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*Technical Report*

## **3rd Generation Partnership Project; Technical Specification Group Services and System Aspects Push Architecture; (Release 6 )**



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Keywords

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## Foreword

This Technical Report has been produced by the 3<sup>rd</sup> Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

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## 1 Scope

This technical report defines methods for supporting push services by 3GPP bearers. The mechanisms defined apply to existing bearers for the 3GPP Packet Switched Domain (PS domain), Circuit-Switched Domain (CS Domain), ~~and the~~ IP Multimedia Core Network Subsystem (IMS), Multimedia Broadcast Multicast Service, and Wireless LAN. This technical report addresses the requirements for supported push services as defined in 3GPP TS 22.174 Push Service; Service aspects (Stage 1). Any necessary changes identified during this work will be introduced by means of CRs to the appropriate specifications.

Definition of push functions that apply to push application servers is outside the scope of this work. The definition of push functions that are best implemented in push application servers such as a Push Proxy and Push Initiator will be undertaken by other standards bodies and industry forums.

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## 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: " Vocabulary for 3GPP Specifications ".
- [2] 3GPP TS 22.060: " General Packet Radio Service (GPRS); Service description; Stage ".
- [3] 3GPP TS 22.174: " Push Service; Service aspects (Stage 1) ".
- [4] 3GPP TS 23.039: " Interface protocols for the connection of Short Message Service Centres (SMSCs) to Short Message Entities (SMEs) ".
- [5] 3GPP TS 23.040: " Technical realization of the Short Message Service (SMS) ".
- [6] 3GPP TS 23.060: " General Packet Radio Service (GPRS); Service description; Stage 2 ".
- [7] 3GPP TS 23.228: " IP Multimedia (IM) Subsystem - Stage 2 ".
- [8] 3GPP TS 23.002: "Network Architecture".
- [9] 3GPP TS 29.007: "General Requirements on interworking between the PLMN and the ISDN or PSTN".
- [9] 3GPP TR 23.875974: "Support of Push Services".
- [10] 3GPP TR 23.910: "Circuit Switched Data Bearer Services".

## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 22.174 [3] and the following apply.

**delivery network:** a network that supports connectionless or connection oriented push services. A delivery network may simply be a GPRS network.

**application server:** a server that provides push services through a delivery network, e.g. via an IP connection

**user IP address:** an IP address provided by the delivery network that can be used by an application server for access to a push services user. The address may be permanently assigned (static) or temporarily assigned (dynamic).

**user-ID:** an identity or name that can be used to deliver push content to a user in a delivery network. The format of user-ID is dependent on the protocol for the push services.

**user availability:** the ability of a delivery network to provide push service to a subscribed user.

**user terminal:** the end user equipment that receives push content.

**long-lived PDP Context:** this is a PDP Context that remains active/open for an indefinite period of time. Also referred to as "always-on PDP context".

**always-on PDP Context:** this is a PDP Context that remains active/open for an indefinite period of time. Also referred to as "long-lived PDP context".

**Push Data:** data sent by the push initiator to the push recipient, of a format known to the receiver (push recipient), and not otherwise defined by the push service.

**Push function:** the function in the PLMN that receives the Push Data from the Push initiator. The push function is responsible for delivering the push data to the Push recipient. ~~The Push Function may also be referred to as a Push Proxy or Push Proxy Gateway.~~

**Push initiator:** the entity that originates push data and submits it to the push function for delivery to a Push recipient. A Push initiator may be e.g. an application providing value added services.

**Push recipient:** the entity that receives the push data from the Push function and processes or uses it. This may include the UE with which the PLMN communicates with, the user agent with the application level address, and the device, machine or person which uses the push data. A Push recipient is controlled by an individual user.

**Push service:** a service capability offered by the PLMN. The Push Service is initiated by a Push Initiator in order to transfer push data (e.g. data, multimedia content) from the Push Initiator to the Push Recipient without a previous user action. The Push Service could be used as a basic capability or as component of a value added service.

**Push User agent:** is any software or device associated with a Push recipient that interprets Push Data to the user. This may include textual browsers, voice browsers, search engines, machine or device interface software, etc.

### 3.2 Symbols

For the purposes of the present document, the following symbols apply:

### 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

NAT	Network Address Translator
NRPCA	Network Requested PDP Context Activation
OTA	Over The Air delivery protocol

PP Push Proxy  
 PI Push Initiator

## 4 Architecture Requirements

### 4.5 Push Architecture Overview

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The Push Service Architecture overview is shown in figure 1. This includes the push application servers Push Function (or Push Proxy) and Push Initiator as well as the bearer services available as the delivery network and the Push Recipient or UE. The definition of functions in the Push Function (Push Proxy) and Push Initiator are outside the scope of this TR. Figure 1 also shows the Push Function performing bearer selection, the definition of how this is performed and the criteria for bearer selection are part of the definition of the Push Function and are outside the scope of this TR. Figure 1 depicts the Push Function being located within the PLMN, this is a logical representation of the Push Service Architecture and does not imply the physical co-location of a Push Function within the PLMN infrastructure.

The [definition-description](#) of the delivery network (bearers) used to support push services and how those bearers are established, maintained and withdrawn is the main focus of this [section](#).

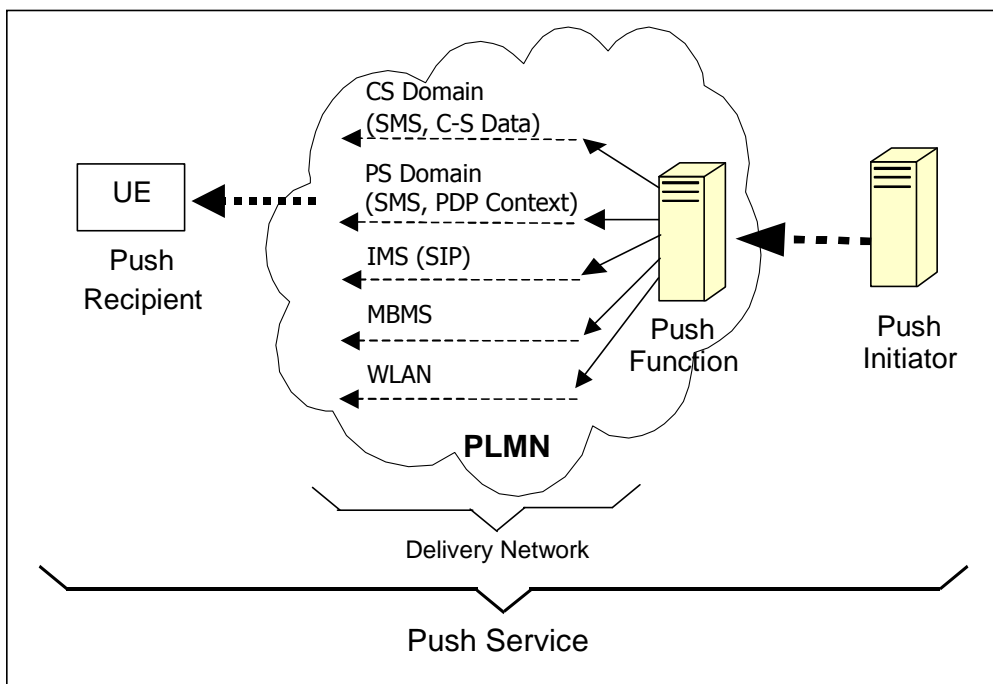


Figure 1: Push Service Architecture Overview.



## 5.1 Push Bearers in the PS Domain

This section describes the use of various mechanisms in the PS Domain to establish and/or maintain a bearer service connection to the UE over which Push services may be delivered.

*Editors Note: the following bullets provide guidance for further work*

### 4.1.1.1 Push using Long Lived PDP Context

- This section describes the use of an existing PDP Context for Push services.

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### 4.1.2.2 Push with Static IP Address Assignment

- This section describes the use of 3GPP TS 23.060 section 9.2.2.2 Network-Requested PDP Context Activation procedure to establish and carry Push services to a UE.

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### 4.1.3.3 Push with Dynamic IP Address Assignment

- This section describes a mechanism to establish a PDP Context that can be used to carry Push services to a UE when the PS Domain implements Dynamic IP address assignment.

### 4.1.4.4 Push using SMS in PS Domain

- The section describes how Push services can be delivered to a UE using the services defined for Short Message Service in the PS Domain.

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## 4.25.2 Push Bearers in the CS Domain

This section describes the use of various mechanisms in the CS Domain to establish and/or maintain a bearer service connection to the UE over which Push services may be delivered.

*Editors Note: the following bullets provide guidance for further work*

### ● Push over Circuit-Switched Data Bearer

- This section describes the use of a circuit-switched data bearer to deliver Push services. The Circuit-Switched Data connection is established based on the mechanisms described in 3GPP TR 23.910 Circuit-Switched Data Bearer Services and 3GPP TS 29.007 General Requirements on interworking between the PLMN and the ISDN or PSTN, section 9.2 Data Calls.

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### 4.2.2.2 Push using SMS in CS Domain

- The section describes how Push services can be delivered to a UE using the services defined for Short Message Service in the CS Domain.

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### 4.35.3 Push in the IP Multimedia Subsystem

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- Push using SIP

- *The solution described in this section defines a method using the SIP protocol in IMS to carry Push services to a UE.*

### 5.4 Push using MBMS

### 5.5 Push using WLAN

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## 6 Analysis and Conclusion

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Annex <A> (normative):  
<Normative annex title>

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Annex <B> (informative):  
<Informative annex title>

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Annex <X> (informative):  
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<u>2003-01</u>					<u>Revised at SA2#29 San Francisco</u>		<u>0.0.1</u>