VMware Adapter for SAP Landscape Management - Connector for vRealize Automation

Installation and User's Guide

Connector version 1.1.0.1 running on VMware Adapater
for SAP Landscape Managment version 1.4.1

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Contents

Document Introduction 1

This chapter provides an overview of this user guide, including its prerequisites, intended audience, system requirements and the organization of this guide.

This chapter includes the following topics:

About This Guide

VMware Adapter for SAP Landscape Management part of the VMware private cloud solution for SAP™, is a virtual appliance that integrates SAP Landscape Management with VMware management software (VMware vCenter Server and VMware vRealize Automation) delivering unique automation capabilities that radically simplify how SAP basis administrators and end users provision and manage SAP Landscapes. The appliance accepts application calls from SAP Landscape Management, then uses VMware vRealize Orchestrator™ workflows to execute commands to VMware vCenter ® for VMware-related operations, such as starting and stopping virtual machines. IT administrators can now leverage the SA-API to automatically provision SAP Systems from VMware vRealize Automation.

This guide focusses on the VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector) feature of the VMware Adapter for SAP Landscape Management (*VASLM*) product. The Connector is installed on the appliance of a VASLM installation (*VLA*) and enables easy integration of the VMware Adapter for SAP Landscape Management and VMware vRealize Automation.

The guide covers: Installation and configuration of the Connector, Instantiation of vRO workflows and vRA blueprints generated by the Connector; Deployment of the said blueprints (once entitled), by end user from the VMware vRealize Automation service catalog.

Target Audience

VMware Adapter for SAP Landscape Management - Connector for vRealize Automation User Guide is primarily written for VMware Virtual Infrastructure (VI) administrators and VMware vRealize Automation (vRA) administrators. Some aspects of the installation may require Landscape Management (LaMa) administrative experience. For users without LaMa experience, consider obtaining the required help for completing tasks requiring those skills.

Prerequisites

VMware Adapter for SAP Landscape Management - Connector for vRealize Automation: Installation and Users Guide covers the installation and configuration of the
VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector). It also covers creating vRealize Automation (vRA) Blueprints for SAP Systems from Gold Masters (GMs).

To use this guide effectively, readers must have the following pre-requisites:

- Good understanding of VMware vSphere
- Understanding of VMware vRealize Automation
- Fully understand the role of Landscape Management (LaMa) in a SAP Landscape
- Full understanding of the VMware Adapter to SAP Landscape Management (http://www.vmware.com/products/adapter-sap-lvm.html)

Understanding the System Requirements

To use this product, you must have the following:

- VASLM 1.4.1 installed on a VM as an appliance
- vRA 7.2 accessible via network to the VASLM appliance (preceding bullet)

Understanding the Organization of this Guide

This user guide contains the following chapters:

1 Document Introduction (this chapter):About This Guide, target audience, pre-requisites, and organization of this guide.

2 Understanding
VMware Adapter for SAP Landscape Management - Connector for vRealize Automation and vRA

3 Installation and Configuration

4 Performing Operations

Understanding VMware Adapter for SAP Landscape Management - Connector for vRealize Automation and vRA

2

This chapter provides a complete overview of the solution including its key benefits. This overview describes the components of a
VMware Adapter for SAP Landscape Management - Connector for vRealize Automation solution, their functions and how they interact with one another. It also describes the life cycle of these components, objects related to these components, and how they enable administrators to create VMware vRealize Automation Blueprints that administrators can use to deploy SAP systems.

This chapter includes the following topics:

VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector) - Solution Overview

This section discusses the business problem that the Connector solves and how it solves it.

Key Benefits

Deployment of new SAP systems may take days or even weeks before they are ready for use. Customers have used various cloning methods to speed up the deployment process. However these processes are complex. The
VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector) simplifies the deployment process by utilizing VMware vSphere cloning and SAP's Landscape Management product to create new SAP workloads in an automated and repeatable form.

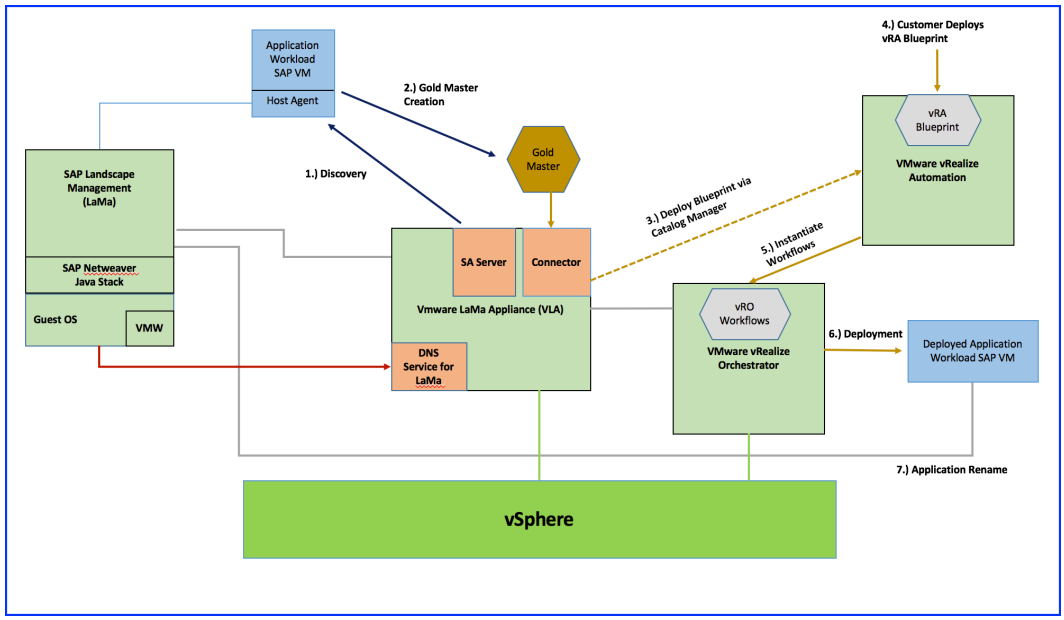
VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector)

The Connector is an extension of the VASLM product. It generates vRA blueprints from verified SAP systems that are created by a SAP BASIS administrator. These template systems are referred to as Gold Masters (GMs). Once entitled, vRA uses these blueprints to deploy new SAP systems from the gold masters.

Architectural Overview

VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector) is built on top of the VMware Adapter for SAP Landscape Management (VASLM). The following diagram illustrates the components of a *VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector)* environment and their relationship to one another:

Figure 2-1. Solution Overview



The key components in this diagram are:

- Verified SAP Systems — Each of these systems consist of software running on one or more machines (bare metal or in case of VLA environments, virtual machines (VMs) hosted on VMware vSphere products [ESXi systems managed by vCenter Server] that perform some business function, such as order processing, accounts payable, general ledger, inventory management etc. Each SAP System consists of one or more components. When all the components are up and running, the SAP System is running. However, when all of the components are stopped, the SAP System is stopped. If some systems are running and some are not, the SAP System is in an intermediate state.
- The SAP Landscape Management (LaMa) VM — The SAP Landscape Management (LaMa) application runs on a SAP Netweaver Application Server Java. It provides a web-based user interface for SAP BASIS administrators to centralize teh SAP Landscape Management and operations of SAP Systems and landscapes running on physical or virtual infrastructures. The SAP Landscape Management (LaMa) has an extensible architecture that allows SAP and third party vendors, for example, VMware to create plugins to extend certain features.
- The VMware Adapter for SAP Landscape Management — This is a plugin to SAP Landscape Management (LaMa) that extends how LaMa integrates with the underlying systems virtualized with VMware vSphere (see next bullet), optimizing and extending the functionality for certain operations, such as activating (Powering On) and deactivating (Powering Off), copying and cloning systems, and automation of these copying and cloning operations.
- VMware vSphere — ESXi is VMware's premier hypervisor product. VI administrators typically install it on bare-metal server-class computers, with VMs running guest operating systems (OSes) with SAP Systems as applications within the guests. vCenter Server is VMware's premier product for managing environments virtualized with ESXi. Collectively called vSphere, these products provide an enterprise-class environment with features for creating clusters, load balancing VMs between host systems (ESXi instances), fault tolerance, virtual networking, virtual storage, and more. In VLA environments, the VLA appliance (next bullet) runs in a VM on this infrastructure.
- VMware vRealize Orchestrator – This VMware product helps VI administrators to automate their environments by creating work flows (essentially scripts) that perform VI administrative actions, including complex actions that may take multiple steps, involve loops, conditions etc.
  VMware vRealize Orchestrator workflows can handle exceptions automatically or can pause waiting for a VI administrator to mitigate an issue.

- VMware Landscape Management Appliance (VLA) — This part of the VLA product is a virtual appliance. Collectively, it consists of one or more web services that accepts commands from (previously discussed) LaMa VLA Adapter and take appropriate actions to implement the commands, typically with the help of the previously discussed) VMware vRealize Orchestrator. For example:
  - When a SAP BASIS administrator activates (Powers On) a SAP System via LaMa, the VLA Adapter sends commands to the vla-service (discussed later in this topic) to Power On the underlying VM. The vla-service in turn invokes a VLA specific workflow on the VMware vRealize Orchestrator to turn on the VM in the underlying vSphere infrastructure. An analogous action occurs when a SAP BASIS administrator deactivates (Powers Off) a SAP System.
  - When a SAP BASIS administrator copies a SAP System, the VLA Adapter sends commands to the vla-service which in turn invokes a VLA-specific VMware vRealize Orchestrator workflow to create vSphere copies of the VMs on which the SAP Systems reside, configuring the VMs according to the parameters provided by the SAP BASIS administrator in the LaMa web user interface.
  - The VLA Appliance contains several components including:
    - A purpose configured and hardened operating system (OS)
    - A minimalist set of OS utilities and VLA specific programs and configuration files required to provide the functionality described here. These include:
      - The vla-service — A web service running in tomcat that receives and processes commands from the VLA Adapter. It also serves out the VLA Dashboard Web UI. By default, this server listens on port 8443.
      - Tomcat Authentication Service — Provides a dedicated authentication domain for the the authentication of SAP Landscape Management requests.
      - Credential store: A secure database to maintain configuration and credential information to access the VMware SDDC. Each entry in the credentials store includes a component type (vRealize Orchestrator, LaMa, vCenter Server etc), the hostname and port (if configurable) for the component's API, and a username / password used to authenticate to the component's API. You create entries in this database using the vla_credentials command.
      - SA-Server — A web service running in tomcat that serves out the SA-API. This is also known as the SA-API engine and it runs as part of the VLA.
        - The SA-API engine includes a tomcat server that serves out the SA-API services via a *REST* interface.
        - The SA-API engine includes a database it uses to keep objects created via calls to the SA-API (for example Gold Masters), Application Instances created from Gold Masters and resources used by those Application Instances.
        - The SA-API engine may also invoke workflows on the vRO System to perform certain vSphere operations. It may invoke certain other vRO workflows specified as parameters to certain SA-API function calls.
      - Connector — The purpose of the SA-API is the furtherance of VMware's *Software Defined Data Center* (SDDC) strategy by allowing automation of the management of business critical applications, such as SAP. It is designed to be consumed by any orchestration and/or automation tool that can integrate with the *REST* API. Though the SA-API is powerful, it is complex to integrate with. Connector makes this SA-API integration easy for the customer, that in turn enables broader adoption of SA-API.
- Gold Master — SA-API provides a model and mechanism that allow organizations to memorialize verified SAP Systems in something called a Gold Master (images of the SAP host system VMs plus certain meta-data). You can quickly deploy a copy/clone of the SAP application from the Gold Master (always leaving the verified gold master as is). This is called instantiation of the Gold Master.

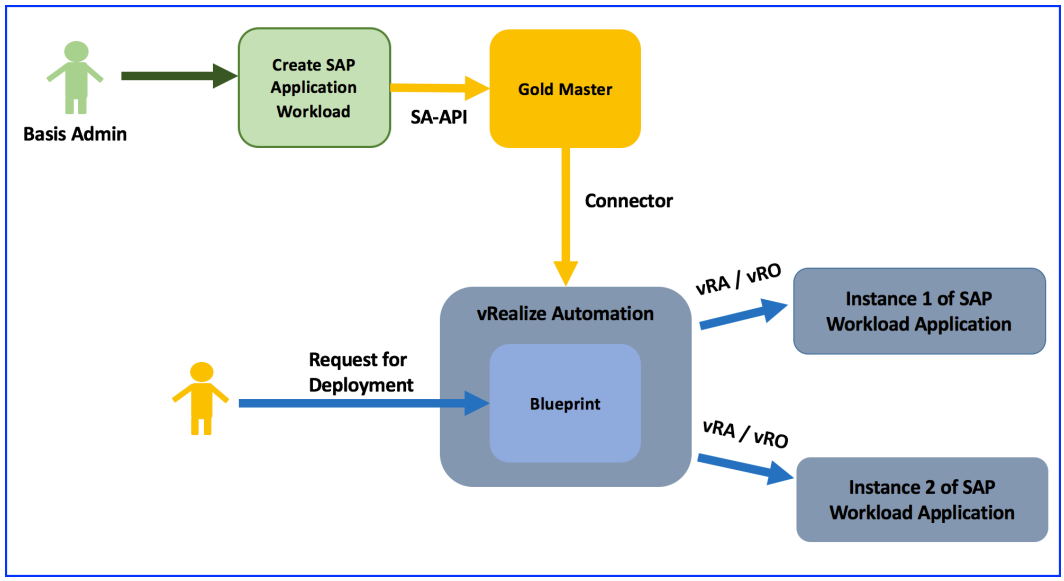
- VMware vRealize Automation — VMware vRealize Automation enables you to create and manage multivendor cloud infrastructure. With VMware vRealize Automation, end users can self-provision virtual machines, cloud machines, physical machines, applications and IT services as per the policies defined by the administrators. VMware vRealize Automation provides a secure portal where authorized administrators, developers, or business users are able to request new IT services. They can manage specific cloud and IT resources while ensuring compliance with business policies. There is a common service catalog where users can request for IT service including infrastructure, applications and desktops. This ensures consistent user experience.
- vRA Blueprint – A machine blueprint is a complete specification of a virtual, cloud or physical machine that defines resources, attributes, policies and method of provisioning for a new system. A blueprint is needed to provision a SAP System from a Gold Master (GM).

Service catalog items on the VMware vRealize Automation are unique SAP System blueprints that the end user can browse and is entitled to request. The end user selects the blueprint for provisioning and provides the required values. The values for different fields may either have to be typed in or the user may also be prompted to select values for any custom properties defined in the blueprint from a drop down list. The user can then monitor the current status of the provisioning request in the portal.

Understanding the Object Life Cycle

This section discusses the complete life cycle of how a Verified SAP System gets converted into a Gold Master and then to a vRA Blueprint that, in turn, is used by vRA end users to deploy new SAP Systems quickly, reliably and conveniently.

Figure 2-2. Object Life Cycle



The preceding figure depicts the following life cycle of objects used with VMware Adapter for SAP Landscape Management - Connector for vRealize Automation. Starting in the upper left corner of the figure, the distinct points are:

1 A Basis Admin creates one or more Verified SAP System(s).

2 The VI admin and/or Basis admin converts the SAP System(s) into a Gold Master(s) (GM(s)) using the SA-API.

3 An administrator invokes the Connector to read the Gold Master(s) from the SA-API inventory and generate vRA Blueprints and vRO Workflows that are based on the configuration of the SAP System memorialized in the GM.

Note This version of the Connector only supports blueprints that deploy a new SAP System from a Gold Master.

For each GM, the Connector generates the following:

- vRA Blueprints that enable an end user to deploy a new SAP System from a Gold Master in the SA-API inventory.
- A matching vRO workflow that invokes the SA-API to deploy the Gold Master into a new instance of the SAP system in the GM.

After the Connector creates the Blueprints and Workflows, it will (optionally) import them into a specified vRA and vRO.

The Connector also imports vRA Resource Actions and vRO workflows that support the following operations on the created SAP System:

- Application Start
- Application Stop
- Application Delete

For each vCenter Server that is managed by the SA-API, the Connector will generates Workflows that are used in vRA Blueprint forms. It will also generate Workflows for Resource Pools, Networks and Datastores.

4 Once all the objects are imported into vRA, the vRA admin needs to entitle them for end users to have access to them.

Note To create a Gold Master from an SAP system, said System must be powered on with all the SAP application services running. We recommend that you take a snapshot of the SAP System before creating a Gold Master for it.

Installation and Configuration 3

This sections describes how to install and configure the
VMware Adapter for SAP Landscape Management - Connector for vRealize Automation feature, including: Installation Pre-requisites; Steps for installing the Connector; Configuring the vRO REST Plugin required by the Connector; Understanding and modifying the properties file used by the Connector

This chapter includes the following topics:

Installation Prerequisites

The pre-requisites for installing
VMware Adapter for SAP Landscape Management - Connector for vRealize Automation are:

- Completely installed and working VLA setup with the SA-API enabled
- An installed VMware vRealize Automation setup
- VMware vRealize Orchestrator installed and connected to the said VMware vRealize Automation setup.

Note This VMware vRealize Orchestrator is normally and typically different from the VMware vRealize Orchestrator that is configured with VLA.

VLA Configuration for SA-API

Prerequisites

You have already deployed the VLA and powered it on.

Procedure

1 SSH to VLA console using appropriate credentials that you set when deploying the VLA

2 Get Administrative privileges

a Execute `sudo` to get administrative access

b You are prompted for the password. Enter the console user password that you provided when you deployed the VLA

```
sudo –s
```

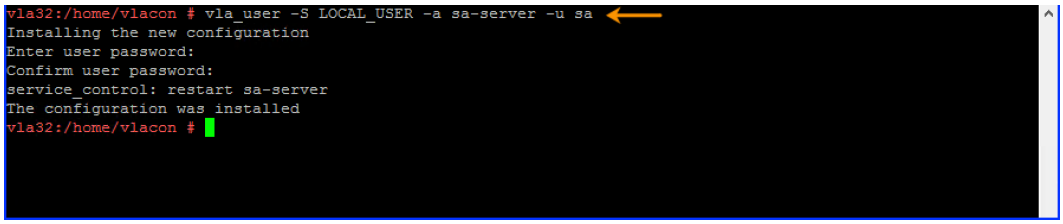
3 Create a user using LOCAL_USER authorization scheme to be able to connect to the SA-API Server

a Execute the `vla_user` command as follows to create a user using LOCAL_USER authorization scheme. You use this account to authenticate to the VLA appliance's SA-API Server web user interface.

```
vla_user –S LOCAL_USER –a sa–server –u <vla–service–user–name>
where, <vla–service–user–name> is the name of the user you wish to create for the SA Server.
```

b You are prompted and required to enter the password twice. The following screenshot shows the usage of the preceding command:

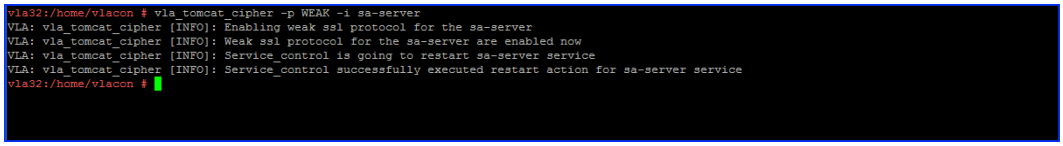
Figure 3-1. LOCAL_USER for sa-server



4 Optionally, configure the tomcat cipher suite on the SA-API Server

a If some SA-API client using weak SSL/TLS ciphers and protocols wants to connect to the SA-API server, you use the following `vla_tomcat_cipher` command to turn **ON** weak SSL/TLS ciphers and protocols for the tomcat instance on the VLA.

Figure 3-2. Configure tomcat cypher suite



Note Using `vla_tomcat_cipher` command VLA administrators can enable tomcat instances on the VLA to accept connection from clients using either weak or strong SSL/TLS ciphers and protocols. This enables the SA-API Server running on the VLA to be able to accept connections from SA-API clients (Browsers, Connector, vRO, any tool that invokes SA-API), depending on whether the later support weak or strong SSL/TLS ciphers and protocols, respectively.

At the end of this task you have successfully completed the VLA configuration for SA-API.

Installing VMware Adapter for SAP Landscape Management - Connector for vRealize Automation

Execute the following steps to perform a fresh installation of the VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (**Connector**).

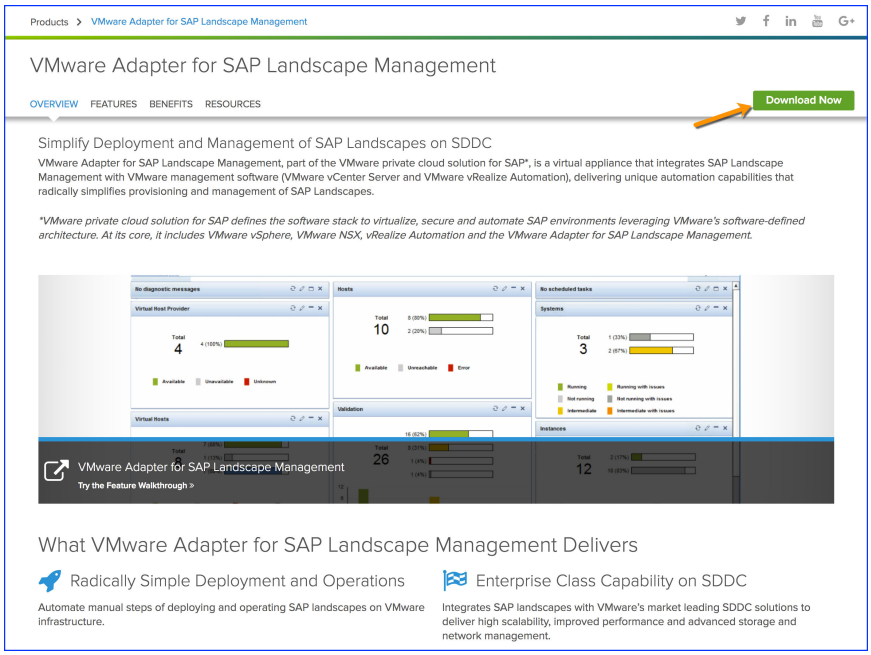
Important If you already have the VMware Adapter for SAP Landscape Management - Connector for vRealize Automation installed on your VASLM appliance, and are upgrading to a newer version, see "Perform an Upgrade of the Connector," on page 21

Procedure

1 Download the `rpm` file for the
VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector)

a Browse to http://www.vmware.com/products/adapter-sap-lvm.html . The browser displays the a page similar to the following:

Figure 3-3.
VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector) Page (UPDATE THIS IMAGE)

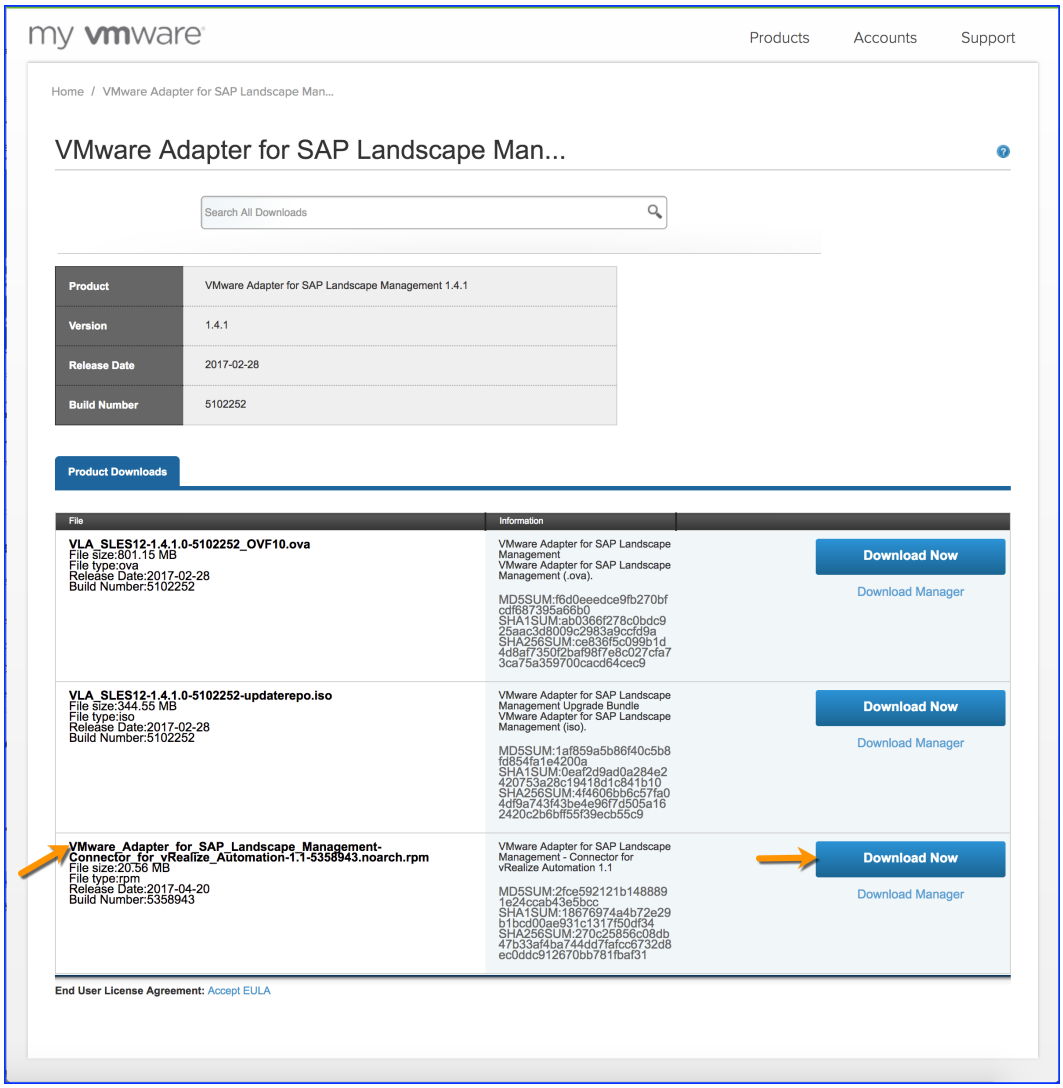


b Click **Download Now** (pointed to in the preceding figure for emphasis). The **Download Now** tab redirects the browser to the login page at `my.vmware.com`, causing the browser to display a page similar to following:

Figure 3-4. my vmware login

c Enter your login credentials and Click **Log In** (pointed to in the preceding figure for emphasis). The browser displays the product download page similar to the following:

Figure 3-5. Connector Download Page



d Click **Download Now** (pointed to in the preceding figure for emphasis), to download the `rpm` file.

2 Install the Connector on VLA

a `SSH` to the VLA Console using appropriate credentials

b Get Administrative privileges

1 Execute `sudo` to get administrative access

2 You are prompted for the password. Enter the console user password that you provided when you deployed the VLA

```
sudo –s
```

c Copy the downloaded `rpm` file (step 1 in this section) to the VLA (highlighted with arrow for reference) as shown in the following figure:

Figure 3-6. Copy `rpm` to VLA

d Install the `rpm` file on VLA by executing the following command:

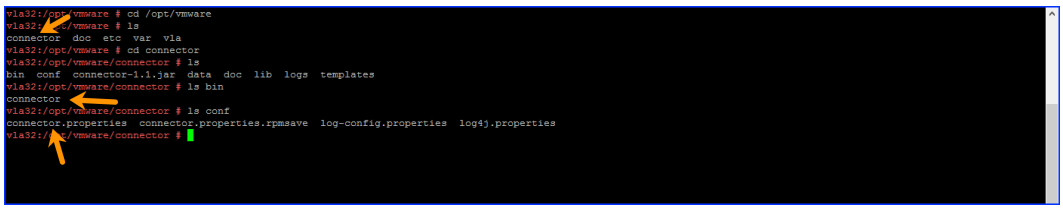
```
rpm –ivh <connector rpm file>
```

The following figure shows the installation step:

Figure 3-7.
VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector) Installation on VLA

e Verify the presence of the directory `/opt/vmware/connector` upon installation (highlighted for emphasis) as shown in the following figure:

Figure 3-8. Verify Installation



f Explore the `/opt/vmware/connector` directory to understand and verify its contents.

The `connector` command is located in `/opt/vmware/connector/bin` directory and the properties file is located in `/opt/vmware/connector/conf` directory (highlighted with arrows for emphasis), as seen in the preceding figure.

At the end of this task you have successfully downloaded and installed the VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector).

Understanding the Properties File

VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector) supports a properties file that enables user to set several different property types under different contexts. Upon installation of the connector (Refer:"Installing VMware Adapter for SAP Landscape Management - Connector for vRealize Automation," on page 15), you can locate this file called `connector.properties` in the directory, `/opt/vmware/connector/conf`. The property values in this file define host connectivity, user profile and impact operations like blueprint and workflow generation.

- Connection Properties — Properties pertaining to establishing connectivity with other relevant constituents of the setup like vRA server and SA server

Table 3-1. Connection Properties

Property Name	Description	Type
vRAHost	IP address or FQDN of the Target vRA server	String
vRAPort		String
vRATenant	vRA Tenant (For details on Tenancy, refer to https://pubs.vmware.com/vra-62/index.jsp#com.vmware.vra.concepts.doc/GUID-D75453AF-8DF0-429E-A0DC-BE5670EF3618.html)	String
vRAUser	Tenant Admin User	String
vROHost	IP address or FQDN of the Source SA server	String
vROPort	Port	Int
vROUser		String
SAAPIHost	IP address or FQDN of the Source SA server. If this is left blank that it is assumed that the Connector is deployed on the VLA and will use the local FQDN	String
SAAPIPort	Port	Int
SAAPIUser		String

- Workflow Generation Properties — Properties pertinent in the context of workflow generation and REST host configuration

Table 3-2. Workflow Generation Properties

Property Name	Description	Type
OriginatorID	vRA Originator ID	String
PreCreateWorkflow	UUID of PreCreateWorkflow	String
PostCreateWorkflow	UUID of PostCreateWorkflow	String
ErrorWorkflow	UUID of ErrorWorkflow	String
PreDeleteWorkflow	UUID of PreDeleteWorkflow	String
PostDeleteWorkflow	UUID of PostDeleteWorkflow	String

Configuring / Modifying the Properties File

When you install the
VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Refer : "Installing VMware Adapter for SAP Landscape Management - Connector for vRealize Automation," on page 15), you see that a new directory `/opt/vmware/connector` gets created upon installation. This section discusses how to locate, modify and configure properties that inturn impact various operations like Blueprint generation and Workflow generation.

Procedure

1 Change directory to `/opt/vmware/connector/conf`

2 Locate the text file `connector.propertiess` in this folder.

3 Open the file, `connector.properties` in an editor of your choice

4 Update / Modify the properties discussed in section "Understanding the Properties File," on page 19 and save the file. The property names and values defined in this file govern connectivity, Blueprint and Workflow generation.

Configuring / Modifying the properties file is done by editing appropriate property values for hosts, users, vRA tenant and optionally workflows, in the `/opt/vmware/connector/conf/controller.properties` text file.

Configuring the connection between vRO and SA-API Server

This section discusses how to setup connectivity between a vRA's VMware vRealize Orchestrator and the SA-API server. You need to perform this task in any of the following circumstances:

1 The first time you set up the Connector

2 If you add a new vRO to your vRA (for example moving from an internal to external vRO for a vRA)

3 If you use a new vRA with the Connector (you need to connect to its vRO)

Procedure

1 SSH to VLA console using appropriate credentials.

2 Get Administrative privileges

   a Execute `sudo` to get administrative access

   b You are prompted for the password. Enter the console user password that you provided when you deployed the VLA

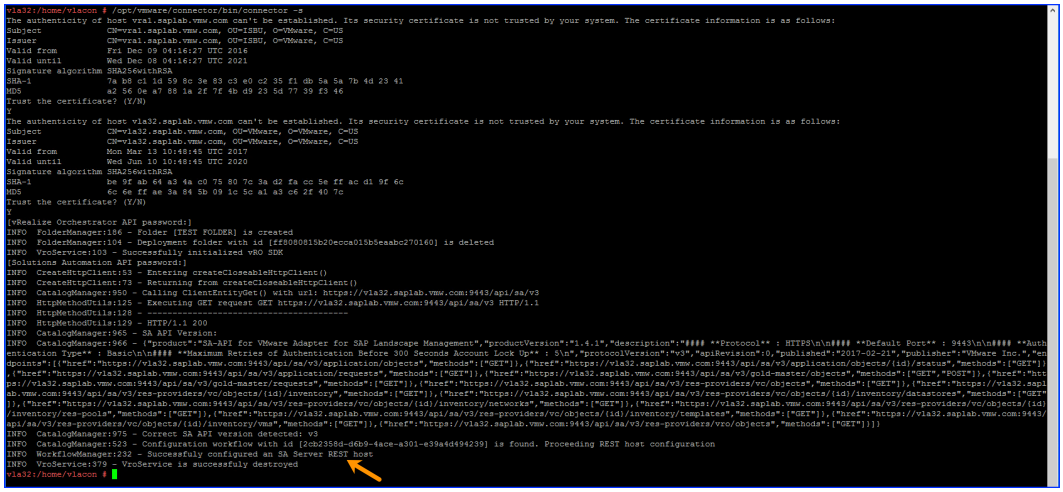
   ```
   sudo –s
   ```

3 Establish connectivity between vRO and SA-API Server

a Execute the `connector` command with `–s` flag to setup connectivity between vRA's vRO (VMware vRealize Orchestrator) and the SA-API Server.

```
/opt/vmware/connector/bin/connector –s
```

Figure 3-9. Setup option of `connector` command



By successfully executing the `connector` command with setup option (`–s`), you have established connectivity between your vRA's vRO and the SA-API server. You are now ready to do other operations like creating a blueprint for a given Gold Master (GM).

Perform an Upgrade of the Connector

If you already have VMware Adapter for SAP Landscape Management - Connector for vRealize Automation version 1.1 installed on your VASLM appliance, you can upgrade version 1.1.0.1 instead of performing a fresh installation. This section provides an overview of the process followed by the steps for performing the upgrade.

Understanding the Upgrade Process

You can upgrade the Connector from version 1.1 to version 1.1.0.1. This section provides an overall update flow.

Upgrading the Connector involves the following high level events:

1 Download the RPM file that contains the new version of the VMware Adapter for SAP Landscape Management - Connector for vRealize Automation from `my.vmware.com` to a specific directory on your existing VLA

2 Use the `rpm` utility with the **-U** option to upgrade the Connector to the newer version

Upgrading from Connector (ver 1.1) to Connector (ver 1.1.0.1)

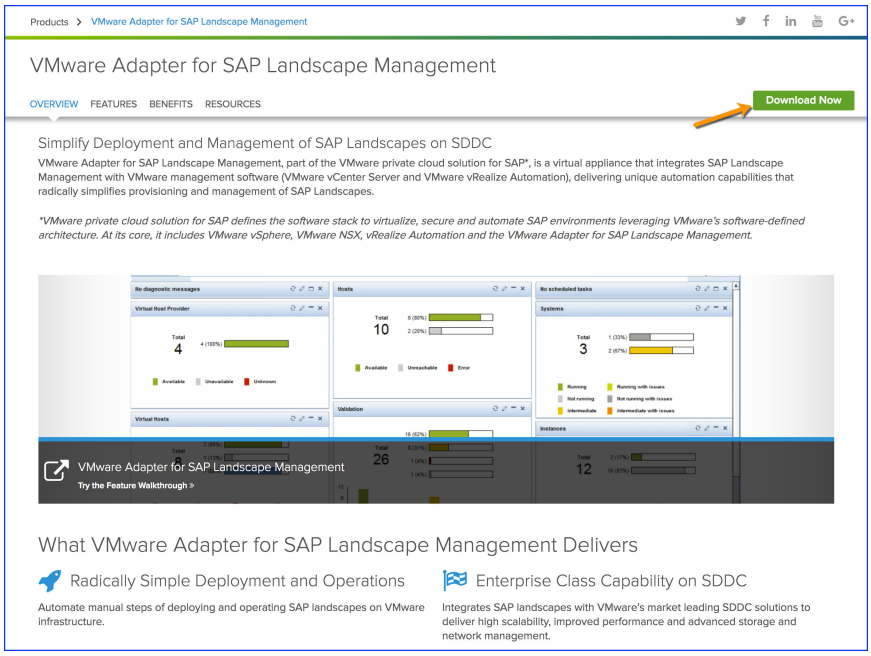
Execute the following steps to Upgrade the VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (**Connector**)

Procedure

1 Download the `rpm` file for the newer version of the VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector)

a Browse to http://www.vmware.com/products/adapter-sap-lvm.html . The browser displays the a page similar to the following:

Figure 3-10.
VMware Adapter for SAP Landscape Management - Connector for vRealize Automation (Connector) Page (UPDATE THIS IMAGE)

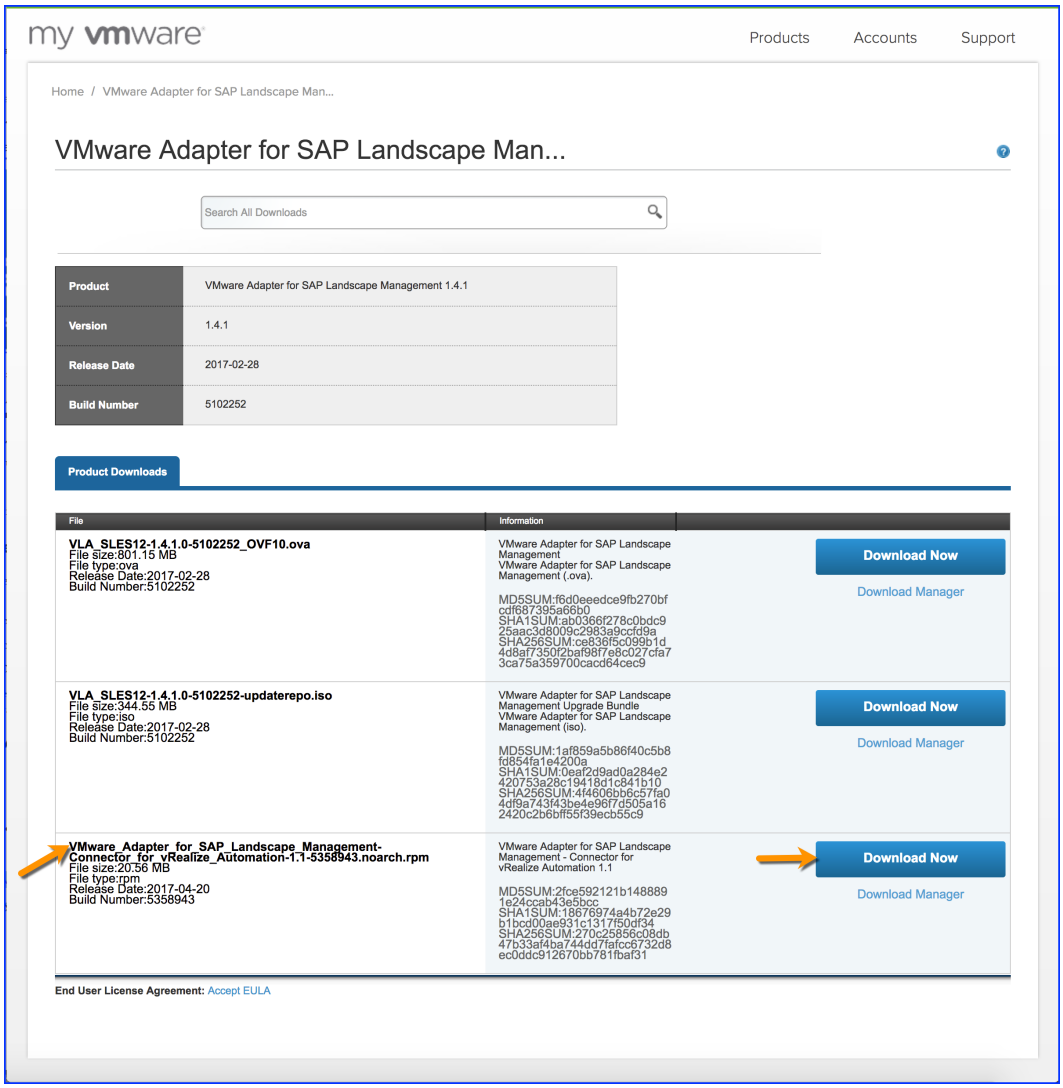


b Click **Download Now** (pointed to in the preceding figure for emphasis). The **Download Now** tab redirects the browser to the login page at `my.vmware.com`, causing the browser to display a page similar to following:

Figure 3-11. my vmware login

c Enter your login credentials and Click **Log In** (pointed to in the preceding figure for emphasis). The browser displays the product download page similar to the following:

Figure 3-12. Connector Download Page



d Click **Download Now** (pointed to in the preceding figure for emphasis), to download the required Connector `rpm` file.

2 Upgrade the Connector on the VLA

a `SSH` to the VLA Console using appropriate credentials

b Get Administrative privileges

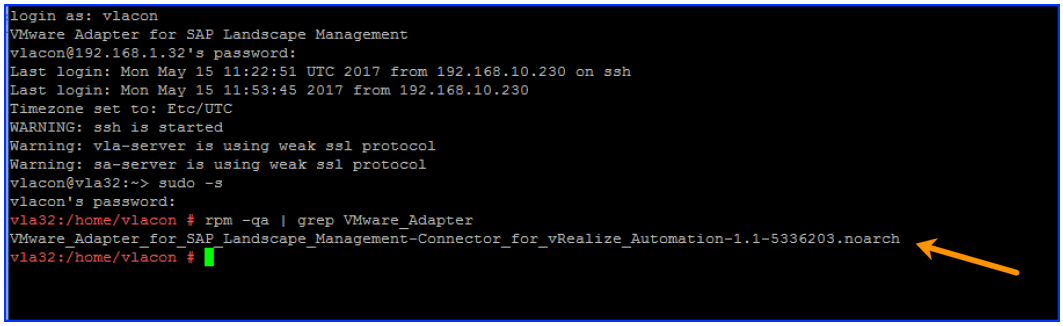
1 Execute `sudo` to get administrative access

2 You are prompted for the password. Enter the console user password that you provided when you deployed the VLA

```
sudo –s
```

c Check the existing version of the Connector using the `rpm` command as depicted in the following figure:

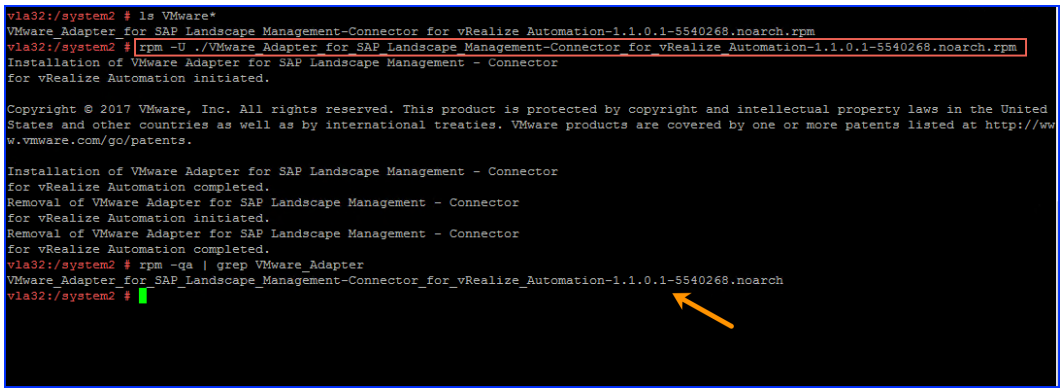
Figure 3-13. Verify Existing Version of the Connector



d Copy the downloaded `rpm` file (step 1 in this section) to the `/system2` directory on the VLA

e Upgrade the Connector using the `rpm` command, including the **-U** flag, as depicted in the following figure:

Figure 3-14. Upgrade the Connector



f Verify the upgraded version of the Connector using the `rpm` command as depicted in the preceding figure.

You have successfully upgraded the Connector from version 1.1 to 1.1.0.1

Performing Operations 4

Once you have installed and configured the Connector you can use it to populate your vRA service catalog in with your blueprints and actions, and your associated vRO with associated workflows, allowing you to automate the provisioning of SAP applications via the vRA.

As a brief reminder from the life-cycle discussion earlier in this document, at a high level, you:

1 Prepare the SAP systems

2 Create a Gold Master (GM) of the SAP system

3 Use the Connector to generate blueprints, workflows, and actions for the Gold Masters

Note Once the blueprints and actions are uploaded to the vRA, an administrator must entitle users to deploy them.

Throughout the life-cycle of these objects, you may decide to update or delete them.

This chapter provides concepts and procedures you need to accomplish these tasks.

This chapter includes the following topics:

Getting the (Verified) SAP System Ready for Gold Master Creation (via SA-API)

To create a Gold Master the SAP System needs to be powered ON with all the SAP application services running. We recommend that you take a snapshot of the SAP System before creating a Gold Master. This will enable you to be able to revert back to a stable and consistent state in case you encounter some issue with Gold Master creation and it does not complete successfully.

Procedure

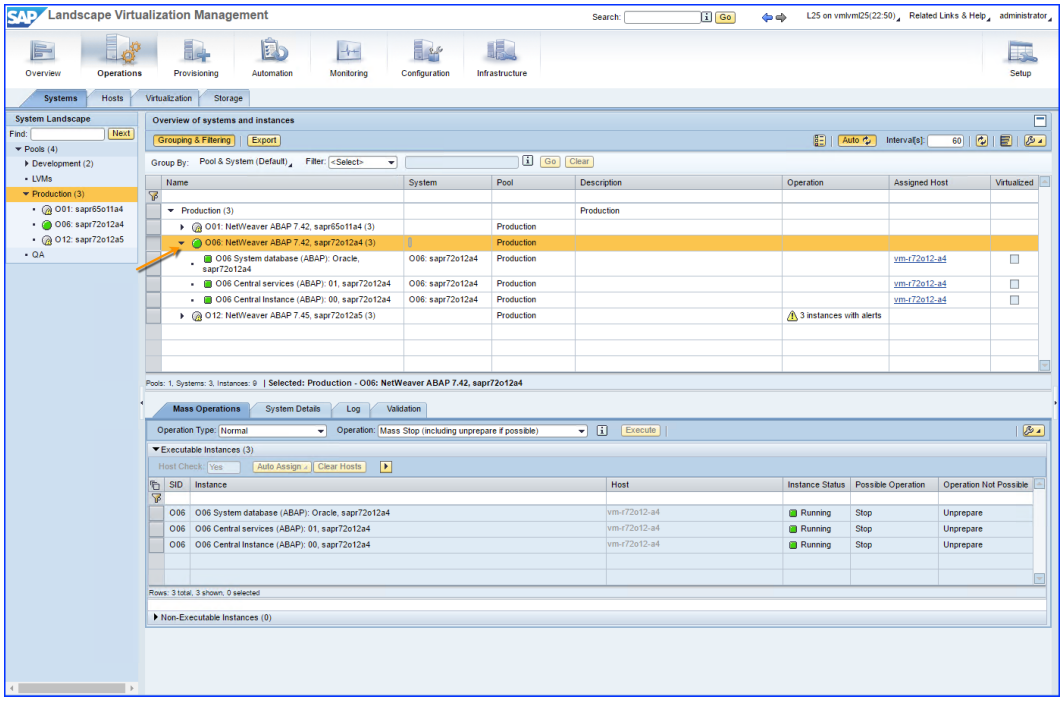
1 Login to LaMa Dashboard

a Open your browser and login to LaMa Dashboard using appropriate credentials. You use the LaMa here to manage your SAP Systems (Power on / Power off)

2 Locate your SAP System VM on the LaMa Dashboard

a On the LaMa Dashboard, select **Operations** tab and Click on the **Systems** tab under it. Locate your SAP System VM under the appropriate pool in the left pane as shown in the following figure:

Figure 4-1. Verified SAP System VM



3 Start up all required services on your SAP System VM.

You should see your SAP System VM in the browser indicated with a green dot (marked for emphasis in the preceding figure) if it is healthy up and running the required services properly.

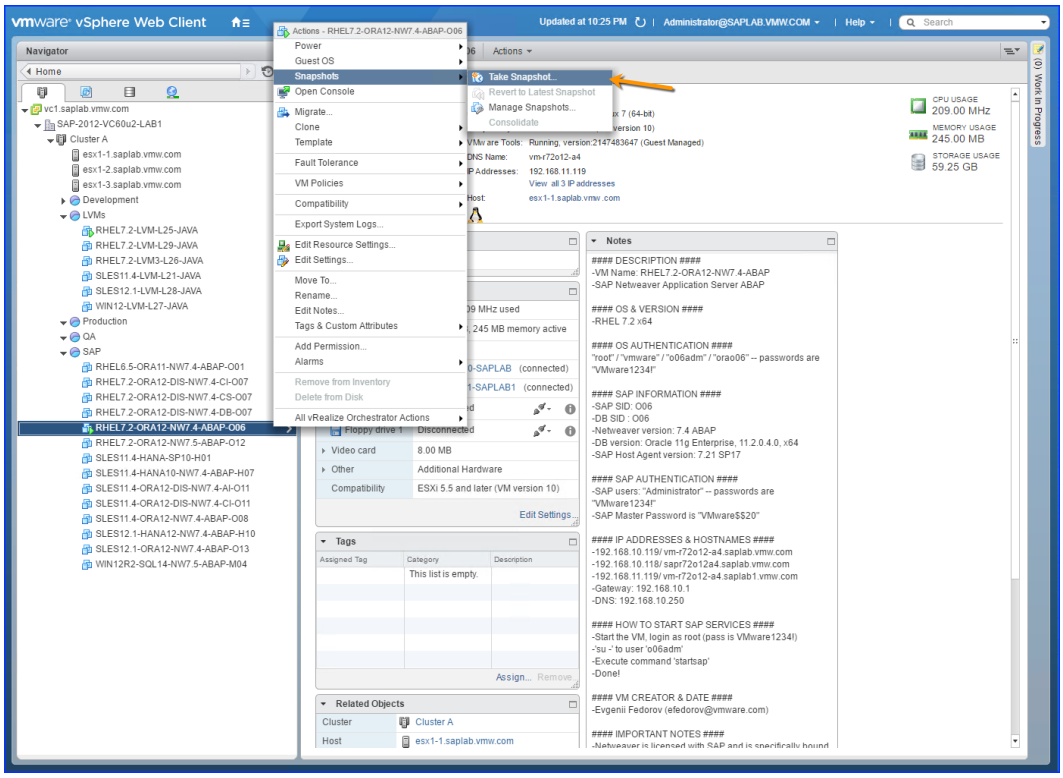
4 Take a snapshot of the running (verified) SAP System VM before generating a Gold Master (GM) out of it.

a Log in to the VMware vSphere Web Client (VWC) using administrator credentials in your browser.

b Click on **Hosts and Clusters** and locate your SAP System VM in the left pane.

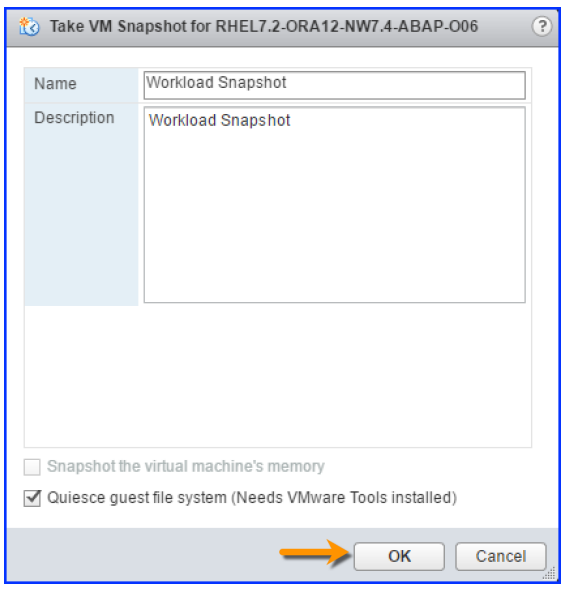
c Right Click on the VM. Select **Snapshots** and Click on **Take Snapshot...**(highlighted for emphasis) as shown in the following figure:

Figure 4-2. Take Snapshot of the SAP System VM



d Enter the **Name** and **Description** of the new snapshot that you are about to create in the pop-up window. Click on **OK** button as shown in the following figure to complete the snapshot operation.

Figure 4-3. Naming the Snapshot



After successfully completing this section, you have your SAP System VM Powered on and running the required services. You have also taken a snapshot of this VM. You are now ready to generate a Gold Master (GM) from this (Verified) SAP System VM.

SA-API Gold Master Methods

This section discusses various SA-API REST methods that you will be using in the forthcoming topics of this chapter.

Get a list of Gold Masters (GM)

- Description: GET method is used to get the list of all Gold Masters (GMs) that are currently available.
- REST Method: **GET**
- Request URL:

  ```
  https://vlahost.example.com:9443/api/sa/v3/gold-master/objects
  ```

- Response Code:
  - Code: 200
    - Description: A response code of 200 indicates that the GET method successfully retrieved the list of all available Gold Masters (GMs)
    - Output Format:

      ```
      Page
      {
          offset:       /* (Integer) Offset of the first entry in the page */
          limit:        /* (Integer) Number of entries in the page */
          end:          /* (Integer) Ending offset of the last entry at the
                           endpoint */
          entries:
              Links[       /* Array of links to resource, collection or endpoint */
                  Link {    /* A link to a resource, collection or endpoint */
                  label:    /* (String) A human readable descriptive label that
                               identifies the resource */
                        href :    /* (String) URI of the link */
                            methods:[ ] /* (String) Set of methods supported by resource,
                                           collection or endpoint identified by the URI */
                        } /* end of Link entry */
                    ] /* end of Array of Links */
      }
      ```

  - Default Failure
    - Description: If the GET operation fails, you get appropriate error code and informational error message that can be used for debugging and finding out the reason for failure.
    - Output Format:

      ```
      StandardError
      {
          code:              /* (Integer) Error code for developers */
          internalMessage:   /* (String)  Error message for developers */
          info:  Uris [ ]  /* (String) Array of 0 or more URIs that are Links to
                              resources where developers can find more information */
          userMessage:       /* (String) Message for end-users */
      }
      ```

Create a Gold Master (GM)

- Description: POST method is used to Create a Gold Master (GM) out of a verified SAP System VM, based on the specified list of parameters. The method returns an execution request that you can use to check the status of the operation.
- REST Method: **POST**
- Request URL:

```
https://vlahost.example.com:9443/api/sa/v3/gold-master/objects
```

- Parameters:

```
GoldMasterCreateParameters {        /* Essential parameters to create a Gold Master (GM) */
    name:                           /* (String) Descriptive name of the new GM being created
*/
    type:                           /* (String) Type of the GM creation parameters, set to
                                       "SapGoldMasterCreateParameters" */
    Enum:
      Array[1]
      0: "SapGoldMasterCreateParameters"

    virtualMachines: {    /* A collection of Virtual Machines hosting an application to
                             be discovered and then converted into a GM. A Virtual
                             Machine URI is used as a key */
                     }
    mode:         /* (String) Specifies a way of creating VM templates from
                     source Virtual Machines. Converting VM to template is a
                     quick method of creating VM template since teh VM is
                     merely re-registered in vCenter as a VM template without
                     copying VM virtual disks. Cloning VM to template prevents
                     the VM from being re-registered as a VM template, but it
                     is time consuming operation of creating a full copy of VM */
    Enum:
      Array[2]
      0:"CONVERT_VM_TO_TEMPLATE"
      1:"CLONE_VM_TO_TEMPLATE"
    operationId: {                  /* A pair of unique identifiers used for operation
                                       traceability purposes */
    originatorId:                 /* (String) A unique identifier of a user who initiates a
                                     transaction. It shall contain only case insensitive
                                     alphanumeric characters */
    transactionId:                /* (String) A unique identifier of a transaction.
                                      It shall be hexadecimal and unique within the
                                      last 1000 transaction IDs */
                 }
     opaqueData:                  /* (String) An object-private data (base64 encoded)
                                                 not interpreted by SA-API framework */
}



Example gmCreateParameters:
{
  "type": "SapGoldMasterCreateParameters",
  "name": "GM-VN-008",
  "virtualMachines": {
    "https://vla32.saplab.vmw.com:9443/api/sa/v3/res-
```

```
providers/vc/objects/rp-2/inventory/vms/vm-250": {
      "cloneToTemplateParameters": {
        "name": "SLES11.4-ORA12-NW7.4-ABAP-GM001",
        "storage": "https://vla32.saplab.vmw.com:9443/api/sa/v3/res-
providers/vc/objects/rp-2/inventory/datastores/datastore-245"
 },
      "labels": {
        "192.168.10.112": "physical",
        "192.168.10.113": "communication",
        "192.168.11.112": "additional"
 }
    }
},
  "mode": "CLONE_VM_TO_TEMPLATE",
  "operationId": {
    "originatorId": "vra-001",
    "transactionId": "2267d841-8bf9-40a4-82a8-488181fvads5"
 },
  "opaqueData": "",
  "globalCredentials": [
    {
      "user": "oracle",
      "password": "VMware1234!",
      "type": "DB_ADMINISTRATOR"
 },
    {
      "user": "o08adm",
      "password": "VMware1234!",
      "type": "SAP_ADMINISTRATOR"
 },
    {
      "user": "sapadm",
      "password": "VMware1234!",
      "type": "HOST_AGENT"
 }
  ],
  "rfcDestinationConfiguration": {
    "credential": {
      "user": "sap*",
      "password": "VMware$$20"
 },
    "router": "",
    "language": "EN",
    "client": "000",
    "destinationsForPCA": [
      {
        "client": "000",
        "credential": {
          "user": "sap*",
          "password": "VMware$$20"
 }
      },
      {
        "client": "001",
        "credential": {
```

```
          "user": "sap*",
          "password": "VMware$$20"
 }
      }
    ]
  },
  "swpmConfiguration": {
    "release": "7.X",
    "isLocal": false,
    "path": "nfs1.saplab.vmw.com:/export/SWPM1/SWPM_LIN/SP10P17P5",
    "mountOptions": "rw",
    "osType": "LINUX"
 },
  "pcaTasks": [
    {
      "client": "000",
      "taskList": "SAP_BASIS_COPY_INITIAL_CONFIG",
      "taskListVariant": ""
 },
    {
      "client": "001",
      "taskList": "SAP_BASIS_COPY_BDLS",
      "taskListVariant": "TEST"
 }
  ]
}
```

- Response Code:
  - Code 202:
    - Description: A response code of 202 indicates that the Gold Master (GM) creation request is successful and the request is queued up for execution.
    - Output Format:

```
Link          /* A link to a resource, collection or endpoint */
{
   label:    /* (String) A human readable descriptive label that
                identifies the resource */
    href :    /* (String) URI of the link */
    methods:[ /* (String) A set of methods supported by resource,
                collection or endpoint identified by the URI */
            ]
}
```

  - default Failure:

```
StandardError
{
    code:                       /* (Integer) Error code for developers */
    internalMessage:            /* (String) Error message for developers */
    info:  Uris [    /*(String) Array of 0 or more URIs that are Links to
                       resources where developers can find more information */
        (0 or more)
            ]
    userMessage:     /* (String) Message for end-users
}
```

Delete a specific Gold Master (GM)

- Description: DELETE method is used to delete a specific Gold Master (GM). It returns an execution request that you can then use to check the status of the operation.
- REST Method: **DELETE**
- Request URL:

  ```
  https://vlahost.example.com:9443/api/sa/v3/gold-master/objects/{id}
  ```

- Parameters:

  ```
  gmDestroyParameters       /* Essential parameters required to destroy a Gold Master (GM)
  {
      OperationID {         /* A pair of unique identifiers used for operation traceability
                               purposes */
          originatorID:      /* (String) A unique identifier of a user who initiates
                                a transaction. It shall contain only case insensitive
                                alphanumeric characters */
          transactionID:     /* A unique identifier of a transcation. It shall be
                               hexadecimal and unique within the last 1000
                               transaction IDs */
       }
  }
      id                     /* (String) It is the path of the unique resource identifier that
                                needs to be deleted */
  ```

- Response Code:
  - Code 202:
    - Description: A response code of 202 indicates that the Gold Master (GM) deletion request is successful and the request is queued up for execution.
    - Output Format:

      ```
      Link          /* A link to a resource, collection or endpoint */
      {
         label:     /* (String) A human readable descriptive label that
                       identifies the resource */
          href :    /* (String) URI of the link */
          methods:[ /* (String) A set of methods supported by resource,
                       collection or endpoint identified by the URI */
                  ]
      }
      ```

  - Code 404:
    - Description: A response code of 404 indicates that the specified Gold Master (GM) is not found and hence delete operation is unsuccessful.
  - default Failure:

    ```
    StandardError
    {
        code:                       /* (Integer) Error code for developers */
        internalMessage:            /* (String) Error message for developers */
        info:  Uris [               /* (String) An array of 0 or more URIs that are Links
                                       to resources where developers can find
                                       more information */
    ```

```
                (0 or more)
                    ]
        userMessage:                /* (String) Message for end-users
    }
```

Creating a Gold Master (GM)

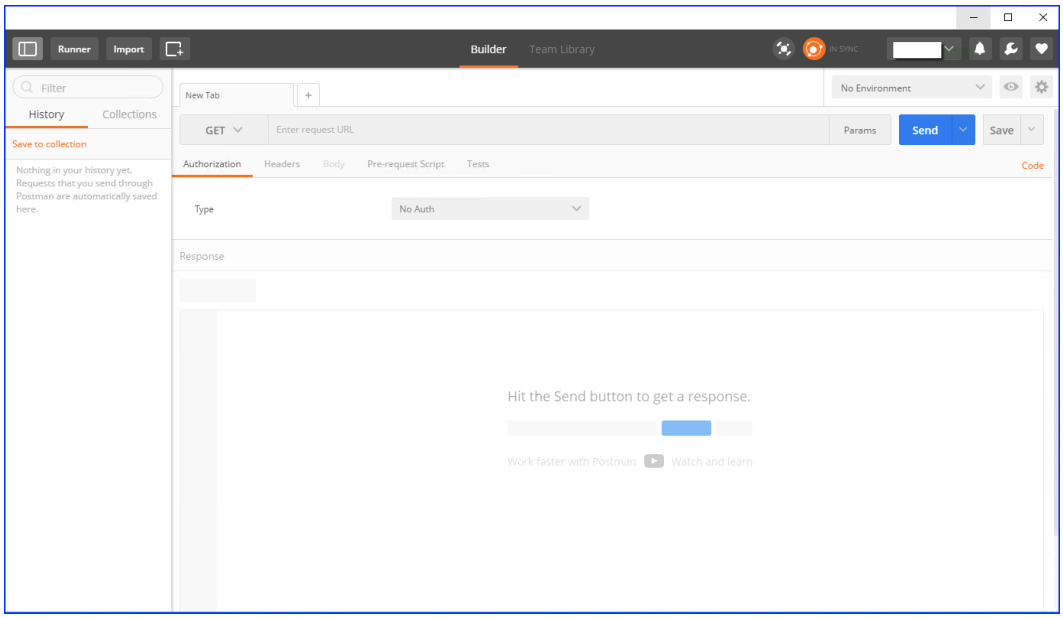
This section discusses the steps you need to follow to create a Gold Master (GM) from a verified SAP System.

Procedure

1 Download a REST client (often called RESTClient) of your choice.

Some are browser plugins. Others are stand-alone applications. VMware does NOT recommend any specific RESTClient plugin as such. For the purpose of this illustration, the Postman RESTClient plugin has been downloaded and is being used with Google Chrome, as shown in the following figure:

Figure 4-4. Postman Client with Google Chrome



2 Set the authentication method your RESTClient will use with the SA-API server.

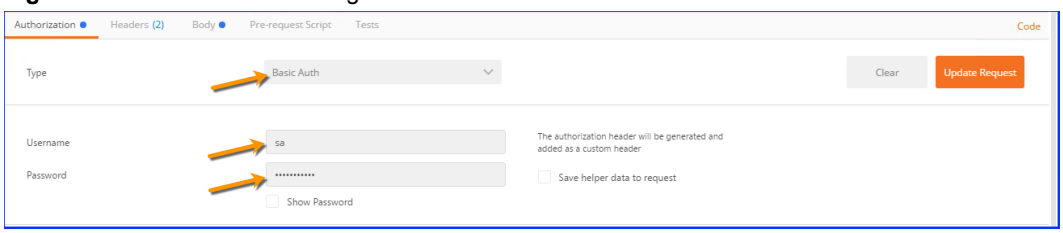
a In Postman, to set the authentication type, select the **Authorization** tab in the right pane of the Postman Client Window.

b Select `Basic Auth` as the Authorization type, in the **Type** drop down list.

c Type in the **Username** and **Password** in the respective fields to be able to connect to the SA-API Server on the VLA

The following diagram depicts the different fields to setup the Authorization:

Figure 4-5. Authorization Settings



3 Set the **Accept** and **Content-Type** key-value pair to convey to the REST service that you intend to work with JSON and that the REST method is to respond with and to, JSON objects.

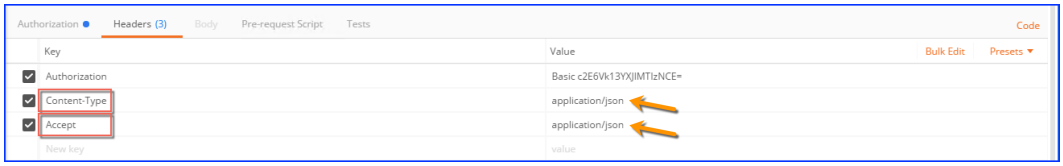
a Click on the **Headers** tab to the right of the **Authorization** tab in the Postman Client Window.

b Set a new key by typing in **Content-Type** in the Key field and setting its value to **application/json**.

c Define another key called **Accept** and set its value to **application/json**

The following figure depicts how to setup the **Accept** and **Content-Type** key-value pair under the **Headers** tab:

Figure 4-6. Setting Accept and Content-Type key-value pairs



4 Create a Gold Master (GM) from a Verified SAP System VM

a Identify the verified SAP System VM that you intend to convert to a Gold Master (GM), either from the LaMa dashboard or the VC. This identified SAP System VM should be up and running with all the required services.

b Select the **POST** REST method from the drop down list (highlighted with arrow for reference).

c Enter the following request URL in its allotted field (to the right of the POST method) in the Postman Client (highlighted with arrow for reference)

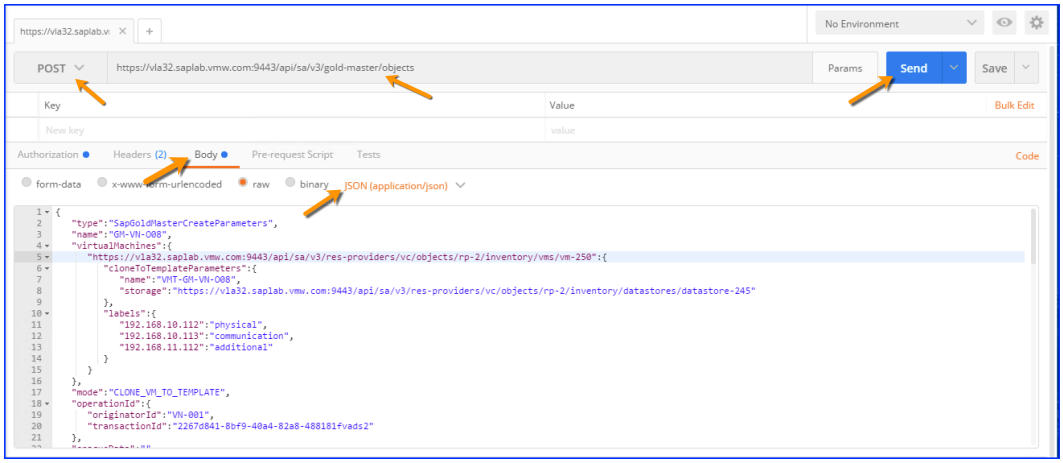
```
https://vlahost.example.com:9443/api/sa/v3/gold-master/objects
```

d Click on the **Body** tab (highlighted with arrow for reference). Select the payload format as appropriate. In this example, the chosen format is `raw` and `JSON(application/json)` respectively (highlighted for reference).

e Type in the payload (the required parameters for GM Creation) (Refer : "SA-API Gold Master Methods," on page 28)

f Click on the **Send** button (highlighted with arrow for reference) to initiate the Gold Master (GM) creation.

Figure 4-7. POST Method Invocation - GM Creation

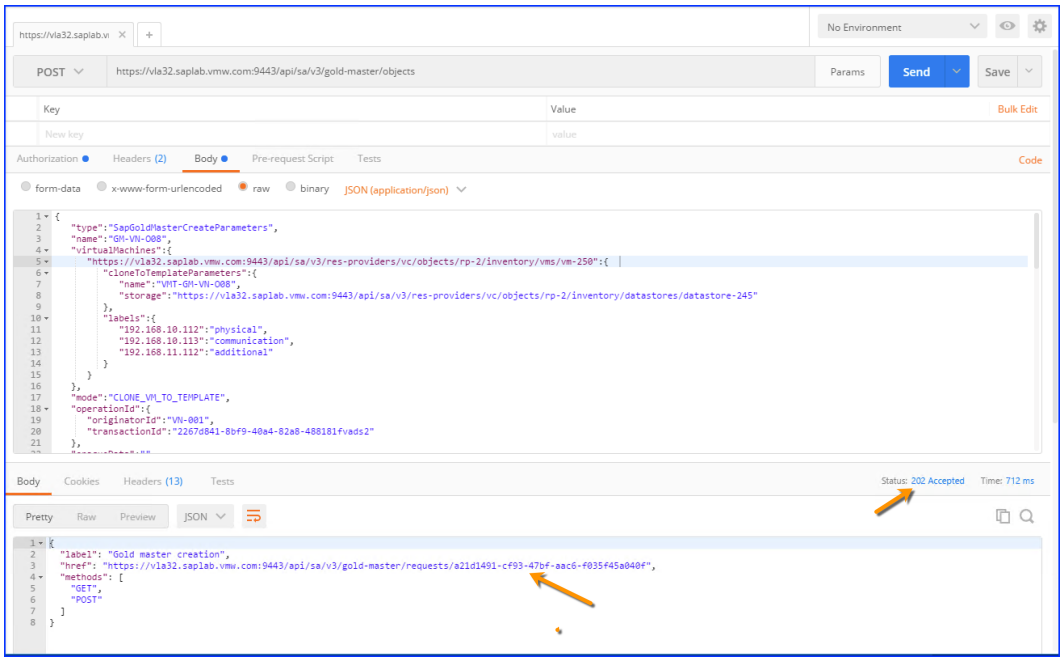


5 Observe the response code at the bottom of the Postman Client window to verify if your Gold Master creation request was successful or not.

a A response code of 202 indicates that the GM creation request was submitted successfully and that the request is queued up for execution. Use the indicated URI (highlighted with arrow for reference) to track the progress of GM creation process.

b In case of a failure, you see an appropriate integer error code along with URI and messages indicating the reason for failure, which you can then use for further debugging (Refer : "SA-API Gold Master Methods," on page 28)

Figure 4-8. POST Operation Request Successful



6 Check the progress of Gold Master creation execution.

a Copy the URI link and open it in a browser to check the status of GM creation process as shown in the following figure:

Figure 4-9. GM Creation Execution Status Check

b Keep refreshing the browser window to track the progress of GM Creation.

7 Verify successful creation of the Gold Master (GM)

a Observe the following output upon successful creation of the Gold Master.

Figure 4-10. GM Creation Successful

8 Verify the presence of your newly created Gold Master (GM) in the list of all available GMs

a Select the GET REST method in your Postman Client window.

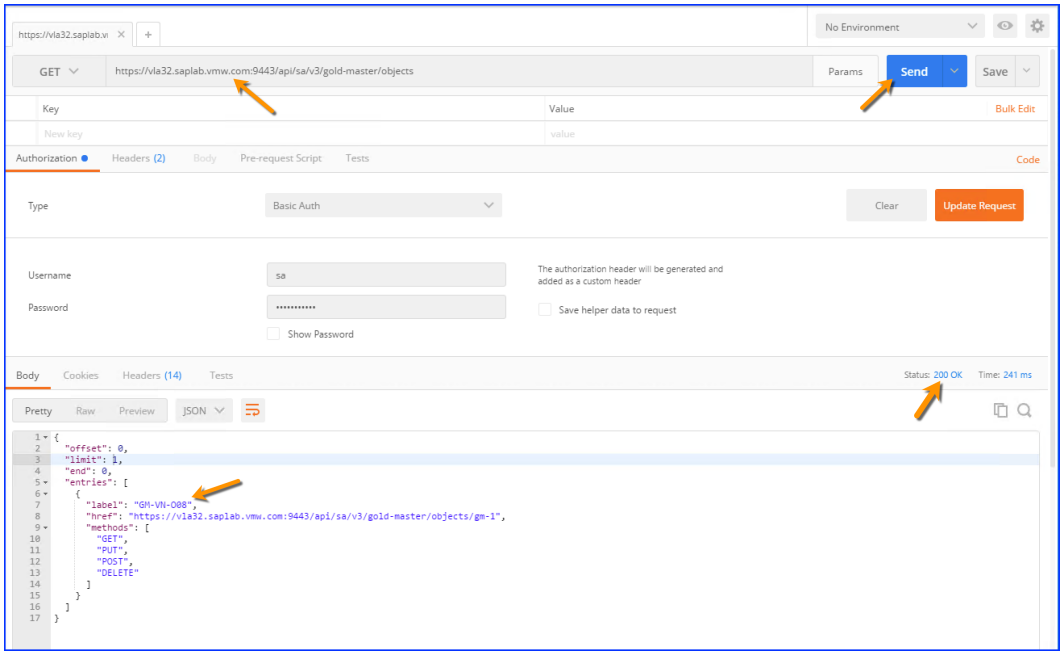
b Type in the following request URL in its allotted field (to the right of the GET method) in the Postman Client

```
https://vla.example.com:9443/api/sa/v3/gold-master/objects
```

c Authorization settings and Accept and Content-Type key value pair settings should be set as per step 2 and 3, in this section.

d Click on the **Send** button, to invoke the GET REST method to list out the available GMs.

Figure 4-11. List of available GMs



e You should see a response code of 200 upon successful execution of the GET REST method (Refer : "SA-API Gold Master Methods," on page 28)

f verify the presence of your newly created GM (highlighted with arrow for reference in the preceding figure) in the array of `entries` in the body of the output, at the bottom of the Postman Client window.

After successful completion of the preceding steps you have created a new Gold Master (GM) from a verified SAP System VM.

Deleting a Gold Master (GM)

This section discusses the steps you need to follow to delete a Gold Master (GM).

Procedure

1 Complete steps 1, 2 and 3 from topic "Creating a Gold Master (GM)," on page 33 before proceeding further.

2 List out all available GMs from which you can select the GM to you wish to delete.

a Select the **GET** REST method from the drop down list (highlighted with arrow for reference).

b Enter the following request URL in its allotted field (to the right of the GET method) in the Postman Client (highlighted with arrow for reference)

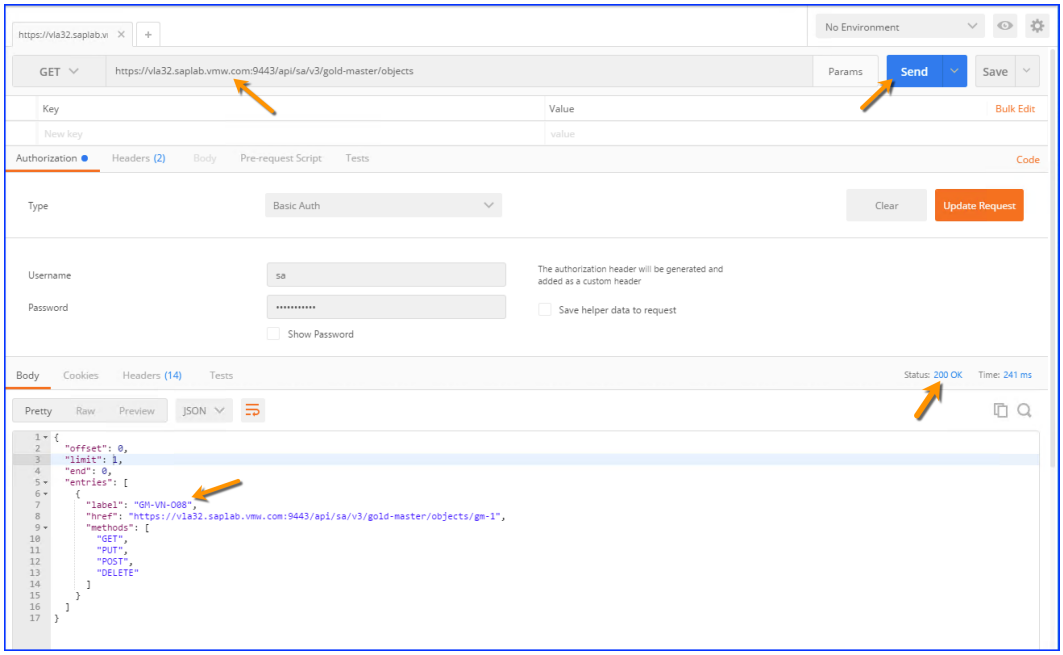
```
https://vlahost.example.com:9443/api/sa/v3/gold-master/objects
```

c Click the **Send** button to initiate the **GET** REST method call.

d Verify the status of execution of the **GET** method. You get a response code of 200 (highlighted with arrow for reference) upon successful execution. (Refer "SA-API Gold Master Methods," on page 28)

e Find the list of all available GMs in the array of `entries` in the body of the output, at the bottom of the Postman Client window (highlighted with arrow for reference) as depicted in the following figure:

Figure 4-12. List available GMs



f Note the path of the unique resource identifier for your Gold Master, the one that you intend to delete. The **href** field in the `entries` array refers to the unique resource identifier of the Gold Master (GM), in this case (highlighted with arrow in the preceding figure). You will pass this as an identifier (`id`) of the GM that you wish to delete, in the following step 3.

3 Delete the specific GM by invoking the **DELETE** REST method.

a Select the **DELETE** REST method from the drop down list in the REST Client

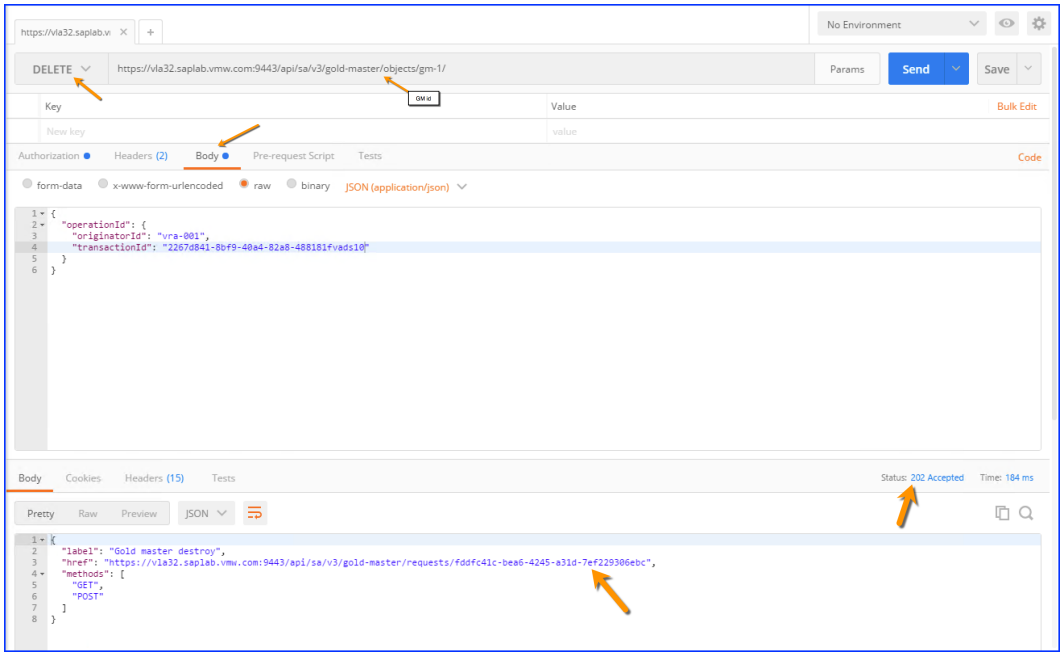
b Type in the identifier (`id`) of the GM that you wish to delete (Refer to step 2(f) in this section) (highlighted with arrow for reference in the following figure)

c Click the **Body** tab (highlighted with arrow for reference). Select the payload format as appropriate. In this example, the chosen format is `raw` and `JSON(application/json)` respectively.

d Type in the payload (the required parameters for GM Deletion) (Refer : "SA-API Gold Master Methods," on page 28)

e Click the **Send** button to initiate the Gold Master (GM) deletion process.

Figure 4-13. Gold Master Deletion



4 Observe the response code at the bottom of the Postman Client window to verify if your Gold Master deletion request was successful or not.

a A response code of 202 indicates that the GM deletion request was submitted successfully and that the request is queued up for execution. Use the indicated URI (highlighted with arrow for reference) to track the progress of GM deletion process

b In case of a failure, you see an appropriate integer error code along with URI and messages indicating the reason for failure, which you can then use for further debugging (Refer : "SA-API Gold Master Methods," on page 28)

5 Check the progress of Gold Master deletion execution.

a Copy the URI link (step 4(a) in this section) and open it in a browser to check the status of GM deletion process

b Keep refreshing the browser window to track the progress of GM deletion.

6 Observe the following output upon successful deletion of the Gold Master.

a Upon successful deletion of the Gold Master you see an output similar to the following in your browser:

Figure 4-14. GM Deletion Successful

7 Execute step 2 (in this section) again, to verify that the Gold Master that you deleted and is no longer listed in the list of all available Gold Masters.

After successful completion of the preceding steps you have deleted a specific Gold Master (GM).

Creating vRA Blueprints

This section discusses how to create vRA Blueprints using the Connector

Procedure

1 SSH to VLA console using appropriate credentials.

2 Get Administrative privileges

   a Execute `sudo` to get administrative access

   b You are prompted for the password. Enter the console user password that you provided when you deployed the VLA

   ```
   sudo –s
   ```

3 Prepare the properties file by setting appropriate property values for hosts, users, vRA tenant and optionally workflows.

a Open the file `/opt/vmware/connector/conf/connector.properties` in an editor of your choice.

b Edit appropriate property values for hosts, users, vRA tenant and optionally workflows in this file as per your setup

c A sample of the edited properties file is shown in the following figure:

Figure 4-15. Sample Properties File

```
vla32:/opt/vmware/connector/conf # cat connector.properties
#
# VMware Adapter for SAP Landscape Management Connector for vRealize Automation
#
# Connection Properties
#
# FQDN of vRealize Automation REST API server
vRAHost=vra1.saplab.vmw.com
#
vRAPort=443
#
vRAUser=configurationadmin@vsphere.local
#
# FQDN of vRealize Orchestrator REST API server
vROHost=vra1.saplab.vmw.com
#
vROPort=443
#
vROUser=administrator@vsphere.local
#
vRATenant=vsphere.local
#
# FQDN of Solutions Automation REST API server
# Comment this property setting to use the local server FQDN
SAAPIHost=vla32.saplab.vmw.com
#
SAAPIUser=sa
#
# SA-API port
SAAPIPort=9443
#
# General Properties
#
DataDirectory=data
#
# Blueprint Generation Properties
#
ApplicationNameMinLength=8
#
# Workflow Generation Properties
#
OriginatorID=1
#
PreCreateWorkflow=
#
PostCreateWorkflow=
#
ErrorWorkFlow=
#
PreDeleteWorkflow=
#
PostDeleteWorkflow=
#
# Boolean - When configuring REST host, accept any certificate
AcceptCertificate=false
#
# Boolean - when configuring REST host, FQDN must match Cert
FQDNMatchesCert=true
#
# The ID of the vRO Configuration Workflow that ties vRO to SA
# Once this property is set correctly run "connector -s" to configure
# vRO/SA connectivity.
ConfigurationWorkflow=2cb2358d-d6b9-4ace-a301-e39a4d494239

vla32:/opt/vmware/connector/conf #
```

4 Create vRA blueprints from Gold Masters

a Execute the following `connector` command using the -c flag

```
/opt/vmware/connector/bin/connector –c –[g <gm–id> | a | i <filename>]
```

NOTE

- Use the -g <gm-id> , option if you want to generate a blueprint for a specific GM
- Use the -a , option if you want to generate blueprints for all the available GMs
- Use the -i <filename> , option if you want to generate blueprints for one or more GMs whose GM Ids you need to specify in a text file whose pathname you pass to the `connector` command with -i option. Each GM Id is specified one per line in the text file.
- You can use only one of the preceding three options at any point in time
- For details on the connector command refer to "The Connector Command," on page 46

The following figures depict sample usage of the `connector` command to create vRA blueprints out of all available GMs:

Figure 4-16. Create Blueprint

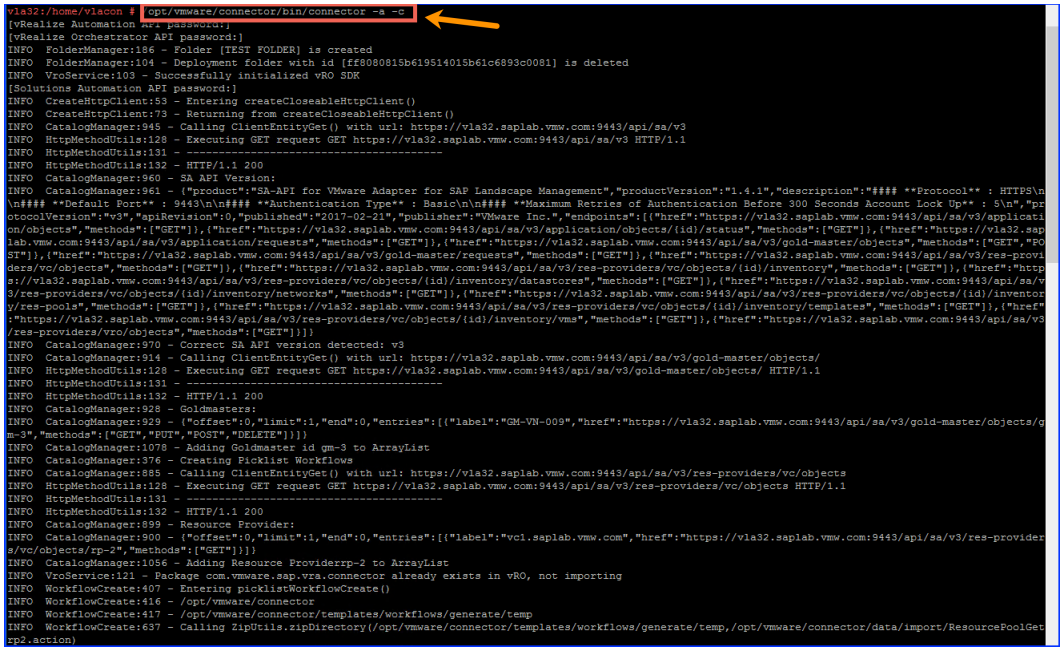


Figure 4-17. Blueprint Create (Contd.)

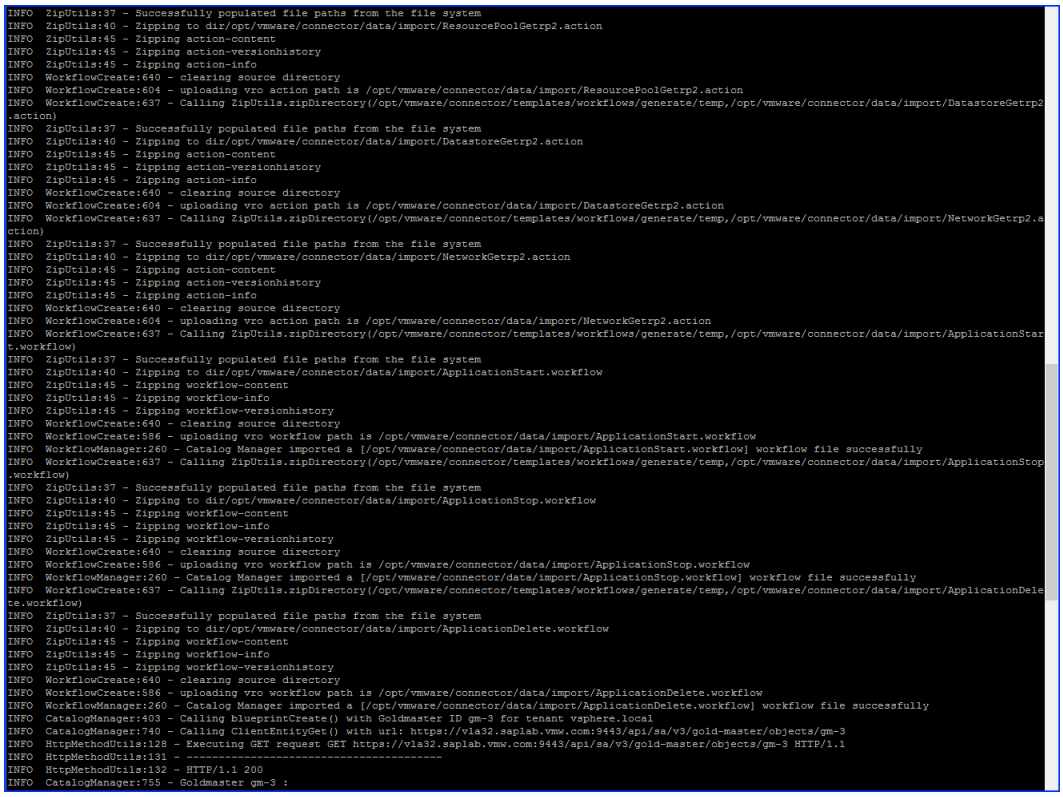


Figure 4-18. Blueprint Create (Contd.)

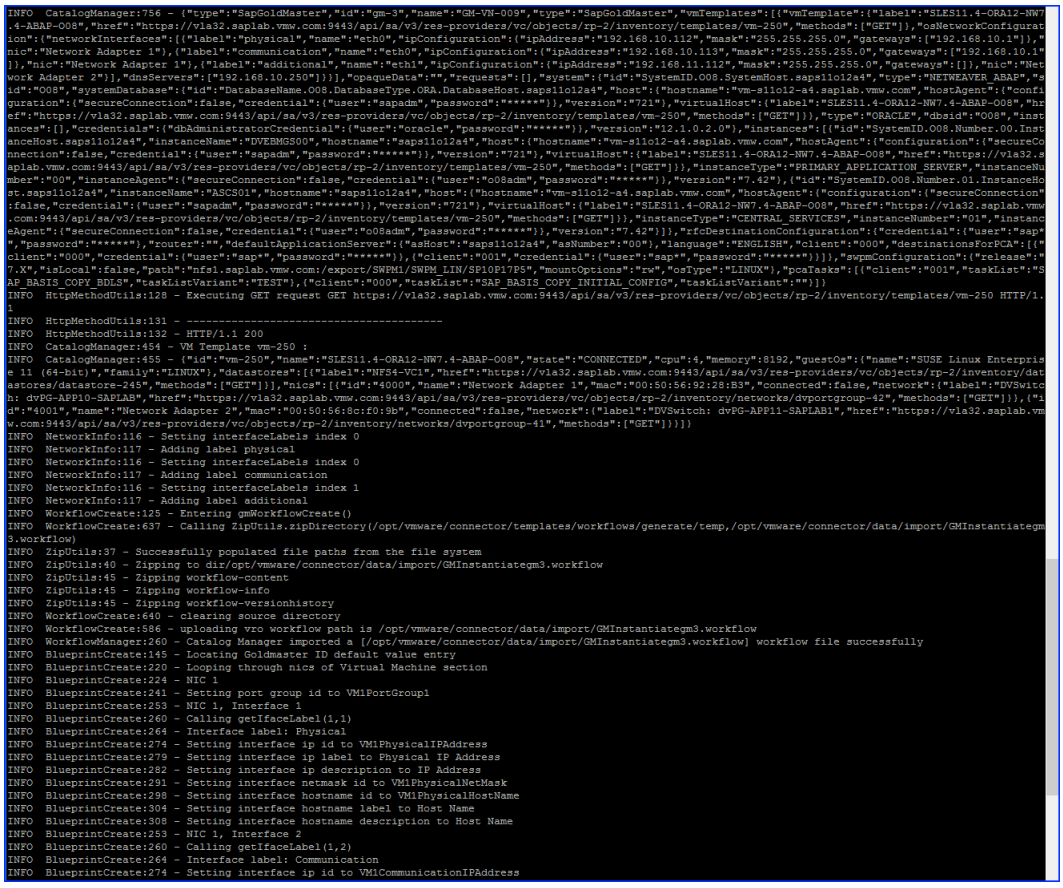
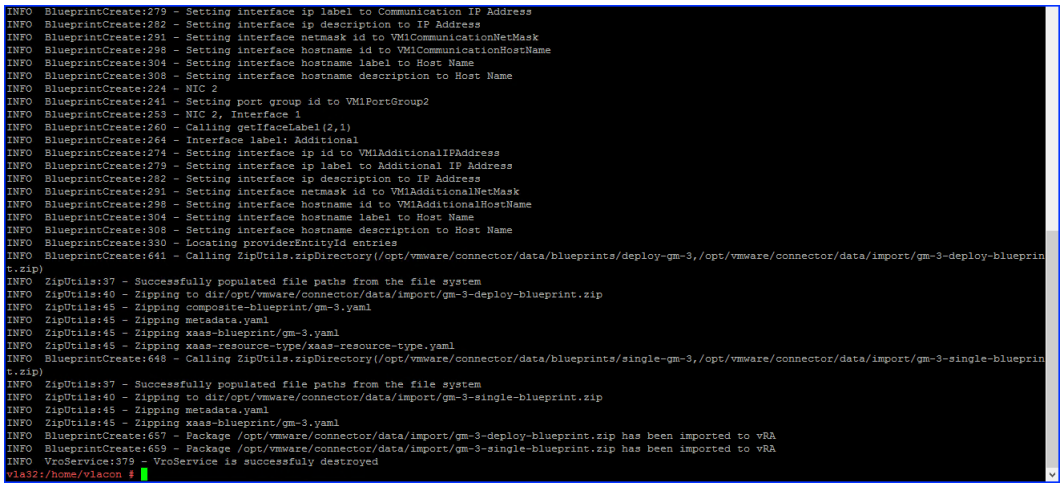


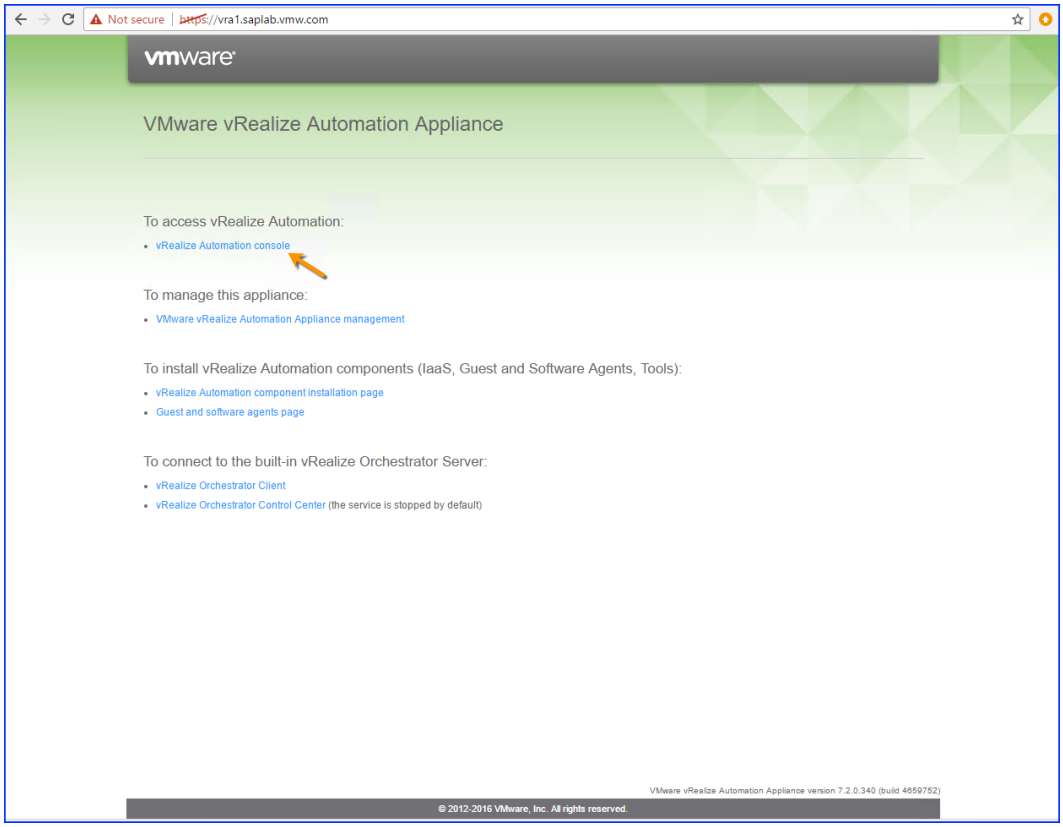
Figure 4-19. Blueprint Create (Contd.)



5 Verify the addition of a new blueprint corresponding to your GM, in the list of **Blueprints** on the vRA

a Login to your browser. Type in the FQDN or IP address of your vRA as depicted in the following figure:

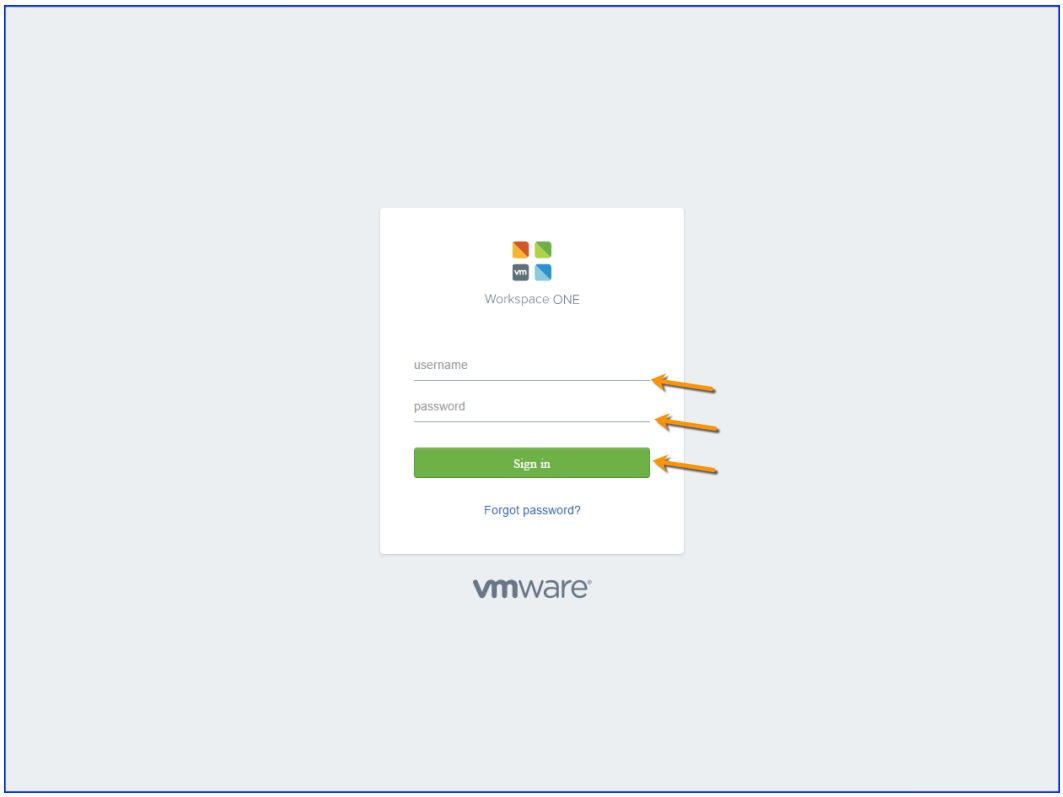
Figure 4-20. vRA - Login Page



The browser opens the VMware vRealize Automation Appliance home page. You need to connect to the VMware vRealize Automation Console (highlighted with arrow for reference in the preceding figure)

b Click on vRealize Automation Console link. The browser now opens the vRealize Automation Console login page as shown in the following figure:

Figure 4-21. vRealize Automation Console Login Page



c Type in the `Username` and `Password` credentials and Click on **Sign in** tab to login (highlighted with arrow for reference in the preceding figure). The browser takes you to the vRA home page.

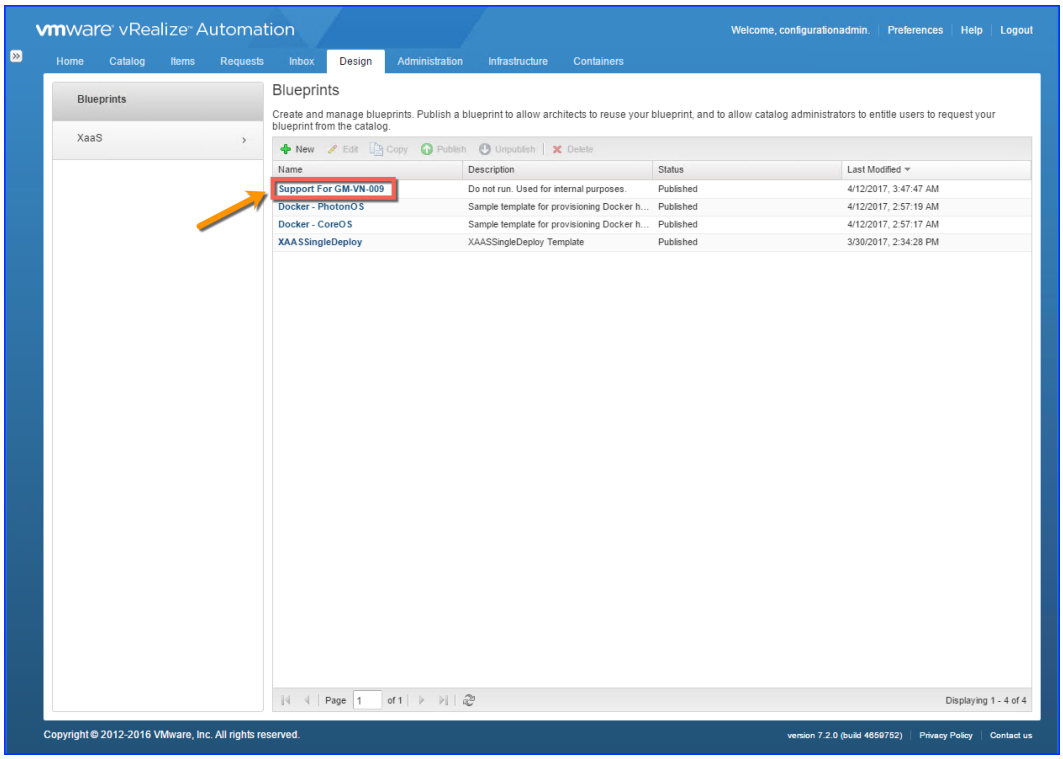
6 Locate the new vRA blueprint that you created.

a Click on the **Design** tab in the menu bar

b Select **Blueprints** in the left pane

c Locate your newly created blueprint in the right pane as seen in the following figure:

Figure 4-22. Verify Blueprint Creation



You have learnt how to create vRA Blueprints from your existing Gold Masters (GMs).

The Connector Command

This section provides a summary of the various options for the `connector` command.

Following are the options currently available with the `connector` command:

Table 4-1. connector command options

Parameter	Type	Description
-c --create	Action	Create Actions, Blueprints and Workflows for specified Goldmaster(s)
-s --setup	Action	Setup vRO/SA connectivity using Workflow ID specified in properties
-l --list	Action	List all Gold Masters (GMs) on the SA Server
-h --help	Action	Display connector command usage message
-a --all	Modifier	Perform action (create) for all the Gold Masters (GMs)

Table 4-1. connector command options (Continued)

Parameter	Type	Description
-g --goldmaster <gmid>	Modifier	Perform action (create) on the specific Gold Master (GM) whose <gmid> is mentioned
-i --input <filename>	Modifier	Perform action for all the Gold Masters IDs mentioned in the file <filename>
-n --noaction	Modifier	Only write workflows and vRA objects to the local file system and does not import any object into vRA or vRO.
-t --tenant <tenant id>	Modifier	Overrides the default tenant specified in the properties file

Deleting a Blueprint for a Gold Master

This section discusses how to delete a specific blueprint of a Gold Master (GM) in the vRA.

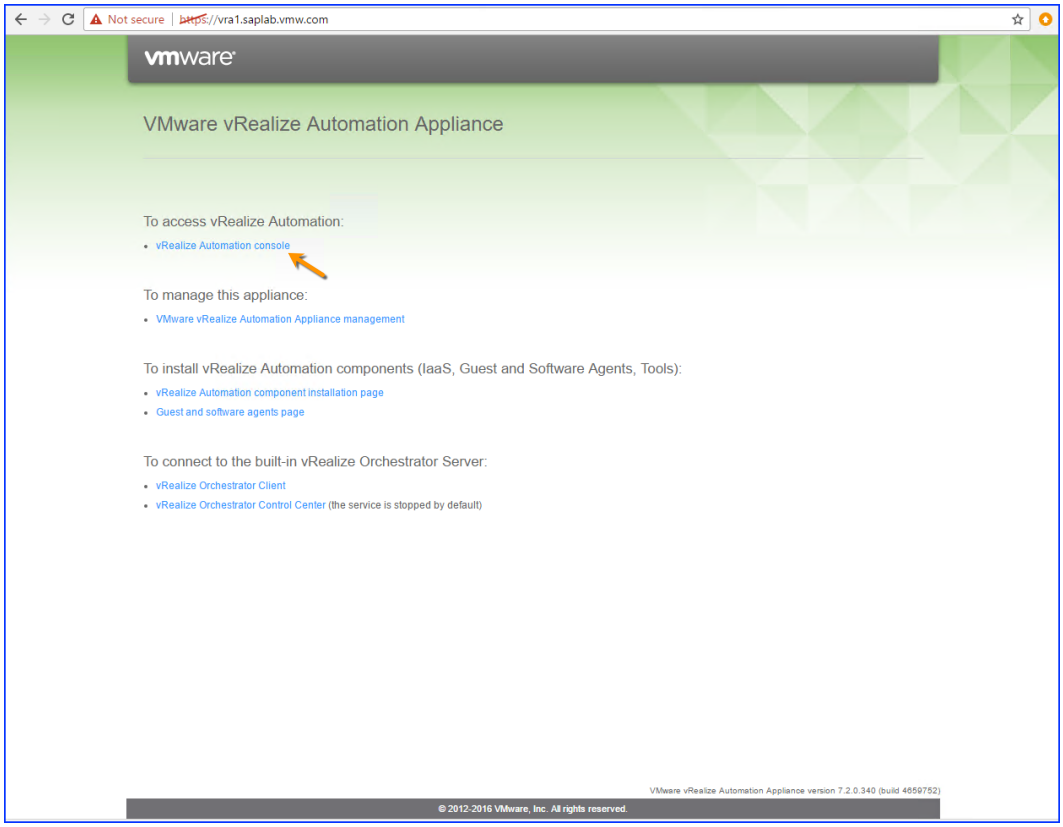
Procedure

1 Login to vRA

a Open the browser of your choice

b Type in the FQDN or IP address of your vRA. The browser opens the VMware vRealize Automation Appliance home page as depicted in the following figure:

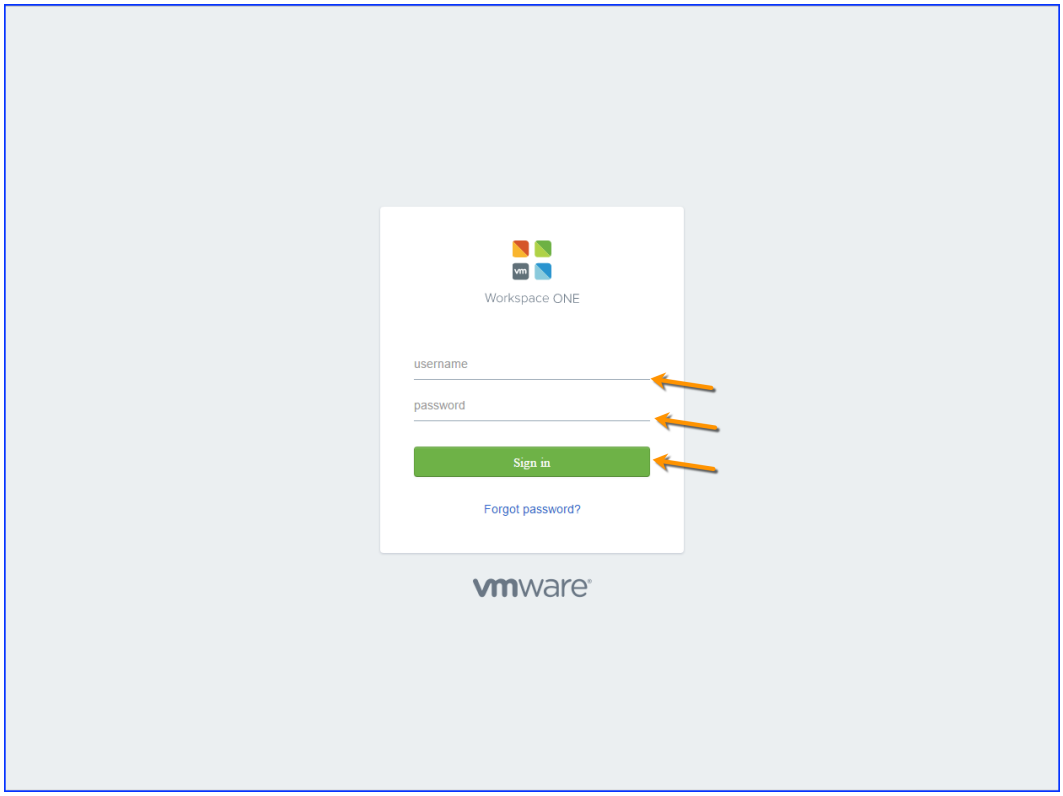
Figure 4-23. vRA - Login Page



2 Login to the VMware vRealize Automation console

a Click on vRealize Automation Console link (highlighted with arrow for reference in the preceding figure). The browser now opens the vRealize Automation Console login page as shown in the following figure:

Figure 4-24. vRealize Automation Console Login Page



b Type in the `Username` and `Password` credentials and Click on **Sign in** tab to login (highlighted with arrow for reference in the preceding figure). The browser now takes you to the vRA home page.

3 Locate the blueprint that you wish to delete

a Click on the **Design** tab in the menu bar (highlighted with arrow for reference in the following figure).

b Select **Xaas Blueprints** in the left pane.

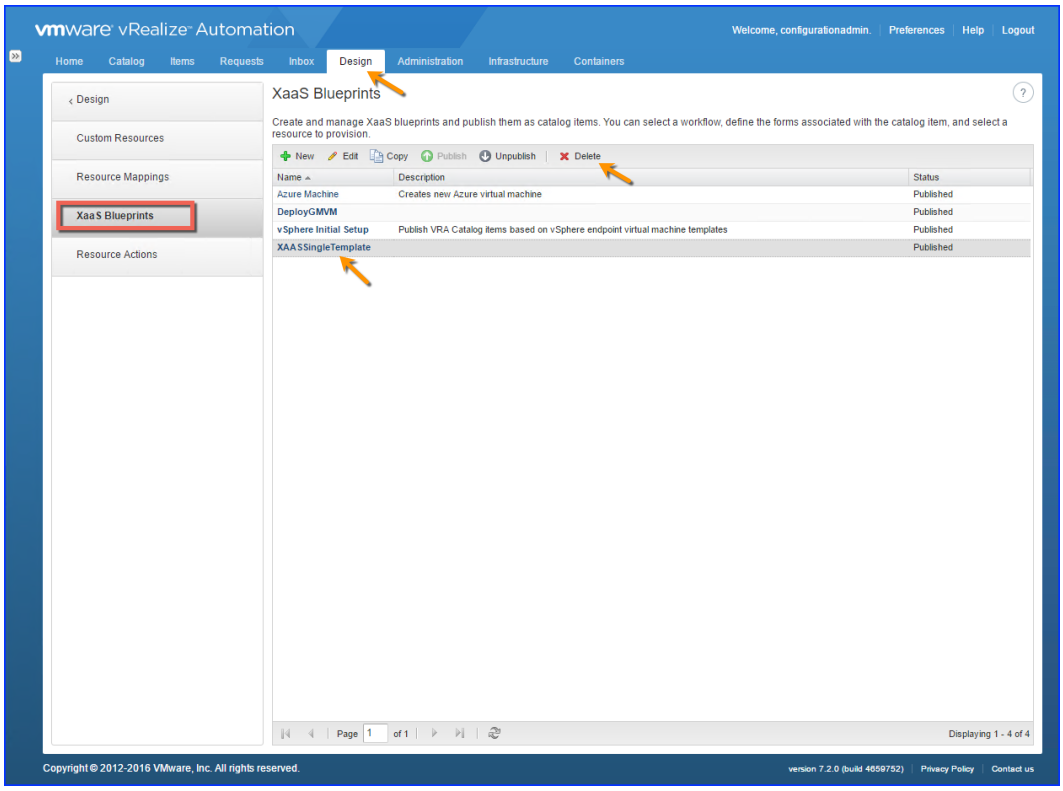
c The list of all blueprints currently available will be listed in the right pane. Locate the blueprint that you wish to delete in this list.

4 Delete the identified blueprint

a Select the specific blueprint that you wish to delete in the right pane by Clicking on it (highlighted with arrow for reference)

b Click on **Delete** tab (highlighted with arrow for reference in the following figure) to delete the identified blueprint

Figure 4-25. vRA Blueprint Deletion



By executing the preceding the steps you have successfully deleted a blueprint of a Gold Master (GM) in vRA.

Deleting a vRO Workflow

This section discusses the steps to execute to be able to delete a vRO Workflow.

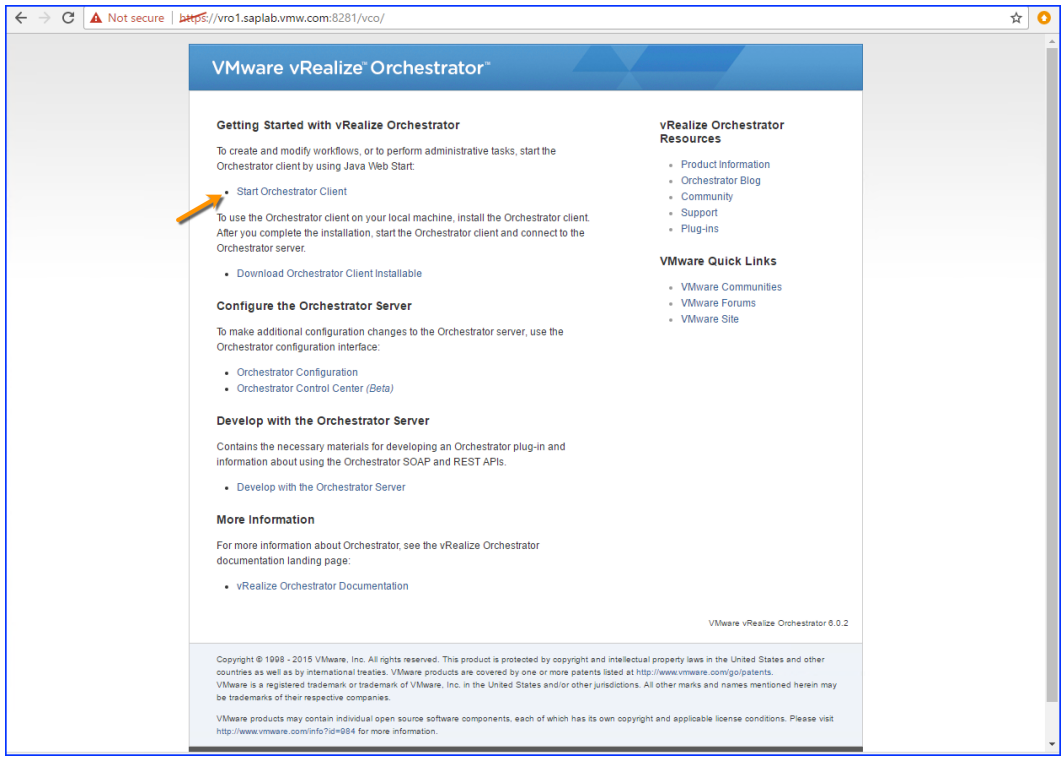
Procedure

1 Open your browser and type in the following URL:

```
https://vro.example.com:8281/vco/
```

The browser opens the VMware vRealize Orchestrator home page. Observe the **Start Orchestrator Client** link (highlighted with arrow for reference) in the following figure:

Figure 4-26. VMware vRealize Orchestrator Home Page

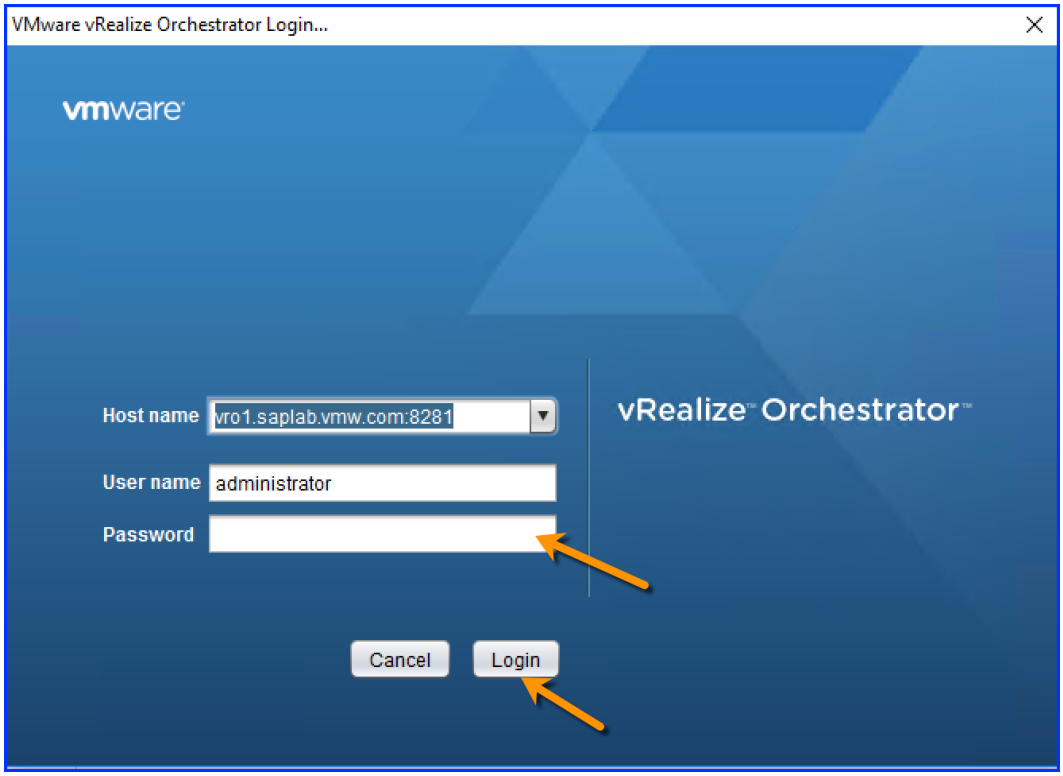


2 Download and start the Orchestrator Client

a Click on the **Start Orchestrator Client** link (highlighted with arrow in the preceding figure)

b Download the Orchestrator Client, Save it and Run it. You see the VMware vRealize Orchestrator login page open up in a new pop-up window as shown in the following figure:

Figure 4-27. vRO Login Credentials



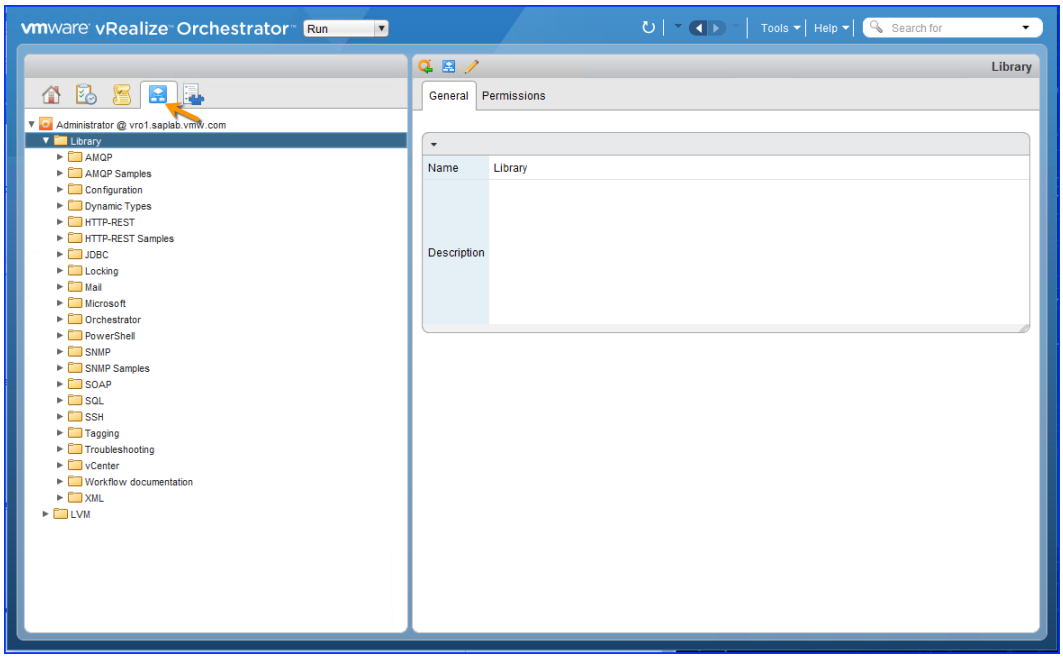
c Type in the credentials, `Username` and `Password` and then Click on the **Login** tab (highlighted with arrow for reference in the preceding figure).

d If you get a certificate warning, accept it to continue. The browser now opens up the vRA home page.

3 Open the library and locate the workflow to delete

a Click on the fourth tab (highlighted with arrow for reference in the following figure) in the left pane. This is the **Library** tab

Figure 4-28. Library



b Click on the directory in the left pane under **Library**. Open the folder containing the workflow and locate the workflow that you wish to delete in that folder

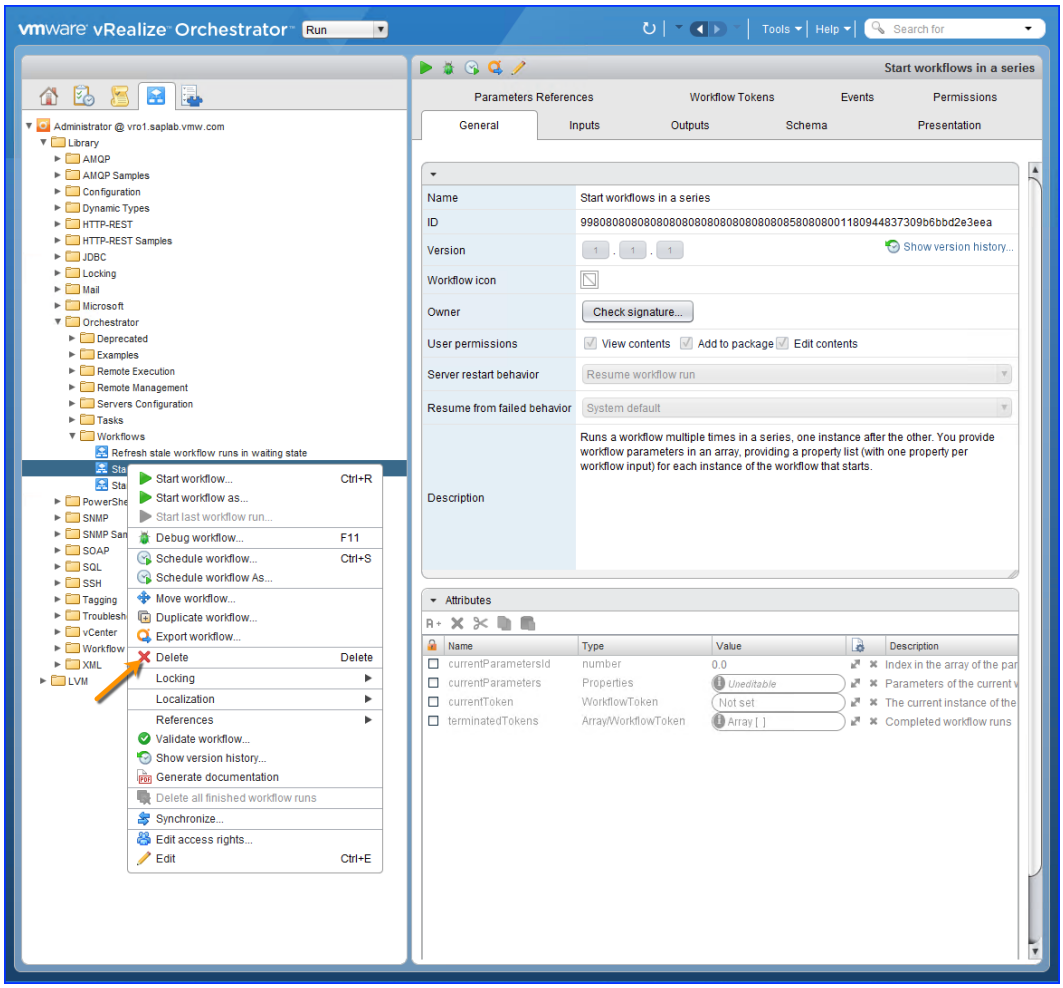
4 Delete the identified workflow

a Right Click on the identified workflow

b Select the **Delete** option in the popup menu by Clicking it to delete the selected workflow.

c The following figure shows an example of how to delete a workflow in the `Workflows` directory:

Figure 4-29. Workflow Delete



Note The chosen directory and the workflow marked for deletion in the preceding figure are representational only. Select the appropriate directory containing the workflow that you intend to delete in order to execute this step.

By executing the previous steps you are able to successfully delete a workflow in VMware vRealize Orchestrator.