Open Market Handsets (OMH) R-UIM Specification

CDG Document 166

Version 2.1

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Contents

Revision History

Date	Version	Description
January 2008	1.0	• Initial release version • Included in OMH Enabler Package v1
May 2008	2.0	• EF$_{Model}$: Added new field "Software Version Information" • EF$_{SMSCAP}$: Changed "Default Service Option" to "Preferred Service Option" • EF$_{SMSCAP}$: SMS Preferred Service Options are byte values, not bits • EF$_{SMSCAP}$: Added an SMS Flag to indicate whether to use EMS per [CS0015] • EF$_{SIPUPPExt}$: Allow LBS application to be associated with more than one profile • EF$_{SIPUPPExt}$: Clarified "Unspecified" bit in APPLICATIONS is for use by applications not present in any other profiles • EF$_{MIPUPPExt}$: Added notes about NAI entry indexes and anticipated usage • EF$_{TCPConfig}$: TCP graceful close of dormant connections default is enabled • Added descriptions to require both CHAP and PAP credentials in R-UIM and to require that authentication algorithm fields in EF$_{SIPCAP}$ and EF$_{SIPUPP}$ not be used • EF$_{BrowserBM}$: Bookmark Name Information is UTF-8 • Added clarification regarding use of Gateway Tag in EF$_{BrowserCP}$ and EF$_{MMSICP}$ • Added Services field to the Gateway Tag • Modified MMS Implementation Tag to include new HTTP value that, unlike WAP, does not require provisioning of Interface to Core Network and Bearer Information • EF$_{BREWDownload}$: Carrier ID is a 32-bit unsigned integer (uint32) • EF$_{BREWDownload}$: BREW Download Server is a NULL-terminated, 8-bit ASCII string • EF$_{BREWDownload}$: BREW Subscriber ID is a NULL-terminated, 8-bit ASCII string • EF$_{BREWDownload}$: Removed incorrect 'LSB' from BREW Download Flags • EF$_{LBSV2PDEADDR}$: V2 LBS PDE Address Information is 8-bit ASCII string • EF$_{LBSV2PDEADDR}$: Corrected typo in V2 LBS PDE Address Information • EF$_{LBSV2PDEADDR}$: Changed the EF to be Transparent type • EF$_{LBSV2MPCADDR}$: V2 LBS MPC Address Information is 8-bit ASCII string • EF$_{LBSV2MPCADDR}$: Changed the EF to be Transparent type • Created references for [OWPVC], [RFC1738], [RFC3629], and [RFC4489]

Date	Version	Description
		• Clarified that 'FF' is for filling the unused bytes and a tag value of 'FF' indicates the end of valid data • Added typical sizes and upper limits for the EFs of variable size • Editorial changes • Included in OMH Enabler Package v2
November 2009	2.1	• Removed definitions for EFs that have been incorporated in 3GPP2 C.S0023-D R-UIM document • Moved size and default value information to CDG169 • Clarified optional features in overview • EF$_{Model}$: Added information on data consistency • Added a section about cPRL, PRL, EPRL • 3GPD, Section 5.3: Removed auth algorithm provisioning sentence • MMS Implementation: Removed the section that introduced a new MMS implementation value • EF$_{BREWDownload}$: Added that the A-Key is the BREW A-Key and is not the AKey in cdma2000® • EF$_{BREWSID}$: Added note that, if MIN_FOR_SID in EF$_{BREWDownload}$ is True, this EF will be ignored • Added LBS PDE and MPC address format definitions • Added byte order information for integer fields • Added requirement on character encoding types • Editorial changes / updated terminology and references

1. *Overview*

This document identifies the minimum capabilities required by an OMH Removable User Identity Module (R-UIM), including minimum commands, mechanisms, Elementary Files (EFs), etc. This document uses [CS0023] as the basis for defining the R-UIM and adds additional requirements, capabilities, and clarifications as necessary to support OMH.

Operators may provide support for any or all of the following features enabled by OMH: Root Certificates, HPRD, WAP Browser, MMS, Java, BREW, and LBS. For each of these features that the operator chooses to support on its OMH R-UIM, the requirements in the corresponding section of this document apply. For example, if an operator supports or has plans to support HRPD (1xEV-DO) in its network, the requirements in the HRPD (1xEV-DO) section of this document must be satisfied.

This document is complementary to and intended to be used with [CDG167].

2. *Mechanisms*

2.1 R-UIM Commands

2.1.1 General

At a minimum, the following general R-UIM commands *shall* be supported:

- SELECT
- STATUS
- READ BINARY
- UPDATE BINARY
- READ RECORD
- UPDATE RECORD
- SEEK
- INCREASE
- VERIFY CHV
- CHANGE CHV

- DISABLE CHV
- ENABLE CHV
- UNBLOCK CHV
- INVALIDATE
- REHABILITATE
- GET RESPONSE
- TERMINAL PROFILE
- ENVELOPE
- FETCH
- TERMINAL RESPONSE

2.1.2 ESN and MEID

The following Electronic Serial Number (ESN) and Mobile Equipment Identifier (MEID) commands *shall* be supported:

- ESN Store ESN_MEID_ME

2.1.3 Voice/SMS Security

The following voice/Short Message Service (SMS) security-related commands *shall* be supported:

- Update Shared Secret Data (SSD)
- Base Station Challenge
- Confirm SSD
- Authenticate
- Generate Key/VPM

2.1.4 Packet Data Security

The following packet data security-related commands *shall* be supported:

- Compute IP Authentication (CHAP, MN-HA, MIP-RRQ, MN-AAA)

2.1.5 OTASP/OTAPA

The following Over-the-Air Service Provisioning/Over-the-Air Parameter Administration (OTASP/OTAPA) commands *shall* be supported:

- Generate Public Key
- Key Generation Request
- Commit
- Validate
- Configuration Request
- Download Request
- SSPR Configuration Request
- SSPR Download Request
- OTAPA Request

2.2 Authentication

The R-UIM *shall* support the following authentication mechanisms:

- Cellular Authentication and Voice Encryption (CAVE) authentication
- Password Authentication Protocol (PAP) for Simple IP authentication
- Challenge Handshaking Authentication Protocol (CHAP) for Simple IP authentication
- CHAP for A12 authentication [High Rate Packet Data (HRPD)]
- Mobile IP authentication

CAVE A-key Generation procedures may be supported.

2.3 Subsidy Lock

OMH does not specify R-UIM support for subsidy lock mechanisms, since such mechanisms are contrary to the goal of creating open devices that may be used across multiple networks.

If an operator desires to subsidize a particular OMH device, it may do so by working with the device original equipment manufacturer (OEM) to implement the desired personalization mechanism on the device. At that point, however, the device would no longer be considered an OMH device.

2.4 Carrier Customization

The following EFs defined in [CS0023] **shall** be supported for carrier customization.

Elementary File	Description
EF$_{SPN}$ (Service Provider Name)	Display Condition Character Encoding Language Indicator Service Provider Name
EF$_{AppLabels}$ (Application Labels)	Character Encoding Language Indicator Application Labels Present Application Labels

The following encoding types **shall** be supported for EF$_{SPN}$:

- 7-bit ASCII
- IA5
- Unicode

The following encoding types **shall** be supported for EF$_{AppLabels}$:

- 7-bit ASCII
- IA5
- Unicode
- Octet, unspecified: Containing 8-bit ASCII characters

2.5 CDMA Card Application Toolkit

At a minimum, the following CDMA Card Application Toolkit (CCAT) items **shall** be supported by the R-UIM.

- Call Control
- CCAT – PROVIDE LOCAL INFORMATION
  (IMSI_11_12, SID, NID, BASE_ID, BASE_LONG, BASE_LAT)
- Event: Access Technology changed
- Event: Browser Termination
- Event: Browsing status
- Event: Call connected (all modes)
- Event: Call disconnected (all modes)
- Event: Idle screen available
- Event: Language selection
- Event: Location status

- Event: Mobile-Terminated (MT) call
- Event: Network Search Mode Change
- Event: User activity
- Menu selection
- Proactive cmd: DISPLAY TEXT
- Proactive cmd: DISPLAY TEXT (Variable Timeout)
- Proactive cmd: GET INKEY
- Proactive cmd: GET INKEY (help supported)
- Proactive cmd: GET INKEY (Variable Timeout)
- Proactive cmd: GET INPUT
- Proactive cmd: LANGUAGE NOTIFICATION
- Proactive cmd: LAUNCH BROWSER
- Proactive cmd: MORE TIME
- Proactive cmd: PLAY TONE
- Proactive cmd: PLAY TONE (Melody tones and Themed tones supported)
- Proactive cmd: POLL INTERVAL
- Proactive cmd: POLLING OFF
- Proactive cmd: PROVIDE LOCAL INFORMATION (Access Technology)
- Proactive cmd: PROVIDE LOCAL INFORMATION (ESN)
- Proactive cmd: PROVIDE LOCAL INFORMATION (language)
- Proactive cmd: PROVIDE LOCAL INFORMATION (MCC)
- Proactive cmd: PROVIDE LOCAL INFORMATION (Search Mode change)
- Proactive cmd: PROVIDE LOCAL INFORMATION (battery state)
- Proactive cmd: REFRESH (all modes)
- Proactive cmd: SELECT ITEM
- Proactive cmd: SEND DTMF command
- Proactive cmd: SEND SHORT MESSAGE
- Proactive cmd: SET UP CALL
- Proactive cmd: SET UP EVENT LIST
- Proactive cmd: SET UP IDLE MODE TEXT
- Proactive cmd: SET UP MENU
- Proactive cmd: TIMER MANAGEMENT (get current value)
- Proactive cmd: TIMER MANAGEMENT (start stop)
- Profile download
- Short Message Service Point to Point (SMS-PP) data download
- Soft keys support for SELECT ITEM

- Soft Keys support for SET UP MENU
- Timer expiration

2.6 Device and Model Identification

The following EFs defined in [CS0023] **shall** be supported for device and model identification.

Elementary File	Description
EF$_{ESNME}$ (ESN_ME)	ESN_ME
EF$_{RUIMID}$ (Removable UIM_ID)	R-UIM ID
EF$_{SF\_EUIMID}$ (Short Form EUIMID)	SF_EUIMID
EF$_{USGIND}$ (Usage Indicator)	UIM ID/SF_EUIMID Usage Indicator
EF$_{Model}$ (Device Model Information)	Character Encoding Language Indicator Model Information Manufacturer Name Software Version Information

Device identification refers to electronic serial number (ESN), mobile equipment identifier (MEID), UIM Identifier (UIMID), or expanded UIM Identifier (EUIMID) of the device and R-UIM.

- The R-UIM **shall** be provisioned with an UIMID containing the pUIMID value derived from EUIMID.
- The R-UIM **shall** support the use of EUIMID.
- If SF_EUIMID is being used, the R-UIM **shall** provision n8 (SF_EUIMID-based EUIMID) in the CDMA Service Table.
- If SF_EUIMID is being used, the EF$_{USGIND}$ (Usage Indicator) **shall** be configured to indicate whether the device should use SF_EUIMID or MEID for network identification.

In addition to supporting device identifiers, the R-UIM supports the storage of model information using EF$_{Model}$. Similar to EF$_{ESNME}$, this file is populated by the device during power-up. This file enables applications running on the R-UIM to provide model information to the network either automatically or on demand.

- The R-UIM **shall** ensure the information stored in EF$_{Model}$ is consistent with the information (model, software version, etc.) of the device it is operating with. If

the information in the file is inconsistent with the device information, the R-UIM ***shall*** clear the content of this EF.

Note: the scenario being addressed in the consistency requirement above is one in which an R-UIM is moved from an OMH device to a legacy device. Since legacy devices do not store EF$_{Model}$ information to the R-UIM, the EF$_{Model}$ information in the R-UIM could be associated with the previous device rather than the current one, potentially resulting in an operator application on the R-UIM providing incorrect information to the network.

- The following encoding types ***shall*** be supported for EF$_{Model}$:
    o 7-bit ASCII
    o IA5
    o Unicode

2.7 Over-the-Air (OTA) Provisioning and Firmware

2.7.1 SMS-PP Data Download

CCAT SMS-PP data download (service n26) ***shall*** be supported by the R-UIM. This generic mechanism provides the ability to modify any EF on the R-UIM. This CCAT mechanism uses a different teleservice value to allow the handset to distinguish SMS-PP data download messages from regular SMS messages.

All EFs on the R-UIM ***shall*** be updatable via the CCAT SMS-PP data download.

UIM Toolkit (UTK) Preferred Roaming List (PRL) updates via SMS-PP ***shall*** be supported by the R-UIM. Unlike the CCAT version of SMS-PP data download, UTK PRL update messages via SMS-PP use the same teleservice as regular SMS messages. To distinguish them from regular SMS messages, reserve bits are used to indicate a Message Display Mode. In other words, the R-UIM must be able to check the Message Display Mode to determine whether an SMS message is a UTK PRL update and treat the message appropriately.

2.7.2 OTASP/OTAPA

Existing OTASP/OTAPA functions in the R-UIM for Basic Voice and SMS ***shall*** be supported.

2.8 Root Certificates

OMH supports the storage of root certificates on the R-UIM to enable download of operator-signed applications. The following EF defined in [CS0023] ***shall*** be supported for this feature.

Elementary File	Description

EF$_{RC}$
(Root Certificates)
	One or more occurrences of:
	    Certificate Type
	    Certificate Information
	    Applications

2.9 CDMA Service Table

The R-UIM *shall* enable service n9 (MEID Support).

Service numbers reserved for CDG in [CS0023] *shall* be used as follows:

- Service n23: BREW
- Service n24: LBS

All OMH R-UIMs *shall* enable service n15 (Messaging and 3GPD Extensions), allowing this service table entry to be used to identify an OMH R-UIM.

3. *Basic Voice Service and Device Operation*

The following EFs defined in [CS0023] **shall** be supported for basic voice service and device operation.

Elementary File	Description
EF$_{ADN}$ (Abbreviated dialing numbers)	Alpha Identifier Length of BCD number/SSC contents TON and NPI Dialing Number/SSC String Capability/Configuration Identifier Extension1 Record Identifier
EF$_{COUNT}$ (Call Count)	COUNT$_{s-p}$
EF$_{IMSI\_M}$ (IMSI_M)	IMSI_M_CLASSp IMSI_M_S2 from IMSI_M_Sp IMSI_M_S1 from IMSI_M_Sp IMSI_M_11_12p IMSI_M_PROGRAMMED/IMSI_M_ADDR_NUMp MCC_Mp
EF$_{IMSI\_T}$ (IMSI_T)	IMSI_T_CLASSp IMSI_T_S2 from IMSI_T_Sp IMSI_T_S1 from IMSI_T_Sp IMSI_T_11_12p IMSI_T_PROGRAMMED/IMSI_T_ADDR_NUMp MCC_Tp
EF$_{TMSI}$ (TMSI)	ASSIGNING_TMSI_ZONE_LENs-p ASSIGNING_TMSI_ZONEs-p M TMSI_CODEs-p M TMSI_EXP_TIMEs-p
EF$_{CDMAHOME}$ (CDMA Home SID, NID)	CDMA Home SID (SIDp) CDMA Home NID (NIDp) Band Class
EF$_{ZNREGI}$ (CDMA Zone-Based Registration Indicators)	REG_ZONE SID NID
EF$_{SNREGI}$ (CDMA System-Network Registration Indicators)	SID NID

Elementary File	Description
EF$_{DISTREGI}$ (CDMA Distance-Based Registration Indicators)	BASE_LAT_REG BASE_LONG_REG REG_DIST_REG
EF$_{ACCOLC}$ (Access Overload Class ACCOLCp)	Access overload class (ACCOLC$_p$)
EF$_{TERM}$ (Call Termination Mode Preferences)	Call termination preferences
EF$_{PRL}$ (Preferred Roaming List)	PRL
EF$_{RUIMID}$ (Removable UIM_ID)	RUIMID
EF$_{CST}$ (CDMA Service Table)	Service Table
EF$_{SPC}$ (Service Programming Code)	Service Programming Code
EF$_{OTAPASPC}$ (OTAPA/SPC_Enable)	OTAPA/SPC_Enable
EF$_{NAMLOCK}$ (NAM_LOCK)	SPASM protection indicator (NAM_LOCK) status
EF$_{OTA}$ (OTASP/OTAPA Features)	A table of OTASP/OTAPA features
EF$_{SP}$ (Service Preferences)	Service Preferences (e.g., band class, analog vs. CDMA)
EF$_{ESNME}$ (ESN_ME)	ESN_ME
EF$_{Revision}$ (R-UIM Revision)	R-UIM Revision
EF$_{PL}$ (Preferred Languages)	One or more language codes
EF$_{SSFC}$ (Supplementary Services Feature Code Table)	A table of feature codes for supplementary services (e.g., Call Forwarding)
EF$_{USGIND}$ (Removable UIM ID/SF_EUIMID Usage Indicator)	UIM ID/SF_EUIMID Usage Indicator
EF$_{AD}$ (Administrative Data)	MS operation mode Additional information

Elementary File	Description
EF_{MDN} (Mobile Directory Number)	Number of digits MDN NUMBER_TYPE NUMBER_PLAN PI SI
EF_{MAXPRL} (Maximum PRL)	MAX_PR_LIST_SIZE for EFPRL MAX_PR_LIST_SIZE for EFEPRL
EF_{SPCS} (SPC Status)	SPC Status
EF_{ECC} (Emergency Call Codes)	One or more emergency codes

3.1 EF$_{PRL}$

R-UIM **shall** allow the download and storage of each of the following in EF$_{PRL}$:

- IS-683A PRL
- Concatenated PRL (cPRL), which contains both IS-683A PRL and IS-683C PRL. See the cPRL appendix in [CDG167] for further description.

4. *Short Message Service (SMS)*

The following EFs defined in [CS0023] *shall* be supported for this feature.

Elementary File	Description
EF$_{SMS}$ (Short Messages)	Status MSG_LEN SMS Transport Layer Message
EF$_{SMSP}$ (SMS Parameters)	Teleservice Identifier Parameter Indicators Reserved Destination Address MSG_ENCODING Validity Period Service Category Destination Subaddress Bearer Reply Option Bearer Data
EF$_{SMSS}$ (SMS Status)	MESSAGE_ID WAP MESSAGE_ID SMS "Memory Cap. Exceeded" Notification Flag / SMS Timestamp Mode Reserved
EF$_{BCSMScfg}$ (Broadcast SMS Configuration)	Operator Broadcast Configuration
EF$_{BCSMSpref}$ (Broadcast SMS Preference)	User Broadcast Configuration
EF$_{BCSMStable}$ (Broadcast SMS Table)	Status Service Category Language Max Messages Alert Option Label Encoding Label
EF$_{BCSMSP}$ (Broadcast SMS Parameter)	Select Priority
EF$_{SMSCAP}$ (SMS Capabilities)	SMS Retry Period SMS Retry Interval SMS Flags SMS Preferred Service Option

5. *3G Packet Data*

The following EFs defined in [CS0023] **shall** be supported for this feature.

Elementary File	Description
EF$_{ME3GPDOPC}$ (ME 3GPD Operation Capability)	SimpleIP MobileIP MobileIP with SimpleIP fallback
EF$_{3GPDOPM}$ (3GPD Operation Mode)	SimpleIP only MobileIP with SimpleIP fallback MobileIP only
EF$_{SIPCAP}$ (SimpleIP Capability Parameters)	MAX_NUM_NAI MAX_NAI_LENGTH MAX_SS_LENGTH AUTH_ALGORITHM
EF$_{MIPCAP}$ (MobileIP Capability Parameters)	MAX_NUM_NAI MAX_NAI_LENGTH MAX_MN-AAA_SS_LENGTH MN-AAA_AUTH_ALGORITHM MAX_MN-HA_SS_LENGTH MN-HA_AUTH_ALGORITHM
EF$_{SIPUPP}$ (SimpleIP User Profile Parameters)	*One or more occurrences of:* NAI_ENTRY_INDEX NAI_LENGTH NAI AUTH_ALGORITHM

Elementary File	Description

EF_{MIPUPP}
(MobileIP User Profile Parameters)
	RETRY_INFO_INCLUDED
	MAX_NUM_RETRY
	FIRST_RETRY_TIMEOUT
	REREG_THRESHOLD
	One or more occurrences of:
	    NAI_ENTRY_INDEX
	    NAI_LENGTH
	    NAI
	    T_BIT
	    HOME_ADDRESS
	    PRIMARY_HOME_AGENT
	    SECONDARY_HOME_AGENT
	    MN-AAA_AUTH_ALGORITHM
	    MN-AAA-SPI_INDICATOR
	    MN-AAA_SPI
	    MN-HA_AUTH_ALGORITHM
	    MN-HA_SPI_INDICATOR
	    MN-HA_SPI

EF_{SIPSP} (SimpleIP Status Parameters)	ACT_NAI_ENTRY_INDEX
EF_{MIPSP} (MobileIP Status Parameters)	ACT_NAI_ENTRY_INDEX *One or more occurrences of:* ADD_ACT_NAI_ENTRY_INDEX

EF_{SIPPAPSS}
(SimpleIP PAP SS Parameters)
	One or more occurrences of:
	    NAI_ENTRY_INDEX
	    SS_LENGTH
	    SS

SimpleIP CHAP SS
Parameter Block
	One or more occurrences of:
	    NAI_ENTRY_INDEX
	    SS_LENGTH
	    SS

MobileIP SS
Parameter Block
	One or more occurrences of:
	    NAI_ENTRY_INDEX
	    MN-AAA_SS_LENGTH
	    MN-AAA_SS
	    MN-HA_SS_LENGTH
	    MN-HA_SS

EF_{MIPFlags} (MobileIP Flags)	MIP_FLAGS

Elementary File	*Description*
EF$_{SIPUPPExt}$ (SimpleIP User Profile Parameters Extension)	*One or more occurrences of:* NAI_ENTRY_INDEX NAI APPLICATIONS PRIORITY DATA_RATE_MODE DATA_BEARER
EF$_{MIPUPPExt}$ (MobileIP User Profile Parameters Extension)	*One or more occurrences of:* NAI_ENTRY_INDEX NAI APPLICATIONS PRIORITY DATA_RATE_MODE DATA_BEARER
EF$_{TCPConfig}$ (TCP Configurations)	TCP Flags TCP Keep-Alive Idle Timer
EF$_{DGC}$ (Data Generic Configurations)	Data dormant timer EPZID Type Information Hysteresis Activation Time
EF$_{IPV6CAP}$ (IPv6 Capabilities)	Initial neighbor solicitation delay time Solicitation interval Re-solicitation interval Maximum solicitation attempts Maximum re-solicitation attempts Pre-RA expiry re-solicitation time IID Information IPv6 Flags: Use IPv6 Failover from IPv6 to IPv4 PDSN as proxy IPv6 DNS server

5.1 EF$_{SIPUPPExt}$

EF$_{SIPUPPExt}$ defines the mechanisms for applications to be associated with 3GPD user profiles. While each profile may be associated with multiple applications, each application, with the exception of Location Based Services (LBS), may only be associated with one profile. In other words, with the exception of LBS, applications **shall not** be assigned to more than one profile.

LBS may be associated with multiple profiles because LBS sessions can be initiated by the network through no action of the user. Therefore, this exception allows operators to provision profiles such that LBS may share data sessions with one, many, or all other applications, depending on provisioning of this EF.

For example, an operator could set up two profiles: one for Binary Runtime Environment for Wireless (BREW) and another for all other applications. To allow LBS

to share any currently established data session in this scenario, one profile would associate BREW and LBS, while the other profile associates Multimedia Message Service (MMS), WAP Browser, Java, Terminal, and LBS. Note that each profile in this example includes LBS, while all other applications appear in only one profile.

If LBS is associated with multiple profiles and the user launches an LBS application when a data session is not already established, the device will use the profile that includes LBS and has the lowest priority to set up a new data session.

5.2 EF$_{MIPUPPExt}$

The ability to enable multiple profile support for Mobile IP has been defined in [CS0023]. However, at the time of this writing, no input has been received from operators indicating plans to use multiple profiles with Mobile IP. Therefore, the anticipated usage of EF$_{MIPUPPExt}$ would be to associate the application value "Unspecified" with a single profile.

5.3 Provisioning for Simple IP Authentication

Both CHAP and PAP credentials (NAIs and Shared Secrets) <u>may</u> be provisioned in the R-UIM using the following EFs:

- EF$_{SIPUPP}$
- EF$_{SIPPAPSS}$
- SimpleIP CHAP SS Parameter Block (Hidden EF)

6. *HRPD (1xEV-DO)*

The following EFs defined in [CS0023] **shall** be supported for this feature.

Elementary File	*Description*
EF$_{HRPDCAP}$ (HRPD Access Authentication Capability Parameters)	MAX_NAI_LENGTH MAX_SS_LENGTH *RESERVED* AUTH_ALGORITHM
EF$_{HRPDUPP}$ (HRPD Access Authentication User Profile Parameters)	NAI_LENGTH NAI AUTH_ALGORITHM
HRPD Access Authentication CHAP SS Parameters Block	SS_LENGTH SS

7. *WAP Browser*

The following EFs defined in [CS0023] **shall** be supported for this feature.

Elementary File	Description
EF_{WAPBrowserCP} (WAP Browser Connectivity Parameters)	*One or more occurrences of:* WAP Browser Connectivity Parameters Gateway HomeURL
EF_{WAPBrowserBM} (WAP Browser Bookmarks)	*One or more occurrences of:* URL Information Bookmark Name Information

8. *Multimedia Messaging Service (MMS)*

The following EFs defined in [CS0023] **shall** be supported for this feature.

Elementary File	Description
EF$_{MMSN}$ (MMS Notification)	MMS Status MMS Implementation Tag MMS Notification Extension file record number
EF$_{EXT8}$ (Extension 8)	Record type Extension data Identifier

EF$_{MMSICP}$ (MMS Issuer Connectivity Parameters)	*One or more occurrences of:*
	    MMS Implementation Tag
	    MMS Relay/Server Tag
	    Interface to Core Network and Bearer Information Tags
	    Gateway Tag
	    MMS Authentication Mechanism Tag
	    MMS Authentication ID Tag

EF$_{MMSUP}$ (MMS User Preferences)	MMS Implementation Tag MMS User Preference Profile Name Tag MMS User Preference information Tag
EF$_{MMSConfig}$ (MMS Configuration)	Max Message Size Value Retry Times Value Retry Interval Value MMSC Timeout Value

OMH enables an operator to configure its Java download server on the R-UIM. The following EF defined in [CS0023] **shall** be supported for this feature.

Elementary File	Description
EF$_{JDL}$ (Java Download URL)	URL pointing to the operator's Java download catalog

9.1 Java Options

Java applications may be pre-loaded and run on the R-UIM or on the device. Additional Java applications may also be downloaded to the device. Each of these Java options may coexist and be used as needed.

9.1.1 Pre-Loaded Java Applets on the R-UIM

On-card applications allow operators to differentiate their service offering. These applications interact with the device using the CCAT. If operators intend to pre-load such applications, they should ensure that their card vendors provide necessary support (e.g., Java Virtual Machine) and ensure that the target card has sufficient memory and processing capabilities for the application(s) that will be pre-loaded.

9.1.2 Pre-Loaded Java Applications on the Device

Pre-loaded applications enable OEMs to differentiate their devices from a software features perspective. Such applications are generally self-contained, requiring no support from the R-UIM.

9.1.3 Download of Java Applications onto the Device

EF$_{JDL}$ allows an operator to identify the URL of their Java download catalog on the R-UIM for use by a dedicated Java catalog icon or menu item on the OMH device.

All downloaded Java applications, whether from the operator catalog, OEM catalog, or elsewhere, will be stored on and run from the device. The operator may provision a root certificate associated with Java on the R-UIM card to enable operator signing of Java applications. For more information on certificate storage on the R-UIM, refer to the EF$_{RC}$ definition in [CS0023].

10. *BREW*

This chapter extends the capabilities of the R-UIM to enable operator BREW download services on OMH devices. If service n23 is allocated, the items defined in the following subsections **shall** be supported.

10.1 EF~BREWDownload~ *(BREW Download)*

This new EF contains information to enable BREW download services. If service n23 (BREW) is allocated, this EF **shall** be present.

Identifier: '6F81'		Structure: Transparent		Optional	
File size: 207 bytes		Update Activity: Low			
Access Conditions:					
READ		CHV1			
UPDATE		ADM			
INVALIDATE		ADM			
REHABILITATE		ADM			
Bytes	Description			M/O	Length
1-4	Carrier ID			M	4 bytes
5-12	BREW A-Key			M	8 bytes
13-76	BREW Download Server			M	64 bytes
77-78	BREW Download Flags			M	2 bytes
79	BREW Download Authentication Policy			M	1 byte
80-207	Reserved for future use			O	128 bytes

- **Carrier ID:** Coding: 32-bit unsigned integer (uint32).

    Byte 1:

b8	b7	b6	b5	b4	b3	b2	b1

    MSB of the integer
    bits in descending order

    Byte 2:

b8	b7	b6	b5	b4	b3	b2	b1

    bits in descending order

Byte 3:

	b8	b7	b6	b5	b4	b3	b2	b1
bits in descending order								

Byte 4:

	b8	b7	b6	b5	b4	b3	b2	b1
bits in descending order LSB of the integer								
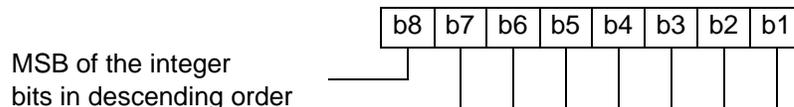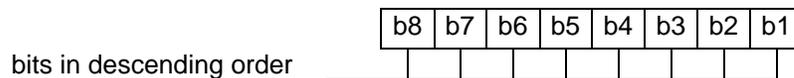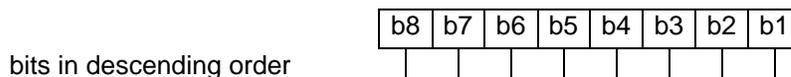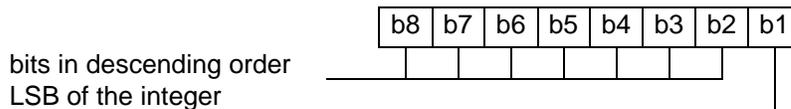
- **BREW A-Key:** Coding: 64-bit binary data.
- **BREW Download Server:** Coding: NULL-terminated, 8-bit ASCII (one octet per character) string. This is either the IP Address or Domain Name associated with the BREW Download Server. The device automatically identifies whether the contents of this field are an IP address or domain name; in the case of domain name, DNS resolution is performed to obtain the IP address. If there is more than one server address, they may be specified with comma delimiters (e.g., *address1, address2*).
- **BREW Download Flags:** Coding: 16-bit flag bits (0 – Not set; 1 – Set).
    - **Byte 1:**

Bit	Description
1	USE_A_KEY. If set, use BREW A-Key; otherwise use B-Key.
	Note: The BREW-key (B-Key) is a unique key that can be generated by the OEM per each device. If it is set to 0, BREW auto-generates one.
2	MIN_FOR_SID. If set, use the MIN for the Subscriber ID.
3	PREPAY. If set, it is a prepay phone.
4	NO_AUTO_ACK. If set, do not force ACKs until user runs the BREW application manager/downloader.
5	SID_ENCODE. Use Subscriber ID rather than ESN for application encoding.
6	SID_VALIDATE_ALL. Validate all applications rather than just Subscription (SSN) applications.
7	RUIM_DEL_OVERRIDE: Allow one R-UIM user to delete applications owned by another.
	Note: In an open market environment, it is important for new users to be able to delete applications that were downloaded by a previous owner of the device. Accordingly, the default for this value is to allow deletion.
8	Reserved for future use

- **Byte 2:**

Bit	Description
1	AUTO_UPGRADE. Perform automatic upgrade when new uses are purchased.
2	NO_LAUNCH_MOD_ACK_DISABLED. If set, do not start an application with flag MOD_ACK_DISABLED set.
3-8	Reserved for future use

- **BREW Download Authentication Policy:**

  Coding: integer values.

Value	Policy	Description
0	APOLICY_NONE	No authentication required.
1	APOLICY_SID	User's Subscriber ID (SID) is passed to the Application Download Server (ADS) before any set of transactions is started.
2	APOLICY_TEXT	User should be prompted for text "key" and this sent to ADS.
3	APOLICY_NUM	User should be prompted for numeric "key" and this sent to ADS.
4-255	Reserved for future use	

10.2 EF$_{BREWTSID}$ (BREW Teleservice ID)

This new EF contains information about BREW Teleservice ID. If service n23 (BREW) is allocated, this EF **shall** be present.

Identifier: '6F82'		Structure: Transparent		Optional
File size: 4 bytes		Update Activity: Low		
Access Conditions:				
READ		CHV1		
UPDATE		ADM		
INVALIDATE		ADM		
REHABILITATE		ADM		
Bytes	Description		M/O	Length
1-4	BREW Teleservice ID		M	4 bytes

▪ **BREW Teleservice ID:** The SMS Teleservice ID to be used in BREW directed SMS messages.

Coding: 32-bit integer.

Byte 1:

b8	b7	b6	b5	b4	b3	b2	b1

MSB of the integer
bits in descending order

Byte 2:

b8	b7	b6	b5	b4	b3	b2	b1

bits in descending order

Byte 3:

b8	b7	b6	b5	b4	b3	b2	b1

bits in descending order

Byte 4:

b8	b7	b6	b5	b4	b3	b2	b1

bits in descending order
LSB of the integer
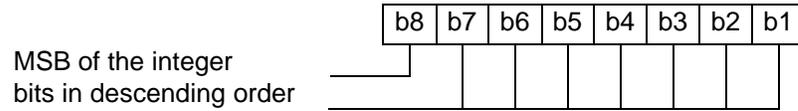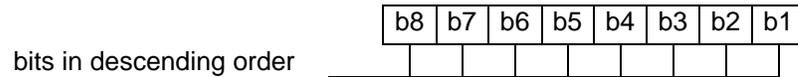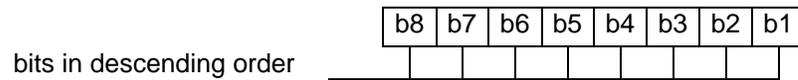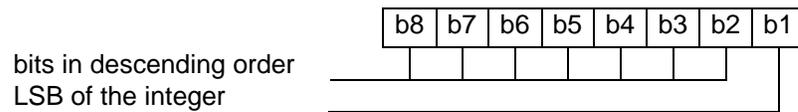
10.3 EF$_{BREWSID}$ (BREW Subscriber ID)

This new EF contains information about BREW Subscriber ID. If service n23 (BREW) is allocated, this EF *shall* be present.

Identifier: '6F83'		Structure: Transparent		Optional	
File size: Variable		Update Activity: Low			
Access Conditions:					
READ		CHV1			
UPDATE		ADM			
INVALIDATE		ADM			
REHABILITATE		ADM			
Bytes	Description			M/O	Length
X	BREW Subscriber ID			M	X bytes

▪ Unused bytes *shall* be set to 'FF.'

- **BREW Subscriber ID:** Coding: NULL-terminated, 8-bit ASCII (one octet per character) string.

  Note: When MIN_FOR_SID in the BREW Download Flags in EF**BREWDownload** is set to 1, this field is ignored.

10.4 EF*BREWAEP* (BREW Application Execution Policy)

This new EF contains information about the BREW Application Execution Policy. If service n23 (BREW) is allocated, this EF **shall** be present.

Identifier: '6F89'		Structure: Transparent		Optional	
File size: 1 byte		Update Activity: Low			
Access Conditions:					
READ		CHV1			
UPDATE		ADM			
INVALIDATE		ADM			
REHABILITATE		ADM			
Bytes	Description			M/O	Length
1	BREW Application Execution Policy			M	1 bytes

- **BREW Application Execution Policy:** Coding: integer values.

Value	Policy	Description
0	PPOLICY_BREW	TRUE-BREW-signed applet only
1	PPOLICY_CARRIER	Carrier-signed applet only
2	PPOLICY_BREW_AND_CARRIER	TRUE-BREW- and carrier-signed applet only
3	PPOLICY_BREW_OR_CARRIER	TRUE-BREW- or carrier-signed applet
4-255	Reserved for future use	

11. *Location Based Services (LBS)*

This chapter extends the capabilities of the R-UIM to enable operator location-based services OMH devices. If service n24 is allocated, the items defined in the following subsections **shall** be supported.

Note: Refer to Section 5.1 EF$_{SIPUPPExt}$ for information on the assignment of the LBS application to multiple user profiles.

11.1 gpsOne XTRA Assistance

11.1.1 EF$_{LBSXTRAConfig}$ (LBS XTRA Configuration)

This new EF contains the configuration of the LBS eXTended Receiver Assistance (XTRA) client on the device. If service n24 (LBS) is allocated, this EF **shall** be present.

Identifier: '6F84'		Structure: Transparent		Mandatory	
File size: 4 bytes			Update Activity: Medium		
Access Conditions:					
READ			CHV1		
UPDATE			ADM		
INVALIDATE			ADM		
REHABILITATE			ADM		
Bytes	Description			M/O	Length
1	XTRA Flags			M	1 byte
2	gpsOneXTRA Download Interval			M	1 byte
3	gpsOneXTRA Download Retries			M	1 byte
4	gpsOneXTRA Download Retry Interval			M	1 byte

- **XTRA Flags:**

  Coding (0 – disabled; 1 – enabled):

Bit	Parameter Indicated
1	Allow gpsOneXTRA
2	Allow gpsOneXTRA automatic download
3-8	Reserved for future use

- **gpsOneXTRA Download Interval:** The number of hours between automatic retrieval of gpsOneXTRAAssistance data from Internet.

  Coding: 8-bit integer. Range: 1 to 168. (168 hours is a week.)

- **gpsOneXTRA Download Retries:** The number of unsuccessful attempts (i.e., retries) made to retrieve gpsOneXTRAAssistance data from the Internet before giving up.

  Coding: 8-bit integer. Range: 0 to 10.

- **gpsOneXTRA Download Retry Interval:** The time (in minutes) between unsuccessful download attempts (i.e., retries).

  Coding: 8-bit integer. Range: 1 to 120.

11.1.2 $EF_{LBSXSURL}$ (LBS XTRA Server URLs)

This new EF contains the XTRA Server URLs for LBS. If service n24 (LBS) is allocated, this EF *shall* be present.

Identifier: '6F85'		Structure: Transparent		Mandatory	
File size: $X_1+X_2+X_3$ bytes			Update Activity: Medium		
Access Conditions:					
READ			CHV1		
UPDATE			ADM		
INVALIDATE			ADM		
REHABILITATE			ADM		
Bytes	Description			M/O	Length
1 to X_1	URL TLV object for Primary XTRA Server			M	X_1
X_1+1 to X_1+X_2	URL TLV object Secondary XTRA Server			M	X_2
X_1+X_2+1 to $X_1+X_2+X_3$	URL TLV object Tertiary XTRA Server			M	X_3

Unused bytes *shall* be set to 'FF.' A Tag value of 'FF' indicates the end of valid data.

- **URL TLV object:** See the definition of "URL Tag" in $EF_{WAPBrowserBM}$ (WAP Browser Bookmarks) for details.

11.2 LBS V2 User Plane

11.2.1 EF$_{LBSV2Config}$ (LBS V2 Configuration)

This new EF contains the configuration of the LBS V2 client on the device. If service n24 (LBS) is allocated, this EF **shall** be present.

Identifier: '6F86'		Structure: Transparent		Mandatory
File size: 1 bytes		Update Activity: Medium		

Access Conditions:
    READ   CHV1
    UPDATE   ADM
    INVALIDATE   ADM
    REHABILITATE ADM				

Bytes	Description		M/O	Length
1	V2 LBS Flags		M	1 byte

- **V2 LBS Flags:**

    Coding (0 – disabled; 1 – enabled):

Bit	Parameter Indicated
1	Allow Sending System Parameter Info Message
2	Allow gpsOne Seed Position Use
3	Allow gpsOne Dynamic Mode
4-8	Reserved for future use

11.2.2 EF$_{LBSV2PDEADDR}$ (LBS V2 PDE Address)

This new EF contains the Position Determination Entity (PDE) Server IP address[1] and Port Number for V2 LBS. If service n24 (LBS) is allocated, this EF **shall** be present.

---

[1] Note: If MPC is in the call flow, it will assign the PDE address. Therefore, if an operator uses an MPC, it only needs to provision the MPC. Basically, either the PDE or the MPC address on the R-UIM needs to be provisioned, depending on the implementation, but both options are available.

Identifier: '6F87'		Structure: Transparent		Mandatory
File size: Variable		Update Activity: Medium		
Access Conditions:				
READ		CHV1		
UPDATE		ADM		
INVALIDATE		ADM		
REHABILITATE		ADM		
Bytes	Description		M/O	Length
1	V2 LBS PDE Address Type		M	1 byte
2	V2 LBS PDE Address Length		M	1 byte
3 to X+2	V2 LBS PDE Address Information		M	X bytes
X+3 to X+4	V2 LBS PDE Port Number		M	2 bytes

Unused bytes **shall** be set to 'FF.'

- **V2 LBS PDE Address Type:** Identifies the type of address contained in the V2 LBS PDE Address Information field.

   Coding (8-bit integer):

Value	Address Type
1	Domain Name (gpsOne needs to perform DNS resolution)
2	IPv4 address
3	IPv6 address

- **V2 LBS PDE Address Length:** Identifies the length in bytes of the address contained in the V2 LBS PDE Address Information field.

   Coding: 8-bit integer.

- **V2 LBS PDE Address Information:** Contains the address of the PDE server. The type of PDE server address contained in this field is determined by the Address Type field above.

   Coding: 8-bit ASCII (one octet per character) string.

   Formats of this address string are the following, corresponding to the value of the Address Type field:

Address Type	Format
Domain Name	As per [RFC1035].
IPv4 address	Dotted decimal representation. *Example: "192.0.2.235"*

Address Type	Format

IPv6 address   Exactly eight groups of four hexadecimal digits, where each group is separated by a colon (:). The characters are case insensitive; e.g., 'f' and 'F' both are a valid representation of a value of 15.

The ***full, non-compressed*** IPv6 address **shall** be provisioned.

Example: "2000:0db8:85a3:0000:0000:8a2e:0370:7330"

- ▪ **V2 LBS PDE Port Number:** The Port Number for V2 LBS PDE Server.

Coding: 16-bit integer.

Byte 1:

b8	b7	b6	b5	b4	b3	b2	b1

MSB of the integer
bits in descending order

Byte 2:

b8	b7	b6	b5	b4	b3	b2	b1

bits in descending order
LSB of the integer
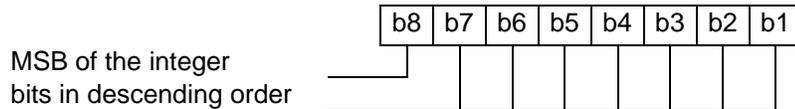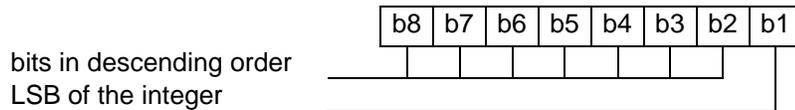
11.2.3 EF_{LBSV2MPCADDR} *(LBS V2 MPC Address)*

This new EF contains the MPC Server IP address and Port Number for V2 LBS. If service n24 (LBS) is allocated, this EF **shall** be present.

Identifier: '6F88'	Structure: Transparent		Mandatory
File size: Variable	Update Activity: Medium		

Access Conditions:
    READ   CHV1
    UPDATE   ADM
    INVALIDATE   ADM
    REHABILITATE ADM			

Bytes	Description	M/O	Length
1	V2 LBS MPC Address Type	M	1 byte
2	V2 LBS MPC Address Length	M	1 byte
3 to X+2	V2 LBS MPC Address Information	M	X bytes
X+3 to X+4	V2 LBS MPC Port Number	M	2 bytes

Unused bytes **shall** be set to 'FF.'

- **V2 LBS MPC Address Type:** Identifies the type of address contained in the V2 LBS MPC Address Information field.

  Coding (8-bit integer):

Value	Address Type
1	Domain Name (gpsOne needs to perform DNS resolution)
2	IPv4 address
3	IPv6 address

- **V2 LBS MPC Address Length:** Identifies the length in bytes of the address contained in the V2 LBS PDE Address Information field.

  Coding: 8-bit integer.

- **V2 LBS MPC Address Information:** 8-bit ASCII (one octet per character) string. The type of MPC server address contained in this field is determined by the Address Type field above.

  Coding: Same as coding used for [V2 LBS PDE Address Information].

- **V2 LBS MPC Port Number:** The Port Number for V2 LBS MPC Server.

  Coding: 16-bit integer.

  Byte 1:

	b8	b7	b6	b5	b4	b3	b2	b1

  MSB of the integer
  bits in descending order

  Byte 2:

	b8	b7	b6	b5	b4	b3	b2	b1

  bits in descending order
  LSB of the integer
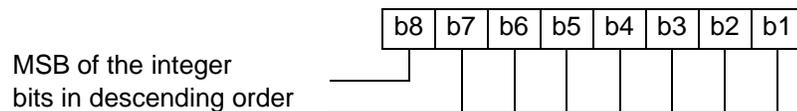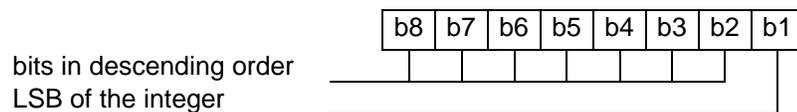
12. *Terminology*

Term	Meaning
AC	Application Characteristics
ADM	Administrator
ADS	Application Download Server
BREW	Binary Runtime Environment for Wireless
CAVE	Cellular Authentication and Voice Encryption
CCAT	CDMA Card Application Toolkit
CHAP	Challenge Handshaking Authentication Protocol
cPRL	Concatenated PRL
CST	CDMA Service Table
ECC	Emergency Call Codes
EF	R-UIM Elementary File
EPRL	Extended PRL
ESN	Electronic Serial Number
HRPD	High Rate Packet Data (i.e., 1xEV-DO)
IID	Interface ID
LBS	Location Based Services
LSB	Least Significant Bit
MCC	Mobile Country Code
MDN	Mobile Directory Number
MEID	Mobile Equipment Identifier
MF	R-UIM Master File
MMS	Multimedia Message Service
MMSC	Mobile Messaging Service Center
MO	Mobile Originated
MPC	Mobile Positioning Center

Term	Meaning
MSB	Most Significant Bit
MT	Mobile Terminated
NAI	Network Address Identifier
NAM	Number Assignment Module, a set of MIN/IMSI-related parameters stored in the mobile station
NID	Network Identifier
OEM	Original Equipment Manufacturer
OTA	Over the Air
OTAPA	Over-the-Air Parameter Administration, a network-initiated OTASP process of provisioning mobile station operational parameters over the air interface
OTASP	Over-the-Air Service Provisioning, a process of provisioning mobile station operational parameters over the air interface
PAP	Password Authentication Protocol
PDE	Position Determination Entity
PDSN	Packet Data Serving Node
Phase	Revision level of the R-UIM
PRL	Preferred Roaming List
RA	Router Advertisement
RFU	Reserved for future use
RS	Router Solicitation
R-UIM	Removable User Identity Module
SID	Subscriber Identifier (as in BREW)
SIM	Subscriber Identity Module
SMS	Short Message Service (text message)
SMS-PP	Short Message Service Point to Point
SO	Service Option, a service capability of the system. Service options may be applications such as voice, data, or facsimile.
SPC	Service Programming Code
SSD	Shared Secret Data
SSN	Subscription (as in BREW)
SSPR	System Selection for Preferred Roaming

Term	Meaning
TLV	Tag Length Value
UIM	User Identity Module
UPP	User Profile Parameters
UTK	UIM Toolkit, a China Variant of CCAT, which is also used in Indonesia
XTRA	eXTended Receiver Assistance

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[OMARC]   OMA-MMS-ARCH-v1_2-20050301-A, *Multimedia Messaging Service Architecture Overview,* v1.2, March 2005.

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[RFC1738]   IETF RFC 1738, *Uniform Resource Locators (URL),* December 1994.

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