TSG-RAN Meeting #23 **RP-040129**
Phoenix, Arizona, USA, 10 - 13 March 2004

Title: **HSDPA capability for multimode FDD-TDD terminals**
Source: **Qualcomm, Nortel, Ericsson**

Agenda item: **7.3.5**

1. Independent Release 5 CRs to **TS 25.331** and the shadow CRs to Release 6 **(RP-040129)**

RP tdoc#	WG tdoc#	Spec	CR	R	Subject	Ph	C	Curr	New	WI	Remarks
RP-040129		25.331	2287	-	HSDPA capability for multimode FDD-TDD terminals	Rel-5	F	5.7.1	5.8.0	HSDPA_L23	
RP-040129		25.331	2288	-	HSDPA capability for multimode FDD-TDD terminals	Rel-6	A	6.0.1	6.1.0	HSDPA_L23	

1. Introduction

The ASN.1 description of the HSDPA Information Elements is not aligned with the tabular description of the same IEs. In particular, with the current ASN.1 it is not possible to signal the HSDPA capability for each of the modes supported by the UE (FDD, TDD, LCR-TDD), while this possibility is clearly allowed by the tabular description.

2. Discussion

In the attached CRs, a correction is proposed to align the ASN.1 description with the tabular description, i.e. it is proposed to allow the signalling of HSDPA capability in multimode UEs (FDD, TDD, LCR-TDD).

10.3.3.25 Physical channel capability

Information Element/Group name	Need	Multi	Type and Reference	Semantics description	Version
Downlink physical channel capability information elements					
FDD downlink physical channel capability	CH-*fdd_req_sup*				

Information Element/Group name	Need	Multi	Type and Reference	Semantics description	Version
>Max no DPCH/PDSCH codes	MP		Integer (1..8)	Maximum number of DPCH/PDSCH codes to be simultaneously received	
>Max no physical channel bits received	MP		Integer (1200, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 48000, 57600, 67200, 76800)	Maximum number of physical channel bits received in any 10 ms interval (DPCH, PDSCH, S-CCPCH)	
>Support for SF 512	MP		Boolean	TRUE means supported	
>Support of PDSCH	MP		Boolean	TRUE means supported	
>CHOICE *Support of HS-PDSCH*	CV-*not_iRAT_HoInfo*				REL-5
>>Supported					REL-5
>>>HS-DSCH physical layer category	MP		Integer (1..64)		REL-5
>>>Support of dedicated pilots for channel estimation of HS-DSCH	MP		Boolean	TRUE means supported	REL-5
>>Unsupported				(no data)	REL-5
>Simultaneous reception of SCCPCH and DPCH	MP		Boolean	TRUE means supported	
>Simultaneous reception of SCCPCH, DPCH and PDSCH	CV-*if_sim_rec_pdsch_sup*		Boolean	TRUE means supported	
>Max no of S-CCPCH RL	CV-*if_sim_rec*		Integer(1)	Maximum number of simultaneous S-CCPCH radio links	
>Support of dedicated pilots for	MD		Enumerated	Presence of this	

Information Element/Group name	Need	Multi	Type and Reference	Semantics description	Version
channel estimation			(true)	element means supported and absence not supported. This IE shall be set to TRUE in this version of the protocol.	
3.84 Mcps TDD downlink physical channel capability	CH-*3.84_Mcps_tdd_req_sup*				Name changed in REL-4
>Maximum number of timeslots per frame	MP		Integer (1..14)		
>Maximum number of physical channels per frame	MP		Integer (5..224)		
>Minimum SF	MP		Integer (1, 16)		
>Support of PDSCH	MP		Boolean	TRUE means supported	
>CHOICE *Support of HS-PDSCH*	CV-*not_iRAT_HoInfo*				REL-5
>>Supported					REL-5
>>>HS-DSCH physical layer category	MP		Integer (1..64)		REL-5
>>Unsupported				(no data)	REL-5
>Maximum number of physical channels per timeslot	MP		Integer (5..16)		
1.28 Mcps TDD downlink physical channel capability	CH-*1.28_Mcps_tdd_req_sup*				REL-4
>Maximum number of timeslots per subframe	MP		Integer (1..6)		REL-4
>Maximum number of physical channels per subframe	MP		Integer (1..96)		REL-4
>Minimum SF	MP		Integer (1, 16)		REL-4
>Support of PDSCH	MP		Boolean	TRUE means supported	REL-4

Information Element/Group name	Need	Multi	Type and Reference	Semantics description	Version
>CHOICE *Support of HS-PDSCH*	CV-*not_iRAT_HoInfo*				REL-5
>>Supported					REL-5
>>>HS-DSCH physical layer category	MP		Integer (1..64)		REL-5
>>Unsupported				(no data)	REL-5
>Maximum number of physical channels per timeslot	MP		Integer (1..16)		REL-4
>Support of 8PSK	MP		Boolean	TRUE means supported	REL-4
Uplink physical channel capability information elements					
FDD uplink physical channel capability	CH-*fdd_req_sup*				
>Maximum number of DPDCH bits transmitted per 10 ms	MP		Integer (600, 1200, 2400, 4800. 9600, 19200. 28800, 38400, 48000, 57600)		
>Support of PCPCH	MP		Boolean	TRUE means supported	
3.84 Mcps TDD uplink physical channel capability	CH-*3.84_Mcps_tdd_req_sup*				Name changed in REL-4
>Maximum Number of timeslots per frame	MP		Integer (1..14)		
>Maximum number of physical channels per timeslot	MP		Integer (1, 2)		
>Minimum SF	MP		Integer (1, 2, 4, 8)		
>Support of PUSCH	MP		Boolean	TRUE means supported	
1.28 Mcps TDD uplink physical channel capability	CH-*1.28_Mcps_tdd_req_s*				REL-4

Information Element/Group name	Need	Multi	Type and Reference	Semantics description	Version
	up				
>Maximum Number of timeslots per subframe	MP		Integer (1..6)		REL-4
>Maximum number of physical channels per timeslot	MP		Integer (1, 2)		REL-4
>Minimum SF	MP		Integer (1, 2, 4, 8, 16)		REL-4
>Support of PUSCH	MP		Boolean	TRUE means supported	REL-4
>Support of 8PSK	MP		Boolean	TRUE means supported	REL-4

Condition	Explanation
if_sim_rec_pdsch_sup	The IE is mandatory present if the IE "Simultaneous reception of SCCPCH and DPCH" = True and IE Support of PDSCH = True. Otherwise this field is not needed in the message.
if_sim_rec	The IE is mandatory present if the IE "capability Simultaneous reception of SCCPCH and DPCH" = True. Otherwise this field is not needed in the message.
3.84_Mcps_tdd_req_sup	The IE is mandatory present if the IE "TDD RF capability" is present with the IE "Chip rate capability" set to "3.84 Mcps" and a 3.84 Mcps TDD capability update has been requested in a previous message. Otherwise this field is not needed in the message.
1.28_Mcps_tdd_req_sup	The IE is mandatory present if the IE "TDD RF capability" is present with the IE "Chip rate capability" set to "1.28 Mcps" and a 1.28 Mcps TDD capability update has been requested in a previous message. Otherwise this field is not needed in the message.
fdd_req_sup	The IE is mandatory present if the IE "Multi-mode capability" has the value "FDD" or "FDD/TDD" and a FDD capability update has been requested in a previous message. Otherwise this field is not needed in the message.
not_iRAT_HoInfo	The CHOICE *Support of HS-PDSCH* is not needed in the INTER RAT HANDOVER INFO message. Otherwise, it is mandatory present.

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CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **2287** ⌘ **rev** **-** ⌘ Current version: **5.7.1** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	HSDPA capability for multimode FDD-TDD terminals
Source:	⌘	Qualcomm, (Nortel, Ericsson)
Work item code:	⌘	HSDPA_L23
Date:	⌘	March 10 2004
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The IE "PhysicalChannelCapability-hspdsch-r5" does not properly reflect the structure of the REL-5 additions to the tabular IE "Physical channel capability" (10.3.3.25). The current structure does not allow "modeSpecificInfo" for more than one access mode (FDD, TDD (3.84 Mcps) or TDD (1.28 Mcps)) at the time. Moreover, according to the tabular, the element "Support of dedicated pilots for channel estimation of HS-DSCH" is needed only for FDD, while in the ASN.1 it currently apples to all modes.
Summary of change:	⌘	In the ASN.1 description "CHOICE" is replaced with "SEQUENCE" and "supportOfDedicatedPilotsForChannelEstimationOfHSDSCH" is only included in the FDD branch.
Consequences if not approved:	⌘	A multimode (FDD-TDD-LCRTDD) terminal would not be able to signal the support of HSDPA independently for each mode. This would allow the use of HSDPA only in one mode even if the UE has the capability to support HSDPA in more than one mode.

Clauses affected:	⌘	11.3			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	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/specs/CR.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.

[…]

11.3 Information element definitions

[…]

```
PhysicalChannelCapability ::=       SEQUENCE {
        fddPhysChCapability                 SEQUENCE {
            downlinkPhysChCapability            DL-PhysChCapabilityFDD,
            uplinkPhysChCapability              UL-PhysChCapabilityFDD
        }                                           OPTIONAL,
        -- tddPhysChCapability describes the 3.84Mcps TDD physical channel capability
        tddPhysChCapability                 SEQUENCE {
            downlinkPhysChCapability            DL-PhysChCapabilityTDD,
            uplinkPhysChCapability              UL-PhysChCapabilityTDD
        }                                           OPTIONAL
}

-- PhysicalChannelCapability-LCR-r4 describes the 1.28Mcps TDD physical channel capability
PhysicalChannelCapability-LCR-r4 ::=        SEQUENCE {
        tdd128-PhysChCapability             SEQUENCE {
            downlinkPhysChCapability            DL-PhysChCapabilityTDD-LCR-r4,
            uplinkPhysChCapability              UL-PhysChCapabilityTDD-LCR-r4
        }                                           OPTIONAL
}

-- PhysicalChannelCapability-hspdsch-r5 describes the HS-PDSCH physical channel capability
PhysicalChannelCapability-hspdsch-r5 ::=        SEQUENCE {
    fdd-hspdsch                                     CHOICE {
        supported                                       SEQUENCE {
            hsdsch-physical-layer-category                  HSDSCH-physical-layer-category,
            supportOfDedicatedPilotsForChannelEstimationOfHSDSCH    BOOLEAN
        },
        unsupported                                     NULL
    },
    tdd384-hspdsch                                  CHOICE {
        supported                                       HSDSCH-physical-layer-category,
        unsupported                                     NULL
    },
    tdd128-hspdsch                                  CHOICE {
        supported                                       HSDSCH-physical-layer-category,
        unsupported                                     NULL
    }
    supportOfDedicatedPilotsForChannelEstimationOfHSDSCH            BOOLEAN,
    modeSpecificInfo                                CHOICE {
        fdd                                             SEQUENCE {
            hspdsch-supported                               CHOICE {
                supported                                       HSDSCH-physical-layer-category,
                notsupported                                    NULL
            }
        },
        tdd384                                          SEQUENCE {
            hspdsch-supported                               CHOICE {
                supported                                       HSDSCH-physical-layer-category,
                notsupported                                    NULL
            }
        },
        tdd128                                          SEQUENCE {
            hspdsch-supported                               CHOICE {
                supported                                       HSDSCH-physical-layer-category,
                notsupported                                    NULL
            }
        }
    }                                               OPTIONAL
}
```

[…]

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Category:	⌘	**A**
Release:	⌘	Rel-6

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Clauses affected:	⌘	11.3			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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        -- tddPhysChCapability describes the 3.84Mcps TDD physical channel capability
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            uplinkPhysChCapability              UL-PhysChCapabilityTDD
        }                                           OPTIONAL
}

-- PhysicalChannelCapability-LCR-r4 describes the 1.28Mcps TDD physical channel capability
PhysicalChannelCapability-LCR-r4 ::=        SEQUENCE {
        tdd128-PhysChCapability             SEQUENCE {
            downlinkPhysChCapability            DL-PhysChCapabilityTDD-LCR-r4,
            uplinkPhysChCapability              UL-PhysChCapabilityTDD-LCR-r4
        }                                           OPTIONAL
}

-- PhysicalChannelCapability-hspdsch-r5 describes the HS-PDSCH physical channel capability
PhysicalChannelCapability-hspdsch-r5 ::=        SEQUENCE {
    fdd-hspdsch                                     CHOICE {
        supported                                       SEQUENCE {
            hsdsch-physical-layer-category                  HSDSCH-physical-layer-category,
            supportOfDedicatedPilotsForChannelEstimationOfHSDSCH    BOOLEAN
        },
        unsupported                                     NULL
    },
    tdd384-hspdsch                                  CHOICE {
        supported                                       HSDSCH-physical-layer-category,
        unsupported                                     NULL
    },
    tdd128-hspdsch                                  CHOICE {
        supported                                       HSDSCH-physical-layer-category,
        unsupported                                     NULL
    }
    supportOfDedicatedPilotsForChannelEstimationOfHSDSCH            BOOLEAN,
    modeSpecificInfo                                CHOICE {
        fdd                                             SEQUENCE {
            hspdsch-supported                               CHOICE {
                supported                                       HSDSCH-physical-layer-category,
                notsupported                                    NULL
            }
        },
        tdd384                                          SEQUENCE {
            hspdsch-supported                               CHOICE {
                supported                                       HSDSCH-physical-layer-category,
                notsupported                                    NULL
            }
        },
        tdd128                                          SEQUENCE {
            hspdsch-supported                               CHOICE {
                supported                                       HSDSCH-physical-layer-category,
                notsupported                                    NULL
            }
        }
    }                                               OPTIONAL
}
```

[…]