TWG
GSM Association   Unrestricted

Meeting Number	**TWG# 37**	**TWG Doc 195/02**
Meeting Date	**10-14 June, 2002**	
Meeting Location	**St. Petersburg, RUSSIA**	

Title   LS to 3GPP TSG-T, TSG-T WG2, TSG-RAN WG2 and TSG-GERAN WG2

Source   **GSMA TWG**
Date   **June 12, 2002**

Security Classification Category:	Please mark with "X" where applicable
Unrestricted - Industry	**X**
Unrestricted - Public	**X**

Status
Please mark with "X" one of the following actions relating to this document:
For Approval ☒   **For Information** ☐

Associated Knowledge Basis	Enter if applicable

Document History		
Revision	**Date**	**Brief Description**

Summary
This document contains a LS to 3GPP TSG-T, TSG-T WG2, TSG-RAN WG2 and TSG-GERAN WG2 concerning an unclear standardisation of an AT command in TS 27.007.

TWG
GSM Association   Unrestricted

Liaison Statement

To: **3GPP TSG-T, TSG-T WG2, TSG-RAN WG2 and TSG-GERAN WG2**

From: **GSMA TWG**

Subject: **Unclear standardisation of AT command +WS46**

1. Introduction

3GPP TS 27.007 defines the PCCA STD 101 AT Command +WS46 (Select Wireless Network). This command is optional for a UE and may be used by a MT/TA to select the cellular network a UE shall use for a connection.

The impact of this command on the behaviour of multi-RAT UEs has not been standardised in TS 27.007 nor in other specs. Implementation of this command could result in a change of the UE radio access capabilities.

It is a highly concern of TWG that when this command is used dual RAT UEs would become single RAT UEs and may not work proper in dual-RAT networks as foreseen by the standard.

2. PCCA STD 101 command AT +WS 46

In the standard STD101 the Portable Computer and Communication Association (PCCA) defines extensions for the interconnection of terminal equipment (DTE) and data circuit-terminating equipment (DCE) for serial data operation via the 100-series interchange circuits or equivalent logical circuits.

The "AT +WS46" command is one of these extensions. With this command the DTE selects a WDS-Side Stack of the Wireless Data Service, i.e. it selects a RAT. This command was designed for DCEs supporting more than one Wireless Data Service Interface, e.g. AMPS-Data Mode + CDMA Digital Cellular.

STD 101 (1993) and the update to the standard from November 23, 2001 define the following +WS46 parameters applicable for 3GPP Release 99 terminals:

+WS46=12   GSM

+WS46=22   Wideband CDMA

+WS46=25   General Packet Radio Service (GPRS), GSM networks

3. Usage of AT +WS46 in dual RAT UEs

3GPP TS 27.007 adapt the +WS46 command. However the command is not standardised completely but a reference to STD101 is included. The 3GPP Rel. 99 standard does not specify the behaviour of a terminal when DTE requests a change of the UE capabilities.

Throughout this paragraph the UE is assumed to be a Type 2 dual RAT terminal supporting GERAN and UTRAN with an interface to connect a DTE. It is further assumed that the UE's dual-RAT operation follows TR 21.910 and the UE operates in a dual-RAT network with at least one GERAN and one UTRAN suitable cell.

TWG
GSM Association   Unrestricted

A terminal supporting the +WS46 command should follow the following recommendation:

Subsequent to receiving the AT+WS46 command the UE shall expect a ATD command (Originated Call) from DTE for setting up a CS connection. The UE shall not change to single-RAT before the ATD command is received. Other call establishments, packet switched establishments or mobile terminating calls shall not result in a side-stack selection, i.e. the UE remains in multi-RAT state.

Subsequent to receiving both AT+WS46 and ATD the UE would use CLASSMARK CHANGE, UMTS CLASSMARK CHANGE procedure or sent UE CAPABILITY INFORMATION to the network about its UE capability change. Call establishment shall start after selection of the requested RAT.

The following table is an example and highlights different cases depending on the RAT of the cell the UE camps and the UE state when the +WS46 command is received from DTE:

RAT of cell where UE camps on before receiving +WS46 command	State of UE before receiving +WS46 command	AT +WS46=12 (GSM) and AT D is received	AT +WS46=22 (WCDMA) and AT D is received
GSM	idle	Change from multi-RAT to single-RAT during call establishment: • Change of classmark during Classmark Change Procedure The UE behaves as pure GSM terminal. The requested connection would be established.	UE would become a Single-RAT terminal (WCDMA) and searches for a UTRAN cell on the same PLMN/ePLMN. • The UE notifies the network about the new capabilities The UE behaves as pure WCDMA terminal. The requested connection would be established.
GSM	CS connected	It is expected that the UE rejects the +WS46 establishment.	Establishing of a connection on UTRAN would require a release of the GERAN connection. It is expected that the UE rejects the +WS46 establishment.

TWG
GSM Association   Unrestricted

RAT of cell where UE camps on before receiving +WS46 command	State of UE before receiving +WS46 command	AT +WS46=12 (GSM) and AT D is received	AT +WS46=22 (WCDMA) and AT D is received
UMTS	idle	UE would become a Single-RAT terminal and searches for a GSM cell of the same PLMN/ePLMN. The UE behaves as pure GSM terminal, i.e. perform registration on the selected GSM cell of the registered PLMN/ePLMN if available. The requested connection would be established.	Change from multi-RAT to single-RAT during call establishment: • RRC connection establishment • Change of classmark during Classmark Change Procedure The UE behaves as pure WCDMA terminal.
UMTS	CELL_PCH, URA_PCH or CELL_FACH	***TWG would kindly ask RAN2 to clarify the correct terminal behaviour in this case.*** The UE has to release the existing connection and return to idle mode before the reselection to GSM RAT can occur. UE would become a Single-RAT terminal, i.e. behaves as pure GSM terminal and selects GSM cell of registered PLMN/ePLMN if available. The requested connection would be established.	Change from multi-RAT to single-RAT during call establishment, where the UE informs RNC about changes of its capabilities. The UE behaves as pure WCDMA terminal.
UMTS	CELL_DCH	Establishing of a new connection on GERAN would require a release of the UTRAN connection(s): It is expected that the UE rejects the +WS46 establishment.	Change of "UE multi-mode/multi-RAT capability" for an existing connection not standardised. It is expected that the UE rejects the +WS46 establishment.

It has to be standardised when the UE has to change its RAT capability back to multi-RAT: The standard should recommend that after release of the DTE triggered connection or if the connection can not be established after a timeout, the UE shall

TWG
GSM Association   Unrestricted

return to multi-mode, informing the network about its capability change. The standard should define a value in the case of a timeout.

4.   Summary

A multi-RAT UE supporting GERAN and UTRAN which maintains the PCCA STD 101 AT Command +WS46 would become a single-RAT UE after receiving the AT+WS46 command from a connected DTE. It is unclear if this terminal would become a multi-RAT UE again before switching it off and on.

TWG requests 3GPP to standardise how the UE informs the network about the change of access capabilities and when the multi-RAT UE shall revert to its original radio access capabilities.