TSG-RAN Meeting #25 RP-040365
Palm Springs, USA, 7-9 September 2004

Agenda Item: **8.11**
Source: **IPWireless**
Title: **Proposed Work Item on 7.68Mcps TDD option**
Document for: **Approval**

In RAN#17, a study item on "Analysis of higher chip rates for UTRA TDD evolution" was approved. The aim of the study was to look at the feasibility and performance gains of introducing a higher TDD chip rate into the 3GPP specifications.

The RAN WG1 study has shown that a chip rate of 7.68Mcps can provide gains of 30-40% for packet based services and 10-15% for voice services. The study has shown that a 7.68Mcps TDD system can be defined that allows for backwards compatibility with existing UTRA releases and that minimises changes from the 3.84Mcps TDD option. The RAN WG4 study has shown that a 7.68Mcps TDD system can coexist with other UTRA modes.

Based on these findings, this document proposes a work item to include a 7.68Mcps TDD option within the 3GPP specifications.

7.68Mcps TDD option

Work Item Description

Title: 7.68Mcps TDD option

1 3GPP Work Area

X	Radio Access
	Core Network
	Services

2 Linked work items

- 7.68Mcps TDD option: Physical Layer
- 7.68Mcps TDD option: Layer 2 and 3 Protocol Aspects
- 7.68Mcps TDD option: UTRAN Iub/Iur Protocol Aspects
- 7.68Mcps TDD option: RF Radio Transmission/ Reception, System Performance Requirements and Conformance Testing

3 Justification

In RAN#17, a study item on "Analysis of higher chip rates for UTRA TDD evolution" was approved. The aim of the study was to look at the feasibility and performance gains of introducing a higher TDD chip rate into the 3GPP specifications.

The RAN study has shown that significant performance gains are achieved when a chip rate of 7.68Mcps is adopted and that a 7.68Mcps TDD option can coexist with, and be backwards compatible with, existing UTRA modes.

4 Objective

The technical objective of the work item is the specification of a 7.68Mcps TDD option within the 3GPP standards. The specified 7.68Mcps option should take into account backwards compatibility aspects.

- For the radio interface physical layer, the feature includes:
  - Physical and Transport Channels mapping
  - Multiplexing and Channel Coding
  - Spreading and modulation
  - Physical Layer procedures
  - Physical layer measurements
  - UE physical layer capabilities

- For radio interface higher RAN layers:
  - Architecture aspects
  - MAC entity
  - Control plane protocols
  - User plane protocols
  - UE capabilities

- For Iur/Iub interface:
  - Control plane protocols
  - User plane protocols

- For radio transmission and reception:
  - UE radio transmission and reception
  - Base Station radio transmission and reception
  - Base Station conformance testing
  - Requirements for support of Radio Resource Management

5 Service Aspects

None

6 MMI-Aspects

None

7 Charging Aspects

None

8 Security Aspects

None

9 Impacts

Affects:	USIM	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

10 Expected Output and Time scale (to be updated at each plenary)

New specifications						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for endorsement at plenary#	Approved at plenary#	Comments
25.3xx	7.68Mcps TDD option stage 2	R1	R4	RAN#28	RAN#29	Rapporteur: Martin Beale, IPWireless

Affected existing specifications				
Spec No.	CR	Subject	Approved at plenary#	Comments

Note: this work item is the parent Work Item dealing with the stage 2 aspects; the stage 3 is defined in each of the 4 work items defined for each WG.

11 Work item raporteurs

Martin Beale (IPWireless)

12 Work item leadership

TSG-RAN WG1

13 Supporting Companies

IPWireless Inc., UTStarcom, Softbank BB Corporation, Panasonic Mobile Communication

14 Classification of the WI (if known)

X	Feature (go to 14a)
	Building Block (go to 14b)
	Work Task (go to 14c)

14a The WI is a Feature: List of building blocks under this feature

(list of Work Items identified as building blocks)
7.68Mcps TDD option: Physical Layer
7.68Mcps TDD option: Layer 2 and 3 Protocol Aspects

7.68Mcps TDD option: UTRAN Iub/Iur Protocol Aspects
7.68Mcps TDD option: RF Radio Transmission/ Reception, System Performance Requirements and Conformance Testing

14b The WI is a Building Block: parent Feature

(one Work Item identified as a feature)

14c The WI is a Work Task: parent Building Block

(one Work Item identified as a building block)
This WI has not finished yet. See RAN_Work_Items.

7.68Mcps TDD option: Physical Layer

Work Item Description

Title: 7.68Mcps TDD option: Physical Layer

1 3GPP Work Area

X	Radio Access
	Core Network
	Services

2 Linked work items

- 7.68Mcps TDD option
- 7.68Mcps TDD option: Layer 2 and 3 Protocol Aspects
- 7.68Mcps TDD option: UTRAN Iub/Iur Protocol Aspects
- 7.68Mcps TDD option: RF Radio Transmission/ Reception, System Performance Requirements and Conformance Testing

3 Justification

In RAN#17, a study item on "Analysis of higher chip rates for UTRA TDD evolution" was approved. The aim of the study was to look at the feasibility and performance gains of introducing a higher TDD chip rate into the 3GPP specifications.

The RAN study has shown that significant performance gains are achieved when a chip rate of 7.68Mcps is adopted and that a 7.68Mcps TDD option can coexist with, and be backwards compatible with, existing UTRA modes.

4 Objective

The technical objective of the work item is the specification of a 7.68Mcps TDD option within the 3GPP standards. The specified 7.68Mcps option should take into account backwards compatibility aspects.

- For physical layer, the building block includes:
  - Physical and Transport Channels mapping
  - Multiplexing and Channel Coding
  - Spreading and modulation
  - Physical Layer procedures
  - Physical layer measurements
  - UE physical layer capabilities

5 Service Aspects

None

6 MMI-Aspects

None

7 Charging Aspects

None

8 Security Aspects

None

9 Impacts

Affects:	USIM	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

10 Expected Output and Time scale (to be updated at each plenary)

New specifications						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for endorsement at plenary#	Approved at plenary#	Comments
		R1				
Affected existing specifications						
Spec No.	CR	Subject			Approved at plenary#	Comments
25.221		Physical channels and mapping of transport channels onto physical channels (TDD)			RAN#29	
25.222		Multiplexing and channel coding (TDD)			RAN#29	
25.223		Spreading and modulation (TDD)			RAN#29	
25.224		Physical layer procedures (TDD)			RAN#29	
25.225		Physical layer; Measurements (TDD)			RAN#29	

Note: this work item is the Physical Layer part of the stage 3 of the 7.68Mcps TDD option work item.

11 Work item raporteurs

Martin Beale (IPWireless)

12 Work item leadership

TSG-RAN WG1

13 Supporting Companies

IPWireless Inc., UTStarcom, Softbank BB Corporation, Panasonic Mobile Communication

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14 Classification of the WI (if known)

	Feature (go to 14a)
X	Building Block (go to 14b)
	Work Task (go to 14c)

14a The WI is a Feature: List of building blocks under this feature

(list of Work Items identified as building blocks)

14b The WI is a Building Block: parent Feature

(one Work Item identified as a feature)
7.68Mcps TDD option
14c The WI is a Work Task: parent Building Block

(one Work Item identified as a building block)
This WI has not finished yet. See RAN_Work_Items.

7.68Mcps TDD option: Layer 2 and 3 Protocol Aspects

Work Item Description

Title: 7.68Mcps TDD option: Layer 2 and 3 Protocol Aspects

1 3GPP Work Area

X	Radio Access
	Core Network
	Services

2 Linked work items

- 7.68Mcps TDD option
- 7.68Mcps TDD option: Physical Layer
- 7.68Mcps TDD option: UTRAN Iub/Iur Protocol Aspects
- 7.68Mcps TDD option: RF Radio Transmission/ Reception, System Performance Requirements and Conformance Testing

3 Justification

In RAN#17, a study item on "Analysis of higher chip rates for UTRA TDD evolution" was approved. The aim of the study was to look at the feasibility and performance gains of introducing a higher TDD chip rate into the 3GPP specifications.

The RAN study has shown that significant performance gains are achieved when a chip rate of 7.68Mcps is adopted and that a 7.68Mcps TDD option can coexist with, and be backwards compatible with, existing UTRA modes.

4 Objective

The technical objective of the work item is the specification of a 7.68Mcps TDD option within the 3GPP standards. The specified 7.68Mcps option should take into account backwards compatibility aspects.

- For radio interface higher RAN layers, the building block includes:
  - Architecture aspects
  - MAC entity
  - Control plane protocols
  - User plane protocols
  - UE capabilities

5 Service Aspects

None

6 MMI-Aspects

None

7 Charging Aspects

None

8 Security Aspects

None

9 Impacts

Affects :	USIM	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

10 Expected Output and Time scale (to be updated at each plenary)

New specifications						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for endorsement at plenary#	Approved at plenary#	Comments
		R2				

Affected existing specifications				
Spec No.	CR	Subject	Approved at plenary#	Comments
25.301		Radio Interface Protocol Architecture	RAN#29	
25.302		Services provided by the physical layer	RAN#29	
25.305		User Equipment (UE) positioning in Universal Terrestrial Radio Access Network (UTRAN)		
25.306		UE Radio Access capabilities definition	RAN#29	
25.321		Medium Access Control (MAC) protocol specification	RAN#29	
25.331		Radio Resource Control (RRC) protocol specification	RAN#29	

Note: this work item is the Layer 2 and 3 Protocol Aspects part of the stage 3 of the 7.68Mcps TDD option work item.

11 Work item raporteurs

Derek Richards (IPWireless)

12 Work item leadership

TSG-RAN WG2

13 Supporting Companies

IPWireless Inc., UTStarcom, Softbank BB Corporation, Panasonic Mobile Communication
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14 Classification of the WI (if known)

	Feature (go to 14a)
X	Building Block (go to 14b)
	Work Task (go to 14c)

14a The WI is a Feature: List of building blocks under this feature

(list of Work Items identified as building blocks)

14b The WI is a Building Block: parent Feature

(one Work Item identified as a feature)
7.68Mcps TDD option

14c The WI is a Work Task: parent Building Block

(one Work Item identified as a building block)
This WI has not finished yet. See RAN_Work_Items.

7.68Mcps TDD option: UTRAN Iub/Iur Protocol Aspects

Work Item Description

Title: 7.68Mcps TDD option: UTRAN Iub/Iur Protocol Aspects

1 3GPP Work Area

X	Radio Access
	Core Network
	Services

2 Linked work items

- 7.68Mcps TDD option
- 7.68Mcps TDD option: Physical Layer
- 7.68Mcps TDD option: Layer 2 and 3 Protocol Aspects
- 7.68Mcps TDD option: RF Radio Transmission/ Reception, System Performance Requirements and Conformance Testing

3 Justification

In RAN#17, a study item on "Analysis of higher chip rates for UTRA TDD evolution" was approved. The aim of the study was to look at the feasibility and performance gains of introducing a higher TDD chip rate into the 3GPP specifications.

The RAN study has shown that significant performance gains are achieved when a chip rate of 7.68Mcps is adopted and that a 7.68Mcps TDD option can coexist with, and be backwards compatible with, existing UTRA modes.

4 Objective

The technical objective of the work item is the specification of a 7.68Mcps TDD option within the 3GPP standards. The specified 7.68Mcps option should take into account backwards compatibility aspects.

- For Iur/Iub interface, the building block includes:
  - Control plane protocols
  - User plane protocols

5 Service Aspects

None

6 MMI-Aspects

None

7 Charging Aspects

None

8 Security Aspects

None

9 Impacts

Affects:	USIM	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

10 Expected Output and Time scale (to be updated at each plenary)

New specifications						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for endorsement at plenary#	Approved at plenary#	Comments
25.42x	Iur user plane protocols for 7.68Mcps TDD option	R3		RAN#28	RAN#29	
25.43x	Iub user plane protocols for 7.68Mcps TDD option	R3		RAN#28	RAN#29	

Affected existing specifications				
Spec No.	CR	Subject	Approved at plenary#	Comments
25.401		UTRAN overall description	RAN#29	
25.420		UTRAN Iur Interface: General Aspects and Principles	RAN#29	
25.423		UTRAN Iur interface Radio Network Subsystem Application Part (RNSAP) signalling	RAN#29	
25.425		UTRAN Iur interface user plane protocols for CCH data streams	RAN#29	
25.427		UTRAN Iur and Iub interface user plane protocols for DCH data streams	RAN#29	
25.430		UTRAN Iub Interface: General Aspects and Principles	RAN#29	
25.433		UTRAN Iub interface NBAP signalling	RAN#29	
25.435		UTRAN Iub interface user plane protocols for CCH data streams	RAN#29	

Note: this work item is the UTRAN Iub/Iur Protocol Aspects part of the stage 3 of the 7.68Mcps TDD option work item.

11 Work item raporteurs

Peter Legg (IPWireless)

12 Work item leadership

TSG-RAN WG3

13 Supporting Companies

IPWireless Inc., UTStarcom, Softbank BB Corporation, Panasonic Mobile Communication

14 Classification of the WI (if known)

	Feature (go to 14a)
X	Building Block (go to 14b)
	Work Task (go to 14c)

14a The WI is a Feature: List of building blocks under this feature

(list of Work Items identified as building blocks)

14b The WI is a Building Block: parent Feature

(one Work Item identified as a feature)
7.68Mcps TDD option

14c The WI is a Work Task: parent Building Block

(one Work Item identified as a building block)
This WI has not finished yet. See RAN_Work_Items.

7.68Mcps TDD option: RF Radio Transmission/ Reception, System Performance Requirements and Conformance Testing

Work Item Description

Title: 7.68Mcps TDD option: RF Radio Transmission/ Reception, System Performance Requirements and Conformance Testing

1 3GPP Work Area

X	Radio Access
	Core Network
	Services

2 Linked work items

- 7.68Mcps TDD option
- 7.68Mcps TDD option: Physical Layer
- 7.68Mcps TDD option: Layer 2 and 3 Protocol Aspects
- 7.68Mcps TDD option: UTRAN Iub/Iur Protocol Aspects

3 Justification

In RAN#17, a study item on "Analysis of higher chip rates for UTRA TDD evolution" was approved. The aim of the study was to look at the feasibility and performance gains of introducing a higher TDD chip rate into the 3GPP specifications.

The RAN study has shown that significant performance gains are achieved when a chip rate of 7.68Mcps is adopted and that a 7.68Mcps TDD option can coexist with, and be backwards compatible with, existing UTRA modes.

4 Objective

The technical objective of the work item is the specification of a 7.68Mcps TDD option within the 3GPP standards. The specified 7.68Mcps option should take into account backwards compatibility aspects.

- For radio transmission and reception, the building block includes:
  - UE radio transmission and reception
  - Base Station radio transmission and reception
  - Base Station conformance testing
  - Requirements for support of Radio Resource Management

5 Service Aspects

None

6 MMI-Aspects

None

7 Charging Aspects

None

8 Security Aspects

None

9 Impacts

Affects:	USIM	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

10 Expected Output and Time scale (to be updated at each plenary)

New specifications						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for endorsement at plenary#	Approved at plenary#	Comments
		R4				

Affected existing specifications				
Spec No.	CR	Subject	Approved at plenary#	Comments
25.102		User Equipment (UE) radio transmission and reception (TDD)	RAN#31	
25.105		Base station (BS): radio transmission and reception (TDD)	RAN#31	
25.123		Requirements for support of radio resource management (TDD)		
25.133		Requirements for support of radio resource management (FDD)	RAN#31	
25.142		Base Station (BS) conformance testing (TDD)	RAN#31	

Note: this work item is the RF Radio Transmission/ Reception, System Performance Requirements and Conformance Testing part of the stage 3 of the 7.68Mcps TDD option work item.

11 Work item raporteurs

Shin Horng Wong (IPWireless)

12 Work item leadership

TSG-RAN WG4

13 Supporting Companies

IPWireless Inc., UTStarcom, Softbank BB Corporation, Panasonic Mobile Communication

14 Classification of the WI (if known)

	Feature (go to 14a)
X	Building Block (go to 14b)
	Work Task (go to 14c)

14a The WI is a Feature: List of building blocks under this feature

(list of Work Items identified as building blocks)

14b The WI is a Building Block: parent Feature

(one Work Item identified as a feature)
7.68Mcps TDD option

14c The WI is a Work Task: parent Building Block

(one Work Item identified as a building block)
This WI has not finished yet. See RAN_Work_Items.