**3GPP TSG-SA5 Meeting #158 *S5-246438***

Orlando, US, 18 - 22 November 2024

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** | **01** | **Current version:** |  |  |
|  | | | | | | | | |
| *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 extend Intent capability exposure | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Huawei | | | | | | | | | |
| ***Source to TSG:*** | SA5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | DUMMY | | | | |  | ***Date:*** | | | 2024-11-07 |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***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 can be 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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | TS28.312 supports intent handling and exposure of handling capability as a list of supported expectationTargets but is incomplete since it does not enable the MnS producer to indicate the specific values ranges that they support. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Extension of intent handling capability exposure to allow the supported values to be exposed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Exposure of the supported values will not be supported. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.3.1.1, 5.3.1.2, 6.2.1.4  5.3.1.1.x2, 5.3.1.1.x3, 6.2.1.3.x (new clauses added) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

***Start of First change***

## 5.3 Generic use case for intent driven management

### 5.3.1 Intent handling capability obtaining

#### 5.3.1.1 Introduction

##### 5.3.1.1.1 Information on supported expectation object and corresponding expectationTargets.

Clause 4.2.2 described that an Intent-driven MnS producer has the following capabilities: fulfil the received intent and report the result/information about the intent fulfilment, and clause 6.2.2 defined different scenario specific intent expectations with different expectation objects and expectation targets to support different use cases. In a network, multiple intent handling functions may be deployed to support different kinds of intents. Different intent handling functions may be deployed to support different intent expectation object domains, e.g. intent handling function A is deployed to handle the radio network related intents, intent handling function B is deployed to handle the 5GC network related intents, while intent handling function C is deployed to handle the service related intents. Or different intent handling functions are deployed to support different areas of the same intent expectation object domain, e.g. intent handling function D is deployed to support to handle the intent for radio network in Area#1, while intent handling function E is deployed to support to handle the intent for radio network in Area#2.

Before MnS consumer expresses the intent expectation targets and expectation objects to MnS producer, MnS consumer may want to know what expectation targets and expectation objects can be supported by MnS producer. Based on such supported expectation targets information and expectation objects information, the MnS consumer may use such information to select the proper intent handling function to express the intent.

In case the MnS producer updates the intent handling capabilities for one or more intent handling functions, the MnS producer may inform these updates to the MnS consumer.

##### 5.3.1.1.X2 Description of supported expectation targets

Besides the list of supported expectation object and expectationTargets, the intent handling capability needs to also describe the supported value ranges for the targets or the sets of targets that are supported. For instance, the intent driven MnS producer for RAN service management intent may want to expose the description of RAN services that they can offer. This means the intent driven MnS producer exposes the supported intents or intent expectations having a specific set of features and a specific set of values for those features as illustrated by Table 5.3.1.1.2-1. The IDMS producer should support expose of such capabilities.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Object Type** | | | | | **RAN or Core network services** | | | | | |
| Feature | Units | Value Options | | | | | | | | |
| End-to-end latency | ms | 0.5 | 1 | 2 | | 5 | 10 | 25 | 50 | 100 |
| Jitter | ms | .001 | 0.01 | 0.1 | | 1 | 2 | 5 | 10 | 20 |
| Survival Time | ms | 0 | 1 | 2 | | 5 | 10 | 25 | 50 | 100 |
| Availability |  | 99% | 99.5%. | 99.9% | | 99.995% | 99.999% | 99.9995% | 99.9999% | .99999% |
| Reliability |  | 99% | 99.5%. | 99.9% | | 99.995% | 99.999% | 99.9995% | 99.9999% | .99999% |
| End user Data rate | ≥ x Mbps | 0.1 | 0.2 | 0.5 | | 1.0 | 2.0 | 5.0 | 10.0 | 20.0 |
| Payload | ≈. x Bytes | 1 | 2 | 5 | | 10 | 20 | 100 | 500 | 1000 |
| Traffic density | Gbps/km2 | 1 | 2 | 5 | | 10 | 20 | 50 | 100 | 1000 |
| Connection density | '000/km2 | 0.1 | 0.5 | 1 | | 5 | 10 | 20 | 50 | 100 |
| Service area size | A x B km | 0.1x10 | 0.1x100 | 0.1x500 | | 0.1 x 0.1 | 1 x1 | 10 x10 | 50 x50 | 100x100 |
| Policy\_contexts | Policy\_1 | Policy 1 value 1 | | Policy 1 value 2 | | | … | | … | |
|  | Policy\_2 | Policy 2 value 1 | | Policy 2 value 2 | | | … | | … | |
|  | **:** | : | | : | | | **…** | | **…** | |

Table 5.3.1.1.2-1: An example of a service offer description indicating the possible characteristics of  
services that can exposed via an intent handling capability as the service characteristic offered by  
an intent driven MnS producer for service management intents.

Note: Details in the table will be updated in the future

##### 5.3.1.1.X3 Describing alternative expectations

The IDMS may be used by the RAN or Core network service management MnS producer to enable the design of a RAN or Core network service between the MnS producer and the MnS consumer.

Based on the extended content of intent handling capability as described in 5.3.1.1.2, the RAN or Core network service MnS consumer can generate an artifact, say called a service-offer description that describes the different candidate characteristics of the desired RAN service from the MnS consumer's point of view. The MnS consumer provides a service-offer description to the service management MnS producer for validation. The service-offer description may be viewed as a RAN service management intent that contains a list of candidate intent expectations, i.e., the expectations are candidates that may be separately submitted by the MnS consumer for fulfilment.

On receiving the service-offer description the RAN or Core network service Management MnS producer validates the service-offer description and confirms to what extent the RAN or Core network service intent as described by the service-offer description can be supported. For that, the RAN or Core network service management MnS producer returns the service-offer description but indicates only the supported combinations of RAN or Core network service features and values with contexts (e.g. policies and conditions) under which the service may be offered.



Figure 5.11.1.1-1: Example interaction between an MnS producer and MnS consumer on  
the exposure of capabilities for service management intents

#### 5.3.1.2 Requirements

**REQ-IDMS\_IHCO-CON-1** The intent driven MnS producer shall have capabilities enabling an MnS consumer to obtain intent handling capabilities of each intent handling function, including supported expectation object and targets..

**REQ-IDMS\_IHCO-CON-2:** The intent driven MnS producer should support a capability to provide a description of the supported scenario specific intents to the authorized MnS consumer, including value ranges for the supported expectation targets.

**REQ-IDMS\_IHCO-CON-3:** The MnS producer should support a capability enabling an MnS consumer to list the set of potential alternative expectations that the MnS consumer would like to be evaluated for whether it is feasible or fulfillable.

***Start of next change***

## 6.2 Information model definition for Intent (MnS component typeB)

### 6.2.1 Generic Information model definition

#### 6.2.1.0 Imported information entities and local labels

|  |  |
| --- | --- |
| 3GPP TS 28.622 [6], DataType, DateTime | DateTime |
| 3GPP TS 28.622 [6], DataType, GeoArea | GeoArea |
| 3GPP TS 28.658 [10], DataType, PLMNId | PLMNId |
| 3GPP TS 28.622 [6], DataType, TimeWindow | TimeWindow |
| 3GPP TS 28.622 [6], DataType, GeoCoordinate | GeoCoordinate |

#### 6.2.1.1 Class diagram

##### 6.2.1.1.1 Relationship



NOTE: Void

Figure 6.2.1.1.1-1: Relationship UML diagram for intent driven management

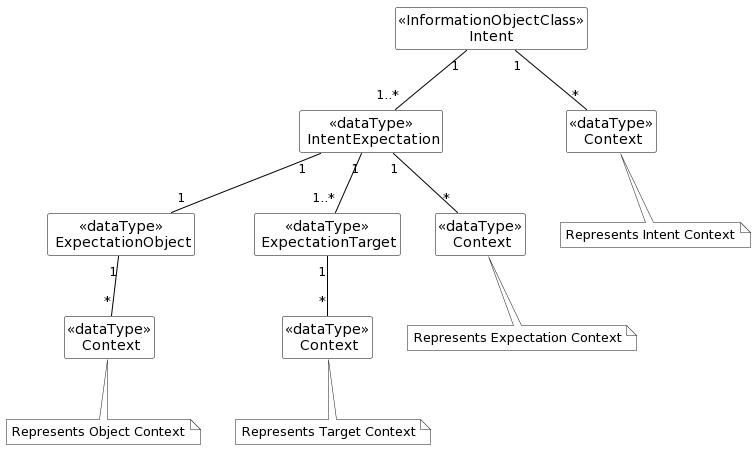


Figure 6.2.1.1.1-2: Relationship UML diagram for intent



Figure 6.2.1.1.1-3: Relationship UML diagram for intent report

##### 6.2.1.1.2 Inheritance



Figure 6.2.1.1.2-1: Inheritance UML diagram for intent driven management

#### 6.2.1.2 Class definition

##### 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 "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 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 used to define how to select among the stated intentContexts.

###### The Intent IOC includes expectationSelectivity used to define how to select among the stated intentExpectations. It enables the MnS consumer to trigger evaluation of different alternative intentExpectations. The MnS consumer can provide alternatives descriptions of service-offers as intent expectations that describes the different candidate characteristics of the desired service from the MnS consumer's point of view that the MnS consumer wants to be validated. By providing the intent containing an expectationSelectivity for feasibility checking, the MnS consumer indicates how the set of candidate services expressed in the intentExpectations are to be validated, i.e., "ALL\_OF", "ONE\_OF", "ANY\_OF" the intentExpectations.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 |
| expectationSelectivity | O | T | T | F | F |
| intentContexts | O | T | T | F | F |
| observationPeriod | O | 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 |
| intentAdminState  Support Qualifier | Condition: MnS consumer-suspension mechanism is supported. |
| intentPreemptionCapability  Support Qualifier | Condition: The preemption 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 | -- |

##### 6.2.1.2.2 IntentReport <<InformationObjectClass>

###### 6.2.1.2.2.1 Definition

This IOC represents intent report information from MnS producer to MnS consumer. The IntentReport instance is created by MnS producer automatically when creating an Intent instance. When the MnS producer delete an intent instance based on a request from MnS consumer, the corresponding intent report instance is also deleted by MnS producer automatically. MnS consumers cannot request MnS producer to create or delete IntentReport instance.

The IntentReport IOC includes

- intentFulfilmentReport, which represents the properties of fulfillment information for expectation target, intent expectation, and the whole intent. The fulfilmentReport will be observed from the start of each observation period (specified in Intent IOC), then at the end of each observation period, the corresponding values will be derived and configured.

- intentConflictReport, which represents detected conflict information, including conflict type (i.e., intent conflict, expectation conflict and target conflict) and possible solution recommendations to address the conflicts.

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

Each instance of IntentReport IOC can contain one or any combination of intentFulfilmentReport, intentConflictReport and intentFeasibilityCheckReport.

Different MnS consumers can use the "getMOIAttributes" operation to query different attributes of the IntentReport <<IOC>> to obtain corresponding intent report information (including intentFulfilmentReport, intentConflictReport and intentFeasibilityCheckReport).

Different MnS consumers can subscribe attribute value change notifications for IntentReport <<IOC>> to obtain the notification for different intent report information.

###### 6.2.1.2.2.2 Attributes

The IntentReport <<IOC>> includes attributes inherited fromTop IOC (defined in TS 28.622 [6]) and the following attributes

Table 6.2.1.2.2.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| intentFulfilmentReport | CM | T | F | F | T |
| intentConflictReports | CM | T | F | F | T |
| intentFeasibilityCheckReport | CM | T | F | F | T |
| lastUpdatedTime | M | T | F | F | T |
| Attribute related to roles | | | | | |
| intentReference | M | T | F | F | F |

###### 6.2.1.2.2.3 Attribute constraints

Table 6.2.1.2.2.3-1

|  |  |
| --- | --- |
| Name | Definition |
| intentFulfilmentReport  Support Qualifier | Condition: intent fulfilment information is supported by IntentReport |
| intentConflictReports  Support Qualifier | Condition: intent conflict information is supported by IntentReport |
| intentFeasibilityCheckReport  Support Qualifier | Condition: intent feasibility check information is supported by IntentReport |

###### 6.2.1.2.2.4 Notifications

The common notifications defined in clause 6.2.1.5 are valid for this IOC, without exceptions or additions

##### 6.2.1.2.3 IntentHandlingFunction <<InformationObjectClass>>

###### 6.2.1.2.3.1 Definition

This IOC represents the intent handling capabilities can be supported by a specific intent handling function of MnS producer. IntentHandlingFunction instances are created by the MnS producer or are pre-installed, and also are modified, deleted by the MnS producer if needed. MnS consumers cannot request to create, modify or delete IntentHandlingFunction instances.

An MnS consumer can query the IntentHandlingFunction IOC to obtain the intent handling capability information for a specific intent handling function of MnS producer. Based on the obtained intent handling capability information and management requirements, MnS consumer generates the corresponding intent information and sends it to MnS producer. The intent information includes the expectation object and expectation targets which are not only supported by the obtained intent handing capabilities, but also satisfy the MnS consumer’s management requuirements.

The MnS consumer also can use the DN of IntentHandlingFunction instance to query all Intent instances handled by a specific intent handling function.

###### 6.2.1.2.3.2 Attributes

The IntentHandlingFunction <<IOC>> includes attributes inherited fromTop IOC (defined in TS 28.622 [6]) and the following attributes

Table 6.2.1.2.3.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| intentHandlingCapabilityList | M | T | F | F | T |
| *supportedExpectationTargetInfo* | M | T | F | F | T |

###### 6.2.1.2.3.3 Attribute constraints

None.

###### 6.2.1.2.3.4 Notifications

The common notifications defined in clause 6.2.1.5 are valid for this IOC, without exceptions or additions.

#### 6.2.1.3 DataType definition

##### 6.2.1.3.1 IntentExpectation <<dataType>>

6.2.1.3.1.1 Definition

IntentExpectation <<dataType>>represents MnS consumer's requirements, goals and contexts given to a 3GPP system*.*

The IntentExpectation <<dataType>> includes contextSelectivity used to define how to select among the stated expectationContexts.

6.2.1.3.1.2 Attributes

The IntentExpectation includes the following attributes.

Table 6.2.1.3.1.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| expectationId | M | T | T | T | T |
| expectationVerb | O | T | T | T | F |
| expectationObject | M | T | T | F | F |
| expectationTargets | M | T | T | F | F |
| contextSelectivity | O | T | T | F | F |
| expectationContexts | O | T | T | F | F |
| NOTE: The scenario specific IntentExpectations in clause 6.2.2 are defined utilizing the constructs of this generic IntentExpectation <<dataType>>. | | | | | |

6.2.1.3.1.3 Attribute constraints

None.

###### 6.2.1.3.1.4 Notifications

The notifications specified for the IOC using this <<dataType>> for its attribute(s), shall be applicable.

##### 6.2.1.3.2 ExpectationObject <<dataType>>

6.2.1.3.2.1 Definition

The ExpectationObject <<dataType>> represents the Object to which the IntentExpectation should apply.

6.2.1.3.2.2 Attributes

The ExpectationObject includes the following attributes.

Table 6.2.1.3.2.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| objectType | CM | T | T | F | F |
| objectInstance | CM | T | T | F | F |
| objectContexts | O | T | T | F | F |

6.2.1.3.2.3 Attribute constraints

Table 6.2.1.3.2.3-1

|  |  |
| --- | --- |
| Name | Definition |
| objectType  Support Qualifier | Condition: The intent expectation is not for a specific object instance or MnS consumer have no knowledge of the DN of this specific object instance. |
| objectInstance  Support Qualifier | Condition: The intent expectation is for a specific object instance and MnS consumer have the knowledge of the DN of this specific object instance. |

##### 6.2.1.3.3 ExpectationTarget <<dataType>>

###### 6.2.1.3.3.1 Definition

The ExpectationTarget <<dataType>> represents the target of the IntentExpectation that are required to be achieved.

The ExpectationTarget <<dataType>> includes a contextSelectivity used to define how to select among the stated targetContexts.

###### 6.2.1.3.3.2 Attributes

The ExpectationTarget includes the following attributes.

Table 6.2.1.3.3.2-1

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

###### 6.2.1.3.3.3 Attribute constraints

None.

###### 6.2.1.3.3.4 Notifications

The notifications specified for the IOC using this <<dataType>> for its attribute(s), shall be applicable.

##### 6.2.1.3.4 Context <<dataType>>

6.2.1.3.4.1 Definition

The Context <<dataType>> represents the properties of a context. A context describes the condition. The context may apply to the intent, the intent expectation, the expectation targets or to the expectation object.

6.2.1.3.4.2 Attributes

The Context includes the following attributes.

Table 6.2.1.3.4.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| contextAttribute | M | T | T | F | F |
| contextCondition | M | T | T | F | F |
| contextValueRange | M | T | T | F | F |

6.2.1.3.4.3 Attribute constraints

None.

##### 6.2.1.3.5 FulfilmentInfo << dataType >>

###### 6.2.1.3.5.1 Definition

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). The fulfilment information describes the MnS producer's assessment of the degree to which a specific aspect of the intent is being fulfilled. The MnS consumer may however assess the fulfilment differently, e.g. the MnS consumer may evaluate the delivered outcome or network state to compute its fulfilment satisfaction.

The fulfilmentStatus field indicates whether the intent is being fulfilled or not being fulfilled. The possible values of the fulfilment include:

- NOT\_FULFILLED: This is the default status for any aspect of the intent and the fulfilmentStatus remains as "NOT\_FULFILLED" until the actions undertaken meet the requirements as stated by the MnS consumer.

- FULFILLED: This is the status if the MnS producer considers that the intent, expectation or target is being fulfilled as desired by the MnS consumer that created the intent.

The degree of fulfilment of an intent with the NOT\_FULFILLED status may have multiple explanations and related states. These different progress states and conditions are recorded in the notFulfilledState field. notFulfilledState is present only when FulfilmentInfo is implemented for IntentFulfilmentInfo. The possible values of the notFulfilledState include:

- ACKNOWLEDGED: this is the default state and is the initial notFulfilledState right after the intent has been received and its instance has been created.

- COMPLIANT: this is the state after the feasibility check has been run for the intent and the intent is accepted as being compliant for fulfilment.

- DEGRADED: this is the state if an intent that was previously fulfilled but after a period of observation it is found not be meeting the initially stated requirements.

- SUSPENDED: this is the state if the MnS producer or MnS consumer decides to suspend the fulfilment of the intent, expectation or target for whatever reason. This notFulfilledState shall be supported by a reason such as the event(s) that were observed when fulfilment was attempted.

- TERMINATED: This state is registered if the respective aspect of the intent (i.e. either an expectation, a target or the whole intent) shall not be considered for fulfilment e.g. when an authorized MnS consumer sends an indication terminating the specific aspect of the intent. For instance, if the MnS consumer sends an update of the intent in which a particular target is eliminated, then that target shall be marked as "TERMINATED".

- FULFILMENTFAILED: This is the state when the MnS producer decides that the intent, expectation or target cannot be fulfilled. This state shall be supported by a reason such as the event(s) that were observed when fulfilment was attempted.

For some scenarios (in particular for the notFulfilledState with value "DEGRADED", “TERMINATED", "SUSPENDED" and "FULFILMENTFAILED"), the notFulfilledState should be supported by extra information describing or related to the state. This extra information is recorded into the notFulfilledReasons field.

###### 6.2.1.3.5.2 Attributes

The FulfilmentInfo includes the following attributes.

Table 6.2.1.3.5.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| fulfilmentStatus | M | T | F | F | T |
| notFulfilledState | CM | T | F | F | T |
| notFulfilledReasons | CO | T | F | F | T |

###### 6.2.1.3.5.3 Attribute constraints

Table 6.2.1.3.5.3-1

|  |  |
| --- | --- |
| Name | Definition |
| notFulfilledState  Support Qualifier | Condition: when FulfilmentInfo is implemented for IntentFulfilmentInfo |
| notFulfilledReasons  Support Qualifier | Condition: when FulfilmentInfo is implemented for IntentFulfilmentInfo |

###### 6.2.1.3.5.4 Notifications

The notifications specified for the IOC using this <<dataType>> for its attribute(s), shall be applicable.

##### 6.2.1.3.6 IntentFulfilmentReport <<dataType>>

###### 6.2.1.3.6.1 Definition

This <<dataType>> includes the intentFulfilmentInfo and expectationFulfilmentResults. The intentFulfilmentInfo describes status of fulfilment of an intent and the related reasons for the infeasible status.

###### 6.2.1.3.6.2 Attributes

The IntentFulfilmentReport includes the following attributes.

Table 6.2.1.3.6.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| intentFulfilmentInfo | M | T | F | F | T |
| expectationFulfilmentResults | O | T | F | F | T |

###### 6.2.1.3.6.3 Attribute constraints

None.

##### 6.2.1.3.7 ExpectationFulfilmentResult <<dataType>>

###### 6.2.1.3.7.1 Definition

ExpectationFulfilmentResult <<dataType>> includes the expectationFulfilmentInfo and targetFulfilmentResults for each IntentExpectation. The expectationFulfilmentInfo describes status of fulfilment of an intentExpectation and the related reasons for the infeasible status.

###### 6.2.1.3.7.2 Attributes

The ExpectationFulfilmentResult includes the following attributes.

Table 6.2.1.3.7.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| expectationId | M | T | F | T | T |
| expectationFulfilmentInfo | M | T | F | F | T |
| targetFulfilmentResults | O | T | F | F | T |

###### 6.2.1.3.7.3 Attribute constraints

None.

##### 6.2.1.3.8 TargetFulfilmentResult<<dataType>>

###### 6.2.1.3.8.1 Definition

TargetFulfilmentResult <<dataType>> includes targetFulfilmentInfo and targetAchievedValue for each ExpectationTarget. The targetFulfilmentInfo describes status of fulfilment of an expectationTarget and the related reasons for the infeasible status. The targetAchievedValue describes current performance value for the ExpectationTarget.

###### 6.2.1.3.8.2 Attributes

The TargetFulfilmentResult includes the following attributes.

Table 6.2.1.3.8.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| targetName | M | T | F | F | T |
| targetFulfilmentInfo | M | T | F | F | T |
| targetAchievedValue | O | T | F | F | T |

###### 6.2.1.3.8.3 Attribute constraints

None.

##### 6.2.1.3.9 IntentConflictReport << dataType >>

###### 6.2.1.3.9.1 Definition

IntentConflictReport <<dataType>> represents the conflict information for the detected conflict.

When a conflict is detected, the MnS producer will configure the value of attributes of IntentConflictReport and notify the MnS consumer about the conflict, indicating the intent, intent expectation or expectation target which give rise to the conflict. The value of recommendedSolutions may be configured by MnS producer and notified to MnS consumer.

###### 6.2.1.3.9.2 Attributes

The IntentConflictReport includes the following attributes.

**Table 6.2.1.3.9.2-1**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| conflictId | M | T | F | T | T |
| conflictType | M | T | F | F | T |
| conflictingIntent | CM | T | F | F | T |
| conflictingExpectation | CM | T | F | F | T |
| conflictingTarget | CM | T | F | F | T |
| recommendedSolutions | O | T | F | F | T |

###### 6.2.1.3.9.3 Attribute constraints

|  |  |
| --- | --- |
| Name | Definition |
| conflictingIntent  Support Qualifier | Condition: This will be present if the value of conflictType is INTENT\_CONFLICT |
| conflictingExpectation  Support Qualifier | Condition: This will be present if the value of conflictType is EXPECTATION\_CONFLICT |
| conflictingTarget  Support Qualifier | Condition: This will be present if the value of conflictType is TARGET\_CONFLICT |

##### 6.2.1.3.10 IntentFeasibilityCheckReport <<dataType>>

###### 6.2.1.3.10.1 Definition

The IntentFeasibilityCheckReport <<dataType>> represents the intent feasibility check information. Intent feasibility check information is provided after MnS producer automatically performs feasibility check when the MnS producer received the intent creation or modification request from the MnS consumer. In case the feasibility check result is 'INFEASIBLE' the MnS producer will notify the MnS consumer.

###### 6.2.1.3.10.2 Attributes

The FeasibilityCheckReport includes the following attributes.

Table 6.2.1.3.10.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| feasibilityCheckResult | M | T | F | F | T |
| infeasibilityReasons | M | T | F | F | T |

###### 6.2.1.3.10.3 Attribute constraints

Void.

##### 6.2.1.3.11 IntentHandlingCapability <<dataType>>

###### 6.2.1.3.11.1 Definition

The IntentHandlingCapability <<dataType>> represents expectation object information and expectation target information which can be supported by a specific intent handling function of MnS producer.

The IntentHandlingCapability <<dataType>> includes a supportedExpectationObjectType and corresponding supportedExpectationTargetNames.

###### 6.2.1.3.11.2 Attributes

The IntentHandlingCapability includes the following attributes.

Table 6.2.1.3.11.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| intentHandlingCapabilityId | M | T | F | F | T |
| supportedExpectationObjectType | M | T | F | F | T |
| supportedExpectationTargetNames | M | T | F | F | T |

###### 6.2.1.3.11.3 Attribute constraints

None.

##### 6.2.1.3.12 ValueRangeType<<choice>>

###### 6.2.1.3.12.1 Definition

This <<choice>> defines the data type for value of the "targetValueRange" and "contextValueRange".

###### 6.2.1.3.12.2 Attributes

Table 6.2.1.3.12.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| CHOICE\_1.1 real | CM | T | T | F | F |
| CHOICE\_2.1 enum | CM | T | T | F | F |
| CHOICE\_3.1 string | CM | T | T | F | F |
| CHOICE\_4.1 boolean | CM | T | T | F | F |
| CHOICE\_5.1 integer | CM | T | T | F | F |
| CHOICE\_6.1 timeWindow | CM | T | T | F | F |
| CHOICE\_7.1 dateTime | CM | T | T | F | F |
| CHOICE\_8.1 geoArea | CM | T | T | F | F |
| CHOICE\_9.1 pLMNId | CM | T | T | F | F |
| CHOICE\_10.1 geoCoordinate | CM | T | T | F | F |
| CHOICE\_11.1 uEGroup | CM | T | T | F | F |
| CHOICE\_12.1 frequency | CM | T | T | F | F |

###### 6.2.1.3.12.3 Attribute constrains

Table 6.2.1.3.12.3-1

|  |  |
| --- | --- |
| Name | Definition |
| CHOICE\_1.1 real CM Support Qualifier | Condition: This attribute shall be supported, when the type is Real. |
| CHOICE\_2.1 enum CM Support Qualifier | Condition: This attribute shall be supported, when the type is Enum. |
| CHOICE\_3.1 string CM Support Qualifier | Condition: This attribute shall be supported, when the type is String. |
| CHOICE\_4.1 boolean CM Support Qualifier | Condition: This attribute shall be supported, when the type is Boolean. |
| CHOICE\_5.1 integer CM Support Qualifier | Condition: This attribute shall be supported, when the type is Integer. |
| CHOICE\_6.1 timeWindow CM Support Qualifier | Condition: This attribute shall be supported, when the type is TimeWindow. |
| CHOICE\_7.1 dateTime CM Support Qualifier | Condition: This attribute shall be supported, when the type is DateTime. |
| CHOICE\_8.1 geoArea CM Support Qualifier | Condition: This attribute shall be supported, when the type is GeoArea. |
| CHOICE\_9.1 pLMNId CM Support Qualifier | Condition: This attribute shall be supported, when the type is PLMNId. |
| CHOICE\_10.1 geoCoordinate CM Support Qualifier | Condition: This attribute shall be supported, when the type is GeoCoordinate. |
| CHOICE\_11.1 uEGroup CM Support Qualifier | Condition: This attribute shall be supported, when the type is UEGroup. |
| CHOICE\_12.1 frequency CM Support Qualifier | Condition: This attribute shall be supported, when the type is frequency. |

##### 6.2.1.3.13 Frequency<<dataType>>

###### 6.2.1.3.13.1 Definition

It describes 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.

###### 6.2.1.3.13.2 Attributes

Table 6.2.1.3.13.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| arfcn | CM | T | T | F | F |
| freqband | CM | T | T | F | F |

###### 6.2.1.3.13.3 Attribute constrains

Table 6.2.1.3.13.3-1

|  |  |
| --- | --- |
| Name | Definition |
| arfcn CM Support Qualifier | Condition: This attribute shall be supported, when the frequency information represent RF reference frequency. |
| freqband CM Support Qualifier | Condition: This attribute shall be supported, when the frequency information represent frequency operating band. |

##### 6.2.1.3.14 UEGroup <<dataType>>

###### 6.2.1.3.14.1 Definition

This <<dataType>> describes the UE Group, which is represented by specific 5QI, specific S-NSSAI, or a specific combination of S-NSSAI and 5QI

###### 6.2.1.3.14.2 Attributes

Table 6.2.1.3.14.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| fiveQI | CM | T | T | F | F |
| sNSSAI | CM | T | T | F | F |

###### 6.2.1.3.14.3 Attribute constrains

Table 6.2.1.3.14.3-1

|  |  |
| --- | --- |
| Name | Definition |
| fiveQI CM Support Qualifier | Condition: This attribute shall be supported, when UE group is represented by 5QI. |
| sNSSAI CM Support Qualifier | Condition: This attribute shall be supported, when UE group is represented by S-NSSAI. |

##### 6.2.1.3.x SupportedExpectationTargetInfo <<dataType>>

###### 6.2.1.3.x.1 Definition

The SupportedExpectationTargetInfo indicates the detailed information about what the intent driven MnS producer supports for a given supportedExpectationObjectType. It allows the intent driven MnS producer to indicate the support in any one of the three ways below as illustrated by Figure 6.2.1.3.x.1-1:

1) As a list of names of supported expectation targets.

2) As a list of names of supported expectation targets and the value ranges within which they are supported.

3) As a set expressing the combination of expectation targets and value ranges that can be jointly supported. The valuerange indicates the general limits supported by the intent handler. A feasibility check may still be needed to confirm feasibility of specific values.



Figure 6.2.1.3.x.1-1: MnS producer can express supported capabilities in any of the 3 possible ways.

###### 6.2.1.3.x.2 Attributes

The supportedExpectationTargetInfo includes the following attributes.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| supportedTargetName | M | T | F | F | T |
| supportedTargetCondition | O | T | F | F | T |
| SupportedTargetValueRange | O | T | F | F | T |

###### 6.2.1.3.x.3 Attribute constraints

None.

#### 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: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: IntentExpectation  multiplicity: 1..\*  isOrdered: True  isUnique: True  defaultValue: None  isNullable: False |
| intentFulfilmentInfo | It describes status of fulfilment of an intent and the related reasons for that status.  allowedValues: Not Applicable | type: FulfilmentInfo  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| expectationFulfilmentInfo | It describes status of fulfilment of an intentExpectation and the related reasons for that status.  allowedValues: Not Applicable | type: FulfilmentInfo  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| targetFulfilmentInfo | It describes status of fulfilment of an expectationTarget and the related reasons for that status.  allowedValues: Not Applicable | type: FulfilmentInfo  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: "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: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: "ACKNOWLEDGED"  isNullable: False |
| notFulfilledReasons | It describes the reasons/observations related to the specific notFulfilledState  allowedValues: Not Applicable | type: String  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: 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: Context  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| expectationId | A unique identifier of the intentExpectation within the intent.  allowedValues: Not Applicable | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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, function  Ensure: AssuranceintentExpectation, e.g. Ensure the target performance value.  allowedValues: DELIVER, ENSURE  Vendor extensions are allowed | type: String  multiplicity: 1  isOrdered:N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| expectationObject | It describes the expectation objects to which the IntentExpectation should apply.  allowedValues: Not Applicable | type: ExpectationObject  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: Enum  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| objectInstance | It describes a specific object instance (e.g. instance of managed object) to which the intentExpectation should apply.  allowedValues: Not Applicable | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: Context  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: 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: ExpectationTarget  multiplicity: 1..\*  isOrdered: True  isUnique: True  defaultValue: None  isNullable: 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: Context  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: 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: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: Enum  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: "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: ValueRangeType  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: 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: Context  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: 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: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: Enum  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: "IS\_EQUAL\_TO"  isNullable: False |
| contextValueRange | It describes the range of values that applicable to the ContextAttribute and the ContextCondition.  AllowedValue: depends on the contextCondition  The 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: ValueRangeType  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: 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: integer  multiplicity: 1  isOrdered: False  isUnique: True  defaultValue: 1  isNullable: False |
| geoArea | It describes a geographical area defined in 3GPP TS 28.622[6].  AllowedValue: As defined by the data type | type: GeoArea  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: 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: PLMNId  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: DateTime  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: TimeWindow  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| geoCoordinate | It describes the information of a geoCoordinate defined in 3GPP TS 28.622[6].  AllowedValue: As defined by the data type | type: GeoCoordinate  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: Frequency  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: UEGroup  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| fiveQI | It describes the information of a 5QI defined in 3GPP TS 28.541[5].  AllowedValue: 0 - 255 | type: integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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-NSSAI  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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 fulfilment  allowedValues: "ACTIVATED", "DEACTIVATED" | type: Enum  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: "ACTIVATED"  isNullable: False |
| intentReference | It indicates the associated intent instance  allowedValues: Not Applicable | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| intentReportReference | It indicates the associated intent report instance(s)  allowedValues: Not Applicable | type: DN  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: 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: Integer  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| intentFulfilmentReport | It describes the fulfillment information which is reported for the associated intent instance.  allowedValues: Not Applicable | type: IntentFulfilmentReport  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| intentConflictReports | It describes the conflict information which is reported for associated intent instance if needed.  allowedValues: Not Applicable | type: IntentConflictReport  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| conflictId | It is used to identify the detected conflict within an IntentReport instance.  allowedValues: Not Applicable | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| conflictType | It describes the type of intent conflict.  allowedValues: INTENT\_CONFLICT, EXPECTATION\_CONFLICT, TARGET\_CONFLICT | type: Enum  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| conflictingIntent | It describes the DN of the conflicting intent  allowedValues: Not Applicable | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| conflictingExpectation | It describes the expectationId of the conflicting IntentExpectation within an Intent.  allowedValues: Not Applicable | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| conflictingTarget | It describes the targetName of the conflicting ExpectationTarget within an IntentExpectation.  allowedValues: Not Applicable | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: ENUM  multiplicity: 1  isOrdered: False  isUnique: True  defaultValue: 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: ExpectationFulfilmentResult  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: 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: TargetFulfilmentResult  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: 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: Number  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| intentFeasibilityCheckReport | It describes the intent feasibility check information which is reported if needed.  allowedValues: Not Applicable | type: IntentFeasibilityCheckReport  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| feasibilityCheckResult | It describes the result of intent fulfilment feasibility check  allowedValues: FEASIBLE, INFEASIBLE | type: Enum  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: 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 INFEASIBLE  NOTE: The ENUM value for infeasibilityReason is not specified in present document. | type: ENUM  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: 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: IntentHandlingCapability  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: 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: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: 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: Enum  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: 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: String  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| lastUpdatedTime | It describes the time for the latest update of the IntentReport Instance. | type: DateTime  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| ContextSelectivity | It expresses the way in which all or a subset of the contexts may be applied. The contextSelectivity indicates which contexts are to be applied, i.e., "ALL\_OF", "ONE\_OF", or "ANY\_OF" the contexts.  AllowedValue: "ALL\_OF", "ONE\_OF", "ANY\_OF" | type: Enum  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: "ALL\_OF"  isNullable: False |
| expectationSelectivity | It expresses the way in which the set of intentExpectations in an intent may be applied, e.g. for validation. The MnS consumer can provide intent expectations that describes the different alternatives candidate characteristics of the desired service from the MnS consumer's point of view that the MnS consumer wants to be validated. The expectationSelectivity indicates which intentExpectations are to be validated, i.e., "ALL\_OF", "ONE\_OF", "ANY\_OF" the intentExpectations  AllowedValue: "ALL\_OF", "ONE\_OF", "ANY\_OF" | type: Enum  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: "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 modification  allowedValue: TRUE, FALSE | type: Boolean  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: "FALSE"  isNullable: False |
| *supportedExpectationTargetInfo* | *It describes the supported expectation targets for the supported expectation object type.* | *type: SupportedExpectationTargetInfo*  *multiplicity: 1 … \**  *isOrdered: False*  *isUnique: True*  *defaultValue: None*  *isNullable:**False* |
| *supportedExpectationTargetName* | *It indicates the name of the supported expectation targets for the supported expectation object type.*  *allowedValues: depends on ExpectationObject in the IntentExpectation* | *type: String*  *multiplicity: 1*  *isOrdered: N/A*  *isUnique: N/A*  *defaultValue: None*  *isNullable: True* |
| *supportedTargetCondition* | *It expresses the limits within which the* ***supportedExpectationTarget****Name shall be supported.*  *allowedValues: targetCondition defined in clause 6.2.1.3.3* | *type: Enum*  *multiplicity: 1*  *isOrdered: N/A*  *isUnique: N/A*  *defaultValue: "IS\_EQUAL\_TO"*  *isNullable: False* |
| *SupportedTargetValueRange* | *It describes the range of values that applicable to the* ***supportedExpectationTarget****Name and the supportedTargetCondition.*  *allowedValues: targetValueRange defined in clause 6.2.1.3.3* | *type: ValueRangeType*  *multiplicity: 1..\**  *isOrdered: False*  *isUnique: True*  *defaultValue: None*  *isNullable: True* |
| NOTE: For "IS\_ALL\_OF", the value shall be a match of the entire list. | | |

#### 6.2.1.5 Common notifications

##### 6.2.1.5.1 Configuration notifications

This clause presents a list of notifications, defined in TS 28.532 [3], that an MnS consumer may receive. The notification header attribute objectClass/objectInstance shall capture the DN of an instance of a class defined in the present document.

Table 6.2.1.5.1-1

| Name | Qualifier | Notes |
| --- | --- | --- |
| notifyMOICreation | O | -- |
| notifyMOIDeletion | O | -- |
| notifyMOIAttributeValueChanges | O | -- |

***End of change***