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Abstract of document:

The presented document TS 22.246 is the stage 1 description for MBMS User Services. MBMS User Services are services that are delivered to a user via the application independent transport service specified in TS 22.146.

TS 22.246 is now more than 50% complete and is ready for presentation for information to SA.

TS 22.246 describes the MBMS User Service scenarios and service requirements that can be used as guidance for the design of codecs and bearers for both UTRAN and GERAN

Regarding the timescales of the MBMS work in SA1, it is intended to meet the current timescales for completion of the work and send the TS for approval in December dependent on the outstanding issues being resolved.

Changes since last presentation to SA

Not Applicable /first presentation

Outstanding Issues:

None at present

Contentious Issues:

None at present

3GPP TS 22.246 V1.0.0 (2003-09)

Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group Services and System Aspects;
Stage 1;
MBMS User Services;
(Release 6)**



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Keywords

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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

TS 22.146 [2] specifies the multimedia broadcast and multicast service (MBMS) application independent transport service and includes some guidance on application services and bit rates. This specification defines MBMS User Services that use the capabilities of MBMS. Service related information is defined in this specification to specify requirements in terms of data rates, quality of service requirements, typical volumes of data etc.

MBMS User Services may be delivered to a user at different bit rates and quality of service depending on radio networks and conditions. This technical specification describes service scenarios for MBMS User Services.

In addition scenarios related to security and charging are described providing information for detailed MBMS User Services security and charging mechanisms to be specified. The service scenarios described in this specification are not exhaustive, it is possible that MBMS may be used for services that are not included in this specification. The present specification describes the minimal requirements for interoperability for MBMS based services. This specification establishes a basis which can also be used for future services.

1 Scope

The present document describes MBMS User Services that use the capabilities of MBMS. Application scenarios including charging, QoS aspects and related service requirements derived from them are described. These scenarios and service requirements can be used as guidance for the design of codecs and bearers for both UTRAN and GERAN.

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 22.146: "Multimedia Broadcast/Multicast Service".
- [3] 3GPP TS 26.140: "Multimedia Messaging Service (MMS): Media formats and Codecs".
- [4] 3GPP TS 26.134: "Transparent end-to-end Packet-switched Streaming Service (PSS) Protocols and codecs".
- [5] 3GPP TS 22.240 "Service requirement for the 3GPP Generic User Profile (GUP);
- [6] 3GPP TS 22.242: "Digital Rights Management".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the definitions in 3GPP TR 21.905 [1] as well as the following definitions apply.

Broadcast service area: The area in which a specific broadcast service is available. It is defined individually per broadcast service. The broadcast service area may represent the coverage area of the entire PLMN, or part(s) of the PLMN's coverage area. The broadcast service area is the sum of all local broadcast areas offering the same service.

Local Broadcast Area: The area of a broadcast service, where the service content is the same. One broadcast service may have different content in different local broadcast areas.

Broadcast mode: The part of MBMS that supports broadcast services.

Broadcast service: A unidirectional point-to-multipoint service in which data is efficiently transmitted from a single source to multiple UEs in the associated broadcast service area. Broadcast services may be received by all users who have enabled the specific broadcast service locally on their UE and who are in the broadcast area defined for the service.

Broadcast session: A continuous and time-bounded reception of a broadcast service by the UE. A single broadcast service can only have one broadcast session at any time. A broadcast service may consist of multiple successive broadcast sessions.

MBMS User Services: Services that are intended to be delivered to multiple users simultaneously. MBMS User Services use the capabilities of the MBMS application independent transport.

Mobile Station (MS): Defined in TS 24.002. (The abbreviation "UE" in this specification refers both to MS and User Equipment.)

Multicast transmission activation: The process by which the network activates the transmission of Multicast data.

Multicast service area: The area in which a specific multicast service is available. It is defined individually per multicast service. The multicast service area may represent the coverage area of an entire PLMN, or part(s) of the PLMN's coverage area. The multicast service area is the sum of all local multicast areas offering the same service.

Local multicast area: The area of a multicast service, where the service content is the same. One multicast service may have different content in different local multicast areas.

Multicast mode: The part of MBMS that supports multicast services.

Multicast joining: The process by which a user joins a multicast group.

Multicast session: A continuous and time-bounded reception of a multicast service by the UE. A single multicast service can only have one multicast session at any time. A multicast service may consist of multiple successive multicast sessions.

Multimedia Broadcast/Multicast Service (MBMS): A unidirectional point-to-multipoint service in which data is transmitted from a single source entity to a group of users in a specific area. The MBMS has two modes: Broadcast mode and Multicast mode.

Multicast group: A group of users that have an activated MBMS in multicast mode and therefore are ready to or are receiving data transmitted by this service. The multicast group is a subset of the **Multicast subscription group**. Multicast subscription group members may join the corresponding multicast group.

Multicast service: A unidirectional point-to-multipoint service in which data is efficiently transmitted from a single source to a multicast group in the associated multicast service area. Multicast services can only be received by such users that are subscribed to the specific multicast service and have joined the multicast group associated with the specific service.

Multicast subscription: The process by which a user subscribes or is subscribed to a multicast subscription group and thereby is authorised to join certain multicast services. Multicast subscription is performed either upon user selection or due to home environment initiation.

Multicast Subscription Group: A group of users who are subscribed to a certain MBMS in multicast mode and therefore authorised to join and receive multicast services associated with this group.

User Equipment: defined in TS 21.905. An occurrence of a User Equipment is an MS for GSM as defined in TS 24.002.

3.2 Abbreviations

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

MBMS	Multimedia Broadcast/Multicast Service
MS	Mobile Station
UE	User Equipment

4 High level requirements

4.1 Common requirements to broadcast and multicast

The following list describes requirements on an application level:

Service classes

A user subscribed to a service class in the HPLMN shall be able to enjoy equivalent services in the same service class as provided by a visited PLMN without explicit subscription in the VPLMN.

Editor's Note :

The intention here is to provide service roaming capabilities without the need for the user to resubscribe to the same or equivalent services in a VPLMN. FFS

Service Interworking

The user shall be able to manipulate content delivered over MBMS and forward it using other services (e.g. MMS, Speech Call- and IMS signalling, Hyperlinks, ...). Care should be taken in order to fulfil requirements concerning DRM and respective barring and charging capabilities.

Editor's Note :

The requirement here is to be able to forward content received using MBMS. The forwarding of streamed data by the UE is not believed to be possible at the present time. The forwarding using the examples given needs to be verified.

When interacting with user profiles, MBMS User Services shall use the mechanisms described in [5] TS 22.240 (Generic User Profile) whenever possible.

Content storage in the UE

It shall be possible for the UE to store content delivered to it over MBMS and provide it to the user at a later time. Care should be taken in order to fulfil requirements concerning DRM and respective charging capabilities.

Data formats and types

Media types like for Audio, Video, Streaming, Pictures, Downloads, Text.... shall be supported independent of specific data types and formats behind. Data format and data types as being used by other multimedia services shall be supported for interoperability reasons.

Editor's Note

The intention here is not to constrain MBMS to existing codec technologies etc but to be future proof as much as possible.

Digital Rights Management

The MBMS User Service shall be able to control content distribution as defined in 3GPP TS 22.242 [6]. MBMS content providers shall be able to invoke DRM to prevent unauthorized copying and forwarding of content.

4.2 Broadcast requirements

FFS

4.3 Multicast requirements

FFS

4.4 Interoperability

MBMS User Services shall ensure service interoperability with respect to media formats and codecs, at the same time being able to re-use existing multimedia capabilities in the UE as far as possible.

Therefore MBMS User Services shall support a minimum set of media formats and codecs. This minimum set should be aligned with the set of media formats and codecs required for MMS [3] and PSS [4].

5 MBMS User Service requirements

5.1 Charging

The MBMS User Service shall support standardized mechanisms to transfer charging related information in-between operators billing systems for both, post- and prepaid subscribers.

It shall be possible to charge for MBMS content the user receives while roaming in a VPLMN.

As indicated in Annex A some services will require an indication that MBMS content has been received. Therefore it shall be possible for the UE to provide such an indication.

Editor's note :

The decision as to whether the above is related to charging or whether there are other issues related to this requirement is FFS. It is possible that this paragraph may be moved. There may be impacts on 22.146 related to this requirement.

5.2 Security

The following security aspects shall be taken into account:

Any user modifiable MBMS service data (e.g. storage of deliveries in the UE, data type and format specific behaviours etc) shall only be modified by the authenticated user, (See also 4.1.1 above).

5.3 Privacy

Third parties and VASP should not be aware about user ID's for MBMS subscriptions unless explicitly allowed by the operator.

Editor's Note :

It is FFS as to which aspects of the Privacy TR is applicable to MBMS User Services

5.4 Addressing

FFS

5.5 Quality of service

It should be possible for the operator to collect statistical data such as lost frames, assigned resources, bit-rates achieved etc.

Editor's note :

We should investigate whether it is an MBMS requirement for notifying the operator if a user has not viewed/heard/read downloaded data before any expiry time provided by DRM or other mechanisms.

5.6 Subscription and activation

At time of subscription to a Multicast Service it shall be possible for the user to declare the service preferences. It shall be possible for the network to store the user settings [using GUP?]

5.7 Roaming

FFS

Annex A - Use Cases (Informative) Type of Service	Media	Distribution Scope	Distribution Method Note 6	Bit rate Note 1	Delivery Verification Required Note 4	Security	User Charging Note 5	Content Provider Charging
Reliable text distribution (eg Local news)	Text	Multicast	Download	Up to 10 kbps	Yes	XXX	Event	FFS
Unverified text distribution	Text	Multicast, Broadcast	Carousel, (Note 2) download	Up to 10 kbps	No	XXX		FFS
Text distribution with still images and/or low quality video	Text, Still images, Video (e.g. 3fps)	Multicast, Broadcast	Carousel, (Note 2) download	Up to 32 kbps	service dependent	XXX	User service dependent Note 3	FFS
Audio streaming	Stereo Audio	Multicast	Streaming	Up to 48kbps	service dependent	XXX		FFS
Audio streaming	Stereo Audio	Broadcast	Streaming	Up to 48kbps	No	XXX		FFS
Audio download	Stereo Audio	Broadcast	Download	Up to 48kbps	service dependent	XXX	FFS	FFS
Audio download	Stereo Audio	Multicast	Download	Up to 48kbps	Yes	XXX	Event	FFS
Audio distribution with low quality video	Stereo Audio, Video (e.g. 3fps)	Broadcast	Streaming	Up to 128kbps Note 7	No	xxx		
Audio distribution with low quality video	Stereo Audio, Video (e.g. 3fps)	Multicast	Streaming	Up to 128kbps Note 7	service dependent	xxx		
Audio distribution with low quality video	Stereo Audio, Video (e.g. 3fps)	Broadcast	Download	Up to 128kbps Note 7	service dependent	xxx	FFS	
Audio distribution with low quality video	Stereo Audio, Video (e.g. 3fps)	Multicast	Download	Up to 128kbps Note 7	Yes	xxx	Event	
Video distribution	Video & supplementary data (e.g. text, still images)	Broadcast	Streaming	Up to 384 kbps Note 7	No			
Video distribution	Video & supplementary data (e.g. text, still images)	Multicast	Streaming	Up to 384 kbps	service dependent			

				Note 7				
Video distribution	Video & supplementary data (e.g. text, still images)	Broadcast	Download	Up to 384 kbps Note 7	service dependent		FFS	
Video distribution	Video & supplementary data (e.g. text, still images)	Multicast	Download	Up to 384 kbps Note 7	Yes		event	
General Content Distribution	Video, Audio, File Data (binary data)	Broadcast	Carousel, download	Up to 384 kbps Note 7	service dependent		FFS	
General Content Distribution	Video, Audio, File Data (binary data)	Multicast	Carousel, download	Up to 384 kbps Note 7	Yes		event	
Secure data download	File; eg UE type specific and/or application specific software	Multicast	Carousel, download	Up to 10kbps				

Notes :

1. Bit rate of the user data at the UE
2. Carousel is the cyclical repetition/update of download data by the application
3. If User Charging is Event based then Delivery Verification is required
4. Delivery Verification relates only to verification itself. Quality assessments may be required in addition.
5. DRM may be applicable to User Charging.
6. Streaming here means a continuous data flow which may not be the same as streaming in eg PSS.
7. For GERAN lower bandwidth availability may constrain some applications. In such cases it may be possible to provide the same content via different delivery methods.

Annex A (Informative): Example Service Scenarios

This annex provides a non-exhaustive list of potential service scenarios for MBMS User Services.

Text notification service

Media: Text

Precondition: The user is a member of a MBMS Multicast group supplying text alerts.

Actions: At an appropriate time an alert is sent to the user's mobile handset using the MBMS Multicast service.

Post condition: The user receives the alert using her mobile handset and takes appropriate action.

Local Area Information distribution (Case A)

Media: Text & Text with low quality video

Precondition: The user is a registered with an MBMS Broadcast service providing information to the local area such as local news and weather reports.

Actions: Information in the form of text & text with low quality video is distributed to the user's mobile handset by the MBMS Broadcast service. The text may be scrolled on the mobile handset. The information distributed by the MBMS Broadcast Service may be repeated periodically and updated at appropriate intervals.

Post condition: The user is aware of events that have taken place within the local area and can view appropriate images.

Local Area Information distribution (Case B)

Media: Video & Audio

Precondition: The user is a registered with an MBMS Broadcast service providing streaming audio and/or visual content related to a local area, such as audio and visual guides to local attractions, traffic reports etc...

Actions: Audio and/or visual information is distributed to the user's mobile handset by the MBMS Broadcast service. The user is able experience the content on her mobile device. The user is able to receive the MBMS broadcast service continuously throughout the local area. At some points the user is able to interact with the content of the MBMS Broadcast service in order to access specific information regarding items being presented within the content. The user is able to activate/deactivate reception of the MBMS service at any time.

Post condition: The user experiences and interacts with the content provided and is therefore able to obtain information regarding the local area and act accordingly.

Multicast distribution

Media: Text & Text with still images

Precondition: The user is a member if a MBMS multicast group providing personally tailored content such as targeted advertising etc...

Actions: Information is provided by the MBMS Multicast service in the form of text & text with still images, to the user's mobile handset based on her subscription to the Multicast group and current location.

Post condition: The user receives tailored content and is able to utilize this as appropriate.

Audio Distribution

Media: Stereo Audio

Precondition: The user is registered with an MBMS Broadcast service providing stereo quality streaming audio content.

Actions: Audio content is distributed to the user's mobile handset by the MBMS Broadcast service. Whilst listening to the audio content the user is able to interact with the service using the capabilities of the mobile handset (e.g. messaging).

Post condition: The user is able to enjoy the stereo quality audio content and interacts with the service as appropriate.

General Content Distribution

Media: Video, Audio & File Data

Precondition: The user is registered with a MBMS Broadcast service providing a variety of content.

Actions: Content is periodically distributed to a particular area by the MBMS Broadcast service. When the user activates reception of the MBMS Broadcast service she is able to receive the content being distributed at that time.

Post condition: The user is able to receive and enjoy the content being distributed.

Software Download

Media : File

Preconditions :Need to update/download software in UE, the User is subscribed to MBMS User Service, OTA download is supported in UE

Actions: The operator compiles a list of affected users and sends them a text message (using MBMS) explaining the problem and that the user should select the MBMS application on their handset. The user sees a message inviting her to activate the Enable Upgrade, selects 'yes' and the software patch transferred by the MBMS User Service, including verification parameters.

Postcondition :The software once installed allows the user to view the MMs that she couldn't see before.

Annex B (informative): Change history

Change history											
TSG SA#	SA Doc.	SA1 Doc	Spec	CR	Rev	Rel	Cat	Subject/Comment	Old	New	WI
Jun 2003			22.246					Initial draft presented	0.0.0	0.1.0	
Aug 2003			22.246					Output from MBMS adhoc Staines	0.1.0	0.2.0	
Sep 2003			22.246					Approved in SA1 for presentation to SA #21	0.2.0	1.0.0	