

**Agenda Item:** 10 (Project Management)  
**Source:** Nokia  
**Title:** RRC and backwards compatibility in release 99  
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## Introduction

After an extremely intensive period in RAN WG2 to complete the UTRAN release 99 RRC [TS 25.331], the specification has reached a level of maturity, where backwards compatibility of the protocol signalling specified in different approved versions of the specification has to be considered. A stable specification with backwards compatibility between different versions of the first release is a necessity to enable timely introduction of interoperable UMTS network and terminal equipment to the market.

Even though this contribution supports the view that future versions of the release 99 RRC protocol should be backwards compatible, there are some concerns related to the consistency of the current tabular and ASN.1 descriptions of the signalling and the currently agreed RRC extension mechanism, that are felt to need further consideration by RAN WG2 before committing to a total backwards compatible freeze of the signalling messages. This contribution proposes guidelines defining the aspects that should be considered in regard to future CR:s raised on the RRC specification.

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## Discussion

Even after implementing the change requests on TS 25.331 that are presented for approval in TSG RAN#11, some inconsistencies between the ASN.1 and the tabular description remain to be corrected. It is our understanding that to ensure compatibility of equipment, out of these two methods the ASN.1 description (encoded using unaligned PER, Packet Encoding Rules, as agreed) has to be the normative one and therefore what should primarily be corrected is the tabular representation. However, as the discussions on CR:s in RAN WG2 have until now focused on the tabular descriptions, it is felt that further review by all participating companies of the resulting ASN.1 after the presently proposed CR:s have been implemented would be beneficial to ensure that the ASN.1 correctly represents past agreements and accurately implements the intended functionality. If significant problems are discovered, utilizing RRC extensions at this point may lead to considerable signalling overhead.

At the moment the definitions in TS 25.331 and TR 25.921 are not entirely clear about which one of the two description methods is normative, the tabular or the ASN.1. These definitions need amendment so that several interpretations will not be possible.

The current extension mechanism agreed to be used for the RRC protocol allows linear extensions to be embedded to the end of an information element, where a special extension clause has been defined. This has two potential problems:

1. Even though the amount of consecutive extensions added in future revisions is infinite, currently there is no mechanism that enables skipping an extension. In our interpretation this means that after starting to maintain backwards compatibility on release 4, no further corrections on release 99 can be added to a message, which has a release 4 extension.
2. Simple corrections can cause significant overhead, if the information element to be corrected belongs to a complex structure such as a sequence of a sequence (etc. etc.), because the whole structure of sequences has to be recreated in order to produce corrective information elements corresponding to all the original elements.

In our understanding both of these two potential problems have existing and emerging solutions and they should be addressed by RAN WG2 before committing to support backwards compatibility via RRC message extensions.

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# Proposal

The consistency of statements regarding normative RRC descriptions in TS 25.331 and TR 25.921 has to be reviewed. The text must be clarified so that it is absolutely clear which form of message syntax description is normative. The extension mechanism of the RRC has to be further refined so that it will be possible to make necessary corrections to a previous release after backwards compatibility on a later release is effective. We also see that the consistency of the tabular description and ASN.1 needs further review by companies after TSGR#11.

Based on these points it is proposed that the following principles be adopted in RAN WG2 regarding change requests to the RRC protocol:

1. Inconsistencies between the tabular format and ASN.1 shall be considered case by case using the ASN.1 description as the default solution. Only where clearly identified that the intended functionality can only be reached by utilizing the signalling defined by the tabular description, can a correction to the ASN.1 be considered. This principle applies only to CR:s addressing inconsistencies between tabular and ASN.1 and it is only valid for CR:s to TSGR#12, for which purposes it overrides the principles described below.
2. Each CR proposing a change shall contain a clear statement regarding the backwards compatibility of the change. If the CR has a problem in compatibility, another compatible solution should be sought.
3. Future CR:s shall be written in a way which does not affect other functionality than the one that is being corrected. If this is not possible without using the RRC extension mechanisms, the extension mechanisms shall be applied. A CR utilizing RRC extensions can only be agreed after the extension mechanism has been reviewed by the working group and sufficient agreements to support extensions of several backwards compatible releases in the future have been reached.
4. Only if the signalling defined for a procedure is agreed by working group consensus to be unusable for any of its intended purposes, can a backwards incompatible correction be considered, as the message could not be used in any product prior to introduction of the correction.