TSG-RAN Working Group 2 (Radio layer 2 and Radio layer 3)
Berlin 25th to 28th May 1999

R2-99397

Agenda Item: 7.4

Source: **Mannesmann Mobilfunk (MMO)**

Title: Scope of TR 25.394 « Radio Interface for Broadcast/Multicast Services »

Document for: Decision

The scope of TR 25.394 is incorporated into version 0.0.1 (provided with R2-99363). It basis on the results of the small e-mail discussion held during the last weeks.

It is proposed to cover each broadcast/multicast service in this report and not to restrict it to some types only. In chapter 4 an overview of broadcast/multicast services is given.

The radio interface aspects of each service will be described in an own chapter, because there are services which exists already like GSM SMS Cell Broadcast and there are other services which are still under study like GPRS PTM-Multicast or UMTS Multimedia Distribution Services and the progress should not be slowed down by those undeveloped services. The evolutional path should not be lost. This means that SMS CB requirements should result into a specification that serves for future requirements of other services too.

Mannesmann Mobilfunk requires strongly the specification of the radio interface to support GSM SMS CB from the beginning (anual release 1999).

Additionally, the already existing descriptions are incorporated except for chapter 5, SMS CB. For this chapter an own contribution (R2-99398) is prepared.

Decision:

1. It is proposed that RAN WG2 accepts the scope described below.

2. It is proposed that RAN WG2 approves the content given below.

TR 25.394 V0.0.x (1999-05)

Technical Report

3rd Generation Partnership Project (3GPP); Technical Specification Group (TSG) RAN; Working Group 2 (WG2);

Radio Interface for Broadcast/Multicast Services

Reference
<Workitem> (<Shortfilename>.PDF)

Keywords
Digital cellular telecommunications system,
Universal Mobile Telecommunication System
(UMTS), UTRA, IMT-2000

3GPP

Postal address

Office address

Internet
secretariat@3gpp.org
Individual copies of this deliverable
can be downloaded from
http://www.3gpp.org

Contents

1 Scope 6
2 References 6
3 Definitions and Abbreviations 6
3.1 Definitions 6
3.2 Abbreviations 6
4 Overview of Point-to-multipoint Services and Requirements 7
5 SMS Cell Broadcast Service (GSM) 13
5.1 Requirements on the Radio Interface 13
6 PTM-Multicast Service (GPRS) 13
6.1 Requirements on the Radio Interface 13
7 PTM-Group Call Service (GPRS) 13
7.1 Requirements on the Radio Interface 13
8 IP Multicast Service (GPRS) 13
8.1 Requirements on the Radio Interface 13
9 Multimedia Distribution Service (UMTS) 13
9.1 Requirements on the Radio Interface 14
~~*1 Scope 6*~~
~~*2 References 6*~~
~~*3 Definitions and Abbreviations 6*~~
~~3.1 Definitions 6~~
~~3.2 Abbreviations 6~~

Intellectual Property Rights

IPRs essential or potentially essential to the present deliverable may have been declared to 3GPP and/or its organizational partners. The information pertaining to these essential IPRs, if any, is publicly available for **3GPP members and non-members, free of charge**. This can be found in the latest version of the 3GPP Technical Report: [reference tbd.]

Pursuant to the 3GPP Interim IPR Policy, no investigation, including IPR searches, has been carried out by 3GPP. No guarantee can be given as to the existence of other IPRs not referenced in the [tbd.], which are, or may be, or may become, essential to the present document.

Foreword

This Technical Report has been produced by the 3GPP.
The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of this TR, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 Indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the specification;

1 Scope

The present document shall provide an overview and the analysis of the UE-UTRAN radio interface aspects regarding broadcast and multicast services as agreed within the 3GPP TSG RAN working group 2.

The TR 25.394 consists of an overview chapter (chapter 4) and on chapter per broadcast/multicast service. Each service specific chapter describes the requirements on the radio interface (subchapter x.1, x service chapter). In these subchapters the impacts on the radio interface architecture and the protocol aspects regarding RRC, RLC, MAC and L1 are descibed. This TR covers only those items which are in the scope of 3GPP TSG RAN WG 2. Information from Technical Specifications or other documents are provided when it is necessary to understand the requirements described.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to a TS shall also be taken to refer to later versions published as an EN with the same number.

[1] UMTS 22.100 " UMTS Phase 1"
[2] UMTS 22.101 " UMTS Serive Principle"
[3] UMTS 22.05 "Services and Service Capabilities"
[4] UMTS 25.301 "Radio Interface Protocol Architecture"

[101] GSM 02.03: "Digital cellular telecommunications system (Phase 2+); Principles of telecommunication services supported by a GSM Public Land Mobile Network (PLMN)".
[102] GSM 02.60: "GPRS Service description"
[103] GSM 03.41: "Digital cellular telecommunications system (Phase 2+); Man-Machine Interface (MMI) of the Mobile Station (MS)"
[104] GSM 03.61: "Digital cellular telecommunications system (Phase 2+); Support of Mobile Number Portability (MNP); Service description; Stage 1"

3 Definitions and Abbreviations

3.1 Definitions

~~1.2~~3.2 Abbreviations

CB	Cell Broadcast
IP	Internet Protocol
MDS	Multimedia Distribution Service
PTM	Point-to-multipoin
SMS	Short Message Service
UE	User Equipment
UMTS	Universal Mobile Telecommunication System
UTRAN	UMTS Terrestrial Radio Access Network

~~**This revision is empty because the scope of this TR is not approved. A proposal of the scope is provided with TDoc R2-99397.)**~~

4 Overview of Point-to-multipoint Services and Requirements

It is agreed to have service continuity for GSM/GPRS point-to-multipoint services in UMTS ([1] and [2]). This means that the user gets the same service behaviour as he knows it form GSM or GPRS. The services are SMS Cell Broadcast [101] and Point-to-multipoint Multicast, Point-to-multipoint Group Call and IP Multicast [102].

Combined with the UMTS service classification given in [2] following classification scheme could be used as a starting point. The figure contains the view of RAN Uu Layer 2 and 3 and should not be applied for service level there other relations between the services exists. Succeeding analysis may result in changes.

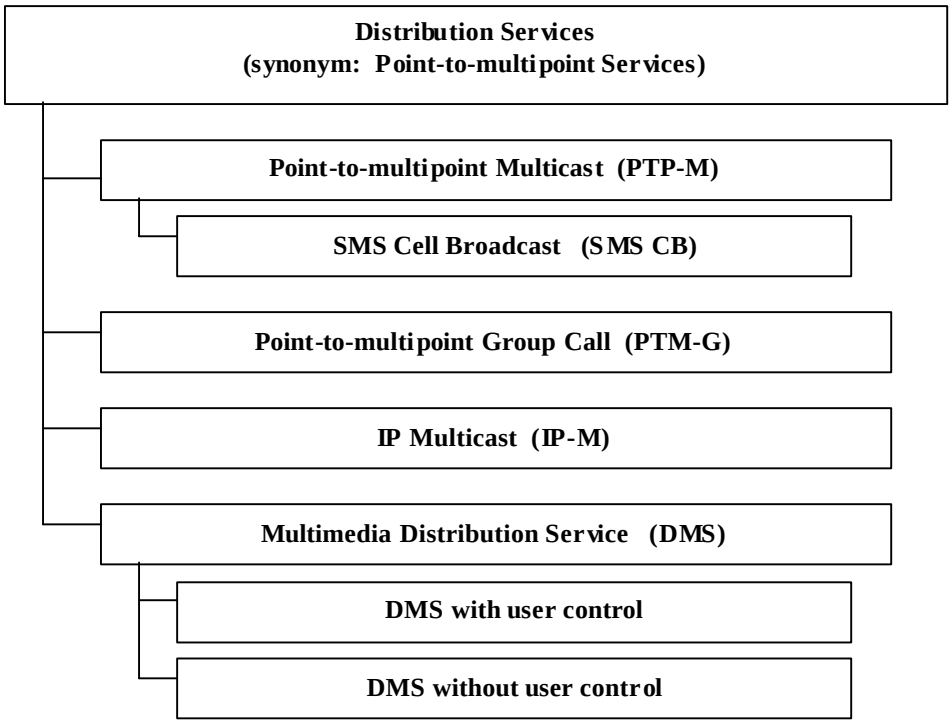

Figure 1: Structure of point-to-multipoint services

The tables below summarizes the attributs defining the broadcast/multicast service (Table 1 and 2) and allocates attributes of the Uu interface to the services (Table 3).

Table 1: Bearer Service attributes ([3])

Attributes		Values
Information transfer attributes	1. Connection mode attribute	Connection oriented: CO (Circuit Switched base)
		Connectionless: CL (Packet Switched)
	2. Transfer type attribute	Constant bit rate
		Variable bit rate
		Available bit rate
		Unspecified bit rate
	3. Symmetry attribute	Unidirectional
		Bi-directional symmetric
		Bi-directional asymmetric
	4. Communication configuration attribute	Point-to-point
		Point-to-multipoint
	5. Information transfer rate attributes	(Continuous rage of values is possible)
		High bit rate
		Medium bit rate
		Low bit rate
Information quality attributes	1. Maximum transfer delay attribute	(Continuous rage of values is possible)
		Delay sensitive
		Delay insensitive
	2. Delay variation attribute	(Continuous rage of values is possible)
		Constant
		Variable
	3. Bit error ratio attribute	(Continuous rage of values is possible)
		Loss sensitive
		Loss insensitive
	4. Error characteristics attribute	Uniform
		Bursty

Table 2: Overview of Broadcast/Multicast Services (Part 1)

Attributes	SMS-CB	PTM Multicast (medium rate)	PTM Multicast (high rate)	PTM Group call	IP-multicast (Medium rate)	IP-multicast (Low rate)
Information transfer attributes						
1. Connection mode attribute	CL	CL	CL	CO	CL	CL
2. Transfer type attribute	Constant	Variable	Variable	Variable	Available	Available
3. Symmetry attribute	UNI	UNI	UNI	UNI BI ASYM MULTI	MULTI (UNI)	MULTI (UNI)
4. Communication configuration attribute	PTM	PTM	PTM	PTM	PTM	PTM
5. Information transfer rate attributes	Low	Medium	High	Low	Medium	Low
Information quality attributes						
1. Maximum transfer delay attribute	Delay insensitive	Delay insensitive	Delay sensitive	Delay sensitive	Delay insensitive	Delay insensitive
2. Delay variation attribute						
3. Bit error ratio attribute	Loss insensitive	Loss insensitive	Loss insensitive	Loss insensitive	Loss sensitive	Loss sensitive
4. Error characteristics attribute						
Defined in	GSM	GPRS	GPRS	GPRS	GPRS	GPRS

(Editor's note: Value MULTI is not defined in [3] yet. It is specified in [102])

Table 2: Overview of Broadcast/Multicast Services (Part 2)

Attributes	MDS without user control (high rate)	MDS without user control (medium rate)	MDS with user control (high rate)	MDS with user control (medium rate)	Messaging service (high rate)	Messaging service (medium rate)
Information transfer attributes						
1. Connection mode attribute						
2. Transfer type attribute						
3. Symmetry attribute						
4. Communication configuration attribute	PTM	PTM	PTM	PTM	PTM	PTM
5. Information transfer rate attributes	High	Medium	High	Medium	High	Medium
Information quality attributes						
1. Maximum transfer delay attribute						
2. Delay variation attribute						
3. Bit error ratio attribute						
4. Error characteristics attribute						
Defined in	UMTS	UMTS	UMTS	UMTS	UMTS	UMTS

Table 3: Radio Interface related attributes of broadcast/multicast services (part 1) [102]

Attributes	SMS-CB	PTM Multicast (medium rate)	PTM Multicast (high rate)	PTM Group call	IP-multicast (Medium rate)	IP-multicast (Low rate)
UE modes (ffs.)						
Logical Channels	CTCH	CTCH	CTCH	CTCH	CTCH	CTCH
Necessity of separate control channel						
Transport Channels						
Physical Channels						
DRX Mode	Yes	Yes	Yes	No	Yes	Yes
Primary addressing	GEO area	Subsciber group	Subscriber group	Subscriber group	Subscriber group	Subscriber group
Secondary addressing	---	GEO area	GEO area	GEO area	---	---
Present subscribers known	No	No	No	Yes	Yes	Yes
Ciphering	No	No	No	Yes	Yes	Yes
Reliable delivery	No	No	No	Optional	Yes	Yes

Table 3: Radio Interface related attributes of broadcast/multicast services (part 2)

Attributes	MDS without user control (high rate)	MDS without user control (medium rate)	MDS with user control (high rate)	MDS with user control (medium rate)	Messaging service (high rate)	Messaging service (medium rate)
UE modes (ffs.)						
Logical Channels						
Necessity of separate control channel						
Transport Channels						
Physical Channels						
DRX Mode						
Primary addressing						
Secondary addressing						
Present subscribers known						
Ciphering						
Reliable delivery						

A logical channel is introduced in [4] for Broadcast/Multicast services: **Common Traffic Channel (CTCH)** (*A point-to-multipoint unidirectional channel for transfer of dedicated user information for all or a group of specified UEs.* S2.01 v0.2.0)

5 SMS Cell Broadcast Service (GSM)

5.1 Requirements on the Radio Interface

6 PTM-Multicast Service (GPRS)

This chapter contains the requirements derived from GPRS specifications of Point-to-multipoint Multicast service and the analysis regarding the UMTS radio interface Uu.

Editor's note:
Less activities are observable at SMG regarding PTM Multicast service. More input is needed to continue on this chapter. Especially, for which annual release of GSM Phase 2+ the specification is planned.

6.1 Requirements on the Radio Interface

7 PTM-Group Call Service (GPRS)

This chapter contains the requirements derived from GPRS specifications of Point-to-multipoint Group Call service and the analysis regarding the UMTS radio interface Uu.

7.1 Requirements on the Radio Interface

8 IP Multicast Service (GPRS)

This chapter contains the requirements derived from GPRS specifications of IP Multicast service and the analysis regarding the UMTS radio interface Uu.

8.1 Requirements on the Radio Interface

9 Multimedia Distribution Service (UMTS)

This chapter contains the requirements derived from UMTS Technical Specifications and the analysis regarding the radio interface Uu.

Input documents:
R2-99075 (LGIC), R2-99076 (LGIC), R2-99218 (LGIC), R2-99219 (LGIC)
Input documents not presented:
R2-99077 (LGIC)
Output documents:
R2-99189 (TSG RAN WG2) LS to SA WG1 and SA WG2 on Multicast

[U1] Are SMS CB service (GSM) and PTM Multicast service (GPRS) covered by the above definitions? If, of which type they are?

RAN WG2 has sent a Liaison statement to SA WG1 and WG2 requesting stage 1 and stage 2 specification of UMTS multicast services and describing the relation to SMS services. Replies can be expected end of May, 1999. Then information may be available about the questions: In which annual release the UMTS Multicast services will be part? What are the requirements for the UMTS system and the protocols?)

9.1 Requirements on the Radio Interface

(Editor's note: The following text is taken from R2-99075 and should give an first overview of functions which should be analysed for MDS. Already made decisions are incorporated.)

RRC functions:
Variable Rate Support
Dynamic Code usage
Dynamic Scheduling
QoS Support (e.g. repetition time)
(LGIC, R2-99075, for information)

RLC functions:
Unacknowledged multicast data transfer
Multicast Delivery
(LGIC, R2-99075, for information)

MAC functions:
Support fo multiple CTCH
Mapping and multiplexing/demultiplexing between CTCH and transport channels
Scheduling among CTCH
Support of dynamic rate change using TFCS
(LGIC, R2-99075, for information)

New types of transport channels are not required.

L1 functions:
Transmission of messages containing multicast data to specific groups of UEs. This service includes provision of the location function necessary to deliver mulitcast messages to a mobile, which is in idle or slotted mode.
DTX (discontinious transmission)
DRX (discontinious reception)
Support of multicast data transmission with multi-code
(LGIC, R2-99075, for information)

History

Document history		
Date	**Version**	**Comment**
Mai 1999	0.0.1	Skeleton without scope

Rapporteur for TR 25.394 is:

Peter Krischan
Mannesmann Mobilfunk GmbH

Tel. : +49 211 533 2835
Fax : +49 211 533 2834
Email : peter.krischan@d2privat.de

This document is written in Microsoft Word 97.