

Agenda Item: 6.3 / Sync Ad-hoc 4.5
Source: NTT DoCoMo
Title: Node Offset Measurement Procedure
Document for: Discussion

1. Abstract

This contribution proposes a new procedure called “Node Offset Measurement (NOM)” procedure. This procedure measures the offset (phase difference) between CRNC and NodeB. Offset Measurement between two RNC is FFS.

2. Discussion

2.1 Node Offset Measurement Procedure

Node Offset Measurement Procedure is performed in order for CRNC to acknowledge the phase difference between the underlying NodeB and the CRNC.

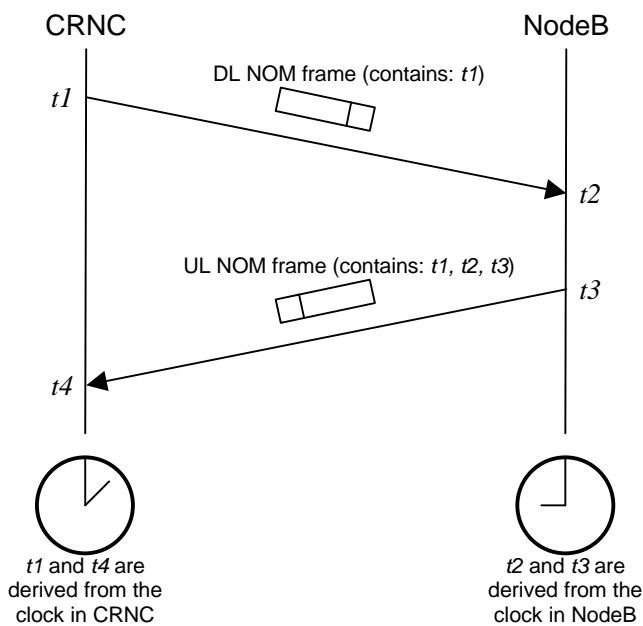


Figure 2 Node Offset Measurement Procedure

The DL NOM frame is sent from CRNC to NodeB. This frame contains the following information:

Time of departure from CRNC (derived by the clock in CRNC) (= $t1$)

Upon reception of DL NOM frame from the CRNC, the NodeB records the time of arrival of the frame from the clock of NodeB and the CRNC sends UL NOM frame back to the NodeB. This UL NOM frame contains the following information:

Time of departure from CRNC (by clock in CRNC) (= $t1$)

Time of arrival to NodeB (by clock in NodeB) (= t_2)

Time of departure from NodeB (by clock in NodeB) (= t_3)

The reason for the need of t_3 in addition to t_2 is that the processing time within NodeB is variable and is not negligible compared with travelling time across Iub.

As the CRNC receives the UL NOM frame from the NodeB, the CRNC records the time of arrival of the frame locally (= t_4).

The one-way travelling time T is derived out as follows:

$$T = \{(t_4 - t_1) - (t_3 - t_2)\} / 2$$

This value, T represents the Offset Difference between the NodeB and the CRNC.

It must be noted that both the UL and DL travelling time are assumed to be equal since the NOM frames in both directions shall travel on high-priority VC [1] and there is little delay and delay variation.

This procedure is performed in the following situation:

After node start / restart

Routine measurement

O&M procedure from Management Platform

2.2 Node Offset Measurement frame structure

The table below shows the contents of DL NOM frame.

	Information element	Description
Payload	Time of departure from CRNC	t_1

The table below shows the contents of UL NOM frame.

	Information element	Description
Payload	Time of departure from CRNC	t_1
	Time of arrival to NodeB	t_2
	Time of departure from NodeB	t_3

3. Proposal

In conjunction with R3-99985 [1], it is proposed to create a new baseline document "TS25.4XX Iub Interface Signalling Transport & Signalling for Node Offset Measurement" for highly prioritised VC with AALO solution. It shall be noticed that this solution is only applicable to ATM solution and this baseline document would not exclude the solution for the future transport layer solution.

4. Reference

[1] R3-99985 "Rationale for AALO on high priority VC for Node Offset Measurement (NOM)" from NTT DoCoMo