Point-to-Multipoint Push Requirements

Candidate Version 1.0 – 26 May 2009

Open Mobile Alliance

OMA-RD-PTM_Push_V1_0-20090526-C

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1. Scope (Informative)

This document defines the requirements for “Point-to-Multipoint Push” (referred to as PTM-Push or “Multipoint Push”). The PTM-Push requirements scope includes the following enhancements to the OMA Push enabler:

- additional network/bearer context support, including point-to-multipoint operation over broadcast and multicast bearers
- Push targeting to multiple users with delivery via multipoint or point-to-point methods
- enhancement of Push Security features and Push Service lifecycle for multipoint Push use cases

2. References

2.1 Normative References

[CBS] "Technical realization of Cell Broadcast Service (CBS)", 3rd Generation Partnership Project; Technical Specification Group Terminals; URL:http://www.3gpp.org/ftp/Specs/archive/23_series/23.041/

[MBMS] "Multimedia Broadcast/Multicast Service (MBMS); Protocols and codecs", 3rd Generation Partnership Project, Technical Specification 3GPP TS 26.346,
URL: http://www.3gpp.org/

[OMACharging] "OMA Charging Requirements"
URL:http://www.openmobilealliance.org/

[PushArch] "OMA Push Architecture"; OMA-AD-Push-V2_2-2. . Open Mobile Alliance™.
URL:http://www.openmobilealliance.org/

[PushPPG] "Push Proxy Gateway Service Specification". Open Mobile Alliance™. OMA-TS-PPGService-V2_2.
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

2.2 Informative References

[OMADICT] "Dictionary for OMA Specifications", Version x.y, Open Mobile Alliance™,
OMA-ORG-Dictionary-Vx_y, 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 Server	A service-providing/supporting entity that can directly deliver Push Content.
Multipoint Push	The Point-to-Multipoint Push feature, in which Push Content is exchanged in multipoint delivery mode, i.e. between one entity and multiple other entities.
Point-to-Point	See [OMADICT]
PPG Service	The OMA Push services provided by a Push Proxy Gateway per [PushPPG].
PTM-Push	The Point-to-Multipoint Push feature.
Pull	See [OMADICT]
Push	See [OMADICT]
Push Client	See [OMADICT]
Push Content	The payload of Push operations, representing end-user content or client/application data used in the delivery of a service.
Push Initiator	See [OMADICT]
Push Proxy Gateway	See [OMADICT]
Push Server	An entity that acts as the server for delivery of Push Content.
Push Service	A service implemented using OMA Push.

3.3 Abbreviations

BCAST	OMA Broadcast
CBS	Cell Broadcast Service
HTTP	Hypertext Transfer Protocol
IP	Internet Protocol
OMA	Open Mobile Alliance
OTA	Over The Air
PPG	Push Proxy Gateway
PTM	Point-to-Multipoint
QoE	Quality of Experience
SIP	Session Initiation Protocol
SMS	Short Message Service
WAP	Wireless Application Protocol

4. Introduction (Informative)

The OMA Push enabler supports server-initiated delivery of content to clients, including various OMA Push defined content types, content defined by other OMA enablers, and arbitrary content types. OMA Push is widely deployed, both directly for push-based services and a supporting enabler in the architectures of many other OMA enablers. A key feature of the OMA Push enabler is the ability to adapt to a variety of network/bearer contexts.

OMA Push supports server-initiated delivery of content to clients using different bearers such as WAP, HTTP and SIP. Prior to PTM-Push, these bearer adaptations are limited to point-to-point operation. Multipoint operation, if supported, is implementation-specific.

In situations where the same content/transaction is targeted at multiple devices, point-to-point operation requires duplicated Push server processing and bearer capacity. As deployments of OMA service enablers scale toward large numbers of subscribers and transactions, the efficient use of network resources becomes both a priority and an opportunity. Few efficiency improvements are possible in point-to-point operation, as transactions are typically already optimized (e.g. via content compression). Significant efficiency improvement is thus not possible without expansion to point-to-multipoint operation. As a result, it is expected that as more devices are point-to-multipoint bearer enabled, e.g. supporting networks over which point-to-multipoint bearers can operate, that service providers will seek to leverage these more efficient bearers.

PTM-Push will add multipoint distribution methods to complement the existing point-to-point methods, enabling Push content delivery to a large number of clients simultaneously. This will both address the limitations of point-to-point methods where large groups of users are targeted, and also create opportunities for new Push-based service use cases.

5. PTM-Push release description (Informative)

OMA Push allows Push Initiators and Application Servers to intiate service-related transactions and content delivery to user devices. OMA Push has evolved over several releases, beginning as WAP Push 1.x releases which supported the WAP1 bearers, and releases from WAP Push 2.0 up to OMA Push 2.2 which extended support to WAP2 (HTTP) and SIP bearers. The service environment enabled by OMA Push is illustrated in the following diagram, which shows the two main options for Push service deployment:

- A service/content provider, acting as Push Intiator, requests the OMA Push-based delivery of content to a user through a Push Proxy Gateway (PPG)
- An Application Server directly uses OMA Push to deliver content to a user.

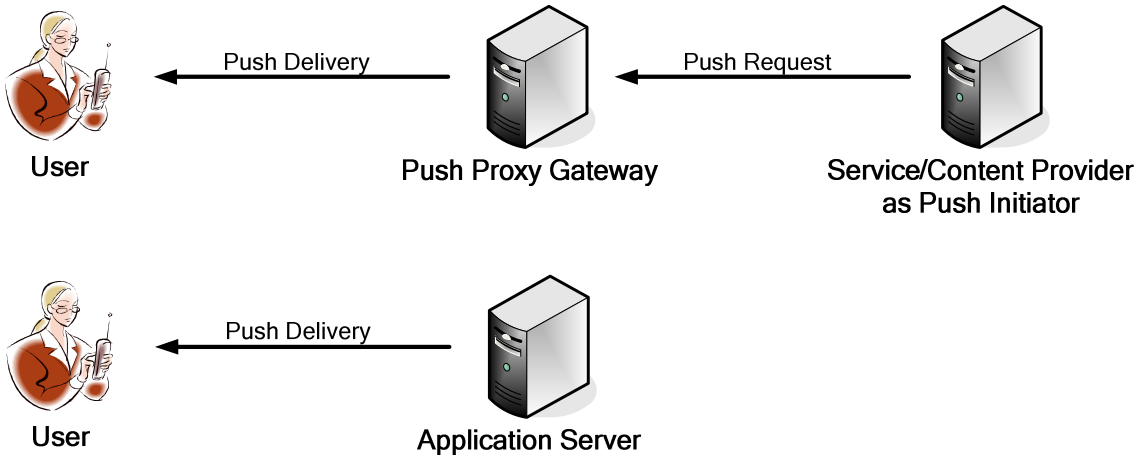

Figure 1: OMA Push service environment

In contrast, the service environment enabled by OMA Push with the enhancement of PTM-Push is illustrated in the following diagram:

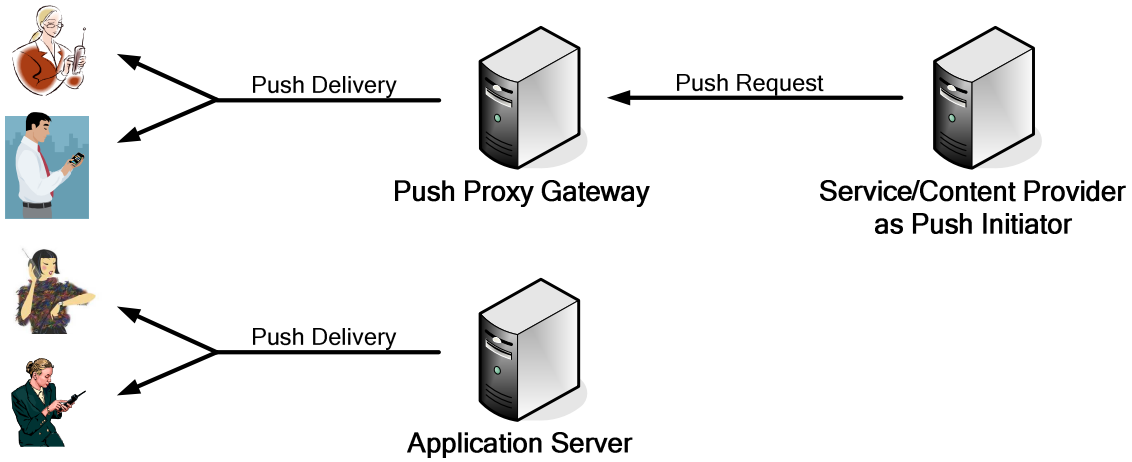

Figure 2: OMA Push service environment with PTM-Push support

PTM-Push relies on unicast, multicast or broadcast capabilities of the underlying bearers allowing transport of Push content to a group of users in a connectionless method. Comparing to previous versions of OMA Push, PTM-Push is a more efficient approach to Push content to a large number of users.

5.1 Version 1.0

The main functionality offered by this version of the PTM-Push requirements is the capability to push content to multiple subscribers simultaneously, including:

- point-to-multipoint Push operation over broadcast and multicast bearers
- Push targeting to multiple users with delivery via multipoint or point-to-point methods
- enhancement of Push Security features and Push Service lifecycle for multipoint Push use cases

6. Requirements (Normative)

6.1 Modularisation

This release contains the following requirement modules:

- Delivery (Mandatory): abililty to initiate and complete delivery of Push requests to multiple users over multipoint and point-to-point bearers
- Security (Mandatory): ability to ensure security, e.g. authenticity and integrity protection of Push requests in multipoint delivery cases
- Admin (Mandatory): ability to administer Multipoint Push services
- QoE (Mandatory): ability to ensure the quality of experience for Multipoint Push services

6.2 High-Level Functional Requirements

Label	Description	Release	Functional module
Push-HLF-001	PTM-Push SHALL support simultaneous delivery of Push Content to multiple end-users, via point-to-multipoint (i.e. broadcast and multicast) bearers.	1.0	Delivery
Push-HLF-002	PTM-Push SHALL support the existing PPG Service features offered to Push Initiators, as applicable to point-to-multipoint service environments.	1.0	Delivery

Table 1: High-Level Functional Requirements

6.2.1 Delivery

Label	Description	Release	Functional module
Push-DEL-001	PTM-Push SHALL support delivery of Push Content via the OMA BCAST enabler to OMA BCAST enabled devices.	1.0	Delivery
Push-DEL-002	PTM-Push SHALL support delivery of Push Content via Cell Broadcast Service [CBS] to CBS enabled devices.	1.0	Delivery
Push-DEL-003	PTM-Push SHALL support delivery of Push Content via Multimedia Broadcast Multicast Service [MBMS] for MBMS enabled devices.	1.0	Delivery
Push-DEL-004	PTM-Push SHALL support delivery of multiple Push Content objects in a single Push operation.	1.0	Delivery
Push-DEL-005	PTM-Push SHALL support selection of the point-to-multipoint bearer to be used for Push Content delivery.	1.0	Delivery
Push-DEL-006	PTM-Push SHALL support selection of the Push target via various options, e.g. by named user group, location (geographic area), or broadcast/multicast address.	1.0	Delivery

Push-DEL-007	PTM-Push SHALL support Push Server mapping of logical Push target addresses to PTM-Push bearer-specific addresses (i.e. the address used for Push Content delivery) if point-to-multipoint delivery has been indicated by Push Initiator.	1.0	Delivery
Push-DEL-008	PTM-Push SHALL support Push Content compression.	1.0	Delivery
Push-DEL-009	For Push operations that require content retrieval from the network, PTM-Push SHALL support Push response spreading, to manage dynamic impact on networks and servers.	1.0	Delivery
Push-DEL-010	PTM-Push SHALL support an indication of the number of successful Push Content deliveries in Result Notifications sent to the Push Initiator.	1.0	Delivery

Table 2: High-Level Functional Requirements - Delivery

6.2.2 Security

Label	Description	Release	Functional module
Push-SEC-001	PTM-Push SHALL support all existing security requirements of the OMA Push enabler applicable to multipoint operation.	1.0	Security
Push-SEC-002	PTM-Push SHALL support integrity protection for Push Content.	1.0	Security
Push-SEC-003	PTM-Push SHALL support confidentiality for Push Content.	1.0	Security
Push-SEC-004	PTM-Push SHALL support Push Server authentication by the Push Client.	1.0	Security
Push-SEC-005	PTM-Push SHALL support Push Client authentication by the Push Server.	1.0	Security
Push-SEC-006	PTM-Push SHALL support Push Server authorization by the Push Client.	1.0	Security
Push-SEC-007	PTM-Push SHALL support Push Client authorization by the Push Server.	1.0	Security
Push-SEC-008	PTM-Push SHALL support the establishment and termination of trust relationships between a Push Client and Push Server.	1.0	Security
Push-SEC-009	PTM-Push SHALL support the establishment and termination of trust relationships between a Push Client and Push Initiator.	1.0	Security

Table 3: High-Level Functional Requirements – Security

6.2.3 Administration

Label	Description	Release	Functional module
Push-ADM-001	PTM-Push SHALL support association of user groups to Multipoint Push target addresses.	1.0	Admin
Push-ADM-002	PTM-Push SHALL support configuration of Push Client access to Multipoint Push services via OMA Device Management.	1.0	Admin
Push-ADM-003	PTM-Push SHALL support recording of the number of successful Push Content deliveries related to a Multipoint Push request.	1.0	Admin
Push-ADM-004	PTM-Push SHALL support configuration of Push services to be delivered via Multipoint Push.	1.0	Admin
Push-ADM-005	PTM-Push SHALL support management of Multipoint Push users.	1.0	Admin

Table 4: High-Level Functional Requirements – Administration

6.2.4 Quality of Experience

Label	Description	Release	Functional module
Push-QoE-001	PTM-Push SHALL support delivery of alternate Push Content representations, to support content selection for usability and interoperability purposes.	1.0	QoE
Push-QoE-002	PTM-Push SHALL support protection of users from unwanted Mutlipoint Push content delivery.	1.0	QoE
Push-QoE-003	PTM-Push SHALL support reliable delivery of Push content.	1.0	QoE

Table 5: High-Level Functional Requirements – Quality of Experience

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
n/a	n/a	No prior version –or- No previous version within OMA

A.2 Draft/Candidate Version 1.0 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-RD-PTM_Push-V1_0	09 Feb 2009	All	Initial document to address the basic starting point.
	04 Mar 2009	3.2, 6.2.2, 6.2.4	OMA-CD-PUSH-2009-0012-CR_Push_2.3_RD_Edits
	26 Mar 2009	5, 6.2.1, 6.2.3	OMA-CD-PUSH-2009-0016R01-CR_Push_2.3_RD_Edits_huawei
	20 Apr 2009	5, 6.2.4, 6.2.1	Per RDRR OMA-RDRR-Push-V2_3-20090420-D
Candidate Version OMA-RD-PTM_Push-V1_0	26 May 2009	All	Status changed to Candidate by TP: OMA-TP-2009-0203-INP_PTM_Push_V1_0_RD_for_Candidate_Approval Editorial fixes: styles and normative references sorted

Appendix B. Use Cases (Informative)

B.1 Efficient and Effective Delivery of Service Notices

B.1.1 Short Description

Multipoint Push can enable efficient and effective delivery of service notices (e.g. informational and emergency) to muliple users. Typical types of informational notices inform users of new services, changes to existing services, and upcoming network events. Notices can also be sent in emergency situations, in which Multipoint Push will provide an effective means to deliver important information to large numbers of users, e.g. in a geographical area.

B.1.2 Market benefits

Delivery of such service notices currently requires discrete Push transactions. Given the potentially large number of users (e.g. millions) targeted by the service notices, Multpoint Push will avoid the following limitations of discrete Push:

- System and network capacity is significantly impacted by the need to deliver discrete Push transactions, including Push Initiator (e.g. service management servers that initiate service notices), Push Proxy Gateway, SMSC, MSC, SIP/IP Core, and signalling links between entities.
- As a result of the capacity impacts, notices must be sent in batches to individual users, which may require spreading over a period of days. This can significantly impact the effectiveness of time-sensitive notices, and effectively prevents use of OMA Push for delivery of emergency notices to very large groups of users.

B.2 Advertising

B.2.1 Short Description

Generic advertising (i.e. not personalized to specific users) can be delivered using Multipoint Push.

B.2.2 Market benefits

Use of Multipoint Push for advertisement delivery will bring the same benefits as for the service notice use case above.

B.3 Push Content Subscription

B.3.1 Short Description

Multipoint Push can be used to coordinate delivery of Push-based content to groups of users that subscribe to an arbitrary Push-based content delivery service.

B.3.2 Market benefits

Use of Multipoint Push can simplify ubscription-based services by separating the subscription management aspects from the delivery aspects, by use of multipoint address schemes. The PTM-Push enabled application clients can be configured for Push reception at a multipoint address as part of subscription management operations. The members of the target subscriber group can then be transparent to the Push content delivery systems (e.g. Push Initiator and Push Proxy Gateway, or PTM-Push enabled application server).

B.4 Extension of OMA Enablers for Multipoint Operation

B.4.1 Short Description

Existing OMA enablers can be extended to support delivery of content/transactions to groups of subscribers, e.g. for OMA Dynamic Content Delivery (DCD), OMA Mobile Advertising (MobAd), OMA Device Management (DM).

B.4.2 Market benefits

OMA enablers can be extended for new use cases supporting groups of subscribers. In addition, the efficiency and effectiveness of existing use cases can be improved through use of multipoint methods.