Push Over the Air Technical Specification

– CBS Adaptation

Approved Version 1.0 – 22 Nov 2011

Open Mobile Alliance

OMA-TS-Push_CBS_Adaptation-V1_0-20111122-A

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1. Scope

OMA Push is designed to enable server-initiated content delivery over a number of different underlying protocols and bearer technologies. This document specifies one network bearer transport binding for the Push Over-the-Air (Push-OTA) protocol variant referred to as OTA-PTM (Point-to-Multipoint). The specific binding specified here is referred to as Push/CBS, i.e. OMA Push over Cell Broadcast Service (CBS) bearers in GSM/UMTS networks. Also addressed are special considerations that should be taken within OMA Push interfaces, and metadata necessary to facilitate the use of OMA Push over the CBS bearer.

The interface between the Push Proxy Gateway and a Cell Broadcast Center (CBC) is considered out of scope for this document. However the responsibility for specific functions, key parameters, and the expected behaviour of each entity are described.

The interface between the Push Client and CB handler in the ME/UE is assumed to be unidirectional data delivery only from the CB handler towards the Push Client. Any other data exchange between these entities is considered to be out of scope for this document. However the responsibility and the expected behavior of each entity are described.

2. References

2.1 Normative References

[3GPP 23.038 v5.0.0]	"Alphabets and language-specific information", V5.0.0 (2002-03), 3rd Generation Partnership Project; Technical Specification Group Terminals; (Release 5)
	URL:http://www.3gpp.org/ftp/Specs/archive/23_series/23.038/
[3GPP 23.038 v6.0.0]	"Alphabets and language-specific information", V5.0.0 (2002-03), 3rd Generation Partnership Project; Technical Specification Group Terminals; (Release 6)
	URL:http://www.3gpp.org/ftp/Specs/archive/23_series/23.038/
[3GPP 23.038 v7.0.0]	"Alphabets and language-specific information", V5.0.0 (2002-03), 3rd Generation Partnership Project; Technical Specification Group Terminals; (Release 7)
	URL:http://www.3gpp.org/ftp/Specs/archive/23_series/23.038/
[3GPP 23.040 v5.0.0]	"Technical realization of the Short Message Service (SMS)", V5.0.0 (2001-06), 3rd Generation Partnership Project; Technical Specification Group Terminals; (Release 5)
	URL:http://www.3gpp.org/ftp/Specs/archive/23_series/23.040/
[3GPP 23.040 v6.0.0]	"Technical realization of the Short Message Service (SMS)", V5.0.0 (2002-09), 3rd Generation Partnership Project; Technical Specification Group Terminals; (Release 6)
	URL:http://www.3gpp.org/ftp/Specs/archive/23_series/23.040/
[3GPP 23.040 v7.0.0]	"Technical realization of the Short Message Service (SMS)", V5.0.0 (2007-03), 3rd Generation Partnership Project; Technical Specification Group Terminals; (Release 7)
	URL:http://www.3gpp.org/ftp/Specs/archive/23_series/23.040/
[3GPP 23.041 v5.2.0]	"Technical realization of Cell Broadcast Service (CBS)", V5.2.0 (2003-12), 3rd Generation Partnership Project; Technical Specification Group Terminals; (Release 5)
	URL:http://www.3gpp.org/ftp/Specs/archive/23_series/23.041/
[3GPP 23.041 v6.2.0]	"Technical realization of Cell Broadcast Service (CBS)", V6.2.0 (2003-12), 3rd Generation Partnership Project; Technical Specification Group Terminals; (Release 6)
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[3GPP 23.041 v7.0.0]	"Technical realization of Cell Broadcast Service (CBS)", V6.2.0 (2006-03), 3rd Generation Partnership Project; Technical Specification Group Terminals; (Release 7)
	URL:http://www.3gpp.org/ftp/Specs/archive/23_series/23.041/
[PPGService]	" Push Proxy Gateway Service". Open Mobile Alliance™. OMA-TS-PPGService-V2_3. URL:http://www.openmobilealliance.org/
[PushCAI]	"Push Client - Application Interface Specification". Open Mobile Alliance™. OMA-TS-PushCAI-V1_1. URL:http://www.openmobilealliance.org/
[PushOTA]	"Push Over the Air ". Open Mobile Alliance™. OMA-TS-PushOTA-V2_3. URL:http://www.openmobilealliance.org/
[RFC2119]	"Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL:http://www.ietf.org/rfc/rfc2119.txt
[RFC4234]	**"Augmented BNF for Syntax Specifications: ABNF". D. Crocker, Ed., P. Overell. October 2005, URL:http://www.ietf.org/rfc/rfc4234.txt**
[SCRRULES]	"SCR Rules and Procedures", Open Mobile Alliance™, OMA-ORG-SCR_Rules_and_Procedures, URL:http://www.openmobilealliance.org/
[WSP]	"Wireless Session Protocol". WAP Forum™. WAP-230-WSP. URL: http://www.wapforum.org/

2.2   Informative References

[ERELDDM]	"Enabler Release Definition for Device Management version 1.2". Open Mobile Alliance. OMA-ERELD-DM-V1_2-20060208-C.
[OMADICT]	"Dictionary for OMA Specifications", Version x.y, Open Mobile Alliance™, OMA-ORG-Dictionary-Vx_y, URL:http://www.openmobilealliance.org/
[OMNA]	"OMA Naming Authority". Open Mobile Alliance™. URL: http://www.openmobilealliance.org/tech/OMNA.aspx
[PushArch]	" Push Architecture ". Open Mobile Alliance™. OMA-AD-Push-V2_3 URL:http://www.openmobilealliance.org/

3. Terminology and Conventions

3.1 Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except "Scope" and "Introduction", are normative, unless they are explicitly indicated to be informative.

3.2 Definitions

Application	An implementation of a related set of functions that perform useful work, often enabling one or more services **[OMADICT]**
Cell Broadcast Entity Protocol	Generic name for the interface expose by the CBC towards the CBE, the interface is vendor specific.
Client Application	An Application that interacts with an OMA Push Client for reception of Push Content, including OMA service enabler user-agents (e.g. Browsers, Multimedia Messaging Clients, Instant Messaging Clients, etc), and other applications designed to utilize the OMA Push enabler.
Content	Digitized work that is processed, stored, or transmitted. It includes such things as text, presentation, audio, images, video, executable files, etc. Content may have properties such as media type, mime type, etc **[OMADICT]**
Push Access Protocol	a protocol used for conveying content that should be pushed to a client, and push related control information, between a Push Initiator and a Push Proxy/Gateway.
Push Architecture	The architecture of the entire OMA Push enabler. The Push Architecture encompasses the protocols, service interfaces, and software entities that provide the means to push data to user agents in the WAP client.
Push Client	A terminal software entity that receives Push Content from a Push Proxy Gateway, and provides the user-agent side interfaces of the OMA Push enabler, including the Push Client-Application Interface (Push-CAI).
Push Content	Content that is delivered using OMA Push,
Push Initiator	An entity or service that initiates Push content delivery to Push clients **[OMADICT]**
Push Message	A Push Content package that includes one or more Push Content items and related metadata (e.g. headers).
Push OTA Protocol	a protocol used for conveying content between a Push Proxy/Gateway and a certain user agent on a client.
Push Proxy Gateway	A gateway acting as a Push proxy for Push Initiators, providing over-the-air Push message delivery services to Push clients **[OMADICT]**

3.3 Abbreviations

BSC	Base Station Controller (GSM)
CB	Cell Broadcast
CBC	Cell Broadcast Center
CBE	Cell Broadcast Entity
CBEP	Cell Broadcast Entity Protocol
CBS	Cell Broadcast Service
DCH	PUSH/CBS Header
DL	Data-Length

ID	ID
PP	Packet-Parameter
IE	Information Element
ME	Mobile Equipment (GSM)
OMA	Open Mobile Alliance
OTA	Over The Air
PDU	Packet Data Unit
PPG	Push Proxy Gateway
PTM	Point To Multipoint
PTP	Point To Point
RNC	Radio Network Controller (UMTS)
UDH	User Data Header
UE	UMTS Equipment (UMTS)
WSP	Wireless Session Protocol

4. Introduction

The OMA Push Architecture is described in [PushArch]. The OMA Push Architecture and specifications define how the entities of OMA Push, the Push Proxy Gateway (PPG) and Push Client, deliver Push Content as originated by Push Initiators (PI) to the targeted Push Clients, and ultimately to Client Applications.

The 3GPP Cell Broadcast Service (CBS) provides a transport mechanism that can be used for Push Content delivery from a PPG to Push Client.

5. Push/CBS Protocol Stack

The Push/CBS protocol stack is described in Figure 1.
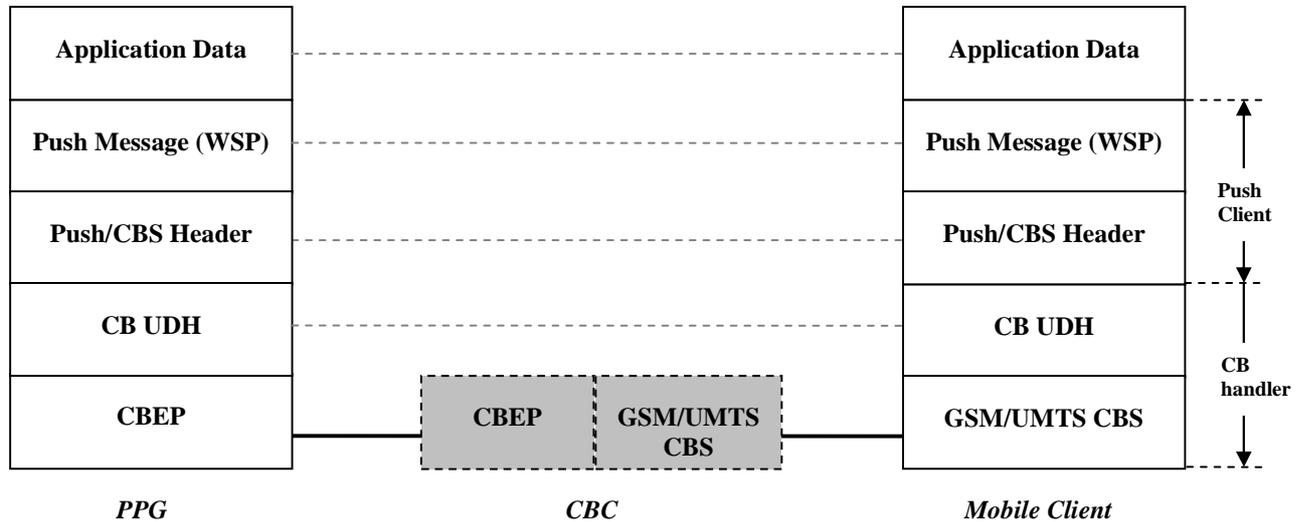
Figure 1: Push/CBS protocol stack

In the above diagram (Figure 1) the PPG acts as a CBE (Cell Broadcast Entity), and connects to the CBC over CBEP (Cell Broadcast Entity Protocol).

At the Mobile Client side the protocol stack is divided among 3 entities:

- CB handler – contains GSM/UMTS CBS layer and the CB UDH handler

- Push Client – contains the Push/CBS Header layer and the Push Message in the WSP protocol format [WSP], either textual or encoded

- Application – an entity that handles Application Data

5.1 GSM/UMTS CB

Figure 2 describes the CBC connectivity to GSM/UMTS network. CBC connectivity in GSM and UMTS share the same basic architecture, but entities names are different.
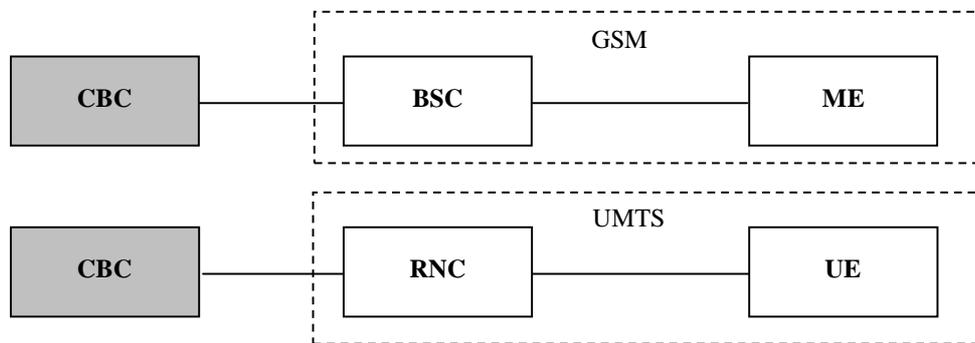
BSC – Base Station Controller (GSM)
CBC – Cell Broadcast Center
ME – Mobile Equipment (GSM)
RNC – Radio Network Controller (UMTS)
UE – UMTS Equipment (UMTS)

Figure 2: CBC basic architecture in GSM and UMTS

[3GPP 23.041] specify the cell broadcast basic structure for both GSM and UMTS.

In both GSM and UMTS within a CBC-BSC/RNC interface, a CBS message is uniquely identified by the triplet: **Message Identifier**, **Serial Number**, and **Cell Identifier**.

Note: In GSM there is additional parameter called "Channel Indicator" that is not used.

- **Message Identifier** parameter is a 2 byte long integer, more familiar as the "Cell Broadcast Channel".
  The Cell Broadcast Message Identifier is usable as a means to address a specific group of Push Clients, when supported by PPG's and Push Client as described in [PPGService].

  For backward compatibility it is recommended that Push/CBS will use the following ranges of Message Identifier (from 3GPP 23.041):

  o A000 - AFFF (hex): PLMN operator specific range. The type of information provided by PLMN operators using these Message Identifiers is not guaranteed to be the same across different PLMNs. If a Message Identifier from this range is in the "search list", the ME shall attempt to receive this CBS message. (total of 4095 channels)

- **Serial Number** parameter identifies a particular CBS message, which may be several pages in length.

- The **Cell Identifier** parameter identifies the broadcast area

Data Coding Scheme (DCS) is a CBS parameter that identifies the alphabet or coding employed for the message characters and message handling at the MS/UE and is passed transparently from the CBC to the MS/UE. This parameter is defined in [3GPP 23.038].

DCS in the range of 1001 xxxx indicates a message with a UDH structure, where xxxx bits determine the encoding of the message (7bit, 8 bit or 16 bit) and the target destination (ME specific, SIM card or TE specific)

Push/CBS SHALL use DCS value 1001 0101 i.e. UDH PDU, ME specific, 8 bits.

Push/CBS MAY use DCS value of 1001 0001 UDH PDU, ME specific, 7 bits

Push/CBS MAY use DCS value of 1001 1001 UDH PDU, ME specific, 16 bits (UCS-2)

5.1.1 CBS based concatenation

The basic payload size of Cell Broadcast page is 82 bytes. In order to enable delivery of information longer than 82 bytes a concatenation mechanism should be introduced.

CBS in GSM and UMTS have inherent mechanisms to perform message concatenation. It is assumed that concatenation decisions at this level are autonomously done at the CBC as result of the payload received from the PPG, and from the known limitations of both BSC/RNC and ME/UE (e.g. maximum number of supported concatenated CB pages).

5.1.1.1 GSM CBS based concatenation

In GSM the Cell Broadcast specification [3GPP 23.041] define a header named *Page-Parameter* which enable concatenation of Cell Broadcast pages to one long message with maximum size of 15 pages, or 1230 bytes of user data.

The CBC sends up to 15 pages over the air with increasing *Page-Parameter* value i.e.: 1/15, 2/15 …15/15.

The CB handler in the ME SHALL reconstruct the CB pages to one long message.

5.1.1.2 UMTS CBS based concatenation

In UMTS the CB payload (*Cb data*) is sent as one piece over the air to the UE with maximum size of 1246 bytes (user data and control information), the internal structure of the *cb data* consist of up to 15 pages of 82 bytes (1230 bytes) of pure user data, similar to GSM.

The CBC collects the Push Message from the PPG and constructs the CB message as described in [3GPP 23.041].

The CB handler in the UE SHALL reconstruct the CB pages to one long message (up to 1230 bytes) containing the message content only (remove all the control/header/concatenation bytes) – see section 6.2.3.

5.2 CB UDH

All CB payload which carries Push/CBS information contains the UDH, as described in section 5.1, primarily to define the application port number (Push Client).

CB UDH is constructed by the PPG and it should be passed through the CBC towards the CB handler on the ME/UE.

There are several values of information elements (IE) that 3GPP allocated for messages with User Data Header (UDH) structure, as defined in [3GPP 23.040 and 3GPP 23.038].

The relevant IE for use in Push/CBS is:

Information Element (IE)	Req	Value [Hex]	Meaning	Comments
Source and Destination Port Addressing	Mandatory	05	Application port addressing scheme, 16 bit address	Destination value is registered in IANA

Table 1: IE to be used in CBS UDH

The PPG SHALL use the applicable (non-secure or secure) OMA Push destination port address as allocated by IANA in a binary UDH to send Push Content over CBS as described in [3GPP 23.040].

The CB handler in the UE SHALL use the OMA Push destination port address as allocated by IANA in a binary UDH to receive Push Content over CBS as described in [3GPP 23.040].

5.2.1 Application Port Addressing 16 bit address

This facility allows CB messages to be routed to one of multiple applications, using a method similar to TCP/UDP ports in a TCP/IP network. An application entity is uniquely identified by the pair of source and destination port addresses. The port addressing is transparent to the transport.

The total length of the IE is 4 octets:

octet 1,2   Destination port.

These octets contain a number indicating the receiving port, i.e. application, in the receiving device.

octet 3,4   Originator port.

These octets contain a number indicating the sending port, i.e. application, in the sending device.

A receiving entity shall ignore (i.e. skip over and commence processing at the next information element) any information element where the value of the Information-Element-Data is Reserved or not supported.

Destination port number for Push Client as allocated by IANA:

```
wap-push         2948/udp   WAP PUSH

wap-pushsecure   2949/udp   WAP PUSH SECURE
```

Source port number can get any value within the range of 2 bytes.

5.2.2   Segmentation and Reassembly

UDH concatenation mechanism which use specific IE's are not allowed to be used according to [3GPP 23.038] and therefore SHALL not be used in Push/CBS.

5.2.3   CB UDH construction example

The UDH for Push/CBS contains one IE for Source and Destination Port Addressing.

The construction of the UDH is done according to [3GPP 23.040].

The complete UDH starts with one byte for UDH length (UDHL) that specifies the length of the User Data Header (UDH)

The "Length-of-User-Data-Header" field is an integer representation of the number of octets within the "User-Data-Header" information fields which follow.

The following diagram describes a general CBS user data, constructed in UDH format as a sequence of: UDHL, Information Element Identifier (IEI), Information Element Data Length (IEDL), Information Element Data (IED). The same sequence is used for remaining Information Elements. The native payload data encoded in 8 bit or 16 bit starts immediately after the UDH end.

UDHL	IEIa	IEDLa	IEDa	IEIb	IEDLb	IEDb	…	8 bit data or UCS-2 data

Figure 3: General construction of CBS message with UDH

To complete the byte stream presentation from [section 6.2.1], one byte of UDHL is added to get the complete UDH value.

Example of IE encoding for Source and Destination Port Addressing:

Assuming that the received UDH is equal to: 06 05 04 29 48 00 00

IE Type	IE Name	Assign numbers	Comments
UDHL	UDH Length	06	
IEIa	Appl. Port Addressing 16bit	05	
IEDLa	Length in Bytes of the Information Element	04	
IEDa	Destination Port	2948	

	Source Port	0x0000	

Table 2: Encoding of CB UDH

5.3 CBEP

Cell Broadcast Entity Protocol is a non-standardized protocol exposed by CBC towards CBE's, usually based upon HTTP. This protocol is intended to enable delivery of data to specific locations in the GSM/UMTS network, at specified times, and in specific formats.

The functionality of this interface and expected behavior of the CBC are described in [3GPP 23.041].

5.3.1 Push/CBS Header

The PUSH/CBS Header (DCH) is part of the data delivered from the CB Handler to the Push Client.

The PUSH/CBS Header is created by the CBC.

The PUSH/CBS Header is following the CB UDH in the CBS message structure.

The purpose of the PUSH/CBS Header is to instruct the Push Client how to handle the Push Content byte stream received from the CB handler, in concept similar to HTTP headers that describe the content that follows.

The PUSH/CBS Header has 3 primary objectives:

1. To ensure forward compatibility.
2. Identify the Content-Type of the message payload
3. Enable concatenation of PUSH/CBS messages

When using PUSH/CBS Header to create Push Message packet concatenation the PUSH/CBS Header must be included in each Push/CBS packet as illustrate in Figure 4:
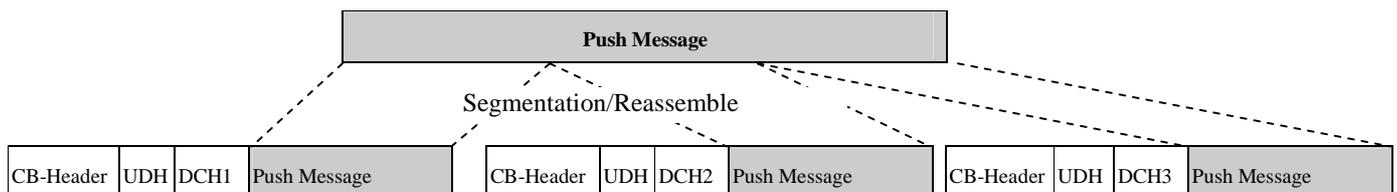
Figure 4: Push/CBS based concatenation

To support the PUSH/CBS Header functions the following 5 bytes SHALL be included in each PUSH/CBS message as describe in Figure 5:

- ID – 1 byte integer
- Content-Type - 1 byte token, a well-known WSP Content Type Number assigned by [OMNA]Packet-Parameter (PP) - 1 byte
- Data-Length (DL) – 2 bytes Integer

ID [1]	Content-Type [1]	PP [1]	DL [2]	Push Message

Figure 5: General construction of message with PUSH/CBS Header, with segmentation

When no concatenation is needed the PUSH/CBS message will be constructed containing 2 bytes header (ID and Content-Type) as describe in Figure 6

ID [1]	Content-Type [1]	Push Message

Figure 6: General construction of message with Push/CBS Header, no segmentation

5.3.2   ID

The first byte after the UDH in the CB payload is the ID.

This parameter is an 8-bit integer which identifies the PUSH/CBS Header version (2 bits) and the PUSH/CBS Packet Identifier (6 bits) received from the same Message Identifier. In case of concatenated messages, all the concatenated messages segments should share the same Packet Identifier.

Version Ind [2 bits]	Packet Identifier [6bits]

Figure 7: ID construction

Version Ind. values:

Value	Meaning
00	PUSH/CBS 1.0 header (current version)
01	Reserve for future use
10	Reserve for future use
11	Reserve for future use

Table 3: Version Indicator values

If the Packet identifier value is 0, the packet is not part of a segmented message (no concatenation). Otherwise the Push Client SHALL collect all related PUSH/CBS packets before processing the message.

5.3.3   Content-Type

The second byte after the UDH in the CB payload SHALL be a one byte token that represents the content (MIME) type, a well-known WSP Content Type Number assigned by [OMNA]..

5.3.4   Packet-Parameter (PP)

This parameter is coded as two 4-bit fields. The first field (bits 0-3) indicates the binary value of the total number of pages in the CBS message and the second field (bits 4-7) indicates binary the page number within that sequence. The coding starts at 0001, with 0000 reserved. If a Push Client receives the code 0000 in either the first field or the second field then it shall treat the packet exactly the same as a packet with Packet-Parameter 0001 0001 (i.e. a single message).

This parameter should be present only in case Packet Identifier (in the ID) does not equal to "0".

This should be used to concatenate all the messages sharing the same ID.

5.3.5   Data-Length (DL)

The Chosen DCS [Section 6.1] is indicating the data coding.

If the CBS message is coded using 8-bit data, the Data-Length field gives an integer representation of the number of octets within the Push Message field to follow.

If the chosen DCS is coded using the GSM 7 bit default alphabet, the Data-Length field gives an integer representation of the number of septets within the Push Message field to follow.

If the CBS message is coded using UCS2 data, the User-Data-Length field gives an integer representation of the number of octets within the Push Message field to follow.

This parameter should be present only in case Packet-Identifier (in the ID) does not equal to "0".

6. Push over CBS Operations

6.1 Push/CBS Configuration

As a prerequisite to Push/CBS use, a CBS Message Identifier must have been assigned, and both the PPG and targeted Push Clients configured for Push Content delivery using the CBS Message Identifier. This section defines the overall requirements for PPG and Push Client establishment and termination of Push/CBS service for OTA-PTM.

Establishment or termination of Push/CBS service is assumed to be initiated by the PPG service provider based upon unspecified service-specific conditions. The detailed mechanisms for CBS Message Identifier allocation and configuration are assumed to be completed via PPG service provider provisioning, and are not defined here.

A separate CBS Message Identifier MAY be used for different groups of targeted Push Clients. PPG's and Push Clients SHOULD be capable of Push/CBS operation using multiple distinct CBS Message Identifiers.

Successful establishment of Push/CBS service will include identification of the necessary CBS access information (e.g. CBS Message Identifier) for Push Client configuration, described in section 6.2.3. This information can be delivered to the necessary Push Clients via OMA Device Management (DM) or via the Push Service Registration procedure described in [PushOTA]..

If OMA DM is available on the device, the Push Client SHALL support configuration of CBS access parameters as part of the OMA Push Management Object (MO) via OMA DM [ERELDDM].

If the Push Client supports SIR, the Push Client SHALL also support the Push Service Registration procedure described in [PushOTA], for reception of Push/CBS configuration data.

Upon successful configuration of CBS access information for Push/CBS, if at least one Push/CBS related Client Application is ready to receive CBS-delivered Push Content, the Push Client SHALL initiate Push/CBS content reception.

Push Client configuration to deactivate Push/CBS service, and removal of the CBS access information, may occur via:

- Update of the OMA Push MO using OMA DM

- Application-specific conditions, e.g. termination of a Push-enabled service or removal of the registered Client Application

6.2 Push Client

6.2.1 Client Application Registration with Push Client

The Push Client MAY enable Client Applications to register for Push/CBS over the Push-CAI interface as described in [PushCAI]. During the registration process, the Push Client MAY allow Client Applications to request Push/CBS service and supply CBS access parameters for delivery of Push content.

The Push Client SHALL reject registration of a Client Application for Push/CBS, and provide a distinct error response under the following conditions:

- the terminal is not Push/CBS capable ("not supported")

- the terminal is not configured for Push/CBS service ("not configured")

- either the Client Application is not authorized to activate Push/CBS service, or the specified CBS access parameters are not allowed ("not allowed")

Upon successful registration of a Push/CBS-enabled Client Application, the Push Client SHALL initiate Push/CBS content reception.

The Push Client SHALL allow Client Applications that have registered for Push/CBS service via the Push-CAI interface to terminate their registration, either by updating their registration to remove Push/CBS service, or by deregistering completely. Upon successful deregistration of a Client Application for Push/CBS service, the Push Client SHOULD terminate Push/CBS reception if no other Client Application is ready to receive CBS-delivered Push Content.

6.2.2   Push Content Reception via Push/CBS

The Push Client SHALL support Push Content reception via Push/CBS as described in Section 5.

The Push Client SHALL support WSP compact encoding of Push Content delivered via Push/CBS.

WSP compact encoding is described in [PushOTA].

The Push Client SHALL support unencoded (textual) Push Content delivered via Push/CBS.

The Push Client SHALL ignore repetitions of Push/CBS messages that have already been received.

The Push Client SHALL ignore Push/CBS messages with an unexpected CBS Message Identifier.

6.2.3   CB handler

This section applies to handling of CBS messages by the "CB handler" function in terminals.

The Push Client MAY act as the CB handler, or use services provided by a CB handler in the terminal.

The CB handler SHALL reassemble all CB pages related to the same message (up to 15 pages to one long CB message), construct them as one piece of user data and UDH information as described in [3GPP 23.041].

The CB handler SHALL identity Push/CBS messages by the IANA-registered ports for OMA Push, and deliver the complete message to the Push Client.

The Push Client will require the following support from interfaces provided by CB handlers, if the Push Client does not directly support the CB handler functions:

Parameters/Fields	Operation	Comments
CB header	Get	
message-identifier	Get/Set	the API must support registration to specific message identifier
CB payload	Get	Constructed from: UDH, Push/CBS header and body or Push/CBS header and body
UDH	Get	If not part of the CB payload
Length of CB payload	Get	The length of the assembled CB payload (as described above) in case of CBS based concatenation

Table 4: Necessary fields exposed by CB Handler API

The above table does not dictate the API structure; the information can be provided as one package of information that will require the Push Client to parse and extract the relevant information or by implementing an API that can provide each parameter individually (i.e. the CB handler parses the CB message and extracts the required fields/parameters).

6.3   PPG

The PPG SHALL support Push Content reception via Push/CBS as described in Section 5.

The PPG SHALL support delivery of WSP compact encoded Push Content via Push/CBS.

WSP compact encoding is described in [PushOTA].

The PPG SHALL support delivery of unencoded (textual) Push Content via Push/CBS.

Push/CBS messages SHALL be less than or equal to 1230 bytes including the Push Message data, the UDH and the PUSH/CBS header (assuming CBS based concatenation is used).

The PPG SHALL specify the target area (location indicators), message-identifier, DCS, and optionally the timing information for delivery for the CBC using the CBEP.

The PPG MAY repeat Push/CBS messages as necessary to increase probability of reception.

6.3.1   Interface to CBC

The CBC is the network entity that enables Cell Broadcast delivery in GSM/UMTS networks.

The PPG SHALL use the CBC-specified CBEP protocol to initiate Push/CBS message delivery, including the key parameters: target area (location indicators), message-identifier, DCS, and timing information (if any) .

The CBC is responsible for constructing the Push/CBS message including the UDH and message segmentation, if required.

Appendix A.   Change History   (Informative)

A.1   Approved Version History

Reference	Date	Description
TS-Push_CBS_Adaptation-V1_0	22 Nov 2011	Status changed to Approved by TP: OMA-TP-2011-0406-INP_Push_V2_3_ERP_for_Final_Approval

Appendix B.   Static Conformance Requirements   (Normative)

B.1   SCR for Push Client

Item	Function	Reference	Requirement
PTMPush-CBS-C-001-M	OTA-PTM/CBS	5, 6	
PTMPush-CBS-C-002-M	Configuration	6.1	
PTMPush-CBS-C-003-O	Client Application Registration	6.2.1	
PTMPush-CBS-C-004-M	Push Content Receiption	6.2.2, 6.2.3	

B.2   Server/PPG Features

Item	Function	Reference	Requirement
PTMPush-CBS-S-001-M	OTA-PTM/CBS	5, 6	
PTMPush-CBS-S-002-M	Push Content Delivery	6.3	
PTMPush-CBS-S-003-M	Interface to CBC	6.3.1	