Technical Specification Group Services and System Aspects
Meeting #14, Kyoto, Japan, 17-20 December 2001

TSGS#14(01)0678

Source: **SA1**

Title: **CRs to 22.146 for Rel-5 for Multimedia Broadcast/Multicast Service**

Document for: **Approval**

Agenda Item: **7.1.3**

Doc-1st-Level	Spec	CR	Rev	Phase	Cat	Subject	Vers	Vers New	Doc-2nd-Level
SP-010678	22.146	002	2	Rel5	F	Proposed CR on changes to definitions in 22.146	5.0.0	5.1.0	1077
SP-010678	22.146	003	3	Rel5	B	Proposed CR on clarification of reliable transmission	5.0.0	5.1.0	1305
SP-010678	22.146	005	1	Rel5	F	Proposed CR on clarifications of the availability of MBMS	5.0.0	5.1.0	1075
SP-010678	22.146	006	2	Rel5	F	Proposed CR on Clarification on MBMS applicability in Gb mode	5.0.0	5.1.0	1303
SP-010678	22.146	009	2	Rel5	F	Proposed CR on data loss during handover	5.0.0	5.1.0	1306
SP-010678	22.146	011	1	Rel5	C	Proposed CR on optional privacy assurance for Multicast services	5.0.0	5.1.0	1076
SP-010678	22.146	018	2	Rel5	F	Proposed CR to 22.146: High level Diagrams of MBMS	5.0.0	5.1.0	1304
SP-010678	22.146	019		Rel5	F	CR Clarifying Service Requirements on Multicast and Broadcast Areas	5.0.0	5.1.0	1065
SP-010678	22.146	020	2	Rel5	F	Proposed CR to 22.146 MBMS	5.0.0	5.1.0	1326
SP-010678	22.146	021		Rel5	B	Multiple Areas for Multicast and Broadcast Services	5.0.0	5.1.0	1225
SP-010678	22.146	022	1	Rel5	F	MBMS service discovery	5.0.0	5.1.0	1309
SP-010678	22.146	023		Rel5	F	CR to 22.146 (MBMS) UE and MS definition	5.0.0	5.1.0	1020

3GPP TSG-SA WG1 MBMS Adhoc ***S1-BM-010061***
Loipersdorf, Austria, October 15 – 16, 2001

CR-Form-v3

CHANGE REQUEST

⌘ **22.146** **CR** **002** ⌘ rev **2** ⌘ Current version: **5.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network **X**

Title:	⌘	Proposed CR on changes to the definitions
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	09.11.2001
Category:	⌘	**F**
Release:	⌘	REL-5

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	At the SA1 MBMS adhoc #3 meeting not all of the proposed changes of the CR002r1 (Tdoc S1-BM-010048) were agreed. This document (revision 2) captures all the agreed changes whereby the not agreed changes are removed. Changes: 1. There are still some inconsistencies and ambiguities in the definition section. Therefore, clearer definitions are introduced and corresponding changes are made throughout the whole document. 2. Some minor corrections and clarifications.
Summary of change:	⌘	- clarifications to the definition section and corresponding sections - minor corrections and clarifications
Consequences if not approved:	⌘	- inconsistencies in the definition section and corresponding sections

Clauses affected:	⌘	3.1, 4.1.2, 4.1.3, 4.1.3.1, 5.1.1, 5.1.2, 5.2.1, 5.2.2
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
	⌘	
Other comments:	⌘	

3.1 Definitions

For the purposes of the present document, the following terms and definitions 3GPP TR 21.905 [1] apply.

Broadcast area: a geographical area in which ~~the~~ a broadcast service is available. The broadcast area may represent the coverage area of the entire PLMN, or a part of the PLMN's coverage area ~~subset of it~~.

Broadcast mode: the mode of the Multimedia Broadcast/Multicast service which provides efficient support within the PLMN of broadcast services.

Broadcast service: the end user service that is supported by the broadcast mode of Multimedia Broadcast/Multicast service.

Multicast activation: The process by which a user joins a multicast group ~~as a member~~ and hence activates reception of ~~multicast~~ data transmitted as part of a multicast mode MBMS service. Multicast activation is performed either upon user selection ~~of a multicast service~~ or due to home environment initiation ~~ed activation~~.

Multicast area: a geographical area in which the multicast service is available. The multicast area may represent the coverage area of an entire PLMN, may span several PLMNs, or may be a part ~~subset~~ of a PLMN's coverage area.

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. ~~When using MBMS all group members in a area may receive the same data over a common radio channel.~~

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

Multicast service: the end user service that is supported by the multicast mode of Multimedia Broadcast/Multicast service.

Multicast subscription: The process by which a user subscribes or is subscribed to a ~~multicast service and~~ multicast subscription group and thereby is authorised to activate 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 ~~have been subscribed to a multicast mode MBMS service~~ and ~~are~~ therefore authorised to activate and receive multicast services associated with this group.

4.1.2 MBMS broadcast mode

The broadcast mode is a unidirectional point-to-multipoint transmission of multimedia data (e.g. text, audio, picture, video) from a single source entity to all users in a broadcast area or areas. The broadcast mode is intended to efficiently use radio/network resources e.g. it could transmit the data over a common radio channel. Data is transmitted to broadcast areas as defined by the network (Home environment).

The broadcast mode should not be confused with the existing Cell Broadcast service (CBS) which is currently used for low bit rate services (messaging) whilst the broadcast mode enables the broadcast of multimedia services (Audio, Video etc).

An example of a service using the broadcast mode could be advertising or a welcome message to the network. As not all users attached to the network may wish to receive these messages then the user shall be able to ~~may have the option~~ to enable/disable the reception of these broadcast service on his UE.

The broadcast mode differs from the multicast mode in that there is no specific requirement to ~~register~~ activate or subscribe to the MBMS in broadcast mode ~~of the MBMS.~~.
It is expected that charging data for the end user will not be generated for this mode.

4.1.3 MBMS multicast mode

The multicast mode allows the unidirectional point-to-multipoint transmission of multimedia data (e.g. text, audio, picture, video) from a single source point to a multicast group in a multicast area. The multicast mode is intended to efficiently use radio/network resources e.g. it could transmit the data over a common radio channel. Data is transmitted to multicast areas as defined by the network (Home environment). In the multicast mode there is the possibility for the network to selectively transmit to cells within the multicast area which contain members of a multicast group.
An example of a service using the multicast mode could be a football results service for which a subscription is required.
Unlike the broadcast mode, the multicast mode generally requires a subscription to the multicast subscription group and then activation of the service. The subscription and activation may be made by the PLMN operator, the user or a third party on their behalf (e.g. company). Unlike the broadcast mode, it is expected that charging data for the end user will be generated for this mode.
The multicast mode defined in this specification should not be confused with IP Multicast (RFC s 1112, 1301, 1458, 1920 [2]). Although there are similarities between these two services, the 3GPP multicast mode has been defined with consideration to maximizing efficiency on the radio interface and of network resources.

4.1.3.1 Subscription and Activation

The following is the expected sequence for the user to be able to access the MBMS multicast mode:

1 The user ~~must~~ subscribes or is ~~be~~ subscribed to a multicast subscription group which is uniquely identified.and thereby becomes a member of that group.

2 The user ~~must activate~~ or the Home Environment ~~must~~ activates ~~on behalf of the user the~~ a selected multicast service and hence the user joins the multicast group.

3. The user may deactivate ~~leave~~ a selected multicast service and thereby leaves the multicast group~~, i.e. select to stop receiving the data~~.

4. The subscriber may unsubscribe from the multicast service and hence leave the multicast subscription group.

The home environment shall be able to remove a user from a multicast group (deactivation) and if required remove the subscriber from the multicast subscription group (un-subscription). This is required to allow the operator to bar service.

5.1 Broadcast mode

5.1.1 Home environment requirements

- Broadcast areas

  The PLMN operator shall be able to provision one or more broadcast areas within his PLMN to support broadcast services.

  It shall be possible to provision and transmit one or more broadcast services for each broadcast area.

  The broadcast area may be smaller than a cell.

An operator should also be able to control the size of Broadcast Area according to the traffic congestion or radio resources in the cell.

- Quality of service

  The PLMN operator shall be able to configure the quality of service for individual broadcast services.

  The home environment shall be able to set priority to select which simultaneous broadcast services are supported when there is a limit on the resources available e.g. in the case of traffic congestion, select which service is downgraded.

- Network and radio efficiency

  The PLMN operator shall be able to use network and radio resources in an efficient manner.

  NOTE: Allocation of resources based on actual need in the broadcast area is not applicable for the broadcast mode.

  The operator shall be able to schedule a certain broadcast service at pre-determined times.

- Types of data ~~services~~

  MBMS in ~~The~~ broadcast mode shall be transparent for the transferred data packets ~~independent of the type of service being transmitted, and permit support of~~ and therefore transfer all data types e.g. Audio, Data, video. ~~A minimum number of data types may need to be identified to enable interoperability.~~

- Sources of data ~~services~~

  In addition to supporting their own broadcast services the PLMN shall as well support broadcast services from third parties (i.e. HE-VASPs or VASPs)

5.1.2 User requirements for MBMS

- User mobility

The user shall be able to continue receiving broadcast ~~ser~~vices throughout the broadcast area. For example, in case of handover and presuming that a certain broadcast service is offered in the target cell, it should be possible for the user to continue receiving the service ~~the session~~ in the target cell.

- User selectivity

  The user shall be able to enable/disable the reception of specific broadcast services and can receive simultaneously more than one service.

  The user may be able to define service preference for reception. A priority procedure may be implemented to allow the user to select between simultaneous broadcast services e.g. while receiving commercial broadcast service a new multicast service may interrupt this.

5.2 Multicast mode

5.2.1 Home environment requirements

- Multicast areas

  The PLMN operator shall be able to provision one or more multicast areas to support multicast services.

  It shall be possible to provision and transmit one or more multicast services for each multicast area.

  The size of the multicast area may be smaller than a cell.

  An operator should also be able to control the size of Multicast Area e.g. according to the traffic congestion or radio resources in an individual cell, set of cells within the multicast area.

- Multicast subscription groups and multicast groups

The PLMN operator shall be able to provision one or more multicast subscription groups. The home environment shall be able to make a user a member ~~identify and assign members~~ of a multicast subscription group (subscription). ~~The home environment shall be able to assign a multicast subscription group to a multicast service.The home environment shall be able to accept or reject an application to join a multicast subscription group.~~

On receipt of a request to join a multicast group, the PLMN shall check that the user is a member of the applicable multicast subscription group. The home environment shall be able to join users to the multicast group e.g. at the request of the subscriber.

- Quality of service

The PLMN operator shall be able to configure the quality of service for individual multicast services.

The home environment shall be able to set priority to select which simultaneous multicast services are supported when there is a limit on the resources available e.g. in the case of traffic congestion, select service is blocked.

- Network and radio efficiency

The PLMN operator shall be able to use network and radio resources in an efficient manner.

Within the multicast area, the network may distribute the data across the whole multicast area or parts of the area. The decision to distribute to only parts of the multicast area may be based on: a) multicast group members are present in a given part of the multicast area b) resources are not available in parts of the multicast area.

The operator shall be able to schedule a certain multicast service at pre-determined times.

- Types of services

The multicast mode shall be independent of the type of service being transmitted, and permit support of all data types e.g. Audio, Data, video. A minimum number of data types may need to be identified to enable interoperability

- Sources of services

In addition to supporting their own multicast services the PLMN shall as well support multicast services by third parties (i.e. HE-VASPs or VASPs).

5.2.2 User requirements for MBMS

- User mobility

The user shall be able to continue receiving multicast services throughout the multicast area.. For example, in case of handover and presuming that a certain multicast service is offered in the target cell, it should be possible for the user to continue the session in the target cell.

Editor's note: Is loss of data during change of cell acceptable?

- User selectivity

The user shall be able to select between different multicast services provided to the user and can receive simultaneously more than one service.

The user may be able to define service preference for reception. A priority procedure may be implemented to allow the user to select between simultaneous broadcast/multicast services e.g. while receiving commercial broadcast service a new multicast service may interrupt this.

- Multicast subscription groups and multicast groups

The subscriber shall be able to subscribe to or unsubscribe from a multicast subscription group. (The subscription mechanism is outside the scope of this TS.)

The user shall be able to join a multicast group if he is a member of the applicable multicast subscription group. The user shall be able to leave a multicast group if he is a member of that group.

TSG-SA WG 1 (Services) meeting #14 **S1-011305**
Kobe, Japan, 5-9 November 2001 **Agenda Item: 9.3**

3GPP TSG-SA WG1 MBMS Adhoc ***S1-BM-010053***
Loipersdorf, Austria, October 15 – 16, 2001

CR-Form-v3

CHANGE REQUEST

⌘ **22.146** **CR** **003** ⌘ rev **3** ⌘ Current version: **5.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network **X**

Title:	⌘	Proposed CR on clarifications of reliable transmission
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	09.11.2001
Category:	⌘	**B**
Release:	⌘	REL-5

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	In Section 4.1.1 it is noted that reception of traffic in broadcast and multicast mode can not be guaranteed but if required, this could be built into the application layer. From an operator and customer point of view it is essential that it can be assured that reception of traffic is guaranteed, e.g. for charging/billing of multicast mode MBMS. The requirement on reliable transmission is essential and should therefore not be put into a note. Broadcast by nature, is a service which is distributed in a certain area without knowledge of the receivers location and if there are any at all. Reliable transmission should therefore not apply to broadcast mode MBMS but may apply to MBMS in multicast mode.
Summary of change:	⌘	- it is proposed, not to reduce realisations to guarantee data reception to the application layer - it is clarified that reliable transmission should not be applied to broadcast mode MBMS - it is clarified that reliable transmission may be applied to multicast mode MBMS
Consequences if not approved:	⌘	- if not approved the TS strongly restricts the realisation of reliable transmission

Clauses affected:	⌘	4.1.1, 4.1.2, 4.1.3
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
	⌘	

Other comments:	⌘	A LS has been sent to RAN2 and GERAN2 to seek advice on the feasibility of enabling reliable transmission for multicast mode MBMS.

4 General description

4.1 Multimedia broadcast/multicast service (MBMS)

4.1.1 Introduction

Point to multipoint services exist today which allow data from a single source entity to be transmitted to multiple endpoints. These services are expected to be used extensively over wireless networks, hence there is a need for a capability in the PLMN to efficiently support them. The Multimedia Broadcast/Multicast Service (MBMS) will provide this capability for such broadcast/multicast services provided by the home environment and other VASPs.
The MBMS is an unidirectional point to multipoint service in which data is transmitted from a single source entity.
There are two modes of operation:

- the broadcast mode

- the multicast mode.

~~NOTE:The reception of the traffic in the multicast and broadcast modes is not guaranteed. If this is required, it may be built into the application layer and hence is outside the scope of this TS.~~

4.1.2 MBMS broadcast mode

The broadcast mode is a unidirectional point-to-multipoint transmission of multimedia data (e.g. text, audio, picture, video) from a single source entity to all users in a broadcast area or areas. The broadcast mode is intended to efficiently use radio/network resources e.g. it could transmit the data over a common radio channel. Data is transmitted to broadcast areas as defined by the network (Home environment).
The broadcast mode should not be confused with the existing Cell Broadcast service (CBS) which is currently used for low bit rate services (messaging) whilst the broadcast mode enables the broadcast of multimedia services (Audio, Video etc).
An example of a service using the broadcast mode could be advertising or a welcome message to the network. As not all users attached to the network may wish to receive these messages then the user may have the option to enable/disable the reception of these broadcast.
The broadcast mode differs from the multicast mode in that there is no specific requirement to register or subscribe to the broadcast mode of the MBMS..
It is expected that charging data for the end user will not be generated for this mode.
The reception of the traffic in the broadcast mode is not guaranteed. The receiver may be able to recognize data loss.

4.1.3 MBMS multicast mode

The multicast mode allows the unidirectional point-to-multipoint transmission of multimedia data (e.g. text, audio, picture, video) from a single source point to a multicast group in a multicast area. The multicast mode is intended to efficiently use radio/network resources e.g. it could transmit the data over a common radio channel. Data is transmitted to multicast areas as defined by the network (Home environment). In the multicast mode there is the possibility for the network to selectively transmit to cells within the multicast area which contain members of a multicast group.
An example of a service using the multicast mode could be a football results service for which a subscription is required.

Unlike the broadcast mode, the multicast mode generally requires a subscription to the multicast subscription group and then activation of the service. The subscription and activation maybe made by the user or a third party on their behalf (e.g. company). Unlike the broadcast mode, it is expected that charging data for the end user will be generated for this mode.
Guaranteed reception of traffic in multicast mode may be possible, but the service aspects and radio implications of guaranteed reception need to be further studied. Note also that for many applications and services guaranteed data reception may be carried out by higher layer services or applications which make use of MBMS.

The multicast mode defined in this specification should not be confused with IP Multicast (RFC s 1112, 1301, 1458, 1920 [2]). Although there are similarities between these two services, the 3GPP multicast mode has been defined with consideration to maximizing efficiency on the radio interface and of network resources.

3GPP TSG-SA WG1 MBMS Adhoc ***S1-BM-010059***
Loipersdorf, Austria, October 15 – 16, 2001

CR-Form-v3

CHANGE REQUEST

⌘ **22.146** **CR** **005** ⌘ rev **1** ⌘ Current version: **5.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network **X**

Title:	⌘	Proposed CR on clarifications of the availability of MBMS
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	09.11.2001
Category:	⌘	**F**
Release:	⌘	REL-5

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change: ⌘ 1. In section 5.3 it is stated that "In general, multicast or broadcast services should be available for all users that are registered in a PLMN. This should include UEs in idle/standby and connected/ready modes."
2. “In general, multicast or broadcast services should be available for all users that are registered in a PLMN.”
’Available’ in this relation means, that a user is informed of MBMS occasion, NOT that the mobile can linger in the current state in order to receive the data.
A notification mechanism isn’t mentioned at all in the current TS.
In order to enable inform users of MBMS occasions and to initiate UE processes for the reception of MBMS data, it is proposed to introduce a information mechanism.

3. Also in section 5.3 the issue of ‘downgraded service’ is mentioned.
From Siemens point of view, MBMS should transparently transmit data and no sorting of the contents should be applied, i.e. either all data of a MBMS messages is transmitted in a specific area or not at all. When a certain QoS is required but not available in a specific area, the data shouldn’t be send at all (not only parts of it).
The concept of a ‘downgrading’ MBMS taking into account the available QoS in the cell leads to a mixture of all layers and a huge

	signalling between all involved network elements (in CN and UTRAN) and therefore increase the complexity and costs of the service.
Summary of change: ⌘	- clarification of the availability of MBMS - introduction of a information mechanism - removal of the 'downgraded service' subject
Consequences if not approved: ⌘	- ambiguities in the description of the availability of MBMS - no procedure for informing users of MBMS occasion - high complexity and costs when realising the 'downgrading' of MBMS

Clauses affected:	⌘	5.1.1, 5.2.1, 5.3		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

5 High level requirements

5.1 Broadcast mode

5.1.1 Home environment requirements

- Broadcast areas

  The PLMN operator shall be able to provision one or more broadcast areas to support broadcast services. It shall be possible to provision and transmit one or more broadcast services for each broadcast area.

  The broadcast area may be smaller than a cell.

  An operator should also be able to control the size of Broadcast Area according to the traffic congestion or radio resources in the cell.

- Quality of service

  The PLMN operator shall be able to configure the quality of service for individual broadcast services.

  The home environment shall be able to set priority to select which simultaneous broadcast services are supported when there is a limit on the resources available. ~~e.g. in the case of traffic congestion, select which service is downgraded.~~

  Network and radio efficiency

  The PLMN operator shall be able to use network and radio resources in an efficient manner.

  NOTE: Allocation of resources based on actual need in the broadcast area is not applicable for the broadcast mode.

  The operator shall be able to schedule a certain broadcast service at pre-determined times.

- Types of services

  The broadcast mode shall be independent of the type of service being transmitted, and permit support of all data types e.g. Audio, Data, video. A minimum number of data types may need to be identified to enable interoperability.

- Sources of services

  In addition to supporting their own broadcast services the PLMN shall as well support broadcast services from third parties (i.e. HE-VASPs or VASPs)

5.1.2 User requirements for MBMS

- User mobility

  The user shall be able to continue receiving broadcast services throughout the broadcast area. For example, in case of handover and presuming that a certain broadcast service is offered in the target cell, it should be possible for the user to continue the session in the target cell.

- User selectivity

  The user shall be able to enable/disable the reception of specific broadcast services and can receive simultaneously more than one service.

  The user may be able to define service preference for reception. A priority procedure may be implemented to allow the user to select between simultaneous broadcast services e.g. while receiving commercial broadcast service a new multicast service may interrupt this.

5.2 Multicast mode

5.2.1 Home environment requirements

- Multicast areas

  The PLMN operator shall be able to provision one or more multicast areas to support multicast services. It shall be possible to provision and transmit one or more multicast services for each multicast area.

  The size of the multicast area may be smaller than a cell.

  An operator should also be able to control the size of Multicast Area e.g. according to the traffic congestion or radio resources in an individual cell, set of cells within the multicast area.

- Multicast subscription groups and multicast groups

  The PLMN operator shall be able to provision one or more multicast subscription groups. The home environment shall be able to identify and assign members of a multicast subscription group. The home environment shall be able to assign a multicast subscription group to a multicast service. The home environment shall be able to accept or reject an application to join a multicast subscription group.

  On receipt of a request to join a multicast group, the PLMN shall check that the user is a member of the applicable multicast subscription group. The home environment shall be able to join users to the multicast group e.g. at the request of the subscriber.

- Quality of service

  The PLMN operator shall be able to configure the quality of service for individual multicast services.

  The home environment shall be able to set priority to select which simultaneous multicast services are supported when there is a limit on the resources available. ~~e.g. in the case of traffic congestion, select service is blocked.~~

- Network and radio efficiency

  The PLMN operator shall be able to use network and radio resources in an efficient manner.

  Within the multicast area, the network may distribute the data across the whole multicast area or parts of the area. The decision to distribute to only parts of the multicast area may be based on: a) multicast group members are present in a given part of the multicast area b) resources are not available in parts of the multicast area.

  The operator shall be able to schedule a certain multicast service at pre-determined times.

- Types of services

  The multicast mode shall be independent of the type of service being transmitted, and permit support of all data types e.g. Audio, Data, video. A minimum number of data types may need to be identified to enable interoperability

- Sources of services

  In addition to supporting their own multicast services the PLMN shall as well support multicast services by third parties (i.e. HE-VASPs or VASPs).

5.2.2 User requirements for MBMS

- User mobility

  The user shall be able to continue receiving multicast services throughout the multicast area.. For example, in case of handover and presuming that a certain multicast service is offered in the target cell, it should be possible for the user to continue the session in the target cell.

Editor's note: Is loss of data during change of cell acceptable?

- User selectivity

  The user shall be able to select between different multicast services provided to the user and can receive simultanously more than one service.

  The user may be able to define service preference for reception. A priority procedure may be implemented to allow the user to select between simultaneous broadcast/multicast services e.g. while receiving commercial broadcast service a new multicast service may interrupt this.

- Multicast subscription groups and multicast groups

  The subscriber shall be able to subscribe to or unsubscribe from a multicast subscription group. (The subscription mechanism is outside the scope of this TS.)

  The user shall be able to join a multicast group if he is a member of the applicable multicast subscription group. The user shall be able to leave a multicast group if he is a member of that group.

5.3 Availability

In general, MBMS in multicast or broadcast mode ~~services~~ should be available for all users that are registered in a PLMN. This should include UEs PMM in idle/connected ~~standby~~ and GPRS standby ~~connected~~/ready modes.
It shall be possible to inform users on up-coming MBMS transmissions within the broadcast and/or multicast area. This may be useful e.g. to initiate UE processes for the reception of MBMS data.
~~Availability of a service might not be uniform over the whole broadcast/multicast area at any given time, but can differ from one cell to another depending on available resources. (e.g. no service, service with downgraded QoS). In the case of downgraded QoS, the home environment should be able to determine the service level given and only part of the service functionality may then be available in that part of the broadcast/multicast area. [e.g. instead of transmitting video clip, only the music is transmitted], etc).~~

~~Editors' note: need to determine what is meant here as it depends on who is able to downgrade the services.~~

In case of roaming, a user should also be able to subscribe and activate to Multicast Services that are provided locally in the visited network.

MBMS Adhoc Tdoc S1-BM-010032
Loipersdorf, Austria, October 15 – 16, 2001 Agenda Item: 8

CR-Form-v4

CHANGE REQUEST

⌘ **22.146** **CR** **006** ⌘ ev **02** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☐

Title:	⌘	Clarification on MBMS Applicability in Gb Mode
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	09/11/01
Category:	⌘	**F**
Release:	⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Current specification states that MBMS is applicable to UMTS which is not a recognised 3GPP term. MBMS should be applicable to UTRAN and GERAN.
Summary of change:	⌘	Change UMTS to 3GPP System (UTRAN and GERAN).
Consequences if not approved:	⌘	Incorrect terminology used

Clauses affected:	⌘	1		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

1 Scope

This Technical specification defines the stage one description of the Broadcast and Multicast Services for ~~UMTS (UTRAN and GERAN in Iu-ps and Gb modes)~~ the 3GPP System (UTRAN and GERAN). Stage one is the set of requirements which shall be supported for the provision of Broadcast and Multicast services, seen primarily from the subscriber's and service providers' points of view.

This TS includes information applicable to network operators, content providers, and terminal and network manufacturers.

This TS contains the core requirements for Multicast and Broadcast Services, which are sufficient to provide a complete service.

MBMS Adhoc Tdoc S1-BM-010058
Loipersdorf, Austria, October 16 – 17, 2001 Agenda Item: 8

CR-Form-v4

CHANGE REQUEST

⌘ **22.146** **CR** **009** ⌘ ev **2** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network **X**

Title:	⌘	Data Loss During Handover
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	09-11-01
Category:	⌘	**F**
Release:	⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Editor's note regarding data loss during handover is redundant. Data loss is possible during handover as it is possible at any other time. In that respect, there is no difference between an unacknowledged point-to-point downlink transmission and a point-to-multipoint transmission.
Summary of change:	⌘	Removal of editor's note.
Consequences if not approved:	⌘	Issue remains seemingly unclear due to editor's note.

Clauses affected:	⌘	5.2.2
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
	⌘	
Other comments:	⌘	This should reduce the complexity of the feature

5.2.2 User requirements for MBMS

- User mobility

  The user shall be able to continue receiving multicast services throughout the multicast area~~.~~. For example, in case of handover and presuming that a certain multicast service is offered in the target cell, it should be possible for the user to continue the session in the target cell. It is possible that data loss will occur due to user mobility.

~~Editor's note: Is loss of data during change of cell acceptable?~~

MBMS Adhoc Tdoc S1-BM-010060
Loipersdorf, Austria, October 15 – 16, 2001 Agenda Item: 8

CR-Form-v4

CHANGE REQUEST

⌘ **22.146** **CR** **011** ⌘ ev **1** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network **X**

Title:	⌘	Optional Privacy Assurance for Multicast Services
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	09/11/01
Category:	⌘	**C**
Release:	⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Currently it is not clear whether multicast service privacy is optional for a given service or if all multicast services must be delivered with assured group privacy. It seems probable that not all multicast services will require private delivery. Further to this, multicast security is a complex issue with application dependent requirements. Taking into account the computational cost of decryption on the UE/MS it is proposed to allow for non-secured multicast transmissions as an option.
Summary of change:	⌘	It is proposed to allow for the home-environment to choose whether a service is to be secured (encrypted) or not. It is clear that not all services will need to be secured. Some editorial changes are introduced to existing text and editor's note regarding this issue is removed.
Consequences if not approved:	⌘	Issue not clarified.

Clauses affected:	⌘	6
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
	⌘	
Other comments:	⌘	

6 Security

~~The~~ In multicast mode it shall be possible~~able~~ to ensure that only those users who are entitled to receive a specific multicast service~~it~~ may do so. It should be possible to choose whether a given multicast service is to be delivered with or without ensured group privacy.

~~Editor's note: the requirement may be modified based on the use cases. Need to determine if it is necessary to be able to turn on/off the security mechanism to restrict who receives the data.~~

TSG-SA WG 1 (Services) meeting #13 **S1-011304**
Kobe, Japan, 5-9 November 2001 **Agenda Item: 6.6**

CR-Form-v4

CHANGE REQUEST

⌘ **22.146** **CR** **018** ⌘ ev **2** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network **X**

Title:	⌘	CR 22.146: "High Level Diagrams for MBMS"
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	9th November 2001
Category:	⌘	**F**
Release:	⌘	REL- 5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	To help clarify the service descriptions of Multicast & Broadcast modes
Summary of change:	⌘	Add high-level diagrams of Multicast and Broadcast architecture including typical services and expanded text on the general description of Multicast mode.
Consequences if not approved:	⌘	Stage 1 would be less informative and more open to misinterpretation.

Clauses affected:	⌘	4.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

4 General description

4.1 Multimedia broadcast/multicast service (MBMS)

4.1.1 Introduction

Point to multipoint services exist today which allow data from a single source entity to be transmitted to multiple endpoints. These services are expected to be used extensively over wireless networks, hence there is a need for a capability in the PLMN to efficiently support them. The Multimedia Broadcast/Multicast Service (MBMS) will provide this capability for such broadcast/multicast services provided by the home environment and other VASPs.
The MBMS is an unidirectional point to multipoint service in which data is transmitted from a single source entity. There are two modes of operation:

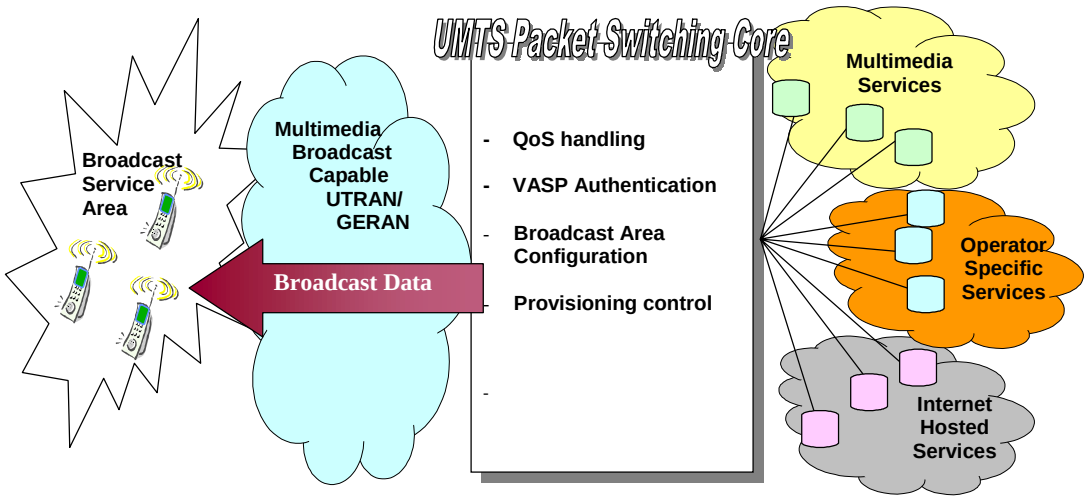
- the broadcast mode

- the multicast mode.

NOTE: The reception of the traffic in the multicast and broadcast modes is not guaranteed. If this is required, it may be built into the application layer and hence is outside the scope of this TS.

4.1.2 MBMS broadcast mode

The broadcast mode is a unidirectional point-to-multipoint transmission of multimedia data (e.g. text, audio, picture, video) from a single source entity to all users in a broadcast area or areas. The broadcast mode is intended to efficiently use radio/network resources e.g. it could transmit the data over a common radio channel. Data is transmitted to broadcast areas as defined by the network (Home environment). Figure 1 gives an example of how a network



can be configured to broadcast a variety of high bit rate services to users within a broadcast area.

Figure 1: Example of Multicast Broadcast Mode Network

The broadcast mode should not be confused with the existing Cell Broadcast service (CBS) which is currently used for low bit rate services (messaging) whilst the broadcast mode enables the broadcast of multimedia services (Audio, Video etc).

An example of a service using the broadcast mode could be advertising or a welcome message to the network. As not all users attached to the network may wish to receive these messages then the user may have the option to enable/disable the reception of these broadcast. The broadcast mode differs from the multicast mode in that there is no specific requirement to register or subscribe to the broadcast mode of the MBMS.~~.~~
It is expected that charging data for the end user will not be generated for this mode.

4.1.3 MBMS multicast mode

The multicast mode allows the unidirectional point-to-multipoint transmission of multimedia data (e.g. text, audio, picture, video) from a single source point to a multicast group in a multicast area. The multicast mode is intended to efficiently use radio/network resources e.g. it could transmit the data over a common radio channel. Data is transmitted to multicast areas as defined by the network (Home environment). In the multicast mode there is the possibility for the network to selectively transmit to cells within the multicast area which contain members of a multicast group.
An example of a service using the multicast mode could be a football results service for which a subscription is required.
Unlike the broadcast mode, the multicast mode generally requires a subscription to the multicast subscription group and then activation of the service. The subscription and activation maybe made by the user or a third party on their behalf (e.g. company). Unlike the broadcast mode, it is expected that charging data for the end user will be generated for this mode.

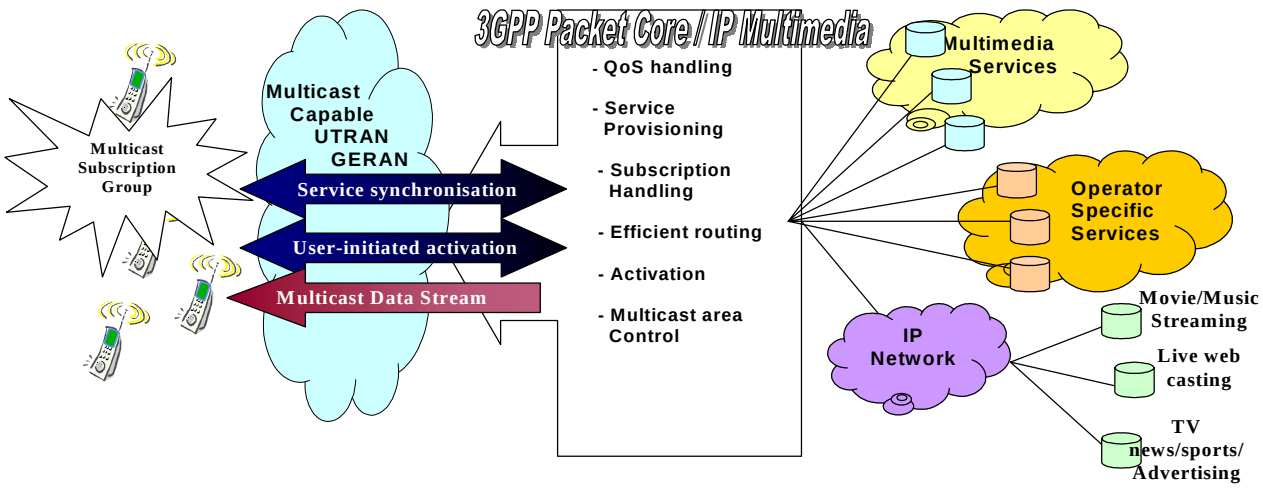


Figure 2: Example of Multicast Mode Network

The multicast mode defined in this specification should not be confused with IP Multicast (RFC s 1112, 1301, 1458, 1920 [2]). ~~Although t~~There are similarities between these two services~~,~~ and such similarities may be exploited in 3GPP networks given that~~e~~ 3GPP multicast mode has been defined with consideration to maximizing efficiency on the radio interface and of network resources.
Multicast mode could make use of IP service platforms to maximize the availability of applications and content so that current and future services can be delivered in a more resource efficient manner. Figure 2 above shows a general high level overview of multicast mode network.

4.1.3.1 Subscription and Activation

The following is the expected sequence for the user to be able to access the MBMS multicast mode:

1 The user must subscribe or be subscribed to a multicast subscription group and thereby becomes a member of that group.

2 The user must activate or the Home Environment must activate on behalf of the user the selected service and hence join the multicast group.

3. The user may leave the multicast group, i.e. select to stop receiving the data.

4. The subscriber may unsubscribe from the service and hence leave the multicast subscription group.

The home environment shall be able to remove a user from a multicast group and if required remove the subscriber from the multicast subscription group. This is required to allow the operator to bar service.

MBMS Adhoc TSG S1-BM-010045
Loipersdorf, Austria, October 15 – 16, 2001 Agenda Item: yy

CR-Form-v4

CHANGE REQUEST

⌘ **22.146** **CR** **19** ⌘ ev **-** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☐

Title:	⌘	Clarifying service requirements on multicast and broadcast areas
Source:	⌘	SA1
Work item code:	⌘	MBMS ***Date:*** ⌘ 09.11.2001
Category:	⌘	**F** ***Release:*** ⌘ REL 5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The current service requirements that "the broadcast / multicast area may be smaller than a cell" is unclear and vague in terms of location based MBMS and from radio aspect point of view. The multicast or broadcast areas (definitions) should not vary depending on the traffic congestion or radio resources in the cells.
Summary of change:	⌘	Deletion of unclear service requirements in 5.1.1 and 5.2.1
Consequences if not approved:	⌘	The requirement that multicast and broadcast areas may be smaller than a cell could be interpretted such that the service should be location related or even such that different mulitcast services could be offered in different parts of the cell. The service areas should not be related to the traffic congestion or radio resources in one cell. These unclear and potentially very demanding requirements may misguide S2 and RAN WGs.
Clauses affected:	⌘	5.1.1 and 5.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at:
http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

5 High level requirements

5.1 Broadcast mode

5.1.1 Home environment requirements

- Broadcast areas

  The PLMN operator shall be able to provision one or more broadcast areas to support broadcast services. It shall be possible to provision and transmit one or more broadcast services for each broadcast area.

  ~~The broadcast area may be smaller than a cell.~~

  ~~An operator should also be able to control the size of Broadcast Area according to the traffic congestion or radio resources in the cell.~~

<< Next change>>

5.2 Multicast mode

5.2.1 Home environment requirements

- Multicast areas

  The PLMN operator shall be able to provision one or more multicast areas to support multicast services. It shall be possible to provision and transmit one or more multicast services for each multicast area.

  ~~The size of the multicast area may be smaller than a cell.~~

  ~~An operator should also be able to control the size of Multicast Area e.g. according to the traffic congestion or radio resources in an individual cell, set of cells within the multicast area.~~

TSG-SA WG 1 (Services) meeting #14 **S1-011326**

Kobe, Japan, 5-9 November 2001 **Agenda Item: 6.6**

CR-Form-v3

CHANGE REQUEST

⌘ **22.146** **CR** **020** ⌘ rev **2** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network **X**

Title:	⌘	Proposed CR on clarifications on MBMS (MBMS defined as a bearer service)
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	09.11.2001
Category:	⌘	**F**
Release:	⌘	REL-5

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	TSG SA has asked for clarification on types of services offered by MBMS, in addition there is confusion on whether MBMS is a bearer service or a teleservice. This contribution tries to address this and clarify that MBMS offers a bearer service
Summary of change:	⌘	Clarification to relevant text that MBMS is a bearer service which may support other services.
Consequences if not approved:	⌘	Confusion

Clauses affected:	⌘	4.1.1, 4.1.2, 4.1.3, 5.1.1, 5.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	There has been confusion in other groups whether to treat MBMS as a teleservice or as a bearer service.

****CHANGE1

4 General description

4.1 Multimedia broadcast/multicast service (MBMS)

4.1.1 Introduction

Point to multipoint services exist today which allow data from a single source entity to be transmitted to multiple endpoints. These services are expected to be used extensively over wireless networks, hence there is a need for a capability in the PLMN to efficiently support them. The Multimedia Broadcast/Multicast Service (MBMS) will provide this capability for such broadcast/multicast services provided by the home environment and other VASPs.

The MBMS is an unidirectional point to multipoint bearer service in which data is transmitted from a single source entity to multiple recipients ~~.~~ It is anticipated that other services will use these bearer capabilities.

3GPP has defined ~~There are~~ two modes of operation:

- the broadcast mode

- the multicast mode.

NOTE: The reception of the traffic in the multicast and broadcast modes is not guaranteed. If this is required, it may be built into the application layer and hence is outside the scope of this TS.

4.1.2 MBMS broadcast mode

The broadcast mode is a unidirectional point-to-multipoint transmission of multimedia data (e.g. text, audio, picture, video) from a single source entity to all users in a broadcast area or areas. The broadcast mode is intended to efficiently use radio/network resources e.g. ~~it could transmit the~~ data is transmitted over a common radio channel. Data is transmitted to broadcast areas as defined by the network (Home environment).

The broadcast mode should not be confused with the existing Cell Broadcast service (CBS) which is currently used for low bit rate services (messaging) whilst the broadcast mode enables the broadcast of multimedia services (Audio, Video etc).

An example of a service using the broadcast mode could be advertising or a welcome message to the network. As not all users attached to the network may wish to receive these messages then the user may have the option to enable/disable the reception of these broadcast.

The broadcast mode differs from the multicast mode in that there is no specific requirement to register or subscribe to the broadcast mode of the MBMS..

It is expected that charging data for the end user will not be generated for this mode.

4.1.3 MBMS multicast mode

The multicast mode allows the unidirectional point-to-multipoint transmission of multimedia data (e.g. text, audio, picture, video) from a single source point to a multicast group in a multicast area. The multicast mode is intended to efficiently use radio/network resources e.g. ~~it could transmit the~~ data is transmitted over a common radio channel. Data is transmitted to multicast areas as defined by the network (Home environment). In the multicast mode there is the possibility for the network to selectively transmit to cells within the multicast area which contain members of a multicast group.

An example of a service using the multicast mode could be a football results service for which a subscription is required.

Unlike the broadcast mode, the multicast mode generally requires a subscription to the multicast subscription group and then activation of the service. The subscription and activation maybe made by the user or a third party on their behalf

(e.g. company). Unlike the broadcast mode, it is expected that charging data for the end user will be generated for this mode.

The multicast mode defined in this specification should not be confused with IP Multicast (RFC s 1112, 1301, 1458, 1920 [2]). Although there are similarities between these two services, the 3GPP multicast mode has been defined with consideration to maximizing efficiency on the radio interface and of network resources.

********CHANGE 2

5 High level requirements

5.1 Broadcast mode

5.1.1 Home environment requirements

- Broadcast areas

  The PLMN operator shall be able to provision one or more broadcast areas to support broadcast services. It shall be possible to provision and transmit one or more broadcast services for each broadcast area.

  The broadcast area may be smaller than a cell.

  An operator should also be able to control the size of Broadcast Area according to the traffic congestion or radio resources in the cell.

- Quality of service

  The PLMN operator shall be able to configure the quality of service for individual broadcast services.

  The home environment shall be able to set priority to select which simultaneous broadcast services are supported when there is a limit on the resources available e.g. in the case of traffic congestion, select which service is downgraded.

- Network and radio efficiency

  The PLMN operator shall be able to use network and radio resources in an efficient manner.

  NOTE: Allocation of resources based on actual need in the broadcast area is not applicable for the broadcast mode.

  The operator shall be able to schedule a certain broadcast service at pre-determined times.

- Types of services

  The broadcast mode shall be independent of the type of service being transmitted, , will support a number of services-and permit support of all data types e.g. Audio, Data, video. A minimum number of data types may need to be identified to enable interoperability.

- Sources of services

  In addition to supporting their own broadcast services the PLMN shall as well support broadcast services from third parties (i.e. HE-VASPs or VASPs)

5.2 Multicast mode

5.2.1 Home environment requirements

- Multicast areas

  The PLMN operator shall be able to provision one or more multicast areas to support multicast services. It shall be possible to provision and transmit one or more multicast services for each multicast area.

  The size of the multicast area may be smaller than a cell.

  An operator should also be able to control the size of Multicast Area e.g. according to the traffic congestion or radio resources in an individual cell, set of cells within the multicast area.

- Multicast subscription groups and multicast groups

  The PLMN operator shall be able to provision one or more multicast subscription groups. The home environment shall be able to identify and assign members of a multicast subscription group. The home environment shall be able to assign a multicast subscription group to a multicast service. The home environment shall be able to accept or reject an application to join a multicast subscription group.

  On receipt of a request to join a multicast group, the PLMN shall check that the user is a member of the applicable multicast subscription group. The home environment shall be able to join users to the multicast group e.g. at the request of the subscriber.

- Quality of service

  The PLMN operator shall be able to configure the quality of service for individual multicast services.

  The home environment shall be able to set priority to select which simultaneous multicast services are supported when there is a limit on the resources available e.g. in the case of traffic congestion, select service is blocked.

- Network and radio efficiency

  The PLMN operator shall be able to use network and radio resources in an efficient manner.

  Within the multicast area, the network may distribute the data across the whole multicast area or parts of the area. The decision to distribute to only parts of the multicast area may be based on: a) multicast group members are present in a given part of the multicast area b) resources are not available in parts of the multicast area.

  The operator shall be able to schedule a certain multicast service at pre-determined times.

- Types of services

  The multicast mode shall be independent of the type of service being transmitted, will support a number of services, and permit support of all data types e.g. Audio, Data, video. A minimum number of data types may need to be identified to enable interoperability

- Sources of services

  In addition to supporting their own multicast services the PLMN shall as well support multicast services by third parties (i.e. HE-VASPs or VASPs).

CR-Form-v4

CHANGE REQUEST

⌘ **22.146** **CR** **021** ⌘ ev **-** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE [X] Radio Access Network [X] Core Network [X]

Title:	⌘	Multiple Areas for Multicast and Broadcast Services
Source:	⌘	SA1
Work item code:	⌘	MBMS ***Date:*** ⌘ 09/11/01
Category:	⌘	**B** ***Release:*** ⌘ REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘

1. The current specification defines a multicast area as possibly spanning multiple PLMNs. It was suggested in previous discussions that while the ability to deliver multicast services over different PLMNs is important, this should not be reflected in the multicast area definition. Rather, a given service could be delivered across different PLMNs to separate multicast areas.
2. It is expected that a certain service might offer location-oriented data. An example is a traffic service which using MBMS, provides the user with local traffic conditions. Another example might be offering the service at different QoS levels depending on the available resources or on the radio access technology employed. Currently the specification does not support such a concept.

Summary of change: ⌘

1. Multicast area definition is updated and is now confined to a single PLMN. Instead, a requirement that a multicast service may span several PLMNs is added to section 5.2.1.
2. The ability to deliver a single service across multiple broadcast/multicast areas is added. This ability is further enhanced with the possibility of delivering different data to each such area where this service is delivered.

Consequences if not approved: ⌘ See reasons section for potential applications.

Clauses affected: ⌘ 3.1, 5.1.1, 5.2.1

Other specs Affected: ⌘
☐ Other core specifications
☐ Test specifications
☐ O&M Specifications
⌘

Other comments: ⌘

How to create CRs using this form:

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions 3GPP TR 21.905 [1] apply.

Broadcast area: a geographical area in which the broadcast service is available. The broadcast area may represent the entire PLMN, or a subset of it.

Broadcast mode: the mode of the Multimedia Broadcast/Multicast service which provides efficient support within the PLMN of broadcast services.

Broadcast service: the end user service that is supported by the broadcast mode of Multimedia Broadcast/Multicast service.

Multicast activation: The process by which a user joins a multicast group as a member and hence activates reception of multicast data transmitted as part of a multicast mode MBMS service. Multicast activation is performed either upon user selection of a multicast service or due to home environment initiated activation.

Multicast area: a geographical area in which the multicast service is available. The multicast area may represent an entire PLMN, ~~may span several PLMNs,~~ or may be a subset of a PLMN.

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. When using MBMS all group members in a area may receive the same data over a common radio channel.

Multicast group: A group of users that are ready to or are receiving any multicast traffic transmitted as part of a multicast mode MBMS service. The multicast group is a subset of the **Multicast subscription group**. Multicast subscription group members join the multicast group by activating the multicast service.

Multicast service: the end user service that is supported by the multicast mode of Multimedia Broadcast/Multicast service.

Multicast subscription: The process by which a user subscribes or is subscribed to a multicast service and multicast subscription group and thereby is authorised to activate certain multicast services.

Multicast Subscription Group: A group of users who have been subscribed to a multicast mode MBMS service and are therefore authorised to activate and receive multicast services associated with this group.

<< **Next Change** >>

5 High level requirements

5.1 Broadcast mode

5.1.1 Home environment requirements

- Broadcast areas

  The PLMN operator shall be able to provision one or more broadcast areas to support broadcast services. It shall be possible to provision and transmit one or more broadcast services for each broadcast area.

  It should be possible to deliver a broadcast service across a number of broadcast areas.

If a broadcast service is transmitted to several broadcast areas, it should be possible to transmit different data to each broadcast area, for the same service. (e.g. a “nationwide traffic service” with localized traffic reports or a service being delivered with different QoS levels to a UTRAN broadcast area and a GERAN broadcast area) If different data is transmitted for the same service, the different data transmissions shall be distinguishable by the UE.

<< Next Change >>

5.2 Multicast mode

5.2.1 Home environment requirements

- Multicast areas

The PLMN operator shall be able to provision one or more multicast areas to support multicast services. It shall be possible to provision and transmit one or more multicast services for each multicast area.

It should be possible to deliver a multicast service across a number of multicast areas. Multicast areas may belong to several PLMNs and delivery of a multicast service across several PLMNs should be possible.

If a multicast service is transmitted to several multicast areas, it should be possible to transmit different data to each multicast area, for the same service. (e.g. a “nationwide traffic service” with localized traffic reports or service being delivered with different QoS levels to a UTRAN multicast area and a GERAN multicast area) If different data is transmitted for the same service, the different data transmissions shall be distinguishable by the UE.

<< Next Change >>

5.2.2 User requirements for MBMS

- User mobility

The user shall be able to continue receiving multicast services throughout the multicast areas in which the service is provided.. For example, in case of handover and presuming that a certain multicast service is offered in the target cell, it should be possible for the user to continue the session in the target cell.

TSG-SA WG 1 (Services) meeting #14 **S1-011309**
Kobe, Japan, 5-9 November 2001 **Agenda Item: MBMS**

CR-Form-v4

CHANGE REQUEST

⌘ **22.146** **CR** **022** ⌘ rev **1** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network **X**

Title:	⌘	MBMS service discovery
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	09.10.2001
Category:	⌘	**F**
Release:	⌘	REL 5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Introducing service requirements on MBMS service discovery Clarifying the description on MBMS multicast service subscription and reception
Summary of change:	⌘	Restructuring chapter 4 and adding new subchapter on MBMS service discovery. Clarifying MBMS service subscription and reception. Home environment may set limitations on MBMS services for roaming subscribers.
Consequences if not approved:	⌘	Undefined MBMS service functionality

Clauses affected:	⌘	3, 4, 5, 7.2
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

<< First change >>

3 Definitions, symbols and abbreviations

3.1 Definitions

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Broadcast area: a geographical area in which the broadcast service is available. The broadcast area may represent the entire PLMN, or a subset of it.

Broadcast mode: the mode of the Multimedia Broadcast/Multicast service which provides efficient support within the PLMN of broadcast services.

Broadcast service: the end user service that is supported by the broadcast mode of Multimedia Broadcast/Multicast service.

Multicast transmission activation: ~~The process by which a user joins a multicast group as a member and hence activates reception of multicast data transmitted as part of a multicast mode MBMS service.~~ The process by which the network activates the transmission of Multicast data~~activation is performed either upon user selection of a multicast service or due to home environment initiated activation~~.

Multicast area: a geographical area in which the multicast service is available. The multicast area may represent an entire PLMN, may span several PLMNs, or may be a subset of a PLMN.

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

Multicast session: The interval from the start to the stop of transmission from a UE point of view.

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. When using MBMS all group members in a area may receive the same data over a common radio channel.

Multicast group: A group of users that are ready to or are receiving any multicast traffic transmitted as part of a multicast mode MBMS service. The multicast group is a subset of the **Multicast subscription group**. Multicast subscription group members may join the corresponding multicast group~~ by activating the multicast service~~.

Multicast service: the end user service that is supported by the multicast mode of Multimedia Broadcast/Multicast service.

Multicast subscription: The process by which a user subscribes or is subscribed to a multicast service and multicast subscription group and thereby is authorised to join~~activate~~ certain multicast services.

Multicast Subscription Group: A group of users who have been subscribed to a multicast mode MBMS service and are therefore authorised to join~~activate~~ and receive multicast services associated with this group.

<< Next change >>

4 General description~~4.1~~ of m~~M~~ultimedia broadcast/multicast service (MBMS)

~~4.1.1 Introduction~~

Point to multipoint services exist today which allow data from a single source entity to be transmitted to multiple endpoints. These services are expected to be used extensively over wireless networks, hence there is a need for a capability in the PLMN to efficiently support them. The Multimedia Broadcast/Multicast Service (MBMS) will provide this capability for such broadcast/multicast services provided by the home environment and other VASPs.

The MBMS is an unidirectional point to multipoint service in which data is transmitted from a single source entity. There are two modes of operation:

- the broadcast mode

- the multicast mode.

NOTE: The reception of the traffic in the multicast and broadcast modes is not guaranteed. If this is required, it may be built into the application layer and hence is outside the scope of this TS.

4.1~~.2~~ MBMS broadcast mode

The broadcast mode is a unidirectional point-to-multipoint transmission of multimedia data (e.g. text, audio, picture, video) from a single source entity to all users in a broadcast area or areas. The broadcast mode is intended to efficiently use radio/network resources e.g. it could transmit the data over a common radio channel. Data is transmitted to broadcast areas as defined by the network (Home environment).

The broadcast mode should not be confused with the existing Cell Broadcast service (CBS) which is currently used for low bit rate services (messaging) whilst the broadcast mode enables the broadcast of multimedia services (Audio, Video etc).

An example of a service using the broadcast mode could be advertising or a welcome message to the network. As not all users attached to the network may wish to receive these messages then the user may have the option to enable/disable the reception of these broadcast.

The broadcast mode differs from the multicast mode in that there is no specific requirement to register or subscribe to the broadcast mode of the MBMS..

It is expected that charging data for the end user will not be generated for this mode.

4.2~~1.3~~ MBMS multicast mode

The multicast mode allows the unidirectional point-to-multipoint transmission of multimedia data (e.g. text, audio, picture, video) from a single source point to a multicast group in a multicast area. The multicast mode is intended to efficiently use radio/network resources e.g. it could transmit the data over a common radio channel. Data is transmitted to multicast areas as defined by the network (Home environment). In the multicast mode there is the possibility for the network to selectively transmit to cells within the multicast area which contain members of a multicast group.

An example of a service using the multicast mode could be a football results service for which a subscription is required.

Unlike the broadcast mode, the multicast mode generally requires a subscription to the multicast subscription group and then the user joining the corresponding multicast group~~activation of the service~~. The subscription and group

joiningactivation may be made by the user or a third party on their behalf (e.g. company). Unlike the broadcast mode, it is expected that charging data for the end user will be generated for this mode.

The multicast mode defined in this specification should not be confused with IP Multicast (RFC s 1112, 1301, 1458, 1920 [2]). Although there are similarities between these two services, the 3GPP multicast mode has been defined with consideration to maximizing efficiency on the radio interface and of network resources.

4.2.11.3.1 Multicast sSubscription and receptionActivation

The following is the expected sequence for the user to be able to access the MBMS multicast mode:

1.1. The user must subscribes or isbe subscribed to a multicast subscription group which is uniquely identified and thereby becomes a member of that group. The subscription may be continuous, e.g. as defined by a subscriber contract, time-limited, or subscribed by the subscriber on a one-time basis. The subscription to multicast services shall not be further standardized.

2.2. The user discovers, or becomes aware of, that there are multicast services currently active, or multicast services that will become active at some time later, at the user's current location.

3.3a) The user must activate the selects aed multicast service and hence joins the corresponding multicast group. or the Home Environment must activate on behalf of the user

3b) As an alternative, the Home Environment can join the user to the selected multicast group on behalf of the user, that has previously subscribed to this multicast group.

-Signalling exchange between the UE and the network might not be necessary in some cases, e.g. in the case of network congestion

3.4. If the transmission is not already in progress the network starts transmitting the corresponding multicast content. Alternatively, the transmission may start at a later time.

3.5. The network may optionally select to set up unicast (point to point) connections to some users e.g. if there are insufficient users to justify multicasting

3.6. The UE starts receiving the multicast data associated with the multicast group(s) it has joined

3.7. The user may select to stop receiving leave the multicast group, i.e. select to stop receiving the data. The user may also select to continue (or not) to receive service announcements for this multicast subscription group.

3.8. The usersubscriber may unsubscribe or be unsubscribed from the service and hence leave the multicast subscription group and stop receiving both the multicast data and future service announcements for this multicast subscription group.

The home environment shall be able to remove a user from a multicast group and if required remove the subscriber from the multicast subscription group. This is required to allow the operator to bar service.

4.3 MBMS service discovery

The user should be informed that there are MBMS services available in the network. The network shall support service announcements both for the broadcast and multicast mode of MBMS in order to enable the user to discover that there are MBMS services available currently, or some time later, in the user's current location.

5 High level requirements

5.1 Broadcast mode

5.1.1 Home environment requirements

- Broadcast areas

  The PLMN operator shall be able to provision one or more broadcast areas to support broadcast services. It shall be possible to provision and transmit one or more broadcast services for each broadcast area.

  The broadcast area may be smaller than a cell.

  An operator should also be able to control the size of Broadcast Area according to the traffic congestion or radio resources in the cell.

- Quality of service

  The PLMN operator shall be able to configure the quality of service for individual broadcast services.

  The home environment shall be able to set priority to select which simultaneous broadcast services are supported when there is a limit on the resources available e.g. in the case of traffic congestion, select which service is downgraded.

- Network and radio efficiency

  The PLMN operator shall be able to use network and radio resources in an efficient manner.

  NOTE: Allocation of resources based on actual need in the broadcast area is not applicable for the broadcast mode.

  The operator shall be able to schedule a certain broadcast service at pre-determined times.

- Types of services

  The broadcast mode shall be independent of the type of service being transmitted, and permit support of all data types e.g. Audio, Data, video. A minimum number of data types may need to be identified to enable interoperability.

- Sources of services

  In addition to supporting their own broadcast services the PLMN shall as well support broadcast services from third parties (i.e. HE-VASPs or VASPs)

- Broadcast service announcements

  The PLMN operators shall be able to activate service announcements within the broadcast area about available broadcasts in the broadcast area.

5.1.2 User requirements for MBMS

- User mobility

  The user shall be able to continue receiving broadcast services throughout the broadcast area. For example, in case of handover and presuming that a certain broadcast service is offered in the target cell, it should be possible for the user to continue the session in the target cell.

- User selectivity

The user shall be able to discover what broadcast services are available at the user's current location.
The user shall be able to enable/disable the reception of specific broadcast services and can receive simultaneously more than one service.

The user may be able to define service preference for reception. A priority procedure may be implemented to allow the user to select between simultaneous broadcast services e.g. while receiving commercial broadcast service a new multicast service may interrupt this.

While receiving one or more broadcast services the user shall be able to receive paging messages.

5.2 Multicast mode

5.2.1 Home environment requirements

- Multicast areas

  The PLMN operator shall be able to provision one or more multicast areas to support multicast services. It shall be possible to provision and transmit one or more multicast services for each multicast area.

  The size of the multicast area may be smaller than a cell.

  An operator should also be able to control the size of Multicast Area e.g. according to the traffic congestion or radio resources in an individual cell, set of cells within the multicast area.

- Multicast subscription groups and multicast groups

  The PLMN operator shall be able to provision one or more multicast subscription groups. The home environment shall be able to identify and assign members of a multicast subscription group. The home environment shall be able to assign a multicast subscription group to a multicast service. The home environment shall be able to accept or reject an application to join a multicast subscription group.

  On receipt of a request to join a multicast group, the PLMN shall check that the user is a member of the applicable multicast subscription group. The home environment shall be able to join users to the multicast group e.g. at the request of the subscriber.

- Quality of service

  The PLMN operator shall be able to configure the quality of service for individual multicast services.

  The home environment shall be able to set priority to select which simultaneous multicast services are supported when there is a limit on the resources available e.g. in the case of traffic congestion, select service is blocked.

- Network and radio efficiency

  The PLMN operator shall be able to use network and radio resources in an efficient manner.

  Within the multicast area, the network may distribute the data across the whole multicast area or parts of the area. The decision to distribute to only parts of the multicast area may be based on: a) multicast group members are present in a given part of the multicast area b) resources are not available in parts of the multicast area.

  The operator shall be able to schedule a certain multicast service at pre-determined times.

- Types of services

  The multicast mode shall be independent of the type of service being transmitted, and permit support of all data types e.g. Audio, Data, video. A minimum number of data types may need to be identified to enable interoperability

- Sources of services

  In addition to supporting their own multicast services the PLMN shall as well support multicast services by third parties (i.e. HE-VASPs or VASPs).

- Multicast service announcements

The PLMN operators shall be able to activate service announcements within the multicast area about available multicasts in the multicast area.

5.2.2 User requirements for MBMS

- User mobility

  The user shall be able to continue receiving multicast services throughout the multicast area.. For example, in case of handover and presuming that a certain multicast service is offered in the target cell, it should be possible for the user to continue the session in the target cell.

Editor's note: Is loss of data during change of cell acceptable?

- User selectivity

  The user shall be able to discover what multicast services are available at the user's current location. The user shall be able to select between different multicast services provided to the user and can receive simultanously more than one service.

  The user may be able to define service preference for reception. A priority procedure may be implemented to allow the user to select between simultaneous broadcast/multicast services e.g. while receiving commercial broadcast service a new multicast service may interrupt this.

  While receiving one or more multicast services the user shall be able to receive paging messages.

- Multicast subscription groups and multicast groups

  The subscriber shall be able to subscribe to or unsubscribe from a multicast subscription group. (The subscription mechanism is outside the scope of this TS.)

  The user shall be able to join a multicast group only if he is a member of the applicable multicast subscription group. The user shall be able to leave a multicast group if he is a member of that group.

5.3 Availability

In general, multicast or broadcast services should be available for all users that are registered in a PLMN. This should include UEs in idle/standby and connected/ready modes.

Availability of a service might not be uniform over the whole broadcast/multicast area at any given time, but can differ from one cell to another depending on available resources. (e.g. no service, service with downgraded QoS). In the case of downgraded QoS, the home environment should be able to determine the service level given and only part of the service functionality may then be available in that part of the broadcast/multicast area. [e.g. instead of transmitting video clip, only the music is transmitted], etc).

Editors' note: need to determine what is meant here as it depends on who is able to downgrade the services.

In case of roaming a user should also be able to subscribe and joinactivate to Multicast Services that are provided locally in the visited network, as allowed by the user's home environment.

<< Next change >>

7.2 Multicast mode

It shall be possible to collect charging information (including roaming) for the use of the multicast mode (e.g. to enable billing to multicast services providers), as well as for the receipt of multicast data (e.g. users), on a per multicast service basis.

Examples of the type of the charging information that could be collected include:

- multicast session duration
- time when joining and leaving a multicast subscription group, duration of membership to a multicast subscription group
- time when joining and leaving a multicast group, duration of membership to a multicast group
- multicast session volume of contents
- ~~activation/deactivation of service~~

The above list of possible charging mechanisms is neither complete nor exhaustive.

Billing issues are out of scope of this TS.

TSG-SA WG 1 (Services) meeting #14 **S1-011020**
Kobe, Japan, 5-9 November 2001 **Agenda Item: MBMS**

CR-Form-v4

CHANGE REQUEST

⌘ **22.146** **CR** **023** ⌘ rev **-** ⌘ Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Definition of "Mobile Station" and "User equipment", usage of "UE"
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	9.11.2001
Category:	⌘	**F**
Release:	⌘	REL 5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The abbreviation "UE" should be used to cover both 2G "MS" and "User Equipment.
Summary of change:	⌘	The term "mobile station" was added in the definition list to explain how the abbreviation "UE" is used in this specification
Consequences if not approved:	⌘	Undefined usage of "MS" and "UE"

Clauses affected:	⌘	3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3GPP TS 22.146 V5.0.0 (2001-09)

Technical Specification

3rd Generation Partnership Project;
Technical Specification Group Services and System Aspects;
Multimedia Broadcast/Multicast Service;
Stage 1
(Release 5)

<< addition >>

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions 3GPP TR 21.905 [1] apply.

Broadcast area: a geographical area in which the broadcast service is available. The broadcast area may represent the entire PLMN, or a subset of it.

Broadcast mode: the mode of the Multimedia Broadcast/Multicast service which provides efficient support within the PLMN of broadcast services.

Broadcast service: the end user service that is supported by the broadcast mode of Multimedia Broadcast/Multicast service.

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

Multicast activation: The process by which a user joins a multicast group as a member and hence activates reception of multicast data transmitted as part of a multicast mode MBMS service. Multicast activation is performed either upon user selection of a multicast service or due to home environment initiated activation.

Multicast area: a geographical area in which the multicast service is available. The multicast area may represent an entire PLMN, may span several PLMNs, or may be a subset of a PLMN.

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. When using MBMS all group members in a area may receive the same data over a common radio channel.

Multicast group: A group of users that are ready to or are receiving any multicast traffic transmitted as part of a multicast mode MBMS service. The multicast group is a subset of the **Multicast subscription group**. Multicast subscription group members join the multicast group by activating the multicast service.

Multicast service: the end user service that is supported by the multicast mode of Multimedia Broadcast/Multicast service.

Multicast subscription: The process by which a user subscribes or is subscribed to a multicast service and multicast subscription group and thereby is authorised to activate certain multicast services.

Multicast Subscription Group: A group of users who have been subscribed to a multicast mode MBMS service and are therefore authorised to activate 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