

rSYBL

rSYBL API

This document describes rSYBL API, and the lifecycle of starting the control for one application. Figure 1 shows the steps that the rSYBL user needs to undergo for starting the control, with all the necessary steps. Below, we describe each of the REST methods depicted in the figure, with input examples.

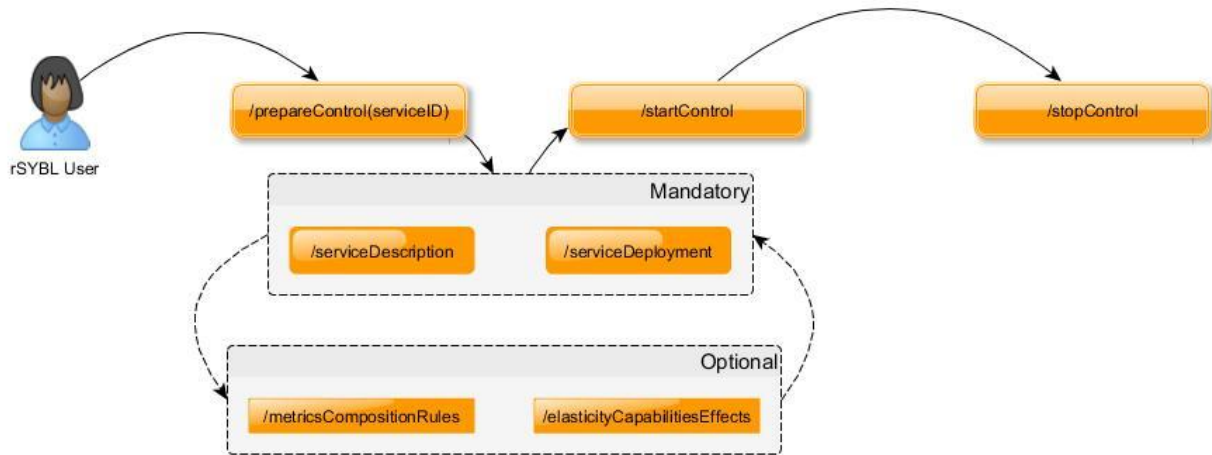


Figure 1: Control Lifecycle

- Service Description

@PUT

@Path("/serviceDescription")

```
<CloudService id="M2MApplication">
  <SYBLDirective Constraints="Co4:CONSTRAINT cost < 0.8 WHEN fulfilled(Co3)"/>
  <ServiceTopology id="DataEndCompositeComponent">
    <SYBLDirective Constraints="Co1:CONSTRAINT latency < 0.9 ms;Co2:CONSTRAINT cpuUsage < 60 %"/>
    <Relationship>
      <Master>DataControllerServiceUnit</Master>
      <Slave>DataNodeServiceUnit</Slave>
    </Relationship>
    <ServiceUnit id="DataControllerComponent" />
    <ServiceUnit id="DataNodeComponent" />
    <SYBLDirective Strategies="St3:STRATEGY CASE cpuUsage < 30 : scalein"/>
  </ServiceUnit>
</CloudService>
```

Figure 2: Service/Application Description

- Elasticity Capabilities Effects

@PUT

@Path("/elasticityCapabilitiesEffects")

```

{ "scaleout": {
  "scaleOutEffectForDataNode": {
    "targetUnit": "DataNodeServiceUnit",
    "effects": {
      "DataNodeServiceUnit": {
        "cpuUsage": -30.0,
        "latency": -2.0,
        "cost": 0.12
      },
      "DataControllerServiceUnit": {
        "cpuUsage": -30.0,
        "latency": -2.0
      },
      "DataEndServiceTopology": {
        "cpuUsage": -30.0,
        "latency": -2.0
      }
    }
  },
  "scaleOutEffectForEventProcessingServiceUnit": {
    "targetUnit": "EventProcessingServiceUnit",
    "effects": {
      "EventProcessingServiceUnit": {
        "cpuUsage": -40.0,
        "responseTime": -1000.0,
        "throughput": 1000,
        "cost": 0.12
      },
      "EventProcessingServiceTopology": {
        "cpuUsage": -20.0,
        "responseTime": -1000.0,
        "throughput": 1000,
        "cost": 0.12
      }
    }
  }
}

```

Figure 3: Effects Specification

- TOSCA Description Set
@PUT
@Path("/TOSCADescriptionAndStartControl")
- Metric Composition Rules
@PUT
@Path("/metricsCompositionRules")

```

<MetricsCompositionRules>
  <CompositionRule TargetMonitoredElementLevel="VM">
    <ResultingMetric type="RESOURCE" measurementUnit="no" name="numberOfVMs"/>
    <Operation value="1" type="SET_VALUE"/>
  </CompositionRule>
  <CompositionRule TargetMonitoredElementLevel="SERVICE_UNIT">
    <TargetMonitoredElementID>LoadBalancerComponent</TargetMonitoredElementID>
    <ResultingMetric type="RESOURCE" measurementUnit="no" name="numberOfClients"/>
    <Operation MetricSourceMonitoredElementLevel="VM" type="AVG">
      <ReferenceMetric type="RESOURCE" measurementUnit="no" name="activeConnections"/>
    </Operation>
  </CompositionRule>
  <CompositionRule TargetMonitoredElementLevel="SERVICE_UNIT">
    <TargetMonitoredElementID>DataNodeComponent</TargetMonitoredElementID>
    <ResultingMetric type="RESOURCE" measurementUnit="%" name="cpuUsage"/>
    <Operation value="100" type="ADD">
      <Operation value="-1" type="MUL">
        <Operation MetricSourceMonitoredElementLevel="VM" type="AVG">
          <ReferenceMetric type="RESOURCE" measurementUnit="%" name="cpu_idle"/>
        </Operation>
      </Operation>
    </Operation>
  </CompositionRule>
  <CompositionRule TargetMonitoredElementLevel="SERVICE_UNIT">
    <TargetMonitoredElementID>EventProcessingComponent</TargetMonitoredElementID>
    <ResultingMetric type="RESOURCE" measurementUnit="%" name="cpuUsage"/>
    <Operation value="100" type="ADD">
      <Operation value="-1" type="MUL">
        <Operation MetricSourceMonitoredElementLevel="VM" type="AVG">
          <ReferenceMetric type="RESOURCE" measurementUnit="%" name="cpu_idle"/>
        </Operation>
      </Operation>
    </Operation>
  </CompositionRule>

```

Figure 4: Example of Metric Composition Rules Input

- Service Deployment

@PUT

@Path("/serviceDeployment")

```

<DeploymentDescription CloudServiceID="M2MApplication" AccessIP="localhost">
  <DeploymentUnit serviceUnitID="LoadBalancerComponent">
    defaultFlavor="m1.tiny" defaultImage="a4fe953e-d4c8-40a5-9c73-d9fee3f00c08" >
  </DeploymentUnit>
  <DeploymentUnit serviceUnitID="EventProcessingComponent">
    defaultFlavor="m1.tiny" defaultImage="15a6385c-f8c1-3ca2-84f1-ab84c8c84fe4">
    <!-- <AssociatedVM IP="109.231.122.180" UUID="f3223096-aa4c-3f3c-aa6a-63985d684f3e"/>
    <AssociatedVM IP="109.231.122.250" UUID=""/>
    <AssociatedVM IP="109.231.122.251" UUID=""/>
    <AssociatedVM IP="109.231.122.93" UUID=""/>

    <AssociatedVM IP="109.231.122.248" UUID=""/>
    <AssociatedVM IP="109.231.122.202" UUID=""/>
    <AssociatedVM IP="109.231.122.48" UUID=""/>
    <AssociatedVM IP="109.231.122.45" UUID=""/>
    <AssociatedVM IP="109.231.122.252" UUID=""/> -->
    <AssociatedVM IP="109.231.122.247" UUID=""/>
    <AssociatedVM IP="109.231.122.144" UUID=""/>
  </DeploymentUnit>
  <ElasticityCapability Name="scaleIn"/>
  <ElasticityCapability Name="scaleOut"/>
</DeploymentUnit>
  <DeploymentUnit serviceUnitID="DataControllerComponent">
    defaultFlavor="m1.tiny" defaultImage="22ce5bdf-de2b-3154-8979-a0c426d2f7e8" >
  </DeploymentUnit>
  <DeploymentUnit serviceUnitID="DataNodeComponent">
    defaultFlavor="m1.tiny" defaultImage="22670567-395f-3245-b596-29c17d34ddc0" >
    <AssociatedVM IP="109.231.122.246" UUID="cf22240b-9514-34c8-acf1-e774e2462bda"/>
    <!-- <AssociatedVM IP="109.231.122.209" UUID=""/> -->
  </DeploymentUnit>
  <ElasticityCapability Name="scaleIn"/>
  <ElasticityCapability Name="scaleOut"/>
</DeploymentUnit>
</DeploymentDescription>

```

Figure 5: Deployment Description

- Prepare Control

@PUT

@Path("/prepareControl")

Example of input : CloudServiceID

- Start Control

@PUT

@Path("/startControl")

Example of input: CloudServiceID

- Stop Control

@PUT

@Path("/stopControl")

Example of input: CloudServiceID