**3GPP TSG-SA5 Meeting #139e *S5- 215286***

**e-meeting 11th - 20st October 2021**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Extend Attributes of the Intent IOC**

**Document for: Approval**

**Agenda Item: 6.4.10**

# 1 Decision/action requested

***The group is asked to discuss and approval.***

# 2 References

[1] 3GPP draft TS 28.312: “Management and orchestration; Intent driven management services for mobile networks v0.5.0”.

# 3 Rationale

This contribution proposes to Extend attributes of the Intent IOC for an Intent-driven Management Service

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# 4 Detailed proposal

It proposes to make the following changes to TS 28.312[1].

|  |
| --- |
| **1st Change** |

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

### 6.2.1 Information model definition for Intent

Editor’s Note: The following information model needs to be revisited based on the further discussion, and the alignment/coordination work with other SDO needs to be considered, which may impact the following information model.

#### 6.2.1.1 Class diagram

##### 6.2.1.1.1 Relationship

@startuml TS 28.541 figure 6.2.1-2 (as of MArch 2021)

' UML diagram for 3GPP TS 28.541 clause 6

skinparam ClassStereotypeFontStyle normal

skinparam ClassBackgroundColor White

skinparam shadowing false

skinparam monochrome true

hide members

hide circle

'skinparam maxMessageSize 250

class ManagedEntity <<ProxyClass>>

class Intent <<InformationObjectClass>>

class intentExpectation <<InformationObjectClass>>

class IntentTarget <<dataType>>

class Context<<dataType>>

ManagedEntity "1" \*-- "\*" Intent: <<names>>

Intent "1" \*-r- "\*" intentExpectation

Intent "1" \*-- "\*" Context

intentExpectation "1" \*-r- "\*" IntentTarget

intentExpectation "1" \*-- "\*" Context

IntentTarget "1" \*-- "\*" Context

note top of ManagedEntity

Represents the following IOCs:

Subnetwork or

ManagedFunction

end note

@enduml

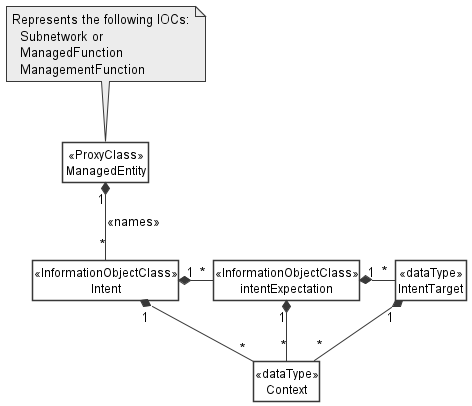


Figure 6.2.1.1.1-1 Relationship UML diagram for intent

Editor’s Note: Whether the intentExpectation is a <<dataType>> or a <<IOC>> is FFS.

##### 6.2.1.1.2 Inheritance

@startuml TS 28.541 figure 6.2.1-2 (as of MArch 2021)

' UML diagram for 3GPP TS 28.541 clause 6

skinparam ClassStereotypeFontStyle normal

skinparam ClassBackgroundColor White

skinparam shadowing false

skinparam monochrome true

hide members

hide circle

class Top <<InformationObjectClass>>

class Intent <<InformationObjectClass>>

class intentExpectation <<InformationObjectClass>>

class Context <<dataType>>

class IntentTarget <<dataType>>

Top <|-- Intent

Top <|-- intentExpectation

@enduml

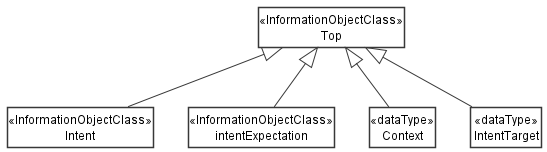


Figure 6.2.1.1.2-1 Inheritance UML diagram for generic intent

#### 6.2.1.2 Class definition

##### 6.2.1.2.1 Intent <<IOC>>

###### 6.2.1.2.1.1 Definition

This IOC represents the properties of an Intent.

###### 6.2.1.2.1.2 Attributes

The Intent includes attributes inherited fromTOP IOC (defined in TS 28.622) and the following attributes:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| intentExpectation | M | T | T | F | T |
| userLabel | M | T | T | F | T |
| IntentContext | O | T | T | F | T |
| intentFulfilStatus | M | T | F | F | T |

Editor’s Note: whether other the attributes are needed for the Intent IOC needs further discussion.

###### 6.2.1.2.1.3 Attribute constraints

None

##### 6.2.1.2.1 IntentExpectation <<IOC>>

###### 6.2.1.2.1.1 Definition

This IOC represents the properties of an IntentExpectation.

###### 6.2.1.2.1.2 Attributes

The IntentExpectation includes attributes inherited fromTOP IOC (defined in TS 28.622) and the following attributes:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| ExpectationIdentifier | M | T | F | T | T |
| ManagedObjectType | M | T | T | F | T |
| ManagedObjectContext | M | T | T | F | T |
| IntentTargets | O | T | T | F | T |
| ExpectationContext | O | T | T | F | T |

Editor’s Note: whether other the attributes are needed for the IntentExpectation IOC needs further discussion.

###### 6.2.1.2.1.3 Attribute constraints

None

#### 6.2.1.3 DataType definition

##### 6.2.1.2.1 IntentTarget <<dataType>>

###### 6.2.1.2.1.1 Definition

This IOC represents the properties of an IntentTarget.

###### 6.2.1.2.1.2 Attributes

The IntentTarget includes the following attributes:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| ObjectStateAttribute | M | T | F | T | T |
| TargetCondition | M | T | T | F | T |
| TargetValueRange | M | T | T | F | T |
| TargetContext | O | T | T | F | T |

###### 6.2.1.2.1.3 Attribute constraints

None

##### 6.2.1.2.1 context << dataType >>

###### 6.2.1.2.1.1 Definition

This IOC represents the properties of a context. A context describes the list of constraints and conditions that should evaluate to True when the targets are fulfilled but are themselves not to be enforced. The context may apply to the intent, the intent expectation, the intent targets or to the managed object as filter information used to identify the manged objects to which the targets are intended.

###### 6.2.1.2.1.2 Attributes

The context includes the following attributes:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| ContextType | M | T | F | T | T |
| ContextAttribute | M | T | F | T | T |
| ContextCondition | M | T | T | F | T |
| ContextValueRange | M | T | T | F | T |

###### 6.2.1.2.1.3 Attribute constraints

None

#### 6.2.1.4 Attribute definition

| 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: F  isUnique: F  defaultValue: None  isNullable: False |
| intentExpectation | It indicates the expectations including requirements, goals and constraints given to a 3GPP system. It states the list of specific outcomes desired to be realized for a specific type of managed object  Editor’s Note: the detailed intentExpectation is for further discussion | type: FFS  multiplicity: \*  isOrdered: F  isUnique: F  defaultValue: None  isNullable: False |
| intentFulfilStatus | It describes the status of the intent fulfilment result, which is configured by MnS producer and can be read by MnS consumer.  allowedValues: "FULFILLED", “NOT\_FULFILLED  Editor’s Note: whether other allowed values should be supported is FFS, and the name for the attribute intentFulfilStatus is FFS. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| IntentContext | It describes the list of constraints and conditions that should apply for the entire intent even if there may be specific constraints and conditions defined for specific parts of the intent.  allowedValues: triple of (attribute, condition, value range) | type: List  multiplicity: 1  isOrdered: False  isUnique: False  defaultValue: None  isNullable: False |
| intentExpectationIdentifier | A user-friendly (and user assignable) name of the intentExpectation.  allowedValues: Not Applicable | type: String  multiplicity: 1  isOrdered: False  isUnique: False  defaultValue: None  isNullable: False |
| ManagedObjectType | It describes the type of managed object to which the given intentExpectation should apply. It is used together with the ManagedObjectContext to identify the specific entity to which the intentExpectation should apply. E.g. the intentExpectation may be stated for a slice (type of Object) with identitier IIOT\_Atomotive\_2021 (identifier as context). Alternatively, the intentExpectation may be stated for a slice (type of Object) serving IIoT users (context 1) with slice profile supporting automotive connectivity (context 2).  allowedValues: NA | type: DN  multiplicity: 1  isOrdered: False  isUnique: False  defaultValue: None  isNullable: False |
| ManagedObjectContext | It describes the list of constraints and conditions to be used as filter information to identify the specific intentObject 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 intentTarget of the considered intentExpectation.  E.g. the intentExpectation may be stated for a slice (type of Object) with identitier IIOT\_Atomotive\_2021 (identifier as context). Alternatively, the intentExpectation may be stated for a slice (type of Object) serving IIoT users (context 1) with slice profile supporting automotive connectivity (context 2).  allowedValues: triple of (attribute, condition, value range) | type: Context  multiplicity: 1  isOrdered: False  isUnique: False  defaultValue: None  isNullable: False |
| intentTargets | It describes the list of specific outcomes on configurations and observables related to the stated intentObject (e.g. parameters, gauges, counters, KPIs, etc) that are desired to be realized for a given intentExpectation.  allowedValues: Not Applicable | type: intentTarget  multiplicity: 1  isOrdered: False  isUnique: False  defaultValue: None  isNullable: False |
| ExpectationContext | It describes the list of 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: triple of (attribute, condition, value range) | type: Context  multiplicity: 1  isOrdered: False  isUnique: False  defaultValue: None  isNullable: False |
| ObjectStateAttribute | It describes a specific attribute of a managed object on which an outcomes may be stated, either a configuration or observable of that managed object. The attributes may be a parameter, gauge, counter, KPI, weighted metric, etc. related to that managed object  allowedValues: parameter, gauge, counter, KPIs or weighted metrics of managed objects | type: DN  multiplicity: 1  isOrdered: False  isUnique: False  defaultValue: Null  isNullable: True |
| TargetCondition | It expresses the limits within which the ObjectStateAttribute is allowed/supposed to be  allowedValues: is equal to; is less than; is greater than;  Note: Others conditions like "is within the range" or "is outside the range" can be expressed in terms of these basic conditions | type: enum  multiplicity: upto 2  isOrdered: False  isUnique: False  defaultValue: "is equal to"  isNullable: False |
| TargetValueRange | It describes the range of values that applicatioble to the ObjectStateAttribute and the TargetCondition. | type: FFS  multiplicity: upto 2  isOrdered: False  isUnique: False  defaultValue: Null  isNullable: True |
| TargetContext | It describes the list of constraints and conditions that should apply for a specific intentTarget. Note there may be other constraints and conditions defined for the entire intent or the intentExpectation.  allowedValues: triple of (attribute, condition, value range) | type: Context  multiplicity: 1  isOrdered: False  isUnique: False  defaultValue: None  isNullable: False |
| ContextType | Defines the roles for which a given context shall play.  allowedValues: {"ManagedObjectContext", "ExpectationContext", "TargetContext", "IntentContext"} | type: enum  multiplicity: 1  isOrdered: False  isUnique: False  defaultValue: None  isNullable: False |
| ContextAttribute | It describes a specific attribute of or related to a managed object or to characteristics thereof (e.g. its control parameter, gauge, counter, KPI, weighted metric,, etc) or an attribute related to the operating conditions of the managed object (szch as weather conditions, load conditions, etc). | type: DN  multiplicity: 1  isOrdered: False  isUnique: False  defaultValue: Null  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;  Note: Others conditions like "is within the range" or "is outside the range" can be expressed in terms of these basic conditions | type: enum  multiplicity: upto 2  isOrdered: False  isUnique: False  defaultValue: "is equal to"  isNullable: False |
| ContextValueRange | It describes the range of values that explicatable to the ContextAttribute and the ContextCondition. | type: FFS  multiplicity: upto 2  isOrdered: False  isUnique: False  defaultValue: Null  isNullable: True |

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| --- |
| **End of changes** |