

VID-MSO Service Instantiation Interface Design

Jan 2017 – version 1.0

Document Attributes

Attribute	Value
Other Attributes	The interfacing application is VID or any NorthBound Application using that interface to trigger MSO.

Revision History

The following table lists the revision history of this document:

Author	Date	Version #	Revision Description
MSO dev. team	01/23/2017	1.0	intitial version

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Introduction

Background – VID – MSO Interface

The VID – MSO interface is used to orchestrate OpenECOMP infrastructure VNFs.

Scope – VID – MSO Interface

The serviceInstantiation POST and DELETE requests are both ASYNC in nature and after immediate SYNC ACK, notifications(one or multiple) will be returned back to VID. MSO is currently not supporting ASYNC notifications to VID, VID will poll MSO for request status.

The serviceInstantiation GET Orchestration requests is SYNC and will return 200 Success response if the requestId is successfully retrieved within MSO.

Proposed MSO API Name

MSOServiceInstantiation

Interfacing Application Roles

Provider	Consumer(s)
-----------------	--------------------

MSO	VID or another Northbound instanciator
------------	---

Interface Overview

VID sends a series of service instantiation API requests to MSO to “build” up an infrastructure “service” (that contains 1 or more related VNFs, with each VNF deployed as 1 or more VF Modules to allow deployment and mgmt. flexibility). A VF Module may have an optional volume group (which would be orchestrated first). A volume group is a collection of 1 or more volumes that will persist beyond the life of the VM it is attached to. This allows for persistent data if so required.

The MSO interface also supports orchestration of networks (these are “external” networks, meaning not internal-to-the-VNF networks, that could span tenants).

1. To start, a service-instance must be orchestrated. A service-instance is like a container that all sub-tending components are related to. VID sends a service instantiation request to MSO to orchestrate the service-instance into A&AI inventory.
 - a. A service-instance is related to a customer and service-subscription in A&AI inventory (those objects are pre-created outside of MSO).
2. Then, a VNF (generic-vnf in A&AI) must be orchestrated and related to the service-instance. The VNF is a container for one or many VF Modules and Volume Groups that make up the VNF instance.
3. Repeating as needed, VID sends a service instantiation request to MSO (to Create or delete a sub-component)
 - a. MSO looks up in its catalog and executes the recipe to create or delete the sub-component:
 - i. Create: Assign resources for the sub-component, create the necessary objects in A&AI inventory, and issue the HEAT request to Openstack to create the virtual resources
Note: At this point the service-instance includes a new sub-component (VF-module, volume group)
 - ii. Delete: Issue the HEAT requests to Openstack to delete the virtual resources, release resources and remove the necessary objects from inventory
Note: At this point the service-instance includes one less sub-component (VF-module, volume group)

Stimulus

Operations needs to instantiate a new infrastructure VNF (or perform growth or contraction).

Assumptions

No.	Assumptions	Approach
1	VID (the system/UI) will not be handling network orchestration	Manual “VID” API calls into MSO will be used to

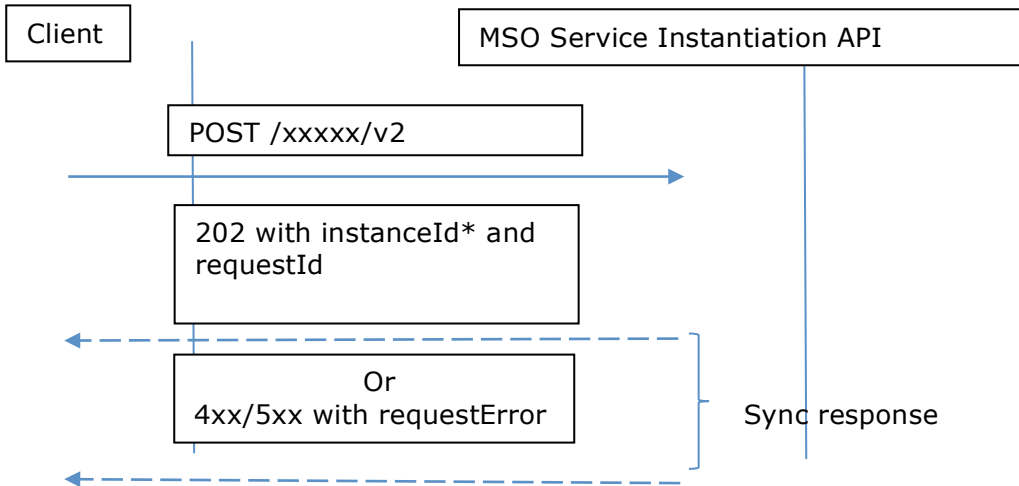
	requests.	orchestrate networks. As a fallback, the v3 infra API could be used alternatively.

Dependencies

Interface Design Rationale

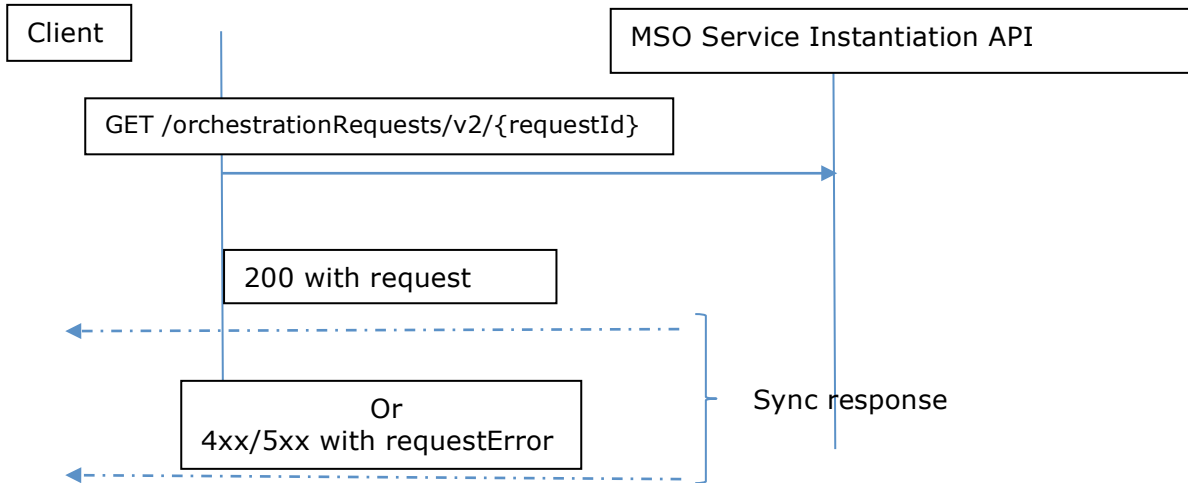
As stated earlier, Service Instantiation API's (With the exception of GET) are ASYNC in nature. VID will call MSO via GSLB (iDNS). MSO will respond with a 202 to indicate the request was accepted and is being processed.

VID Flow Diagram (Generic Create of an instance)

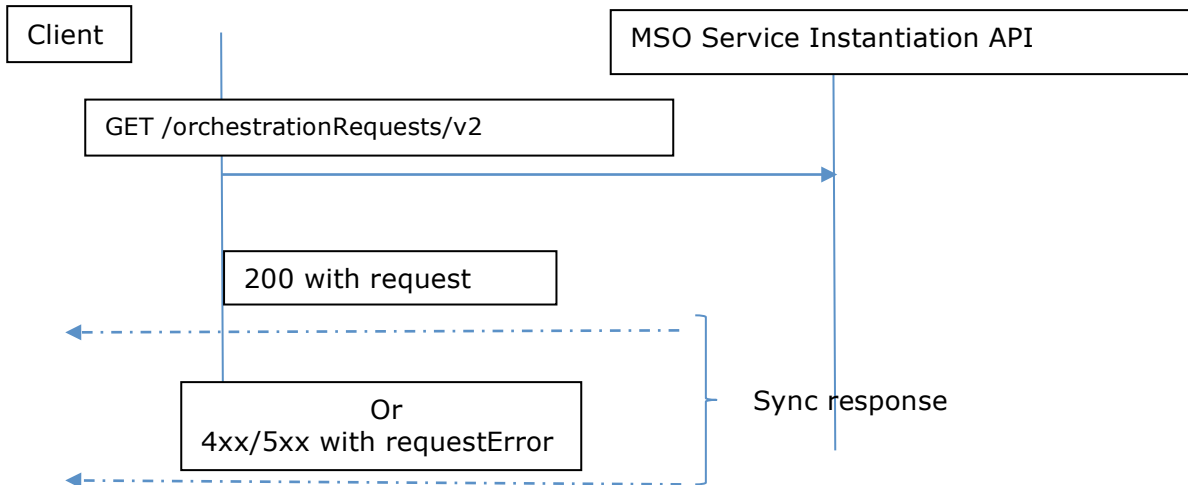


*Note: For the VID interface, the instanceIds for service, vnf, vfModule, and volumeGroup modelTypes will be returned in the sync response. But the instanceId for network modelType will NOT be returned in the sync response (but would be available via a GET once generated if request proceeds that far)

VID Flow Diagram (Get specific request status)



VID Flow Diagram (Get request(s) status per filter criteria)



VID Interface Specification

MSO Server Root

REST resources are defined with respect to a serverRoot:

serverRoot = <https://{FQDN}:{Port}/ecomp/mso/infra/{resourcePath}>

For HTTPS, port = 8443, for HTTP (only in dev), port = 8080

MSO Header Fields

Parameter	Data Type	Required?	Brief description
Accept	String	No	Determines the format of the body of the response. Valid value is: <ul style="list-style-type: none"> • application/json
Authorization	String	Yes	The username and password are formed into one string as "username:password". This string is then Base64 encoded to produce the encoded credential which is communicated in the header after the string "Authorization: Basic ". See examples below. If the Authorization header is missing, then an HTTP 400 Invalid Request message shall be returned. If the string supplied is invalid, then an HTTP 401 Unauthorized message shall be returned.
Content-length	Integer	No	Number of bytes in the body of the request. Note that content length is limited to 1Megabyte.
Content-type	String	Yes	Must be set to the following value: <ul style="list-style-type: none"> • application/json
Date	datetime	No	Date time of the response in GMT

Common Data Structures

To avoid field repetition below for each type of API operation, here is a listing of the common data structures and their fields with the VID-MSO interface specific requirements for each request type and by request scope.

1. cloudConfiguration

cloudConfiguration					
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enumerated value; D=default value)	NOTES
CloudConfiguration	cloudConfiguratio	C	Container		

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{	n				Request Scope	C R E A T E	U P D A T E	D E L E T E
					service	O		O
					vnf	M		M
					volumeGroup	M		M
					vfModule	M		M
					network	M		M
LcpCloudRegionId	lcpCloudRegionId	M	string		AIC LCP node location identifier			
TenantId	tenantId	M	string		Openstack tenant id (UUID)			
}					End CloudConfiguration			

2. modelInfo

modelInfo					
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enumerated value; D=default value)	NOTES
ModelInfo {	modelInfo	M	Container		
ModelType	modelType	M	string	E={"service" "vnf" "vfModule" "volumeGroup" "network" }	Matches the type of "instance" that is being requested to be orchestrated.
ModelInvariantId	modelInvariantId	C	string		<p>Always REQUIRED, except for</p> <p>1) DELETE of any resource</p> <p>Note: VID should still provide this field on a DELETE if populated in A&AI (persona-model-id).</p> <p>2) VF Module CREATE in the relatedInstance.modelInfo[volumeGroup] object (if attaching a volumeGroup to a VF Module)</p> <p>3) Network CREATE/UPDATE.</p> <p>Invariant UUID for the model name, irrespective of the version, as defined by ASDC</p>
	modelNameVersi	O	string		UUID for the model name and

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ModelNameVersionId	onId				version combination, as defined in ASDC
ModelName	modelName	C	string		<p>Always REQUIRED, <u>except</u> for</p> <p>1) DELETE of a resource that does NOT have a SDN-C preload (service, vnf, volumeGroup).</p> <p>2) VF Module CREATE in the relatedInstance.modelInfo[volumeGroup] object (if attaching a volumeGroup to a VF Module).</p> <p>Name of the model entity as defined in ASDC (non-authoritative)</p>
ModelVersion	modelVersion	C	string		<p>Always REQUIRED, <u>except</u> for</p> <p>1) DELETE of any resource Note: VID should still provide this field on a DELETE if populated in A&AI (persona-model-version).</p> <p>2) VF Module CREATE in the relatedInstance.modelInfo[volumeGroup] object (if attaching a volumeGroup to a VF Module)</p> <p>3) Network CREATE/UPDATE.</p> <p>Version number of the model entity as defined in ASDC (non-authoritative)</p>
ModelCustomizationName	modelCustomizationName	C	String		<p>Required when modelType = vnf, <u>except</u> for VNF DELETES.</p> <p>Reference to the customized set of parameters associated with a model in a given service context.</p> <p>In the current release this means a VF resource within a service model in ASDC that has had its VF Module(s) ENV file values customized.</p>
}					End ModelInfo

3. relatedInstance

relatedInstance								
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enumerated value; D=default value)	NOTES			
RelatedInstance {	relatedInstance	C	Container		Request Scope	C R E A T E	U P D A T E	D E L E T E
					service			
					vnf	M		O
					volumeGroup	M		O
					vfModule	M		O
					network	O		O
InstanceName	instanceName	O			Inventoried instance name for the instanceId (originally user provided)			
InstanceId	instanceId	M			instanceId associated with the modelInfo structure			
ModelInfo {	modelInfo	M	modelInfo		modelInfo for the related instance			
}					End RelatedInstance			

4. requestInfo

requestInfo							
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enumerated value; D=default value)	NOTES		
RequestInfo{	requestInfo	M	Container				
InstanceName	instanceName	C	String		Request Scope	C R E A T E	U P D A T E
					service	M	
					vnf	M	
					volumeGroup	M	

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					<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">vfModule</td> <td style="width: 10%;">M</td> <td style="width: 20%;"></td> </tr> <tr> <td>network</td> <td>M</td> <td>O</td> </tr> </table> <p>VID user provided name** for the instance being operated on (note: must be unique within A&AI for the given entity type). **</p> <p>the InstanceName provided (for all resources) must contain only alphanumeric or "_-." characters, and must start with alpha. Spaces are not allowed (VID user should replace any spaces with underscore).</p> <p>NOTE: For resources that currently end up being orchestrated into AIC (volumeGroup, vfModule, network), this field becomes the heat stack name.</p>	vfModule	M		network	M	O			
vfModule	M													
network	M	O												
ProductFamilyId	productFamilyId	C	String		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">Request Scope</td> <td style="width: 10%;">C R E A T E</td> <td style="width: 20%;">U P D A T E</td> </tr> <tr> <td>vnf</td> <td>M</td> <td></td> </tr> <tr> <td>network</td> <td>M</td> <td>M</td> </tr> </table> <p>UUID for the product family associated with the model being operated on (named service-id in A&AI)</p>	Request Scope	C R E A T E	U P D A T E	vnf	M		network	M	M
Request Scope	C R E A T E	U P D A T E												
vnf	M													
network	M	M												
Source	source	M	String		<p>Source of the request (non-authoritative). The authoritative source is revealed through authentication.</p> <p>VID MUST use a value of "VID" (else recipe lookup will fail).</p>									

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SuppressRollback	suppressRollback	O	Boolean	D={"false"}	Is not supported for UPDATE/DELETE. Automatically revert/rollback changes that have been made when instantiation fails.
}					End of RequestInfo

5. requestParameters

requestParameters																													
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enumerated value; D=default value)	NOTES																								
RequestParameters{	requestParameters	C	Container		<table border="1"> <tr> <td>Request Scope</td> <td>C R E A T E</td> <td>U P D A T E</td> <td>D E L E T E</td> </tr> <tr> <td>service</td> <td>M</td> <td></td> <td>O</td> </tr> <tr> <td>vnf</td> <td>O</td> <td></td> <td>O</td> </tr> <tr> <td>volumeGroup</td> <td>O</td> <td></td> <td>O</td> </tr> <tr> <td>vfModule</td> <td>O</td> <td></td> <td>O</td> </tr> <tr> <td>network</td> <td>O</td> <td></td> <td>O</td> </tr> </table>	Request Scope	C R E A T E	U P D A T E	D E L E T E	service	M		O	vnf	O		O	volumeGroup	O		O	vfModule	O		O	network	O		O
Request Scope	C R E A T E	U P D A T E	D E L E T E																										
service	M		O																										
vnf	O		O																										
volumeGroup	O		O																										
vfModule	O		O																										
network	O		O																										
SubscriptionService Type	subscriptionServiceType	C	String		<table border="1"> <tr> <td>Request Scope</td> <td>C R E A T E</td> <td>U P D A T E</td> <td>D E L E T E</td> </tr> <tr> <td>service</td> <td>M</td> <td></td> <td>O</td> </tr> </table> <p>In A&AI's service-instance object hierarchy, becomes the service-type parameter</p>	Request Scope	C R E A T E	U P D A T E	D E L E T E	service	M		O																
Request Scope	C R E A T E	U P D A T E	D E L E T E																										
service	M		O																										
UserParams[userParams	O	array		Optional tag/value pairs for extra params not included in requestDetails																								
name	name	O	String		Tag name of attribute																								
value	value	O	String		Value of the tag																								
]					End of UserParams																								
}					End of RequestParameters																								

Service Instance Create

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POST {serverRoot}/serviceInstances/v2

Service Instance Create					
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enumerated value; D=default value)	NOTES
RequestDetails {	requestDetails	M	Container		
ModelInfo {}	modelInfo	M	Container		Refer to section 2 above
CloudConfiguration {}	cloudConfiguratio n	O	Container		Refer to section 1 above
SubscriberInfo {	subscriberInfo	M	Container		
GlobalSubscriberId	globalSubscriberId	M	String		Global customer Id (in A&AI)
SubscriberName	subscriberName	O	string		Subscriber Name. MSO is not creating customers so not required.
}					End of SubscriberInfo
RequestInfo {}	requestInfo	M	Container		Refer to section 4 above
RequestParameters{}	requestParamete rs	M	Container		Refer to section 5 above
}					End of RequestDetails

Sample Request:

```
POST /serviceInstances/v2 HTTPS/1.1
Authorization: Basic QWxhZGRpbjpvYVUyIHNlc2FtZQ==
content-type: application/json
content-length: 1024
accept: application/json
```

```
{
  "requestDetails": {
    "modelInfo": {
      "modelType": "service",
      "modelInvariantId": "ff3514e3-5a33-55df-13ab-12abad84e7ff",
      "modelNameVersionId": "fe6985cd-ea33-3346-ac12-ab121484a3fe",
      "modelName": "Test",
      "modelVersion": "1.0"
    }
  },
  "subscriberInfo": {
    "globalSubscriberId": "{some subscriber id}",
    "subscriberName": "{some subscriber name}"
  },
  "requestInfo": {
```

```

        "instanceName": "MSO_TEST",
        "source": "VID",
        "suppressRollback": true
    },
    "requestParameters": {
        "subscriptionServiceType": "MOG",
        "userParams": [
            {
                "name": "someUserParam",
                "value": "someValue"
            }
        ]
    }
}
}
}

```

Service Instance Delete

DELETE {serverRoot}/serviceInstances/v2/{serviceInstanceId}

Service Instance Delete					
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enumerated value; D=default value)	NOTES
RequestDetails {	requestDetails	M	Container		
ModelInfo {}	modelInfo	M	Container		Refer to section 2 above
CloudConfiguration {}	cloudConfiguratio n	O	Container		Refer to section 1 above
RequestInfo {}	requestInfo	M	Container		Refer to section 4 above
}					End of RequestDetails

Sample Request:

```

DELETE /serviceInstances/v2/ff305d54-75b4-431b-adb2-eb6b9e5ff000 HTTPS/1.1
Authorization: Basic QWxhZGRpbjpvYVUyIHNlc2FtZQ==
content-type: application/json
content-length: 12345
accept: application/json

```

```

{
  "requestDetails": {
    "modelInfo": {
      "modelType": "service",
      "modelInvariantId": "ff3514e3-5a33-55df-13ab-12abad84e7ff",
      "modelName": "Test",
      "modelVersion": "1.0"
    }
  }
  "requestInfo": {
    "source": "VID"
  }
}

```

```
}
}
```

Volume Group Create

POST {serverRoot}/serviceInstances/v2/{serviceInstanceId}/vnfs/{vnfInstanceId}/volumeGroups

Volume Group Create					
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enum rated value; D=default value)	NOTES
RequestDetails {	requestDetails	M	Container		
ModelInfo {	modelInfo	M	Container		Provide modelInfo for the corresponding VF Module that will attach the volumes (volumeGroups don't have their own modelInfo). Refer to section 2 above
CloudConfiguration {	cloudConfiguratio n	M	Container		Refer to section 1 above
RequestInfo {	requestInfo	M	Container		Refer to section 4 above
RelatedInstanceList[]	relatedInstanceLi st	M	Array(relatedInstance)		Provide parent vnf and service instance/model information.
RequestParameters{}	requestParamete rs	O	Container		Refer to section 5 above
}					End of RequestDetails

Sample Request:

```
POST /serviceInstances/v2/ff305d54-75b4-431b-adb2-eb6b9e5ff000/vnfs/aca51b0a-710d-4155-bc7c-
7cef19d9a94e/volumeGroups HTTPS/1.1
Authorization: Basic QWxhZGRpbjpvGVuIHNlc2FtZQ==
content-type: application/json
content-length: 1024
accept: application/json
```

```
{
  "requestDetails": {
    "modelInfo": {
      "modelType": "volumeGroup",
      "modelInvariantId": "ff5256d2-5a33-55df-13ab-12abad84e7ff",
      "modelNameVersionId": "fe6478e5-ea33-3346-ac12-ab121484a3fe",
```

```
    "modelName": "vSAMP12..base..module-0",
    "modelVersion": "1"
  },
  "cloudConfiguration": {
    "lcpCloudRegionId": "mdt1",
    "tenantId": "88a6ca3ee0394ade9403f075db23167e"
  },
  "requestInfo": {
    "instanceName": "MSOTESTVOL103a-vSAMP12_base_module-0_vol",
    "source": "VID",
    "suppressRollback": true
  },
  "relatedInstanceList": [
    {
      "relatedInstance": {
        "instanceId": "{serviceInstanceId}",
        "modelInfo": {
          "modelType": "service",
          "modelInvariantId": "ff3514e3-5a33-55df-13ab-12abad84e7ff",
          "modelNameVersionId": "fe6985cd-ea33-3346-ac12-ab121484a3fe",
          "modelName": "{parent service model name}",
          "modelVersion": "1.0"
        }
      }
    },
    {
      "relatedInstance": {
        "instanceId": "{vnfInstanceId}",
        "modelInfo": {
          "modelType": "vnf",
          "modelInvariantId": "ff5256d1-5a33-55df-13ab-12abad84e7ff",
          "modelNameVersionId": "fe6478e4-ea33-3346-ac12-ab121484a3fe",
          "modelName": "vSAMP12",
          "modelVersion": "1.0",
          "modelCustomizationName": "vSAMP12 1"
        }
      }
    }
  ]
}
```

Volume Group Delete

DELETE

{serverRoot}/serviceInstances/v2/{serviceInstanceId}/vnfs/{vnfInstanceId}/volumeGroups/{volume-group-instance-id}

Volume Group Delete

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FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enum rated value; D=default value)	NOTES
RequestDetails {	requestDetails	M	Container		
ModelInfo {}	modelInfo	M	Container		Provide modelInfo for the corresponding VF Module that will attach the volumes (volumeGroups don't have their own modelInfo). Refer to section 2 above
CloudConfiguration {}	cloudConfiguratio n	M			Refer to section 1 above
RequestInfo {}	requestInfo	M	Container		Refer to section 4 above
RelatedInstanceList[]	relatedInstanceLi st	O	Array(relatedInstance)		Parent vnf and service instance/model information.
RequestParameters{}	requestParamete rs	O	Container		Refer to section 5 above
}					End of RequestDetails

Sample Request:

```
DELETE /serviceInstances/v2/ff305d54-75b4-431b-adb2-eb6b9e5ff000/vnfs/aca51b0a-710d-4155-bc7c-7cef19d9a94e/volumeGroups/ff305d54-75b4-ff1b-cdb2-eb6b9e5460ff HTTPS/1.1
Authorization: Basic QWxhZGRpbjpvGVuIHNlc2FtZQ==
content-type: application/json
content-length: 12345
accept: application/json
```

```
{
  "requestDetails": {
    "modelInfo": {
      "modelType": "volumeGroup",
      "modelName": "vSAMP12..base..module-0",
    },
    "cloudConfiguration": {
      "lcpCloudRegionId": "mdt1",
      "tenantId": "88a6ca3ee0394ade9403f075db23167e"
    },
    "requestInfo": {
      "source": "VID"
    }
  }
}
```

VF Module Create

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POST {serverRoot}/serviceInstances/v2/{serviceInstanceId}/vnfs/{vnfInstanceId}/vfModules

VF Module Create					
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enum rated value; D=default value)	NOTES
RequestDetails {	requestDetails	M	Container		
ModelInfo {}	modelInfo	M	Container		Refer to section 2 above
CloudConfiguration {}	cloudConfiguratio n	M	Container		Refer to section 1 above
RequestInfo {}	requestInfo	M	Container		Refer to section 4 above
RelatedInstanceList[]	relatedInstanceLi st	M	Array(relatedInstance)		Provide parent vnf and service info. Also must provide volumeGroup if one needs to be attached to the vfModule. If VID provides volumeGroup as a relatedInstance, then only relatedInstance.instanceId, relatedInstance.instanceName and relatedInstance.modelInfo.modelType for the volumeGroup are required, the rest of the fields in relatedInstance.modelInfo are Optional for the volumeGroup.
RequestParameters{}	requestParamete rs	O	Container		Refer to section 5 above
}					End of RequestDetails

Sample Request:

```
POST /serviceInstances/v2/ff305d54-75b4-431b-adb2-eb6b9e5ff000/vnfs/aca51b0a-710d-4155-bc7c-7cef19d9a94e/vfModules HTTPS/1.1
```

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```
Authorization: Basic QWxhZGRpbjpvYVUHNlc2FtZQ==
content-type: application/json
content-length: nnn
accept: application/json
```

```
{
  "requestDetails": {
    "modelInfo": {
      "modelType": "vfModule",
      "modelInvariantId": "ff5256d2-5a33-55df-13ab-12abad84e7ff",
      "modelNameVersionId": "fe6478e5-ea33-3346-ac12-ab121484a3fe",
      "modelName": "vSAMP12..base..module-0",
      "modelVersion": "1"
    },
    "cloudConfiguration": {
      "lcpCloudRegionId": "mdt1",
      "tenantId": "88a6ca3ee0394ade9403f075db23167e"
    },
    "requestInfo": {
      "instanceName": "MSOTEST103a-vSAMP12_base_module-0",
      "source": "VID",
      "suppressRollback": true
    },
    "relatedInstanceList": [
      {
        // This related instance captures the volumeGroup to attach
        "relatedInstance": {
          "instanceId": "17ef4658-bd1f-4ef0-9ca0-ea76e2bf122c",
          "instanceName": "MSOTESTVOL103a-vSAMP12_base_module-0_vol",
          "modelInfo": {
            "modelType": "volumeGroup"
          }
        }
      },
      {
        "relatedInstance": {
          "instanceId": "{serviceInstanceid}",
          "modelInfo": {
            "modelType": "service",
            "modelInvariantId": "ff3514e3-5a33-55df-13ab-12abad84e7ff",
            "modelNameVersionId": "fe6985cd-ea33-3346-ac12-ab121484a3fe",
            "modelName": "{parent service model name}",
            "modelVersion": "1.0"
          }
        }
      },
      {
        "relatedInstance": {
          "instanceId": "{vnfInstanceid}",
          "modelInfo": {
            "modelType": "vnf",
            "modelInvariantId": "ff5256d1-5a33-55df-13ab-12abad84e7ff",
            "modelNameVersionId": "fe6478e4-ea33-3346-ac12-ab121484a3fe",
            "modelName": "vSAMP12",
            "modelVersion": "1.0",
            "modelCustomizationName": "vSAMP12 1"
          }
        }
      }
    ]
  },
}
```

```

    "requestParameters": {
      "userParams": []
    }
  }
}

```

VF Module Delete

DELETE {serverRoot}/serviceInstances/v2/{serviceInstanceId}/vnfs/{vnfInstanceId}/vfModules/{vfmodule-instance-id}

Volume Module Delete					
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enumerated value; D=default value)	NOTES
RequestDetails {	requestDetails	M	Container		
ModelInfo {	modelInfo	M	Container		vfModule ModelInfo Refer to section 2 above Must provide modelName for SDN-C preload lookup.
CloudConfiguration {	cloudConfiguration	M	Container		Refer to section 1 above
RequestInfo {	requestInfo	M	Container		Refer to section 4 above
RelatedInstanceList[]	relatedInstanceList	O	Array(relatedInstance)		Parent vnf and service instance/model information.
RequestParameters{	requestParameters	O	Container		Refer to section 5 above
}					End of RequestDetails

Sample Request:

```

DELETE /serviceInstances/v2/ff305d54-75b4-431b-adb2-eb6b9e5ff000/vnfs/aca51b0a-710d-4155-bc7c-7cef19d9a94e/vfModules/ff305d54-75b4-ff1b-bdb2-eb6b9e5460ff HTTPS/1.1
Authorization: Basic QWxhZGRpbjpwGVuIHNlc2FtZQ==
content-type: application/json
content-length: 12345
accept: application/json

{
  "requestDetails": {
    "modelInfo": {

```

```

        "modelType": "vfModule",
        "modelInvariantId": "ff5256d2-5a33-55df-13ab-12abad84e7ff",
        "modelName": "vSAMP12..base..module-0",
        "modelVersion": "1"
    },
    "cloudConfiguration": {
        "lcpCloudRegionId": "mdt1",
        "tenantId": "88a6ca3ee0394ade9403f075db23167e"
    },
    "requestInfo": {
        "source": "VID"
    }
}
}

```

Network Create

Note: VID will not be handling network orchestration requests in some its releases.

POST {serverRoot}/serviceInstances/v2/{serviceInstanceId}/networks

Network Create					
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enum rated value; D=default value)	NOTES
RequestDetails {	requestDetails	M	Container		
ModelInfo { }	modelInfo	M	Container		Network's modelInfo Refer to section 2 above
CloudConfiguration { }	cloudConfiguratio n	M	Container		Refer to section 1 above
RequestInfo { }	requestInfo	M	Container		Refer to section 4 above
RelatedInstanceList[]	relatedInstanceLi st	O	Array(relatedInstance)		Provide parent service info if known/available.
RequestParameters{ }	requestParamete rs	O	Container		Refer to section 5 above
}					End of RequestDetails

Sample Request:

```
POST /serviceInstances/v2/ff305d54-75b4-431b-adb2-eb6b9e5ff000/networks HTTPS/1.1
Authorization: Basic QWxhZGRpbjpvYVUHNlc2FtZQ==
content-type: application/json
content-length: 12345
accept: application/json
```

```
{
  "requestDetails": {
    "modelInfo": {
      "modelType": "network",
      "modelName": "CONTRAIL30_BASIC"
    },
    "cloudConfiguration": {
      "lcpCloudRegionId": "mdt1",
      "tenantId": "8b1df54faa3b49078e3416e21370a3ba"
    },
    "requestInfo": {
      "instanceName": "GN_EVPN_direct_net_0_ST_Subnets_Ipv4",
      "productFamilyId": "a9a77d5a-123e-4ca2-9eb9-0b015d2ee0fb",
      "source": "VID",
      "suppressRollback": true
    },
    "relatedInstanceList": [
      //This section is Optional, it is not required for the "parent" service, but can be
      //provided to give some debugging information.
      {
        "relatedInstance": {
          "instanceId": "{serviceInstanceId}",
          "modelInfo": {
            "modelType": "service",
            "modelInvariantId": "ff3514e3-5a33-55df-13ab-12abad84e7ff",
            "modelNameVersionId": "fe6985cd-ea33-3346-ac12-ab121484a3fe",
            "modelName": "{parent service model name}",
            "modelVersion": "1.0"
          }
        }
      }
    ],
    "requestParameters": {
      "userParams": []
    }
  }
}
```

Network Update

Note: VID will not be handling network orchestration requests in some its releases.

PUT {serverRoot}/serviceInstances/v2/{serviceInstanceId}/networks/{networkInstanceId}

Network Create

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FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enumera ted value; D=default value)	NOTES
RequestDetails {	requestDetails	M	Container		
ModelInfo {}	modelInfo	M	Container		Network's modelInfo Refer to section 2 above
CloudConfiguration {}	cloudConfiguratio n	M	Container		Refer to section 1 above
RequestInfo {}	requestInfo	M	Container		Refer to section 4 above
RelatedInstanceList[]	relatedInstanceLi st	O	Array(relatedInstance)		Provide parent service info if known/available.
RequestParameters{}	requestParamete rs	O	Container		Refer to section 5 above
}					End of RequestDetails

Sample Request:

```
PUT /serviceInstances/v2/ff305d54-75b4-431b-adb2-eb6b9e5ff000/networks/2b125640-bd1a-4ef0-9ca0-ea76e2a22801
HTTPS/1.1
Authorization: Basic QWxhZGRpbjpwGVuIHhlc2FtZQ==
content-type: application/json
content-length: 12345
accept: application/json
```

```
{
  "requestDetails": {
    "modelInfo": {
      "modelType": "network",
      "modelName": "CONTRAIL30_BASIC"
    },
    "cloudConfiguration": {
      "lcpCloudRegionId": "mdt1",
      "tenantId": "8b1df54faa3b49078e3416e21370a3ba"
    },
    "requestInfo": {
      "productFamilyId": "a9a77d5a-123e-4ca2-9eb9-0b015d2ee0fb",
      "source": "VID",
      "suppressRollback": true
    },
    "relatedInstanceList": [
      //This section is Optional, it is not required for the "parent" service, but can be
      //provided to give some debugging information.
      {
        "relatedInstance": {
          "instanceId": "{serviceInstanceId}",
          "modelInfo": {
            "modelType": "service",

```

```

        "modelInvariantId": "ff3514e3-5a33-55df-13ab-12abad84e7ff",
        "modelNameVersionId": "fe6985cd-ea33-3346-ac12-ab121484a3fe",
        "modelName": "{parent service model name}",
        "modelVersion": "1.0"
    }
}
}
],
"requestParameters": {
    "userParams": []
}
}
}

```

Network Delete

Note: VID will not be handling network orchestration requests in some of its releases.

DELETE {serverRoot}/serviceInstances/v2/{serviceInstanceId}/networks/{networkInstanceId}

Network Delete					
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enumerated value; D=default value)	NOTES
RequestDetails {	requestDetails	M	Container		
ModelInfo {	modelInfo	M	Container		Network's modelInfo Refer to section 2 above Must provide modelName for SDN-C preload lookup.
CloudConfiguration {	cloudConfiguration	M	Container		Refer to section 1 above
RequestInfo {	requestInfo	M	Container		Refer to section 4 above
RelatedInstanceList []	relatedInstanceList	O	Array(relatedInstance)		Could provide parent service info if known/available.

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Network Delete					
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enum rated value; D=default value)	NOTES
RequestParameters{}	requestParamete rs	O	Container		Refer to section 5 above
}					End of RequestDetails

Sample Request:

```
DELETE /serviceInstances/v2/ff305d54-75b4-431b-adb2-eb6b9e5ff000/networks/2b125640-bd1a-4ef0-9ca0-ea76e2a22801
HTTPS/1.1
Authorization: Basic QWxhZGRpbjpvYVUHNlc2FtZQ==
content-type: application/json
content-length: 12345
```

```
{
  "requestDetails": {
    "modelInfo": {
      "modelType": "network",
      "modelName": "CONTRAIL30_BASIC"
    },
    "cloudConfiguration": {
      "lcpCloudRegionId": "mdt1",
      "tenantId": "8b1df54faa3b49078e3416e21370a3ba"
    },
    "requestInfo": {
      "source": "VID"
    }
  }
}
```

VNF Create

POST {serverRoot}/serviceInstances/v2/{serviceInstanceId}/vnfs

VNF Create					
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enum rated value; D=default value)	NOTES
RequestDetails {	requestDetails	M	Container		
ModelInfo {	modelInfo	M	Container		VNF modelInfo

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VNF Create					
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enum rated value; D=default value)	NOTES
					Refer to section 2 above
CloudConfiguration {}	cloudConfiguratio n	M	Container		Refer to section 1 above
RequestInfo {}	requestInfo	M	Container		Refer to section 4 above
RelatedInstanceList[]	relatedInstanceLi st	M	Array(relatedInstance)		Provide parent service info
RequestParameters{} }	requestParamete rs	O	Container		Refer to section 5 above End of RequestDetails

Sample Request:

```
POST /serviceInstances/v2/ff305d54-75b4-431b-adb2-eb6b9e5ff000/vnfs HTTPS/1.1
Authorization: Basic QWxhZGRpbjpvGVuIHhlc2FtZQ==
content-type: application/json
content-length: nnn
accept: application/json
```

```
{
  "requestDetails": {
    "modelInfo": {
      "modelType": "vnf",
      "modelInvariantId": "ff5256d1-5a33-55df-13ab-12abad84e7ff",
      "modelNameVersionId": "fe6478e4-ea33-3346-ac12-ab121484a3fe",
      "modelName": "vSAMP12",
      "modelVersion": "1.0",
      "modelCustomizationName": "vSAMP12 1"
    },
    "cloudConfiguration": {
      "lcpCloudRegionId": "mdt1",
      "tenantId": "88a6ca3ee0394ade9403f075db23167e"
    },
    "requestInfo": {
      "instanceName": "MSOTEST103a",
      "productFamilyId": "a9a77d5a-123e-4ca2-9eb9-0b015d2ee0fb",
      "source": "VID",
      "suppressRollback": false
    },
    "relatedInstanceList": [
      {
        "relatedInstance": {
          "instanceId": "{serviceInstanceid}",
          "modelInfo": {
            "modelType": "service",
            "modelInvariantId": "ff3514e3-5a33-55df-13ab-12abad84e7ff",
            "modelNameVersionId": "fe6985cd-ea33-3346-ac12-ab121484a3fe",

```

```

        "modelName": "{parent service model name}",
        "modelVersion": "1.0"
    }
}
},
"requestParameters": {
}
}
}

```

VNF Delete

DELETE {serverRoot}/serviceInstances/v2/{serviceInstanceId}/vnfs/{vnfInstanceId}

VNF Delete					
FIELD NAME	TAG NAME	M O C	FORMAT	VALUES (E=enumerated value; D=default value)	NOTES
RequestDetails {	requestDetails	M	Container		
ModelInfo { }	modelInfo	M	Container		VNF modelInfo Refer to section 2 above
CloudConfiguration { }	cloudConfiguration	M	Container		Refer to section 1 above
RequestInfo { }	requestInfo	M	Container		Refer to section 4 above
RelatedInstanceList[]	relatedInstanceList	O	Array(relatedInstance)		Optionally Provide parent service info.
RequestParameters{ }	requestParameters	O	Container		Refer to section 5 above
}					End of RequestDetails

Sample Request:

```

DELETE /serviceInstances/v2/ff305d54-75b4-431b-adb2-eb6b9e5ff000/vnfs/aca51b0a-710d-4155-bc7c-7cef19d9a94e
HTTPS/1.1
Authorization: Basic QWxhZGRpbjpvGvuIHNlc2FtZQ==
content-type: application/json
content-length: 12345
accept: application/json

{
  "requestDetails": {
    "modelInfo": {
      "modelType": "vnf",

```

```
    "modelInvariantId": "ff5256d1-5a33-55df-13ab-12abad84e7ff",
    "modelName": "vSAMP12",
    "modelVersion": "1"
  },
  "cloudConfiguration": {
    "lcpCloudRegionId": "mdt1",
    "tenantId": "88a6ca3ee0394ade9403f075db23167e"
  },
  "requestInfo": {
    "source": "VID"
  },
  "requestParameters": {
    "userParams": []
  }
}
}
```

GET Orchestration Request

GET {serverRoot}/orchestrationRequests/v2/{request-id}

Sample Request:

```
GET /orchestrationRequests/v2/rq1234d1-5a33-55df-13ab-12abad84e333 HTTPS/1.1
Authorization: Basic QWxhZGRpbjpvGVuIHhNlc2FtZQ==
accept: application/json
```

Sample Response:

```
HTTPS/1.1 200 OK
content-type: application/json
content-length: nnn
date: Sat, 04 Jul 2015 02:03:15 GMT
```

```
{
  "request": {
    "requestId": "rq1234d1-5a33-55df-13ab-12abad84e333",
    "startTime": "Thu, 04 Jun 2009 02:51:59 GMT",
    "instanceReferences": {
      "serviceInstanceId": "bc305d54-75b4-431b-adb2-eb6b9e546014"
    }
  },
  "requestScope": "service",
  "requestType": "createInstance",
  "requestDetails": {
    "modelInfo": {
      "modelType": "service",
      "modelInvariantId": "sn5256d1-5a33-55df-13ab-12abad84e764",
      "modelNameVersionId": "ab6478e4-ea33-3346-ac12-ab121484a333",
      "modelName": "WanBonding",
      "modelVersion": "1.0"
    },
    "subscriberInfo": {
      "globalSubscriberId": "C12345",
      "subscriberName": "General Electric Division 12"
    }
  },
  "requestInfo": {
    "instanceName": "WanBonding Service",

```

```
    "source": "VID",
    "suppressRollback": true
  },
  "requestParameters": {
    "subscriptionServiceType": "Trinity",
  }
},
"requestStatus": {
  "timestamp": "Thu, 04 Jun 2009 02:53:39 GMT",
  "requestState": "InProgress",
  "statusMessage": "",
  "percentProgress": "30"
}
}
}
```

GET Orchestration Requests

GET {serverRoot}/orchestrationRequests/v2

Request Filter criteria (Querystring Variables):

- Contains an array of filters that constrain the requests returned:
 - filter={propertyName}:<EQUALS|DOES_NOT_EQUAL>:{propertyValue}
 - Where {propertyName} is drawn from fields within requestDetails; MSO currently supports the following propertyNames:

serviceInstanceId
serviceInstanceName
vnfInstanceId
vnfInstanceName
vfModuleInstanceId
vfModuleInstanceName
volumeGroupInstanceId
volumeGroupInstanceName
networkInstanceId
networkInstanceName
lcpCloudRegionId
tenantId
modelType (becomes requestScope in response)

- MSO does **not** support the EXISTS and DOES-NOT-EXIST filter qualifiers.
- Multiple filter criteria may be specified.

Sample Request:

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```
GET /orchestrationRequests/v2?filter=serviceInstanceId:EQUALS:bc305d54-75b4-431b-adb2-eb6b9e546014
HTTPS/1.1
Authorization: Basic QWxhZGRpbjpvGvuIHNlc2FtZQ==
accept: application/json
```

Sample Response:

```
HTTPS/1.1 200 OK
content-type: application/json
content-length: nnn
date: Sat, 04 Jul 2015 02:03:15 GMT
```

```
{
  "requestList": [
    {
      "request": {
        "requestId": "rq1234d1-5a33-55df-13ab-12abad84e333",
        "startTime": "Thu, 04 Jun 2009 02:51:59 GMT",
        "instanceReferences": {
          "serviceInstanceId": "bc305d54-75b4-431b-adb2-eb6b9e546014"
        },
        "requestScope": "service",
        "requestType": "createInstance",
        "requestDetails": {
          "modelInfo": {
            "modelType": "service",
            "modelInvariantId": "sn5256d1-5a33-55df-13ab-12abad84e764",
            "modelNameVersionId": "ab6478e4-ea33-3346-ac12-ab121484a333",
            "modelName": "WanBonding",
            "modelVersion": "1.0"
          },
          "subscriberInfo": {
            "globalSubscriberId": "C12345",
            "subscriberName": "General Electric Division 12"
          },
          "requestInfo": {
            "instanceName": "WanBonding Service",
            "source": "VID",
            "suppressRollback": true
          },
          "requestParameters": {
            "subscriptionServiceType": "Trinity"
          }
        },
        "requestStatus": {
          "timestamp": "Thu, 04 Jun 2009 02:53:39 GMT",
          "requestState": "Complete",
          "statusMessage": "Service created successfully",
          "percentProgress": "100"
        }
      }
    },
    {
      "request": {
        "requestId": "25faf364-6031-4f58-9703-26955815562a",
        "startTime": "Thu, 30 Jun 2009 03:52:59 GMT",
        "instanceReferences": {
          "serviceInstanceId": "bc305d54-75b4-431b-adb2-eb6b9e546014"
        },
        "requestScope": "service",
        "requestType": "deleteInstance",
        "requestDetails": {
          "modelInfo": {
            "modelType": "service",
            "modelInvariantId": "sn5256d1-5a33-55df-13ab-12abad84e764",
            "modelName": "WanBonding",

```

```
    "modelVersion": "1.0"
  },
  "requestInfo": {
    "source": "VID"
  },
},
"requestStatus": {
  "timestamp": "Thu, 30 Jun 2009 03:53:39 GMT",
  "requestState": "InProgress",
  "statusMessage": "",
  "percentProgress": "30"
}
}
}
}
```

Implementation Specification

Web Services Interface Specification

RESTful Web Services Definition

Operation Action	HTTP Verb	Resource URL relative to {serverRoot}
Create service instance	POST	/serviceInstances/v2
Delete service instance	DELETE	/serviceInstances/v2/{serviceInstanceId}
Create vnf instance	POST	/serviceInstances/v2/{serviceInstanceId}/vnfs
Delete vnf instance	DELETE	/serviceInstances/v2/{serviceInstanceId}/vnfs/{vnfInstanceId}
Create vf module instance	POST	/serviceInstances/v2/{serviceInstanceId}/vnfs/{vnfInstanceId}/vfModules
Delete vf module instance	DELETE	/serviceInstances/v2/{serviceInstanceId}/vnfs/{vnfInstanceId}/vfModules/{vfmoduleInstanceId}
Create volume group instance	POST	/serviceInstances/v2/{serviceInstanceId}/vnfs/{vnfInstanceId}/volumeGroups
Delete volume group instance	DELETE	/serviceInstances/v2/{serviceInstanceId}/vnfs/{vnfInstanceId}/volumeGroups/{volumeGroupInstanceId}

Create network instance	POST	/serviceInstances/v2/{serviceInstanceId}/networks
Delete network instance	DELETE	/serviceInstances/v2/{serviceInstanceId}/networks/{networkInstanceId}
Get orchestration requests (per filter criteria)	GET	/orchestrationRequests/v2
Get a specific orchestration request	GET	/orchestrationRequests/v2/{requestId}

Outage and Error Handling

Outage Handling

In case of outage, initiate a system restart for the system with an outage.

Error Handling

Exceptions

Exception Types

RESTful services generate and send exceptions to clients in response to invocation errors. Exceptions send HTTP status codes (specified later in this document for each operation). HTTP status codes may be followed by an optional JSON exception structure described below. Two types of exceptions may be defined: service exceptions and policy exceptions.

Field Name	Data Type	Required?	Description
messageId	xs:string	Yes	<p>Unique message identifier of the format 'ABCnnnn' where 'ABC' is either 'SVC' for Service Exceptions or 'POL' for Policy Exception.</p> <p>Exception numbers may be in the range of 0001 to 9999 where:</p> <ul style="list-style-type: none"> 0001 to 2999 are defined by OMA (see OMA's Common definitions for RESTful Network APIs for details) 3000-9999 are available and undefined
text	xs:string	Yes	Message text, with replacement variables

Field Name	Data Type	Required?	Description
			marked with %n, where n is an index into the list of <variables> elements, starting at 1
variables	xs:string [0..unbounded]	No	List of zero or more strings that represent the contents of the variables used by the message text.
url	xs:anyUrl	No	Hyperlink to a detailed error resource (e.g., an HTML page for browser user agents).

Service Exceptions

When a service is not able to process a request, and retrying the request with the same information will also result in a failure, and the issue is not related to a service policy issue, then the service will issue a fault using the service exception fault message. Examples of service exceptions include invalid input, lack of availability of a required resource or a processing error.

A service exception uses the letters 'SVC' at the beginning of the message identifier. 'SVC' service exceptions used by the Generic Event Listener API are defined below.

<i>MessageId</i>	<i>Description / Comment</i>	<i>Text</i>	<i>Variables</i>	<i>Parent HTTP Code</i>
SVC0001	General service error (see SVC2000)	<custom error message>	None	400
SVC0002	Bad parameter	Invalid input value for message part %1	%1: message part	400
SVC1000	No server resources	No server resources available to process	None	500

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		the request		
SVC2000	More elaborate version of SVC0001	The following service error occurred: %1. Error code is %2.	%1: human readable description of the error %2: error code	400

Policy Exceptions

When a service is not able to complete because the request fails to meet a policy criteria, then the service will issue a fault using the policy exception fault message. To clarify how a policy exception differs from a service exception, consider that all the input to an operation may be valid as meeting the required input for the operation (thus no service exception), but using that input in the execution of the service may result in conditions that require the service not to complete. Examples of policy exceptions include privacy violations, requests not permitted under a governing service agreement or input content not acceptable to the service provider.

A Policy Exception uses the letters 'POL' at the beginning of the message identifier. 'POL' policy exceptions used by the Generic Event Listener API are defined below.

<i>Message Identifier</i>	<i>Description / Comment</i>	<i>Text</i>	<i>Variables</i>	<i>Parent HTTP Code</i>
POL0001	General policy error (see POL2000)	A policy error occurred.	None	401
POL1009	User not provisioned for service	User has not been provisioned for service	None	401
POL1010	User suspended from service	User has been suspended from service	None	401
POL2000	More elaborate version of POL0001	The following policy error occurred: %1. Error code is %2.	%1: human readable description of the error %2: error code	401
POL9003	Message size exceeds limit	Message content size exceeds the	None	400

		allowable limit		
--	--	-----------------	--	--

Authentication

Authentication in MSO is done using basic authentication (TLS (for https) can be activated)

Encryption

Requirements

HTTPS (one-way TLS authentication) will be utilized to encrypt client traffic into MSO. Clients must use only TLSv1.1 or TLSv1.2 when talking to MSO (no SSL or TLSv1 will be allowed). If using java, this may require the addition or modification of the following JVM args (depending on java version used):

If your app runs java 1.7, put in or update the following JVM arg (leaving v1 in there should be fine for other systems you talk to that may not support 1.1/1.2 yet):

```
-Dhttps.protocols=TLSv1,TLSv1.1,TLSv1.2
```

If running java 1.8, it appears this is also needed:

```
-Djdk.tls.client.protocols=TLSv1,TLSv1.1,TLSv1.2
```

MSO uses signed server-side certificates. It has been found that due to the Verisign > Symantec name change, the default java jdk cacerts trustStore does not have the required chain intermediate CA cert included to trust certs signed by "Symantec Class 3 Secure Server CA - G4". As such clients may need to import a separate certificate ("**symantecclass3g4ca.cer**") into their trustStore. This certificate file can be found at the following link: <link to certificate file>

Related Informations

VID specific requestParameters schema:

```
{
  "$schema": "http://json-schema.org/draft-04/schema#",
  "type": "object",
  "properties": {
    "requestParameters": {
      "type": "object",
      "properties": {
        "subscriptionServiceType": {
          "type": "string"
        },
      },
      "userParams": {
        "type": "array",
        "items": {
          "type": "object",
          "properties": {
            "name": {
              "type": "string"
            },
            "value": {
              "type": "string"
            }
          }
        }
      }
    }
  }
}
```