3GPP TSG-SA WG2#163 S2-240xxxx

Jeju, Korea, May 27 – May 31, 2024 (revision of S2-2406773)

**Source: Qualcomm Incorporated, Sony, Nokia**

**Title: New WID on Vehicle Mounted Relays (VMR) Phase 2**

**Document for: Approval**

**Agenda Item: 30.1**

*Abstract of the contribution: New WID for Vehicle Mounted Relays (VMR) Phase 2.*

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>   
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: Vehicle Mounted Relays Phase 2

Acronym: VMR\_Ph2

Unique identifier: TBD

Potential target Release: Rel-19

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  | X | X | X |  |
| No | X |  |  |  | X |
| Don't know |  |  |  |  |  |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
|  | Study |
|  | Normative – Stage 1 |
| X | Normative – Stage 2 |
|  | Normative – Stage 3 |
|  | Normative – Other\* |

**\* Other = e.g. testing**

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |  |  |  |
| --- | --- | --- | --- |
| Parent Work / Study Items | | | |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
|  |  |  | N/A |

### 2.3 Other related Work Items and dependencies

|  |  |  |
| --- | --- | --- |
| Other related Work /Study Items (if any) | | |
| Unique ID | Title | Nature of relationship |
| 930021 | Stage 1 of Vehicle-Mounted Relays | Stage 1 for VMR in Rel-18 |
| 980019 | Architecture Enhancements for Vehicle Mounted Relays | Stage 2 for VMR in Rel-18 |
| 850009 | Architecture enhancements for the support of Integrated access and backhaul (IAB) | Baseline IAB architecture support |
| 941009 | Mobile IAB (Integrated Access and Backhaul) for NR | RAN aspects of the VMR feature in Rel-18 |
| 1020082 | Study on additional topological enhancements for NR | RAN aspects of the VMR feature in Rel-19 |
| 1020067 | Study on Vehicle Mounted Relays Phase 2 | Stage 2 study for VMR Phase 2 in Rel-19 |

# 3 Justification

In Rel-18, SA2 conducted a study followed by a work item on VMR (Vehicle-Mounted Relays). During the study, it was agreed to limit the scope of the work to the IAB (Integrated Access and Backhaul) architecture, whereby the IAB-node consist of an IAB-MT and an IAB-DU, with the IAB-DU establishing an F1 interface with a donor CU over a wireless link.

There are however other architecture options to achieve the functionality of vehicle-mounted relay as defined in TS 22.261, for instance the so-called “Velcro” solution whereby the relay node consists of a UE co-located with a full gNB, with the gNB in the relay establishing N2 and N3 interface to an AMF and UPF residing in the 5GC over a PDU session or PDU sessions.

This architecture option is better suited to certain deployment scenarios for vehicle-mounted relays, for instance using the VMR where IAB is not widely supported, or the scenario in which the relay process local traffic in the vehicle to provide onboard services with low latency.

Additionally, the following other functionalities were not included in the Rel-18 work:

- NTN backhauling, to provide coverage e.g. on vessels, aircrafts and in other areas without TN coverage

- a scenario where the backhaul (midhaul) MNO is different from the VMR provider.

SA2 carried out the corresponding architecture enhancement studies (FS\_VMR\_ph2), focusing on the above mentioned aspects. Solutions, evaluations and conclusions were documented in TR 23.700-06. Based on the evaluation and conclusions, it is proposed to progress the necessary normative works for the agreed architecture enhancements to support the Mobile gNB with wireless access backhauling (MWAB).

# 4 Objective

The objective of this work items is to specify the architecture enhancements, functionalities and procedures to support MWAB based on conclusions of TR 23.700-06 (clause 8).

Specifically, the detailed objectives include:

1) providing support for the configuration of the MWAB-gNB by the OAM of the PLMN or SNPN it serves via BH PDU sessions established over the PLMN serving the MWAB-UE;

2) authorization of the MWAB-UE by 5GC (of a PLMN or SNPN), including in the roaming case and when the authorization status changes;

3) enhancements to location service procedures for accurate UE location estimation when it is served by MWAB;

4) document the support of the control of UEs’ access to MWAB by reusing CAG and/or other existing SNPN control mechanisms;

5) support of the mobility for UEs moving together with MWAB;

6) enhancements to support UE's emergency services when connected via a MWAB-gNB.

## **TU estimates:**

**Total TU estimates for the normative phase: 2.5**

# 5 Expected Output and Time scale

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| New specifications {One line per specification. Create/delete lines as needed} | | | | | |
| Type | TS/TR number | Title | For info  at TSG# | For approval at TSG# | Rapporteur |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} | | | |
| TS/TR No. | Description of change | Target completion plenary# | Remarks |
| 23.501 | System architecture for support of VMR feature. | TSG#106 (Dec. 2024) |  |
| *23.502* | *Procedures for support of VMR features.* | *TSG#106 (Dec. 2024)* |  |
|  |  |  |  |
| *23.273* | *eLCS procedure enhancements to support the VMR features.* | *TSG#106*  *(Dec. 2024)* |  |

# 6 Work item Rapporteur(s)

Primary Rapporteur: Hong Cheng (Qualcomm), hongc@qti.qualcomm.com

Secondary Rapporteur: Lars Nord (Sony), Lars.Nord@sony.com (in charge of producing reports to the WG plenary on progress)

# 7 Work item leadership

SA2

# 8 Aspects that involve other WGs

The following aspects involving other WGs may arise related to this SID:

- SA3 for Security aspects

- SA5 for charging and management aspects

- RAN aspects

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Qualcomm Incorporated |
| Sony |
| Dish Network |
| IIT Bombay ? |
| FirstNet |
| NEC ? |
| Nokia |
| AT&T |
| Verizon ? |
| Xiaomi ? |
| LG Electronics ? |
| CATT ? |
| Ericsson |