3GPP TSG-RAN Meeting #22 ***RP-030700***
Maui, Hawaii, USA, 9th – 12th December 2003

Agenda item: 7.4.3
Source: Motorola, Huawei, NEC
Title: RNSAP DCH Information Response issue
Document for: Decision

Introduction

The *DCH Information Response* IE Group semantics in the case of a set of coordinated DCHs are currently unspecified in RNSAP. This situation can cause huge Iur IOT problems between R99 nodes (DRNS Radio links for voice AMR connections can not be setup) and therefore needs to be addressed by 3GPP RAN plenary.

This issue has been discussed in two previous RAN3 meetings (RAN3#38, RAN3#39) but no consensus has been agreed so far.

In this paper we show that the "Semantics description" "Only one DCH per set of co-ordinated DCHs shall be included" was removed by mistake, that the NBAP (Nortel) solution is non-backwards compatible, and finally that the most sensible solution is to revert back to the original text.

Since this R99 issues has not been resolved in RAN 3 we ask for RAN to discuss and approve the CRs in RP-030701.

Background

During RAN3#38, R3-031405 (Nortel) pointed out an ambiguity in RNSAP related to the lack of semantics in the *DCH Information Response* IE group in the case of co-ordinated DCHs. RNSAP currently allows two different interpretations:

- ***Interpretation#1***: in the *DCH Information Response* IE all DCH belonging to a set of co-ordinated DCHs shall be included.
- ***Interpretation#2***: in the *DCH Information Response* IE only one DCH belonging to a set of co-ordinated DCHs shall be included.

Such an ambiguous situation was confirmed during RAN3#38. During that meeting, RAN3 also recalled that this situation did not occur in NBAP, where it clearly mandates *Interpretation#2*. Nortel tried pointing out that for RNSAP, *Interpretation#1* was the valid interpretation, that is, given *Binding ID* and *TLA* IEs optionality. Consequently, Nortel proposed the possible solution of aligning NBAP with RNSAP. However, this proposal was not supported by all companies. It was clarified in the meeting that the *Binding ID* and *TLA* IEs were made optional as part of Extensibility during a RAN3#16 decision. Since no consensus could be reached at RAN3#38, it was decided discuss this topic further on the RAN3 reflector.

During RAN3#39 there were several contributions presented treating this issue again:

-R3-031548, R3-031549, R3-031550 (Huawei) which requested RNSAP changes to uniquely allow *Interpretation#2*, (i.e. to align RNSAP with NBAP (which is unambiguous)).

- R3-031723 (Nortel) which was an update of R3-031405, highlighted the fact that *Interpretation#2* did not allow to build ing of eventual DCH specific extensions in the case of co-ordinated DCHs ("forward compatibility NBAP issue"). It also stated that the only unique way to ensure forward compatibility was to allow *Interpretation#1*, and thus proposed to align the NBAP specification with RNSAP (R3-031724, R3-

031725, R3-031726), where the lack of semantics should be interpreted as "*DRNS/Node B is allowed to include* ***all DCHs*** in the *DCH Information Response* IE. *Interpretation#1* then also implies *that DRNS/Node B is also allowed to include only one DCH per set of co-ordinated DCHs. (i.e. The number of DCHs included in the DCH Information Response IE is not specified.)"*.

- R3-031834 was Motorola's reply to R3-031723. It provided the history that during RAN3#17, the RNSAP semantics description was removed as a result of an editorial CR where such a change was not recorded (i.e. was removed by mistake and not related to Extensibility decisions). Thus, any sensible implementation would assume *Interpretation#2* in RNSAP.

At RAN#10, several CRs to 25.423 were approved in Tdocs RP-000618, 619, 621, 696. The CRs of most interest to TS 25.423 are CR 253R4 and CR 211R1. CR 253R4 shows where the text was removed from the tabular format but upon reading the CR it is clearly found to be an editorial mistake in the tabular format as there is no reference made to the removal of the note on the cover sheet. Furthermore you only have to look at CR 211R1 and CR 232R2 which moves the descriptive text to Section 8.3.4.2 Successful Operation, **General** – "In case of a set of coordinated DCHs requiring a new transport bearer on Iur, the DCH Information Response IE shall be included only for one of the DCH in the set of coordinated DCHs.". The intent of RAN 3 and RAN is clear, the note should not have been removed. Of equal concern is that the text in Section 8.3.4.2 Successful Opertion, **General** in TS 25.423v3.4.0 has been implemented incorrectly, RAN has never approved a CR which changed the sentence "In case of a set of coordinated DCHs requiring a new transport bearer on Iur, the DCH Information Response IE shall be included only for one of the DCH in the set of coordinated DCHs." to "In case of a set of coordinated DCHs requiring a new transport bearer on Iur, the Transport Layer Address IE and the Binding ID IE in the DCH Information Response IE shall be included only for one of the DCH in the set of coordinated DCHs.".

Regarding the issue of "forward compatibility" in *Interpretation#2:* Firstly "forward compatibility" was already addressed in RAN3#17 during Extensibility discussions/decisions in which *Interpretation#2* was still mandated. Secondly, inclusion of REL-6 extension specifics to DCHs belonging to a set of co-ordinated DCHs was a hypothetical case that would require a separate discussion, when needed, and where other alternatives compatible with *Interpretation#2* should also be considered (other companies have already suggested forward compatible solutions during the RAN3 reflector discussion). Finally, expressions of major concerns on changes requested to NBAP not being backward compatible with previous versions of the specification (so far, several DCHs inclusion for the set of co-ordinated DCHs was mandated as a logical error, as per the requirements in the Semantics Description, and with new changes this would not be valid, as the change is removing a requirement from an existing specification). R3-031723 would therefore force existing NBAP compliant R99 implementations to be changed.

Discussion

Available solutions

RAN3 has so far produced 2 proposed solutions to correct IOT problem in RNSAP:

- ***Solution#1****:* proposes to change NBAP specifications to unspecify semantics i.e. allow both *Interpretation#1 and Interpretation#2* in the same time.
- ***Solution#2****:* proposes to clarify RNSAP to allow uniquely *Interpretation#2*.

It is proposed to consider such solutions in during RAN plenary.

Criteria

Four criteria need to be considered for solution selection, sorted in order of precedence:

- ***Criteria#1*****:** solution shall solve issue (make Iur an open interface in R99 and onwards)
- ***Criteria#2***: solution shall be backwards compatible with current NBAP R99 specification
- ***Criteria#3***: solution should have minimum impact on RNSAP implementations
- ***Criteria#4***: solution should allow forward compatibility with potential future extensions.

It is proposed that RAN plenary agree to the above criteria as valid and relevant during this further discussion.

Solution evaluation

It is proposed to evaluate the available solutions based on the above criteria and agree on a solution to the issue.

Solution#1
Solution#1 meets ***Criteria#1***, although not very elegantly since this forces UMTS vendors to analyze many Tdocs to understand the history of this issue in order to gain the correct interpretation of the lack of semantics in RNSAP and NBAP (i.e. ambiguity remains in RNSAP and would now be introduced in NBAP and the clarification would only be found in a single RAN3 Tdoc).

Solution#1 does NOT meet ***Criteria#2*** since it is not backwards compatible with previous versions of NBAP R99 specifications (to date, NBAP mandates the CRNC to reject any NBAP radio link setup messages which include more than one DCH when setting up a set of co-ordinated DCHs (Interpretation#1) and now this would not be valid).

Regarding ***Criteria#3,*** provided the current version of RNSAP is ambiguous, **Solution#1** would have an impact on implementations following either Interpretation#1 (as the SRNC should allow Interpretation#2 as valid also) or Interpretation#2 (as the SRNC should allow Interpretation#1 also and not treat the reception of more than one DCH as a logical error).

Finally, regarding ***Criteria#4,*** **Solution#1** only guarantees forward compatibility if an Extension IE, which is specific to each DCH (not specific to co-ordinated DCHs), is added.

Solution#2
The above signing companies believe that **Solution#2** clearly meets **Criteria#1** as it solves the ambiguity in RNSAP by aligning it with NBAP that is fully specified.

Solution#2 also meets **Criteria#2** as it is backwards compatible with NBAP since it does not modify existing R99 NBAP implementations.

Regarding ***Criteria#3***, given that RNSAP is ambiguous in the current version of the spec, **Solution#2** would not have any impact on implementations following Interpretation#2 but would have an impact on implementations following Interpretation#1. Given the background of the semantics description removal and the existing requirement in NBAP, it can be assumed that any sensible implementation would follow Interpretation#2, which is aligned with NBAP and which was explicitly mandated in RNSAP until Sept00 and never explicitly overruled by RAN3 as captured in any RAN3 meeting decisions/notes.

Regarding ***Criteria#4,*** **Solution#2** allows forward compatibility if some Extension IE, which is specific to each DCH (not specific to co-ordinated DCHs), needs to be added. This can be achieved by adding *Extension DCH Information Response* IE in the extension container in the RL Setup/Addition Response/Failure message and in the RL Reconfiguration Ready/Response message, as suggested by NEC on the RAN3 email reflector prior to RAN3#39. With this solution, some additional consistency checks with the existing *DCH Information Response* IE may be needed though. In case the hypothetical Extension IE is common to all DCHs included in a set of co-ordinated DCHs, it can be included in a clean way by directly adding it to the *DCH Information Response* IE.

Evaluation is reflected in below table.

	Criteria#1	***Criteria#2***	***Criteria#3***	***Criteria#4***
Solution#1 (R3-031724, R3-031725, R3-031726**)**	YES	NO	NO-HIGH	YES
Solution#2 (R3-031548, R3-031549, R3-031550**)**	YES	YES	NO-MEDIUM	YES

Conclusion:

So, in summary, the above signing companies think that the best resolution to this misinterpretation issue in RNSAP is to (re-)clarify the RNSAP specification by aligning it with NBAP (***i.e.*** only allowing one DCH belonging to a set of co-ordinated DCHs to be included in the *DCH Information Response* IE.). Therefore we request RAN plenary to approve RP-030701.