TSG-RAN Meeting #24 **RP-040209**
Seoul, Korea, 02-04 June 2004

Title: **CRs to 25.305 (Rel-5 and associated Rel-6)**

Source: **TSG-RAN WG2**

Agenda item: **7.3.5**

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Workitem	Doc-2nd-Level
25.305	102	-	Rel-5	Corrections to time stamp in position information report and to SRNC relocation	F	5.8.0	5.9.0	TEI5	R2-041149
25.305	103	-	Rel-6	Corrections to time stamp in position information report and to SRNC relocation	A	6.0.0	6.1.0	TEI5	R2-041150

3GPP TSG-RAN WG2 Meeting #42
Montreal, Canada, May 10th – 14th, 2004

Tdoc ⌘R2-041149

CR-Form-v7

CHANGE REQUEST

⌘ **25.305** **CR** **102** ⌘ **rev** **-** ⌘ Current version: **5.8.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Corrections to time stamp in position information report and to SRNC relocation
Source:	⌘	RAN WG2
Work item code:	⌘	TEI5
Date:	⌘	13/05/2004
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change: ⌘

Clause 4 and 9.6:

At RAN3#23, a misalignment between TS 25.305 and TS 23.271 regarding a time stamp of location information was discussed and a LS to SA2 was sent (R3-012628 or 012726, S2-012727).

This LS was answered by SA2#2 in a way that RAN does not have to provide a time stamp for location information over RANAP and RAN2 should modify TS 25.305 accordingly, provided SA1 would not object (see S2-013064).

This has been acknowledged by RAN2#25, waiting for response from SA1. The issue was discussed further at SA1#14 in Kobe but it seems that SA1 has never responded any LS on this matter, so TS 25.305 has never been modified as requested by SA2 (S2-013064).

Clause 7.2.1

This clause is not in line with TS 23.271. There, if an Iu aborted positioning procedure caused by a SRNS relocation it is not under responsibility of the SRNC but under responsibility of MSC, MSC Server or SGSN to restart the procedure.

Summary of change: ⌘

In clauses 4 and 9.6, the requirement to include the time stamp into the position information report is removed.

In clause 7.2.1 the responsibility for restarting the Iu positioning procedure is changed from "SRNC" to "MSC, MSC Server or SGSN" as depicted in TS 23.271.

Consequences if ⌘ TS 25.305 is not in line with RAN3 and CN specifications

not approved:	

Clauses affected:	⌘	4, 2.7.1, 9.6			
Other specs affected:	⌘	**Y** / **N**		⌘	
			X Other core specifications		
			X Test specifications		
			X O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4 Main concepts and requirements

The stage 1 LCS description providing an overall service description and the core requirements for the LCS at the service level is given in [5]. The stage 2 LCS description providing a system functional model for the whole system, the LCS system architecture, state descriptions and message flows are described in [13].

By measuring radio signals the capability to determine the geographic position of the UE shall be provided. The position information may be requested by and reported to a client (application) associated with the UE, or by a client within or attached to the CN. The position information may also be utilised internally by UTRAN, for example, for location-assisted handover or to support other features such as home location billing. The position information shall be reported in standard formats, such as those for cell based or geographical co-ordinates, together with ~~the time of day and~~ the estimated errors (uncertainty) of the position of the UE and, if available, the positioning method (or the list of the methods) used to obtain the position estimate. Restrictions on the geographic shape encoded within the 'position information' parameter may exist for certain LCS client types. The SRNC shall comply with any shape restrictions defined in GSM/UMTS and, in a particular country, with any shape restrictions defined for a specific LCS client type in relevant national standards. For example, in the US, national interim standard TIA/EIA/IS-J-STD-036 restricts the geographic shape for an emergency services LCS client to minimally either an "ellipsoid point" or an "ellipsoid point with uncertainty circle and confidence" as defined in [11].

It shall be possible for the majority of the UE (active or inactive) within a network to use the feature without compromising the radio transmission or signalling capabilities of the UTRAN.

The uncertainty of the position measurement shall be network implementation dependent at the choice of the network operator. The uncertainty may vary between networks as well as from one area within a network to another. The uncertainty may be hundreds of metres in some areas and only a few metres in others. In the event that the position measurement is also a UE-assisted process, the uncertainty may also depend on the capabilities of the UE. In some jurisdictions, there is a regulatory requirement for location service accuracy that is part of an emergency service. Further details of the accuracy requirements can be found in [5].

The uncertainty of the position information is dependent on the method used, the position of the UE within the coverage area and the activity of the UE. Several design options of the UTRAN system (e.g. size of cell, adaptive antenna technique, path loss estimation, timing accuracy, Node B surveys) shall allow the network operator to choose a suitable and cost effective UE Positioning method for their market.

There are many different possible uses for the positioning information. The positioning functions may be used internally by the UTRAN, by value-added network services, by the UE itself or through the network, and by "third party" services. The feature may also be used by an emergency service (which may be mandated or "value-added"), but the location service is not exclusively for emergencies.

The UTRAN is a new radio system design without a pre-existing deployment of UE operating according to the radio interface. This freedom from legacy equipment enables the location service feature design to make use of appropriate techniques to provide the most accurate results. The technique must also be a cost-effective total solution, must allow evolution to meet evolving service requirements and be able to take advantage of advances in technology over the lifetime of UTRAN deployments.

[...]

7.2.1 Signalling in case of SRNS relocation

In case of SRNC relocation UE Positioning functionalities may be transferred in order for DRNC to be able to handle the responsibility of SRNC in LCS process. Therefore the Source RNC may transfer the following information to the Target RNC:

- last known position, time stamp and accuracy of the position calculation;
- LCS capabilities of the UE.

If there is a positioning procedure going on in order to estimate the position of the UE and a SRNS relocation occurs, the positioning procedure shall be stopped in the old SRNC. After SRNS relocation, ~~the new SRNC then decides~~it is under the responsibility of the MSC, MSC Server or SGSN to restart an Iu aborted ~~if a new~~ positioning procedure ~~should be started~~. In the UE, the positioning procedure is going on and positioning information (e.g. measurement results) may be sent back to UTRAN if the UE was requested to do so. The new SRNC then decides whether it wants to use these information or discard them. If an SAS is used, the SRNC shall send an Abort message to the SAS over the Iupc interface.

[...]

9.6 OTDOA network positioning procedures

The following diagram illustrates the operations for the OTDOA method for UE Positioning when the request for positioning information is initiated by an LCS application from the CN.

This illustration only includes the information flow related to UE Positioning operations and does not indicate other operations that may be required, for example, to establish a signalling connection between the UE and the SRNC. Also not illustrated is the signalling used to initiate the location service request from the CN or a UE-based application.

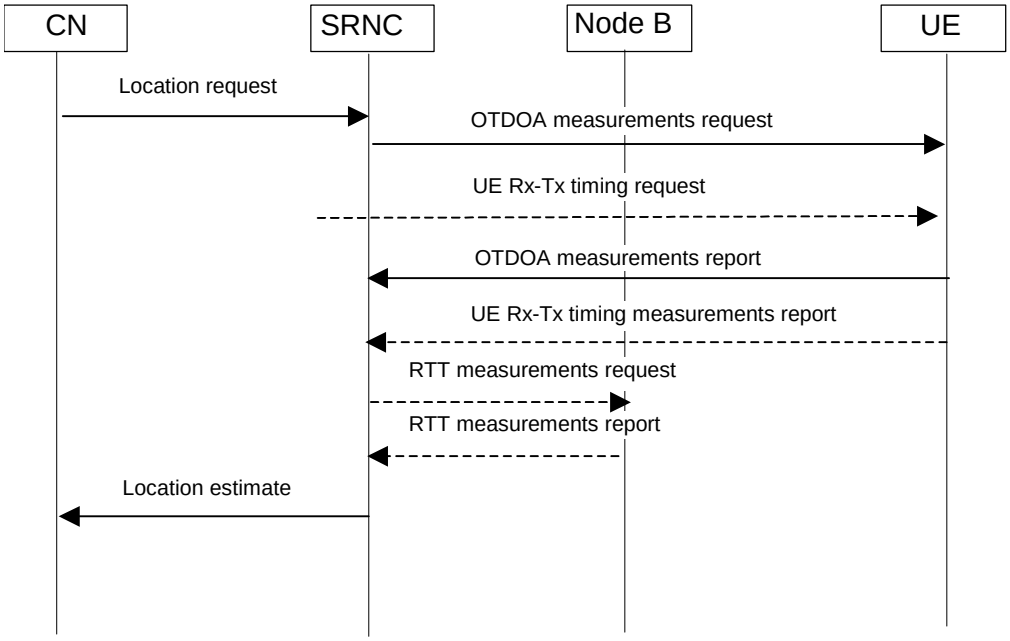

Figure 9.2: OTDOA Signalling Operations

1. The operation begins with an authenticated request for positioning information about a UE from an application in the CN being received at the SRNC. The SRNC considers the request and the UTRAN and UE capabilities.

2. The SRNC requests from the UE the measurement of the OTDOA for the signals in the active and neighbourhood sets. These measurements are made while the UE is in connected mode CELL_DCH state.

3. If it is considered advantageous to do so, the SRNC requests the UE Rx-Tx timing difference (FDD only) or UE timing advance, $T_{ADV,}$ (1.28 Mcps TDD) information from the UE.

4. The UE returns the OTDOA measures to the SRNC. The SRNC receives the OTDOA information and co-ordinates obtaining other information to support the calculation request.

5. The UE returns the UE Rx-Tx timing difference (FDD only) or UE timing advance, $T_{ADV,}$ (1.28 Mcps TDD) information to the SRNC, together with a time stamp of when the value was obtained.

6. If there are insufficient OTDOA measures, or it is otherwise considered advantageous to do so, the SRNC requests the RTT (in FDD) or Rx timing deviation (in TDD) and/or angle of arrival (in 1.28 Mcps TDD) measure for the UE from the serving Node B.

7. In FDD, the SRNC requests the RTD values for the associated transmitters from the associated database. These may be stored locally if they are constant over time, otherwise they must be updated to represent the RTD timing at the time-of-day the OTDOA measurements were made.

8. The Node B returns the RTT (in FDD) or Rx Timing Deviation (in TDD) and/or angle of arrival (in 1.28 Mcps TDD) measures to the SRNC if they were requested.

9. The SRNC performs a position calculation using the OTDOA, RTD and, if necessary, RTT (in FDD) or Rx timing deviation and UE timing advance (in TDD) information and angle of arrival information (1.28 Mcps TDD). The calculation may include a co-ordinate transformation to the geographic system requested by the application. The position estimate includes the position~~,~~ and the estimated accuracy of the results ~~and the time of day of the estimate~~. In networks that include the SAS, the SAS may perform the position calculation and then pass the position estimate to the SRNC.

10. The SRNC passes the position estimate to the CN including, if available, the positioning method (or the list of the methods) used to obtain the position estimate.

3GPP TSG-RAN WG2 Meeting #42
Montreal, Canada, May 10th – 14th, 2004

Tdoc ⌘R2-041150

CR-Form-v7

CHANGE REQUEST

⌘ **25.305** **CR** **103** ⌘ **rev** **-** ⌘ Current version: **6.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Corrections to time stamp in position information report and to SRNC relocation
Source:	⌘	RAN WG2
Work item code:	⌘	TEI5
Date:	⌘	13/05/2004
Category:	⌘	**A**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change: ⌘

Clause 4 and 9.6:

At RAN3#23, a misalignment between TS 25.305 and TS 23.271 regarding a time stamp of location information was discussed and a LS to SA2 was sent (R3-012628 or 012726, S2-012727).

This LS was answered by SA2#2 in a way that RAN does not have to provide a time stamp for location information over RANAP and RAN2 should modify TS 25.305 accordingly, provided SA1 would not object (see S2-013064).

This has been acknowledged by RAN2#25, waiting for response from SA1. The issue was discussed further at SA1#14 in Kobe but it seems that SA1 has never responded any LS on this matter, so TS 25.305 has never been modified as requested by SA2 (S2-013064).

Clause 7.2.1

This clause is not in line with TS 23.271. There, if an Iu aborted positioning procedure caused by a SRNS relocation it is not under responsibility of the SRNC but under responsibility of MSC, MSC Server or SGSN to restart the procedure.

Summary of change: ⌘

In clauses 4 and 9.6, the requirement to include the time stamp into the position information report is removed.

In clause 7.2.1 the responsibility for restarting the Iu positioning procedure is changed from "SRNC" to "MSC, MSC Server or SGSN" as depicted in TS 23.271.

Consequences if ⌘ TS 25.305 is not in line with RAN3 and CN specifications

not approved:	

Clauses affected:	⌘	4, 2.7.1, 9.6			
Other specs affected:	⌘	**Y** / **N**		⌘	
			X Other core specifications		
			X Test specifications		
			X O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4 Main concepts and requirements

The stage 1 LCS description providing an overall service description and the core requirements for the LCS at the service level is given in [5]. The stage 2 LCS description providing a system functional model for the whole system, the LCS system architecture, state descriptions and message flows are described in [13].

By measuring radio signals the capability to determine the geographic position of the UE shall be provided. The position information may be requested by and reported to a client (application) associated with the UE, or by a client within or attached to the CN. The position information may also be utilised internally by UTRAN, for example, for location-assisted handover or to support other features such as home location billing. The position information shall be reported in standard formats, such as those for cell based or geographical co-ordinates, together with ~~the time of day and~~ the estimated errors (uncertainty) of the position of the UE and, if available, the positioning method (or the list of the methods) used to obtain the position estimate. Restrictions on the geographic shape encoded within the 'position information' parameter may exist for certain LCS client types. The SRNC shall comply with any shape restrictions defined in GSM/UMTS and, in a particular country, with any shape restrictions defined for a specific LCS client type in relevant national standards. For example, in the US, national interim standard TIA/EIA/IS-J-STD-036 restricts the geographic shape for an emergency services LCS client to minimally either an "ellipsoid point" or an "ellipsoid point with uncertainty circle and confidence" as defined in [11].

It shall be possible for the majority of the UE (active or inactive) within a network to use the feature without compromising the radio transmission or signalling capabilities of the UTRAN.

The uncertainty of the position measurement shall be network implementation dependent at the choice of the network operator. The uncertainty may vary between networks as well as from one area within a network to another. The uncertainty may be hundreds of metres in some areas and only a few metres in others. In the event that the position measurement is also a UE-assisted process, the uncertainty may also depend on the capabilities of the UE. In some jurisdictions, there is a regulatory requirement for location service accuracy that is part of an emergency service. Further details of the accuracy requirements can be found in [5].

The uncertainty of the position information is dependent on the method used, the position of the UE within the coverage area and the activity of the UE. Several design options of the UTRAN system (e.g. size of cell, adaptive antenna technique, path loss estimation, timing accuracy, Node B surveys) shall allow the network operator to choose a suitable and cost effective UE Positioning method for their market.

There are many different possible uses for the positioning information. The positioning functions may be used internally by the UTRAN, by value-added network services, by the UE itself or through the network, and by "third party" services. The feature may also be used by an emergency service (which may be mandated or "value-added"), but the location service is not exclusively for emergencies.

The UTRAN is a new radio system design without a pre-existing deployment of UE operating according to the radio interface. This freedom from legacy equipment enables the location service feature design to make use of appropriate techniques to provide the most accurate results. The technique must also be a cost-effective total solution, must allow evolution to meet evolving service requirements and be able to take advantage of advances in technology over the lifetime of UTRAN deployments.

[...]

7.2.1 Signalling in case of SRNS relocation

In case of SRNC relocation UE Positioning functionalities may be transferred in order for DRNC to be able to handle the responsibility of SRNC in LCS process. Therefore the Source RNC may transfer the following information to the Target RNC:

- last known position, time stamp and accuracy of the position calculation;
- LCS capabilities of the UE.

If there is a positioning procedure going on in order to estimate the position of the UE and a SRNS relocation occurs, the positioning procedure shall be stopped in the old SRNC. After SRNS relocation, ~~the new SRNC then decides~~it is under the responsibility of the MSC, MSC Server or SGSN to restart an Iu aborted ~~if a new~~ positioning procedure ~~should be started~~. In the UE, the positioning procedure is going on and positioning information (e.g. measurement results) may be sent back to UTRAN if the UE was requested to do so. The new SRNC then decides whether it wants to use these information or discard them. If an SAS is used, the SRNC shall send an Abort message to the SAS over the Iupc interface.

[...]

9.6 OTDOA network positioning procedures

The following diagram illustrates the operations for the OTDOA method for UE Positioning when the request for positioning information is initiated by an LCS application from the CN.

This illustration only includes the information flow related to UE Positioning operations and does not indicate other operations that may be required, for example, to establish a signalling connection between the UE and the SRNC. Also not illustrated is the signalling used to initiate the location service request from the CN or a UE-based application.

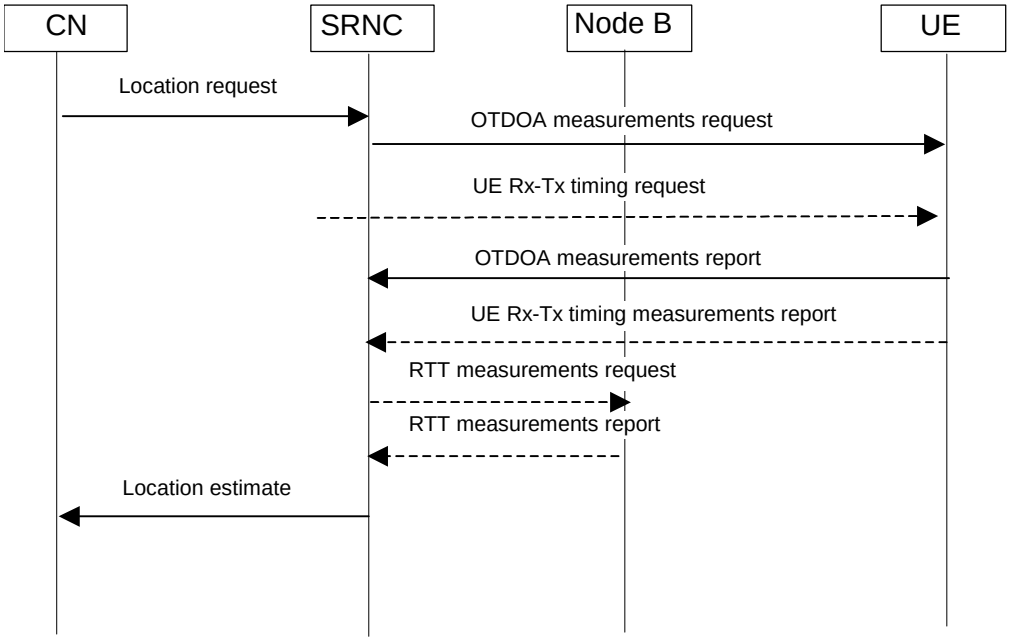

Figure 9.2: OTDOA Signalling Operations

1. The operation begins with an authenticated request for positioning information about a UE from an application in the CN being received at the SRNC. The SRNC considers the request and the UTRAN and UE capabilities.

2. The SRNC requests from the UE the measurement of the OTDOA for the signals in the active and neighbourhood sets. These measurements are made while the UE is in connected mode CELL_DCH state.

3. If it is considered advantageous to do so, the SRNC requests the UE Rx-Tx timing difference (FDD only) or UE timing advance, $T_{ADV,}$ (1.28 Mcps TDD) information from the UE.

4. The UE returns the OTDOA measures to the SRNC. The SRNC receives the OTDOA information and co-ordinates obtaining other information to support the calculation request.

5. The UE returns the UE Rx-Tx timing difference (FDD only) or UE timing advance, $T_{ADV,}$ (1.28 Mcps TDD) information to the SRNC, together with a time stamp of when the value was obtained.

6. If there are insufficient OTDOA measures, or it is otherwise considered advantageous to do so, the SRNC requests the RTT (in FDD) or Rx timing deviation (in TDD) and/or angle of arrival (in 1.28 Mcps TDD) measure for the UE from the serving Node B.

7. In FDD, the SRNC requests the RTD values for the associated transmitters from the associated database. These may be stored locally if they are constant over time, otherwise they must be updated to represent the RTD timing at the time-of-day the OTDOA measurements were made.

8. The Node B returns the RTT (in FDD) or Rx Timing Deviation (in TDD) and/or angle of arrival (in 1.28 Mcps TDD) measures to the SRNC if they were requested.

9. The SRNC performs a position calculation using the OTDOA, RTD and, if necessary, RTT (in FDD) or Rx timing deviation and UE timing advance (in TDD) information and angle of arrival information (1.28 Mcps TDD). The calculation may include a co-ordinate transformation to the geographic system requested by the application. The position estimate includes the position~~,~~ and the estimated accuracy of the results ~~and the time of day of the estimate~~. In networks that include the SAS, the SAS may perform the position calculation and then pass the position estimate to the SRNC.

10. The SRNC passes the position estimate to the CN including, if available, the positioning method (or the list of the methods) used to obtain the position estimate.