A General Implementation with Intent-based network in ONAP

November 7 , 2022

Contents

Requirements introduction

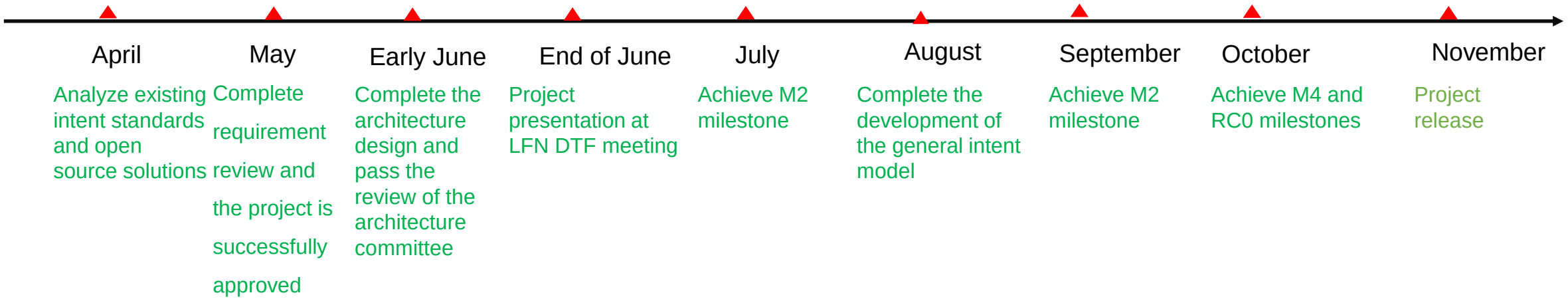
A

REQ Qwner:

- **China Mobile: Lingli Deng, Keguang He**
- **Huawei: Chuanyu Chen**

B

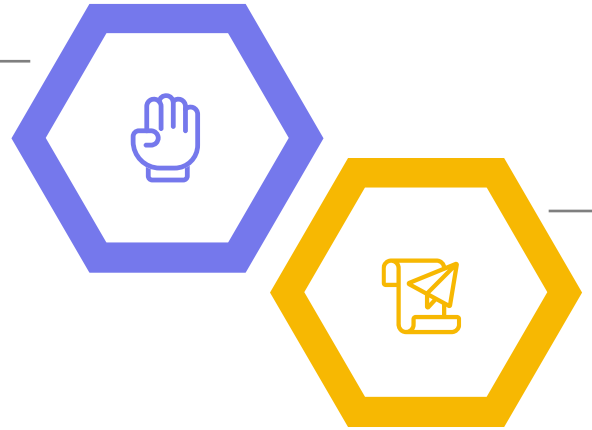
Requirements progress



Motivation and background

Why 01

- Research the intent use case, intent model and intent management of **autonomous network**.
- Improve interoperability between components/systems via **standarded intent description.**
- Make all intents(especially machine-machine intents) in the system **operate in the same way**.
- Decompose the complex intent into **sub intents** of different dimensions.
- Refer to the intent research ideas of **TMF**, **3GPP**, **ENI** and other standard organizations.



02 How

- Support general **intent model**.
- Support general **intent interface** and **processing flow**.
- Support **formatting intent input**.
- Supprt **intent decomposition**.
- Support **use case** related to intents to demonstrate our requirements.

Contents

Important concepts

- **Intent:**

Intent is the formal specification of all expectations including requirements, goals, and constraints given to a technical system. (TMF IG1253)

- **Intent Object:**

An object described in the format after the two parties of the requirement negotiate the intent.

- **Intent Instance:**

Intent instance is the carrier of formatting intent and intent realization information.

- **Intent Owner:**

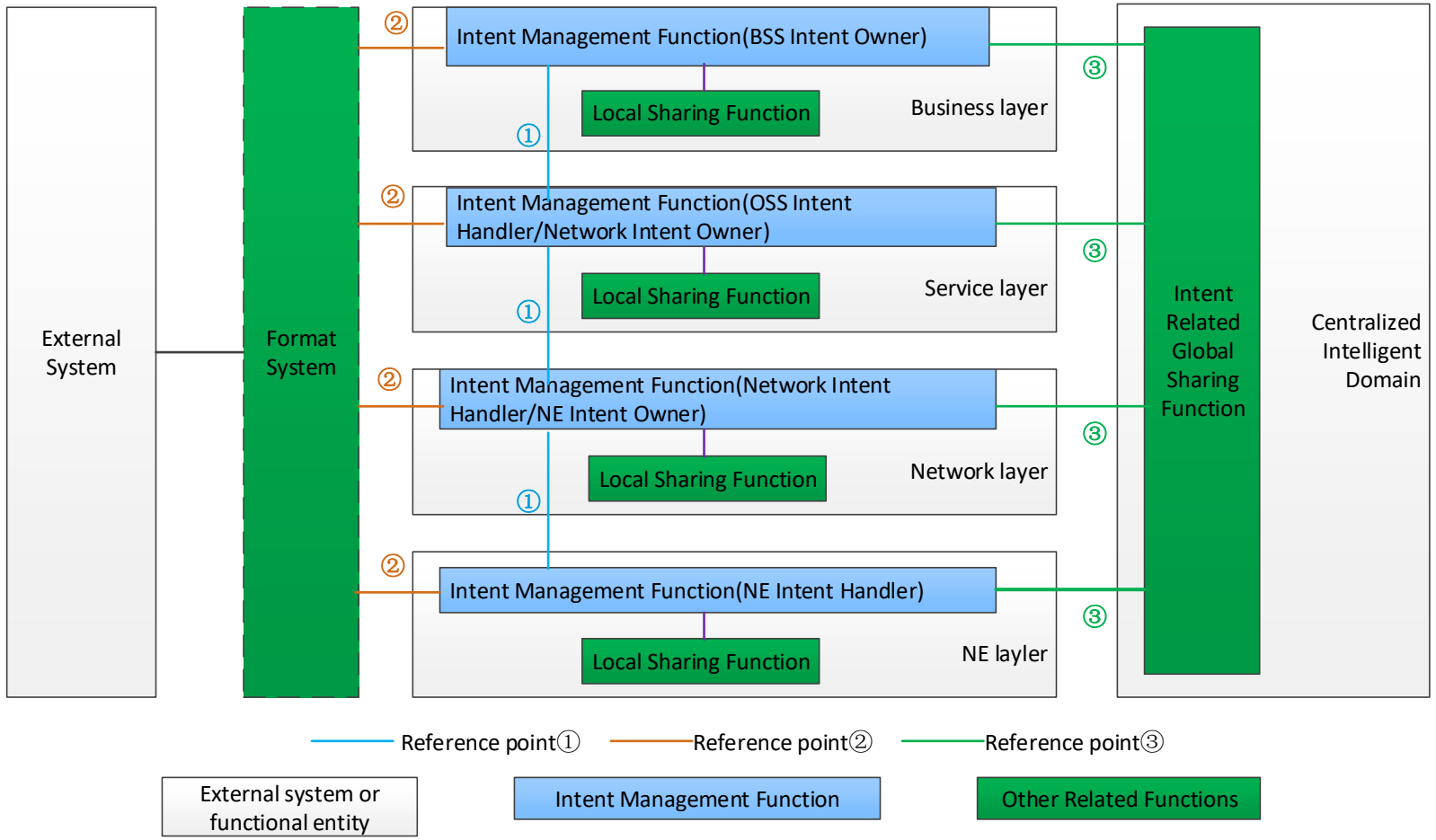
Intent owner is the creator of the intent object and is responsible for managing the life cycle of the intent object.

- **Intent Handler:**

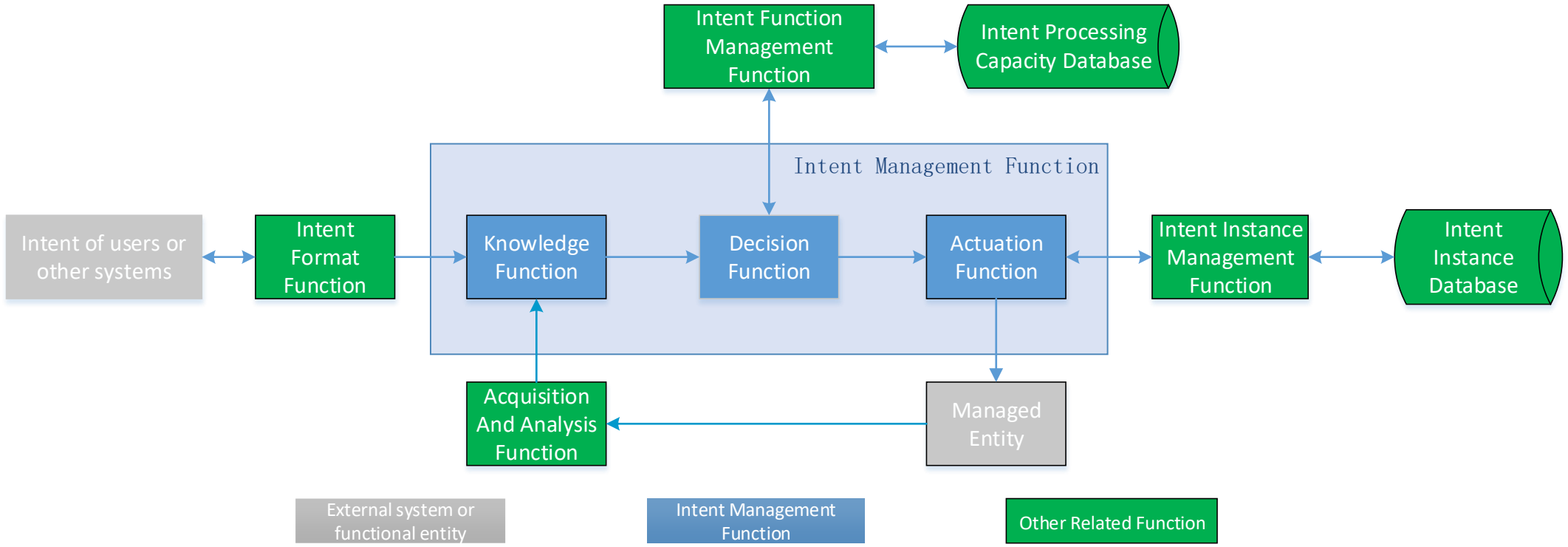
Intent handler is the receiver of the intent object, responsible for the realization and satisfaction of the intent object, and managing the life cycle of the intent instance.

Autonomous network intent management framework

- The intent management function of the intent owner interacts with the intent management function of the intent handler.
- Format intent input interface provided by intent management function.
- Intent management functions interact with intent related global external functions.



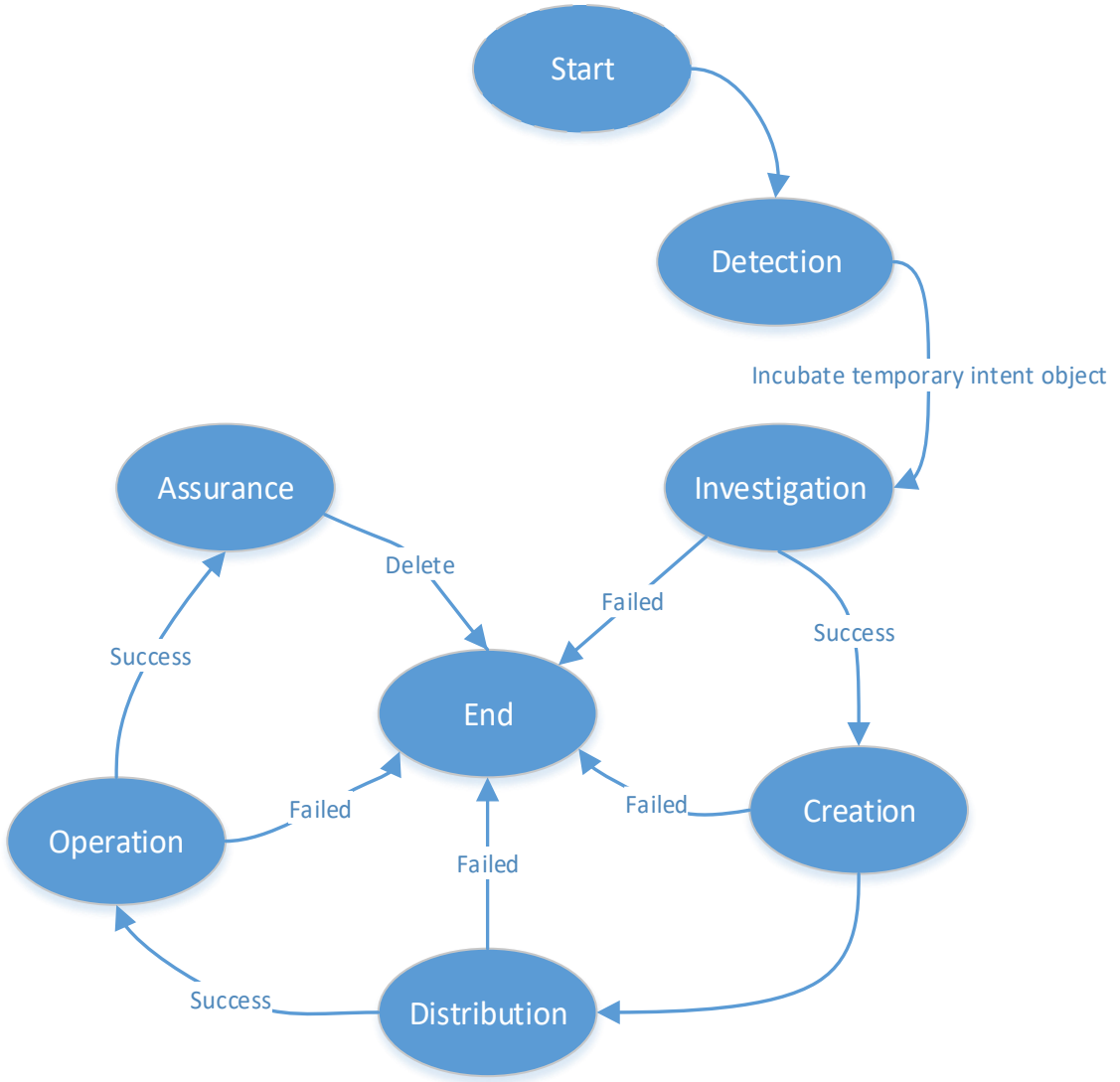
Functional architecture related to intent management



- **Intent Format Funciton:** Receive intent from external users or other systems, and format it into a general intent model definition form.
- **Acquisition And Analysis Funciton:** Collect and analyze the corresponding information of the system, and monitor the operation status.
- **Intent Function Management Funciton:** Provide intent management function registration mechanism, and support the query function .
- **Intent Instance Management Funciton:** Perform lifecycle management on intent instances.

General Intent processing flow

- **Detection stage:** Intent owner determines whether to define new intent or change existing intent.
- **Investigation stage:** Intent owner and intent handler complete investigation and negotiation to check feasibility.
- **Creation stage:** Formal intent object is created.
- **Distribution stage:** Intent owner sends the intent object to the intent handler.
- **Operation stage:** Intent handler operates its responsibility domain according to the accepted intent object.
- **Assurance stage:** Intent handler continuously ensures that the expectations corresponding to the intent are met.



General intent inerface

A

Mandatory Interface

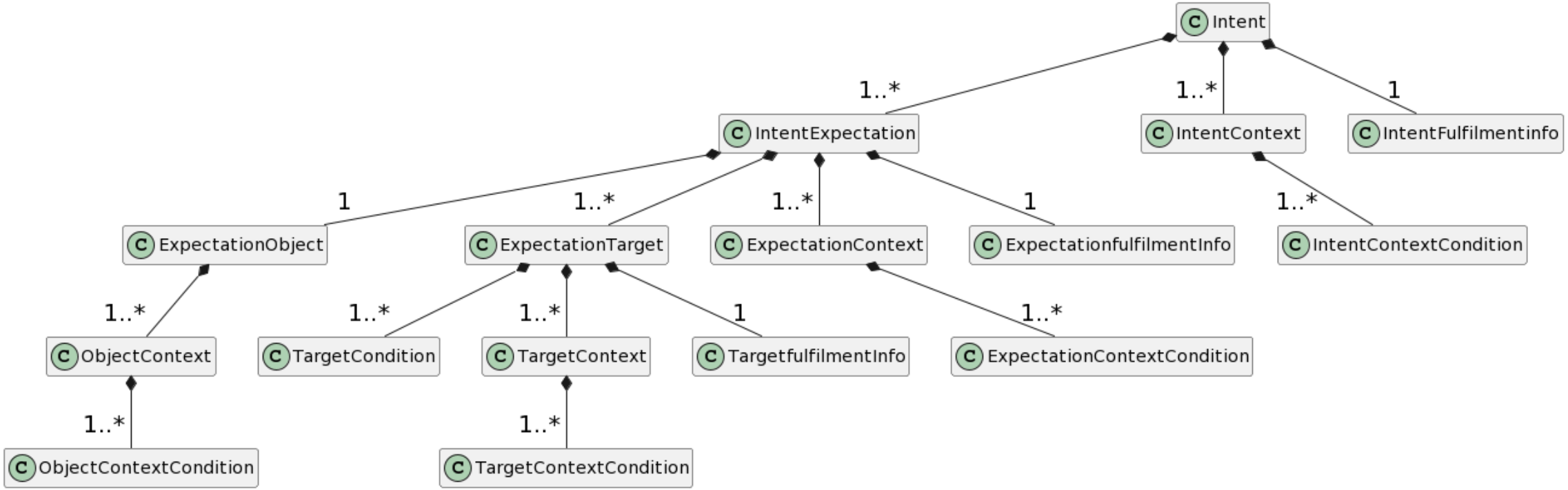
- **Create:** Intent owner requests intent handler to create a new intent instance.
- **Update:** Intent owner requests intent handler to update the intent instance.
- **Delete:** Intent owner requests intent handler to delete the intent instance.
- **Query:** Intent owner and intent handler query the existing intent instances information from the intent instance management function.
- **Report(TBD):** Used for intent handler to report intent execution status and reasons for dissatisfaction to intent owner.

B

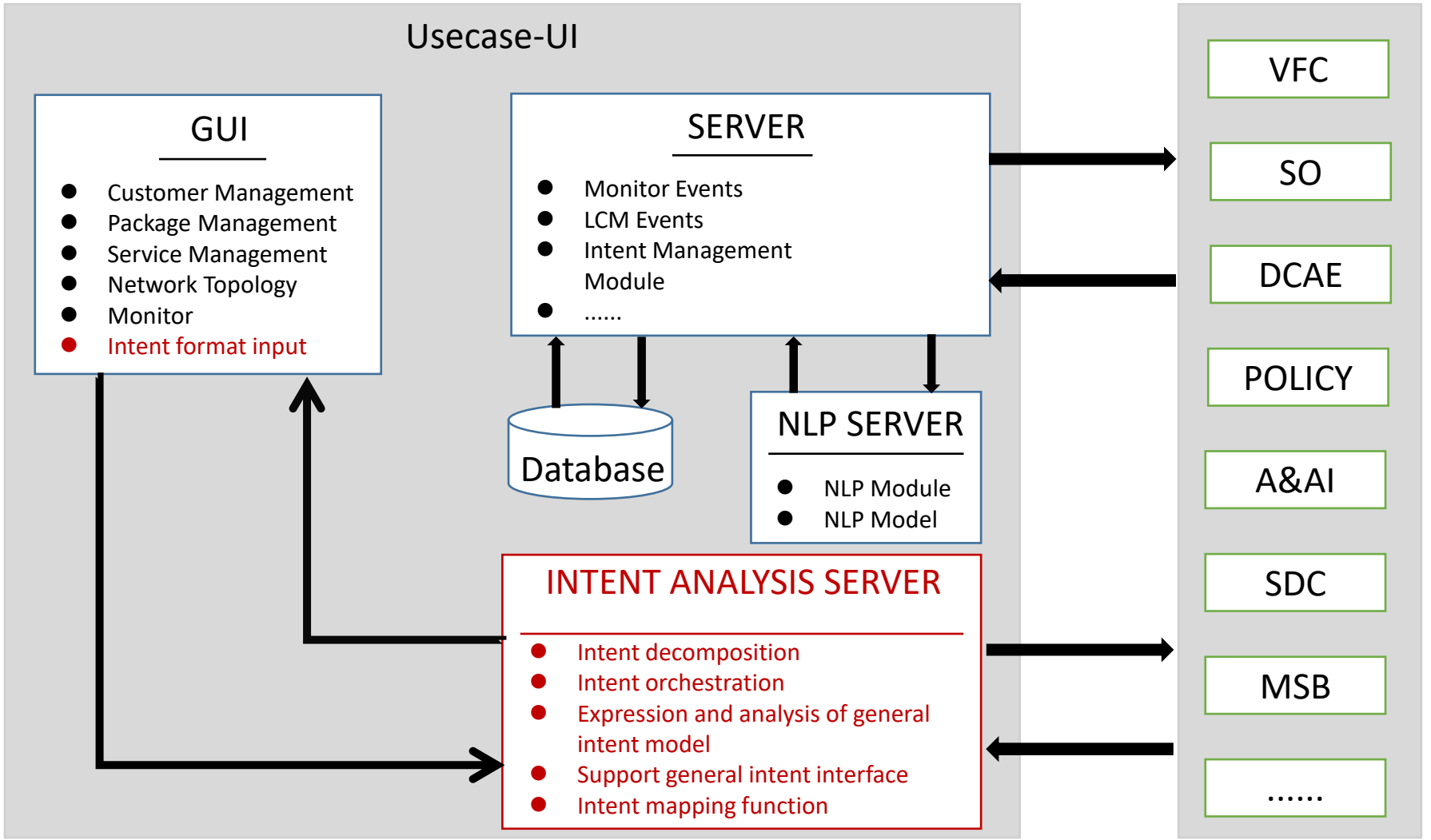
Optional Interface

- **Probe(TBD):** Explore whether intent handler can implement the specific intent, and verify the effect and possible impact of the intent in advance.
- **Negotiate(TBD):** Intent owner and intent handler negotiate necessary modifications to the content of the intent object to ensure the realization of the intent.

General intent intent model



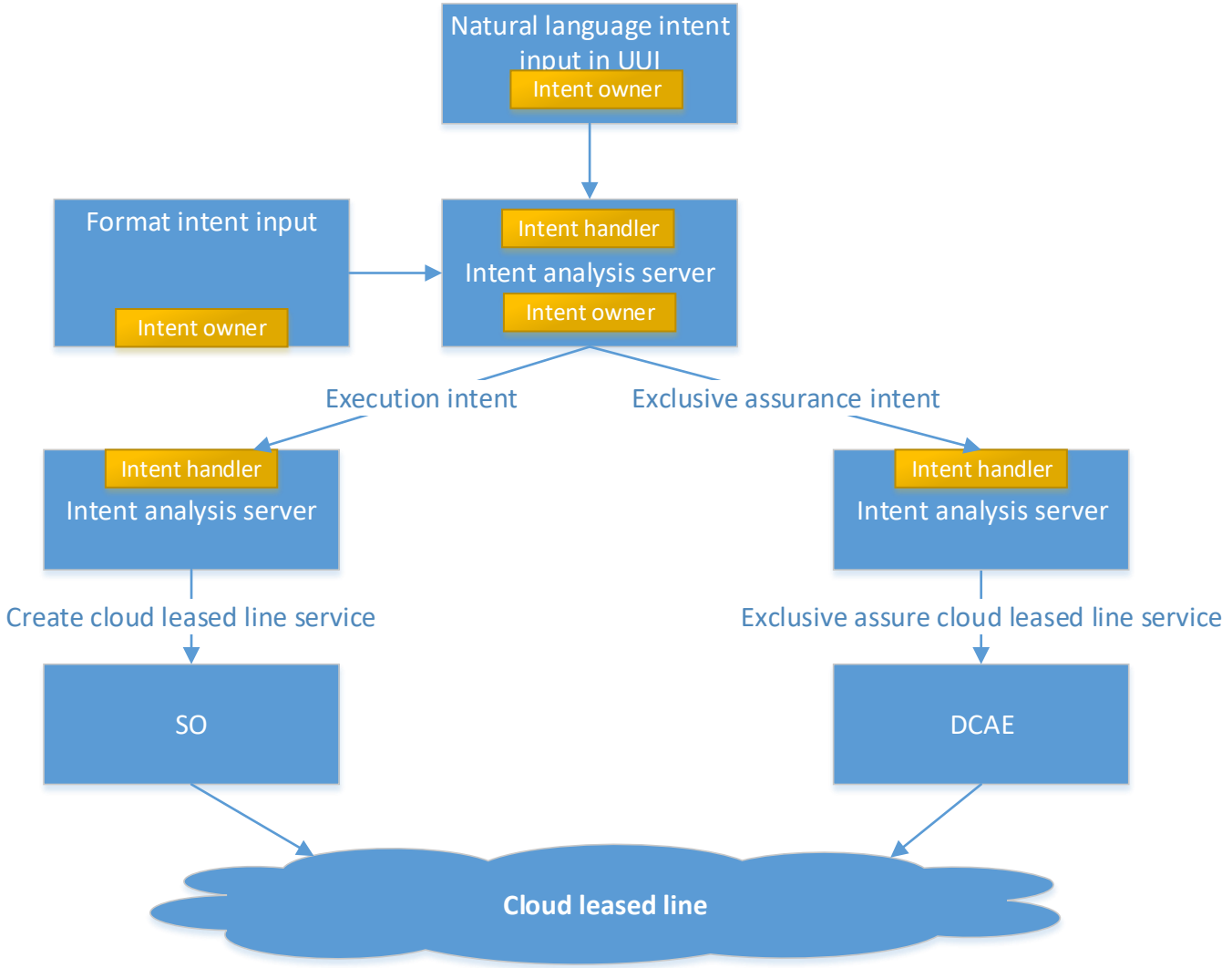
Interaction with existing ONAP components



Contents

Use case description

Operators provide intent based cloud leased line services, and provide corresponding assurance measures based on user requirements. An enterprise user orders a cloud leased line with a bandwidth of 1G from the operator. In order to meet this intent, the intent handler will configure the cloud leased line with a bandwidth of 1G. At the same time, provides some high level service quality assurance technology. For example, When the bandwidth utilization rate exceeds 80%, the bandwidth will be expanded by 60% to ensure the user experience. At the same time, when the traffic returns to normal (the utilization rate is 30%), the service bandwidth will be restored to 1g. Whenever the expansion / reduction operation is executed, the intent handler will notify the intent owner through the intent report.



Contents

Future Plans

Improve AI intelligence level

Introduce more AI related technologies in intent analysis, translation, decomposition and other processes.

Optimize intent model

Optimize intent report and implementation information model.

Provide intent verification function

Verify the effect and possible impact of the intent in advance.

Follow up standards organization

Analyze new technologies related to intent in major standards organizations (TMF/3GPP/ETSI) and consider introducing into the next version.

Implement more intent interfaces

The interface of intent negotiation stage shall be formulated and relevant processing flow shall be realized.

Provide more use cases

Provide more usage scenarios and use case implementations to support our solutions.

Contents

Discussion and Question

Thanks