**3GPP TSG-SA5 Meeting #145-e *S5-225372rev1***

**e-meeting, 15 August – 24 August 2022**

**Source: China Mobile**

**Title: pCR 28.912 Add potential solutions for intent conflict**

**Document for: Approval**

**Agenda Item: 6.7.3.2**

# Decision/action requested

***The group is asked to discuss and endorse the proposal in section 4***

# 2 References

[1] 3GPP draft TR 28.912: “Management and orchestration; Study on enhanced intent driven management services for mobile networks v0.3.0”.

[2] 3GPP TS 28.312: "Management and orchestration; Intent driven management services for mobile networks"

# 3 Rationale

This contribution proposes to update the description for Issue#4.2: Intent conflicts and intents containing contradictions in the following aspects:

- Add some description of conflict between two or more intents

- Add potential solutions.

# 4 Detailed proposal

It proposes to make the following changes.

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| **1st Change** |

## 4.2 Issue#4.2: Intent conflicts

### 4.2.1 Description

The MnS consumer may create an intent containing two or more intent expectations, and each intent expectation may contain multiple expectation targets. For example, a Radio Network related intent may express an intent with targets on radio network parameters (like, downlink transmit power, remote electrical tilt) or on KPIs (like, DL UE throughput target, average RSRP target, coverage area). On receiving and after analysing the intent, the MnS producer may realize that the intent expectations or expectation targets in one intent are contradicted, i.e. the MnS producer may detect conflicts in the intent. Also an intent is considered to have conflict with other intents if the requirements (includes intent expectation and corresponding expectation targets) stated in one intent is conflicted with the requirements (includes intent expectation and corresponding expectation targets) stated in another intent. Following are the intent related conflict scenarios:

- Target conflict, which represents the conflict between two or more expectation targets within the same intent expectation.

- Expectation conflict, which represent the conflict between two or more intent expectations with the same intent

- Intent conflict, which represent the conflict between two or more different intents.

For example, consider two targets target\_1=: throughput > threshold\_1 and target\_2 := interference < threshold\_2, and while trying to achieve target\_1, target\_2 gets degraded, so the producer will see that the targets are conflicting. The two are intent conflict if they are in different intents, but they are expectation conflict or target conflict if they are in the same intent.

For the intent conflict, the two or more intents may be proposed by the same MnS consumer, or may be proposed by different MnS consumers. An example of the latter is that the MnS producer cannot satisfy the intents of two MnS consumers simultaneously. From the perspective of intent creation time, conflicting intentions may be proposed at different time, so a newer intent may be in conflict with an intent that is being executed but has not yet been fulfilled. The MnS producer may terminate the intent execution task.

When such conflicts are detected, the MnS producer needs to notify the MnS consumer about the conflict, indicating the intent, intent expectations or expectation targets which give rise to the conflict. Additionally, the MnS producer may also notify the MnS consumer about the additional information (e.g. the impact for other expectation targets when fulfill the specified expectation targets in the same or different intent) for the conflict. The MnS producer can also provide solutions regarding intent conflicts, such as termination the whole intent, recommended intent (recommended expectations or targets, or termination part of intent,), or updating the execution time of the intent.

Thereby, the MnS consumer may task actions (e.g. modify and delete the intent or intent expectation or expectation targets,) to address such intent conflict or MnS consumer may give some intent conflict handling guidelines (e.g. assign priority for such intent or intent expectation or expectation targets) to MnS producer to solve such intent conflict or eliminate the terminated state which is caused by the reason of conflict detected.

**REQ-Intent\_conflict-CON-1:** The intent driven MnS should have the capability to inform the authorized MnS consumer about intent related conflicts, including intent conflict, expectation conflict and target conflict.

**REQ-Intent\_conflict-CON-2:** The intent driven MnS should have the capability to allow the authorized MnS consumer to give intent conflict handling guidelines to MnS producer to solve such intent conflict and potentially affect the terminated state which is caused by the reason of conflict detected.

**REQ-Intent\_conflict-CON-3:** The intent driven MnS should have the capability to inform the authorized MnS consumer about possible solutions related conflicts, including suggesting to terminate intent instances, recommended intent instances, or recommended execution time of the intent instances.

### 4.2.2 Potential Solution

The MnS producer should notify the MnS consumer whenever such a conflict is detected with intent, intent expectations or expectation targets specified which give rise to the conflict. Additionally, for an executing intent, the intent progress status should be marked as terminated with the reason as conflict detected. Also MnS consumer can give intent conflict handling guidelines to MnS producer to solve such intent conflict and potentially affect terminated state which is caused by the reason of conflict detected.

Also, the MnS producer can notify the authorized MnS consumers about possible solutions related conflicts, and then the MnS consumer can choose one solution, e.g. updating the intent. By analyzing multiple conflicting intent instances, the MnS producer can preliminarily obtain a overall optimal solution when considering multiple factors, such as conflict impacts, conflict priority, etc. For example, the expectation of intent instance 1 can be modified to expectation 1, expectation 2, and the targets intent instance 2 can be modified target1, target2, and intent instance 3 is recommended to be cancelled, and intent instance 4 is recommended to be executed at some other time. Then the notified MnS consumer can update or cancel its intent instance according to the solution information provided by the MnS producer.

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| **End of Change** |