3GPP TSG-RAN WG2 Meeting #128 R2-240xxxx

Orlando, United States of America, 18 – 22 November 2024

**Agenda item: 8.0**

**Source: Nokia (Rapporteur)**

**Title: Report of [POST127][004][ASN.1 Modernization] Requirements**

**WID/SID: NR\_newRAT-Core - Release 19**

**Document for: Discussion and Decision**

# 1 Introduction

This document is the report of the following email discussion:

* [POST127][004][ASN.1 Modernization] Requirements (Nokia)

Intended outcome: Agree on requirements for the ASN.1 review process

Deadline:

The deadline for providing comments is November 1, 2024, Friday at 21:00 UTC.

# 2 Contact Points

Respondents to the email discussion are kindly asked to fill in the following table.

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| --- | --- | --- |
| Company | Name | Email Address |
| Nokia (Rapporteur) | Jerediah Fevold | [jerediah.fevold@nokia.com](mailto:jerediah.fevold@nokia.com) |
| Qualcomm | Umesh Phuyal | uphuyal <at> qti.qualcomm.com |
| OPPO | Qianxi Lu | qianxi.lu@oppo.com |
| Huawei, HiSilicon | David Lecompte | david.lecompte@huawei.com |
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# 3 Discussion

An offline session ([R2-2407786](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_127/Docs/R2-2407786.zip)), based on [R2-2407190](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_127/Docs/R2-2407190.zip) (Nokia) and [R2-2407087](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_127/Docs/R2-2407087.zip) (Ericsson), was held during RAN2#127 to discuss potential ways forward to modernize the ASN.1 review process, which takes place at the end of each release. R2-2407190 exemplified an end-to-end procedure using Git and an intermediate format for collaborative review, and R2-2407097 discussed ways to optimize the current review process, which is based on Microsoft Word and macros. Several aspects of process described in R2-24071090 were clarified, but the majority of participants, including the rapporteur, agreed that it would be useful to first hold a discussion on the requirements of the current review process.

The following will be discussed: fundamental requirements, taking into consideration the current process; automated procedures, such as report generation; Microsoft Word, and its ability to meet the requirements; and the use of other tools in conjunction with the current process.

## 3.1 Fundamental Requirements

The following features, excluding report generation, are currently supported as part of the review process, whether manual or automatic: providing comments with suggested corrections; providing comments for discussion or clarification; checking out the latest version of the review file; locking the review file; checking in the review file; notification of checking in the review file; assignment of an ID to each comment; and the merging of agreed corrections into a CR.

These components of the review process imply the following requirements, which we can use as a starting point:

1. Use of a common tool available to all 3GPP member companies.
2. Ability to collaborate on the review file without creating conflicts.
3. Ability to provide comments on the review file.
4. Distribution of notifications when the review file is checked out or checked in.
5. Trackability of comments such that they can be referenced in discussion.
6. Merging of corrections into a CR for merging into the frozen specification.

This first question addresses these requirements and any others that might need to be added.

**Question 1**: Is the list of requirements complete, and if not, which requirements should be removed, and which requirements should be added?

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| Answers to Question 1 | | |
| Company | Yes/No | Technical Arguments |
| Qualcomm |  | 1. If #2 is fully workable, then #4 could be irrelevant and not needed. 2. The loading time for the review file is one of the major issues today. The tool should be relatively faster to open the review file/cases. |
| OPPO |  | Following the current ASN.1 review process, in addition, the tool needs to be able/used for:   1. RIL list generation, which is now implemented via Macro in Word (related to step-5 above) 2. WI Rapp to generate CR for a specific WI (related to step-6 above) |
| Huawei, HiSilicon |  | For #2, real-time merging is needed (similar to MS share point). One could then see that another person is working on the same section, and then refrain from commenting and add a comment to the comment later on.  If it is not possible to have #2 with real-time merging, #4 would be beneficial.  Is #6 about merging agreed corrections after the meeting (for next round of review) or proposed corrections before the meeting? What is agreed is rarely the original proposed changes, so merging proposed corrections may not be so meaningful.  Additional requirements:  1) Handle not only ASN.1, also procedure text and field description  2) Allow (or even help) to add comments to other companies' comments  3) It would be useful to be notified when another company commented on your comment  Side remark: any additional tool should be easy enough for all delegates, or some training would be needed. |
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**Summary 1**: TBD.

**Proposal 1**: TBD.

Given that at least the requirements described above are met by the existing review process, the benefits and deficiencies of current procedures should be discussed. Please note that tools will be discussed in future sections, so the discussion should be limited to the experience of executing the review with the current tools.

Review File Check in and Check out Procedure

The following procedure is currently used to check out and check in the review file:

1. Check the FTP server for the latest version of the review file, ending in vN, where N is the version number.
2. Check for the existence of a LOCK file named “vN IS LOCKED for editing.txt”, where N is the version number.
   1. If the version of number of the LOCK file is less than the most recent review file, then the review file is available for checkout.
   2. Else, if the version number of the LOCK file is equal to the most recent review file, then the review file is already checked out, and is unavailable for editing.
3. If the review file was available for checkout, upload a new LOCK file with a new version number equal to the latest version of the review file and set its contents to the reviewer’s name and email address in the following format: “Name <email>”.
4. Work on the review file, adding comments.
5. Rename the review file by incrementing the version number. For example, v010 would become v011.
6. Upload the review file.
7. Send an email on the 3GPP RAN2 reflector notifying everyone that the review file has been checked back in.

**Question 2**: Consider the current process for checking a file in and out. Please describe the any experiences, positive or negative about the existing process.

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| Answers to Question 2 | |
| Company | Benefits and Deficiencies |
| Qualcomm | One potential problem in current process is this: once you download the latest file, it takes a lot of time to add all the comments (due to freezing of computer and what not), and if it takes hours to do that, doesn’t make sense to “check-out” the file and block others from uploading for many hours, especially near the deadline. On the other hand, if you are preparing comments locally, first you must again copy paste, and second, they may be already obsolete (others may have already commented similarly). This brings more clerical work overhead instead of technical work.  So, we should aim to allow near-real-time parallel work on the review file. |
| OPPO | Positive Side:   1. It is easier to identify comment on related/similar issues, since it is visible based on the related text in the specification   Negative Side:   1. It is quite slow to open 331 with comments (easy to collapse) 2. The txt-based flow-control is not very robust sometimes, and may end up with version collision |
| Huawei, HiSilicon | Benefits:  - Current process allows to easily identify comments on related/similar issues, and react to them.  Deficiencies:  - one needs to manually check availability of review file and wait for check in (David L. used some automatic polling with notification), it is easy for people to make mistakes  - MS word is very slow on 38.331, even without comments  - it is only practical to deal with comments in print layout, which makes MS word even slower  - long comments/multiple comments nearby get collapsed, making it more difficult to review them |
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**Summary 2**: TBD.

**Proposal 2**: TBD.

RIL ID Assignment

Each comment requires an ID based on a company identifier, which is fixed by 3GPP RAN2, and a number, which is managed by the company providing comments. The ID is entered into the comment template when the comment is entered into the review file.

**Question 3**: Consider the current process for manually assigning an ID to a RIL. Please describe the any experiences, positive or negative about the existing process.

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| Answers to Question 3 | |
| Company | Benefits and Deficiencies |
| Qualcomm | As long as they are unique, it does its job. More automated and meaningful RIL ID could be beneficial to guarantee uniqueness and potentially include some information about the review issue itself (e.g. by implicitly indicating whether it is Procedure or ASN.1, or which section of spec it is for... etc). |
| OPPO | Since it is mainly for intra-company coordination, it seems not a critical problem. |
| Huawei, HiSilicon | No issue here. |
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**Summary 3**: TBD.

**Proposal 3**: TBD.

Comments, identified by RIL IDs, generally come in two varieties: comments for clarification or discussion; and comments suggesting changes to the text. When a comment is provided to make a change to the text, the existing text is copied and pasted into the comment description, and the correction is provided in the proposed change section of the comment, with a strikethrough font for deletions, and an underlined font for additions, essentially replicating the format of Microsoft Word’s “Track Changes” functionality. These changes cannot be directly copied into a CR containing a snippet of the specification to modify, but rather they are manually entered into the CR.

**Question 4**: Consider the current process for providing comments. Please describe the any experiences, positive or negative about the existing process.

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| Answers to Question 4 | |
| Company | Benefits and Deficiencies |
| Qualcomm | Manually creating/mimicking track-changes-like behaviour by adding underline, changing font, adding strike etc is time consuming and error-prone. In addition, while extracting it to excel as done today (Q6 below), the formatting is lost. Automation of such would be beneficial. |
| OPPO | Tend to agree with what Rapp observed.  On the other hand, the changes suggested is more informative, and the typical case is that the changes finally adopted is different from the original version that RIL-source company proposed. |
| Huawei, HiSilicon | Agree with rapporteur observations.  Also agree with OPPO that what is adopted is generally not what is proposed exactly. |
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**Summary 4**: TBD.

**Proposal 4**: TBD.

End-to-End Procedure

3GPP has implemented a functional process to facilitate the end-of-release ASN.1 review. However, improvements could be made to each component of the review by modifying existing procedures or by developing new ones. The discussion on these improvements could apply to any of the previously discussed components or additional components.

**Question 5**: For any of the fundamental features of the review process, please provide any additional comments regarding suggestions for improvement, which could be to the current process or for a new process.

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| Answers to Question 5 | |
| Company | Technical Arguments |
| Qualcomm | A tool that can reduce the overhead of manual work e.g. by automating tags, enabling parallel work etc as commented above. |
| OPPO | When there are multiple changes made by different companies, the style in word may be easily changed, and it usually ends with the work by WI Rapp re-doing each change from an original specification version, it would be helpful if this can be improved somehow. |
| Huawei, HiSilicon | In current procedure described before question 2:  - 1 to 3 could (hopefully easily) be automated, to avoid someone mistakenly editing/uploading a file that is locked, be notified when the new file is available, possibly have a queue or reserve a time slot for editing. Then 7 is not needed.  - the review file could be split in smaller files, so that MS word could hopefully freeze less. Having several files would increase the burden if 1 to 3 is not automated, but it is not a problem if it is automated.  Besides, ASN.1 is pure text, except for the tables for field descriptions and presence conditions. If saved as a pure text file with MS word and opened e.g., with notepad, it remains readable (text in cells of table are just in consecutive lines, without the table and without formatting), so one option could be to do that for ASN.1 review and add comments e.g., as additional lines starting with #.  Then, it might be possible to use online collaboration tools like etherpad (which does not require any license as it is free/open-source software), but this would need to be checked. |
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**Summary 5**: TBD.

**Proposal 5**: TBD.

## 3.2 Automated Procedures

Automated procedures such as one to create a report of all the “RILs” are used to ease the work of the rapporteur in tracking corrections submitted by companies. These are useful for summarization and reducing the burden of searching the entire review file for comments.

**Question 6**: Which automations have been useful during the review process?

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| Answers to Question 6 | |
| Company | Existing Automations |
| Qualcomm | Extracting all comments is useful, however it looses the formatting of the suggested text changes, which can make suggested changes even more confusing. |
| OPPO | RIL list generation seems to be a useful tool to have a throughout summary. |
| Huawei, HiSilicon | Extracting all comments is useful, we did not feel too much issue with losing the formatting because it is anyway needed to check the comments in place. |
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**Summary 6**: TBD.

**Proposal 6**: TBD.

In addition to the automations used today, which others could be useful augmentations of the review process? Some examples could include automatic version control instead of the manual creation of a lock file and sending of an email to advertise that comments have been added.

**Question 7**: Which additional automations could be useful during the review process?

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| Answers to Question 7 | |
| Company | Potential Additional Automations |
| Qualcomm | Automatic version control would be good. Possibility of simultaneous/parallel working on the same file would also be good. |
| OPPO | A version control tool would be useful, yet we are wondering how to make the intended change more visible to others, in order to avoid duplicated/colliding RILs (if considering each RIL-source company check-out for one RIL and thus result into a big number of branches). |
| Huawei, HiSilicon | We need to automate the steps 1 to 3 for sure.  If we can do parallel work with real-time merging, this would be even better, even if restricted to ASN.1 in pure text. |
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**Summary 7**: TBD.

**Proposal 7**: TBD.

## 3.3 Microsoft Word Features

Microsoft Word supports a wide variety of features that aid in collaborative work on documents. These features include balloon comments, all of which can be viewed simultaneously, and tracked changes. While the tracked changes feature has been determined to be infeasible for use with many collaborators, other features may work well for large-group collaboration.

**Question 8**: Which collaborative features of Microsoft Word have been most useful in the review process, and what are their benefits and detractors, in the context of use in Microsoft Word?

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| Answers to Question 8 | |
| Company | Microsoft Word Collaborative Features - Benefits and Detractors |
| Qualcomm | MS word is good for smaller specifications/files, but seems to struggle with large specifications. |
| OPPO | MS word is more useful in order to make the RIL raised by one company visible, before other company(ies) raise similar/related issue.  And we agree with the point that so far it is not friendly with simultaneous change by multiple editors, and not work well with large spec. |
| Huawei, HiSilicon | We also understand that MS word has scaling problems for the size of something like RRC. At least for the review, we may want to split RRC in a number of files. |
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**Summary 8**: TBD.

**Proposal 8**: TBD.

Microsoft Word supports a wide variety of features useful in individual work on documents, such as split view, viewing multiple pages at the same time, and easy navigation between sections using the Navigation Pane.

**Question 9**: Which document editing and viewing features of Microsoft Word have been most useful in the review process, and what are their benefits and detractors, in the context of use in Microsoft Word?

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| Answers to Question 9 | |
| Company | Microsoft Word Editing and Viewing Features - Benefits and Detractors |
| Qualcomm | Exclusively in the context of ASN.1 review, it is hard to come up with a standout feature in MS word. The features like split view, navigation pane all stop functioning effectively with a big file and on top of that when there are enough balloon comments. |
| OPPO | See reply to Q8 above. |
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**Summary 9**: TBD.

**Proposal 9**: TBD.

## 3.4 Other Tools

During the offline discussion, companies mentioned using tools other than Microsoft Word to aid in the review, such as external tools or Microsoft Word plugins to perform syntax checking and highlighting of the ASN.1 parts of the specification. It would be useful to understand which other tools have been used in the review process to ensure that any future changes to the review process are not overly disruptive to companies’ procedures.

**Question 10**: Other than Microsoft Word, which tools have been useful during the ASN.1 review process, and what have the tools been used for?

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| Answers to Question 10 | |
| Company | Review Tools and their Purpose |
| Huawei, HiSilicon | It may be worth converting ASN.1 to text, then any text editor can be used, or, if feasible, something like etherpad could be used.  Comments could be entered as lines starting with #. If etherpad can be used, revision marks could be made as formatting. Otherwise, comments could include the changes, with text explanations to help understand what is changed. |
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**Summary 10**: TBD.

**Proposal 10**: TBD.

# 4 Conclusion

TBD.