ETSI TS 122 174 V15.0.0 (2019-07)

TECHNICAL SPECIFICATION

Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);
LTE;
Push Service;
Service aspects;
Stage 1
(3GPP TS 22.174 version 15.0.0 Release 15)

Reference

RTS/TSGS-0122174vf00

Keywords

GSM,LTE,UMTS

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:
http://www.etsi.org/standards-search

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx

If you find errors in the present document, please send your comment to one of the following services:
https://portal.etsi.org/People/CommiteeSupportStaff.aspx

Copyright Notification

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (https://ipr.etsi.org/).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

Legal Notice

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Foreword

This Technical Specification has been produced by the 3rd 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.

Introduction

The Push Service introduces a means to transmit push data from a push initiator to a push recipient (e.g. a UE) without a previous user action. The push concept, as provided by the SMS teleservice, has been very successful in the GSM second generation, both for text messaging (for user viewing) and for other unstandardized data to the SIM (as a building block used for OTA and other purposes). This TS introduces the Push Service as a generalization of existing network capabilities plus the development of new capabilities. The Push Service should therefore be understood as a building block (network capability), which can be used for new services, both public and private, in 3GPP.

In the normal client/server model, a client requests a service or information from a server, which then responds in transmitting information to the client. This is known as the "pull" technology, the user pulls information from the content provider. The World Wide Web is a typical example of pull technology, where a user enters a URL (the request) that is sent to a server and the server answers by sending a Web page (the response) to the user.

In contrast to this there is also the "push" technology where there is no explicit request from the user before the content provider (push initiator) initiates an information transfer to a user. Another way of saying this is that whereas "pull" transaction of information are always initiated from the user, "push" transactions are content provider initiated. The welcome message received after registration with a visited network whilst roaming is an example of information transfer that has been initiated without a request from the user. Typically, a user signs up with the push initiator and defines their interest, volume of information acceptable and other factors in the push subscription profile. As information becomes available that satisfies the user's push subscription profile, the push initiator delivers it to the user using the Push Service.

The Push service may be used to implement high level services such as IP multimedia services, MMS, etc., and new services including public safety, government, corporate IT, transfer of push data to machines and devices, in addition to infotainment type services.

Another common use for push services is the delivery of notification from e.g. MMS to the user while the user has the option of "pulling" the actual push data from the push initiator.

The PLMN Push function provides the push data to the user agent in the UE. The user agent interprets and presents the push data to a person, device or machine using the UE.

NOTE: The requirements of services such as streaming, conversational services and broadcast are independent from push. Therefore they are not considered appropriate for inclusion here. Push will be available for use in appropriate applications of all high level services.

1 Scope

This Technical Specification defines the Stage 1 description of the Push Service and is the set of requirements that shall be supported for the provision of push, seen primarily from the subscriber's, service providers' and delivery network points of view.

This TS includes information applicable to network operators, service providers, terminal and network manufacturers. It is of use to manufacturers and organisations which have devices or machines benefiting by availability of push service.

This TS contains the core requirements for the Push Service, for operator and external Push Initiators, which are sufficient to provide a complete service capability and service capability feature.

This TS defines the requirements for the Push Service to enable delivery of push data, including such functionality as:

- Transfer of push data from a Push Initiator to a Push Recipient
- Latency and Priority classes,
- Definition of handling of undeliverable push data.

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 TS 21.133: "3G security; Security threats and requirements".

[2] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[3] 3GPP TS 22.240: "Service requirements for 3GPP Generic User Profile (GUP); Stage 1".

3 Definitions and abbreviations

Definitions and abbreviations used in the present document are listed in TR 21.905 [2]. For the purposes of this document the following definitions and abbreviations apply:

3.1 Definitions

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.

PLMN: the 3GPP network that receives the push data from the push initiator and ensures the delivery of push data to the push recipient. The delivery of the push data may involve other networks.

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.

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.

Push Subscription Profile: a set of parameters indicating the Push recipient's settings and preferences for the Push Service.

3.2 Abbreviations

For the purposes of this document the following abbreviations apply:

URL – Uniform Resource Locator.

4 Overview of the Push Service

The overview of push is followed by a summary of the relationships among the entities involved (operators, users, push recipients and push initiators).

NOTE: these are functional descriptions: multiple functions may, depending on business arrangements, be performed by a single entity.

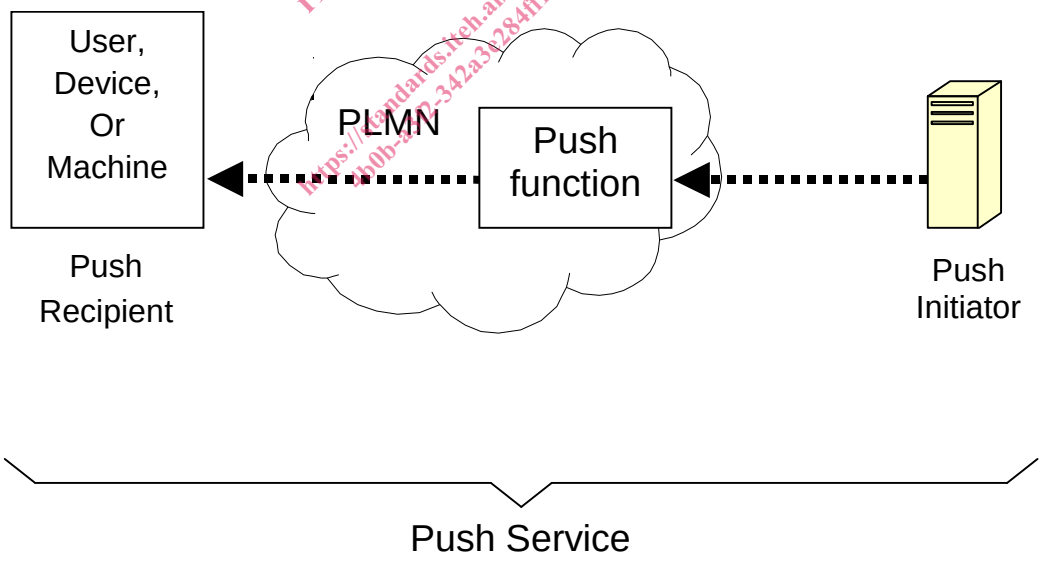

Figure 1: Push Service Overview

The Push Service is a service whereby the Push Initiator sends push data through a Push Server to a Push Recipient, without interaction from the Push Recipient.

The typical mode of operation is as follows:

- A Push Recipient (e.g. user, receiving device like a meter) explicitly or implicitly subscribes to a set of value added services offered by various Push Initiators and allow these Push Initiators to send it push data that meet the Push Recipient's configured criteria. (This configured criteria is part of the Push user profile.)

- A Push Initiator identifies information matching the criteria set by the Push Initiator and package it up into the push data

- The Push Initiator delivers the push data to the Push function, identifying the Recipient's address, and optionally priority, delivery time parameters, etc.

- The Push function takes the responsibility of delivering the push data, optionally following the priority and delivery time parameters, to the Push Recipient and for providing feedback to the Push Initiator regarding delivery of the push data if requested by the Push Initiator.

Key characteristics of the Push Service include:

- The Push Initiator may, but is not required to deal with the specifics of the wireless transport, selection of appropriate bearers, out-of-coverage or roaming issues, and other wireless network anomalies. These are all managed by the Push Service and hence can be optimised at the network level rather than being handled by all applications. Using an available bearer the push service offers as many capabilities that are available to delivery of the push data following the requested push services requested by the push initiator.

- The push initiator shall be provided with a means to query the push server for a specific recipient's push user profile subject to privacy considerations.

- The push server shall not change the push data (contents). Any transformations that the Push Server provides shall be compliant with user privacy requirements as defined in the push subscriber profile.

- The push service shall be able to handle user groups (i.e. have the ability to target a certain group of push recipients).

- The push service is capable of supporting asynchronous communication between a Push Initiator and the push recipient on a wireless device.

- The privacy of the user is important and the introduction of the push services should in no way result in unwanted information "spam" being sent to mobile users.

The Push data could contain:

- Application specific data exchanged between a server and its client e.g. ERP, CRM, Field Service management, m-commerce transaction data or a meter reading

- Provisioning or configuration control data

The entities shown in Figure 1 are Push Initiator, Push Server (PLMN) and the Push Recipient. The Push Initiator may be outside the Operators network and hence will require well-defined relationships amongst them.

For example, a Push Initiator can be within the Operator domain (e.g. an operator portal) or an external VASP. A Push Recipient (e.g. a User) will need to be part of the Operators network and will require allowing the network to pass through push data and also subscribing to the Push Initiator to generate the data it wants pushed. To support flexible billing models, it becomes necessary for the Operator to have a defined commercial relationship with the Push Initiator.

5 Requirements

The following list gives the high level requirements for the Push service.

5.1 General

The Push Service shall allow a Push Initiator (which may be external to the PLMN) to initiate delivery of push data to the Push recipient. It shall be possible to deliver push data to the push recipient without any user intervention, subject to settings in the push subscription profile. The Push Initiator may interrogate the push subscription profile, if available, in order to establish the user preference related to the Push Service.

- The push mechanism shall be efficient in the use of network resources and terminal resources.
- It shall be possible to support Push Service independently over CS (including CS data and SMS), PS domains or IMS.
- NOTE: Operators should be able to choose which of these options they use to deliver Push services, and it should be possible to use these options independently from each other. E.g. delivery over the PS domain would allow operators who are not planning to introduce IMS and SMS to offer Push Services.
- It shall be possible to deploy Push Services independently of other services defined by 3GPP.
- The quality of service delivery shall be able to include time-sensitive as well as reliable delivery choices
- It shall be possible to use all available access networks (e.g. GERAN, UTRAN,).
- It shall be possible for the Push Initiator to specify a bearer for the Push Service, as a default the push service shall identify the bearer. The Push Initiator may, however, require certain grade of service for delivery, e.g. speed of delivery or delivery acknowledgement.

5.2 Provisioning

The operator shall be able to provision a user or organisation-user (e.g. a subscriber or a VASP) with the Push Service. The provision may include usage of the Push Service as a Push initiator, as a Push recipient or both.

The provision may be:

- general: where the service is made available to all user or organisation-users (subject to compatibility restrictions enforced) without prior arrangements being made with the operator;
- pre-arranged: where the service is made available to an individual user or organisation-user only after the necessary arrangements have been made with the operator.

If the user is provisioned with the Push Service as a Push initiator he may use the Push Service in order to transfer push data to the Push Recipient, subject to settings in the push subscription profile of the Push Recipient.

If the user is provisioned with the Push Service as a Push recipient he may use the Push Service in order to receive push data from a Push initiator.

The push subscription profile parameters (user's settings and preferences) are managed by the user or the operator on behalf of the user.

The operator shall be able to withdraw the provision of the Push service. Withdrawal may be general or pre-arranged.

NOTE: Provisioning with – or subscription to – value added services, that make use the Push service are out of scope of this specification.

NOTE : the concept of organisation user may apply to GUP and if so will not be duplicated here.

5.3 Subscription

The usage of the Push Service to deliver push data from a Push Initiator to a Push Recipient requires as a precondition either an explicit or implicit subscription to the Push Service

Explicit Push Subscription: