



## Overview

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## Structure of an Example

Under a descriptive title, each example comprises the following sections:

### **Objective**

What the example is designed to accomplish.

### **Context**

When you would use the example, when you would not use it, and why.

### **Prerequisites**

What conditions have to exist for the example to work.

### **REST URL**

What is the REST URL to pass the REST API.

### **Components**

Which objects and methods are used in the example, and what the input variables represent.

### **Code**

The example code.

**Results**

What output is expected from the example code.

**Implementation**

Notes on implementing the example, including what modifications might be necessary to implement it.

**See Also**

Related Examples

## How to Use the Examples

This document is a collection of examples-recipes, if you will—for using REST API, a server-side scripting solution for use with Cisco UCS Director Orchestrator. Like a cookbook, you can use this document in at least three ways:

- You can follow the examples as written (substituting your own variables, of course) to complete tasks without necessarily knowing everything about the steps you are following.
- You can use the examples as templates and adapt them to similar tasks in your work.
- You can study the examples to figure out “how things are done” in REST API and, along with the REST API Javadoc reference, generalize to using different methods for other tasks you need to script.

The examples are chosen to illustrate common use cases and are intended to facilitate all three of these modes of use.

## Example: Self-Service Provisioning of Virtual Machines

This use case shows how to use REST APIs to perform a straightforward task of enabling a user to self-service provision virtual machines (VMs).

The REST API calls involved in this use case are summarized, and the requests and the system responses are detailed. The responses are typical and will not exactly match your implementation, depending on the state of your Cisco UCS Director database. You need to extract required parameters from response and pass them through the API requests in your application.

You can provision virtual machines (VMs) using predefined catalog items. To accomplish this, you need to view a list of catalogs and choose an appropriate service container catalog. You can create a service container using the chosen catalog and submit a service request for self-provisioning the VMs on the service container.

To implement self-service VM provisioning, execute the following REST APIs in sequence:

- 1 **UserAPIGetAllCatalogs**—Retrieve a list of catalogs containing the cloud name and the group name to choose a catalog for provisioning a VM.
- 2 **UserAPIServiceContainerCatalogRequest**—Submit a service request to create a service container for provisioning VM, using the chosen catalog.
- 3 **UserAPIGetServiceRequestWorkFlow**—Optional. View the workflow details of the service request.

#### 4 userAPISubmitServiceRequest—Submit the service request to provision a VM.

### Step 1

Retrieve a list of catalogs containing the cloud name and the group name to which the VM is bound using the userAPIGetAllCatalogs API. You can then choose a catalog from the list that is returned.

#### Request

```
/app/api/rest?formatType=json&opName=userAPIGetAllCatalogs&opData={}
```

#### Response

```
{
  "serviceResult": {
    "rows": [
      {
        "Catalog_ID": "5",
        "Catalog_Name": "VNX_Pranita",
        "Folder": "Advanced",
        "Catalog_Type": "Advanced",
        "Template_Name": "Not Applicable",
        "Catalog_Description": "",
        "Cloud": "",
        "Image": "",
        "Group": "Default Group",
        "Icon": "/app/images/temp/1436492144835_ibm.png",
        "OS": "",
        "Additional_OS_Info": "",
        "Applications": "",
        "Additional_Application_Details": "",
        "Status": "OK",
        "Catalog_ID": "6",
        "Catalog_Name": "MSP_CAT",
        "Folder": "Advanced",
        "Catalog_Type": "Advanced",
        "Template_Name": "Not Applicable",
        "Catalog_Description": "",
        "Cloud": "",
        "Image": "",
        "Group": "Default Group",
        "Icon": "/app/images/temp/1436492144835_ibm.png",
        "OS": "",
        "Additional_OS_Info": "",
        "Applications": "",
        "Additional_Application_Details": "",
        "Status": "OK",
        "Catalog_ID": "7",
        "Catalog_Name": "VNX_Update_Tenant",
        "Folder": "Advanced",
        "Catalog_Type": "Advanced",
        "Template_Name": "Not Applicable",
        "Catalog_Description": "",
        "Cloud": "",
        "Image": "",
        "Group": "Default Group",
        "Icon": "/app/images/temp/1436492144835_ibm.png",
        "OS": "",
        "Additional_OS_Info": "",
        "Applications": "",
        "Additional_Application_Details": "",
        "Status": "OK",
        "Catalog_ID": "8",
        "Catalog_Name": "Pja_cat",
        "Folder": "Advanced",
        "Catalog_Type": "Advanced",
        "Template_Name": "Not Applicable",
        "Catalog_Description": "",
        "Cloud": "",
        "Image": "",
        "Group": "Default Group",
        "Icon": "/app/images/temp/1436492144835_ibm.png",
        "OS": "",
        "Additional_OS_Info": "",
        "Applications": "",
        "Additional_Application_Details": "",
        "Status": "OK",
        "Catalog_ID": "10",
        "Catalog_Name": "pja_upd",
        "Folder": "Advanced",
        "Catalog_Type": "Advanced",
        "Template_Name": "Not Applicable",
        "Catalog_Description": "",
        "Cloud": "",
        "Image": "",
        "Group": "pja_sep",
        "Icon": "/app/images/temp/1436492144835_ibm.png",
        "OS": "",
        "Additional_OS_Info": "",
        "Applications": "",
        "Additional_Application_Details": "",
        "Status": "OK",
        "Catalog_ID": "4",
        "Catalog_Name": "zmn_con",
        "Folder": "Service Container",
        "Catalog_Type": "Service Container",
        "Template_Name": "zmnACT",
        "Catalog_Description": "",
        "Cloud": "",
        "Image": "",
        "Group": "All Groups",
        "Icon": "/app/images/temp/1436514875643_container_clear_64x64.png",
        "OS": "",
        "Additional_OS_Info": "",
        "Applications": "",
        "Additional_Application_Details": "",
        "Status": "OK",
        "Catalog_ID": "9",
        "Catalog_Name": "ayc_LB",
        "Folder": "Service Container",
        "Catalog_Type": "Service Container",
        "Template_Name": "aycACT",
        "Catalog_Description": "",
        "Cloud": "",
        "Image": "",
        "Group": "apREGsep9_org1",
        "Icon": "/app/images/temp/1436514875643_container_clear_64x64.png",
        "OS": "",
        "Additional_OS_Info": "",
        "Applications": "",
        "Additional_Application_Details": "",
        "Status": "OK",
        "Catalog_ID": "11",
        "Catalog_Name": "pja_con",
        "Folder": "Service Container",
        "Catalog_Type": "Service Container",
        "Template_Name": "pja_tmp",
        "Catalog_Description": "",
        "Cloud": "",
        "Image": "",
        "Group": "pja_sep",
        "Icon": "/app/images/temp/1436514875643_container_clear_64x64.png",
        "OS": "",
        "Additional_OS_Info": "",
        "Applications": "",
        "Additional_Application_Details": "",
        "Status": "OK",
        "Catalog_ID": "12",
        "Catalog_Name": "prsConCat",
        "Folder": "Service Container",
        "Catalog_Type": "Service Container",
        "Template_Name": "prsACT",
        "Catalog_Description": "",
        "Cloud": "",
        "Image": "",
        "Group": "arpAPIReg2_Org",
        "Icon": "/app/images/temp/1436514875643_container_clear_64x64.png",
        "OS": "",
        "Additional_OS_Info": "",
        "Applications": "",
        "Additional_Application_Details": "",
        "Status": "OK",
        "columnMetaData": null,
        "ReportParams": {}
      }
    ],
    "serviceError": null,
    "serviceName": "InfraMgr",
    "opName": "userAPIGetAllCatalogs"
  }
}
```

### Step 2

Choose a catalog (for example, pja\_con) that is used for creating a service container to provision a VM and submit a service request using the userAPIServiceContainerCatalogRequest API to create a service container using the chosen catalog.

In this example, a service container called SCN\_Name is created using the pja\_con catalog.

#### Request

```
/app/api/rest?formatType=json&opName=userAPIServiceContainerCatalogRequest&opData={param0:
  {
    "catalogName": "pja_con",
    "groupName": "Default Group",
    "serviceContainerName": "SCN_Name",
    "apiResourceLimits": null,
    "networkThroughput": "1G",
    "enableNetworkMgmt": true,
    "customTierLabels": [
      {
        "name": "web",
        "value": "web"
      }
    ],
    "comments": "test"
  }
}
```

## Response

```
{
  "serviceResult": 728,
  "serviceError": null,
  "serviceName": "InfraMgr",
  "opName": "userAPIServiceContainerCatalogRequest"
}
```

The URL returns the service request ID. The service request ID for creating the service container is 728.

## Step 3

(Optional) After creating the service request, get the details regarding the service request and the related workflow steps using the `userAPIGetServiceRequestWorkFlow` API. The SR ID (728) is passed from the [Step 2](#) response.

## Request

```
/app/api/rest?formatType=json&opName=userAPIGetServiceRequestWorkFlow&opData={param0:728}
```

## Response

```
{
  "serviceResult": {
    "requestId": 728,
    "workflowCreated": 1442274648591,
    "submittedTime": 1442274648981,
    "cancelledTime": -1,
    "cancelledByUser": null,
    "adminStatus": 1,
    "executionStatus": 2,
    "futureStartTime": 1442274648591,
    "entries": [
      {
        "stepId": "Initiated by aks",
        "executionStatus": 3,
        "statusMessage": null,
        "handlerId": 4,
        "startedTime": -1,
        "completedTime": 1442274649606,
        "validTill": -1,
        "startAfter": -1,
        {
          "stepId": "GetResourceRequirementFromThroughput",
          "executionStatus": 3,
          "statusMessage": "",
          "handlerId": 12,
          "startedTime": -1,
          "completedTime": 1442274657097,
          "validTill": -1,
          "startAfter": -1,
          {
            "stepId": "Allocate APIC Container Resources",
            "executionStatus": 2,
            "statusMessage": "Execution of the task resulted in errors",
            "handlerId": 12,
            "startedTime": -1,
            "completedTime": 1442274662674,
            "validTill": -1,
            "startAfter": -1,
            {
              "stepId": "Verify Container Resource Limits",
              "executionStatus": 0,
              "statusMessage": null,
              "handlerId": 12,
              "startedTime": -1,
              "completedTime": -1,
              "validTill": -1,
              "startAfter": -1,
              {
                "stepId": "If Else",
                "executionStatus": 0,
                "statusMessage": null,
                "handlerId": 12,
                "startedTime": -1,
                "completedTime": -1,
                "validTill": -1,
                "startAfter": -1,
                {
                  "stepId": "APIC Reterive Secondary Container",
                  "executionStatus": 0,
                  "statusMessage": null,
                  "handlerId": 12,
                  "startedTime": -1,
                  "completedTime": -1,
                  "validTill": -1,
                  "startAfter": -1,
                  {
                    "stepId": "Trigger APIC Container - DR Site",
                    "executionStatus": 0,
                    "statusMessage": null,
                    "handlerId": 12,
                    "startedTime": -1,
                    "completedTime": -1,
                    "validTill": -1,
                    "startAfter": -1,
                    {
                      "stepId": "Create Tenant Application Profile",
                      "executionStatus": 0,
                      "statusMessage": null,
                      "handlerId": 12,
                      "startedTime": -1,
                      "completedTime": -1,
                      "validTill": -1,
                      "startAfter": -1,
                      {
                        "stepId": "Create Private Network",
                        "executionStatus": 0,
                        "statusMessage": null,
                        "handlerId": 12,
                        "startedTime": -1,
                        "completedTime": -1,
                        "validTill": -1,
                        "startAfter": -1,
                        {
                          "stepId": "Trigger Multiple Container Tier Creation",
                          "executionStatus": 0,
                          "statusMessage": null,
                          "handlerId": 12,
                          "startedTime": -1,
                          "completedTime": -1,
                          "validTill": -1,
                          "startAfter": -1,
                          {
                            "stepId": "Wait For Service Requests",
                            "executionStatus": 0,
                            "statusMessage": null,
                            "handlerId": 12,
                            "startedTime": -1,
                            "completedTime": -1,
                            "validTill": -1,
                            "startAfter": -1,
                            {
                              "stepId": "Setup APIC Container Network Connection",
                              "executionStatus": 0,
                              "statusMessage": null,
                              "handlerId": 12,
                              "startedTime": -1,
                              "completedTime": -1,
                              "validTill": -1,
                              "startAfter": -1,
                              {
                                "stepId": "Create APIC Container Contracts",
                                "executionStatus": 0,
                                "statusMessage": null,
                                "handlerId": 12,
                                "startedTime": -1,
                                "completedTime": -1,
                                "validTill": -1,
                                "startAfter": -1,
                                {
                                  "stepId": "Child workflow (APIC Container Attached L4L7 Configuration)",
                                  "executionStatus": 0,
                                  "statusMessage": null,
                                  "handlerId": 12,
                                  "startedTime": -1,
                                  "completedTime": -1,
                                  "validTill": -1,
                                  "startAfter": -1,
                                  {
                                    "stepId": "Provision APIC Container VMs",
                                    "executionStatus": 0,
                                    "statusMessage": null,
                                    "handlerId": 12,
                                    "startedTime": -1,
                                    "completedTime": -1,
                                    "validTill": -1,
                                    "startAfter": -1,
                                    {
                                      "stepId": "Re-Sync Container VMs",
                                      "executionStatus": 0,
                                      "statusMessage": null,
                                      "handlerId": 12,
                                      "startedTime": -1,
                                      "completedTime": -1,
                                      "validTill": -1,
                                      "startAfter": -1,
                                      {
                                        "stepId": "If Else",
                                        "executionStatus": 0,
                                        "statusMessage": null,
                                        "handlerId": 12,
                                        "startedTime": -1,
                                        "completedTime": -1,
                                        "validTill": -1,
                                        "startAfter": -1,
                                        {
                                          "stepId": "Wait For Service Requests",
                                          "executionStatus": 0,
                                          "statusMessage": null,
                                          "handlerId": 12,
                                          "startedTime": -1,
                                          "completedTime": -1,
                                          "validTill": -1,
                                          "startAfter": -1,
                                          {
                                            "stepId": "Child workflow (APICContainerSRMSSettings)",
                                            "executionStatus": 0,
                                            "statusMessage": null,
                                            "handlerId": 12,
                                            "startedTime": -1,
                                            "completedTime": -1,
                                            "validTill": -1,
                                            "startAfter": -1,
                                            {
                                              "stepId": "Initiate APIC Container BM Provisioning",
                                              "executionStatus": 0,
                                              "statusMessage": null,
                                              "handlerId": 12,
                                              "startedTime": -1,
                                              "completedTime": -1,
                                              "validTill": -1,
                                              "startAfter": -1,
                                              {
                                                "stepId": "Send Container Email",
                                                "executionStatus": 0,
                                                "statusMessage": null,
                                                "handlerId": 12,
                                                "startedTime": -1,
                                                "completedTime": -1,
                                                "validTill": -1,
                                                "startAfter": -1,
                                                {
                                                  "stepId": "GetMSPAdminEmailAddresses",
                                                  "executionStatus": 0,
                                                  "statusMessage": null,
                                                  "handlerId": 12,
                                                  "startedTime": -1,
                                                  "completedTime": -1,
                                                  "validTill": -1,
                                                  "startAfter": -1,
                                                  {
                                                    "stepId": "Send Container Email",
                                                    "executionStatus": 0,
                                                    "statusMessage": null,
                                                    "handlerId": 12,
                                                    "startedTime": -1,
                                                    "completedTime": -1,
                                                    "validTill": -1,
                                                    "startAfter": -1,
                                                    {
                                                      "stepId": "Complete",
                                                      "executionStatus": 0,
                                                      "statusMessage": null,
                                                      "handlerId": 13,
                                                      "startedTime": -1,

```

```
"completedTime":-1,"validTill":-1,"startAfter":-1}}}, "serviceError":null, "serviceName":"InfraMgr",
"opName":
"userAPIGetServiceRequestWorkFlow" }
```

In the response, the `stepId` represents the task executed by the workflow. On successful completion of the workflow execution, the `stepId` is represented as **Complete**. The service container called `SCN_Name` is created.

#### Step 4

Execute the service request using the `userAPISubmitServiceRequest` API to provision a VM.

##### Request

```
/app/api/rest?formatType=json&opName=userAPISubmitServiceRequest&opData={param0:"cat82",param1:"vdc82",
param2:1,param3:-1,param4:1,param5:"vm provisioning"}
```

Where,

- `param0`—The name of the catalog that is used for provisioning a VM.
- `param1`—The name of the virtual datacenter (VDC) on which the VM needs to be provisioned.
- `param2`—The duration of VM provisioning in hours. After the set duration, VM will be automatically deprovisioned. Use -1 to set the duration as indefinite.
- `param3`—This is an optional parameter. Schedule the time at which you want to start provisioning a VM. For example, January 1, 2014, 00:00:00 GMT. Use 0 or -1 to start the VM provisioning immediately.
- `param4`—The number of VM to be provisioned.
- `param5`—This is an optional parameter. Any comments on provisioning a VM.

##### Response

```
{ "serviceResult":456, "serviceError":null, "serviceName":"InfraMgr",
"opName":"userAPISubmitServiceRequest" }
```

The service request ID for provisioning a VM is 456.

## Example: Rollback a Provisioned VM

When a provisioned VM is no longer required, you can use the rollback workflow to release and reallocate the resources allotted to that VM. A system administrator or an end user with Write - Group Service Request user permissions can roll back a workflow.

The roll back workflow must include a task to pass the ID of the service request that was used to provision the VM in the `userAPIRollbackWorkflow` API. The ID of the service request that is in progress is available in Cisco UCS Director (**Organizations > Service Requests**).

When you roll back a VM that was provisioned by another user, a rollback workflow approval is triggered to get approval from that user. The rollback workflow is completed after approval is received.

##### Request

The following REST URL rolls back the service request with the ID 456.

```
/app/api/rest?formatType=json&opName=userAPIRollbackWorkflow&opData={param0:456}
```

##### Response

```
{ "serviceResult":458, "serviceError":null, "serviceName":"InfraMgr",
"opName":"userAPIRollbackWorkflow" }
```

Check the status of the rollback workflow using the `userAPIGetServiceRequestWorkFlow` API as follows:

##### Request

```
/app/api/rest?formatType=json&opName=userAPIGetServiceRequestWorkFlow&opData={param0:458}
```

On successful completion of the rollback workflow execution, the stepId is represented as **Complete**. The resources allotted for the VM are released and made available for reallocation.

### Exceptions

The userAPIRollbackWorkflow API throws exceptions on unsuccessful roll back of a workflow.

If you try to rollback a service request ID that is still in progress, the userAPIRollbackWorkflow API throws the following exception:

```
REMOTE_SERVICE_EXCEPTION: Cannot rollback work-flow for SR ID 332, when the work-flow  
execution is in progress
```

If you try to rollback a service request ID that is rolled back already, the userAPIRollbackWorkflow API throws the following exception:

```
REMOTE_SERVICE_EXCEPTION: Cannot Rollback SR:332 as it is already rolled back.
```