

Source: Lucent Technologies, Ericsson
Title: CR 25.215-044R2: Correction to UE/UTRAN GPS timing of cell frames for LCS
Document for: Approval

1. Introduction

This is a revision 2 of CR 25.215 – 044.

Following discussion, CR 25.215 - 044Rev2 is presented here for approval.

2. References

- [1] Tdoc R1-00-0110: "CR 25.215-030R1"; RAN WG1 #10; 18 Jan – 21 Jan 2000.
- [2] Tdoc R1-00-0324: "CR 25.215-044"; RAN WG1 #11; 29 Feb – 3 Mar 2000.

5.1.13 UE Rx-Tx time difference

Definition	The difference in time between the UE uplink DPCCH/DPDCH frame transmission and the first significant path, of the downlink DPCH frame from the measured radio link. Measurement shall be made for each cell included in the active set. Note: The definition of "first significant path" needs further elaboration.
Applicable for	Connected Intra
Range/mapping	The UE Rx-Tx time difference is given with the resolution of 0.25 chip with the range [876, ..., 1172] chips.

5.1.14 Observed time difference to GSM cell

Definition	The Observed time difference to GSM cell is defined as: $T_{RxGSMj} - T_{RxSFNi}$, where: T_{RxSFNi} is the time at the beginning of the P-CCPCH frame with SFN=0 from cell i. T_{RxGSMj} is the time at the beginning of the GSM BCCH 51-multiframe from GSM frequency j received closest in time after the time T_{RxSFNi} . If the next GSM multiframe is received exactly at T_{RxSFNi} then $T_{RxGSMj} = T_{RxSFNi}$ (which leads to $T_{RxGSMj} - T_{RxSFNi} = 0$). The timing measurement shall reflect the timing situation when the most recent (in time) P-CCPCH with SFN=0 was received in the UE.
Applicable for	Idle, Connected Inter
Range/mapping	The Observed time difference to GSM cell is given with the resolution of $3060/(4096*13)$ ms with the range [0, ..., $3060/13-3060/(4096*13)$] ms.

5.1.15 UE GPS Timing of Cell Frames for LCS

Definition	The timing between cell j and GPS Time Of Week. $T_{UE-GPSj}$ is defined as the time of occurrence of a specified UTRAN event according to GPS time. The specified UTRAN event is the beginning of a particular frame (identified through its SFN) in the first significant multipath of the cell j CPICH, where cell j is a cell within the active set.
Applicable for	Connected Intra, Connected Inter
Range/mapping	The resolution of $T_{UE-GPSj}$ is 0.125 chips/4 μ s. The range is from 0 to 2319360000000 chips/6.04 $\times 10^{11}$ μ s. $T_{UE-GPSj}$ shall be reported in the unit GPS_TIME where: GPS_TIME_00000000000000: 0 chip $\leq T_{UE-GPSj} < 0.125$ chip GPS_TIME_00000000000001: 0.125 chip $\leq T_{UE-GPSj} < 0.250$ chip GPS_TIME_00000000000002: 0.250 chip $\leq T_{UE-GPSj} < 0.375$ chip ... GPS_TIME_18554879999997: 2319359999999.625 chip $\leq T_{UE-GPSj} < 2319359999999.750$ chip GPS_TIME_18554879999998: 2319359999999.750 chip $\leq T_{UE-GPSj} < 2319359999999.875$ chip GPS_TIME_18554879999999: 2319359999999.875 chip $\leq T_{UE-GPSj} < 2319360000000.000$ chip

Definition	<p>Type 1: Measured on the DPDCH: The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination in Node B.</p> <p>Type 2: Measured on the DPCCH: The Physical channel BER is an estimation of the average bit error rate (BER) on the DPCCH after RL combination in Node B.</p> <p>It shall be possible to report a physical channel BER estimate of type 1 or of type 2 or of both types at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.</p>
Range/mapping	<p>The Physical channel BER shall be reported for $0 \leq \text{Physical channel BER} \leq 1$ in the unit BER_dB where:</p> <p>BER_dB_00: Physical channel BER = 0 BER_dB_01: $-\infty < \text{Log}_{10}(\text{Physical channel BER}) < -4.03$ BER_dB_02: $-4.03 \leq \text{Log}_{10}(\text{Physical channel BER}) < -3.965$ BER_dB_03: $-3.965 \leq \text{Log}_{10}(\text{Physical channel BER}) < -3.9$... BER_dB_61: $-0.195 \leq \text{Log}_{10}(\text{Physical channel BER}) < -0.13$ BER_dB_62: $-0.13 \leq \text{Log}_{10}(\text{Physical channel BER}) < -0.065$ BER_dB_63: $-0.065 \leq \text{Log}_{10}(\text{Physical channel BER}) \leq 0$</p>

5.2.7 Round trip time

NOTE: The relation between this measurement and the TOA measurement defined by WG2 needs clarification.

Definition	<p>Round trip time (RTT), is defined as $RTT = T_{RX} - T_{TX}$, where T_{TX} = The time of transmission of the beginning of a downlink DPCH frame to a UE. T_{RX} = The time of reception of the beginning (the first significant path) of the corresponding uplink DPCCH/DPDCH frame from the UE. Note: The definition of "first significant path" needs further elaboration. Measurement shall be possible on DPCH for each RL transmitted from an UTRAN access point and DPDCH/DPCCH for each RL received in the same UTRAN access point.</p>
Range/mapping	<p>The Round trip time is given with the resolution of 0.25 chip with the range [876, ..., 2923.75] chips.</p>

5.2.8 UTRAN GPS Timing of Cell Frames for LCS

Definition	<p>The timing between cell j and GPS Time Of Week. $T_{UTRAN-GPSj}$ is defined as the time of occurrence of a specified UTRAN event according to GPS time. The specified UTRAN event is the beginning of a particular frame (identified through its SFN) in the first significant multipath of the cell j CPICH, where cell j is a cell within the active set.</p>
Applicable for	<p>Connected Intra, Connected Inter</p>
Range/mapping	<p>The resolution of $T_{UTRAN-GPSj}$ is 0.125 chips/μs. The range is from 0 to $231936000000 \text{ chips} \times 10^{-4} \mu\text{s}$. $T_{UTRAN-GPSj}$ shall be reported in the unit GPS_TIME where:</p> <p><u>GPS_TIME_0000000000000: 0 chip $\leq T_{UTRAN-GPSj} < 0.125 \text{ chip}$</u> <u>GPS_TIME_000000000000001: 0.125 chip $\leq T_{UTRAN-GPSj} < 0.250 \text{ chip}$</u> <u>GPS_TIME_000000000000002: 0.250 chip $\leq T_{UTRAN-GPSj} < 0.375 \text{ chip}$</u> ... <u>GPS_TIME_18554879999997: 231935999999.625 chip $\leq T_{UTRAN-GPSj} < 231935999999.750 \text{ chip}$</u> <u>GPS_TIME_18554879999998: 231935999999.750 chip $\leq T_{UTRAN-GPSj} < 231935999999.875 \text{ chip}$</u> <u>GPS_TIME_18554879999999: 231935999999.875 chip $\leq T_{UTRAN-GPSj} < 231936000000.000 \text{ chip}$</u></p>