

Agenda Item: 14 (primarily – effects 7 & 10 as well)

Source: InterDigital

Title: TDD definition of RACH Access Service Class (ASC)
and use of System Information for RACH ASC
identification.

Document for: Decision

Introduction

This contribution proposes RACH Access Service Class definition for TDD. This definition is in alignment with the current FDD scheme so that common classes exist in both FDD and TDD.

Description

The FDD scheme, described in [3], defines three access service classes:

Access Service Class-1: CCCH signaling and MAC Peer to peer signaling
Access Service Class-2: DCCH signaling
Access Service Class-3: DTCH traffic and currently unspecified traffic

In TDD, a number of RACH channels can be planned and assigned to different access service classes to carry the same prioritized RACH classes as in FDD.

It is proposed that the Access Service Class (1 – 3) is assigned for each RACH channel and it is broadcast via the System Information message. The operator has the option to configure RACH “trunk groups” for each class or to combine multiple classes on to a common RACH group. It is important that in cases where RACH resources are rare the operator has the ability to combine RACH trunk groups for more efficient use of RACH resources.

Associated with each PRACH info IE in the System Information message will be an optional ASC info IE, which will indicate the Access Service Classes the particular RACH supports.

The current definition for “Access Service Class selection for RACH transmission” in TS25.301 [1] section 5.3.1.2 defines access slots and preamble signatures and is specific for FDD. This definition is updated to identify channelisation code and time slot for TDD. Definitions in TS25.321 [2] are also updated to reflect ASC support.

Change Request to TS 25.331 [4]

10.1.6.1 SYSTEM INFORMATION

<Functional description of this message to be included here>
RLC-SAP: t.b.d.
Logical channel: BCCH or DCCH or CCCH
Direction: UTRAN → UE

NOTE: The division of the system information into messages is FFS.

Information element category	Information elements	REFERENCE	TYPE	NOTE
	Message Type		M	
CN information elements	PLMN Identity		M	
	CN domain identity		M	For each Core Network Domain. Information must be included for at least one core network domain type.
	NAS system information		M	
UTRAN mobility information elements	URA identity		M	For each URA
	Information for periodic cell and URA update		M	<i>Note: not for each URA any more</i>
	Cell identity		M	The necessity and usage of cell identity is FFS.
	Cell selection and re-selection info		M	
UE information elements	Uplink access control info		M	
	Transmission probability		O	For all UE having DCH controlled by DRAC procedure
	Maximum bit rate		O	
PhyCH information elements	Frequency info		O	For each RACH
	PRACH info		M	
	ASC info		O	
	Frequency info		O	For each FACH on secondary CCPCH
	Secondary CCPCH info		M	
	Frequency info		O	For each PCH on secondary CCPCH
	Secondary CCPCH info		M	
	PRACH power control info		M	
Measurement Information elements	Measurement Identity Number		M	Note 1
	Intra-frequency cell info		M	For each measurement object
	Intra-frequency measurement quantity		M	
	Intra-frequency measurement reporting criteria		M	
	Intra-frequency reporting quantity for RACH reporting		C	Only included if RACH reporting is indicated in the reporting criteria

Measurement Identity Number		M	Note 1	For each Inter-frequency measurement control
Inter-frequency cell info		M	For each measurement object	
Inter-frequency measurement quantity		M		
Inter-frequency measurement reporting criteria		M		
Measurement Identity Number		M	Note 1	For each Inter-system measurement control
Inter-system cell info		M	For each measurement object	
Inter-system measurement quantity		M		
Inter-system measurement reporting criteria		M		

Note 1: The necessity and usage of Measurement identity number in this message is FFS.

Note 2: The split of parameters into several System Information message X is FFS.

10.2.6 Physical CH Information elements

10.2.6.15 ASC info

Parameters	REFERENCE	TYPE	NOTE
Access Service Class 1 Support		O	Each PRACH Info IE in System Information is associated with an ASC info IE. Any one RACH can support multiple ASC's.
Access Service Class 2 Support		O	
Access Service Class 3 Support		O	

Change Request to TS 25.301 [1]

5.3.1.2 MAC Functions

- Access Service Class selection for RACH transmission.** The RACH resources (i.e. access slots and preamble signatures for FDD, and timeslot and channelisation code for TDD) may be divided between different Access Service Classes in order to provide different priorities of RACH usage. This function selects, based upon the type of data to be transmitted, the RACH parameters in accordance with the Service Access Class assignment.

Change Request to TS 25.321 [2]

4.2.3 Traffic Related Architecture – UE Side

- Selection of Access Service Classes (ASC) for RACH defined by the System Information message, ~~details on definition of ASC and~~ The relation to the RACH retransmission algorithm are ffs.

6.1 Description of the MAC functions

The functions of MAC include:

- Access Service Class selection for RACH transmission.

The following potential functions is regarded as further study items:

- Processing of messages received at common control channels
- Successive Transmission on RACH
- ~~Access Service Class selection for RACH transmission.~~

References

- [1] TS25.301 V3.1.0 (1999-06), 3GPP, Radio Interface Protocol Architecture
- [2] TS25.321 V3.0.0 (1999-06), 3GPP, MAC protocol specification
- [3] Tdoc TSGR2#2(99)133, Sony International, RACH Prioritisation Scheme for Multi-service Provision.
- [4] TS25.332 V.1.1.2.0 (1999-7), 3GPP, RRC Protocol Specification