

**27 - 30 November, 2001****Sophia Antipolis, France**

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**TSG-SA WG 1 (Services) meeting #14**  
**Kobe, Japan, 5-9 November 2001****S1-011252**  
**Agenda Item:**

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**Title:** Liaison Statement on Revised Push Service Stage 1  
**Source:** SA1  
**To:** SA2, SA3, SA5, T2, GSM-A SerG, WAP Forum  
**Cc:**

**Contact Person:**

**Name:** DeWayne Sennett  
AT&T Wireless Services  
**Tel. Number:** +1 425 580 6847  
**E-mail Address:** [dewayne.sennett@attws.com](mailto:dewayne.sennett@attws.com)

**Attachments:** S1-011251 [Description i.e. Draft Push Services Stage 1 TS 22.174 v0.3.0].

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**1. Overall Description:**

SA1 thanks those who provided liaison statements on the draft Push Services Stage 1 document.

SA1 has updated the draft Stage 1 for the Push Service, which is attached. This Stage 1 is still an early draft, which will continue to be used as a basis for further work. However, as with the previous draft version of the Push Services Stage 1, SA1 feels that it would be useful to receive some feedback on these updated requirements.

**2. Actions:**

**To SA2, SA3, SA5, T2, GSM-A SerG, WAP Forum groups.**

**ACTION:** SA1 requests SA2, T2, GSM-A, and WAP Forum to review the last draft of the Push Services Stage 1 document and provide comments for the next SA1 Push Services Adhoc meeting which will occur during the week of 14 January, 2002.

**3. Date of Next SA1 Meetings:**

Title	Date	Location	Country
SA1 Adhocs	14 – 18 Jan 02	Phoenix	United States
SA1#15	11 – 15 Feb 02	Saalfelden	Austria
SA1 Adhocs	8 – 12 Apr 02	Sophia Antipolis	France
SA1#16	13 – 17 May 02	Victoria	Canada
SA1 Adhocs	8 – 12 Jul 02		
SA1#17	12 – 16 Aug 02	To be determined	North America
SA1 Adhocs	14 - 18 Oct 02		
SA1#18	11-15 Nov 02		

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**3rd Generation Partnership  
Technical Specification Group Services**



**Push Service  
Service aspects (Stage 1)  
(Release 5)**

**NOTE : major changes highlighted in grey!  
Text in red is not yet agreed**

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Keywords

UMTS, service, push

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650 Route des Lucioles - Sophia Antipolis  
Valbonne - FRANCE  
Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

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## Foreword

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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 specification.

## Introduction

The Push Service introduces a means to transmit information to a device without a previous user action. 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 URI (the request) which 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” transactions of information are always initiated from the user, “push” transactions are content provider initiated.

Typically, a user signs up for content provider and defines their interest, volume of information acceptable and other factors in the subscription profile. As information becomes available that satisfies the user subscription and profile, the push initiator delivers it to the user using the Push Service.

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 information from the push initiator.

Push initiators may include use cases such as MMS, public safety, government, corporate IT in addition to infotainment type services.

**Editors Note : what is the interaction between the Push Service and MBMS and Streaming ?**

### 4 Scope

This Technical Specification defines the stage one description of the Push Service. Stage one is the set of requirements that shall be supported for the provision of push services, 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.

This TS contains the core requirements for the Push Service, which are sufficient to provide a complete service.

### 2 References

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

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[1] 3G TS 21.133: "3G Security; Security Threats and Requirements"

[2] 3G TS 21.905: “Vocabulary for 3GPP Specifications”

Editors note : [other refs ? charging , security](#)

## 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

**Delivery Network:** the network that delivers the information from the Push Initiator to the User.

**Push initiator:** the entity that originates push content and submits it to the push service for delivery to a user agent on the UE e.g. content provider, MMS, corporate IT systems.

**Push service:** a service which delivers information (e.g. notification, data, multimedia content) initiated from a Push Initiator (which may be external to the PLMN) to the UE.

**Trust Level :** ?

**User:** a person who interacts with a user agent to view, hear or otherwise use a rendered content.

**User agent:** is any software or device that interprets resources. This may include textual browsers, voice browsers, search engines etc.

### 3.2 Abbreviations

For the purposes of this document the following abbreviations apply:

URL – Uniform Resource Locator.

## Overview of the Push Service

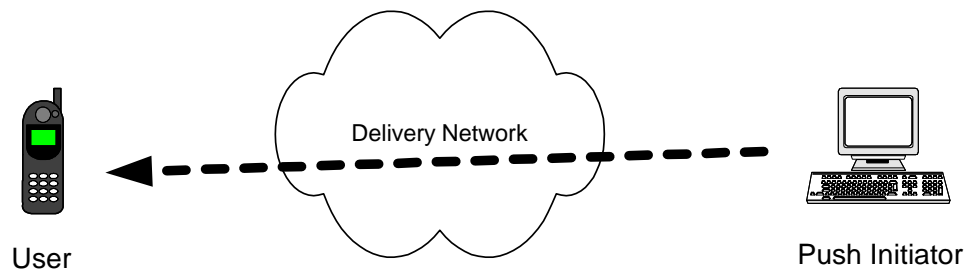


Figure 1 : Push Service Overview

A Push Service is a service whereby the Push Initiator sends information to a user at a time that is determined by the Push Initiator. For example :

- the information could be advertising, which the user has agreed to accept,
- the information could be news bulletins, weather forecasts, stock quotes etc. that the user has subscribed to by prior arrangement,
- the information could be very specific to the users interests, hobbies e.g. details of the location of a rare bird for birdwatchers, the latest news from a favourite TV show,
- the information could be related to work (corporate information service) e.g. company notices, details of next job for field engineers.

The information push is initiated by a Push Initiator that has permission to push information over a particular delivery network and permission to address a particular set of users.

The privacy of the user is important and push services should in no way result in large amounts of unwanted information “spam” being sent to mobile users.

**Editors note :** description of commercial relationships between operators, users and Push Initiators needs elaboration.

### Requirements

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

#### General

The Push Service shall allow a Push Initiator (which may be external to the PLMN) to initiate delivery of information to the user.

It shall be possible to provide the Push Service without any user intervention, subject to settings in the Generic User Profile [x]. The Push Initiator may interrogate the Generic User Profile, if available, in order to establish the user preference related to the Push Service.

The push mechanism will be efficient in the use of network resources and terminal resources.

Push Initiator may access user specific data held in the network (e.g. presence information and location information), when available, subject to the user’s privacy requirements and operator agreement.

**Editors note:** The following text (in red) is not yet agreed:

A default bearer shall be selected / standardized for push service.

Note: It would be highly preferable that the bearer would be or has potential to become widely available within 3GPP system. As example SMS was not considered suitable as the default bearer service.

Further it shall be possible to support push service over following legacy bearers:

- GPRS (preferred option)
- CS MT data call
- SMS / EMS / MMS (note : to be clarified )

Supporting of push service over legacy bearers is subject to limitations due to varying capabilities of the used bearer service and terminals. It shall be possible to use all available access networks (e.g. GERAN, UTRAN, WLAN) as specified per each legacy bearer. Legacy bearer may be used when the default transport cannot be provided by serving network (e.g. roaming).

Note: There are no new requirements for legacy bearers.

The bearer service for delivery of push information should be transparent to the Push Initiator, that is, the Push Initiator need not know what bearer service the client is using. The Push Initiator may, however, require certain grade of service for delivery, e.g. speed of delivery or delivery acknowledgement.

It shall be possible to provide Push Services independently and simultaneously of other services e.g. SMS.

“It shall be possible to deploy Push Services independently of other services (eg SMS)”

The push mechanism shall be efficient in the use of network resources and terminal resources.

## Addressing and Routing

It shall be possible to uniquely identify push service recipients.

The addressing model shall include network addresses of the device, device identities to support devices with multiple network addresses, user identities and application level addressing (i.e. user agents). The addressing model shall be compatible with Internet specifications when applicable.

Both telecom and internet numbering and addressing schemes shall be supported.

A variety of identifiers can be used externally to address entities. For example, data only terminals (e.g. vending machine) can be reached without necessarily using E.164 numbers.

There is no requirement to address users by IMEI.

## Service Delivery

The Push Service may offer classes of service delivery. This shall include support for the following,

- lifetime for Push requests (undelivered content, how long it will reside in the Push network);
- requested delivery priority (different priorities dependent on for example originator)
- Immediate (e.g. within 10 seconds)
- Time sensitive (within a specified time)
- Low priority (e.g. Batch, off-peak)
- Reliability (e.g. guaranteed, non-guaranteed, with or without acknowledgement)
- no. of retries

The Push Service shall provide a single-attempt delivery mechanism.

The Push Initiator requests the delivery of information with a particular class of service and the Push Service determines the most appropriate delivery mechanism.

If the user declines delivery of a specific instance of pushed information the Push Service shall not attempt to re-send it.

It shall be possible for the Push initiator to deliver push-related control information together with the pushed content.

- An example of what could be included in the control part is an instruction to replace or delete information for a previously sent Push message.

The Push Service shall be provided independent of the content type of the pushed information.

## Service Management

The basic principle of service management is “the user is in control”.

The user of the Push Service has a basic subscription relationship with the provider of the delivery network e.g. network operator. However, the main service relationship is with the Push Initiators who by definition have access rights to the delivery network.

The user can control the information pushed from a particular Push Initiator by setting the appropriate parameters in the Generic User Profile [x] e.g. white lists and black lists. The details of this is outside the scope of this specification.

The user shall be able to request Information from a particular Push Initiator be suppressed.

**Editors Note : mechanisms to allow users to dynamically control the type and size of information received need further consideration.**

## Security

**Editors note : relationship to DRM ?**

The “Security Threats and Requirements” specified in 22.133 [1] shall not be compromised.

The user shall be able to use the Push Service in a authorized and authenticated manner. Mechanisms shall be provided to ensure that the Push message is sent to and accessed only by the intended addressed entity.

It shall be possible for the Delivery Network or the user to deny an unauthorized push message.

It shall be possible to deny an unauthorized push message. An authorization may be based on the following:

- identity of the Push Initiator
- the destination user, device or user agent
- push related attributes such as priority and content type

It shall be possible for the user agent in the UE to control acceptance of content pushed to the user based on the trust level of the Push Initiator.

The Delivery Network shall provide data integrity and data confidentiality of the pushed information.

Push Initiators must have authorization from the Delivery Network (e.g. PLMN Operators) in order to use the Push Service.

## Privacy

| The Push Initiator shall comply with user and operator privacy requirements.

**[note: this has the same type of privacy requirements as in Presence Service/Generic User Profile, could reference or copy]**



## Charging

Push services shall support various charging mechanisms (e.g. reverse, prepaid and reply charging etc.).

The following charging scenarios shall be supported:

1. Charging for push services can be subscription based.
2. Charging for push services can be based on the content, the resources used and time needed to carry out the push service.
3. Charging for push services can be based on the number of messages pushed to a receiver.
4. It should be possible to charge the user only, the Push Initiator only, or both the user and the Push Initiator.
5. It should be possible to charge third parties e.g. corporate accounts.
6. It shall also be possible to mix and match the various different charging scenarios outlined above.
7. One-off charging for subscription and cancellation of Push Service should be possible.
8. Need to charge for rejected push content.

It shall be possible to include the following data in the CDRs as charging information if available:

- message types, length, storage time in the network, etc
- delivery time, upload / download method,
- Push service sender / -recipient
- number of Push messages sent
- number of Push messages received.
- roaming conditions (e.g. in a visited network)
- location conditions
- media.

## Roaming

Push services shall be available when roaming.

**Note : Further work required.**

### Inter-working

**Note : Further work required.**

## Annex A (informative): Push Service Use Cases

**Editors note : this section contains some initial ideas and requires a lot of work.**

Push services may be defined and profiled in various ways, including types of service entities, types of information and delivery characteristics.

The basic principles which apply include:

- A mobile may have many services
- Each service may have its own requirements for provisioning, service delivery and support
- Service delivery architecture shall accommodate and efficiently support this diverse range of services
- The functionality required to support various business model shall be provided
- No single entity has complete control of the subscriber

Services will be provided by many service entities including:

- Operators
  - News, weather, e-mail, advertising, presence, location
  - Consumer M-services, M-Commerce applications
- VASPs
  - Vertical industry applications, niche interest applications
  - Banking, stock trading
- Corporations
  - Corporate intranet, extranet, field support applications
- Public Safety
  - Internal local communications, inter-group (including emergency response)
  - Public alerts: traffic, weather safety,
- Government
  - Security agency internal communications
  - Agency dissemination of information (like a VASP)
- Internet (for mass consumption)

A wide range of use cases may be described. This list is intended to illustrate some of the corporate, public safety and government cases in addition to those, which are in the information, entertainment, advertising and Internet areas.

A user may subscribe to many services.

- Bank Services - (724 Solutions Inc. like services) closed system, very, very high security (down to the using public-key encryption at the field level). This is a public service that is offered by a private company that needs low-level network access. Service could include bank account access, mutual fund, portfolio access, money transfers, and stock operations.
- Private banking service - notifications could be pushed out if your bank account reaches a certain level, could also push real-time debit or credit transactions to the user...
- Stock Services - could be public or private, but in all cases strong security is required.(like the Pocket Broker application).
- Private Stock Server - could indicate that a sale as gone through, a portfolio has reached a certain level, a stock broker's buy or sell suggestion for paying members, etc.
- Public Stock Server - that simply allows the user to receive notification of major stock changes, volume level concerns or key levels being reached. Since there is no trading this is public information and might cost a modest subscription fee.
- Corporate Push Services - company private e-mails and calendar events, company alerts for: (1) CRM changes – e.g. please contact Joe immediately, (2) inventory levels, (3) field service calls, (4) ERP data - manufacturing stopped – e.g. parts missing, (5) collaboration alerts – e.g. new specs document to review, and (6) workgroup alerts – e.g. Tom's code has been checked-in integration can continue
- Public Safety - Police Department in a city provides: (1) alerts to all department members through very secure push service, (2) alerts to police members in adjoining municipalities. Department members receive alerts from state police department, as coordinated by the city's department. The cross-department alerting is tailored to the individual member's assignments.
- Public Safety – Police, Fire and other related agencies provide alerts with some ranking of their severity to the public: (1) traffic status and problems, (2) severe weather alerts.
- Government – Agency with high security requirements and closed system uses the service to notify their members while keeping the terminal addresses totally private and confidential and preventing monitoring of the amount of their traffic. The agency is able to maintain security and key control without the knowledge or need for cooperation of any other entities.

The service initiator of high security and high sensitivity services shall be provided with flexible interfacing with operator user profile and other databases, restricting critical information (e.g., user identities, sensitive services enabled, and usage data) from others, while providing the operator with a limited set of required data.

- The user receives a short information message about important news (e.g. the user subscribes to a news list) the full news article will not be retrieved until the user accepts the pushed information. The possibility to reject the message is also valid.
- The user receives information about e.g. new e-mails, voice-mails, fax etc and can choose to receive the whole content immediately or at a later occasion.
- During a sports event the user is interested in receiving a short streaming video with highlights from the most important happenings and can choose to read/view more when interested.
- The user is part of a cell broadcast group and will be notified about local news from the group owner. All messages will then be, cost and capacity efficiently, pushed to the subscribers in the group.
- When entering a particular place (e.g. shopping mall, airport, amusement park) a message is pushed to the user and a list of available services are presented to the user. If the user is interested in any of the services he can easily visit the recommended sites. The message can also include information about other kind of bearers related to this local area e.g. Bluetooth,WLAN.
- When passing a store included in the users interest list the IMS capable client receives a streaming video commercial e.g. pizza options to order from. Reverse charging in the IMS network can be used if the user decides to order something.
- When roaming a message can be pushed to the user with information about e.g. a phone call cost when roaming in this particular area.
- An IMS capable client is roaming into an IMS network and receives a Streaming video trailer e.g. presenting the IMS operator for the user.
- Since the home operator is aware of when the client is roaming, Push messages related to the client's roaming position can be sent to the user e.g. a list of available services (like weather forecast, local news, ongoing events) the user can choose from.

- Game invitation can be pushed to the selected game partner. If the invitation is accepted a session is set up to start the game.
- Games where it's likely that the opponent's answer might take some time (e.g. chess). Each time one of the players do a move a push message is sent to the opponent.
- A notification when you exceed some application dependent counters/limits (e.g. money left on pre-paid) giving you options to set up a session related to solving the problem (e.g. put more money on the prepaid account).
- Occasions where a waiting time is expected (e.g. at a doctor's office, dentist, a restaurant, Swedish systembolaget i.e. wine store). After being registered (establishment of a long-lived session) a push message will be sent to you when it's your turn (eventually a reuse of the session).
- E-ticket, a document being pushed to the client and activated by an application in the client. When entering the arena for which the e-ticket is valid the information is transferred via e.g. Bluetooth (e.g. at a music event, sports event or an airport) additional information might be transferred to the client (e.g. where to go).
- Synchronisation, e.g. automatically update the terminal's address book when the user makes a change elsewhere (for example in "Contacts" stored on an Exchange server).
- Provisioning, i.e. push a message to the client containing settings needed by the terminal to access the services the user is subscribed to. For example when buying a new terminal/getting a new subscription.

It shall be possible to address groups of user, where groups are defined by subscriptions, geographic area or any other useful grouping.

**Comment: This section is confusing, e.g. specification of both delivery class and delivery priority. The following parameters should be specified by the push originator for each push message (as examples):**

- **delivery class (or priority)**
- **immediate (< 5 seconds)**
- **medium (< 1 minute)**
- **low (as available)**
- **time to live**
- **content type (e.g. MIME)**
- **streaming / non-streaming**
- **minimum bit rate**
- **guaranteed / non-guaranteed**
- **acknowledged / un-acknowledged**
- **control information (replace, delete, client capability query, client update capability)**

The push initiator for non-public services (e.g., private or corporate services, public safety services and government services ) shall have flexible interfacing with service provisioning to enable restriction and management in accordance with suitable arrangements with operators. Specifically, for sensitive push services, the push initiator may maintain parts of the user profile and service provisioning database with flexible interfacing to the operator's database.

The user shall be able to subscribe to multiple Push Initiators at the same time.

It shall be possible for a user to convey their unique address to the Push Initiator when subscribing to a new service.

The user shall be able to cancel a particular push service from their mobile terminal.

The user shall be able to discover and subscribe to new push services from their mobile terminal.

The user shall be able to easily determine their current subscription list for push services from their mobile terminal.

The push initiator for third party services (e.g., private or corporate services, public safety services and government services) shall have flexible interfacing with operator administrative services including billing.

**Annex B: Change history**

V. 0.1.0	February 2001	First Draft (Presented at TSG-SA-WG1 6 <sup>th</sup> – 9 <sup>th</sup> February 2001)
V. 0.2.0	July 2001	Second Draft (from SA1 ad-hoc, 9 July 2001)
V. 0.3.0	November 2001	Third Draft (presented at SA1 5 <sup>th</sup> – 9 <sup>th</sup> November 2001)

Change history										
TSG SA#	SA Doc.	SA1 Doc	Spec	CR	Rev	Rel	Cat	Subject/Comment	Old	New

# 3G TS 22.174 0.3.0 (2001-11)

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*Technical Specification*

## **3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Push Service Service aspects (Stage 1) (Release 5)**

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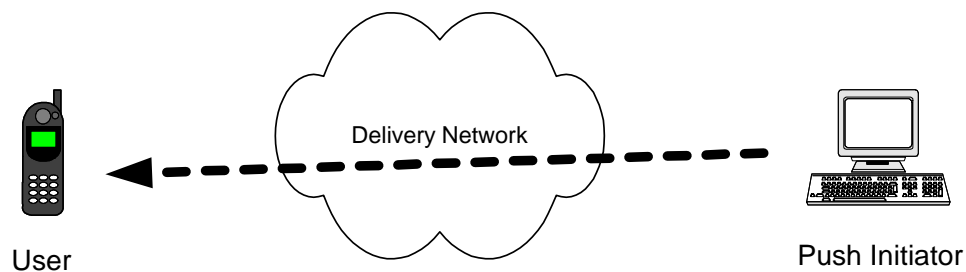


Figure 1 : Push Service Overview

A Push Service is a service whereby the Push Initiator sends information to a user at a time that is determined by the Push Initiator. For example :

- the information could be advertising, which the user has agreed to accept,
- the information could be news bulletins, weather forecasts, stock quotes etc. that the user has subscribed to by prior arrangement,
- the information could be very specific to the users interests, hobbies e.g. details of the location of a rare bird for birdwatchers, the latest news from a favourite TV show,
- the information could be related to work (corporate information service) e.g. company notices, details of next job for field engineers.

The information push is initiated by a Push Initiator that has permission to push information over a particular delivery network and permission to address a particular set of users.

The privacy of the user is important and push services should in no way result in large amounts of unwanted information “spam” being sent to mobile users.

**Editors note : description of commercial relationships between operators, users and Push Initiators needs elaboration.**

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## 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 information to the user.

It shall be possible to provide the Push Service without any user intervention, subject to settings in the Generic User Profile [x]. The Push Initiator may interrogate the Generic User Profile, if available, in order to establish the user preference related to the Push Service.

The push mechanism will be efficient in the use of network resources and terminal resources.

Push Initiator may access user specific data held in the network (e.g. presence information and location information), when available, subject to the user’s privacy requirements and operator agreement.

**Editors note: The following text (in red) is not yet agreed:**

**A default bearer shall be selected / standardized for push service.**

**Note: It would be highly preferable that the bearer would be or has potential to become widely available within 3GPP system. As example SMS was not considered suitable as the default bearer service.**

**Further it shall be possible to support push service over following legacy bearers:**

**-GPRS (preferred option)**

**-CS MT data call**

**-SMS / EMS / MMS (note : to be clarified )**

**Supporting of push service over legacy bearers is subject to limitations due to varying capabilities of the used bearer service and terminals. It shall be possible to use all available access networks (e.g. GERAN, UTRAN, WLAN) as specified per each legacy bearer. Legacy bearer may be used when the default transport cannot be provided by serving network (e.g. roaming).**

**Note: There are no new requirements for legacy bearers.**

**The bearer service for delivery of push information should be transparent to the Push Initiator, that is, the Push**

Initiator need not know what bearer service the client is using. The Push Initiator may, however, require certain grade of service for delivery, e.g. speed of delivery or delivery acknowledgement.

It shall be possible to provide Push Services independently and simultaneously of other services e.g. SMS.

“It shall be possible to deploy Push Services independently of other services (eg SMS)”

The push mechanism shall be efficient in the use of network resources and terminal resources.

## 5.2 Addressing and Routing

It shall be possible to uniquely identify push service recipients.

The addressing model shall include network addresses of the device, device identities to support devices with multiple network addresses, user identities and application level addressing (i.e. user agents). The addressing model shall be compatible with Internet specifications when applicable.

Both telecom and internet numbering and addressing schemes shall be supported.

A variety of identifiers can be used externally to address entities. For example, data only terminals (e.g. vending machine) can be reached without necessarily using E.164 numbers.

There is no requirement to address users by IMEI.

## 5.3 Service Delivery

The Push Service may offer classes of service delivery. This shall include support for the following,

- lifetime for Push requests (undelivered content, how long it will reside in the Push network);
- requested delivery priority (different priorities dependent on for example originator)
- Immediate (e.g. within 10 seconds)
- Time sensitive (within a specified time)
- Low priority (e.g. Batch, off-peak)
- Reliability (e.g. guaranteed, non-guaranteed, with or without acknowledgement)
- no. of retries

The Push Service shall provide a single-attempt delivery mechanism.

The Push Initiator requests the delivery of information with a particular class of service and the Push Service determines the most appropriate delivery mechanism.

If the user declines delivery of a specific instance of pushed information the Push Service shall not attempt to re-send it.

It shall be possible for the Push initiator to deliver push-related control information together with the pushed content.

- An example of what could be included in the control part is an instruction to replace or delete information for a previously sent Push message.

The Push Service shall be provided independent of the content type of the pushed information.

## 5.4 Service Management

The basic principle of service management is “the user is in control”.

The user of the Push Service has a basic subscription relationship with the provider of the delivery network e.g. network operator. However, the main service relationship is with the Push Initiators who by definition have access rights to the delivery network.

The user can control the information pushed from a particular Push Initiator by setting the appropriate parameters in the Generic User Profile [x] e.g. white lists and black lists. The details of this is outside the scope of this specification.

The user shall be able to request Information from a particular Push Initiator be suppressed.

**Editors Note : mechanisms to allow users to dynamically control the type and size of information received need further consideration.**

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## 6 Security

**Editors note : relationship to DRM ?**

The “Security Threats and Requirements” specified in 22.133 [1] shall not be compromised.

The user shall be able to use the Push Service in a authorized and authenticated manner. Mechanisms shall be provided to ensure that the Push message is sent to and accessed only by the intended addressed entity.

It shall be possible for the Delivery Network or the user to deny an unauthorized push message.

It shall be possible to deny an unauthorized push message. An authorization may be based on the following:

- identity of the Push Initiator
- the destination user, device or user agent
- push related attributes such as priority and content type

It shall be possible for the user agent in the UE to control acceptance of content pushed to the user based on the trust level of the Push Initiator.

The Delivery Network shall provide data integrity and data confidentiality of the pushed information.

Push Initiators must have authorization from the Delivery Network (e.g. PLMN Operators) in order to use the Push Service.

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## 7 Privacy

The Push Initiator shall comply with user and operator privacy requirements.

**[note: this has the same type of privacy requirements as in Presence Service/Generic User Profile, could reference or copy]**

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## 8 Charging

Push services shall support various charging mechanisms (e.g. reverse, prepaid and reply charging etc.).

The following charging scenarios shall be supported:

1. Charging for push services can be subscription based.
2. Charging for push services can be based on the content, the resources used and time needed to carry out the push service.
3. Charging for push services can be based on the number of messages pushed to a receiver.
4. It should be possible to charge the user only, the Push Initiator only, or both the user and the Push Initiator.
5. It should be possible to charge third parties e.g. corporate accounts.
6. It shall also be possible to mix and match the various different charging scenarios outlined above.
7. One-off charging for subscription and cancellation of Push Service should be possible.
8. Need to charge for rejected push content.

It shall be possible to include the following data in the CDRs as charging information if available:

- message types, length, storage time in the network, etc
- delivery time, upload / download method,
- Push service sender / -recipient
- number of Push messages sent
- number of Push messages received.
- roaming conditions (e.g. in a visited network)
- location conditions
- media.

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## 9 Roaming

Push services shall be available when roaming.

**Note :** Further work required.

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## 10 Inter-working

**Note :** Further work required.

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## 11 Annex A (informative): Push Service Use Cases

**Editors note :** this section contains some initial ideas and requires a lot of work.

Push services may be defined and profiled in various ways, including types of service entities, types of information and

delivery characteristics.

The basic principles which apply include:

- A mobile may have many services
- Each service may have its own requirements for provisioning, service delivery and support
- Service delivery architecture shall accommodate and efficiently support this diverse range of services
- The functionality required to support various business model shall be provided
- No single entity has complete control of the subscriber

Services will be provided by many service entities including:

- Operators
  - News, weather, e-mail, advertising, presence, location
  - Consumer M-services, M-Commerce applications
- VASPs
  - Vertical industry applications, niche interest applications
  - Banking, stock trading
- Corporations
  - Corporate intranet, extranet, field support applications
- Public Safety
  - Internal local communications, inter-group (including emergency response)
  - Public alerts: traffic, weather safety,
- Government
  - Security agency internal communications
  - Agency dissemination of information (like a VASP)
- Internet (for mass consumption)

A wide range of use cases may be described. This list is intended to illustrate some of the corporate, public safety and government cases in addition to those, which are in the information, entertainment, advertising and Internet areas.

A user may subscribe to many services.

- Bank Services - (724 Solutions Inc. like services) closed system, very, very high security (down to the using public-key encryption at the field level). This is a public service that is offered by a private company that needs low-level network access. Service could include bank account access, mutual fund, portfolio access, money transfers, and stock operations.
- Private banking service - notifications could be pushed out if your bank account reaches a certain level, could also push real-time debit or credit transactions to the user...
- Stock Services - could be public or private, but in all cases strong security is required.(like the Pocket Broker application).
- Private Stock Server - could indicate that a sale as gone through, a portfolio has reached a certain level, a stock broker's buy or sell suggestion for paying members, etc.
- Public Stock Server - that simply allows the user to receive notification of major stock changes, volume level concerns or key levels being reached. Since there is no trading this is public information and might cost a modest subscription fee.
- Corporate Push Services - company private e-mails and calendar events, company alerts for: (1) CRM changes –

e.g. please contact Joe immediately, (2) inventory levels, (3) field service calls, (4) ERP data - manufacturing stopped – e.g. parts missing, (5) collaboration alerts – e.g. new specs document to review, and (6) workgroup alerts – e.g. Tom's code has been checked-in integration can continue

- Public Safety - Police Department in a city provides: (1) alerts to all department members through very secure push service, (2) alerts to police members in adjoining municipalities. Department members receive alerts from state police department, as coordinated by the city's department. The cross-department alerting is tailored to the individual member's assignments.
- Public Safety – Police, Fire and other related agencies provide alerts with some ranking of their severity to the public: (1) traffic status and problems, (2) severe weather alerts.
- Government – Agency with high security requirements and closed system uses the service to notify their members while keeping the terminal addresses totally private and confidential and preventing monitoring of the amount of their traffic. The agency is able to maintain security and key control without the knowledge or need for cooperation of any other entities.

The service initiator of high security and high sensitivity services shall be provided with flexible interfacing with operator user profile and other databases, restricting critical information (e.g., user identities, sensitive services enabled, and usage data) from others, while providing the operator with a limited set of required data.

- The user receives a short information message about important news (e.g. the user subscribes to a news list) the full news article will not be retrieved until the user accepts the pushed information. The possibility to reject the message is also valid.
- The user receives information about e.g. new e-mails, voice-mails, fax etc and can choose to receive the whole content immediately or at a later occasion.
- During a sports event the user is interested in receiving a short streaming video with highlights from the most important happenings and can choose to read/view more when interested.
- The user is part of a cell broadcast group and will be notified about local news from the group owner. All messages will then be, cost and capacity efficiently, pushed to the subscribers in the group.
- When entering a particular place (e.g. shopping mall, airport, amusement park) a message is pushed to the user and a list of available services are presented to the user. If the user is interested in any of the services he can easily visit the recommended sites. The message can also include information about other kind of bearers related to this local area e.g. Bluetooth, WLAN.
- When passing a store included in the users interest list the IMS capable client receives a streaming video commercial e.g. pizza options to order from. Reverse charging in the IMS network can be used if the user decides to order something.
- When roaming a message can be pushed to the user with information about e.g. a phone call cost when roaming in this particular area.
- An IMS capable client is roaming into an IMS network and receives a Streaming video trailer e.g. presenting the IMS operator for the user.
- Since the home operator is aware of when the client is roaming, Push messages related to the client's roaming position can be sent to the user e.g. a list of available services (like weather forecast, local news, ongoing events) the user can choose from.
- Game invitation can be pushed to the selected game partner. If the invitation is accepted a session is set up to start the game.
- Games where it's likely that the opponent's answer might take some time (e.g. chess). Each time one of the players do a move a push message is sent to the opponent.
- A notification when you exceed some application dependent counters/limits (e.g. money left on pre-paid) giving you options to set up a session related to solving the problem (e.g. put more money on the prepaid account).

- Occasions where a waiting time is expected (e.g. at a doctor's office, dentist, a restaurant, Swedish systembolaget i.e. wine store). After being registered (establishment of a long-lived session) a push message will be sent to you when it's your turn (eventually a reuse of the session).
- E-ticket, a document being pushed to the client and activated by an application in the client. When entering the arena for which the e-ticket is valid the information is transferred via e.g. Bluetooth (e.g. at a music event, sports event or an airport) additional information might be transferred to the client (e.g. where to go).
- Synchronisation, e.g. automatically update the terminal's address book when the user makes a change elsewhere (for example in "Contacts" stored on an Exchange server).
- Provisioning, i.e. push a message to the client containing settings needed by the terminal to access the services the user is subscribed to. For example when buying a new terminal/getting a new subscription.

It shall be possible to address groups of user, where groups are defined by subscriptions, geographic area or any other useful grouping.

Comment: This section is confusing, e.g. specification of both delivery class and delivery priority. The following parameters should be specified by the push originator for each push message (as examples):

- delivery class (or priority)
- immediate (< 5 seconds)
- medium (< 1 minute)
- low (as available)
- time to live
- content type (e.g. MIME)
- streaming / non-streaming
- minimum bit rate
- guaranteed / non-guaranteed
- acknowledged / un-acknowledged
- control information (replace, delete, client capability query, client update capability)

The push initiator for non-public services (e.g., private or corporate services, public safety services and government services ) shall have flexible interfacing with service provisioning to enable restriction and management in accordance with suitable arrangements with operators. Specifically, for sensitive push services, the push initiator may maintain parts of the user profile and service provisioning database with flexible interfacing to the operator's database.

The user shall be able to subscribe to multiple Push Initiators at the same time.

It shall be possible for a user to convey their unique address to the Push Initiator when subscribing to a new service.

The user shall be able to cancel a particular push service from their mobile terminal.

The user shall be able to discover and subscribe to new push services from their mobile terminal.

The user shall be able to easily determine their current subscription list for push services from their mobile terminal.

The push initiator for third party services (e.g., private or corporate services, public safety services and government services) shall have flexible interfacing with operator administrative services including billing.



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## 12 Annex B: Change history

V. 0.1.0	February 2001	First Draft (Presented at TSG-SA-WG1 6 <sup>th</sup> – 9 <sup>th</sup> February 2001)
V. 0.2.0	July 2001	Second Draft (from SA1 ad-hoc, 9 July 2001)
V. 0.3.0	November 2001	Third Draft (presented at SA1 5 <sup>th</sup> – 9 <sup>th</sup> November 2001)

Change history										
TSG SA#	SA Doc.	SA1 Doc	Spec	CR	Rev	Rel	Cat	Subject/Comment	Old	New