

Agenda Item: 16.3

Source: Motorola

Title: Call Trace

Document for: Decision

1 Introduction

The purpose of this paper is to introduce the Call Trace procedure to the Iub and Iur interface. Call Trace is a mechanism used to collect and analyse data about a specific UE context or set of UE contexts. This data can be used for network optimisation, fault management, or security.

The impact to the Iub and the Iur interfaces does not include data collection and transfer. Call trace data is collected by the NE's and should be forwarded to the NE's management system, which will determine how the data will be consolidated for purposes of analysis. The performance of the Iub and Iur interfaces should not be degraded because of call trace data collection and transfer.

A call trace could be triggered in either the RNC or the Node B. The criterion used by each NE to trigger a trace is an issue for the NE and the corresponding management system and is therefore beyond the scope of this paper. The impacts to the Iub and Iur interfaces are reduced to the RNC or the Node B instructing the other entity to activate or deactivate a call trace on a specific UE context as illustrated in the following discussion.

2 Discussion

2.1 Call Trace

This procedure provides the means to trace a specific UE context within the UTRAN. Call trace is used to gather information on a UE context and to report the information to a collection entity for further analysis of the data. A call trace may be initiated in either the RNC or the Node B. If the trace requires data from the other entity, the initiating entity must instruct the other NE to activate a trace on the UE context. A trace may remain local to the initiating entity depending on the implementation. The data gathered by each NE is forwarded to their respective NE manager and is thus outside the scope of this document. The Iub and the Iur interfaces do not provide transport for any call trace generated data.

The initiating entity of a trace is responsible for determining the procedure to follow when a UE hands between Node B's. In the case of an RNC initiated trace, the RNC will determine whether to activate the trace in the destination Node B of a handover as well in the DRNC if the Node B is controlled by another RNC. In the case of a Node B initiated trace, it is *FFS* as to whether the Node B may indicate to the RNC whether the trace should continue after the UE leaves the Node B.

2.1.1 Activate RNC Call Trace

The purpose of this dedicated procedure is to activate a Node B initiated trace on a specific UE context within the RNC. The *ACTIVATE RNC CALL TRACE* message will contain the types of data to collect along with a reference number to be used by the management system to correlate all data collected. If the RNC is not the SRNC, the CRNC may also activate the trace within the SRNC by forwarding the *ACTIVATE RNC CALL TRACE* message along to the SRNC.



Figure 1 Activate RNC Call Trace at the CRNC

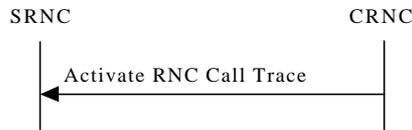


Figure 2 Activate RNC Call Trace at the SRNC

If the RNC is in an overload situation in which activating a call trace would be detrimental to the system, the RNC may choose not to activate the trace. In this case, no trace data for the specified UE will be forwarded to the management system by the RNC. However, the trace in the initiating Node B will continue until either the RNC deactivates the trace or the Node B terminates the trace. An RNC overload situation does not necessarily result in deactivating the trace in the Node B.

The *ACTIVATE RNC CALL TRACE* message contains the following information:

- RNC Communication Context ID
- Trace Reference Number
- Trace Data Type
- Trace Continue Indicator (*FFS*)

2.1.2 Activate Node B Call Trace

The purpose of this dedicated procedure is to activate an RNC initiated trace on a specific UE context within a Node B. The *ACTIVATE NODE B CALL TRACE* message will contain the types of data to collect along with a reference number to be used by the management system to correlate all data collected. If the RNC is not the CRNC, the *ACTIVATE NODE B CALL TRACE* will first be sent to the CRNC and then forwarded along to the Node B.

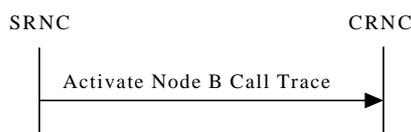


Figure 3 Activate Node B Call Trace forwarded through the CRNC

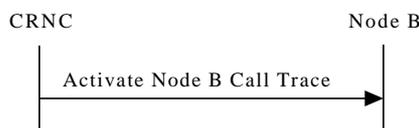


Figure 4 Activate Node B Call Trace

If the Node B is in an overload situation in which activating a call trace would be detrimental to the system, the Node B may choose not to activate the trace. In this case, no trace data for the specified UE will be forwarded to the management system by the Node B. However, the trace in the RNC will continue until either the Node B deactivates the trace or the RNC terminates the trace. A Node B overload situation does not necessarily result in deactivating the trace in the RNC.

The *ACTIVATE NODE B CALL TRACE* message contains the following information:

- Node B Communication Context ID
- Trace Reference Number
- Trace Data Type

2.1.3 Deactivate RNC Call Trace

The purpose of this dedicated procedure is to deactivate a Node B initiated trace for a specific UE context within the RNC. The Node B may decide to deactivate the trace because the criteria for the trace has been met, or because of a system overload condition that may be resolved by reducing call trace traffic. The Node B does not necessarily have to be the initiator of the trace to deactivate the trace. The *DEACTIVATE RNC CALL TRACE* message will contain the UE context identifier used to determine which UE to stop tracing. If the RNC is not the SRNC, the CRNC must also deactivate the trace within the SRNC by forwarding the *DEACTIVATE RNC CALL TRACE* along to the SRNC.

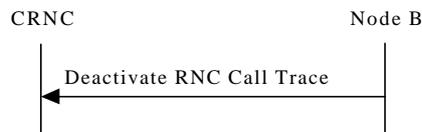


Figure 5 Deactivate RNC Call Trace

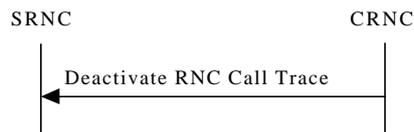


Figure 6 Deactivate RNC Call Trace at the SRNC

2.1.4 Deactivate Node B Call Trace

The purpose of this dedicated procedure is to deactivate an RNC initiated trace for a specific UE context within the Node B. The RNC may decide to deactivate the trace because the criteria for the trace has been met, or because of a system overload condition that may be resolved by reducing call trace traffic. The RNC does not necessarily have to be the initiator of the trace to deactivate the trace. The *DEACTIVATE NODE B CALL TRACE* message will contain the UE context identifier used to determine which UE to stop tracing. If the RNC is not the CRNC, the *DEACTIVATE NODE B CALL TRACE* will first be sent to the CRNC and then forwarded along to the Node B.

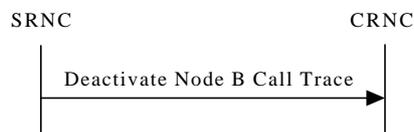


Figure 7 Deactivate Node B Call Trace forwarded through the CRNC

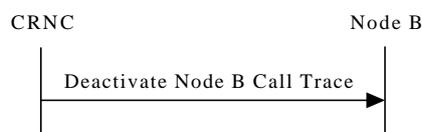


Figure 8 Deactivate Node B Call Trace

2.2 Message Functional Definition and Content

2.2.1 Activate RNC Call Trace

This message is sent from a Node B to the CRNC to activate a trace on a UE context in the CRNC.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
CRNC Communication Context ID		M
Trace Reference Number		M
Trace Data Type		M
Trace Continue Indicator		<i>FFS</i>

2.2.2 Activate Node B Call Trace

This message is sent from the CRNC to a Node B to activate a trace on a UE context in the Node B.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
Node B Communication Context ID		M
Trace Reference Number		M
Trace Data Type		M

2.2.3 Deactivate RNC Call Trace

This message is sent from a Node B to the CRNC to deactivate a trace on a UE context in the CRNC.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
CRNC Communication Context ID		M
Trace Reference Number		M

2.2.4 Deactivate Node B Call Trace

This message is sent from the CRNC to a Node B to deactivate a trace on a UE context in the Node B.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
Node B Communication Context ID		M
Trace Reference Number		M

2.3 Information Element Functional Definition and Contents

This section defines the message types for the information elements introduced in section 2.2 that are not already defined in [1].

2.3.1 Trace Reference Number

The Trace Reference Number is the number used by the management system to consolidate all call trace data collected by each NE for a UE context.

2.3.2 Trace Data Type

The Trace Data Type indicates the call trace data to be collected for a UE context.

2.3.3 Trace Continue Indicator

The Trace Continue Indicator informs the RNC whether or not a call trace should continue once the UE hands out of the current Node B. The use of this element is *FFS*.

3 Proposal

The following changes to TS 25.433 [1] are proposed –

1. Include a new sub-section 8.2.x – Call Trace in the NBAP Dedicated Procedures (section 8.2) with the contents of Section 2.1 (Call Trace) with the following exception:
 - These figures should not be included: Figure 2, Figure 3, Figure 6, and Figure 7
2. Include a new section 9.1.x – Activate RNC Call Trace with the contents of Section 2.2.1 (Activate RNC Call Trace).
3. Include a new section 9.1.x – Activate Node B Call Trace with the contents of Section 2.2.2 (Activate Node B Call Trace).
4. Include a new section 9.1.x – Deactivate RNC Call Trace with the contents of Section 2.2.3 (Deactivate RNC Call Trace).
5. Include a new section 9.1.x – Deactivate Node B Call Trace with the contents of Section 2.2.4 (Deactivate Node B Call Trace).
6. Add sub-sections of 2.3 to section 9.2 of [1].

The following changes to TS 25.423 [2] are proposed –

1. Include a new sub-section 8.2.x – Call Trace in the DCH Procedures (section 8.2) with the contents of Section 2.1 (Call Trace) with the following exception:
 - These figures should not be included: Figure 1, Figure 4, Figure 5, and Figure 8

4 References

[1] 3GPP TS 25.433 - NBAP Specification v1.1.1

[2] 3GPP TS 25.423 – UTRAN Iur Interface RNSAP Signalling v1.2.1