Technical Specification Group Services and System Aspects
Meeting #15, Cheju Island, Korea, 11-14 March 2002

TSGS#15(02)0057

Source: SA1

Title: CRs to 22.146 Rel-5 on various MBMS issues

Document for: Approval

Agenda Item: 7.1.3

SA Doc	Spec	CR	Rev	Phase	Cat	Subject	Old Vers	New Vers	SA1 Doc
SP-020057	22.146	024		Rel-5	F	CR 22.146 Rel. 5 F Area Specific QoS for Broadcast and Multicast Services	5.1.0	5.2.0	S1-020125
SP-020057	22.146	025		Rel-5	F	CR 22.146 Rel. 5 F Clause 4.2 Multicast mode	5.1.0	5.2.0	S1-020128
SP-020057	22.146	026		Rel-5	F	CR 22.146 Rel. 5 F Addition of MBMS multicast mode and broadcast mode definitions	5.1.0	5.2.0	S1-020133
SP-020057	22.146	027		Rel-5	B	Proposed CR on MBMS Broadcast and Multicast Sessions	5.1.0	5.2.0	S1-020563
SP-020057	22.146	028		Rel-5	B	Power consumption minimisation for MBMS	5.1.0	5.2.0	S1-020565
SP-020057	22.146	029		Rel-5	F	CR to 22.146 (MBMS stage 1) 'Editorial Change'	5.1.0	5.2.0	S1-020646

MBMS Ad-hoc **S1-020125**
Phoenix, Arizona, January 14-18, 2002 **Agenda Item:**

CR-Form-v4

CHANGE REQUEST

⌘ **22.146 CR 024** ⌘ ev **-** ⌘ Current version: **5.1.0** ⌘

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

Title:	⌘	Area Specific QoS for Broadcast and Multicast Services
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	15/2/02
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 specification allows for multiple transmissions with differing QoS to be provided to different multicast or broadcast areas within the framework of a single service. This ability is clearly stated when multicast or broadcast areas are discussed but unfortunately the text regarding quality-of-service has not been appropriately changed to offer the possibility for differentiation of QoS per multicast or broadcast area.
Summary of change:	⌘	Additional text dealing with quality-of-service raises the possibility of differentiation of QoS per multicast or broadcast area.
Consequences if not approved:	⌘	The issue remains unclear.

Clauses affected:	⌘	5.1.1, 5.2.1
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.

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.

  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.

- Quality of service

  The PLMN operator shall be able to configure the quality of service for individual broadcast services. If transmitted to multiple broadcast areas, a broadcast service may be provided with different QoS parameters for each broadcast area associated with the service.

  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.-

- 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, will support a number of services, 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)

- Broadcast service announcements

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

<Next Change>

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.

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 of a multicast subscription group (subscription).

  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. If transmitted to multiple multicast areas, a multicast service may be provided with different QoS parameters for each multicast area associated with the service.

  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.

- 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).

- Multicast service announcements

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

TSG-SA WG 1 (Services) meeting #15 **S1-020646**
Saalfelden, Austria, 11-15th February 2002 **Agenda Item: MBMS**

CR-Form-v5

CHANGE REQUEST

⌘ **22.146** **CR** **029** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*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:	⌘	Changes to Clause 4.2.1
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	12th Feb 2002
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:	⌘	Text in Sub-section 4.2.1 points 1,2,6 and 7 is not very clear
Summary of change:	⌘	Point 1: replacement of word "subscribed" with "generated". Point 2: addition of "(e.g. via service announcements)," Point 6: "UE" was replaced by "user"; the latter term has been used throughout the section apart from point 6. Point 7: "choose" instead of "select"
Consequences if not approved:	⌘	The text will not the be clear.

Clauses affected:	⌘	4.2.1
Other specs affected:	⌘	[ ] Other core specifications ⌘ [ ] Test specifications [ ] O&M Specifications
Other comments:	⌘	

4.2.1 Multicast subscription and reception

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

1 The user subscribes or is 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~~the subscriber's contract), time-limited, or ~~subscribed~~generated by the subscriber on a one-time basis. The subscription to multicast services shall not be further standardized.

2 The user discovers, or becomes aware ~~of~~ (e.g. via service announcements), that there are multicast services currently active, or multicast services that will become active at some time later, at the user's current location.

3a) The user selects a multicast service and hence the user joins the corresponding multicast group.

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.

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.

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

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

7 The user may ~~select~~choose to stop receiving~~-~~ a selected multicast service and thereby leaves the multicast group. The user may also select to continue (or not) to receive service announcements for this multicast subscription group.

8 The user may unsubscribe or be unsubscribed from 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 (deactivation) and if required remove the subscriber from the multicast subscription group (un-subscription). This is required to allow the operator to bar service.

3GPP TSG-SA WG1 (Services) Meeting #15 **S1-020565**
Saalfelden, Austria, 11-15 February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **22.146** **CR** **028** ⌘ ev **-** ⌘ Current version: **5.1.0** ⌘

*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 ☐

Title:	⌘	Power consumption minimisation for MBMS
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	01.02.02
Category:	⌘	**B**
Release:	⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
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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 minimization of power consumption is an essential issue for terminals in order to increase their operating time. Nevertheless, this requirement is not yet included in the current stage 1 on MBMS (TS 22.146).
Summary of change:	⌘	Introduction of the requirement to allow terminals to minimize their power consumption when receiving MBMS services.
Consequences if not approved:	⌘	Terminals receiving MBMS services do not have the possibility to reduce their power consumption and therefore to increase their operating time.

Clauses affected:	⌘	4.1, 4.2
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.

4.1 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. data is transmitted 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.

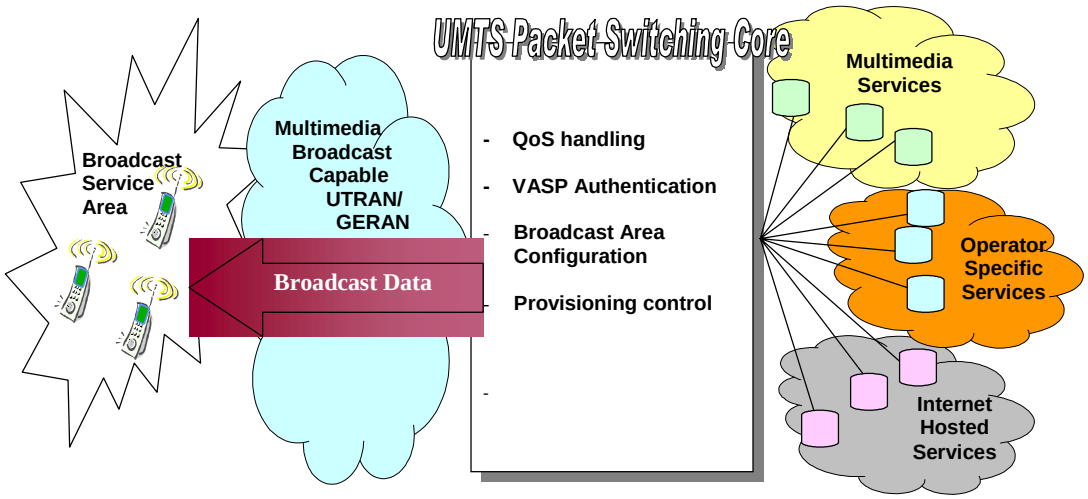

Figure 1: Example of Multicast Broadcast Mode Network

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 shall be able to 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 activate or subscribe to the MBMS in broadcast mode.

The broadcast mode should allow terminals to minimise their power consumption.

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.

4.2 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. 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 the user joining the corresponding multicast group. The subscription and group joining 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.

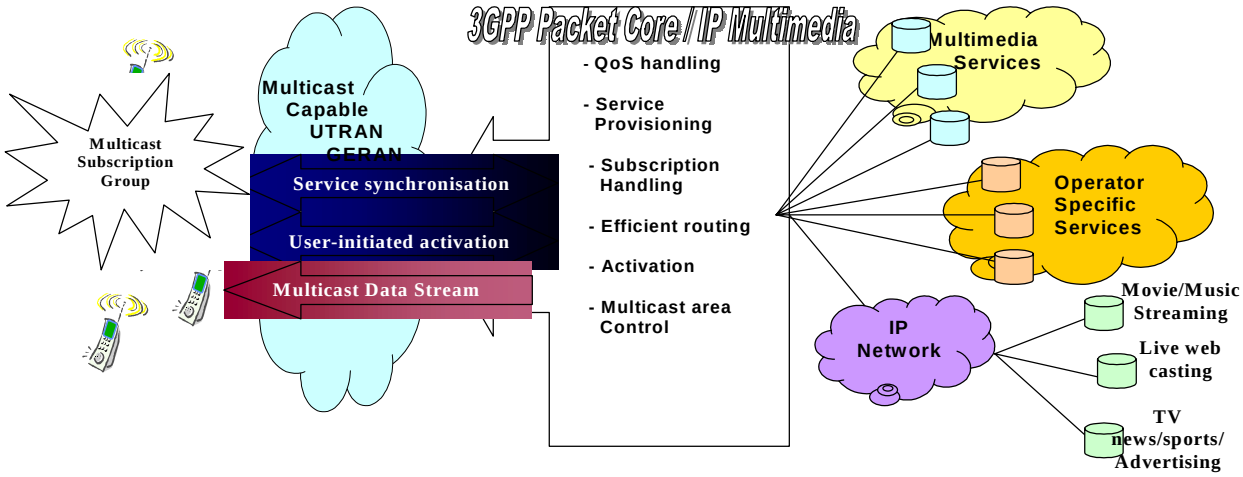

Figure 2: Example of Multicast Mode Network

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.

Multicast mode should allow terminals to minimise their power consumption.

The multicast mode defined in this specification should not be confused with IP Multicast (RFC s 1112, 1301, 1458, 1920 [2]). There are similarities between these two services and such similarities may be exploited in 3GPP networks given that 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.

TSG SA WG1#15 **Tdoc S1-020563**
Saalfelden, Austria, February 11-15, 2002 **Agenda Item: 10.6**

CR-Form-v4

CHANGE REQUEST

⌘ **22.146** **CR** **027** ⌘ ev **-** ⌘ Current version: **5.1.0** ⌘

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

Title:	⌘	MBMS Broadcast and Multicast Sessions
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	13-02-2002
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)*
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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 specification does not deal with the possibility of using MBMS for intermittent transmissions. Presumably, MBMS might be used to transmit relatively short message or updates to users who choose to receive them, over an extensive period of time. While the current specification does not rule these out, it is considered valuable to state that such applications are possible and to deal with resulting service requirements.
Summary of change:	⌘	1. Introduction of the term "session" which is used to define a logically distinct transmission provided using MBMS. 2. Possibility of intermittent as well as continuous transmission is inserted into both descriptive and requirements sections. 3. Per session QoS control for multicast mode is added.
Consequences if not approved:	⌘	Possibility of intermittent transmissions and the resulting requirements remain unclear.

Clauses affected:	⌘	3.1, 4.1, 4.2, 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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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 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 .

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.

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

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

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

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

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

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

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

Multicast service: 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 subscription group and thereby is authorised to join certain multicast services. Multicast subscription is performed either upon user selection or due to home environment initiation.

Multicast Subscription Group: A group of users who are subscribed to a certain MBMS in multicast mode and therefore authorised to join and receive multicast services associated with this group.**User Equipment:** defined in TS 21.905. An occurrence of a User Equipment is an MS for GSM as defined in TS 24.002.

<< Next Change >>

4.1 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. data is transmitted 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.

A broadcast service received by the UE, involves one or more successive broadcast sessions. A broadcast service might, for example, consist of a single on-going session (e.g. a media stream) or may involve several intermittent sessions over an extended period of time (e.g. messages).

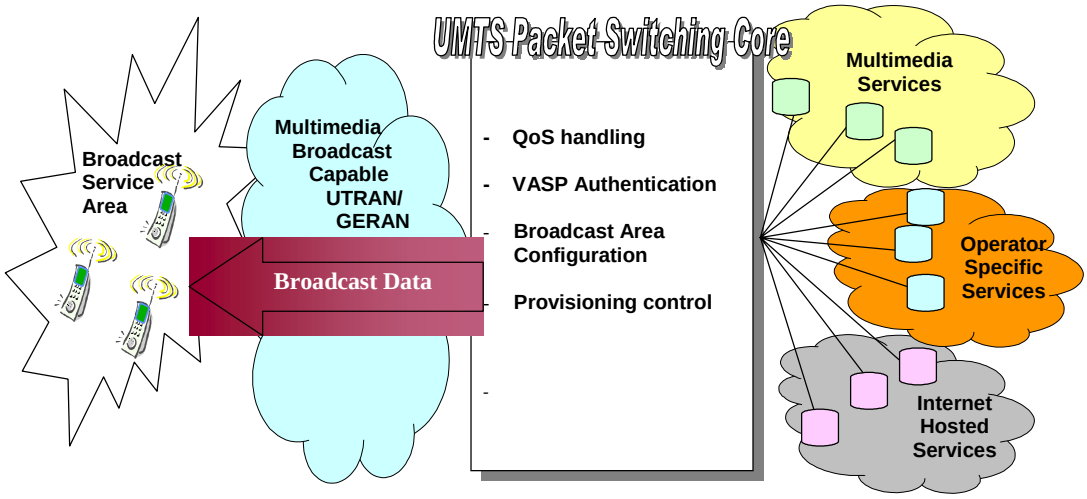

Figure 1: Example of Multicast Broadcast Mode Network

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 shall be able to 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 activate or subscribe to the MBMS in broadcast mode.

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.

4.2 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. 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.

A multicast service received by the UE, involves one or more successive multicast sessions. A multicast service might, for example, consist of a single on-going session (e.g. a multimedia stream) or may involve several intermittent multicast sessions over an extended period of time (e.g. messages).

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. The subscription and group joining 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.

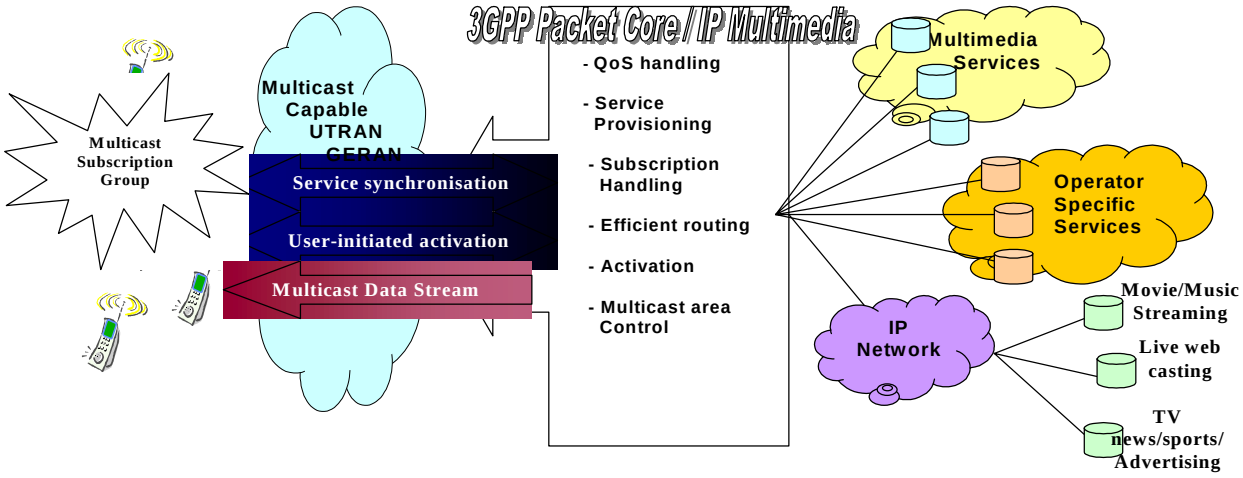

Figure 2: Example of Multicast Mode Network

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]). There are similarities between these two services and such similarities may be exploited in 3GPP networks given that 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.

<< Next Change >>

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.

  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.

- 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.-

- 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, will support a number of services, and permit support of and therefore transfer all data types e.g. Audio, Data, V~~v~~ideo or combinations thereof. 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)

- Broadcast service announcements

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

<< Next Change >>

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.

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 of a multicast subscription group (subscription).

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.

As part of the same service, it should be possible for the operator to provide the UEs with multiple successive sessions with different quality-of-service for each session.

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.

- 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, V~~v~~ideo or combinations thereof. 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.

5.3 Availability

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

Within the broadcast or multicast area, ~~I~~it shall be possible to inform users of~~n~~ up-coming MBMS sessions which they may receive.~~transmissions within the broadcast and/or multicast area~~. This may be useful e.g. to initiate UE processes for the reception of MBMS data.

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

MBMS Ad-hoc **S1-020124**
Phoenix, Arizona, January 14-18, 2002 **Agenda Item:**

CR-Form-v4

CHANGE REQUEST

⌘ **22.146 CR 026** ⌘ ev **-** ⌘ Current version: **5.1.0** ⌘

*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:	⌘	Addition of MBMS multicast mode and broadcast mode definitions
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	15/01/2002
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 specification is missing a definition in the definitions section for multicast mode. The broadcast mode definition is also lacking as it simply refers to the broadcast service definition. In previous SA1 MBMS ad-hoc it was indicated that an update on both definitions is desired.
Summary of change:	⌘	Broadcast and multicast service definitions are updated. The broadcast and multicast mode definitions are added and refer to their respective service definitions.
Consequences if not approved:	⌘	Definitions remain unclear.

Clauses affected:	⌘	3.1
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.

3.1 Definitions

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

Broadcast area: A~~a~~ geographical area in which 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 .

Broadcast mode: ~~the mode of the Multimedia Broadcast/Multicast service which provides efficient support within the PLMN of broadcast services.~~ The part of MBMS that supports broadcast services.

Broadcast service: ~~the end user service that is supported by the broadcast mode of Multimedia Broadcast/Multicast service.~~ A unidirectional point-to-multipoint service in which data is efficiently transmitted from a single source to multiple UEs in one or more broadcast areas. Broadcast services may be received by all users who have enabled the specific broadcast service locally on their UE and are in one of the broadcast areas defined for the service.

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

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

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

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

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

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

Multicast service: A unidirectional point-to-multipoint service in which data is efficiently transmitted from a single source to a multicast group in one or more multicast areas. Multicast services can only be received by those users which are subscribed to the specific multicast service and have joined the multicast group associated with the specific 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 subscription group and thereby is authorised to join certain multicast services. Multicast subscription is performed either upon user selection or due to home environment initiation.

Multicast Subscription Group: A group of users who are subscribed to a certain MBMS in multicast mode and therefore authorised to join and receive multicast services associated with this group.**User Equipment:** defined in TS 21.905. An occurrence of a User Equipment is an MS for GSM as defined in TS 24.002.

TSG-SA1 MBMS SWG
Phoenix, Arizona, USA, January 16-18, 2002 ***S1-020128***

CR-Form-v5

CHANGE REQUEST

⌘ **22.146** **CR** **025** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*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 to Clause 4.2 Multicast mode
Source:	⌘	SA1
Work item code:	⌘	MBMS
Date:	⌘	15th January 2002
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)*
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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:	⌘	This CR proposes two changes to the stage 1 on re-transmissions and IP Multicast interoperability: - 1) It has been agreed in S1 Plenary that link layer re-transmissions are not suitable for point-to-multipoint multicast links. Further correspondences have confirmed that guaranteeing data delivery could be a function of upper layers. 2) S2 have agreed that MBMS shall allow interoperability with IETF IP Multicast
Summary of change:	⌘	Addition and clarification text of section 4.2
Consequences if not approved:	⌘	Stage 1 would not be clear on the requirements to other groups on multicast mode MBMS

Clauses affected:	⌘	4.2
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

4.2 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. 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 the user joining the corresponding multicast group. The subscription and group joining 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.

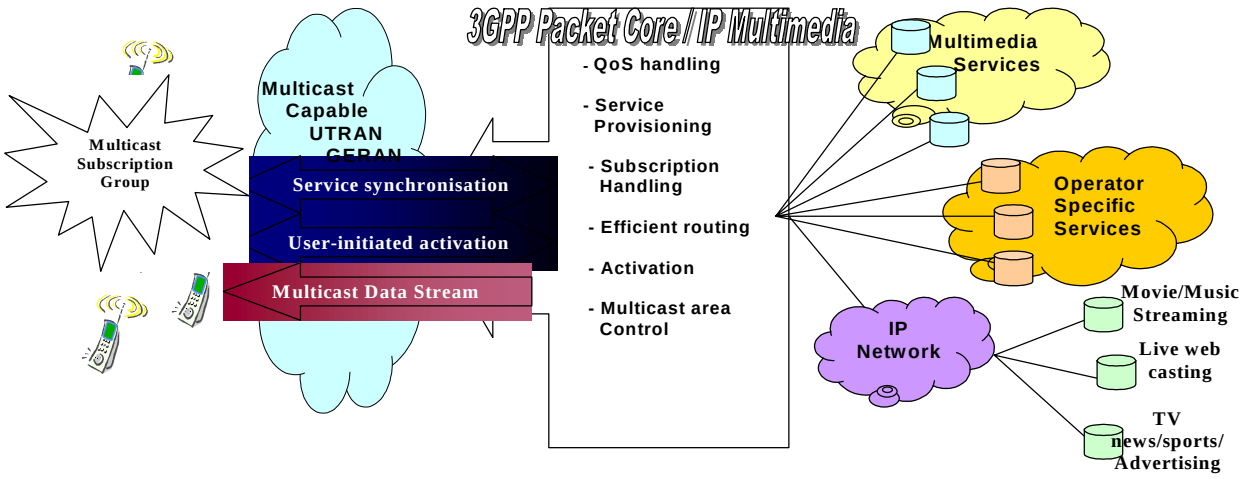

Figure 2: Example of Multicast Mode Network

~~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~~. Reception of multicast services cannot be guaranteed over the access network. ~~Note also that f~~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]). There are similarities between these two services and such similarities may be exploited in 3GPP networks given that 3GPP multicast mode has been defined with consideration to maximizing efficiency on the radio interface and of network resources.

Multicast mode shall be inter-operable with IETF IP Multicast. This could allow the best ~~make~~ use of IP service platforms to help 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.