
Study on management of network sharing phase3

1 References

[1] 3GPP TS 22.101: "Service principles".

[2] 3GPP TS 22.261: "Service requirements for the 5G system".

[3] 3GPP TR 22.851: "Feasibility Study on Network Sharing Aspect(Release 19)"

2 Justification

Network sharing is a crucial approach to decrease CAPEX of 5G constructions for operators. As stated in TS 22.261 the increased density of access nodes needed to meet future performance objectives pose considerable challenges in deployment and acquiring spectrum and antenna locations. RAN sharing is seen as a technical solution to these issues. Plenty of previous normative works have been completed during Rel-17 and Rel-18. Several TSGs, including SA1 and SA2, have been keeping track of this topic in Rel-19.

SA1 introduces the newly supported network sharing scenario, where a NG-RAN is shared among multiple operators without necessarily assuming a direct connection between the shared radio access network and the participating operator's core network. Use cases including service continuity and QoS, access control and mobility, international roamers in shared network, hosted services, long-distance road transport are analyzed in Rel-19.

Until now TR 22.851 has introduced new types of network sharing scenarios and TS 22.261 has specified service requirements of Indirect Network Sharing.

Clause 6.21.2.2 of TS 22.261 specifies Indirect Network Sharing as follows:

"The 5G system shall be able to support Indirect Network Sharing between the Shared NG-RAN and one or more Participating NG-RAN Operators' core networks, by means of the connection being routed through the Hosting NG-RAN Operator's core network."

SA2 has started the discussion on the future Rel-19 study supporting indirect network sharing.

Indirect Network Sharing is different from existing MOCN Network Sharing. Potential effects on OAM are supposed to be studied.

During Rel-18, SA5 has specified new scenarios for MOCN Network sharing, SBMA deployment examples for MOCN management architectures and related NRM enhancements. Some leftover issues for existing MOCN, including management of non-operator-specific configuration or performance measurement in CU level, EE-related, MDT and management data requirements for Participating NG-RAN Operator, etc., are supposed to be further studied.

For Rel-19, following topics are suggested to study in general:

- Investigate the enhancement of management supporting Indirect Network Sharing;
- Investigate the enhancement of existing MOCN Network Sharing.

3 Objectives

Potential scope includes:

1. The enhancement of management supporting Indirect Network Sharing:

- definition of 5G indirect network sharing management scenarios.
- management architecture and requirements of 5G indirect network sharing, including interaction requirements between Participating NG-RAN Operators' core networks and the Hosting NG-RAN Operator's core network, etc.
- potential MnS(s) provided by Hosting NG-RAN Operator, including regulatory services, e.g., PWS or emergency calls apply to Indirect Network Sharing.
- support NG-RAN sharing of 5G satellite access network.
- investigate potential effects on present performance measurements.

2. The enhancement of existing MOCN Network Sharing:

- Rel-18 leftover issues, e.g., management of non-operator-specific configuration or performance measurement in CU level.
- MDT and management data requirements for POPs.

Potential collaboration groups and related topics: SA1

Feedback Form 1: Comments for objectives

1 – HUAWEI TECHNOLOGIES Co. Ltd.

Suggest classify the objectives into two categories: one is focus on research the basic functions of 5G indirect network sharing scenarios and the other is the enhancement of existing MOCN.

- For objective1 suggest to study the basic functions on management of indirect network sharing. The third and fourth objectives in objective 1 belong to MOCN, suggest merge these two with objective 3.
- For objective2, suggest to be placed in objective 1.

2 – China Unicom

Please find updates in version 0.0.2.

3 – TELEFONICA S.A.

We need to include a reference to the SA1 document that describes the indirect network sharing scenario

4 – TELEFONICA S.A.

- *“management architecture and requirements of 5G indirect network sharing, including interaction requirements between Participating NG-RAN Operators’ core networks and the Hosting NG-RAN Operator’s core network, etc”*
 - » why core networks from different operators need to interact? Justification and rationale is needed.

- *“investigate more performance measurements for 5G network sharing, e.g. indirect network sharing”*
 - » we need to be more concrete on the nature of these performance measurements, justify what they are needed for. Do we have a SA1 prescription/ recommendation on the need to investigate new PMs, or is it something that you have identified beforehand?

5 – Samsung R&D Institute UK

I think this has dependency on ”SP-231052”. As discussed in SA#101, we cannot agree on this unless the related SI is agreed in SA2. We have nothing to manage yet

6 – Nokia Corporation

As commented by Telefonica, request to add the reference to SA1 specification. Though justification has been added, the reference(s) to SA1 specification is still missing.

7 – China Unicom

Thank you for all comments and suggestions.

Reply to TELEFONICA:

- References have been added in the latest version.
- For question 1: According to definitions in TS 22.261, Indirect Network Sharing between the Shared NG-RAN and one or more Participating NG-RAN Operators’ core networks are supported by means of the connection being routed through the Hosting NG-RAN Operator’s core network. Detailed descriptions have been added to Justification.
- Indirect Network Sharing is different from the existing MOCN network sharing, so potential effects on performance measurement should be studied. This bullet has been reworded as “investigate potential effects on present performance measurements”.

Reply to Samsung:

References, Justification and Objectives have been updated.

As described in Justification, our study has two major objectives:

- Investigate the enhancement of management supporting Indirect Network Sharing
- Investigate the enhancement of existing MOCN Network Sharing

Among them, bullet 2 comes from leftover issues in Rel-19 which is not related to the study of either SA1 or SA2. Bullet 1 is related to the existing specification TS 22.261 and technical report TR 22.851.

Reply to Nokia:

References have been added in the latest version.

8 – China Unicom

Sorry for a typo, this is the latest version of reply to Samsung:

References, Justification and Objectives have been updated.

As described in Justification, our study have two major objectives:

- Investigate the enhancement of management supporting Indirect Network Sharing
- Investigate the enhancement of existing MOCN Network Sharing

Among them, bullet 2 comes from leftover issues in Rel-18 which is not related to the study of either SA1 or SA2. Bullet 1 is related to the existing specification TS 22.261 and technical report TR 22.851.

Feedback Form 2: Suggestions for other potential scopes