high rate packet data channel or an IS-95A quick net connect (QNC) data channel.

User plane specifications support single positioning sessions, for both Device Initiated applications (e.g., Points of Interest) and Network Initiated applications (e.g., friend finder); and tracking positioning sessions, for both device initiated tracking (turn-by-turn car navigation) and Network Initiated tracking applications (Fleet Management, Workforce enterprise applications).

3.1 Reference Model

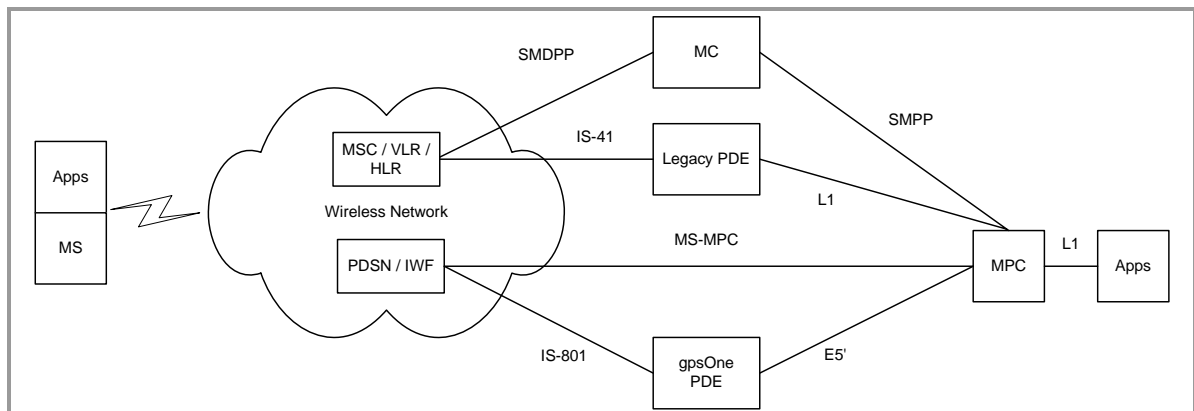


Figure 3-1: User Plane Location Services Network Architecture

Some of the key interfaces are:

- MPC-PDE interface – This is based on the E5 Interface from [11] and [12]. However, the actual details of this interface are fully defined in [22] and [23]. To distinguish this interface from that strictly defined in [11] and [12], this interface is labeled E5'.
- L1 interface – This is defined by OMA and is compliant with the LIF MLP 3.0.0 protocol ([14]).
- Legacy PDE IS-41 interface – This is an IS-41-compliant interface, but the mechanisms by which a cell/sector-based position estimate is obtained are implementation specific. Such details are not found in this specification and must be provided by the Legacy PDE vendor.

- gpsOne IS-801 interface – This is just a TCP/IP interface. The IS-801 messages are standards compliant ([9]) and encapsulated in a TCP/IP Wrapper ([17]) and carried end-to-end between the mobile and the gpsOne PDE.
- MS-MPC interface – This is used to support many location-specific service aspects, including authorization, gpsOne triggers, notification and verification events, etc. The details can be found in [18] and [19].
- MPC-MC interface – This interface is compliant with [15]. This will be used to carry special location-specific SMS messages performing such tasks as gpsOne triggers, notification and verification events, etc. The details can be found in [18] and [19].

3.2 User Plane Specific Requirements

The CDMA mobile station must support the protocols for LBS as defined in user plane specifications. There are 2 types of user plane specifications- Version 1 specifications (V1) and Version 2 specifications (V2).

V1 user plane specifications support single-shot positioning applications like Points of interests, Buddy finder, etc.; whereas V2 user plane specifications support tracking applications like turn-by-turn car navigation, fleet management, etc., in addition to single-shot applications.

3.2.1 Protocol

All User Plane applications can be treated as either trusted or non-trusted. Non-trusted applications are required to interface with the MPC to obtain position determination privileges, whereas trusted applications bypass the MPC and access the PDE directly.

3.2.1.1 Trusted Mode Requirements

Requirements in this section are applicable to terminals that support trusted model operation in V1 and/or V2 user plane specifications.

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.1.1.1	If the mobile station supports trusted mode operation then it shall support positioning over a TCP/IP packet data session without interaction with the MPC. The MS shall format message content in accordance with [9]; however, the MS shall encapsulate the message content in a wrapper as specified in 17].	M	Trusted mode requirements are identical for both V1 and V2.	[9], [17]. V1 specific : [18], [20], [22], [24]. V2 specific: [19], [21], [23], [25]	

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.1.1.2	The mobile station shall support AFLT Location technology and it shall also support trusted model call flows per the user plane specifications.	M		[18],[20], [19], [21]	
3.2.1.1.3	If the mobile station supports MS-Assisted technology then it shall support trusted model call flows per the user plane specifications.	M		[18],[20], [19], [21]	
3.2.1.1.4	If the mobile station supports MS-Based technology then it shall support trusted call flows per the user plane specifications.	M		[18],[20], [19], [21]	
3.2.1.1.5	If the mobile station is capable of supporting user plane LBS and if it supports BREW application environment then the mobile station shall provide the LBS BREW API (IPOSDET) and support all MS resident trusted call flows per the user plane specifications.	M		[30]	
3.2.1.1.6	If the mobile station is capable of supporting user plane LBS and if it supports WAP then the mobile station shall have the capability to support WAP trusted call flows per user plane specifications.	M	A special URL is defined in user plane specifications for supporting WAP services. The WAP browser detects this URL to begin positioning process		
3.2.1.1.7	If the mobile station is capable of supporting user plane LBS and if it supports JAVA application environment then the mobile station shall provide the JSR-179 API to support MS resident trusted call flows per user plane specifications.	M		[16]	

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.1.1.8	If the mobile station is capable of supporting user plane LBS and if it supports network initiated applications then the mobile station shall support trusted Network Initiated call flows per user plane specifications.	M			
3.2.1.1.9	If the mobile station supports user plane trusted call flows then it shall support system parameters info message.	HD		The details of the system parameters info. message are given in Appendix A.	

1 **3.2.1.2 V1 Non-Trusted Mode Requirements**

2 The following requirements are applicable for terminals that support V1 non-trusted
3 model.

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.1.2.1	If the mobile station supports non-trusted mode operation then it shall support positioning over a TCP/IP packet data session. The MS shall format message content in accordance with [9]; however, the MS shall encapsulate the message content in a wrapper as specified in [17].	M		[9], [17]. V1 specific : [18], [20], [22], [24].	
3.2.1.2.2	The mobile station shall support AFLT Location technology and it shall also support V1 non-trusted model call flows per the user plane specifications.	M		[18], [20]	
3.2.1.2.3	If the mobile station supports MS-Assisted technology then it shall support V1 non-trusted model call flows per the user plane specifications.	M		[18], [20]	

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.1.2.4	If the mobile station supports MS-Based technology then it shall not support non-trusted call flows per the V1 non-trusted user plane specifications, since the V1 specification does not support non-trusted tracking applications.	M			
3.2.1.2.5	If the mobile station is capable of supporting user plane LBS and it supports BREW application environment then the mobile station shall provide the LBS BREW API (IPOSDET) and support MS resident V1 non-trusted call flows per the user plane specifications.	M		[30]	
3.2.1.2.6	If the mobile station is capable of supporting user plane LBS and it supports WAP then the mobile station shall have the capability to support WAP V1 non-trusted call flows per user plane specifications.	M	A special URL is defined in user plane specifications for supporting WAP services. The WAP browser detects this URL to begin positioning process.		
3.2.1.2.7	If the mobile station is capable of supporting user plane LBS and it supports JAVA application environment then the mobile station shall provide the JSR-179 API to support MS resident V1 non-trusted call flows per user plane specifications.	M		[16]	
3.2.1.2.8	If the mobile station is capable of supporting user plane LBS and it supports network initiated applications then the mobile station shall support V1 non-trusted Network Initiated call flows per user plane specifications.	M			
3.2.1.2.9	If the mobile station supports user plane V1 trusted call flows then it shall support system parameters info. Message.	HD		The details of the system parameters info. message are given in Appendix A.	

1 **3.2.1.3 V2 Non- Trusted Mode Requirements**

2 The following requirements are applicable for terminals that support V2 non-trusted
3 model.

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.1.3.1	If the mobile station supports non-trusted mode operation then it shall support positioning over a TCP/IP packet data session. The MS shall format message content in accordance with [9]; however, the MS shall encapsulate the message content in a wrapper as specified in [17].	M		[9], [17] V2 specific: [19], [21], [23], [25]	
3.2.1.3.2	The mobile station shall supports AFLT Location technology and it shall also support V2 non-trusted model call flows per the user plane specifications.	M		[19], [21]	
3.2.1.3.3	If the mobile station supports MS-Assisted technology then it shall support V2 non-trusted model call flows per the user plane specifications.	M		[19], [21]	
3.2.1.3.4	If the mobile station supports MS-Based technology then it shall support non-trusted call flows per the V2 user plane specifications.	M		[19], [21]	
3.2.1.3.5	If the mobile stations is capable of supporting user plane LBS and it supports BREW application environment then the mobile station shall provide the LBS BREW API (IPOSDET) and support MS resident non-trusted call flows per the V2 user plane specifications.	M		[30]	

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.1.3.6	If the mobile station is capable of supporting user plane LBS and it supports WAP then the mobile station shall have the capability to support WAP non-trusted call flows per V2 user plane specifications.	M	A special URL is defined in user plane specifications for supporting WAP services. The WAP browser detects this URL to begin positioning process.		
3.2.1.3.7	If the mobile station is capable of supporting user plane LBS and it supports JAVA application environment then the mobile station shall provide the JSR-179 API to support MS resident non-trusted call flows per V2 user plane specifications.	M		[16]	
3.2.1.3.8	If the mobile station is capable of supporting user plane LBS and it supports network initiated applications then the mobile station shall support non-trusted Network Initiated non-trusted call flows per V2 user plane specifications.	M			
3.2.1.3.9	If the mobile station supports user plane V2 trusted call flows then it shall support system parameters info message.	HD		The details of the system parameters info. message are given in Appendix A.	

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3.2.2 User Plane Bearers

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.2.1	If the mobile station is capable of supporting user plane LBS then it shall support CDMA SMS.	M		[6]	
3.2.2.2	If the mobile station supports and the carrier allows data services using IS-2000 data	M		[5]	

Req. #	Requirement	Category	Remarks	References	PRI Configurable
	service options then the mobile station shall support positioning over IS-2000 packet data calls				
3.2.2.3	If the mobile station supports and carrier allows data services over IS95A/B or Quick net connect (QNC) data service options then the mobile station shall support positioning over IS95 A/B packet data and Quick net connect data call.	M		[4]	
3.2.2.4	If the mobile station supports and carrier allows data services over IS-2000 high data rate service option then the mobile station shall support positioning over IS-2000 high rates packet data (HRPD) calls. The mobile station shall be able to tune to 1x frequency and do AFLT measurements.	M		[3]	
3.2.2.5	The mobile station shall use the same PPP authentication parameters used for all other data clients(ex. browser, MMS, etc) to establish user plane data connections.	M			
3.2.2.6	The mobile station shall reuse the data connection established by other data services clients for user plane operation. Conversely the mobile station shall reuse the data connection established by user plane operation for other data services clients.	M			

1 **3.2.3 DNS Resolution**

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.3.1	If the mobile station is capable of supporting user plane LBS then it shall support DNS Resolution.	HD		[31]	

2 **3.2.4 Teleservice 65001 NI Call Flows**

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.4.1	If the mobile station supports network initiated user plane call flows the it shall respond to the incoming SMS message with TS:65001 per[18] and [19]	M	The network must support a unique teleservice identifier 65001 in Network Initiated SMS triggers.	[18], [19].	

3 **3.2.5 Notification and Verification**

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.5.1	If the mobile station is capable of supporting user plane specifications then it shall support notification and verification procedures per [18] and [19].	M		[18], [19].	

4 **3.2.6 Quality of Service(QOS)**

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Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.6.1	The mobile station shall support the PQOS parameter on the MS-MPC interface according to the user plane specifications for single fix operation.	M	PQOS values range from 0-255. The mobile station may use the PQOS values in the following manner: 0: Request a cached position from the MPC. 1: Request a cell/sector position from the MPC. 2-255: Request for all other positioning requests (Ex: MS Assisted). Note: PQOS values of >1 also indicate response time in seconds for the IS-801-1 session in the user plane call flows.	[18].	
3.2.6.2	The mobile station shall support the duration parameter on the MS-MPC interface according to the user plane specifications for periodic fix operation.	M	For periodic fix operation the mobile can request the MPC to grant access to the PDE for a fixed duration. This is indicated in the duration parameter in the SPPREQ message	[18].	

1 **3.2.7 User plane operation mode**

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Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.7.1	Mobile station that is able to support non-trusted or trusted mode of operation, shall have a protected configurable option to select the operation mode to be used. The default value for this option shall be defined on the PRI.	M			Yes

1 **3.2.8 Provision PDE and MPC address**

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.8.1	The mobile station shall have the capability to program PDE IP address and Port number. The ability to program PDE address shall be protected by the Service Programming Code (SPC) or the PDE address can be programmed by mobile station vendor's proprietary tool.	M			Yes
3.2.8.2	The mobile station shall have the capability to program MPC IP address and port number. The ability to program MPC address shall be protected by the service programming code (SPC) or the MPC address can be programmed by mobile station vendor's proprietary tool.	M			Yes

2 **3.2.9 Out of CDMA service support**

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.9.1	If the mobile station supports location method that do not require CDMA network coverage and location request from non-trusted terminal application is received while the mobile station is outside CDMA coverage, the mobile station shall serve the location request using the location method not requiring CDMA network coverage.	HD			No

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.9.2	If the mobile station was outside CDMA coverage when it started to serve the location request from non-trusted application and the mobile station re-acquires CDMA system in the middle ongoing location request, the mobile station shall complete the ongoing location request using the original location method.	HD			No
3.2.9.3	If location request has been started while mobile station was <u>within CDMA coverage</u> and Mobile station <u>has received Start Positioning Process Response</u> allowing location procedure and mobile station <u>loses the CDMA system</u> , the mobile station shall continue to provide location updates to terminal resident application if the currently used location method allows operation without CDMA network coverage.	HD	The location request using MS-Based GPS location method may continue after loss of CDMA network.		No

4. Control Plane Requirements

The control plane position location operation based on the DBM signaling method, the MS shall support protocol requirements for position location operation as specified in [9], [11] and [12]. Data Burst Message shall be used as the transport for the message content over the air.

Control plane specifications support single positioning sessions, for Network Initiated applications (e.g., E-911 emergency services, concierge services etc).

4.1 Reference Model

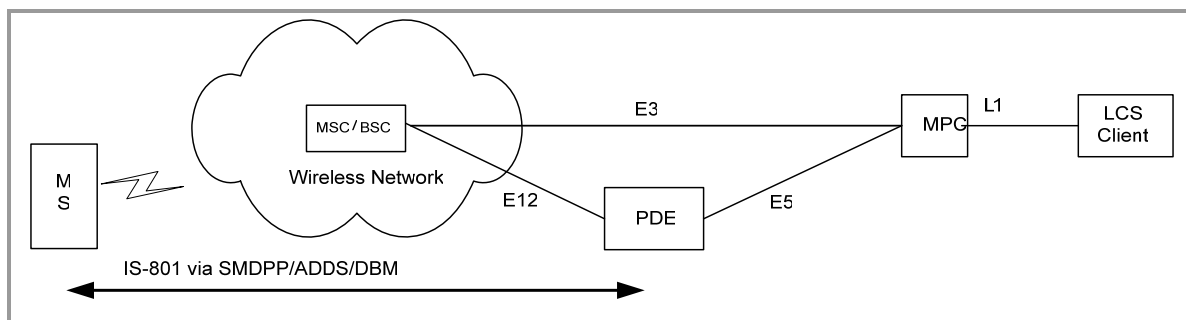


Figure 4-1: Control Plane Location Services Network Architecture

Some of the key interfaces are:

- E5 MPC-PDE interface – The details of this interface are defined in [11], [12].
- E3 MSC/BSC-MPC interface – The details of this interface are defined in [11], [12].
- E12 MSC/BSC-PDE interface – The details of this interface are defined in [11], [12].
- L1 interface – This is defined by OMA and is compliant with [14].
- gpsOne IS-801 interface – The IS-801 messages are standards compliant ([9]) and carried end-to-end between the mobile and the gpsOne PDE.

4.2 Control Plane Specific Requirements

The CDMA mobile station must support the protocols for LBS as defined in control plane specifications.

1

4.2.1 Protocol

Req. #	Requirement	Category	Remarks	References	PRI Configurable
4.2.1.1	If the mobile station (MS) supports Control Plane feature then the MS shall support the position location operation based on the Data Burst Message signaling method and the MS shall support protocol requirements for position location operation as specified in [9], [11] and [12].	M		[9]	
4.2.1.2	The mobile station shall support AFLT technology it shall also support control plane positioning call flows as specified in control plane specifications.	M		[9]	
4.2.1.3	If the mobile station supports control plane specifications then it shall support MS-Assisted technology.	M		[9]	
4.2.1.4	The MS-Based location method shall not be supported in control plane positioning mode.	M			
4.2.1.5	The mobile station shall support service options 35 and 36 per the control plane specifications.	M		[9], [11], [12]	
4.2.1.6	If a traffic channel associated with the voice call is active then IS-801-1 signaling information shall be supported on the existing traffic channel per the control plane specifications.	M		[9], [11], [12]	



5. Functional Requirements

5.1 Global Privacy Settings Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
5.1.1	The mobile station shall provide a configuration option to turn the user plane LBS functionality on or off. On meaning all location functions shall be working, without user intervention. Off meaning no location functions shall be performed in any situation for user plane (trusted and non-trusted) modes. Control plane emergency services (ex: E911) shall always be allowed irrespective of whether user plane LBS is enabled or disabled.	M			

5.2 Visual Indicators requirement

Req. #	Requirement	Category	Remarks	References	PRI Configurable
5.2.1	If the mobile station is capable of supporting user and/or control plane LBS then it shall provide visual indicator indicating the status of location request that is underway.	M	Visual indication should be un-intrusive and it is recommended that it uses the annunciator line in the UI of the mobile.		

Req. #	Requirement	Category	Remarks	References	PRI Configurable
5.2.2	The mobile station shall provide a visual indicator about the status of the LBS functionality - active or not active.	M			

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5.3 Emergency Call Service Interaction requirement

Req. #	Requirement	Category	Remarks	References	PRI Configurable
5.3.1	If a user dials an emergency number (such as 911) during an LBS session all LBS functionality should be stopped.	M			
5.3.2	If a user dials an emergency number (such as 911) during a network initiated LBS session, all LBS functionality shall be stopped.	M			
5.3.3	The mobile station shall always provide location information using control plane specifications during an emergency(ex: E911) call.	M			



1 **5.4 Simultaneous IS-801-1 sessions**

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5.4.1	The mobile station shall not support simultaneous IS-801-1 sessions.	M			
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6. Testability Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
6.1	The mobile station shall meet minimum performance criteria set by specification [10]	M		[9], [10]	
6.2	The mobile station shall enable data logging of standard OTA messages, Rx and Tx PPP packets, and Rx and Tx RLP packets. The mobile station shall enable data logging the entire contents of all [9] messages. All logging events shall be time stamped.	M	Data logging may be turned on or off on as needed basis. Data logging tools (For example a data logging tool such as CAIT) may be used to collect mobile station logs.		
6.3	The mobile station shall log when the LBS application launches and closes.	O			
6.4	The mobile station shall log beginning and end of TCP/IP socket setup with the MPC.	HD			
6.5	The mobile station shall log beginning and end of TCP/IP socket setup with the PDE.	HD			

Req. #	Requirement	Category	Remarks	References	PRI Configurable
6.6	The mobile station shall log Instance in time when application requests user consent.	O			
6.7	The mobile station shall log Instance in time when application receives user consent.	O			
6.8	The mobile station shall log Beginning and End of rendering of LBS specific content on the display	O			
6.9	The mobile station shall log MT SMS trigger for the network initiated LBS Application Trigger.	HD			
6.10	The terminal shall have a field test screen capable of displaying location determination parameters for the last available position fix. The field test menu shall be protected by a key sequence (Field test code) or similar protection mechanism.	HD	Desired parameters are: - Lat/Long, Velocity, Heading, and Height with time stamp. - SV's w/ PRN's, Pseudo range measurements, and C/No estimates - Pilots w/ PN Offsets, Pilot Phase measurements, and Ec/Io estimates - Uncertainty - SID, NID, BASE_ID, BASE_LAT, BASE_LONG, and Serving PN from the Provide System Parameters Message.		

Req. #	Requirement	Category	Remarks	References	PRI Configurable
6.11	The mobile station shall have the capability to program PDE IP address and Port number to support testing needs in pre-commercial system. The ability to program PDE address shall be protected by the Service Programming Code (SPC) or the PDE address can be programmed by mobile station vendor's proprietary tool.	M			
6.12	The mobile station shall have the capability to program MPC IP address and port number to support testing needs in pre-commercial system. The ability to program MPC address shall be protected by the service programming code (SPC) or the MPC address can be programmed by mobile station vendor's proprietary tool..	M			



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7. Standalone mode requirement

Req. #	Requirement	Category	Remarks	References	PRI Configurable
7.1	The mobile shall support standalone mode of operation. ²	HD			

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² There is no network interaction in Standalone mode of operation. This mode may be useful if the mobile station goes out of CDMA coverage areas.

8. Appendix A: System Parameter Info Message

The message format shall be in accordance with [9]. PD_MSG_TYPE shall be set to binary '11000000'. RESP_TYPE shall be set to binary '0010' (Provide System Parameters Info).

RESP_PAR_RECORD shall include the following record:

Field	Length (bits)
TIME_REF_CDMA	14
STILL_ACTIVE	1
BAND_CLASS	5
CDMA_FREQ	11
PILOT_PN	9
SID	15
NID	16
BASE_ID	16
BASE_LAT	22
BASE_LONG	23
RESERVED	4

1 **Field Definitions**

TIME_REF_CDMA	–	CDMA system time at the time the coarse location is valid – the base station shall set this field to $(t/50 \bmod 16384)$, where t is the CDMA system time in frames, as defined in 1.2 of TIA/EIA-95B, at the time the coarse location is valid. This is the time at which the values of the parameters reported in this response element parameter record are valid.
STILL_ACTIVE	–	If the serving base station at TIME_REF_CDMA has dropped out of the active set, this field shall be set to '0'; otherwise this field shall be set to '1'.
BAND_CLASS	–	Band class – the mobile station shall set this field to the CDMA band class, as specified in TSB58-B, at the time the coarse location is valid.
CDMA_FREQ	–	Frequency assignment – the mobile station shall set this field to the CDMA channel number, in the specified CDMA band class, as specified in 6.1.1.1 of TIA/EIA-95B, at the time the coarse location is valid.
PILOT_PN	–	Pilot PN sequence offset index – if the mobile station is on the Paging Channel, the mobile station shall set this field to the Pilot PN sequence offset index obtained from the Paging Channel that the mobile station is demodulating; otherwise, the mobile station shall set this field to the Pilot PN sequence offset index obtained from the Paging Channel that the mobile station last demodulated.
SID	–	System identification – if the mobile station is on the Paging Channel, the mobile station shall set this field to the system identification number obtained from the Paging Channel that the mobile station is demodulating; otherwise, the mobile station shall set this field to the system identification number obtained from the Paging Channel that the mobile station last demodulated.
NID	–	Network identification – if the mobile station is on the Paging Channel, the mobile station shall set this field to the network identification number obtained from the Paging Channel that the mobile station is demodulating; otherwise, the mobile station shall set this field to the network identification number obtained from the Paging Channel that the mobile station last demodulated.
BASE_ID	–	Base station identification – if the mobile station is on the Paging Channel, the mobile station shall set this field to the base station identification number obtained from the Paging Channel that the mobile station is demodulating; otherwise, the mobile station shall set this field to the base station identification number obtained from the Paging Channel that the mobile station last demodulated.
BASE_LAT	–	Base station latitude – if the mobile station is on the Paging Channel, the mobile station shall set this field to the base station latitude obtained from the Paging Channel that the mobile station is demodulating; otherwise, the mobile station shall set this field to the base station latitude obtained from the Paging Channel that the mobile station last demodulated.
BASE_LONG	–	Base station longitude – if the mobile station is on the Paging Channel, the mobile station shall set this field to the base station longitude obtained from the Paging Channel that the mobile station is demodulating; otherwise, the mobile station shall set this field to the base station longitude obtained from the Paging Channel that the mobile station last demodulated.