**3GPP TSG-SA5 Meeting #158 *S5-247178***

**Orlando, United States, 18th Nov 2024 - 22nd Nov 2024**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **28.312** | **CR** | **0260** | **rev** | **1** | **Current version:** | **18.5.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network | **X** |

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| ***Title:***  | Rel-19 CR TS 28.312 Enhance the intent report use case, reqs and solution to support implicit intent report subscription with customized requirements |
|  |  |
| ***Source to WG:*** | Huawei, Deutsche Telekom, ZTE |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | DUMMY |  | ***Date:*** | 2024-11-04 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-19 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***Reason for change:*** | The use case, requirements and solution for implicit intent report subscription with customized requirements are investigated in TR 28.914 and recommeded for normative work. It proposes to update use case, requirements and solution for intent report to support implicit intent report subscription with customized requirements in TS 28.312. |
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| ***Summary of change:*** | Update use case, requirements and solution for intent report to support implicit intent report subscription with customized requirements |
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| ***Consequences if not approved:*** |  |
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| ***Clauses affected:*** | 5.3.2.1, 6.2.1.2.1.1, 6.2.1.2.1.2, 6.2.1.2.1.3, 6.2.1.3.X(new), 6.2.1.3.Y(new), 6.2.1.4 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | Forge MR link: <https://forge.3gpp.org/rep/sa5/MnS/-/merge_requests/1440> at commit 97a93b7e5182d848927af5c0a694a4da669eac97 |
|  |  |
| ***This CR's revision history:*** | S5-247178 is the merged version of S5-246371,S5-246461 and S5-246462 |

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| **1st Change** |

### 5.3.2 Intent report

#### 5.3.2.1 Introduction

The intent fulfilment information is defined as one type of intent report information in which the intentFulfilmentInfo, expectationFulfilmentInfo and targetFulfilmentInfo are included for the MnS consumer to monitor the intent fulfilment information. The intent fulfilment information also can contain the current value for performance indicated by corresponding expectation targets (e.g. WeakRSRPRatio for the weakRSRPRatioTarget, Average UL RAN UE Throughput for aveULRANUEThptTarget), which can be used by MnS consumer to validate whether the intent is really fulfilled and to evaluate whether the intent (especially for expectation targets) needs to be updated if needed (improve the target value when corresponding target is fulfilled or reduce the target value when corresponding target is not fulfilled). Besides, intent conflict information and intent fulfilment feasibility check information sent by MnS producer to MnS consumer is another type of intent report information. So, following are the three types of information needs to be monitored by MnS consumer:

- Intent fulfilment information, which represents the properties of a specific fulfilment information for an aspect of the intent (i.e. either an expectation, a target or the whole intent), including fulfilment status and achieved values for targets.

- Intent conflict information, which represents intent with conflict. The information includes conflict type (i.e., intent conflict, expectation conflict and target conflict) and possible solutions (e.g. intent deletion, intent modification).

- Intent fulfilment feasibility check information, which indicates that the intent is feasible or infeasible. Intent fulfilment feasibility check information is provided after MnS producer automatically performs feasibility check when receiving the intent creation and modification request from MnS consumer.

Different MnS consumer may have different requirements for intent report (e.g. Some MnS consumer may want to have corresponding performance value information while others do not want. Different MnS consumer may want to calculate or monitor the performance value in different period).

MnS consumers may subscribe to get notifications of changes in the intent report. However,in some scenarios, MnS consumer who expresses the intent may want to obtain the intent report by default, instead of triggering separate subscription action (i.e., request to create a NtfSubscriptionControl instance) to subscribe intent report information (especially intent fulfilment information).

In addition, MnS consumer who expresses the intent may want to obtain the customized intent report intent report based on specified conditions. When the condition is satisfied, the MnS producer will send the intent report to the MnS consumer automatically. So, the capability to support for implicit intent report subscription is important for the MnS consumer who express the intent. By expressing the requirements of the intent report in an intent, the MnS consumers can customize the content of an intent report.

An intent under fulfilment may go through multiple states, i.e., the life cycle includes multiple alternative transitions. The transitions are triggered either by actions of the MnS consumer or observations at the MnS producer or its intent handling function. Generally, intents received at the MnS producer will have one of the states represented in Figure 5.3.2.1-1.



Figure 5.3.2.1-1: State transitions and reporting events for Intents delivered for fulfilment.

Intent reports should be delivered for each of these different states and related state transitions, specifically for:

1. ACKNOWLEDGED: When an intent instance is created, its default state is "ACKNOWLEDGED". An intent report should be delivered to indicate that the intent instance has been created. The transitions from "ACKNOWLEDGED" state can only be to "COMPLIANT", "FULFILLMENT\_FAILED" or "TERMINATED " states as described hereafter.

2. COMPLIANT: When the feasibility check for the intent is successful and the intent is accepted as being compliant, the intent state is changed to "COMPLIANT". An intent report should be delivered to indicate the results of the feasibility check. In the case of an intent delivered for fulfillment, a corresponding intent report should be delivered to indicate the status change. The payload for the intent feasibility report (outcome of the feasibility check) may be one of the following:

1. an indication for feasible or infeasible;

2. a detailed report indicating which intent expectations or ExpectationTargets are infeasible and the corresponding reasons;

 The transitions from "COMPLIANT" state are either to "ACKNOWLEDGED" state when the intent attributes are modified by the MnS consumer, or to "SUSPENDED", " FULFILLED " or "FULFILLMENT\_FAILED" states as described hereafter.

3. SUSPENDED: If the MnS consumer decides to suspend the intent, the intent state changes to "SUSPENDED". Alternatively, an event may occur while the MnS producer attempts to fulfil the intent, in which case the MnS producer may suspend the intent pending further actions. Such events at the MnS producer may among others include conflicts from another intent and resource constraints. An intent report should be delivered to indicate that the intent has been suspended. The intent report may include a reason for the suspension when the intent was suspended by the MnS producer.

 The transitions from "SUSPENDED" state are either to "ACKNOWLEDGED" state when the intent attributes are modified by the MnS consumer, or to "COMPLIANT" state if the suspension is lifted by the entity (MnS consumer or MnS producer) that suspended the intent. Otherwise, the state is "TERMINATED" if the intent is deleted.

4. FULFILLED: If the MnS producer considers that the intent, expectation or target has been fulfilled as stated by the MnS consumer, the state changes to "FULFILLED". An intent report should be delivered to indicate that the intent has been fulfilled.

 The transitions from "FULFILLED" state are either to "ACKNOWLEDGED" state when the intent attributes are modified by the MnS consumer or to "DEGRADED" as described for the "DEGRADED" state below.

5. DEGRADED: If an intent that was previously fulfilled but after a period of observation it is found not be meeting the initially stated requirements, the state changes to "DEGRADED". An intent report should be delivered to indicate that the intent has degraded.

 The transitions from "DEGRADED" state are either to "ACKNOWLEDGED" state when the intent attributes are modified by the MnS consumer, or to "FULFILLED" state if the MnS producer once again fulfills the intent.

6. FULFILLMENT\_FAILED: If the MnS producer determines that they cannot do anything to fulfil the intent, the state changes to "FULFILLMENT\_FAILED". An intent report should be delivered to indicate that the fulfillment of the intent has ceased. The intent is not deleted unless the MnS consumer explicitly requests for it to be deleted.

 The only transition from "FULFILLMENT\_FAILED" state is to "ACKNOWLEDGED" state when the intent attributes are modified by the MnS consumer.

7. TERMINATED: If the MnS consumer requests to delete the intent, the state changes to "TERMINATED". An intent report should be delivered to indicate that the intent has been terminated.

 There is no possible transition from TERMINATED state.

8. The intent may be modified when in any of the states "ACKNOWLEDGED", "COMPLIANT ", "SUSPENDED " "FULFILLED ", "DEGRADED" or "FULFILLMENT\_FAILED". An intent report should be delivered to indicate that the intent has been modified.

9. The intent may be deleted when in any of the states "ACKNOWLEDGED", "COMPLIANT ", "SUSPENDED " "FULFILLED ", "DEGRADED" or "FULFILLMENT\_FAILED". An intent report should be delivered to indicate that the intent has been deleted.

#### 5.3.2.2 Requirements

**REQ-IDMS\_IntentReport-CON-1:** The intent driven MnS producer shall have the capability to enable the MnS consumer to request intent report information.

**REQ-IDMS\_IntentReport-CON-2:** The intent driven MnS producer shall have the capability to enable the MnS consumer to obtain intent report information with intent fulfilment information (including fulfilment status and achieved values for targets).

**REQ-IDMS\_IntentReport-CON-3:** The intent driven MnS producer shall have the capability to enable the MnS consumer to obtain intent report information with intent conflict information.

**REQ-IDMS\_IntentReport-CON-4:** The intent driven MnS producer shall have the capability to enable the MnS consumer to obtain intent report information with intent fulfilment feasibility check information.

**REQ-IDMS\_IntentReport-CON-5:** The intent driven MnS producer shall have capability enabling MnS consumer to specify the content of the intent report.

**REQ-IDMS\_IntentReport-CON-6:** The intent driven MnS producer shall have capability enabling MnS consumer to configure the frequency of the intent reporting.

**REQ-IDMS\_IntentReport-CON-7:** The intent driven MnS producer shall have the capability enabling MnS consumer to receive reports, with different content and intervals according to its specified requirements.

**REQ-IDMS\_IntentReport-CON-8** The intent driven MnS producer shall have capability enabling the MnS consumer to receive an intent report when any of the following happens:

- the intent state has been changed to either "ACKNOWLEDGED" (intent has been created or modified), "COMPLIANT ", "SUSPENDED " "FULFILLED ", "DEGRADED" or "TERMINATED" (intent has been deleted).

**REQ-IDMS\_IntentReport-CON-9** The intent driven MnS producer shall have capability enabling MnS consumer to receive an intent report indicating the reasons associated with any of the following events: “SUSPENDED”, “DEGRADED” or “TERMINATED”.

**REQ-IDMS\_IntentReport-CON-10** The intent driven MnS producer shall have capability enabling MnS consumer to receive an intent report on the outcomes of a feasibility check, the report indicating either of 1) an indication for feasible or infeasible; 2) a detailed report indicating which intent expectations or ExpectationTargets are infeasible and corresponding reasons.

**REQ-IDMS\_IntentReport-CON-11** The intent driven MnS producer should have the capability to enable an MnS consumer, who expresses an intent, to specify intent report control information in the intent when creating or modifying the intent.

**REQ-IDMS\_IntentReport-CON-12** The intent driven MnS producer should have the capability to enable the MnS consumer to specify the conditions in the intent which triggers an intent report.

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| **2nd Change** |

##### 6.2.1.2.1 Intent <<InformationObjectClass>>

###### 6.2.1.2.1.1 Definition

This IOC represents the properties of an Intent driven management information between MnS consumer and MnS producer.

The Intent IOC contains one or multiple IntentExpectation(s) which includes MnS consumer's requirements, goals and contexts given to a 3GPP system*.*

The Intent IOC also contains intentAdminState to support intent suspension mechanism. In case MnS consumer wants to suspend an intent, MnS consumer can request MnS producer to configure attribute intentAdminState with the value "DEACTIVATED". A suspended intent means this intent is not considered for fulfillment. In case MnS consumer wants to resume an intent on the MnS producer side when the intent is suspended, MnS consumer can request MnS producer to configure attribute intentAdminState with the value "ACTIVATED".

The attribute "intentReportControl" indicates the intent report control and subscription information. MnS consumer needs to specify the values for the attribute "intentReportControl" when the MnS consumer wants to obtain the intent report with customized requirements by default, instead of triggering a separate subscription action.

The Intent IOC includes the attribute objectClass and objectInstance from the TOP IOC. The value of attribute objectClass is "Intent" and the value of attribute objectInstance is the DN of the instance of Intent IOC.

The Intent IOC includes contextSelectivity respectively used to define how to select among the stated intentContexts

###### 6.2.1.2.1.2 Attributes

The Intent IOC includes attributes inherited fromTop IOC (defined in 3GPP TS 28.622 [6]) and the following attributes.

Table 6.2.1.2.1.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| intentExpectations | M | T | T | F | F |
| userLabel | M | T | T | F | F |
| contextSelectivity | O | T | T | F | F |
| intentContexts | O | T | T | F | F |
| intentReportControl | CM | T | T | F | F |
| intentPriority  | O | T | T | F | T |
| intentAdminState | CM | T | T | F | F |
| intentPreemptionCapability | CM | T | T | F | F |
| **Attribute related roles** |
| intentReportReference | M | T | F | F | F |

###### 6.2.1.2.1.3 Attribute constraints

|  |  |
| --- | --- |
| Name | Definition |
| intentAdminStateSupport Qualifier | Condition: MnS consumer-suspension mechanism is supported. |
| intentPreemptionCapabilitySupport Qualifier | Condition: The preemption mechanism is supported. |
| intentReportControlSupport Qualifier | Condition: The implicit intent report subscription mechanism is supported. |

###### 6.2.1.2.1.4 Notifications

The common notifications defined in clause 6.2.1.5 are valid for this IOC. In addition, the following set of notifications is also valid.

| Name | S | Notes |
| --- | --- | --- |
| notifyMOIChanges | M | -- |

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| **3rd Change** |

##### 6.2.1.3.X IntentReportControl <<dataType>>

###### 6.2.1.3.X.1 Definition

This <<dataType>> describes intent report subscription information, including customized requirements on intent report.

The attribute "reportRecipientAddress" indicates the address of report recipient for MnS consumer.

The attribute "observationPeriod" indicates the time period for which the fulfilment process is observed and at the end of which the fulfilmentInfo for corresponding ExpectationTargets, IntentExpectations and Intent is updated. The observation period can be set by the MnS consumer or by the MnS producer if the MnS consumer does not provide a value.

The attribute "expectedReportTypes" indicates the type of IntentReports, which can be one/any/all of "IntentFulfilmentReport", "IntentConflictReport", and "IntentFeasibilityCheckReport".

The attribute " reportingConditions" indicates the specified conditions for intent reporting. TimeCondition is one choice for reportingCondition. For example, TimeCondition can be an interval, a specific time, or a time window. TagrtFulfilmentCondition in another choice for reportCondition. For example, the intent report needs to be sent by MnS producer when the achiveVlaue for specific target value crosses the pre-defined threshold.

The intent report will be sent to the MnS Consumer when the specified reportingConditions is satisfied

The attribute "reportingTargets" indicates the specified targets needed to be reported. All the targets described in the corresponding Intent instance need to be reported if the MnS consumer does not provide values for the attribute "reportingTargets".

###### 6.2.1.3.X.2 Attributes

Table 6.2.1.3.X.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable  | isWritable | isInvariant | isNotifyable |
| reportRecipientAddress | M | T | T | F | F |
| observationPeriod | M | T | T | F | F |
| expectedReportTypes | O | T | T | F | F |
| reportingConditions | O | T | T | F | F |
| reportingTargets | O | T | T | F | F |

###### 6.2.1.3.X.3 Attribute constrains

None.

##### 6.2.1.3.Y ReportingConditions <<Choice>>

###### 6.2.1.3.Y.1 Definition

This <<dataType>> describes the specified conditions for intent reporting. TimeCondition and targetFulfilmentConfition are choice for reportingConditions.

###### 6.2.1.3.Y.2 Attributes

Table 6.2.1.3.X.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable  | isWritable | isInvariant | isNotifyable |
| CHOICE\_1.1 timeCondition | CM | T | T | F | F |
| CHOICE\_1.2 targetFulfilmentCondition | CM | T | T | F | F |

###### 6.2.1.3.Y.3 Attribute constrains

|  |  |
| --- | --- |
| Name | Definition |
| CHOICE\_1.1 timeCondition | This attribute shall be supported, when MnS producer support the capability to allow a MnS consumer to specify time condition for intent reporting |
| CHOICE\_1.2 targetFulfilmentCondition | This attribute shall be supported, when MnS producer support the capability to allow a MnS consumer to specify condition of targets for intent reporting |

##### 6.2.1.3.y TargetFulfilmentCondition <<dataType>>

###### 6.2.1.3.y.1 Definition

TargetFulfilmentCondition <<dataType>> indicates the specified conditions of target fulfilment for intent reporting. The TargetFulfilmentCondition <<dataType>> includes a targetName, targetCondition, and targetValueRange.

###### 6.2.1.3.y.2 Attributes

Table 6.2.1.3.x.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable  | isWritable | isInvariant | isNotifyable |
| targetName | M | T | T | F | T |
| targetCondition | M | T | T | F | T |
| targetValueRange | M | T | T | F | T |

###### 6.2.1.3.y.3 Attribute constraints

None.

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| **4th Change** |

#### 6.2.1.4 Attribute definition

Table 6.2.1.4-1

| Attribute Name | Documentation and Allowed Values | Properties |
| --- | --- | --- |
| userLabel | A user-friendly (and user assignable) name of the intent.allowedValues: Not Applicable | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| intentExpectations | It describes the expectations including requirements, goals and contexts (including constraints and filter information) given to a 3GPP system. It states the list of specific outcomes desired to be realized for expectation object(s).The intentExpectations are arranged in an ordered list such that the most important intentExpectations are on the top of the list.allowedValues: Not Applicable | type: IntentExpectationmultiplicity: 1..\*isOrdered: TrueisUnique: TruedefaultValue: NoneisNullable: False  |
| intentFulfilmentInfo | It describes status of fulfilment of an intent and the related reasons for that status. allowedValues: Not Applicable | type: FulfilmentInfomultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| expectationFulfilmentInfo | It describes status of fulfilment of an intentExpectation and the related reasons for that status.allowedValues: Not Applicable | type: FulfilmentInfomultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| targetFulfilmentInfo | It describes status of fulfilment of an expectationTarget and the related reasons for that status. allowedValues: Not Applicable | type: FulfilmentInfomultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| fulfilmentStatus | It describes the current status of the fulfilment result for intent, intentExpectation or expectationTarget, which is configured by MnS producer and can be read by MnS consumer.allowedValues: "FULFILLED", "NOT\_FULFILLED" | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: "NOT\_FULFILLED"isNullable: False |
| notFulfilledState | It describes the current state for not achieving fulfilment for the intent, intentExpectation or expectationTarget. It is configured/written by MnS producer and can be read by MnS consumer.allowedValues: "ACKNOWLEDGED", "COMPLIANT", "DEGRADED", "SUSPENDED", "TERMINATED" "FULFILMENTFAILED" | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: "ACKNOWLEDGED"isNullable: False |
| notFulfilledReasons | It describes the reasons/observations related to the specific notFulfilledStateallowedValues: Not Applicable | type: Stringmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| intentContexts | It describes the list of IntentContext(s) which represents the constraints and conditions that should apply for the entire intent even if there may be specific contexts defined for specific parts of the intent.allowedValues: triple of (attribute, condition, value range) | type: Contextmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| expectationId | A unique identifier of the intentExpectation within the intent.allowedValues: Not Applicable | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| expectationVerb | It describes the characteristic of the intentExpectation and is the property that describes the types of intentExpectations. Examples of verbs and their related types of expectation are Deliver: DeliveryIntentExpectation, e.g. Deliver a RAN network, Service, Slice, functionEnsure: AssuranceintentExpectation, e.g. Ensure the target performance value.allowedValues: DELIVER, ENSUREVendor extensions are allowed | type: Stringmultiplicity: 1isOrdered:N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| expectationObject | It describes the expectation objects to which the IntentExpectation should apply.allowedValues: Not Applicable | type: ExpectationObjectmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| objectType | It describes the type of expectation object of the IntentExpectation that is required to be applied to. It can be class name of the managed object.allowedValues: see scenario specific IntentExpectation | type: Enummultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| objectInstance | It describes a specific object instance (e.g. instance of managed object) to which the intentExpectation should apply.allowedValues: Not Applicable | type: DNmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| objectContexts | It describes the list of ObjectContext(s) which represents the constraints and conditions to be used as filter information to identify the object(s) to which a given intentExpectation should apply. Note there may be other constraints and conditions defined either for the entire intent, for the specific intentExpectation or for the expectationTarget of the considered intentExpectation.The concrete ObjectContext depends on the ExpectationObject, which is defined in clause 6.2.2. All the concrete ObjectContexts follow the common structure of ObjectContext. | type: Contextmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| expectationTargets | It describes the list of ExpectationTarget(s) which represent specific outcomes on the metrics that characterize the performance of the object(s) or some abstract index that expresses the behavior of the object(s) that are desired to be realized for a given intentExpectation.The concrete ExpectationTarget depends on the ExpectationObject, which is defined in clause 6.2.2. All the concrete ExpectationTargets follow the common structure of ExpectationTarget.The expectionTargets are arranged in an ordered list such that the most important expectionTargets are on the top of the list. | type: ExpectationTargetmultiplicity: 1..\*isOrdered: TrueisUnique: TruedefaultValue: NoneisNullable: False |
| expectationContexts | It describes the list of context(s) which represents the constraints and conditions that should apply for a specific intentExpectation.Note there may be other constraints and conditions defined for the entire intent or for specific parts of the intentExpectation.allowedValues: depends on Expectation Object in the IntentExpectation | type: Contextmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| targetName | It describes the name of the expectation target which represents specific outcomes on the metrics that characterize the performance of the object(s) or some abstract index that expresses the behavior of the object(s) that are desired to be realized for a given intentExpectation.allowedValues: depends on ExpectationObject in the IntentExpectation | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| targetCondition | It expresses the limits within which the targetName is allowed/supposed to be. allowedValues: "IS\_EQUAL\_TO", "IS\_LESS\_THAN", "IS\_GREATER\_THAN", "IS\_WITHIN\_RANGE", "IS\_OUTSIDE\_RANGE", "IS\_ONE\_OF", " IS\_EQUAL\_TO\_OR\_LESS\_THAN”, "IS\_EQUAL\_TO\_OR\_GREATER\_THAN", "IS\_NOT\_ONE\_OF", "IS\_ALL\_OF" | type: Enummultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: "IS\_EQUAL\_TO"isNullable: False |
| targetValueRange | It describes the range of values that applicable to the targetName and the targetCondition.allowedValues: depends on the targetCondition.The value will be a single value when the targetCondition is either "IS\_EQUAL\_TO", "IS\_LESS\_THAN", "IS\_GREATER\_THAN", "IS EQUAL TO OR LESS THAN", "IS EQUAL TO OR GREATER THAN” The value will be a pair of values when the targetCondition is either "IS\_WITHIN\_RANGE", "IS\_OUTSIDE\_RANGE"The value will be a list when the targetCondition is "IS\_ONE\_OF", "IS\_NOT\_ONE\_OF","IS\_ALL\_OF". See NOTE 1.  | type: ValueRangeTypemultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: True |
| targetContexts | It describes the list of constraints and conditions that should apply for a specific expectationTarget. Note there may be other constraints and conditions defined for the entire intent or the intentExpectation.allowedValues: Not Applicable | type: Contextmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| contextAttribute | It describes a specific attribute of or related to the object or to characteristics thereof (e.g. its control parameter, gauge, counter, KPI, weighted metric, etc) to which the expectation should apply or an attribute related to the operating conditions of the object (such as weather conditions, load conditions, etc). | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| contextCondition | It expresses the limits within which the ContextAttribute is allowed/supposed to be allowedValues: "IS\_EQUAL\_TO", "IS\_LESS\_THAN", "IS\_GREATER\_THAN", "IS\_WITHIN\_RANGE", "IS\_OUTSIDE\_RANGE, "IS\_ONE\_OF", "IS\_EQUAL\_TO\_OR LESS\_THAN", "IS\_EQUAL\_TO\_OR\_GREATER\_THAN", "IS\_NOT\_ONE\_OF", "IS\_ALL\_OF" | type: Enummultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: "IS\_EQUAL\_TO"isNullable: False |
| contextValueRange | It describes the range of values that applicable to the ContextAttribute and the ContextCondition.AllowedValue: depends on the contextConditionThe value will be a single value when the contextCondition is either "IS\_EQUAL\_TO", "IS\_LESS\_THAN", "IS\_GREATER\_THAN", "IS\_EQUAL\_TO\_OR\_LESS\_THAN", "IS\_EQUAL\_TO\_OR\_GREATER\_THAN". The value will be a pair of values when the contextCondition is either "IS\_WITHIN\_RANGE", "IS\_OUTSIDE\_RANGE"The value will be a list when the contextCondition is "IS\_ONE\_OF", "IS\_NOT\_ONE\_OF","IS\_ALL\_OF".See NOTE 1. | type: ValueRangeTypemultiplicity: 1..\*isOrdered: False isUnique: TruedefaultValue: NoneisNullable: True |
| intentPriority | It expresses the priority of the stated intent within an MnS consumer. AllowedValue: values in the range [1-100] where 1 indicates the highest priority and 100 indicates the lowest priority.NOTE: The handing of the priorities across MnS consumers is left to implementation  | type: integermultiplicity: 1isOrdered: FalseisUnique: TruedefaultValue: 1isNullable: False |
| geoArea | It describes a geographical area defined in 3GPP TS 28.622[6].AllowedValue: As defined by the data type | type: GeoAreamultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: True |
| pLMNId | It describes the information of a PLMN identification defined in 3GPP 28.658[10]AllowedValue: As defined by the data type | type: PLMNIdmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| dateTime | It describes the information of a date time defined in 3GPP TS 28.622[6].AllowedValue: As defined by the data type | type: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| timeWindow | It describes the information of a time window (including startTime, endTime) defined in 3GPP TS 28.622[6].AllowedValue: As defined by the data type | type: TimeWindowmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| geoCoordinate | It describes the information of a geoCoordinate defined in 3GPP TS 28.622[6].AllowedValue: As defined by the data type | type: GeoCoordinatemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| frequency | It desribes the RF reference frequency (i.e. Absolute Radio Frequency Channel Number) and/or the frequency operating band used for a given direction (UL or DL) in FDD or for both UL and DL directions in TDD.AllowedValue: As defined by the data type | type: Frequencymultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| arfcn | It desribes the RF reference frequency (i.e. Absolute Radio Frequency Channel Number).Allowed Value:For NR, see TS 38.104 [8] clause 5.4.2.1.For EUTRAN, see TS 36.104 [14] clause 5.7.3. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| freqband | It desribes the the frequency operating band.Allowed Value:For NR, see TS 38.104 [8] clause 5.4.2.3.For EUTRAN, see TS 36.104 [14] clause 5.7.3. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| uEGroup | It describes the information of a UE Group (represented by specific 5QI, specific S-NSSAI, or a specific combination of S-NSSAI and 5QI).AllowedValue: As defined by the data type | type: UEGroupmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| fiveQI | It describes the information of a 5QI defined in 3GPP TS 28.541[5].AllowedValue: 0 - 255 | type: integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| sNSSAI | It describes the information of a S-NSSAI defined in 3GPP TS 28.541[5].AllowedValue: As defined by the data type | type: S-NSSAImultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| intentAdminState | It describes the intent administrative state, which enables the MnS consumer to suspend an intent or cancel the suspension for a suspended intent. A suspended intent means this intent is not considered for fulfilmentallowedValues: "ACTIVATED", "DEACTIVATED" | type: Enummultiplicity: 1isOrdered: N/A isUnique: N/AdefaultValue: "ACTIVATED"isNullable: False |
| intentReference | It indicates the associated intent instanceallowedValues: Not Applicable | type: DNmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| intentReportReference | It indicates the associated intent report instance(s)allowedValues: Not Applicable | type: DNmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| intentReportControl | It indicates the intent report control and subscription information.allowedValues: Not Applicable | type: IntentReportControlmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| reportRecipientAddress | It indicates the address of report recipient for MnS consumer.allowedValues: Not Applicable | type: String multiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: False |
| observationPeriod | It represents the observation period of the fulfilmentInfo for corresponding ExpectationTargets, IntentExpectations and Intent. At the end of the observation period, the corresponding fulfilment info is updated in the intent report. The observation period can be assigned by MnS consumer through requesting the MnS producer to set attribute "observationPeriod". MnS producer also can assign the observation period if MnS consumer didn’t assign it.The observation time is expressed in seconds.allowedValues: Not Applicable | type: Integermultiplicity: 0..1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| expectedReportTypes | It indicates the type of IntentReports, which can be one/any/all of "IntentFulfilmentReport", "IntentConflictReport", and "IntentFeasibilityCheckReport"allowedValues: INTENT\_FULFILMENT\_REPORT, INTENT\_CONFLICT\_REPORT, INTENT\_FEASIBILITY\_CHECK\_REPORT | type: ENUMmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: None isNullable: False |
| reportingConditions | It indicates the specified conditions for intent reporting. The intent report will be sent when the specified reportingConditions is satisfied.allowedValues: Not Applicable | type: ReportingConditionmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: None isNullable: False |
| reportingTargets | It indicates the specified targets needed to be reported.allowedValues: the scenario specific targetName defined in clause 6.2.2 Scenario specific IntentExpectation definition | type: Stringmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: None isNullable: False |
| timeCondition | It indicates the specified times for intent reporting. The specified times can be one-time interval, daily periodicity, weekly periodicity or monthly periodicityallowedValues: Not Applicable | type: SchedulingTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: False |
| targetFulfilmentCondition | It indicates the specified conditions of target Fulfilment for intent reporting. The targetFulfimentConfition can be described based on the achieved value for a specific targetName. allowedValues: Not Applicable | type: TargetFulfilmentConditionmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: False |
| intentFulfilmentReport | It describes the fulfillment information which is reported for the associated intent instance.allowedValues: Not Applicable | type: IntentFulfilmentReportmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: False |
| intentConflictReports | It describes the conflict information which is reported for associated intent instance if needed.allowedValues: Not Applicable | type: IntentConflictReportmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| conflictId | It is used to identify the detected conflict within an IntentReport instance.allowedValues: Not Applicable | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| conflictType | It describes the type of intent conflict.allowedValues: INTENT\_CONFLICT, EXPECTATION\_CONFLICT, TARGET\_CONFLICT | type: Enummultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: False |
| conflictingIntent | It describes the DN of the conflicting intentallowedValues: Not Applicable | type: DNmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: False |
| conflictingExpectation | It describes the expectationId of the conflicting IntentExpectation within an Intent.allowedValues: Not Applicable | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| conflictingTarget | It describes the targetName of the conflicting ExpectationTarget within an IntentExpectation.allowedValues: Not Applicable | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| recommendedSolutions | It describes the action recommended by the MnS producer to be undertaken by the MnS consumer to resolve intent conflict. The recommended solution applies only for the specific intent whose intent report contains this attribute.allowedValues: "MODIFY", "DELETE" | type: ENUMmultiplicity: 1isOrdered: FalseisUnique: TruedefaultValue: None isNullable: False |
| expectationFulfilmentResults | It includes the expectationFulfilmentInfo and targetFulfilmentResults for each IntentExpectation. The expectationFulfilmentInfo describes status of fulfilment of an intentExpectation and the related reasons for infeasible status.allowedValues: Not Applicable | type: ExpectationFulfilmentResultmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| targetFulfilmentResults | It includes targetFulfilmentInfo and targetAchievedValue for each ExpectationTarget. The targetFulfilmentInfo describes status of fulfilment of an expectationTarget and the related reasons for infeasible status. The targetAchieveValue describes current performance value for the ExpectationTarget.allowedValues: Not Applicable | type: TargetFulfilmentResultmultiplicity: \*isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: False |
| targetAchievedValue | It describes the value that has been achieved for the expectation target at the time at which the report is generated.allowedValues: Not Applicable | type: Numbermultiplicity: 0..1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: False |
| intentFeasibilityCheckReport | It describes the intent feasibility check information which is reported if needed.allowedValues: Not Applicable | type: IntentFeasibilityCheckReportmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: False |
| feasibilityCheckResult | It describes the result of intent fulfilment feasibility checkallowedValues: FEASIBLE, INFEASIBLE | type: Enummultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: False |
| infeasibilityReasons | It describes the reason (e.g. invalid intent expression, the intent conflict) of the result of intent fulfilment feasibility check is INFEASIBLENOTE: The ENUM value for infeasibilityReason is not specified in present document. | type: ENUMmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: None isNullable: False |
| intentHandlingCapabilityList | It describes the list of expectation object information and expectation target information which can be supported by intent handling function.allowedValues: Not Applicable | type: IntentHandlingCapabilitymultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: None isNullable: False |
| intentHandlingCapabilityId | A unique identifier of property of intent handling capability should be supported by the intent handling function of MnS producer.allowedValues: Not Applicable | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| supportedExpectationObjectType | It describes the expectation object type which can be supported by a specific intent handling function of MnS producer.allowedValues: objectType defined in clause 6.2.1.3.2. | type: Enummultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: False |
| supportedExpectationTargetNames | It describes the supported expectation targets for the supported expectation object type.allowedValues: targetName defined in clause 6.2.1.3.3 | type: Stringmultiplicity: 1..\*isOrdered: FalseisUnique: TruedefaultValue: None isNullable: False |
| lastUpdatedTime | It describes the time for the latest update of the IntentReport Instance. | type: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: False |
| ContextSelectivity | It expresses the may in which all or a subset of the expectationTargets may be applied.AllowedValue: "ALL\_OF", "ONE\_OF", "ANY\_OF" | type: Enummultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: "ALL\_OF"isNullable: False |
| intentPreemptionCapability | It describes the pre-emption capability. The attribute is used by MnS producer to decide the target of intent deletion or intent modificationallowedValue: TRUE, FALSE | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: "FALSE"isNullable: False |
| NOTE: For "IS\_ALL\_OF", the value shall be a match of the entire list. |

|  |
| --- |
| **5th Change** |

Forge MR link: <https://forge.3gpp.org/rep/sa5/MnS/-/merge_requests/1440> at commit 97a93b7e5182d848927af5c0a694a4da669eac97

\*\*\* START OF CHANGE 1 \*\*\*

\*\*\* OpenAPI/TS28312\_IntentNrm.yaml \*\*\*

<CODE BEGINS>

openapi: 3.0.1

info:

 title: Intent NRM

 version: 18.5.0

 description: >-

 OAS 3.0.1 definition of the Intent NRM

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externalDocs:

 description: 3GPP TS 28.312; Intent driven management services for mobile networks

 url: http://www.3gpp.org/ftp/Specs/archive/28\_series/28.312/

paths: {}

components:

 schemas:

 #-------- Definition of types for name-containments ------

 SubNetwork-ncO-IntentNrm:

 type: object

 properties:

 IntentHandlingFunction:

 $ref: '#/components/schemas/IntentHandlingFunction-Multiple'

 #-------Definition of generic IOCs ----------#

 Intent-Single:

 description: >-

 This IOC represents the properties of an Intent driven management information between MnS consumer and MnS producer.

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 userLabel:

 type: string

 intentExpectations:

 type: array

 uniqueItems: true

 items:

 type: object

 oneOf:

 - $ref: "#/components/schemas/IntentExpectation"

 - $ref: "TS28312\_IntentExpectations.yaml#/components/schemas/RadioNetworkExpectation"

 - $ref: "TS28312\_IntentExpectations.yaml#/components/schemas/EdgeServiceSupportExpectation"

 - $ref: "TS28312\_IntentExpectations.yaml#/components/schemas/5GCNetworkExpectation"

 - $ref: "TS28312\_IntentExpectations.yaml#/components/schemas/RadioServiceExpectation"

 contextSelectivity:

 $ref: "#/components/schemas/Selectivity"

 intentContexts:

 type: array

 uniqueItems: true

 items:

 $ref: '#/components/schemas/Context'

 description: >-

 It describes the list of Context(s) which represents the constraints and conditions that should apply

 for the entire intent even if there may be specific contexts defined for specific parts of the intent

 intentAdminState:

 type: string

 enum:

 - ACTIVATED

 - DEACTIVATED

 description: >-

 It describes the intent administrative state.

 This attribute is used when MnS consumer-suspension mechanism is supported

 intentPriority:

 type: integer

 minimum: 1

 maximum: 100

 description: It expresses the priority of the stated intent within a MnS consumer.

 intentPreemptionCapability:

 type: boolean

 intentReportControl:

 $ref: '#/components/schemas/IntentReportControl'

 intentReportReference:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnRo'

 IntentReport-Single:

 description: It represents intent report information from MnS producer to MnS consumer.

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 intentFulfilmentReport:

 $ref: '#/components/schemas/IntentFulfilmentReport'

 intentConflictReports:

 type: array

 uniqueItems: true

 items:

 $ref: '#/components/schemas/IntentConflictReport'

 intentFeasibilityCheckReport:

 $ref: '#/components/schemas/IntentFeasibilityCheckReport'

 lastUpdatedTime:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DateTimeRo'

 intentReference:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnRo'

 IntentHandlingFunction-Single:

 description: >-

 It represents the intent handling capabilities can be supported by a specific intent

 handling function of MnS producer.

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 intentHandlingCapabilityList:

 type: array

 uniqueItems: true

 items:

 $ref: '#/components/schemas/IntentHandlingCapability'

 Intent:

 $ref: '#/components/schemas/Intent-Multiple'

 IntentReport:

 $ref: '#/components/schemas/IntentReport-Multiple'

 #-------Definition of generic IOCs ----------#

 #-------Definition of the generic IntentExpectation dataType ----------#

 IntentExpectation:

 description: >-

 This data type is the "IntentExpectation" data type without specialisations

 It represents MnS consumer's requirements, goals and contexts given to a 3GPP system

 type: object

 properties:

 expectationId:

 type: string

 description: A unique identifier of the intentExpectation within the intent.

 expectationVerb:

 $ref: "#/components/schemas/ExpectationVerb"

 expectationObject:

 $ref: "#/components/schemas/ExpectationObject"

 expectationTargets:

 type: array

 uniqueItems: true

 items:

 $ref: '#/components/schemas/ExpectationTarget'

 contextSelectivity:

 $ref: "#/components/schemas/Selectivity"

 expectationContexts:

 type: array

 uniqueItems: true

 items:

 $ref: '#/components/schemas/Context'

 required:

 - expectationId

 #-------Definition of the generic IntentExpectation dataType ----------#

 #-------Definition of the generic ExpectationObject dataType ----------#

 ExpectationObject:

 description: >-

 It represents the Object to which the IntentExpectation should apply.

 This data type is the "ExpectationObject" data type without specialisations

 type: object

 properties:

 objectType:

 type: string

 enum:

 - RAN\_SUBNETWORK #value for Radio Network Expectation--#

 - EDGE\_SERVICE\_SUPPORT #value for Edge Service Support Expectation--#

 - 5GC\_SUBNETWORK #value for 5GC Network Expectation--#

 - Radio\_Service #value for Radio Service Expectation--#

 objectInstance:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 objectContexts:

 type: array

 uniqueItems: true

 items:

 $ref: '#/components/schemas/Context'

 description: >-

 It describes the list of Context(s) which represents the constraints and conditions to be

 used as filter information to identify the object(s) to which a given intentExpectation should apply.

 #-------Definition of the generic ExpectationObject dataType ----------#

 #-------Definition of the generic dataType --------------#

 Condition:

 type: string

 enum:

 - IS\_EQUAL\_TO

 - IS\_LESS\_THAN

 - IS\_GREATER\_THAN

 - IS\_WITHIN\_RANGE

 - IS\_OUTSIDE\_RANGE

 - IS\_ONE\_OF

 - IS\_NOT\_ONE\_OF

 - IS\_EQUAL\_TO\_OR\_LESS\_THAN

 - IS\_EQUAL\_TO\_OR\_GREATER\_THAN

 - IS\_ALL\_OF

 Selectivity:

 type: string

 enum:

 - ALL\_OF

 - ONE\_OF

 - ANY\_OF

 FulfilmentStatus:

 type: string

 readOnly: true

 enum:

 - FULFILLED

 - NOT\_FULFILLED

 default: NOT\_FULFILLED

 description: It describes the current status of the intent fulfilment result.

 NotFulfilledState:

 type: string

 readOnly: true

 enum:

 - ACKNOWLEDGED

 - COMPLIANT

 - DEGRADED

 - SUSPENDED

 - TERMINATED

 - FULFILMENTFAILED

 default: ACKNOWLEDGED

 description: It describes the current progress of or the reason for not achieving fulfilment

 for the intent, intentExpectation or expectationTarget.

 An attribute which is used when FulfilmentInfo is implemented for IntentFulfilmentInfo

 FulfilmentInfo:

 description: >-

 This dataType represents the properties of a specific fulfilment information for an aspect of

 the intent (i.e. either an expectation, a target or the whole intent).

 type: object

 properties:

 fulfilmentStatus:

 $ref: '#/components/schemas/FulfilmentStatus'

 notFullfilledState:

 $ref: "#/components/schemas/NotFulfilledState"

 notFulfilledReasons:

 type: array

 uniqueItems: true

 items:

 type: string

 readOnly: true

 description: An attribute which is used when FulfilmentInfo is implemented for IntentFulfilmentInfo

 ExpectationVerb:

 type: string

 enum:

 - DELIVER

 - ENSURE

 description: It describes the characteristic of the intentExpectation and is the property that describes the types of intentExpectations. Vendor extensions are allowed

 Frequency:

 description: >-

 It desribes the RF reference frequency (i.e. Absolute Radio Frequency Channel Number)

 and/or the frequency operating band used for a given direction (UL or DL) in FDD or

 for both UL and DL directions in TDD.

 type: object

 properties:

 arfcn:

 type: integer

 description: >-

 This attribute shall be supported, when the frequency information represent RF reference frequency.

 The allowed values for NR see TS 38.104 subclause 5.4.2.1; The allowed values for EUTRAN see TS 36.104 [X] subclause 5.7.3;

 freqband:

 type: string

 description: >-

 This attribute shall be supported, when the frequency information represent frequency operating band.

 The allowed values for NR see TS 38.104 subclause 5.4.2.3; The allowed value for EUTRAN see TS 36.104 subclause 5.7.3

 ValueRangeType:

 oneOf:

 - type: number

 - type: string

 - type: boolean

 - type: integer

 - $ref: 'TS28623\_ComDefs.yaml#/components/schemas/TimeWindow'

 - $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DateTime'

 - $ref: 'TS28623\_ComDefs.yaml#/components/schemas/GeoArea'

 - $ref: 'TS28623\_ComDefs.yaml#/components/schemas/PlmnId'

 - $ref: 'TS28623\_ComDefs.yaml#/components/schemas/GeoCoordinate'

 - $ref: '#/components/schemas/UEGroup'

 - $ref: '#/components/schemas/Frequency'

 UEGroup:

 description: >-

 It describes the UE Group, which is

 represented by specific 5QI, specific S-NSSAI, or a specific combination

 of S-NSSAI and 5QI

 type: object

 properties:

 fiveQI:

 type: integer

 minimum: 0

 maximum: 255

 sNssai:

 $ref: 'TS28541\_NrNrm.yaml#/components/schemas/Snssai'

 #-------Definition of the generic dataType --------------#

 #-------Definition of the generic ExpectationTarget dataType----------#

 ExpectationTarget:

 description: >-

 This data type represents the target of the IntentExpectation that are required to be achieved.

 This data type is the "ExpectationTarget" data type without specialisations

 type: object

 properties:

 targetName:

 type: string

 targetCondition:

 $ref: '#/components/schemas/Condition'

 targetValueRange:

 oneOf:

 - type: array

 uniqueItems: true

 items:

 $ref: "#/components/schemas/ValueRangeType"

 - $ref: "#/components/schemas/ValueRangeType"

 contextSelectivity:

 $ref: "#/components/schemas/Selectivity"

 targetContexts:

 type: array

 uniqueItems: true

 items:

 $ref: '#/components/schemas/Context'

 description: It describes the list of constraints and conditions that should apply for a specific expectationTarget.

 #-------Definition of the generic ExpectationTarget dataType----------#

 #-------Definition of the generic Context dataType----------------#

 Context:

 description: >-

 This data type is the "Context" data type without specialisations

 type: object

 properties:

 contextAttribute:

 type: string

 contextCondition:

 $ref: '#/components/schemas/Condition'

 contextValueRange:

 oneOf:

 - type: array

 uniqueItems: true

 items:

 $ref: "#/components/schemas/ValueRangeType"

 - $ref: "#/components/schemas/ValueRangeType"

 #-------Definition of the generic Context dataType----------------#

 #-------Definition of the generic IntentReportControl dataType----------------#

 IntentReportControl:

 description: >-

 It describes intent report subscription information

 type: object

 properties:

 reportRecipientAddress:

 description: >-

 It indicates the address of report recipient for MnS consumer

 type: string

 observationPeriod:

 description: >-

 It indicates the time period for which the fulfilment process is observed

 and at the end of which the fulfilmentInfo for corresponding

 ExpectationTargets, IntentExpectations and Intent is updated.

 type: integer

 expectedReportTypes:

 description: >-

 It indicates the type of IntentReports.

 type: string

 enum:

 - INTENT\_FULFILMENT\_REPORT

 - INTENT\_CONFLICT\_REPORT

 - INTENT\_FEASIBILITY\_CHECK\_REPORT

 reportingConditions:

 description: >-

 It indicates the specified conditions for intent reporting.

 type: array

 items:

 $ref: '#/components/schemas/ReportingCondition'

 reportingTargets:

 description: >-

 It indicates the specified targets needed to be reported.

 type: array

 items:

 type: string

 ReportingCondition:

 description: >-

 It describes the specified conditions for intent reporting.

 oneOf:

 - $ref: '#/components/schemas/TimeCondition'

 - $ref: '#/components/schemas/TargetFulfilmentCondition'

 TimeCondition:

 $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/SchedulingTime'

 TargetFulfilmentCondition:

 description: >-

 It indicates the specified conditions of target fulfilment for intent reporting.

 type: object

 properties:

 targetName:

 type: string

 targetCondition:

 $ref: '#/components/schemas/Condition'

 targetValueRange:

 oneOf:

 - type: array

 uniqueItems: true

 items:

 $ref: "#/components/schemas/ValueRangeType"

 - $ref: "#/components/schemas/ValueRangeType"

 #-------Definition of the concrete IntentReportControl dataType----------------#

 #-------Definition of the generic IntentFulfilmentReport dataType----------------#

 IntentFulfilmentReport:

 description: >-

 It includes the intentFulfilmentInfo and expectationFulfilmetResult.

 This attribute shall be supported when intent fulfilment information is supported by IntentReport

 type: object

 properties:

 intentFulfilmentInfo:

 $ref: '#/components/schemas/FulfilmentInfo'

 expectationFulfilmentResult:

 type: array

 uniqueItems: true

 items:

 $ref: '#/components/schemas/ExpectationFulfilmentResult'

 #-------Definition of the concrete IntentFulfilmentReport dataType----------------#

 #-------Definition of the generic ExpectationFulfilmentResult dataType----------------#

 ExpectationFulfilmentResult:

 description: >-

 It includes the expectationFulfilmentInfo and targetFulfilmentResults for each IntentExpectation.

 type: object

 properties:

 expectaitonId:

 type: string

 readOnly: true

 expectationFulfilmentInfo:

 $ref: '#/components/schemas/FulfilmentInfo'

 targetFulfilmentResult:

 type: array

 uniqueItems: true

 items:

 $ref: '#/components/schemas/TargetFulfilmentResult'

 #-------Definition of the concrete ExpectationFulfilmentResult dataType----------------#

 #-------Definition of the generic TargetFulfilmentResult dataType----------------#

 TargetFulfilmentResult:

 description: >-

 This data type includes targetFulfilmentInfo and targetAchievedValue for each ExpectationTarget.

 type: object

 properties:

 targetName:

 type: string

 readOnly: true

 targetFulfilmentInfo:

 $ref: '#/components/schemas/FulfilmentInfo'

 targetAchievedValue:

 type: number

 description: >-

 It describes the value that has been achieved for the expectation target at the time at which

 the report is generated.

 readOnly: true

 #-------Definition of the concrete TargetFulfilmentResult dataType----------------#

 #-------Definition of the generic IntentConflictReport dataType----------------#

 IntentConflictReport:

 description: >-

 It represents the conflict information for the detected conflict

 This attribute shall be supported when intent conflict information is supported by IntentReport

 type: object

 properties:

 conflictId:

 type: string

 readOnly: true

 conflictType:

 type: string

 readOnly: true

 enum:

 - INTENT\_CONFLICT

 - EXPECTATION\_CONFLICT

 - TARGET\_CONFLICT

 conflictingIntent:

 description: >-

 This will be present if the value of conflictType is INTENT\_CONFLICT. It describes the DN of the conflicting intent

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnRo'

 conflictingExpectation:

 description: >-

 This will be present if the value of conflictType is EXPECTATION\_CONFLICT. It describes the expectationId of the conflicting IntentExpectation with an Intent

 type: string

 readOnly: true

 conflictingTarget:

 description: >-

 This will be present if the value of conflictType is TARGET\_CONFLICT. It describes the targetName of the conflicting ExpectationTarget with an IntentExpectation

 type: string

 readOnly: true

 recommendedSolutions:

 type: string

 readOnly: true

 enum:

 - MODIFY

 - DELETE

 #-------Definition of the concrete IntentConflictReport dataType----------------#

 #-------Definition of the generic IntentFeasibilityCheckReport dataType----------------#

 IntentFeasibilityCheckReport:

 description: >-

 It represents the intent feasibility check information

 This attribute shall be supported when intent feasibility check information information is supported by IntentReport

 type: object

 properties:

 feasibilityCheckResult:

 type: string

 readOnly: true

 enum:

 - FEASIBLE

 - INFEASIBLE

 infeasibilityReason:

 type: string

 readOnly: true

 description: An attribute which is used when feasibilityCheckResult is INFEASIBLE

 #-------Definition of the concrete IntentFeasibilityCheckReport dataType----------------#

 #-------Definition of the generic IntentHandlingCapability dataType----------------#

 IntentHandlingCapability:

 description: >-

 It represents expectation object information and expectation target information

 which can be supported by a specific intent handling function of MnS producer.

 type: object

 properties:

 intentHandlingCapabilityId:

 type: string

 readOnly: true

 supportedExpectationObjectType:

 type: string

 enum:

 - RAN\_SUBNETWORK

 - EDGE\_SERVICE\_SUPPORT

 - 5GC\_SUBNETWORK

 - Radio\_Service

 readOnly: true

 description: It describes the expectation object type which can be supported by a specific intent handling function of MnS producer.

 supportedExpectationTargetNames:

 type: array

 uniqueItems: true

 items:

 type: string

 readOnly: true

 description: It describes the supported expectation targets for the supported expectation object type.

 #-------Definition of the concrete IntentHandlingCapability dataType----------------#

 #------Definition of JSON arrays for name-contained IOCs ---------------#

 Intent-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/Intent-Single'

 IntentReport-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/IntentReport-Single'

 IntentHandlingFunction-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/IntentHandlingFunction-Single'

 #------Definition of JSON arrays for name-contained IOCs ---------------#

 #----- Definitions in TS 28.312 for TS 28.532 --------------------------#

 resources-intentNrm:

 oneOf:

 - $ref: '#/components/schemas/IntentHandlingFunction-Single'

 - $ref: '#/components/schemas/Intent-Single'

 - $ref: '#/components/schemas/IntentReport-Single'

 #----- Definitions in TS 28.312 for TS 28.532 --------------------------#

<CODE ENDS>

\*\*\* END OF CHANGE 1 \*\*\*

|  |
| --- |
| **End of Changes** |