Parent Item: A common ontology-based intelligent configuration management model for ip network devices

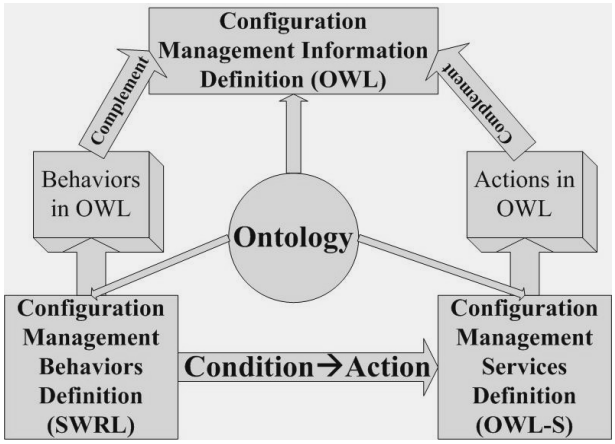
Ontology of Services

Service

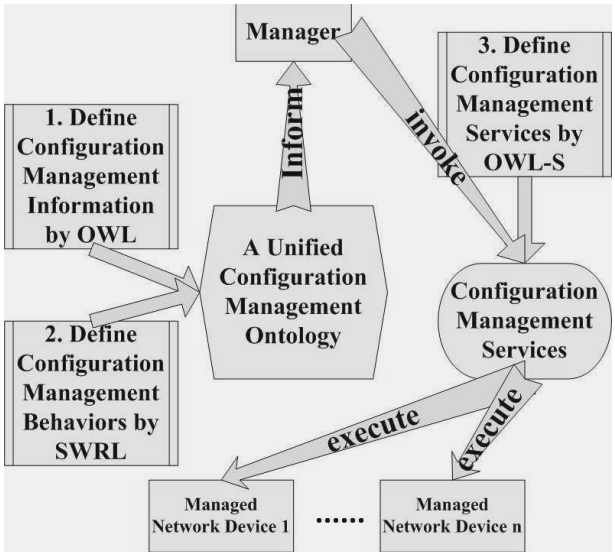
- ServiceProfile (the **what** part)
- ServiceModel (the **abtract how** part)
- ServiceGrounding (the **concrete how** part)

As for the standardization of intelligent configuration management, the ServiceModel class is of great importance. In ServiceModel, the services are modeled as processes and the class Process is used to indicate the operations of different granularities. The Process class collects mainly two types of processes, which are atomic ones and composite ones. Since the configuration management information is defined as an OWL ontology, the information can be used as the parameters of configuration management operations, which are defined in the form of composite processes. Each configuration management service corresponds acomposite process consisting of several atomic processes. When the manager invokes a configuration management service predefined by OWL-S, the service will then be executed to the managed network device.

The relationship among OWL, SWRL and OWL-S in the implementation of intelligent configuration management



A common ontology-based intelligent configuration management model for IP network devices



SWRL

Listing 1. A SWRL rule for the start of a test

```
ifTestEntry(s?)∧
swrlb:equal(ifTestStatus(s?),“notInUse”)∧
managerTest(s?)∧
swrlb:equal(managerTestStatus(s?),“begin”)
→ SetIfTestStatus(s?, "inUse")
```

Listing 2. A SWRL rule for the completion of a test

```
ifTestEntry(s?)∧
swrlb:equal(ifTestStatus (s?),“inUse”)∧
managerTest(s?)∧
swrlb:equal(managerTestStatus (s?),“stop”)
→ SetIfTestStatus(s?, "notInUse")
```

Listing 3. The SetIfTestStatus atomic process

```
<process:AtomicProcess
    rdf:ID="ifTestEntry_Class_SetIfTestStatus">
    <process:hasResult>
      <process:Output rdf:ID=" ifTestEntry_Class_
        SetIfTestStatus_Result">
        <process:parameterType>
          ”ifTestEntry_TestStatus”
        </process:parameterType>
      </process:Output>
    </process:hasResult>
</process:AtomicProcess>
```

Parent Item: A static theory of promises

Definitions

Term 1 (Current intention of an agent A) A current intention of an agent A is description of a possible behaviour, or goal, or objective, or state of affairs, that is contemplated by A with the understanding that it can be and preferably (for A) will be brought to realization.

Term 2 (Possible intention for an agent A) A possible intention for an agent A is a description of a possible behaviour, or goal, or objective, or state of affairs, that may but need not currently (at the time of qualifying the description) be contemplated or preferably brought to realization by A, and which might be in some (possibly different) circumstances a current intention of A.

Term 3 (Commitment) Commitments are current intentions that we are committed to. We may call them intended intentions, or equivalently real intentions, intentions that we hold, or committed intentions. The commitment of an intention exceeds its merely being current in that it is stable and persists in time until some achievement of the intention will take place or until some overruling considerations invalidate the commitment.

Term 4 (Intention utterance) An agent a produces an intention utterance if A produces an expression of a description of a possible intention.

Term 5 (Apparent Intention utterance) An utterance expressing a possible intention (of a principal agent) with the contextual appearance of an intention. Apparent intentions, may be drawn from the following range:

- **Real intention**: (alternatively: commitment, true intention, or intended intention) what is announced corresponds to wha the agent expects that will happen, or that(s)he will do, or what holds or what will hold. In other words the apparent intention is real if it is a commitment (and therefore current).
- **Incidental intention:** (alternatively: non-committing current intention) what is announced corresponds to why the agent expects that will happen, or that (s)he will do, or what holds or what will hold, but only a the time of expression.
- **Indifferent intention:** (alternatively: quasi-intention) the issuer has no current intention corresponding to the utterance, and no current conflicting intention either. An indifferent intention is currently contemplated as a possible behaviour, goal, objective, or state of affairs, but its bringing about is not preferred, and thus an indifferent intention is not a current intention.
- **Deceptive intention:** (also: misleading intention) the announcement might seem to be real for an audience in scope but it is a lie from the perspective of the promiser. A deceptive intention is incompatible regarding realization with a current intention, though this may be only known to the principal agent.
- **Invalid intention:** (alternatively: manifest lie) all observers may notice a discrepancy between what is announced and the facts. The invalidity of an invalid intention will become clear to agents in scope of that utterance.

Term 6 (Underlying intention (of an apparent intention utterance)) Given an apparent intention utterance of an agent, there is an underlying intention (which need not be comprised in the same

utterance) as well. We will distinguish five cases, corresponding to the case distinction of intention utterances:

- **Real intention:** The underlying intention of a real intention is that same intention.
- **Incidental intention:** The underlying intention of an incidental intention is that same intention which is known to be consistent but is non-committing as well.
- **Indifferent intention**: The underlying intention of an indifferent intention is empty.
- **Deceptive intention**: The underlying intention of a deceptive intention differs significantly from the (deceptive) intention.
- **Invalid intention:** The underlying intention of an invalid intention differs noticeably (for observing agents) from the (invalid) intention.

Term 7 (Promise) A promise is an apparent intention of an agent, (the promiser or promising agent) the utterance of which has been documented within a scope that goes beyond the promiser. According to the definition of intention utterances, a promise brings with it an apparent intention and an underlying intention, and five cases can be distinguished for promises: real, incidental, indifferent, deceptive, and invalid

Term 8 (Keeping a promise (relative to an observing agent)) A promise is kept, for the perspective of an agent A (e.g. the promisee), if an action is performed or a state of affairs is reached that complies, according to A's assessment or observation, with the body of the promise. It is plausible but not strictly needed to require that once a promise is kept some causal relation with promiser behaviour can be found.

Term 9 (Keeping a promise (in absolute terms)) A promise is kept in absolute terms, if it is kept according to all agents in its scope.

Term 10 (Broken promise) A promise is broken if after it has been issued a state is reached at which the promise has not been kept, from any conceivable (though reasonable) perspective, and from which it will certainly not be kept anymore either, again from any conceivable (though reasonable) perspective that an agent in its scope mint have.

Term 11 (Promissory obligation) With each promise of an agent A an obligation is connected, the so-called promissory obligation. It is that obligation to which the agent has become obliged by making the promise

Term 12 (Obligationism) With obligationism we denote the viewpoint that (i) promises are characterized by a unique capacity to (auto)generate an obligation (specifically the promissory obligation) for the promising agent, and that (ii) the essence or content of a promise is fully captured by its promissory obligation.

Term 13 (Non-obligationism) With non-obligationism we denote the belief that obligationism is false.

Term 14 (Strong non-obligationism) With strong non-obligationism we denote the belief that obligationism is false and that in addition the concept of promise may be accounted for without making use of the concept of an obligation.

Term 15 (Restricted strong non-obligationism) With restricted non-obligationism we denote the

belief that obligationism is false, and that for a large class of promises, though not for all, the concept of promise may be accounted for without making use of the concept of an obligation.

Term 16 (Deception) A deception consists of two intentions: a documented intention (i.e. a promise) and a non-documented commitment, which are incompatible.

Term 17 (Assessment) An assessment is a subjective statement made by an agent about whether the intentions of itself or of another agent were fulfilled.

Promise related reasoning processes

Promise preparation: a reasoning process performed by A leading to the design, timing and issuing of p by A.

Credibility analysis: a reasoning process where agents C in scope of p determine the credibility they assign to A's promising p in the light of general facts known of A (but excluding specific historical information about the individual behavior of A as a member of its agent class.)

Prior trust determination: reasoning processes performed by C (provided that C is in the scope of p) aimed at (i) determining the trust C had in A before becoming aware of p (C's prior trust in A), and (ii) specifying which expectations are generated by taking notice of p.

Counter-promise deliberation: reasoning processes performed by B concerning plausible counter-promises that may be issued in by B reply of taking notice of p (provided B is in scope of p).

Promise impact prediction: (this may be done with the understanding that B has issued one or more plausible counter-promises) (i) reasoning processes performed by B (when in scope of p) and by C (any agent in scope of p) aimed at determining the (change of) expectation (as viewed by B resp. C) that p creates in B (and that A intended to generate), (ii) and reasoning processes aimed at modification of plans (held by B or by C) given the change of expectations held by each of them that was brought about by taking notice of p.

Promise assessment: reasoning processes performed by C concerning (i) the way in which C will assess whether or not A's promise is kept, (ii) assessing the latter by means of the preferred assessment method.

Promise withdrawal monitoring: A may at some later stage issue another promise, say q, the keeping of which is not compatible with keeping p. It that case q qualifies as a withdrawal of p. An agent C applies a reasoning process that monitors and evaluates subsequent promises issued by A to determine whether these may be viewed as breaking p to an extent that p may be considered having been withdrawn.

Trust updating: reasoning processes in place for each agent C in scope of p. The process aims at

updating C's prior trust in A in accordance with the result of the assessment C makes concerning the degree of keeping p that is achieved by A.

Reputation processing: a reasoning processes performed by each agent C in scope of p aimed at exchanging the effects of trust updates between different agents. Reputation flow permits an agent C while having no prior trust assessment of an agent A to acquire an initial trust of A by taking notice of evidence gathered about A by other agents.