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Technical Report

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Optimisations for Iur and Iub

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Foreword

This Technical Report (TR) has been produced by the 3rd Generation Partnership Project (3GPP), Technical Specification Group RAN.

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

Version m.t.e

where:

- m indicates [major version number]
- x the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- y the third digit is incremented when editorial only changes have been incorporated into the specification.

1 Scope

The purpose of the present document is to help the TSG RAN WG3 group to specify the changes to existing specifications, needed for the introduction of the "Radio Resource Management (RRM) optimisations for Iur and Iub" Building Block (BB) option for Release 2000.

Based on [1], the "RRM optimisations for Iur and Iur" BB consists of 7 Work Tasks (WTs):

1) Congestion handling of DCH
2) Procedure parallelism on Iub/Iur
3) DPC Rate Reduction in soft handover
4) Introduction of common measurements over Iur
5) Extension of Radio Interface Parameters updating in the user plane
6) Separation of resource reservation and radio link activation
7) Triggering of the Common Transport Channel Resources Initiation procedure by DRNC

The different WTs will be described in subsequent chapters. It is intended to gather all information in order to trace the history and the status of the WTs in RAN WG3. It is not intended to replace contributions and Change Requests, but only to list conclusions and make references to agreed contributions and CRs. When solutions are sufficiently stable, the CRs can be issued.

It describes agreed requirements related to the WTs.

It identifies the affected specifications with related Change Requests.

It also describes the schedule of the WTs.

This document is a 'living' document, i.e. it is permanently updated and presented to all TSG-RAN meetings.

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 an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1.] Work Item Description: RRM optimisations for Iur and Iur
RP-000310, submitted and approved at RAN#8

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

~~1.2~~3.2 Symbols

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

BB Building Block

RRM Radio Resource Management

WT Work Task

4 RRM Opt 1: Congestion handling of DCH

4.1 Introduction

Currently a DRNC accepting a dedicated RL, in principle needs to reserve resources for the maximum bitrate which could possibly be required for the DCH's on this RL. This because the DRNC has a very limited view on the load statistics of the DCH's (source descriptor) and has no possibility to control the DL-rate of the DCH's in congestion situations.

~~1.2~~4.2 Requirements

The following requirements are identified:

1) It shall be possible for the DRNS to request the SRNC to decrease the resource usage for one or more DCH's due to local congestion conditions in the DRNS.

2) Primary focus should be on UL interference and DL power congestion conditions, allthough congestion for other types of resources may also be considered;

3) Any chosen solution shall support interworking to Iu rate control for real-time services;

4) It shall be possible to have the requested decrease indicated with a granularity sufficiently small to enable an efficient usage of any remaining DRNS resources;

5) …..

4.3 Study areas

4.3.1 General

Any new functionality introduced in R4 should be introduced with the least possible impact to the existing R99 specifications.

4.3.2 New information

To indicate a partial resource usage request, the following information should be provided by the DRNS to the SRNC:

1. Indication of one or more affected RL's;
2. Indication of one or more specific DCH's;
3. Indication of the level of decrease in resource usage that is requested;

For indicating the requested decrease level, one could think of several ways to signal this information. Possibilities included e.g.:

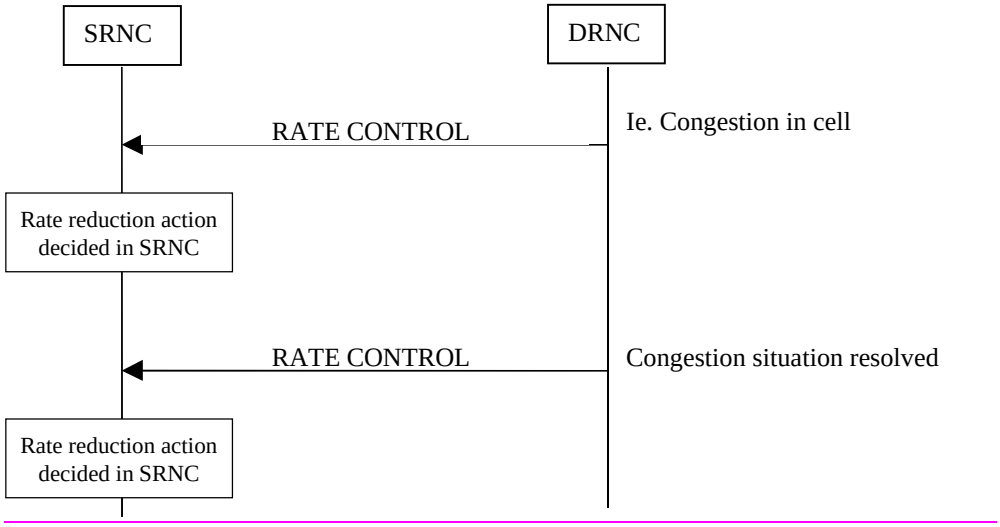
- desired TFS;
- desired TFCS;
- user data rate related information;

To leave as much as possible freedom to the SRNC concerning how to smartly adapt to the new resource situation in the DRNS, it is proposed to signal the user data rate that a DRNS proposes the SRNC to use as a new maximum rate.

4.3.3 New message format

4.3.4 Example scenario

The following sequence shows a possible signalling scenario executed during a temporary local congestion situation in the DRNC.



4.4 Agreements and associated contributions

4.5 Specification Impact and associated Change Requests

This section is intended to list the affected specifications and the related agreed Change Requests. It also lists the possible new specifications that may be needed for the completion of the Work Task.

~~1.6~~4.6 Open issues

The following open issues are identified:

1. Should also the end of the congestion situation be indicated with the same procedure ?
2. Is it sufficient for the SRNC to limit the TFS/TFCS used to the newly indicated rate or should a physical channel reconfiguration be required ?
3. Shall the indicated signalling take place in the Iur control plane or user plane ?

5 RRM Opt 2: Procedure parallelism on Iub/Iur

5.1 Introduction

Currently almost no procedure parallelism is allowed in NBAP/RNSAP (dedicated) procedures. As a result, an RRM procedure used for handling problems in a fast changing radio environment, could have to wait for termination of a procedure e.g. introducing a new service on the RL.

In order to improve the capability of the UTRAN to respond to fast changes in the radio environment, the restrictions on parallelism between procedures coping with radio environment changes (e.g. RL_ADDITION/RL_DELETION) and other procedures (e.g. RL_RECONFIGURATION) should be decreased.

~~1.2~~5.2 Requirements

5.3 Study areas

5.4 Agreements and associated contributions

5.5 Specification Impact and associated Change Requests

This section is intended to list the affected specifications and the related agreed Change Requests. It also lists the possible new specifications that may be needed for the completion of the Work Task.

~~1.6~~5.6 Open issues

6 RRM Opt 3: DPC Rate Reduction in soft handover

6.1 Introduction

Currently R1 describes two DPC_modes in 25.214, however mode change signalling is not supported by R3.

By supporting DPC-mode change signalling in the UTRAN, the UTRAN should be better capable of combating power drifting in the DL.

~~1.2~~6.2 Requirements

6.3 Study areas

6.4 Agreements and associated contributions

6.5 Specification Impact and associated Change Requests

This section is intended to list the affected specifications and the related agreed Change Requests. It also lists the possible new specifications that may be needed for the completion of the Work Task.

~~1.6~~6.6 Open issues

7 RRM Opt 4: Introduction of common measurements over Iur

7.1 Introduction

It is proposed to study the usefulness of / possibilities for introducing common measurements on Iur. For example, at present an SRNC has no information regarding cell load information in neighbouring cells on a DRNC when making soft handover decisions. A study should indicate whether clear benefits exist of providing such load information to a neighbouring CRNC.

If this, or other possible measurements are identified, a common measurement procedure as currently supported on Iub could be introduced in RNSAP.

~~1.2~~7.2 Requirements

7.3 Study areas

7.4 Agreements and associated contributions

7.5 Specification Impact and associated Change Requests

This section is intended to list the affected specifications and the related agreed Change Requests. It also lists the possible new specifications that may be needed for the completion of the Work Task.

~~1.6~~7.6 Open issues

8 RRM Opt 5: Extension of Radio Interface Parameters updating in the user plane

8.1 Introduction

Currently the Iub/Iur DCH FP supports a fast update of the TPC Power Offset in the DL RL via user plane signalling.

It should be studied if more radio interface parameters would benefit from a similar handling. If such parameters are identified, the user plane should be extended for this purpose.

~~1.2~~8.2 Requirements

8.3 Study areas

8.4 Agreements and associated contributions

8.5 Specification Impact and associated Change Requests

This section is intended to list the affected specifications and the related agreed Change Requests. It also lists the possible new specifications that may be needed for the completion of the Work Task.

~~1.6~~8.6 Open issues

9 RRM Opt 6: Separation of resource reservation and radio link activation

9.1 Introduction

This work task aims at introducing the possibility to have dedicated resources reserved in UTRAN without transmitting energy on the corresponding radio link(s). Furthermore, a separate mechanism for activating and deactivating radio transmission related to the reserved resources shall be introduced.

The separation will enable the following optimisations in UTRAN:

- delayed activation of a radio link at soft handover for high bit rate users, thus avoiding a potential handover problem;
- quicker channel type switching back to Cell_DCH;
- quicker radio link additions of radio links that recently were part of the active set;

9.2 Requirements

9.3 Study areas

9.4 Agreements and associated contributions

9.5 Specification Impact and associated Change Requests

This section is intended to list the affected specifications and the related agreed Change Requests. It also lists the possible new specifications that may be needed for the completion of the Work Task.

~~1.6~~9.6 Open issues

10 RRM Opt 7: Triggering of the Common Transport Channel Resources Initiation procedure by DRNC

10.1 Introduction

Currently the DRNC has no possibility to request an SRNC to move a UE from using one combination of RACH/FACH channels to other RACH/FACH channels. However this functionality is provided by R(99) RRC signalling and is considered beneficial for obtaining a good distribution of the common resource usage in the DRNS.

For R(00) an appropriate solution should be specified to provide this capability to the DRNC.

~~1.2~~10.2 Requirements

10.3 Study areas

10.4 Agreements and associated contributions

10.5 Specification Impact and associated Change Requests

This section is intended to list the affected specifications and the related agreed Change Requests. It also lists the possible new specifications that may be needed for the completion of the Work Task.

~~1.6~~10.6 Open issues

11 Project Plan

11.1 Schedule

Date	Meeting	Scope	[expected] Input	[expected]Output

~~1.2~~11.2 Work Task Status

	Planned Date	Milestone	Status
1.			
2.			

12 History

Document history		
V0.0.1	2000-07	First proposal
V 0.1.0	2000-08	Version agreed at RAN3#15
V 0.1.1	2000-11	Rapporteurs proposal for inclusion of contributions/comments received during R3#17
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