**3GPP TSG SA WG5 Meeting #140e S5-216127**

**Online, , 15 Nov 2021- 24 Nov 2021**

**Source: Samsung**

**Title: pCR 28.104 software management usecase and requirements**

**Document for: Approval**

**Agenda Item: 6.4.18**

# 1 Decision/action requested

***The group is asked to discuss and approve the proposals.***

# 2 References

None

# 3 Rationale

The pCR provides use case of software management.

# 4 Detailed proposal

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| **First modification** |

### 7.2.6 MDA assisted critical maintenance management

#### 7.2.6.1 Description

This capability deal with enabling various functionalities related with critical maintenance e.g software management.

#### 7.2.6.2 Use cases

##### 7.2.6.2.1 RAN Node Software Upgrade

As per the current mechanism of software upgrade at RAN node results in service disruption or huge operational cost. Consider a scenario, when a RAN Node is required to shut down manually to undergo critical maintenance for a very short duration of time. Software upgrade can be one such critical maintenance scenario. In such cases, all the resources (bearer, security functions, mobility management) that are managed by this RAN Node need to be purged and reconfigured at another RAN Node (standby RAN Node) or if another RAN Node is not available then resources will be reconfigured again when former RAN Node comes up after software upgrade. Both the situations lead to additional operational expenses and data loss. Operational expense in terms of all the resources to be released/attached again and data loss for all GBR sessions/bearer.

It is expected to use MDAS to optimize the procedure of software upgrade at RAN Node by providing the right time to execute the required upgrade. The software upgrade should be automatically initiated by the OAM system, once configured, during the time frame when the expected impacts are minimum i.e. at the Optimal Time when there would be minimum expected operational cost and data loss. The Optimal Time (current or futuristic) can be derived by collecting and analysing the data related to DRBs including GBR/non-GBR, state, modification count, ongoing handover etc. MDAS can utilize historical data and AI/ML (e.g., time series based) algorithm to derive the future optimal time frame for software upgrade.

Note: RAN Node above refers to CU-CP in case of gNB split case.

#### 7.2.6.3 Requirements

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| **Requirement label** | **Description** | **Related use case(s)** |
| **REQ-SWA\_MDA-CON-x** | The MDAS producer should have a capability allowing the authorized consumer to get the DRB info analytics output describing the DRBs info at a particular RAN Node(s). | RAN Node Software Upgrade |
| **REQ-SWA\_MDA-CON-x** | The MDAS producer should have a capability to provide the DRB info analytics report describing the DRB info based on the following DRB characteristics; type (GBR/non-GBR), state (idle/active), modification count (indicating number of times, this bearer has gone for modification since its creation), handover in-progress (indicates whether the bearer is undergoing handover or not). | RAN Node Software Upgrade |
| **REQ-SWA\_MDA-CON-x** | The DRB info analytics output describing the DRB info should contain the following information:  - Timeframe: Time frame/duration at which the output is generated  - CurrentUpgradeOptimal: Whether RAN Node is optimal for upgrade at present  - DRB count: Total number of GBR and non-GBR DRBs at present  - FutureUpgradeOptimal: Whether RAN Node will be optimal for upgrade during a future time frame. This will also provide a future frame.  - DRB count: Total number of GBR and non-GBR DRBs at future point of time frame. This will also provide a future frame. | RAN Node Software Upgrade |
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| **End of First modification** |