ONAP R11- General intent model

Modeling Subcommittee Review
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Ref: ITU-T "Scenarios and Requirements of Intent-Based Network for Network Evolution"

Motivation for introducing general intent model

The formal expression of intents can be achieved by well-defined information models which completely define the semantics and vocabulary that is required for the operation of each autonomous system that uses intents.

TMF IG1253

Intent modeling defines the expressiveness of intent. It introduces vocabulary and semantics needed to express and encode the knowledge about requirements, goals and constraints an intent object shall carry. Standardized intent models define common semantics in order to enable two parties to agree on the meaning of intent and remove ambiguities and divergent interpretation.
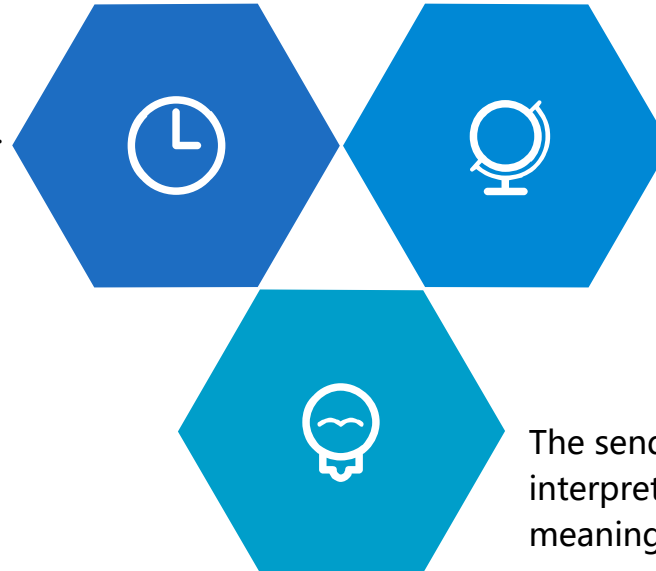
3GPP 28.312

An intent is typically understandable by humans, and also needs to be interpreted by the machine without any ambiguity.

ZSM 011

The sender and receiver of intents need to agree in their interpretation; therefore, there should be no ambiguity in their meaning.

REQ-1267 General intent model and general intent interface requirements in R11

For complex intent, such as the intent of cloud leased line, it is necessary to decompose the complex intent into sub intents of different dimensions, and implement the user's original intent through the execution of sub intents. So we need to deal with machin-machine intent, and for different intents or sub intents in the system, it is necessary to provide general intent model and general intent interface to ensure that all intents(especially machine-machine intents) operate according to the same expression and process.

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Executive Summary - This requirement provides general intent model and general intent interface in ONAP to make all intents(especially machine-machine intents) in the system operate in the same way. At the same time, for complex intents, the technology of intent decomposition and orchestration is provided, and the above ideas and schemes are fully implemented in ONAP through a use case based on cloud leased line.

Business Impact - Complex intents can be decomposed into simple intents, and the modeling and interaction of intents can be ensured to be handled in a unified way.

Business Markets - This REQ provides a novel solution to intent modeling and interaction:
1. It provides model federation mechanism to make the intent modeling execute according to the unified specification, and can reuse the existing domain related models which enables extension to different application scenarios.
2. It provides the unified intent interface, which makes the intent interaction in the running state more interoperable and manageable.

Funding/Financial Impacts - By formulating general intent modeling methods and interactive interfaces, standardize the intent operation process, improve user friendliness, improve the customer experience and increase the business value.

Organization Mgmt, Sales Strategies -*There is no additional organizational management or sales strategies for this requirement outside of a service providers "normal" ONAP deployment and its attendant organizational resources from a service provider.*

Benefits of introducing general intent model in ONAP

01

Improve interoperability between components/systems via standarded intent description.

02

Model federation mechanism is introduced (later explained in detail) to enable domain extension.
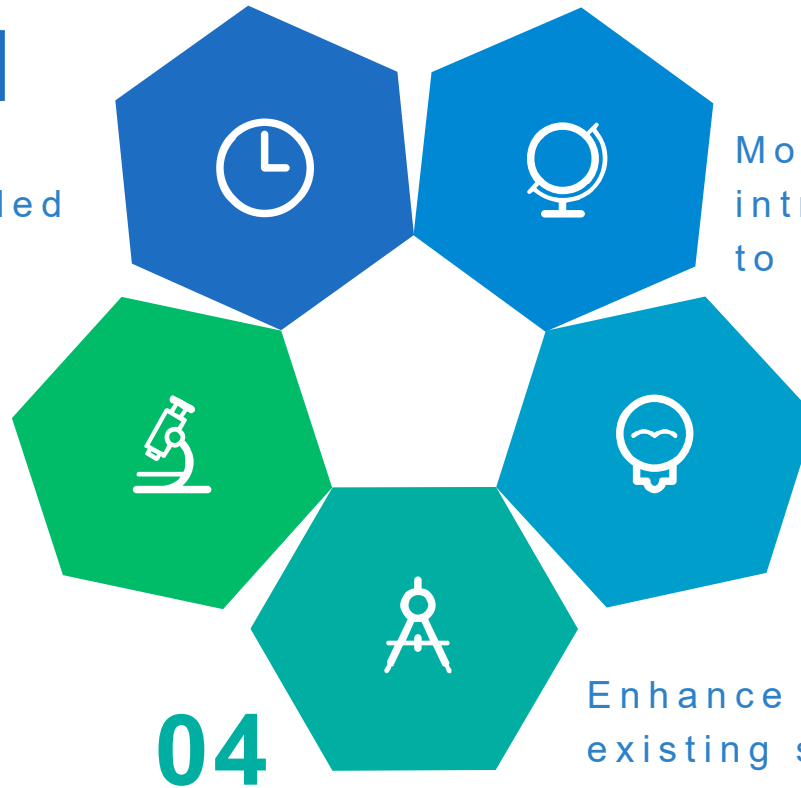
05

Reuse the existing domain related models which enables extension to different application scenarios.

03

Based on the general intent model, the machine-machine intent is supported

04

Enhance standardization based on the existing standards of TMF(TMF IG1253).

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General intent model

```
├── Intent expectation list
|  ├── expectation1
|  |  └── expectation target
|  |  └── state list of expectation target
|  |     └── state1
|  |        └── condition1
|  ├── expectation2
|  |  └── expectation target
|  |  └── state list of expectation target
|  |     └── state1
|  |        └── condition1
|  |        └── condition2
|  |     └── state2
|  |        └── condition1
|  |        └── condition2
```

Base on the model federation mechanism defined in TMF IG1253

Intent common model

The domain independent general expression ability is defined.

Intent extension model

A model is based on the intent common model and connects the new modeling components with the intent common model.

Domain information model

A model is independent of the intent common model and the intent extension model. This information model of the existing domain created by the intent independent operation can be directly used in the intent expression.

UUI

INTENT ANAlYSIS SERVER

INTENT MODEL

AAI
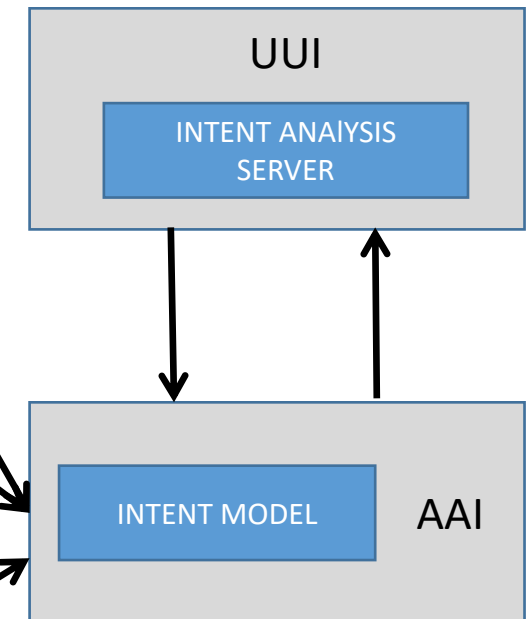
UML diagram of general intent model
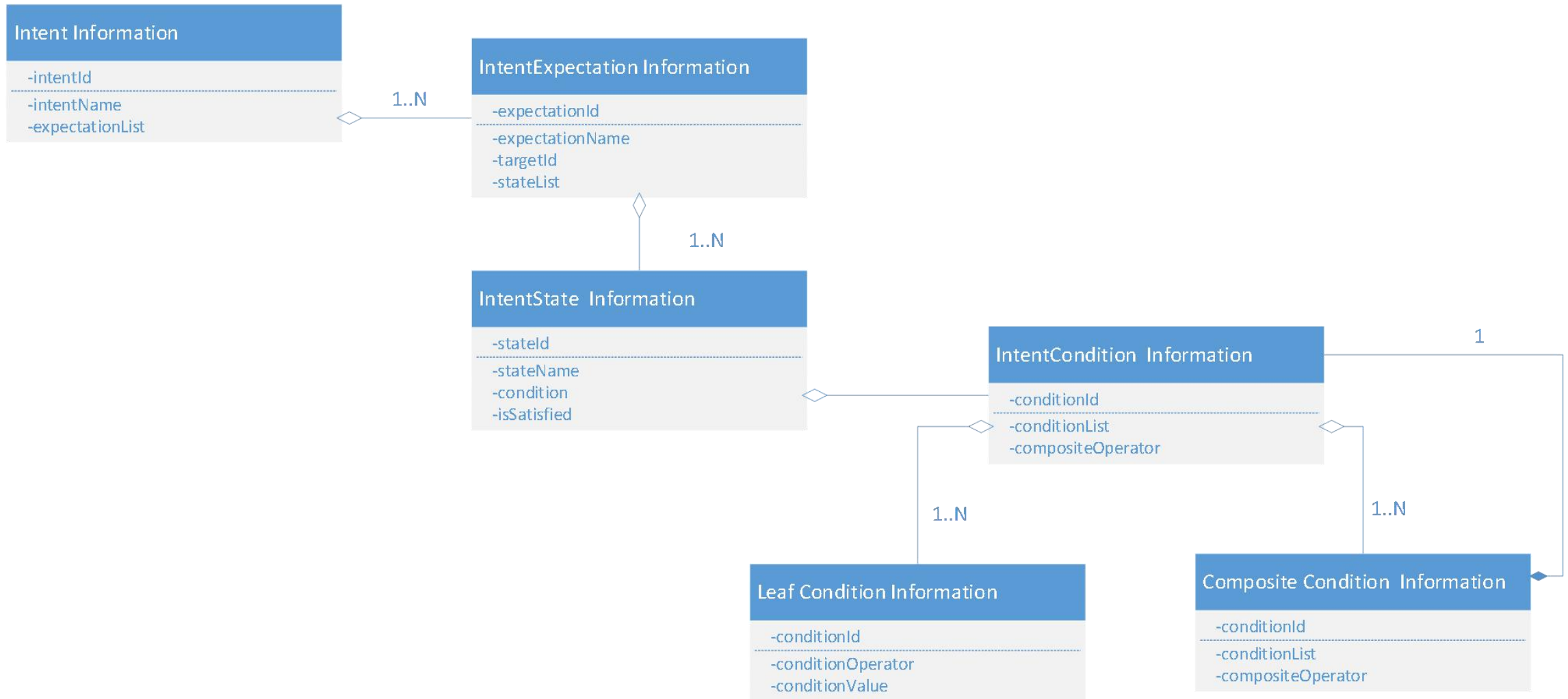
Intent Information

-intentId

-intentName
-expectationList

1..N

IntentExpectation Information

-expectationId

-expectationName
-targetId
-stateList

1..N

IntentState Information

-stateId

-stateName
-condition
-isSatisfied

IntentCondition Information

-conditionId

-conditionList
-compositeOperator

1

1..N

1..N

Leaf Condition Information

-conditionId

-conditionOperator
-conditionValue

Composite Condition Information

-conditionId

-conditionList
-compositeOperator

IntentCondition&IntentCompositeCondition

Leaf Condition Information Element

Attribute	Qualifier	Cardinality	Content	Description
conditionId	M	1	Identifier	The identifier of this condition.
conditionOperator	M	1	Enum (for example, it can be greater than, equal to, less than, not equal to, one or more, etc.), or it can be a defined complex operator (for example, the maximum value, minimum value, median, credibility, etc. in numerical statistics)	Operator information, connected with the following conditionvalue, represents the specific requirements for condition.
conditionValue	M	1	String	The specific value of the condition.

Intent Condition(Composite Condition) Information Element

Attribute	Qualifier	Cardinality	Content	Description
conditionId	M	1	Identifier	The identifier of this composite condition.
conditionList	M	1..N	ENUM (Leaf Condition\Composite Condition\IntentCondition)	It can consist of Multiple conditions of different types.
compositeOperator	M	1	Enum(Can be and, or, etc)	All conditions use the same operator, representing the relationship between all conditions

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IntentState&IntentExpectation

IntentState Information Element

Attribute	Qualifier	Cardinality	Content	Description
stateId	M	1	Identifier	The identifier of this state.
stateName	M	1	String	State name.
condition	M	1	IntentCondition	Represents the state that the condition needs to reach.
isSatisfied	M	1	Boolean	Whether the status is satisfied.

IntentExpectation Information Element

Attribute	Qualifier	Cardinality	Content	Description
expectationId	M	1	Identifier	The identifier of this expectation.
expectationName	M	1	String	Expectation name
targetId	M	1	Identifier	It can be a definite goal. And can also be a certain type of target that does not exist before the execution of the intent. The corresponding target can be generated by the intent handler in the intent operation phase.
stateList	M	1..N	IntentState	Multiple state lists contained in an expectation

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Intent

Intent Information Element

Attribute	Qualifier	Cardinality	Content	Description
intentId	M	1	Identifier	The identifier of this intent.
intentName	M	1	String	Intent name.
expectationList	M	1..N	IntentExpectation	Multiple expectation lists contained in one intent.

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Projects Impact

Project	Code impact	Notes
UUI	Support input, parsing and mapping of general intent model.	
AAI	1. Provide storage of intent general model, intent extension model and domain information model. 2. Query of the information of the existing model.	
MODELING	Document the modeling scheme of general intent model.	