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| --- | --- |
| CHANGE REQUEST | |
| Meeting ID:\* | SDS#43 |
| Source:\* | Xu Li, Convida, [li.xu@convidawireless.com](mailto:li.xu@convidawireless.com)  Chonggang Wang, Convida, [wang.chonggang@convidawireless.com](mailto:wang.chonggang@convidawireless.com) |
| Date:\* | 2019-11-23 |
| Reason for Change/s:\* | Some maintenances for the semantic reasoning related resources. |
| CR against: Release\* | Release 4 |
| CR against: WI\* | Active <WI-0053>  MNT maintenance / < Work Item number(optional)>  Is this a mirror CR? Yes  No  mirror CR number: (Note to Rapporteur - use latest agreed revision)  STE Small Technical Enhancements / < Work Item number (optional)>  Only ONE of the above shall be ticked |
| CR against: TS/TR\* | TS-0001 V4.3.0 |
| Clauses \* | 9.6.65, 9.6.66, 9.6.67 |
| Type of change: \* | Editorial change  Bug Fix or Correction  Change to existing feature or functionality  New feature or functionality  Only ONE of the above shall be ticked |
| Impacted other TS/TR(s) | N/A |
| Post Freeze checking:\* | This CR contains only essential changes and corrections? YES  NO  This CR may break backwards compatibility with the last approved version of the TS? YES  NO |
| Template Version: January 2017 (Do not modify) | |

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# Introduction

Just small maintenances for semantic reasoning related resources.

### -----------------------Start of change 1-------------------------------------------

### 9.6.X Resource Type *semanticRuleRepository*

A *<semanticRuleRepository>* resource is a child resource of the *<CSEBase>* resource. The *<semanticRuleRepository>* resource may have one or multiple <*reasoningRules*> child resources to represent different sets of reasoning rules in the oneM2M system. A reasoning initiator can create <*reasoningJobInstance*> child resources of a *<semanticRuleRepository>* resource to initiate desired reasoning operations.

The *<semanticRuleRepository>* resource shall contain the child resources specified in Table 9.6.X-1 and the attributes specified in Table 9.6.X-2.

**Table 9.6.X-1: Child resources of <*semanticRuleRepository*> resource**

| **Child Resources of *<semanticRuleRepository>*** | **Child Resource Type** | **Multiplicity** | **Description** | **<*ruleRepositoryAnnc*> Child Resource Types** |
| --- | --- | --- | --- | --- |
| *[variable]* | *<reasoningRules>* | 0..n | <*reasoningRules*> resource for describing a set of reasoning rules. | *<reasoningRulesAnnc>* |
| *[variable]* | *<subscription>* | 0..n | See [i.3], clause 9.6.8. | *<subscription>* |
| *[variable]* | *<reasoningJobInstance>* | 0..n | <*reasoningJobInstance*> resource for describing a specific reasoning job instance. | <*reasoningJobInstanceAnnc*> |

**Table 9.6.X-2: Attributes *of <semanticRuleRepository> resource***

| **Attribute Name**  **<*semanticRuleRepository*>** | **Multiplicity** | **RW/RO/WO** | **Description** | **<*ruleRepositoryAnnc*> Attributes** |
| --- | --- | --- | --- | --- |
| *resourceType* | 1 | RO | See clause 9.6.1.3. | NA |
| *resourceID* | 1 | RO | See clause 9.6.1.3. | NA |
| *resourceName* | 1 | WO | See clause 9.6.1.3. | NA |
| *parentID* | 1 | RO | See clause 9.6.1.3. | NA |
| *expirationTime* | 1 | RW | See clause 9.6.1.3. | NA |
| *accessControlPolicyIDs* | 0..1 (L) | RW | See clause 9.6.1.3. | NA |
| *labels* | 0..1 (L) | RW | See clause 9.6.1.3. | MA |
| *creationTime* | 1 | RO | See clause 9.6.1.3. | MA |
| *lastModifiedTime* | 1 | RO | See clause 9.6.1.3. | MA |
| *announceTo* | 0..1 (L) | RW | See clause 9.6.1.3. | NA |
| *announcedAttribute* | 0..1 (L) | RW | See clause 9.6.1.3. | NA |
| *dynamicAuthorizationConsultationIDs* | 0..1 (L) | RW | See clause 9.6.1.3. | OA |

### 9.6.Y Resource Type *reasoningRules*

A <*reasoningRules*> resource can be used to store a set of related reasoning rules (e.g. for supporting a particular application). A *<reasoningRules>* resource is a child resource of the *<semanticRuleRepository>* resource. By performing the CRUD operations on the <*reasoningRules*> resources, various reasoning rules (e.g., user-defined reasoning rules based on business logic) can be created, discovered, retrieved, updated and deleted inside the oneM2M system.

The *<reasoningRules>* resource shall contain the child resources specified in Table 9.6.Y-1 and the attributes specified in Table 9.6.Y-2.

**Table 9.6.Y-1: Child resources of *<reasoningRules>* resource**

| **Child Resources of <*reasoningRules*>** | **Child Resource Type** | **Multiplicity** | **Description** | **<*reasoningRulesAnnc*> Child Resource Types** |
| --- | --- | --- | --- | --- |
| *[variable]* | *<subscription>* | 0..n | See [1], clause 9.6.8 | *<subscription>* |

**Table 9.6.Y-2: Attributes of *<reasoningRules>* resource**

| **Attribute Name**  **<*reasoningRules*>** | **Multiplicity** | **RW/RO/WO** | **Description** | **<*reasoningRulesAnnc*> Attributes** |
| --- | --- | --- | --- | --- |
| *resourceType* | 1 | RO | See clause 9.6.1.3. | NA |
| *resourceID* | 1 | RO | See clause 9.6.1.3. | NA |
| *resourceName* | 1 | WO | See clause 9.6.1.3. | NA |
| *parentID* | 1 | RO | See clause 9.6.1.3. | NA |
| *expirationTime* | 1 | RW | See clause 9.6.1.3. | NA |
| *accessControlPolicyIDs* | 0..1 (L) | RW | See clause 9.6.1.3. | NA |
| *labels* | 0..1 (L) | RW | See clause 9.6.1.3. | MA |
| *creationTime* | 1 | RO | See clause 9.6.1.3. | MA |
| *lastModifiedTime* | 1 | RO | See clause 9.6.1.3. | MA |
| *announceTo* | 0..1 (L) | RW | See clause 9.6.1.3. | NA |
| *announcedAttribute* | 0..1 (L) | RW | See clause 9.6.1.3. | NA |
| *dynamicAuthorizationConsultationIDs* | 0..1 (L) | RW | See clause 9.6.1.3. | OA |
|  |  |  |  |  |
| *ontologyRef* | 1(L) | WO | A reference (URIs) of the ontologies used to represent the reasoning rules that are stored in the content attribute. | OA |
| *ruleRepresentation* | 1 | RW | Indicates the format of the rules, e.g. Rule Interchange Format (RIF). | OA |
| *content* | 1 | RW | Stores a set of rules. | OA |

### 9.6.Z Resource Type *reasoningJobInstance*

A <*reasoningJobInstance*> resource represents a specific reasoning job instance for enabling the two types of reasoning operations (One type is a one-time reasoning operation and the other type is a continuous reasoning operation). A reasoning initiator such as an AE or a CSE may initiate a desired reasoning operation by creating a <*reasoningJobInstance*> resource as a child resource of a *<semanticRuleRepository>* resource.

The *<reasoningJobInstance>* resource shall contain the child resources specified in Table 9.6.Z-1 and the attributes specified in Table 9.6.Z-2.

**Table 9.6.Z-1: Child resources of *<reasoningJobInstance>* resource**

| **Child Resources of <*reasoningJobInstance*>** | **Child Resource Type** | **Multiplicity** | **Description** | **<*reasoningJobInstance*> Child Resource Types** |
| --- | --- | --- | --- | --- |
| *[variable]* | *<subscription>* | 0..n | See clause 9.6.8 | *<subscription>* |

**Table 9.6.Z-2: Attributes of *<reasoningJobInstance>* resource**

| **Attribute Name** | **Multiplicity** | **RW/RO/WO** | **Description** | **<*reasoningJobInstance*> Attributes** |
| --- | --- | --- | --- | --- |
| *resourceType* | 1 | RO | See clause 9.6.1.3. | NA |
| *resourceID* | 1 | RO | See clause 9.6.1.3. | NA |
| *resourceName* | 1 | WO | See clause 9.6.1.3. | NA |
| *parentID* | 1 | RO | See clause 9.6.1.3. | NA |
| *expirationTime* | 1 | RW | See clause 9.6.1.3. | NA |
| *accessControlPolicyIDs* | 0..1 (L) | RW | See clause 9.6.1.3. | NA |
| *labels* | 0..1 (L) | RW | See clause 9.6.1.3. | MA |
| *creationTime* | 1 | RO | See clause 9.6.1.3. | MA |
| *lastModifiedTime* | 1 | RO | See clause 9.6.1.3. | MA |
| *announceTo* | 0..1 (L) | RW | See clause 9.6.1.3. | NA |
| *announcedAttribute* | 0..1 (L) | RW | See clause 9.6.1.3. | NA |
| *dynamicAuthorizationConsultationIDs* | 0..1 (L) | RW | See clause 9.6.1.3. | OA |
|  |  |  |  |  |
| *reasoningType* | 1 | WO | The type of the reasoning job represented by this resource.  The supported values of this attribute include:   * “one-time” * “continuous” | OA |
| *mode* | 0..1 | WO | The supported values of this attribute include:   * “Periodic” - the reasoning job represented by this resource is executed periodically. * “When the invovled FS/RS changes” - if the *factSet* and/or *ruleSet* attributes change, the reasoning job represented by this resource is executed.   This attribute is present only when the value of *reasoningType* is set to “continuous”. | OA |
| *period* | 0..1 | RW | The time period for executing the reasoning job represented by this resource. For example, every two hours.  This attribute is present only when the value of *mode* is present and set to “Periodic”. | OA |
| *factSet* | 1 (L) | RW | A list of URIs of the resources that store the facts used by this reasoning job. | OA |
| *ruleSet* | 1 (L) | RW | A list of URIs of resources that store the reasoning rules used by this reasoning job. | OA |
| *result* | 1 | RO | The latest reasoning result produced by this reasoning job. | OA |
| *resultRepresentation* | 1 | RW | Indicates the type of serialization of the *result* attribute, e.g. RDF/XML, OWL/XML. | OA |

### -----------------------End of change 1-------------------------------------------