3GPP TSG RAN WG1 #109-e R1-220xxxx

e-Meeting, May 9th – 20th , 2022

Source: Moderator (ZTE)

Title: [109-e-R18-Repeater-01] Email discussion and approval of TR skeleton

Agenda Item: 9.8

**Document for: Discussion and Decision**

# **Introduction**

In RAN1#109e meeting, the SI on NCR is initialized [1]. The original draft TR skeleton can be found in [R1-2203235](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_109-e/Docs/R1-2203235.zip)

For completion of the approval, the following email discussion is assigned.

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| [109-e-R18-Repeater-01] Email discussion and approval of TR skeleton for Rel-18 SI on NR network-controlled repeaters by May 13 – Nan (ZTE) |

# **Comments and discussion**

The main content/structure of current TR is listed in appendix. Companies are encouraged to provide the comments and suggestions on the main content/structure of current TR.

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| --- | --- |
| Company | Comment |
| **Ericsson** | As mentioned in the online session, cost is an essential parameter in specifying repeaters. Although not necessarily a RAN1 topic in itself, we expect the cost parameter to be included when discussing different alternatives for a certain topic in the TR.  We interpret Sec. 8 to concern how to make the repeater access and attach to the controlling gNB, e.g., initial access procedure, authentication and authorization etc. |
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# **Reference**

1. RP-213700, SID on NR Network-controlled Repeaters, RAN#94-e

# **Appendix**

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| 4 Introduction [Editor’s Note: This clause reuses the text from the Justification parts in SID.]  Coverage is a fundamental aspect of cellular network deployments. Mobile operators rely on different types of network nodes to offer blanket coverage in their deployments. Deployment of regular full-stack cells is one option but it may not be always possible (e.g., no availability of backhaul) or economically viable.  As a result, new types of network nodes have been considered to increase mobile operators’ flexibility for their network deployments. For example, Integrated Access and Backhaul (IAB) was introduced in Rel-16 and enhanced in Rel-17 as a new type of network node not requiring a wired backhaul. Another type of network node is the RF repeater which simply amplify-and-forward any signal that they receive. RF repeaters have seen a wide range of deployments in 2G, 3G and 4G to supplement the coverage provided by regular full-stack cells. In Rel-17, RAN4 specified RF and EMC requirements for such RF repeaters for NR targeting both FR1 and FR2.  While an RF repeater presents a cost effective means of extending network coverage, it has its limitations. An RF repeater simply does an amplify-and-forward operation without being able to take into account various factors that could improve performance. Such factors may include information on semi-static and/or dynamic downlink/uplink configuration, adaptive transmitter/receiver spatial beamforming, ON-OFF status, etc.  A network-controlled repeater is an enhancement over conventional RF repeaters with the capability to receive and process side control information from the network. Side control information could allow a network-controlled repeater to perform its amplify-and-forward operation in a more efficient manner. Potential benefits could include mitigation of unnecessary noise amplification, transmissions and receptions with better spatial directivity, and simplified network integration. 5 Modelling of Network-controlled repeater [Editor’s Note: This clause intent to capture the conceptual model of network-controlled repeater.] 6 Side control information [Editor’s Note: This clause includes the progress for each side control information, which will be captured in sub-clause.] 6.1 Beam information6.2 Timing information6.3 Information on UL-DL TDD configuration6.4 ON-OFF information6.5 Power control information7 L1/L2 signalling for side control information7.1 Signalling for side control information [Editor’s Note: This clause includes the candidate signalling for each side control information, which will be captured in sub-clause.] 7.2 Configuration of signalling8 Repeater management8.1 Solution on Repeater management8.2 Specification impacts [Editor’s Note: This clause includes the identified specification impacts for each solution based on the inputs from RAN2 and RAN3, it will be captured in sub-clause.] 9 Conclusion |