

**Source:** TSG CN WG 1  
**Title:** WID: Intra Domain Connection of RAN Nodes to Multiple CN Nodes  
**Agenda item:** 9.10  
**Document for:** APPROVAL

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**3GPP TSG-CN1 Meeting #21**  
**Cancun, Mexico, 26.- 30. November 2001**

***Tdoc N1-011990***  
**(N1-011940)**

**Source:** Vodafone  
**Title:** Work Item Description: Intra Domain Connection of RAN Nodes to Multiple CN Nodes  
**Agenda item:** 8.15  
**Document for:** Approval

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**1 3GPP Work Area**

	Radio Access
X	Core Network
	Services

**2 Linked work items**

- F1 Intra Domain Connection of RAN Nodes to Multiple CN Nodes: Overall System Architecture  
SA 2 is responsible for this.
- BB2 RAN work for Intra Domain Connection of RAN Nodes to Multiple CN Nodes  
[RAN 3 is predicted to lead the work in RAN]
- BB3 GERAN work for Intra Domain Connection of RAN Nodes to Multiple CN Nodes  
[GERAN 2 is predicted to lead the work in GERAN]

**3 Justification**

In the current network architecture, an RNC can only be connected to one MSC and/or one SGSN. The same restriction applies to BSCs. This has the following consequences:

- a) when a BSC (or RNC) has a relatively large capacity compared to that of an MSC/SGSN there are frequently significant wastages of hardware. (For example, if a BSC has 40% of the capacity of an MSC, do you connect 2 or 3 BSCs to that MSC?)
- b) as networks carry more traffic, the geographic area covered by one MSC or SGSN (of a given capacity) decreases. However, subscribers still tend to travel the same physical distances and therefore there are more inter-MSC/SGSN registration updates. The signalling associated with these inter MSC/SGSN updates causes additional load on MSCs, SGSNs, HLRs, the core network signalling networks and on the radio interface signalling channels.

The ability to connect RNCs and BSCs to more than one MSC and to more than one SGSN could reduce the above problems. In addition, the ability to provide load sharing between MSCs (SGSNs) would further improve the efficiency of hardware utilisation.

This work will focus on a solution where a routing function is placed in the RNC (or BSC). This avoids most of the problems of a standalone node (TR 23.913 called it the Turbo Routing Function), while retaining the other advantages described in R'99, TR 23.913.

This Work Item (which is a Building Block) proposes to provide a standardised mechanism for the connection of multiple MSCs (and SGSNs) to an RNC or a BSC (both A/Gb mode and Iu mode) which reduces mobility management signalling and permits improved efficiency in hardware utilisation.

It is intended that this new concept is an architectural option for any PLMN. Its deployment, or non-deployment, by one network operator should not place requirements on other network operators.

#### 4 Objective

The objective of this Work Item is to produce the necessary updates to the CN TSs and to verify that there is no impact on other CN TSs.

#### 5 Service Aspects

*None*

#### 6 MMI-Aspects

*None*

#### 7 Charging Aspects

*None*

#### 8 Security Aspects

*None*

#### 9 Impacts

<b>Affects:</b>	<b>USIM</b>	<b>ME</b>	<b>AN</b>	<b>CN</b>	<b>Others</b>
<b>Yes</b>				X	
<b>No</b>	X	X	X		X
<b>Don't know</b>					

**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 information at plenary#	Approved at plenary#	Comments
Affected existing specifications						
Spec No.	CR	Subject		Approved at plenary#	Comments	
23.003	033	Rules for TMSI partitioning		CN #14		
23.007		None?		CN #15?	Need to verify that no changes are needed.	
23.009	052	Clarify handover issues		CN#14		
23.012		Relay of the SEND IDENTIFICATION message		CN#15		
24.007		None			It was decided during CN1 #20 that no change was necessary.	
24.008	493	Mandatory use of TMSI		CN #14		
29.002		None?		CN #15?	Need to verify that no changes are needed.	
29.018	024 ?	Update to Paging message and other minor changes		CN #14		
29.060	259	Relay of Identification Request message and SGSN Context Request message.		CN #14		

**11 Work item rapporteurs**

Duncan Mills, Vodafone

**12 Work item leadership**

CN 1

**13 Supporting Companies**

Vodafone, Nokia, Ericsson, Nortel, Mannesmann

**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, F1: Intra Domain Connection of RAN Nodes to Multiple CN Nodes: Overall System Architecture

SA 2 is responsible for this.

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

(one Work Item identified as a building block)