# HOL-1790-CHG-1

# Table of Contents


Lab Overview - HOL-1790-CHG-1 - vRealize Automation Challenge Lab ..... 3
Lab Guidance ..... 4
Module 1: Introduction ..... 8
Overview of vRealize Automation Challenge Lab ..... 9
Troubleshooting tools available ..... 10
Module 2: Cloud Administration, Basic Challenge ..... 18
Introduction ..... 19
Some users are not receiving email notifications. ..... 20
Service architect is not able to find vCenter templates when designing their blueprints ..... 24
Some users are not able to see requests for catalog item, it keeps failing ..... 27
Some users are not able to manage provisioned VMs ..... 29
The Service Architect is unable to create XaaS Blueprints ..... 32
Module 3: Cloud Extensibility, Basic Challenge ..... 34
Introduction ..... 35
Workflows are seen running multiple times instead of just once ..... 36
Workflows are not being triggered when they are supposed to ..... 49
Assigning a new workflow as an action that could be triggered by user ..... 62
Module 4: Cloud Administration, Advanced Challenge ..... 69
Introduction ..... 70
Some users noticed that they are not entitled to perform certain actions on their VMs ..... 73
Importing new content into catalog ..... 77
Unable to manage existing virtual machines in vRealize Automation portal ..... 83
Module 5: Cloud Extensibility, Advanced Challenge ..... 89
Introduction ..... 90
Provisioning process is not stopping when an event broker error occurs ..... 91
Post provisioning task extensibility ..... 107
Appendix ..... 114
Module 2: Cloud Administration, Basic Challenge ..... 115
Module 3: Cloud Extensibility, Basic Challenge ..... 116
Module 4: Cloud Administration, Advanced Challenge ..... 118
Module 5: Cloud Extensibility, Advanced Challenge ..... 119

# Lab Overview - HOL-1790-CHG-1 - vRealize Automation Challenge Lab

# Lab Guidance

**Note: It will take more than 90 minutes to complete this lab. You should expect to only finish 2-3 of the modules during your time. The modules are independent of each other so you can start at the beginning of any module and proceed from there. You can use the Table of Contents to access any module of your choosing.**

**The Table of Contents can be accessed in the upper right-hand corner of the Lab Manual.**

Lab Module List:

- **Module 1 - Introduction** (30 minutes) First time here? No problem. Start here to learn about the Challenge Labs and vRealize Automation specifically.
- **Module 2 - Cloud Administration, Basic Challenge** (30 minutes) This module challenges you to solve common cloud administration issues, including failed catalog item requests.
- **Module 3 - Cloud Extensibility, Basic Challenge** (45 minutes) Can you identify and resolve common integration issues between vRealize Orchestrator and vRealize Automation?
- **Module 4 - Cloud Administration, Advanced Challenge** (45 minutes) Increase the quality of your private cloud offering by identifying and fixing advanced issues in vRealize Automation, including day 2 operations failures, service provisioning errors, and more.
- **Module 5 - Cloud Extensibility, Advanced Challenge** (45 minutes) You deserve a pat on the back if you can track down these advanced integration challenges, some of which even seasoned integration engineers and cloud administrators find challenging to resolve.

**Lab Captains:**

- **Sam Aaron - Senior Consultant, United States of America**
- **Clement Wong - Senior Systems Engineer, Singapore**

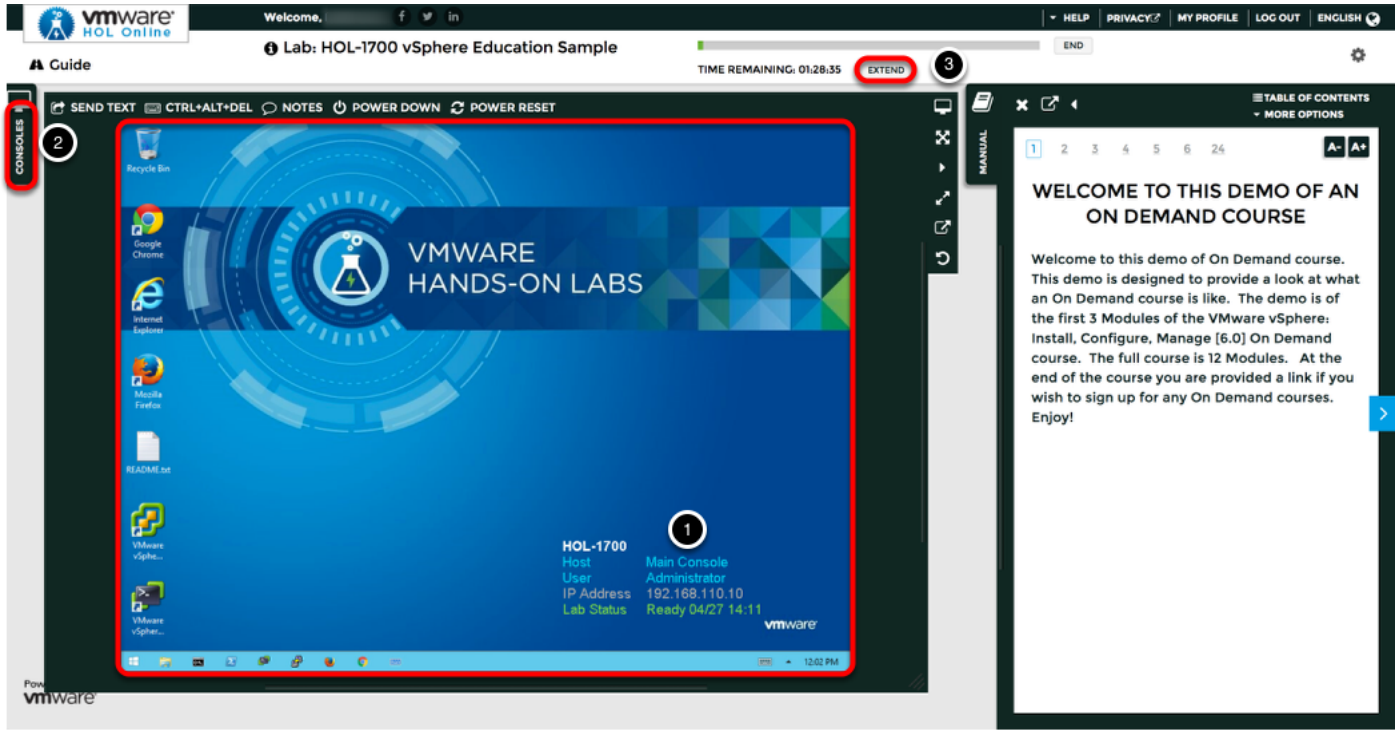
This lab manual can be downloaded from the Hands-on Labs Document site found here:

[http://docs.hol.pub/HOL-2017]

This lab may be available in other languages. To set your language preference and have a localized manual deployed with your lab, you may utilize this document to help guide you through the process:

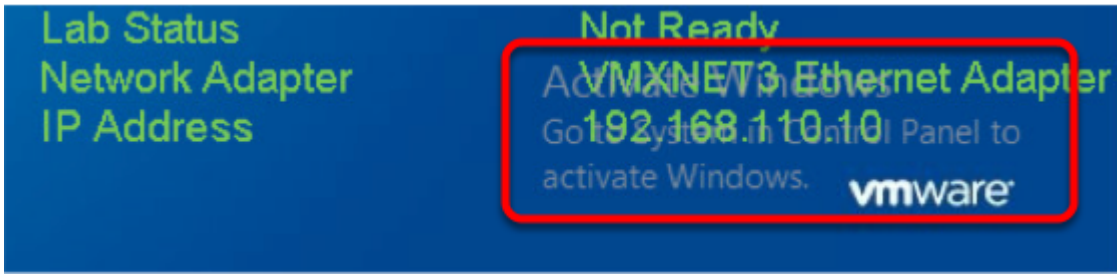
http://docs.hol.vmware.com/announcements/nee-default-language.pdf

# Location of the Main Console




1. The area in the RED box contains the Main Console. The Lab Manual is on the tab to the Right of the Main Console.
2. A particular lab may have additional consoles found on separate tabs in the upper left. You will be directed to open another specific console if needed.
3. Your lab starts with 90 minutes on the timer. The lab can not be saved. All your work must be done during the lab session. But you can click the **EXTEND** to increase your time up to 9 hours and 30 minutes. Each click gives you an additional hour.

# Activation Prompt or Watermark




When you first start your lab, you may notice a watermark on the desktop indicating that Windows is not activated.

One of the major benefits of virtualization is that virtual machines can be moved and run on any platform. The Hands-on Labs utilizes this benefit and we are able to run the labs out of multiple datacenters. However, these datacenters may not have identical processors, which triggers a Microsoft activation check through the Internet.

Rest assured, VMware and the Hands-on Labs are in full compliance with Microsoft licensing requirements. The lab that you are using is a self-contained pod and does not have full access to

the Internet, which is required for Windows to verify the activation.  Without full access to the Internet, this automated process fails and you see this watermark.

This cosmetic issue has no effect on your lab.

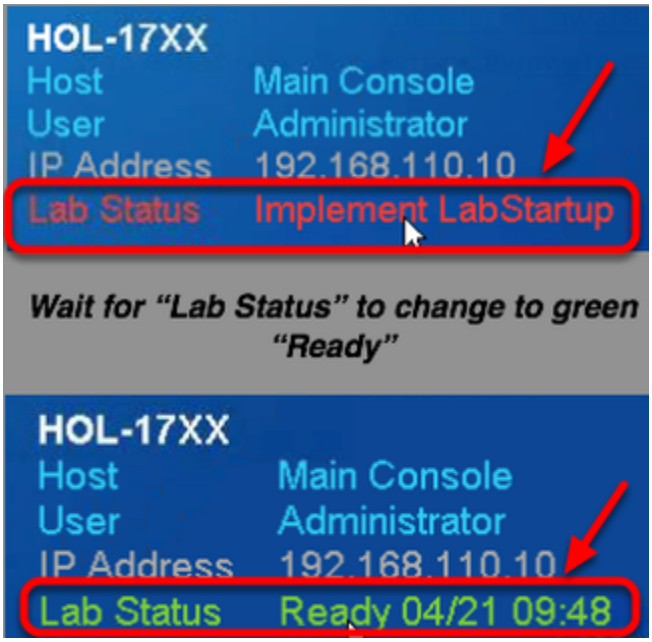
## Alternate Methods of Keyboard Data Entry

During this module, you will input text into the Main Console. Besides directly typing it in, there are two very helpful methods of entering data which make it easier to enter complex data.

## Click and Drag Lab Manual Content Into Console Active Window

You can also click and drag text and Command Line Interface (CLI) commands directly from the Lab Manual into the active window in the Main Console.

## Look at the lower right portion of the screen



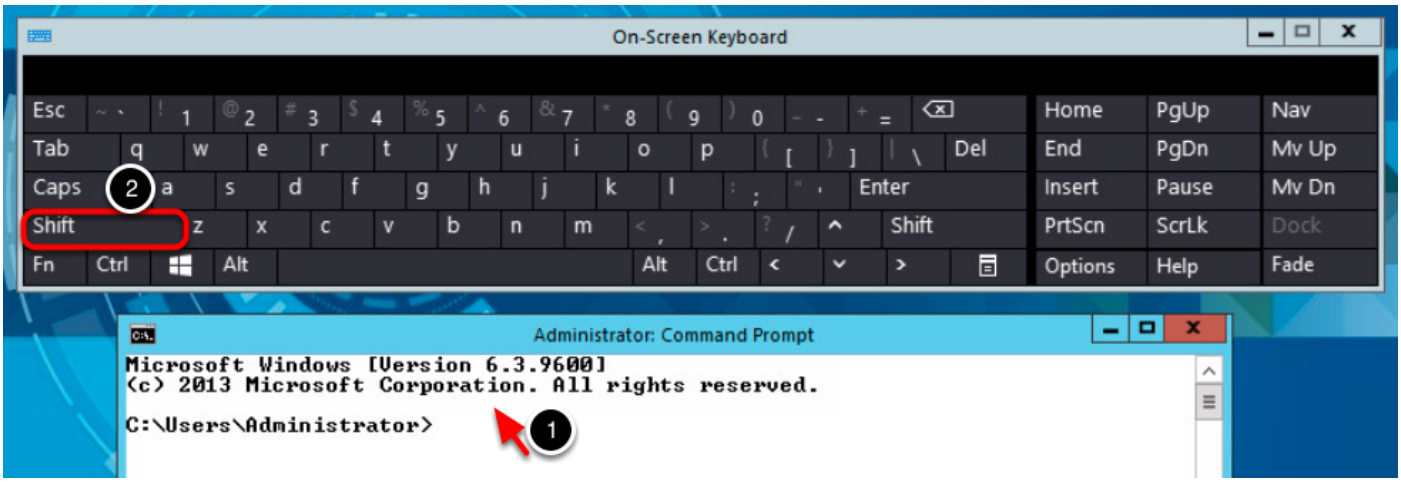

Please check to see that your lab is finished all the startup routines and is ready for you to start. If you see anything other than "Ready", please wait a few minutes.  If after 5 minutes you lab has not changed to "Ready", please ask for assistance.

## Accessing the Online International Keyboard

You can also use the Online International Keyboard found in the Main Console.

1. Click on the Keyboard Icon found on the Windows Quick Launch Task Bar.

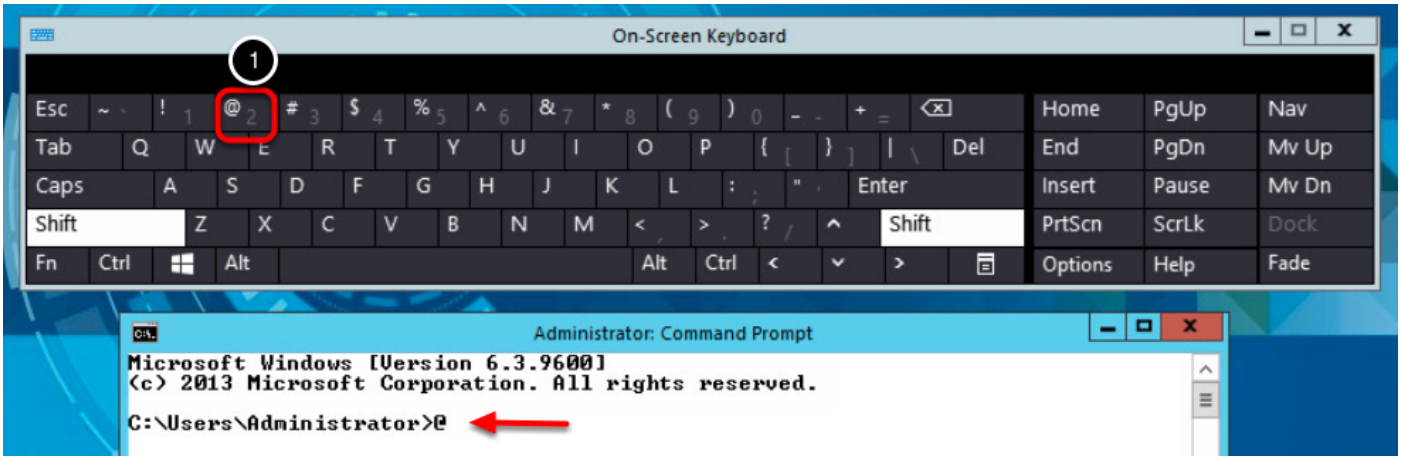
## Click once in active console window




In this example, you will use the Online Keyboard to enter the "@" sign used in email addresses. The "@" sign is Shift-2 on US keyboard layouts.

1. Click once in the active console window.
2. Click on the **Shift** key.

## Click on the @ key




1. Click on the "@ **key**".

Notice the @ sign entered in the active console window.

# Module 1: Introduction

# Overview of vRealize Automation Challenge Lab

First day on the job as a cloud administrator? No problem. Start here.

The vRealize Automation Challenge asks you to put on your thinking cap to save the day! Each module places you in a different fictional scenario to fix common vRealize Automation administrative and integration problems. Have you ever had an entitlement issue with users? How about a mysterious request that is not functioning properly? In this lab, you will learn to solve these and more.

As you walk into a tall glass building, you glance at your watch: 9:00AM. It's the beginning of another workday at one of the most desirable businesses in the year 2096: Rainpole Enterprise Inc.

Rainpole Enterprise Inc is a global IT services company that offers various IT services to organizations across the globe. They've recently adopted VMware's Software Defined Datacenter approach to modernizing their datacenter. This is all inline with their vision of transforming the way they run their businesses. Any of their customers, could now request for any services that is provided by Rainpole Enterprise Inc through their self service portal like an IT App Store. But Rainpole Enterprise Inc technology isn't magic. No, it's powered by the primary datacenter, which is the gleaming building you just entered, and by vRealize Automation.

As the largest and most trusted global IT services company, Rainpole Enterprise Inc's highest priorities are the reliability and stability of its continuity of operations. That responsibility rests on you and your colleagues' shoulders.

The various modules will test your mettle in order to keep the services operations running smoothly. This lab is best suited for those with some vRealize Automation experience, or who have already taken labs such as **HOL-1721-USE-1: vRealize Automation 7 Basics** or **HOL-1721-USE-2: vRealize Automation 7 Advance**. This lab includes over two hours of content, so you might not be able to complete it all in one sitting. Because the vRealize Automation Challenge lab requires troubleshooting, your completion time could vary. We provide optional hints along the way as well as providing the Challenges' final solutions.

We recommend that you start with Module 1 and then proceed to the rest of the modules. But if you are feeling rather confident today, you can skip right ahead to modules that interests you more.

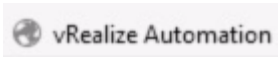
This Module contains the following lessons:

- [Lesson 1] Troubleshooting tools available

# Troubleshooting tools available

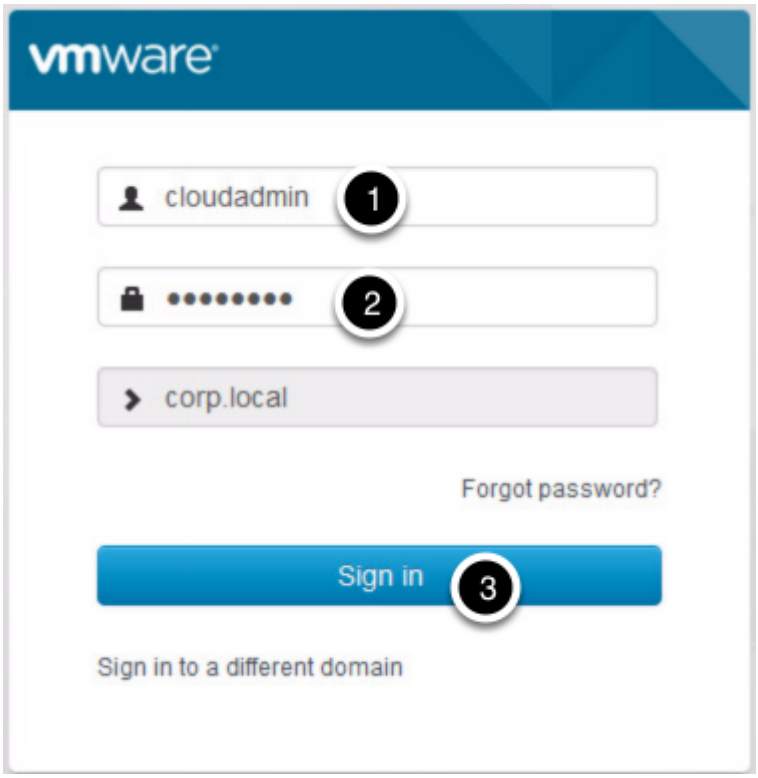
In this lab, we have provided you with some tools that you may or may not want to use to help in identifying root cause of a problem. In this guide, you will learn how to access those tools and use them to accelerate the pace at which you solve these challenges.

## Open the vRealize Automation Web Page




On the desktop, click on the Firefox browser desktop shortcut. Locate the bookmark "vRealize Automation". Click on it.

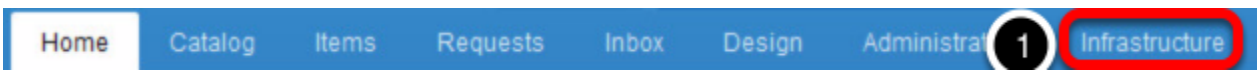
## Login to vRealize Automation




Fill in the login form with the following details:

1. Username: cloudadmin
2. Password: VMware1!
3. Click "Sign in" button

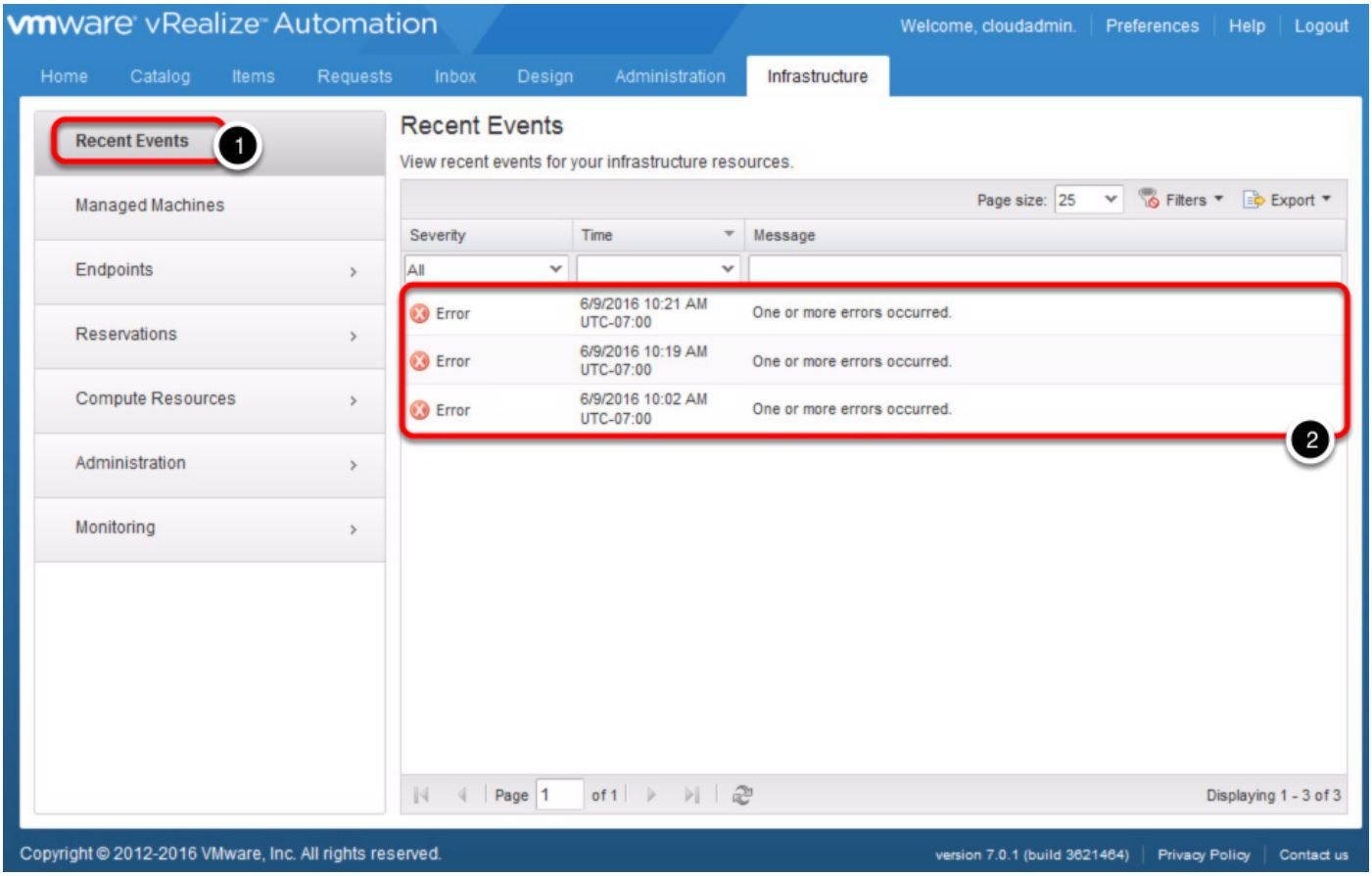
## Locate the Infrastructure tab view




To view the recent events tab:

1. Click on "Infrastructure" tab

## Click on Recent Events

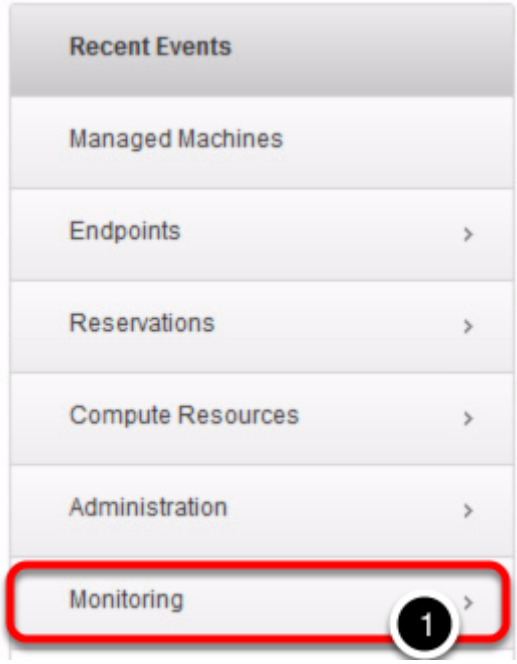



To be able to view a list of recent activities on vRealize Automation:

1. Click on "Recent Events"
2. You will be presented with a list of recent events that has occured.

NOTE: This view will give you some information required to start investigating where an issue derived from.

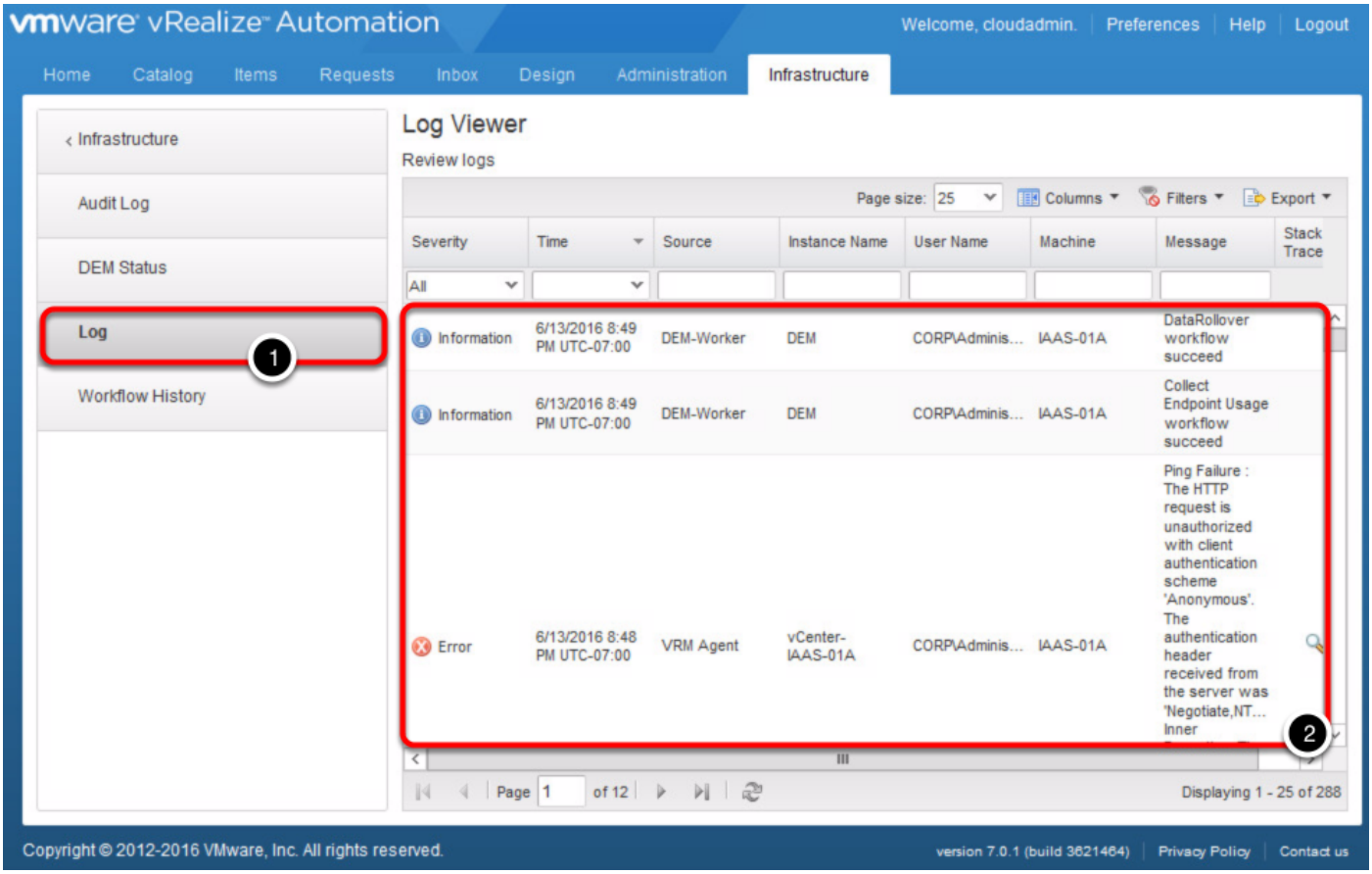
# Locating Logs View




Sometimes, you might need to view much more details information from the logs. You can do so by navigating to the log details:

1. Click on "Monitoring"

## Access the Logs View

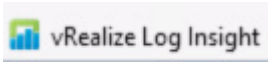



To access the logs view:

1. Click on "Log"
2. You will be presented with detailed log information

NOTE: You can use this view to retrieve much more detail information in helping you to troubleshoot issues.

## Open the Log Insight Web Page




Another great tool that you can use is vRealize Log Insight with vRealize Automation Content Pack

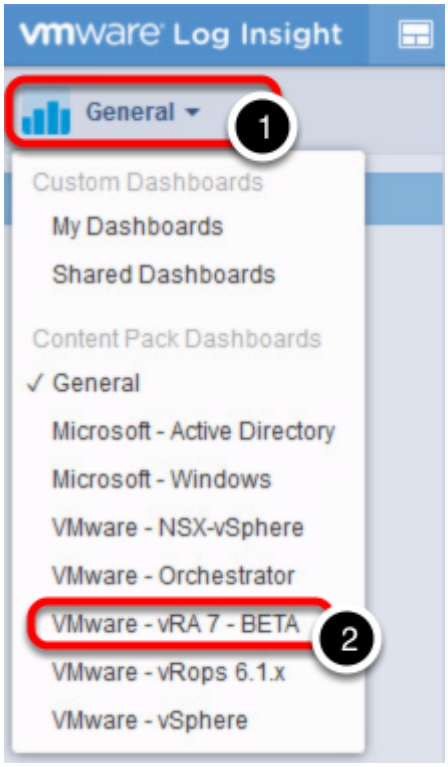
On the desktop, click on the Firefox browser desktop shortcut. Locate the bookmark "vRealize Log Insight". Click on it.

# Login to vRealize Log Insight

Fill in the login form with the following details:

1. Username: admin
2. Password: VMware1!
3. Click "Login" button

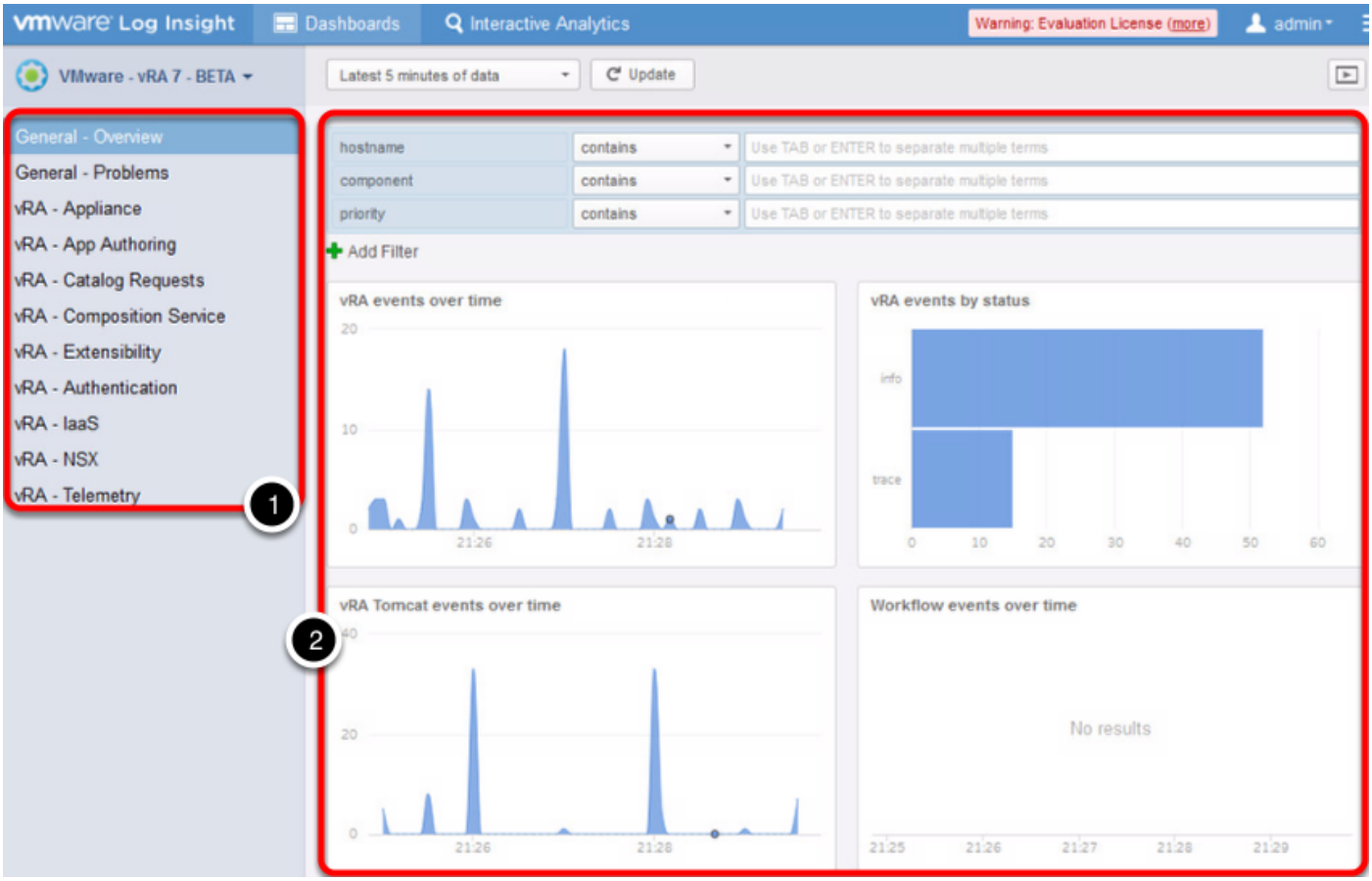
# Locating vRealize Automation Content Dashboards




In order to look at the vRealize Automation Content Dashboard:

1. Click on "General"
2. Click on "VMware - VRA 7 - BETA"

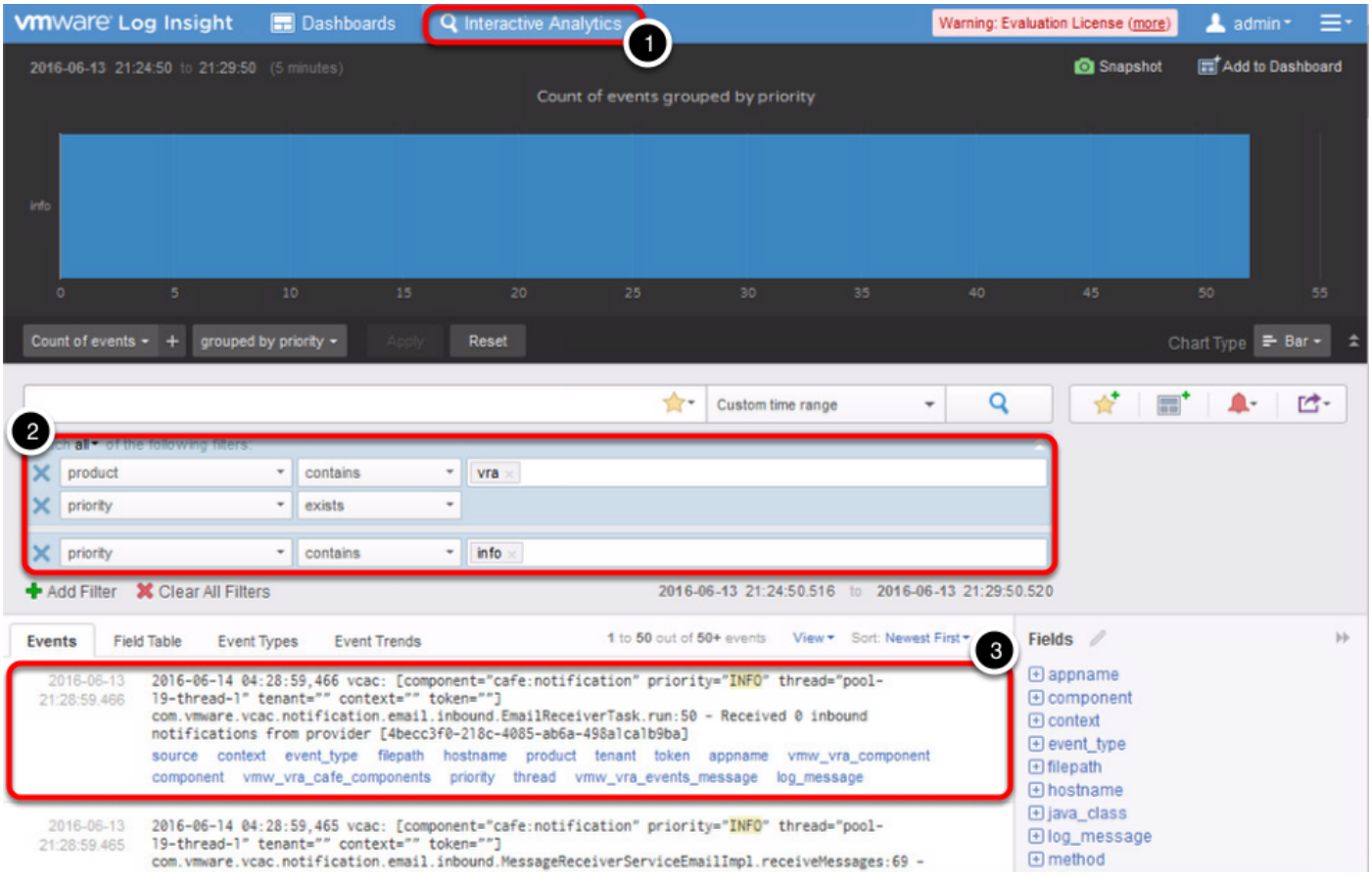
# Accessing vRealize Automation Content Dashboards




You will be presented with dashboards that focuses on key areas within vRealize Automation. You can use those to deep dive into areas that you want to begin troubleshooting an issue.

1. Choose an area to focus on
2. Dashboard will be populated automatically

# Querying Log Insight for specific vRealize Automation log entries




If you are an advanced user of vRealize Log Insight, you can leverage on the Interactive Analysis feature of Log Insight, to search for specific log entries that you want to discover for more information.

1. Click on "Interactive Analysis"
2. Create your own search queries or filters
3. Log Insight will present the log details based on your queries or filters

# Module 2: Cloud Administration, Basic Challenge

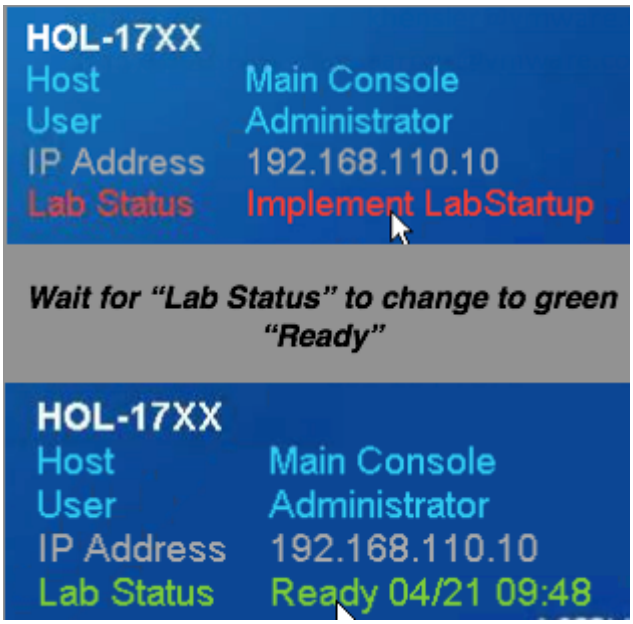
# Introduction

This module will challenge you on common issues faced when working on basic administration of vRealize Automation.

This Module contains the following lessons:

- [Lesson 1] Some users are not receiving email notifications.
- [Lesson 2] Service architect is not able to find vCenter templates when designing their blueprints.
- [Lesson 3] Some users are not able to see requests for catalog item, it keeps failing.
- [Lesson 4] Some users are not able to manage provisioned VMs.
- [Lesson 5] The Service Architect is unable to create XaaS Blueprints.

## Look at the lower right portion of the screen




Please check to see that your lab is finished all the startup routines and is ready for you to start. If you see anything other than "Ready", please wait a few minutes.  If after 5 minutes you lab has not changed to "Ready", please ask for assistance.

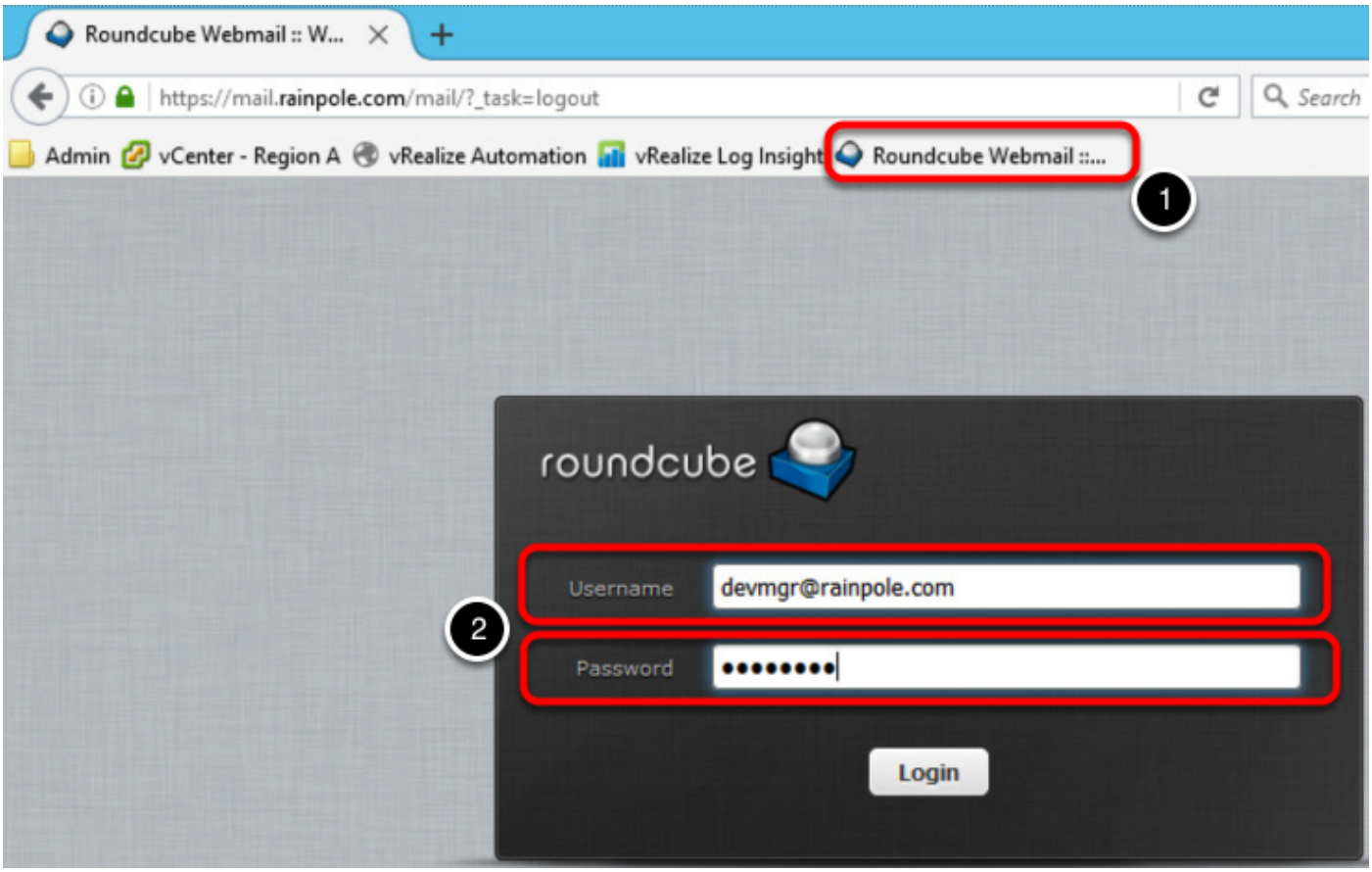
# Some users are not receiving email notifications.

You receive a call from the Development Manager. He claims that he used to get email notifications when he and his team would provision VMs. Recently, however, these notifications are no longer being received.

## Open Firefox Browser from Windows Quick Launch Task Bar

1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar.

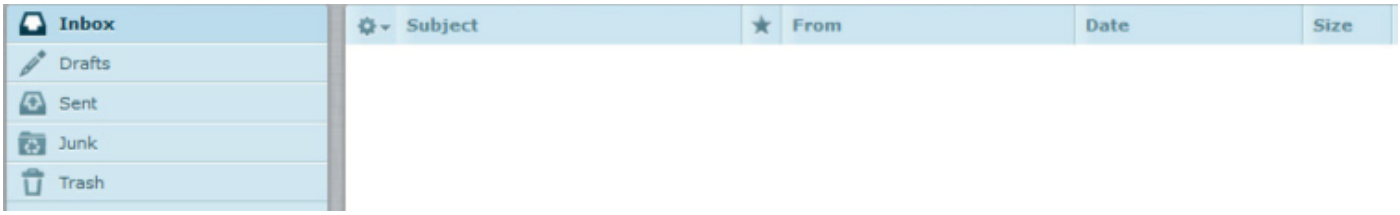
## Login to the Roundcube Webmail Portal




1. Open the Roundcube Webmail Portal from the link in the favorite bookmarks bar.
2. Login as the Development Manager.

- Username: devmgr@rainpole.com
- Password: VMware1!

## Validate Inbox




Verify that the Development Manager is not receiving email notifications from the vRealize Automation Portal (cloudadmin@rainpole.com). (For this scenario, the inbox will be empty.)

## Login to the vRealize Automation Portal

1. Open a new tab and launch the vRealize Automation Portal link from the favorite bookmarks bar.

- Username: devmgr
- Password: VMware1!
- Domain: corp.local
- Tenant Administrator: cloudadmin
- Password: VMware1!

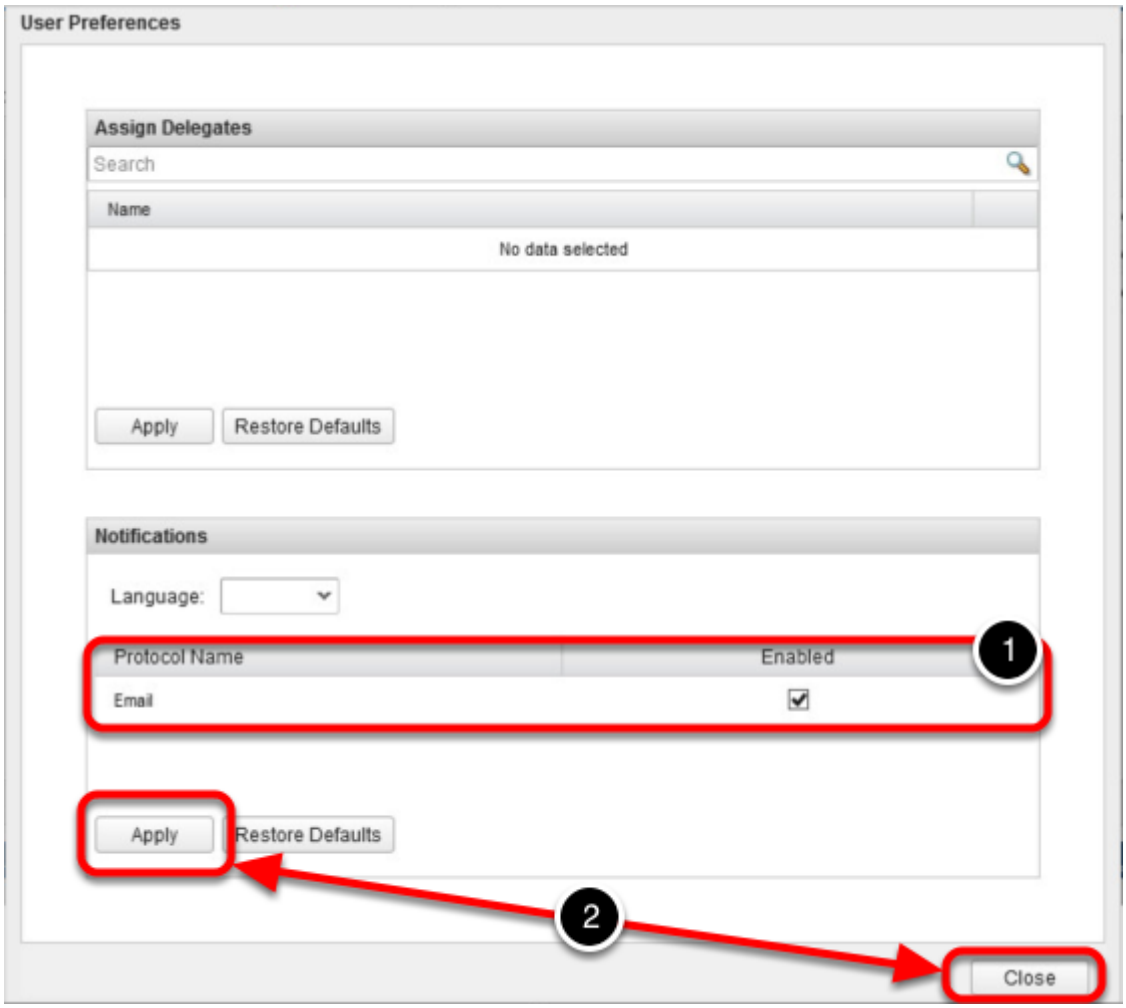
For this challenge:

1. Determine why the Development Manager is not receiving notification emails.

Need hints?

View Hint #1 (Hint will open in a new browser window)

## Solution

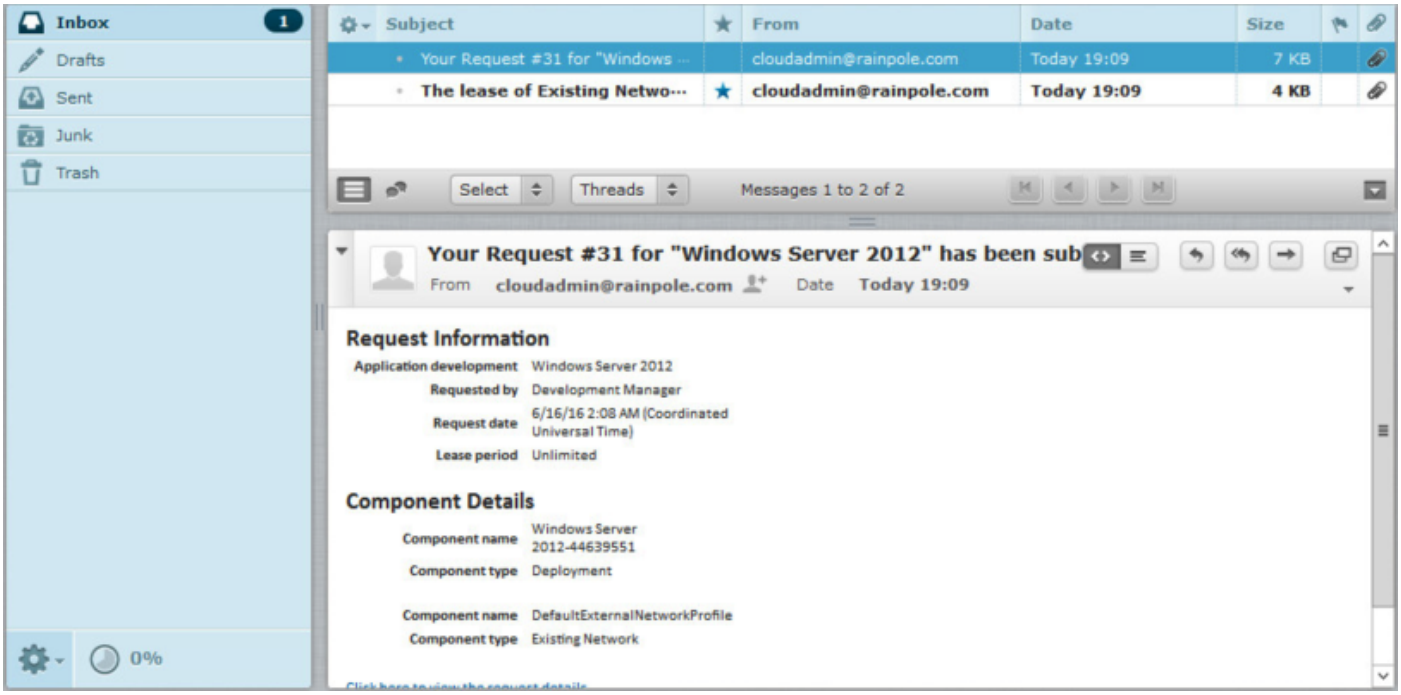



Enable Email Notifications:

While logged into the vRealize Automation Portal as the Development Manager (devmgr), do the following:

1. Click on Preferences, locate Email in the Notifications Section. Place a check under "Enabled".
2. Apply, then Close.

# Validate email notifications




Log back into the Roundcube Webmail Client as the Development Manager and validate that notifications are filling the user's inbox.

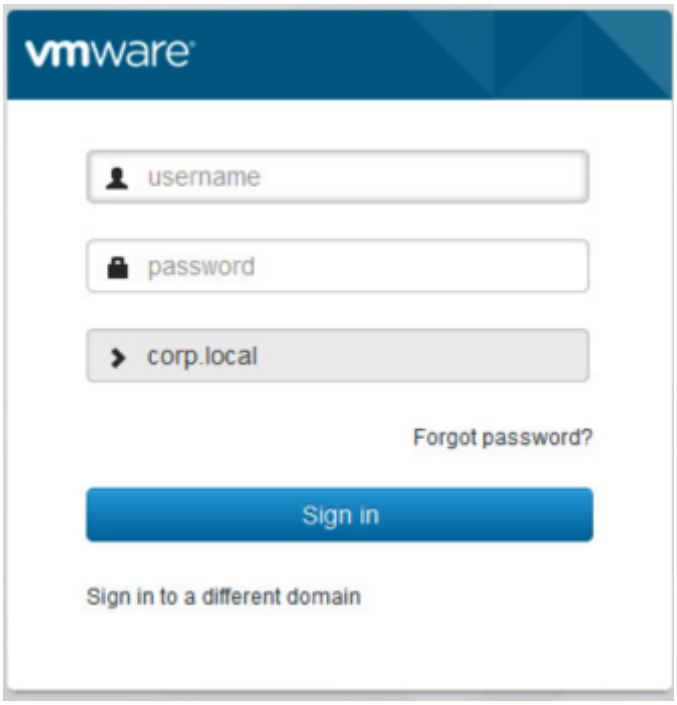
# Service architect is not able to find vCenter templates when designing their blueprints

The server team has created a new Windows 2012 virtual machine with all of the latest patches. It has been uploaded, and converted into a template in the vSphere environment. Unfortunately, the Tenant Administrator cannot seem to locate the template to add it to the "Windows 2012 patch" blueprint.

## Open Firefox Browser from Windows Quick Launch Task Bar

1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar.

## Login to the vRealize Automation Portal




1. Launch the vRealize Automation Portal link from the favorite bookmarks bar.

    - Tenant Administrator: cloudadmin
    - Password: VMware1!
    - Domain: corp.local
    - Template: base-w12-patched
    - Payload Cluster: RegionA01-COMP01

For this challenge:

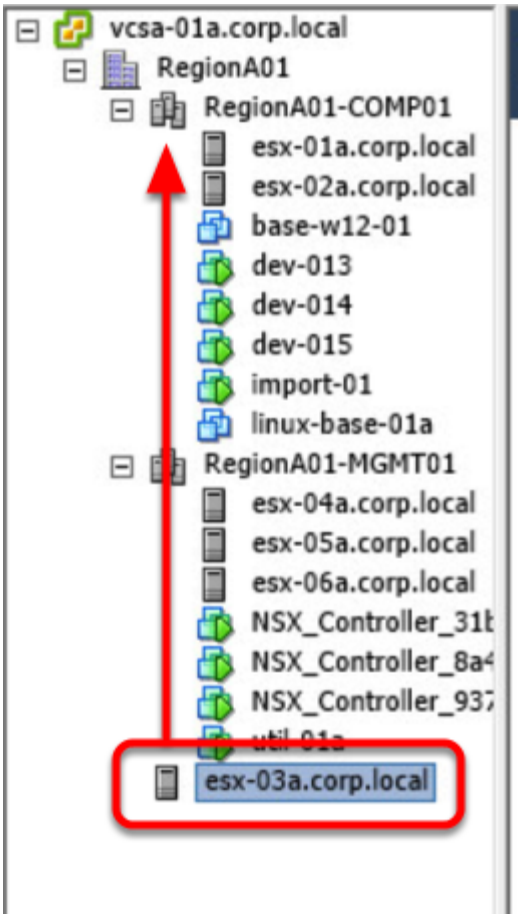
1. The new template (**base-w12-patched**) was added to an ESX host (**esx-03a.corp.local**). However, this host is not a member of the payload cluster (**RegionA01-COMP01**).
2. You will need to add the host (**esx-03a.corp.local**) to the payload cluster (**RegionA01-COMP01**).
3. Then edit the patch blueprint to use the new template.

Need hints?

View Hint #1 (Hint will open in a new browser window)

View Hint #2 (Hint will open in a new browser window)

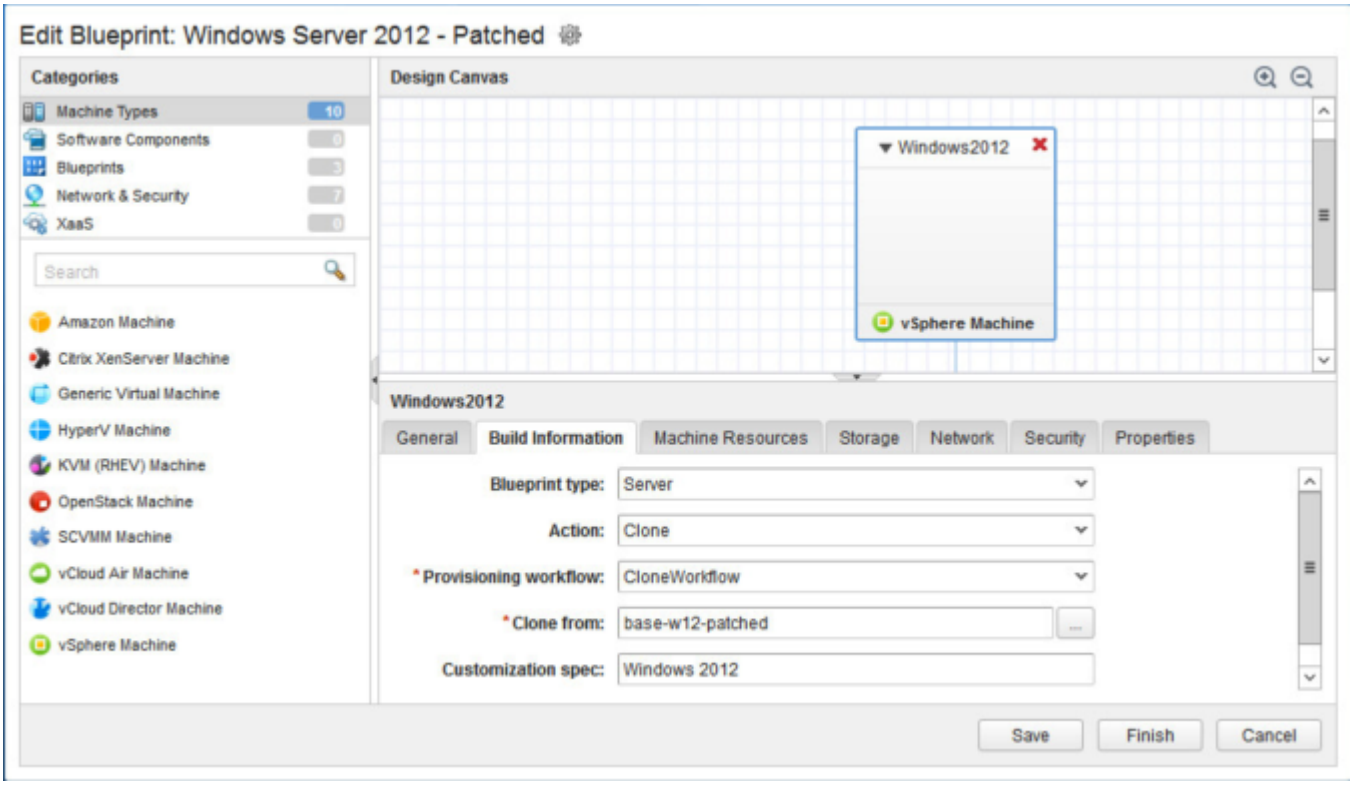
## Solution: Part 1




To resolve, you will start your task in vCenter.

1. Log into vCenter using Username: Corp\Administrator, Password: VMware1!
2. Move the esx host (**esx-03a.corp.local**) to the payload cluster (**RegionA01-COMP01**).

## Solution: Part 2




Once the host has been migrated to the cluster, log into vRA as the Tenant Administrator (cloudadmin) and perform the following steps:

Username: cloudadmin

Password: VMware1!

1. Click on Infrastructure -> Compute Resources -> Compute Resources
2. Mouse over the **RegionA01-COMP01** Compute Resources, and perform a **Data Collection**.
3. When the **Data Collection** has been performed, click the **Infrastructure** menu to go back.
4. Choose **Blueprints**.
5. Edit the **Windows Server 2012 - Patched** blueprint.
6. Click on the **Windows2012** Virtual Machine Object within the blueprint canvas.
7. Select **Build Information.**
8. Under "Clone from:", change the template from **base-w12-02** to the newly patched template **base-w12-patched**.
9. Click **OK**.
10. **Save** the blueprint, then Click **Finish.**

The new template has now been implemented and is ready for use.

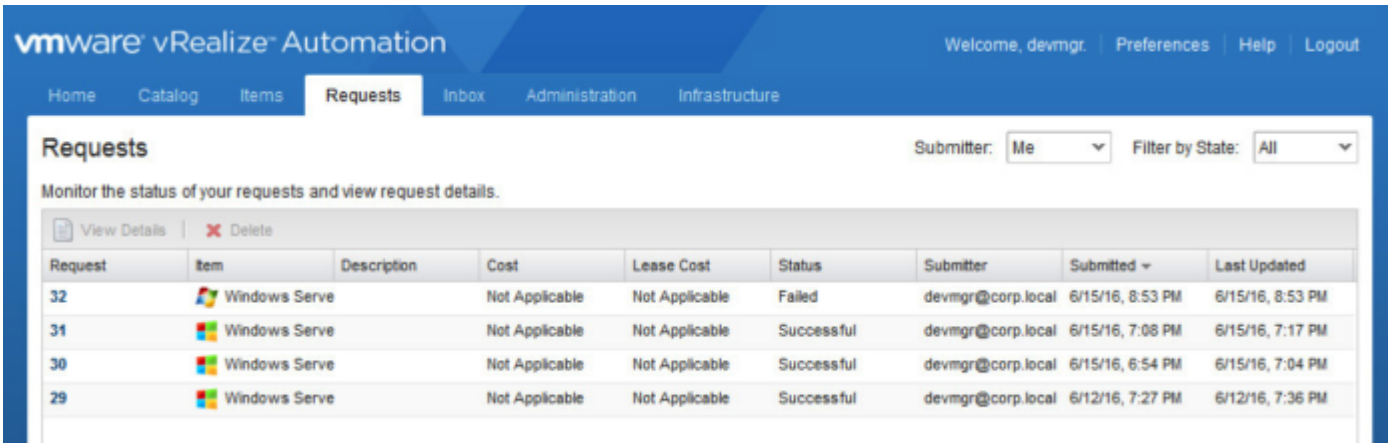
# Some users are not able to see requests for catalog item, it keeps failing

The new Windows patch blueprint has been updated, you have communicated the change to the business groups. Unfortunately, when the Development Manager attempts to request the a VM from the new blueprint, it fails.

## Open Firefox Browser from Windows Quick Launch Task Bar

1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar.

## Login to the vRealize Automation Portal




1. Launch the vRealize Automation Portal link from the favorite bookmarks bar.

   - Tenant Administrator: cloudadmin
   - Password: VMware1!
   - Development Manager: devmgr
   - Password: VMware1!
   - Domain: corp.local
   - Blueprint: Windows 2012 - Patched

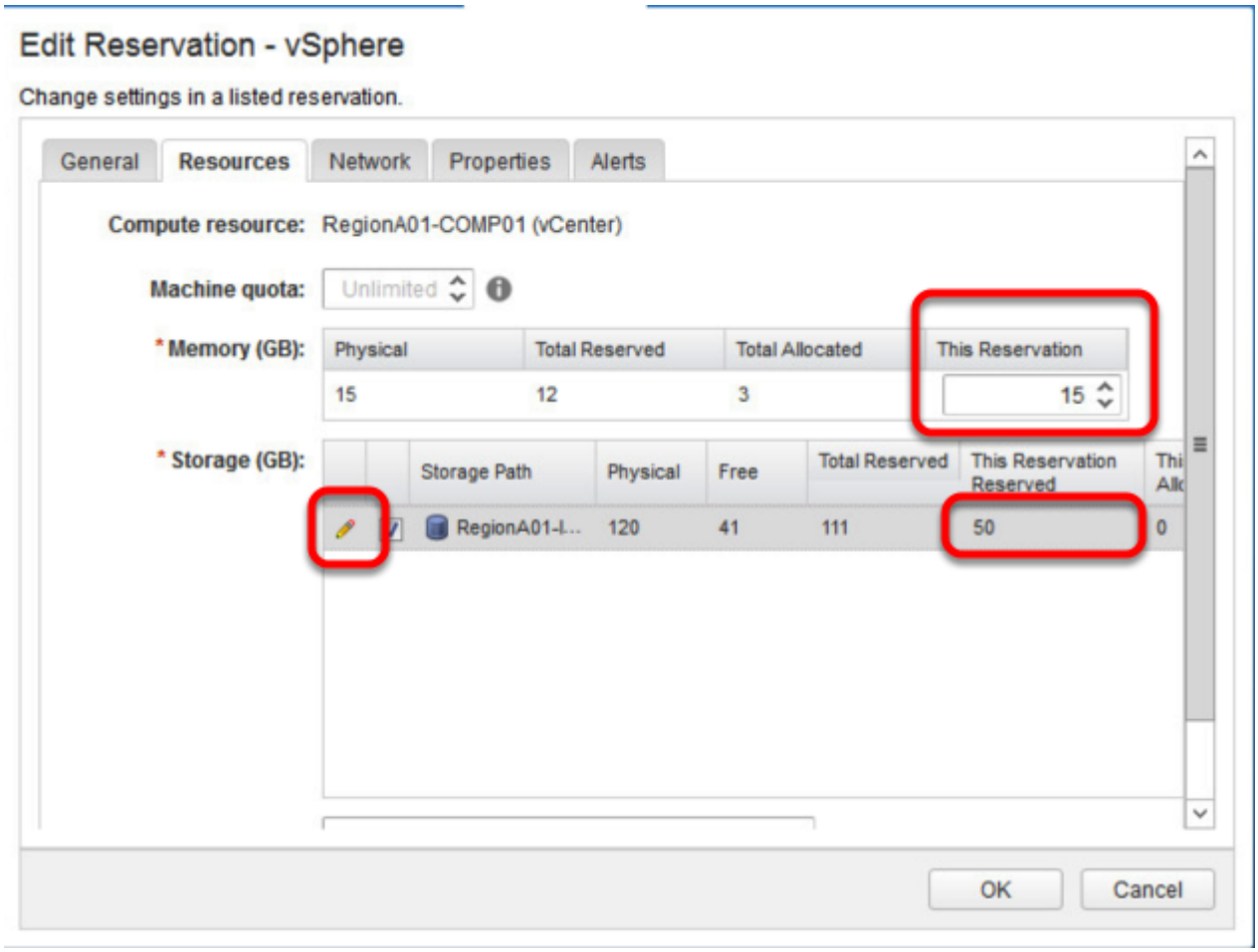
For this challenge:

1. Open the details of the request and investigate why the request failed.
2. Fix the reservation and reattempt the the catalog request.

Need hints?

View Hint #1

## Solution



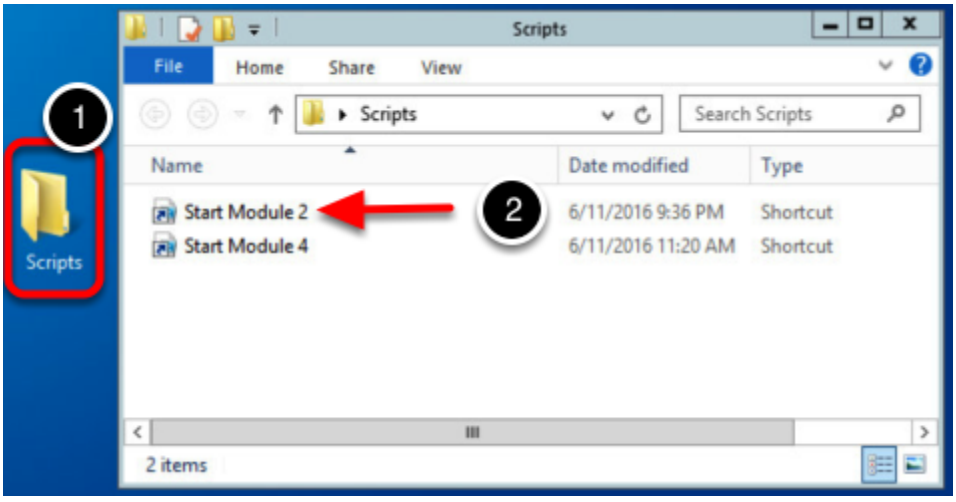

There will likely be times where the Business Group Reservations may run out of resources. When this occurs we will need to add additional compute resources to the reservation and resize it. For this scenario, we need to expand the reservation to resolve the Development Manager's issue.

1. Log into vRealize Automation as cloudadmin.
2. Click Infrastructure -> Reservations -> Reservations
3. Select and edit the **Development Sandbox** reservation.
4. Choose the **Resources** tab.
5. Change the **Memory** Reservation to **15**GB.
6. Click the **pencil** icon next to the datastore and change the storage reservation to **50**GB. Click **OK**.
7. Click **OK** to save the reservation change.
8. Perform a **data collection**.
9. Log out and log back in as the Development Manager.
10. Reattempt to deploy the **Windows 2012 - Patched** Catalog Item.

# Some users are not able to manage provisioned VMs

You've received a complaint from the Development Manager that he is unable to perform tasks within the vRealize Automation portal. He states that provisioning new VMs hang on "In Progress" and eventually fail. Additionally, he states that he can no longer perform day 2 operations, such as powering on and off virtual machines.

## Launch the Module 2 startup script

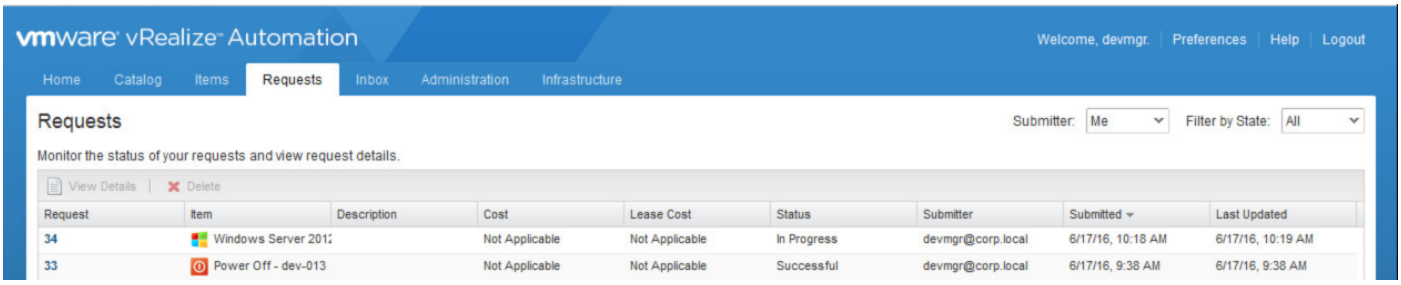



1. Open the **Scripts** folder located on the Control Center Desktop.
2. Right click the file labeled "**Module 2-startup**" and select to **Run with Powershell**.
3. Press **Enter** when the script is Ready.

## Open Firefox Browser from Windows Quick Launch Task Bar

1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar.

## Login to the vRealize Automation Portal




1. Launch the vRealize Automation Portal link from the favorite bookmarks bar.

   - Tenant Administrator: cloudadmin
   - Password: VMware1!

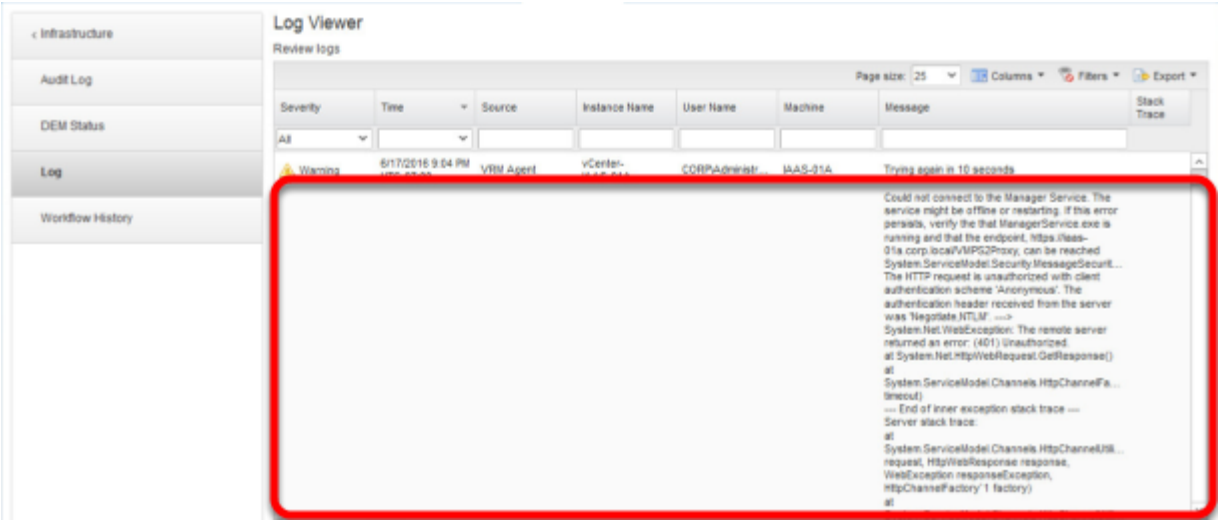
- Development Manager: devmgr
- Password: VMware1!
- Domain: corp.local
- Managed VM: dev-013
- LogInsight Username: Admin
- LogInsight Password: VMware1!

For this challenge:

The Development Manager is unable to provision a new virtual machine. The deployment hangs on "In Progress." The problem seems very peculiar as no error message is presented to the enduser.

1. Investigate why the virtual machine fails to deploy.
2. Attempt to perform day 2 actions, such as "Power On"or "Power Off" on the managed VM: dev-013. Determine why these actions do not perform their respective tasks.

## Solution




When the IaaS Manager Service (VMware vCloud Automation Center Service) is not running, the vRealize Automation Portal will attempt to function until the service can be restarted. No error message or indication is given which causes this particular problem to be an elusive mystery. However, simple troubleshooting can help to quickly identify and resolve this issue.

To identify the problem, follow these steps:

1. Log into the vRealize Automation Portal as cloudadmin.
2. Navigate to Infrastructure -> Monitoring -> Log
3. An error should be displayed within the logs that reads; "Could not connect to the Manager Service. The service might be offline or restarting. If this error persists, verify that the Manager Service.exe is running."

To resolve the problem;

1. Launch a Remote Desktop Connection (RDP) to the IaaS Manager (iaas-01a.corp.local).
2. Log in using -- Username: corp\administrator, Password: VMware1!
3. Launch the services control panel
4. Check the VMware vCloud Automation Center Service is currently stopped.
5. Start the service and log out.
6. Reattempt to provision a VM from the catalog as the Development Manager.
7. Attempt to perform Day 2 operations (Power Off/On) a virtual machine.

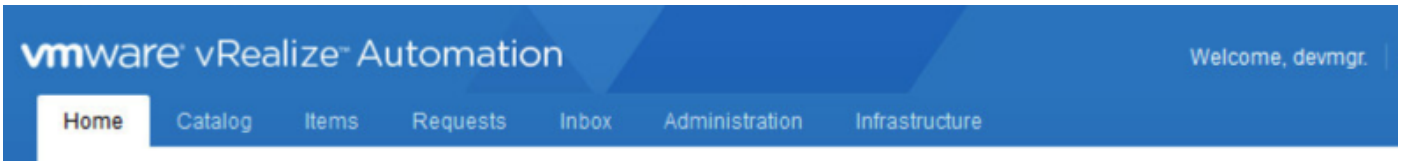
# The Service Architect is unable to create XaaS Blueprints

A new project has been announced and the Development Manager is going to need the ability to create blueprints and service blueprints.

## Open Firefox Browser from Windows Quick Launch Task Bar

1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar.

## Login to the vRealize Automation Portal




1. Launch the vRealize Automation Portal link from the favorite bookmarks bar.

   - Tenant Administrator: cloudadmin
   - Password: VMware1!
   - Development Manager: devmgr
   - Password: VMware1!
   - Domain: corp.local

For this challenge:

The Development Manager needs to create service blueprints for the Development Business Group. However, the Blueprint canvas is missing.

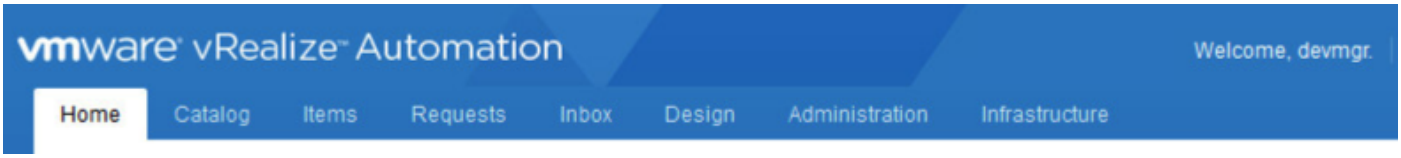
1. Investigate why the blueprint canvas is missing and fix.
2. Ensure that the Development Manager has the ability to create service blueprints.

Need hints?

View Hint #1 (Hint will open in a new browser window)

View Hint #2 (Hint will open in a new browser window)

## Solution




1. Log into the vRealize Automation portal as the CloudAdmin
2. Click Administration -> Users & Groups -> Directory Users and Groups
3. Search for the **Development Manager** (**devmgr**)
4. Select the **Development Manager** user to edit the profile.
5. Under **Add Roles To This User**, locate **Software Architect** and **XaaS Architect** and select them.
6. Click **Finish** to save these role privileges to the Development Manager.
7. Log out and log back in as the Development Manager.
8. The Development Manager now has the ability to create blueprints and service blueprints.

# Module 3: Cloud Extensibility, Basic Challenge

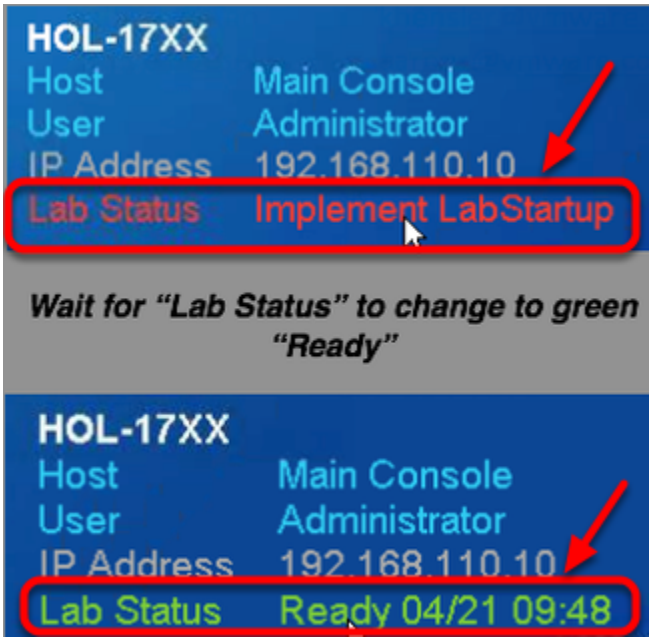
# Introduction

This module will challenge you on common issues faced when working on integrating vRealize Automation and vRealize Orchestrator

This Module contains the following lessons:

- [Lesson 1] Workflows are seen running multiple times instead of just once.
- [Lesson 2] Workflows are not being triggered when they are supposed to.
- [Lesson 3] Assigning a new workflow as an action that could be triggered by user.

## Look at the lower right portion of the screen




Please check to see that your lab is finished all the startup routines and is ready for you to start. If you see anything other than "Ready", please wait a few minutes.  If after 5 minutes you lab has not changed to "Ready", please ask for assistance.

# Workflows are seen running multiple times instead of just once

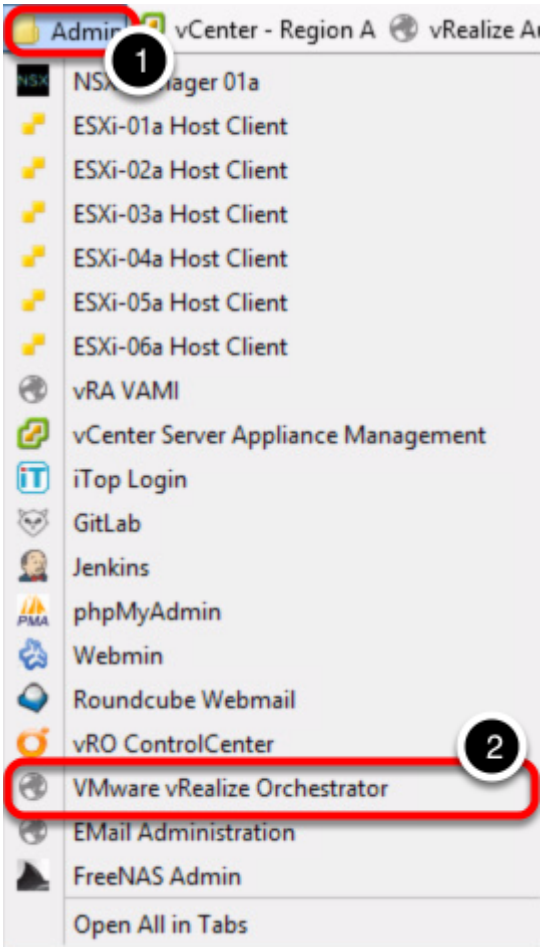
You are sitting in your office, reading vRealize Automation - Lifecycle Extensibility (opens in a new window), when you decided to double check on a recent enhancement done by your extended team of Integration Engineers. You want to make sure that they are in line with best practises. Maybe you should double check the integration efforts made by the team is being implemented correctly.

test

## Open Firefox Browser from Windows Quick Launch Task Bar

1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar. here

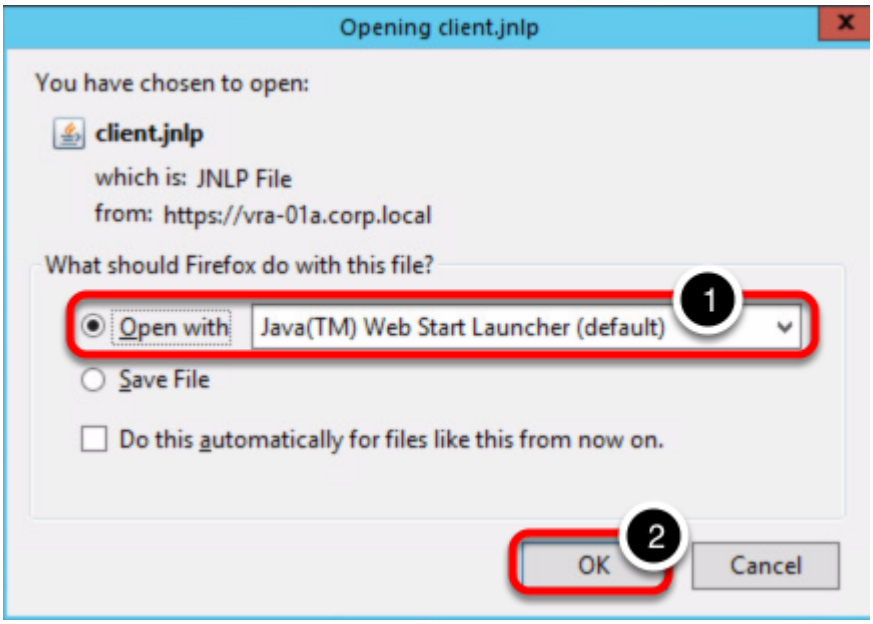
## Launch vRealize Orchestrator Client




To launch vRealize Orchestrator:

1. Click on "Admin" folder bookmark
2. Click on "VMware vRealize Orchestrator"

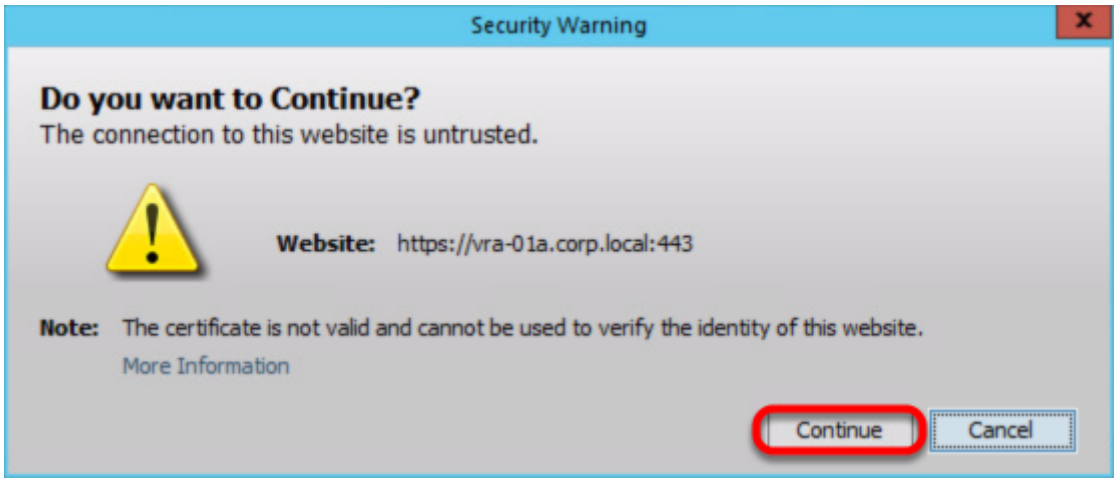
## Open vRealize Orchestrator Client




You will be presented with a popup dialog

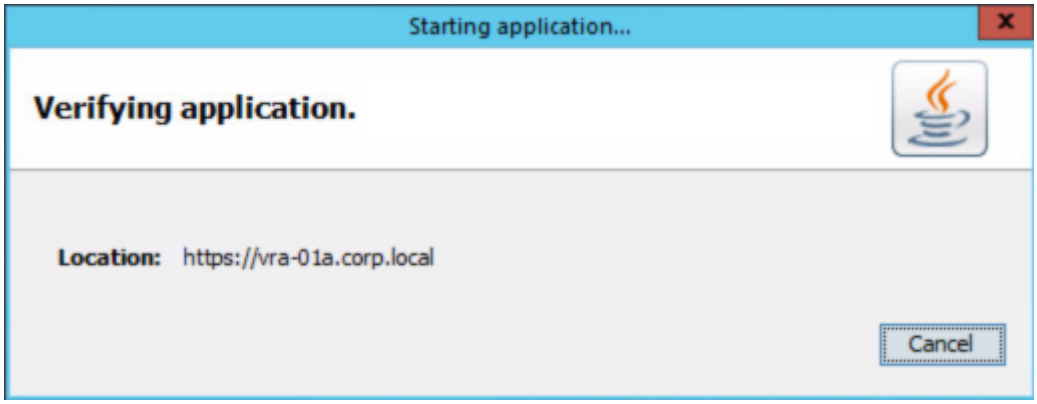
1. Select "Open with .. Java(TM) Web Start Launcher (default)"
2. Click "OK" button

## Accept Security Warning




You may be presented with a security warning, this is normal. Click "Continue" to proceed

## Verifying application notification



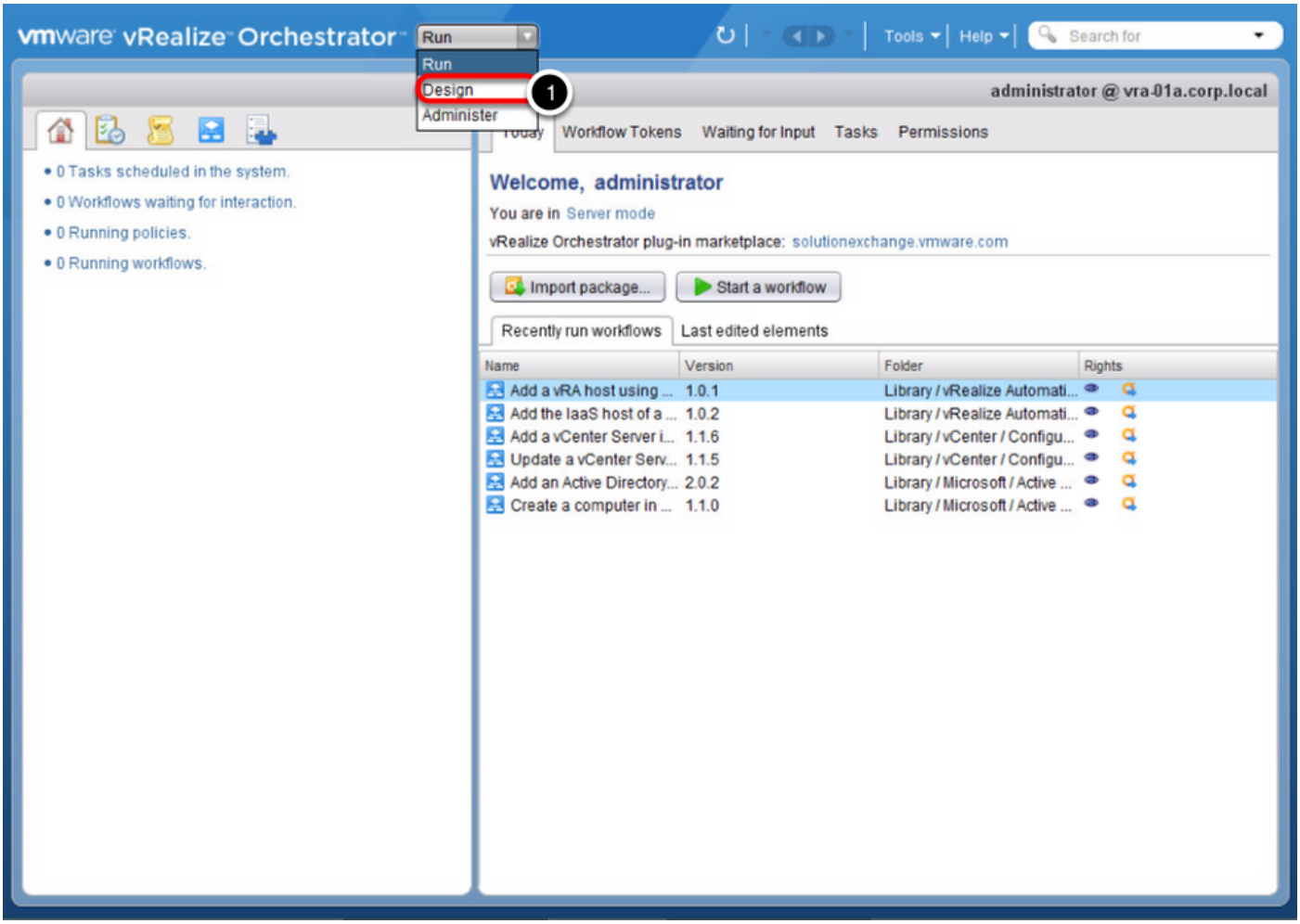

You will be presented with a dialog that is verifying and staring the application. **DO NOT** click "Cancel". The dialog will automatically close once application has been verified.

## Login to vRealize Orchestrator

To login to vRealize Orchestrator:

1. Ensure that the Host name is vra-01a.corp.local:443
2. User name: administrator@vsphere.local
3. Password: VMware1!
4. Click "Login"

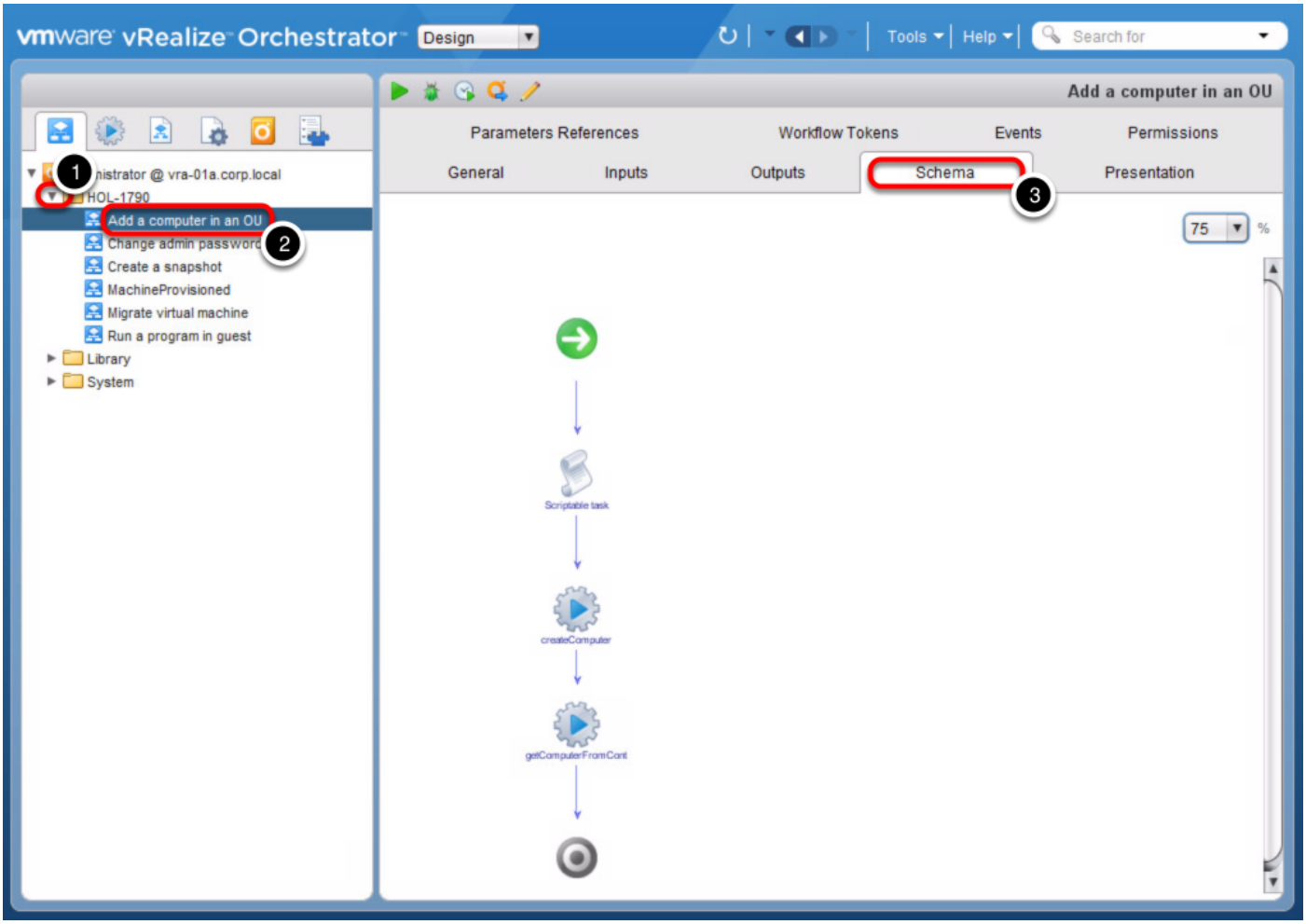
# Switching to Design mode in vRealize Orchestrator




Once vRealize Orchestrator client has been successfully launched, you need to switch to "Design" mode:

1. Click on the dropdown list and select "Design"

# Exploring vRealize Orchestrator workflow




Rainpole's team of integration engineers have built a workflow that will add a computer account into your organization Active Directory Organizational Unit after a virtual machine request has been made through vRealize Automation. To find out more about what the workflow operates:

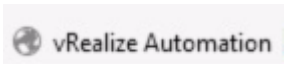
1. Expand the "HOL-1790" folder
2. Click on the workflow "Add a computer in an OU"
3. Click on "Schema" to show details on the execution steps in the workflow

NOTE: Do not close the vRealize Orchestrator Client, you will need it later.

# Open Firefox Browser from Windows Quick Launch Task Bar

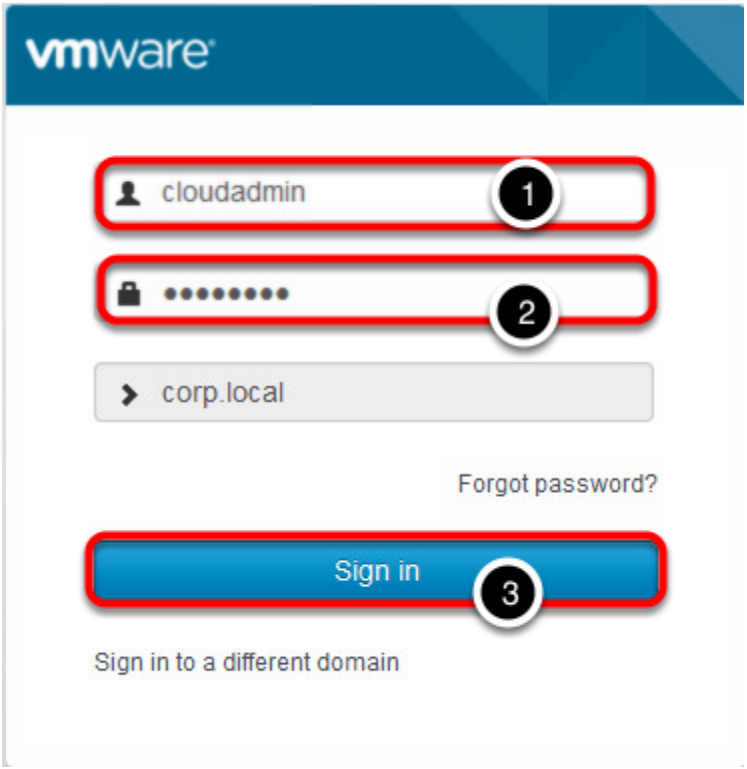
1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar.

## Launch vRealize Automation



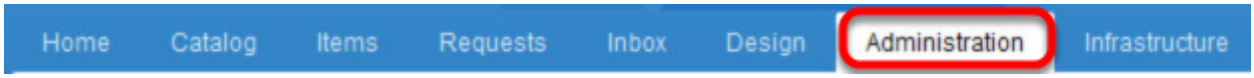

Click on the "vRealize Automation" bookmark

## Log into vRealize Automation



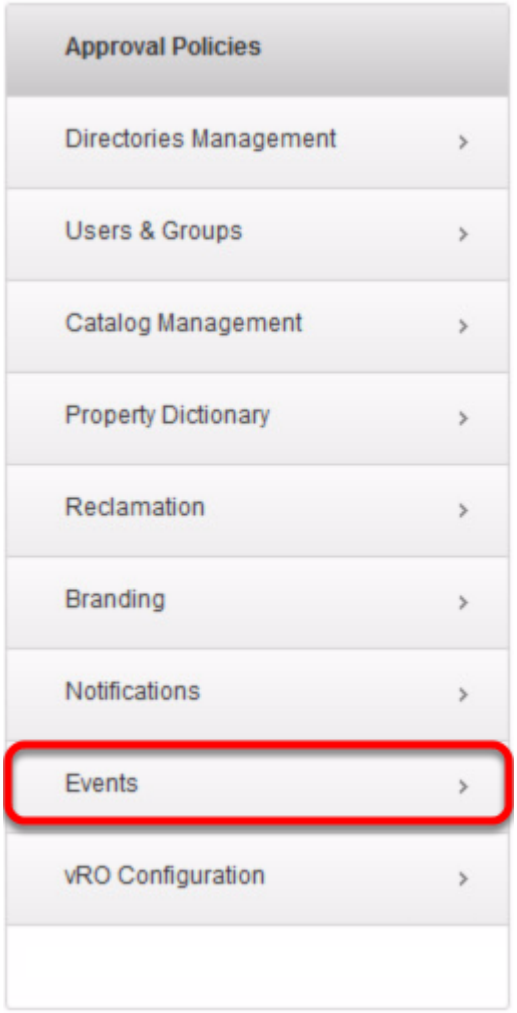

1. User Name: cloudadmin
2. Password: VMware1!
3. Click on "Sign in" button

## Accessing Administration options



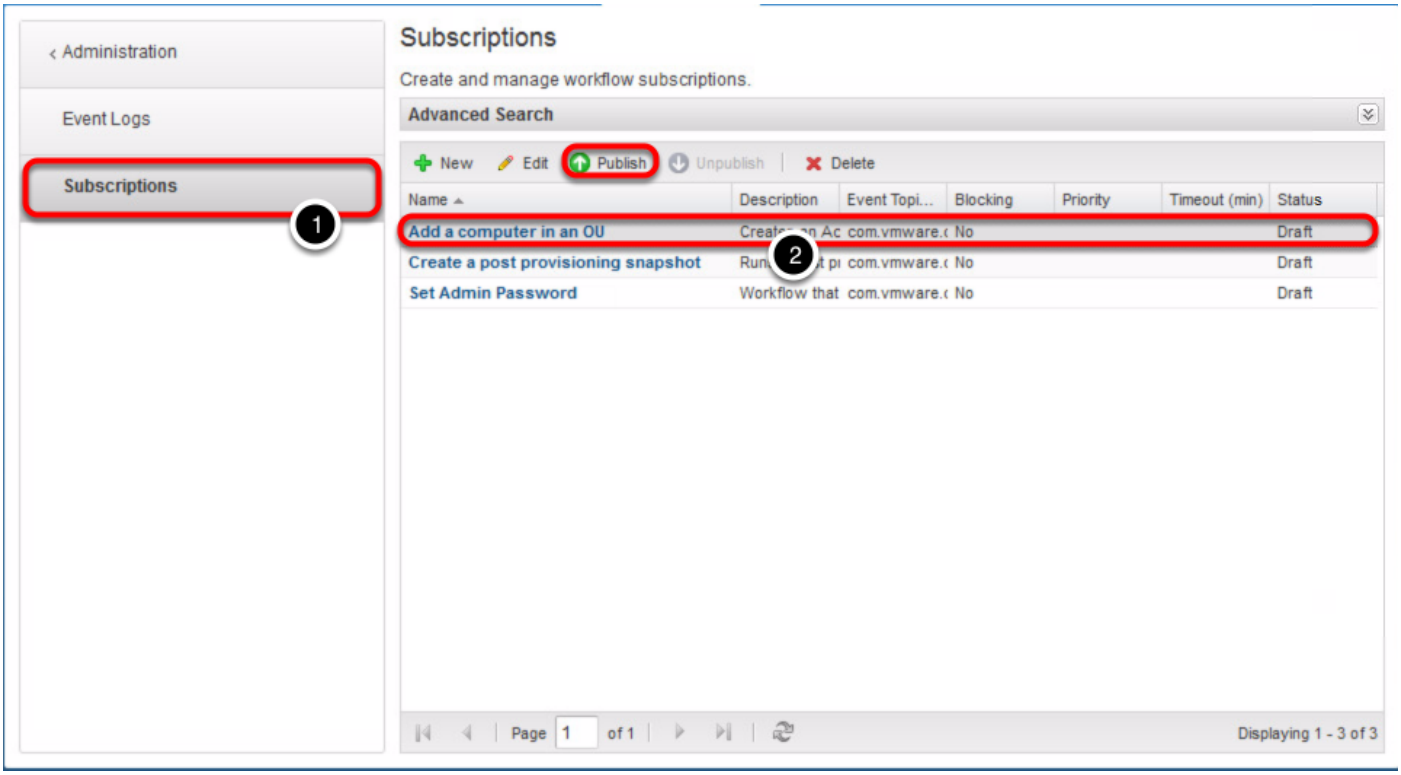

Click on the "Administration" tab

# Click on Events




Click on "Events"

## Accessing subscriptions created




1. Click on "Subscriptions"
2. Select the "Add a computer in an OU" subscription
3. Click "Publish"

NOTE: This step activates the workflow subscription that will invoke the vRealize Orchestrator workflow "Add a computer in an OU" which you previously saw in the vRealize Orchestrator client.

## Open Firefox Browser from Windows Quick Launch Task Bar

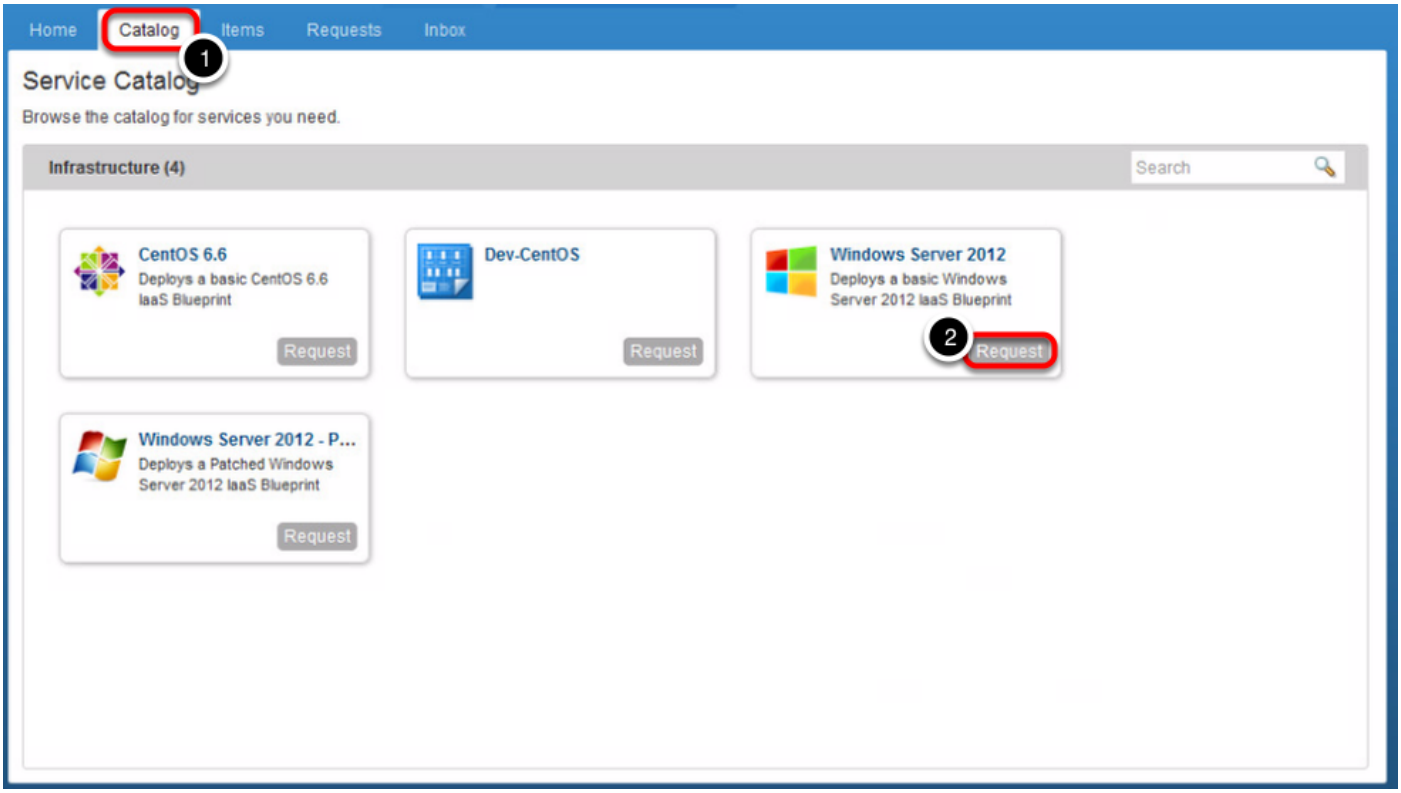
1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar.

# Login to vRealize Automation as Dev User

1. User Name: devuser
2. Password: VMware1!
3. Click on "Sign in" button

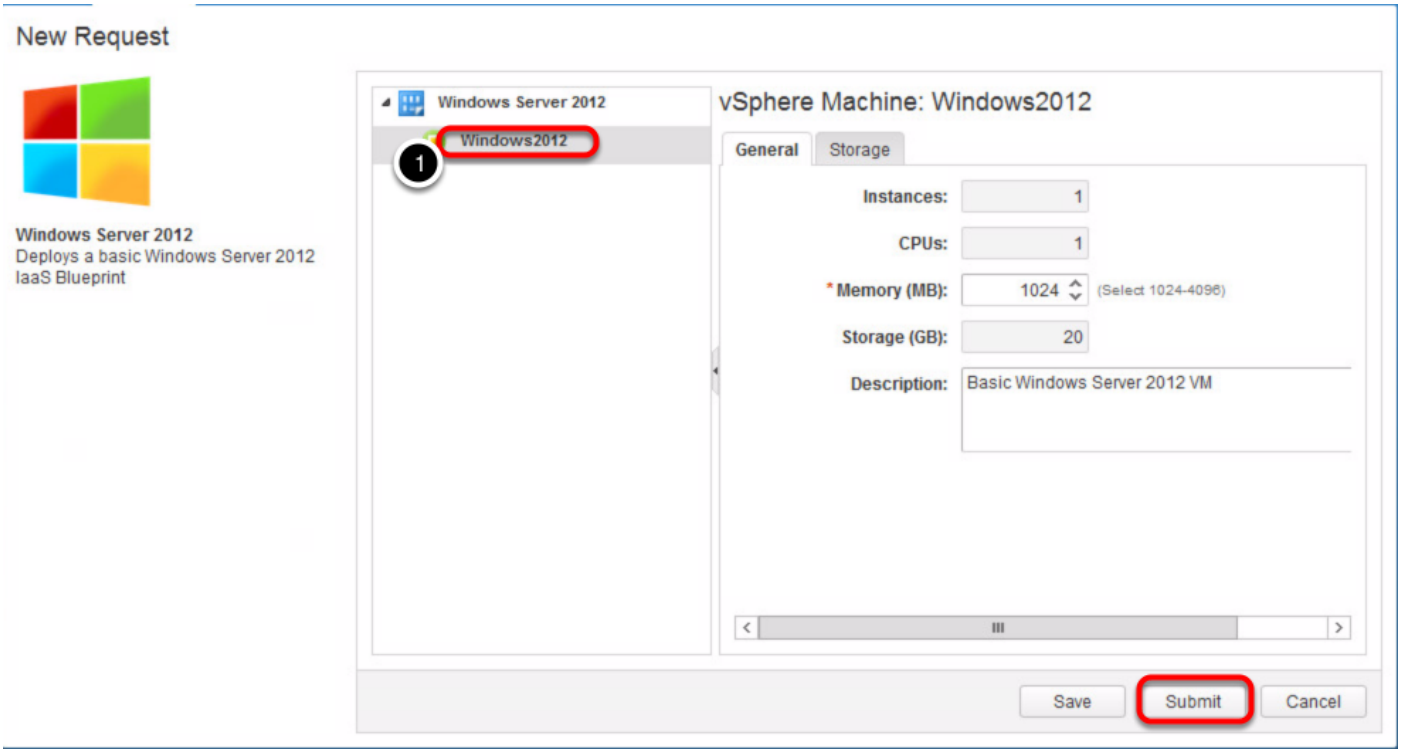
NOTE: You would need to log out from cloudadmin user in order to log in as devuser

## Select catalog item




1. Click on "Catalog" tab
2. "Request" for a CentOS 6.6 catalog item

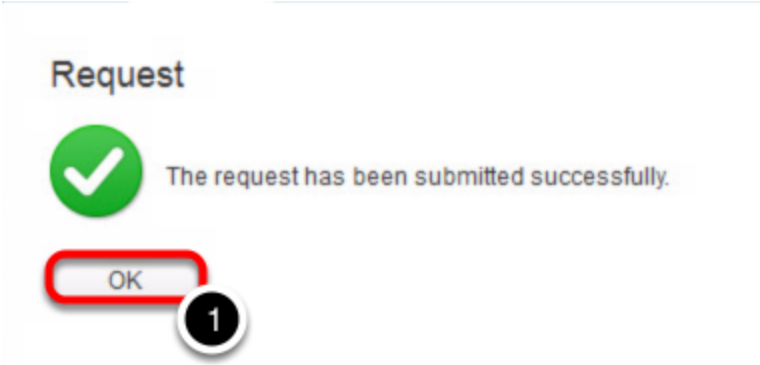
## Submit a Request




1. Click on Windows2012

2. Click "Submit"

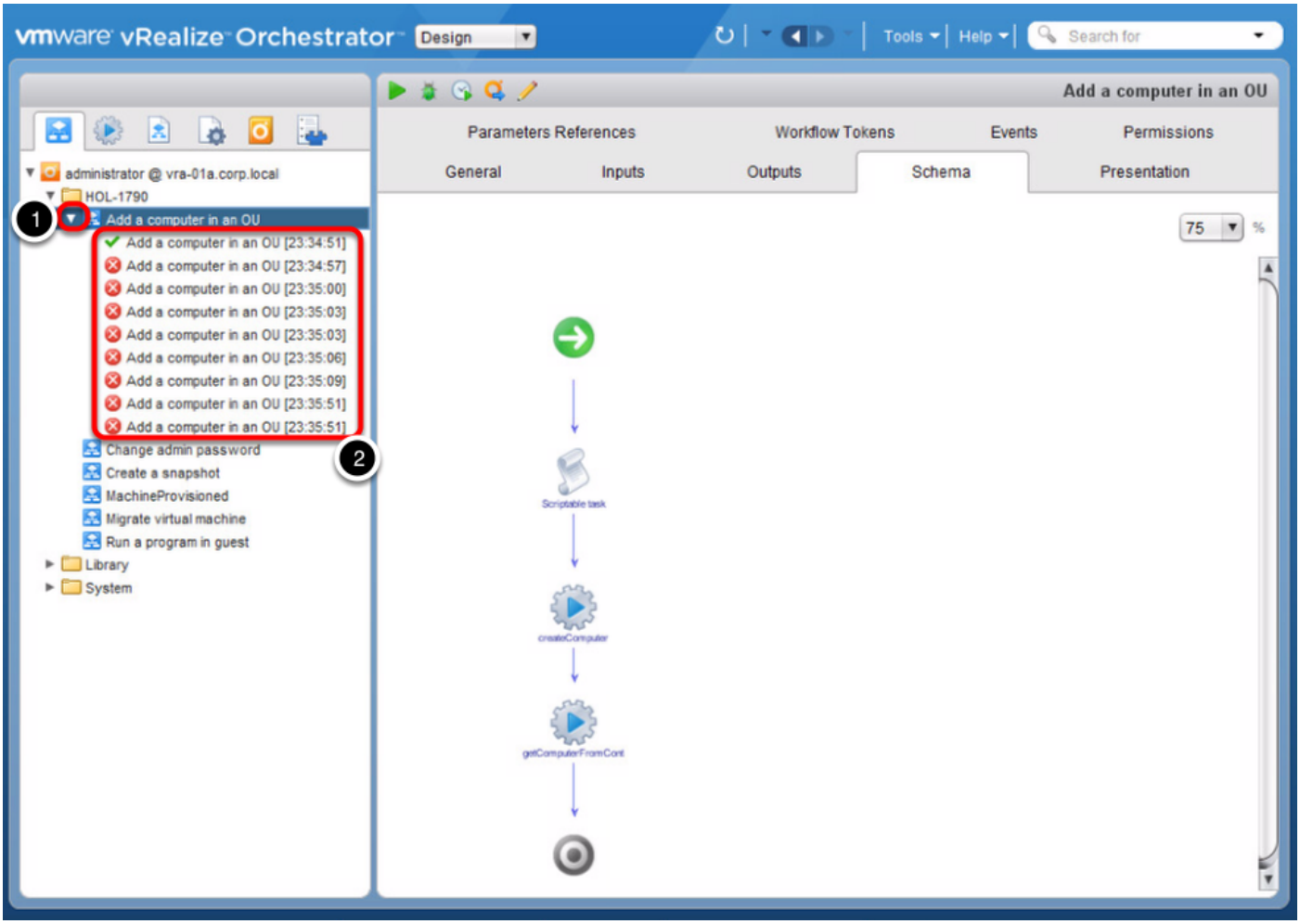
## Request Submission status




A request acknowledgement will be displayed once you have submitted the request form.

1. Click "OK"

## Viewing the workflow run in vRealize Orchestrator




1. Expand the workflow "Add a computer in an OU" to view the workflow execution history.

For this challenge:

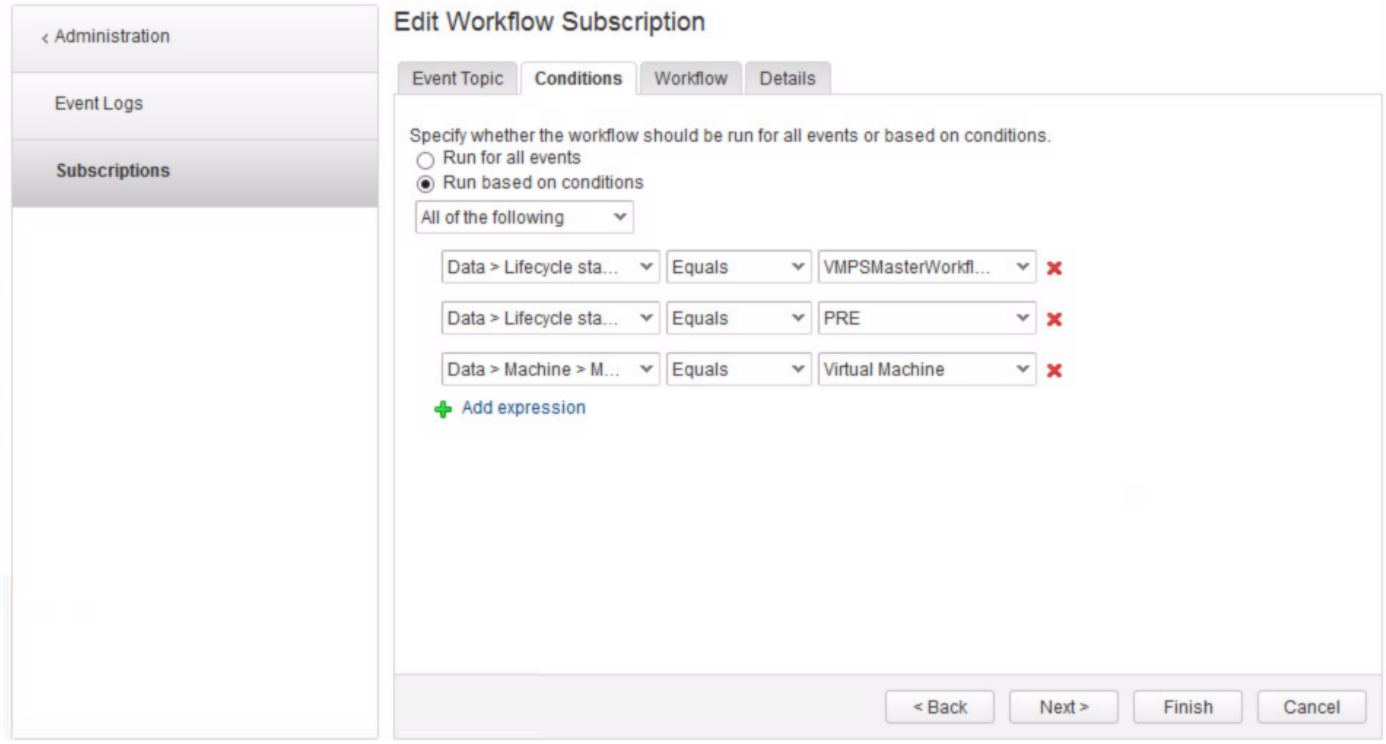
1. You are to investigate why did the workflow run multiple times, instead of just once
2. Fix the issue where the "Add a computer in an OU" workflow is only invoked **once** during a the **VMPSMasterWorkflow32.BuildingMachine** phase for a vRealize Automation request for a **Virtual Machine**.
3. This workflow should only be invoked during the **PRE** state phase of **VMPSMasterWorkflow32.BuildingMachine**

Need hints?

View Hint #1

View Hint #2

## Solution




Many a times, when setting up subscription events, workflows do not run or behave as they should if:

1. Subscription events do not have conditions setup
2. Conditions defined are not correctly configured
3. Workflows that was developed has errors

To solve this challenge:

1. Login to vRealize Automation as cloudadmin
2. Click on Adminstration -> Events -> Subscriptions
3. Edit "Add a computer in an OU" subscription
4. Click Next

5. Select **Run based on conditions**
6. Select **All of the following** to match against ALL conditions in the subscription
7. Select **Data -> Lifecycle state -> Lifecycle state name** from the menu
8. Select **Equals** as the Operator
9. In the 3rd dropdown, select **Constant -> VMPSMasterWorkflow32.BuildingMachine**
10. Click **Add Expression** to add another expression
11. Select **Data -> Machine -> Machine type**
12. Select **Equals** as the Operator
13. For the value, choose **Constant -> Virtual Machine**
14. Click **Add Expression** to add one more expression
15. Select **Data -> Lifecycle state -> State phase**
16. Select **Equals** as the Operator
17. For the value, choose **Constant -> PRE**
18. Click **Finish**

You can now try to request for the same machine, and the workflow should only be invoked once during the pre-stage of BuildingMachine.

## Congratulations!

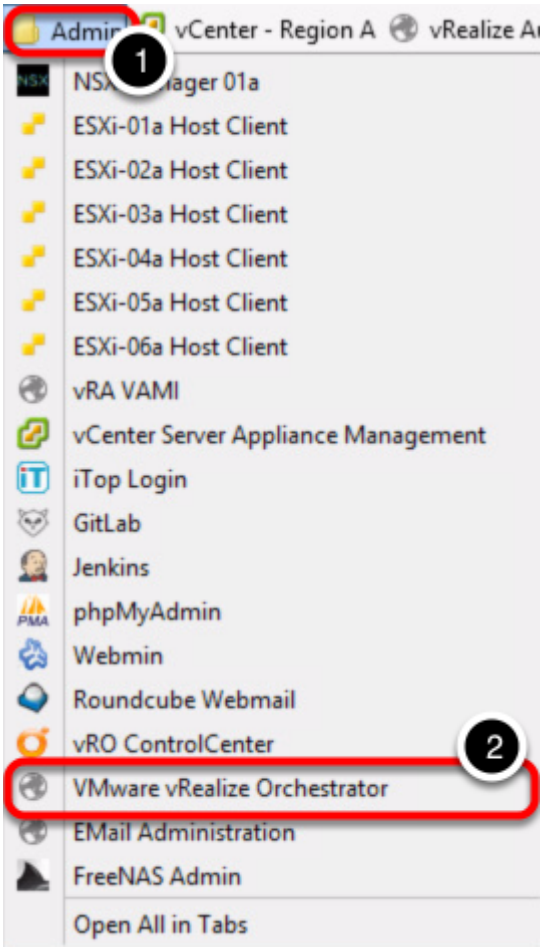
Your new knowledge of how to setup Lifecycle extensibility in vRealize Automation will come in handy when you have such similar requirements in future.

Onwards and upwards, are you ready for more extensibility challenge?

# Workflows are not being triggered when they are supposed to

Just when you are about to take a breather from the previous challenge, you received a complain about a newly integrated workflow that allows users to change a machine's admin/root password during the request submission, is not working! It is up to you now, to save the day with this new challenge!

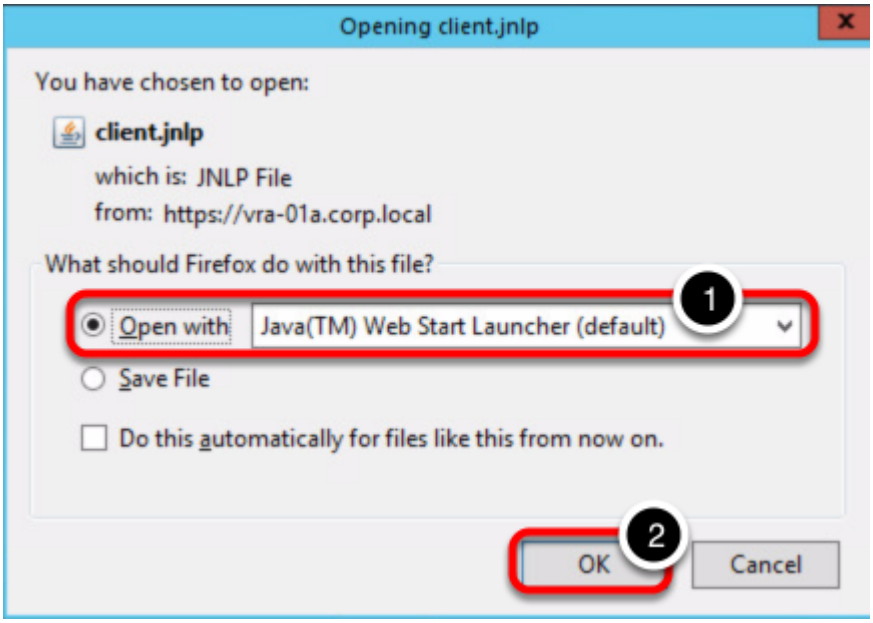
## Launch vRealize Orchestrator Client




To launch vRealize Orchestrator:

1. Click on "Admin" folder bookmark
2. Click on "VMware vRealize Orchestrator"

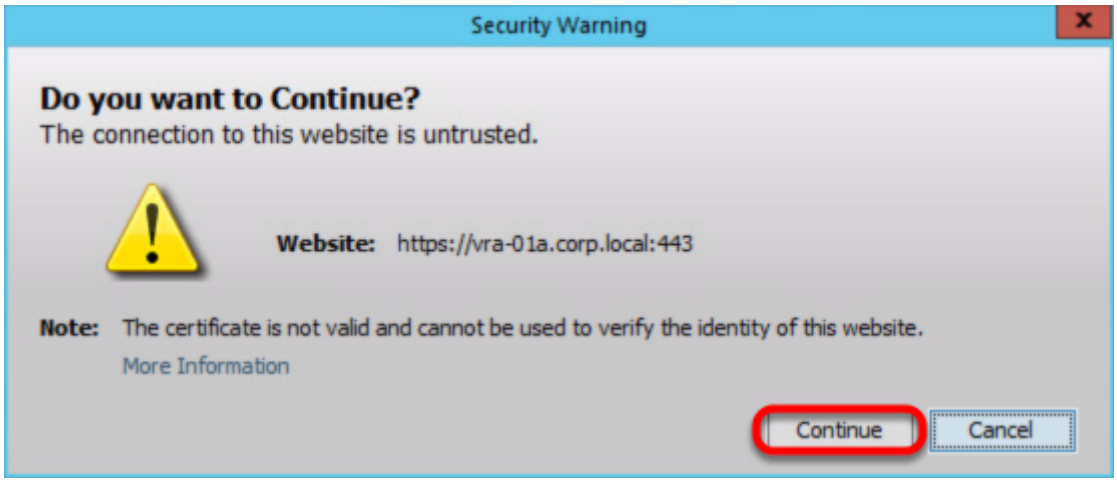
## Open vRealize Orchestrator Client




You will be presented with a popup dialog

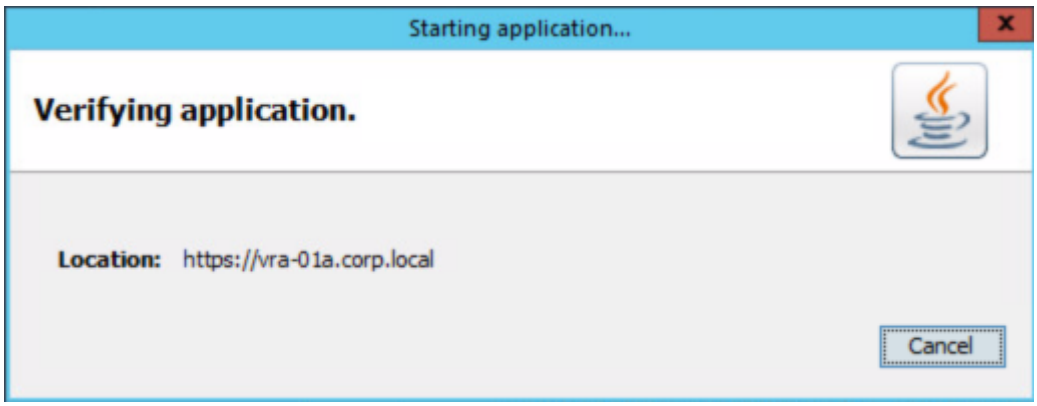
1. Select "Open with .. Java(TM) Web Start Launcher (default)"
2. Click "OK" button

## Accept Security Warning




You may be presented with a security warning, this is normal. Click "Continue" to proceed

## Verifying application notification



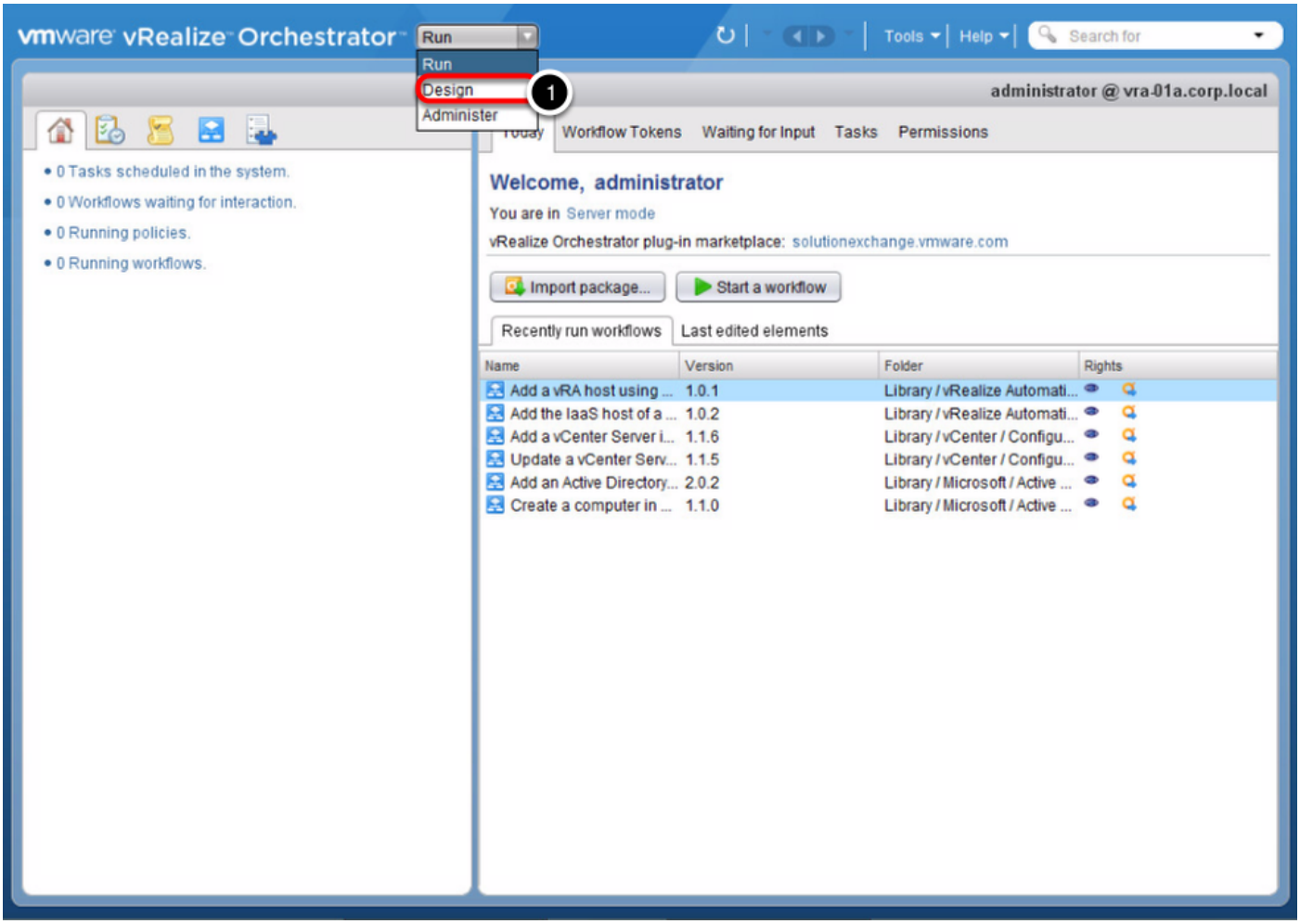

You will be presented with a dialog that is verifying and staring the application. **DO NOT** click "Cancel". The dialog will automatically close once application has been verified.

## Login to vRealize Orchestrator

To login to vRealize Orchestrator:

1. Ensure that the Host name is vra-01a.corp.local:443
2. User name: administrator@vsphere.local
3. Password: VMware1!
4. Click "Login"

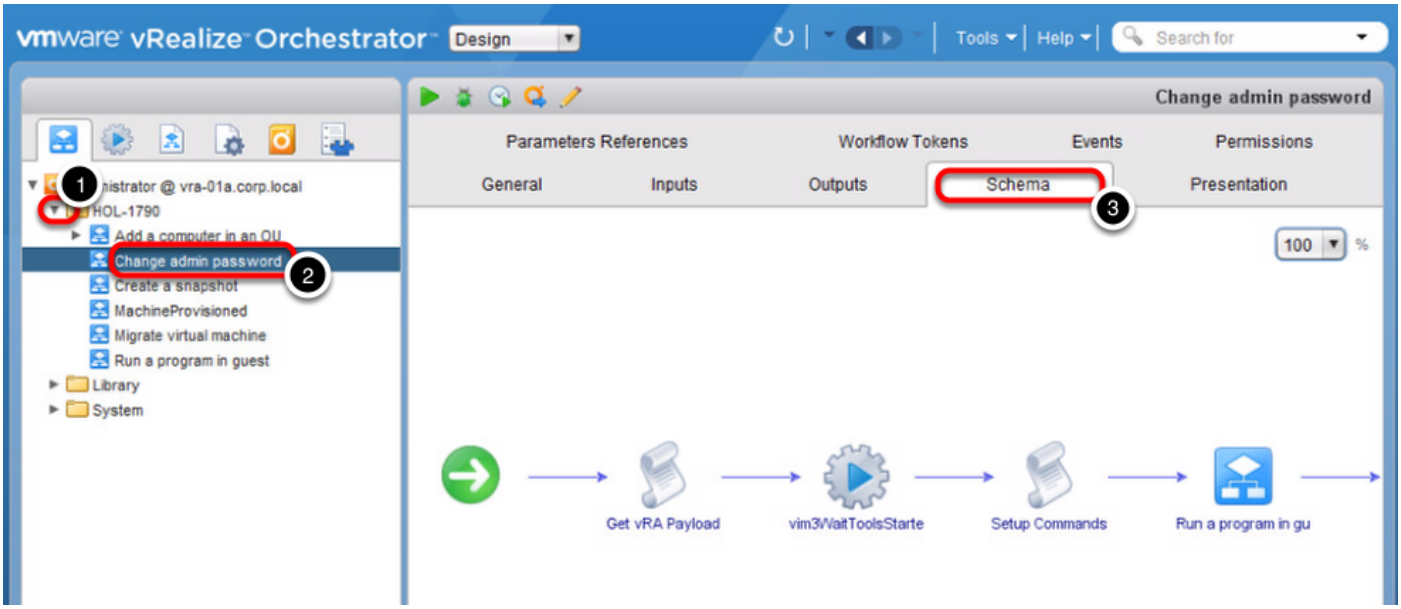
# Switching to Design mode in vRealize Orchestrator




Once vRealize Orchestrator client has been successfully launched, you need to switch to "Design" mode:

1. Click on the dropdown list and select "Design"

## Exploring vRealize Orchestrator workflow




One of your integration engineer have built a workflow that will allow the user to change the admin/root password when they are submitting a request through vRealize Automation. To find out more about what the workflow operates:

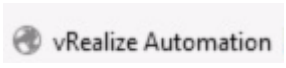
1. Expand the "HOL-1790" folder
2. Click on the workflow "Change admin password"
3. Click on "Schema" to show details on the execution steps in the workflow

NOTE: Do not close the vRealize Orchestrator Client, you will need it later.

## Open Firefox Browser from Windows Quick Launch Task Bar

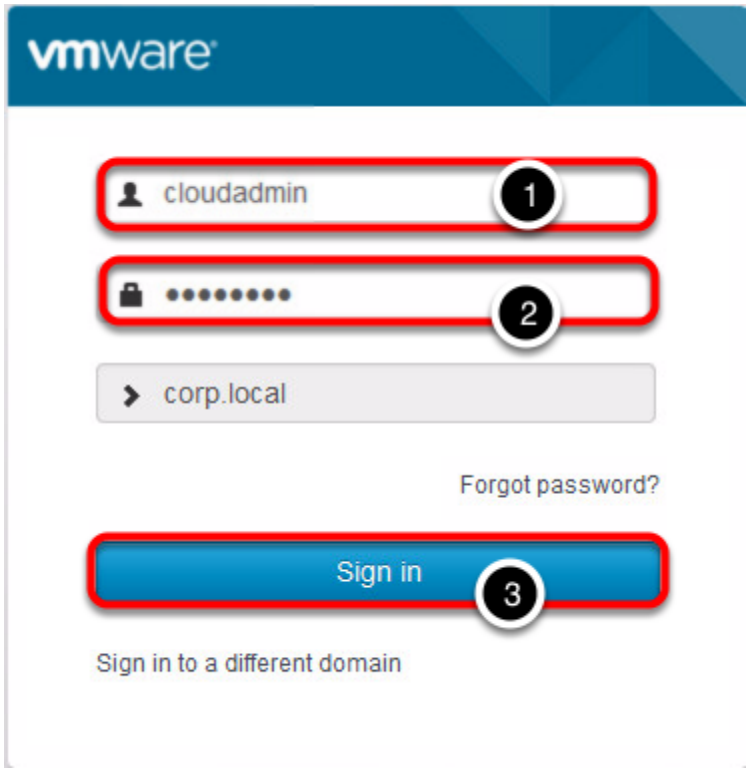
1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar.

## Launch vRealize Automation



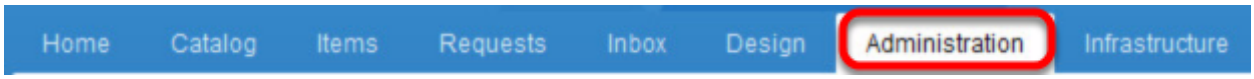

Click on the "vRealize Automation" bookmark

## Log into vRealize Automation



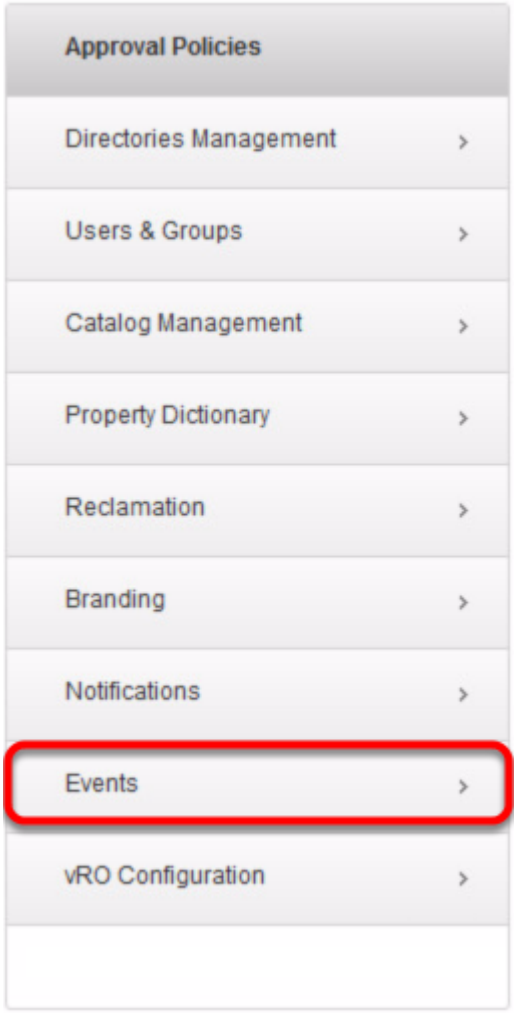

1. User Name: cloudadmin
2. Password: VMware1!
3. Click on "Sign in" button

## Accessing Administration options



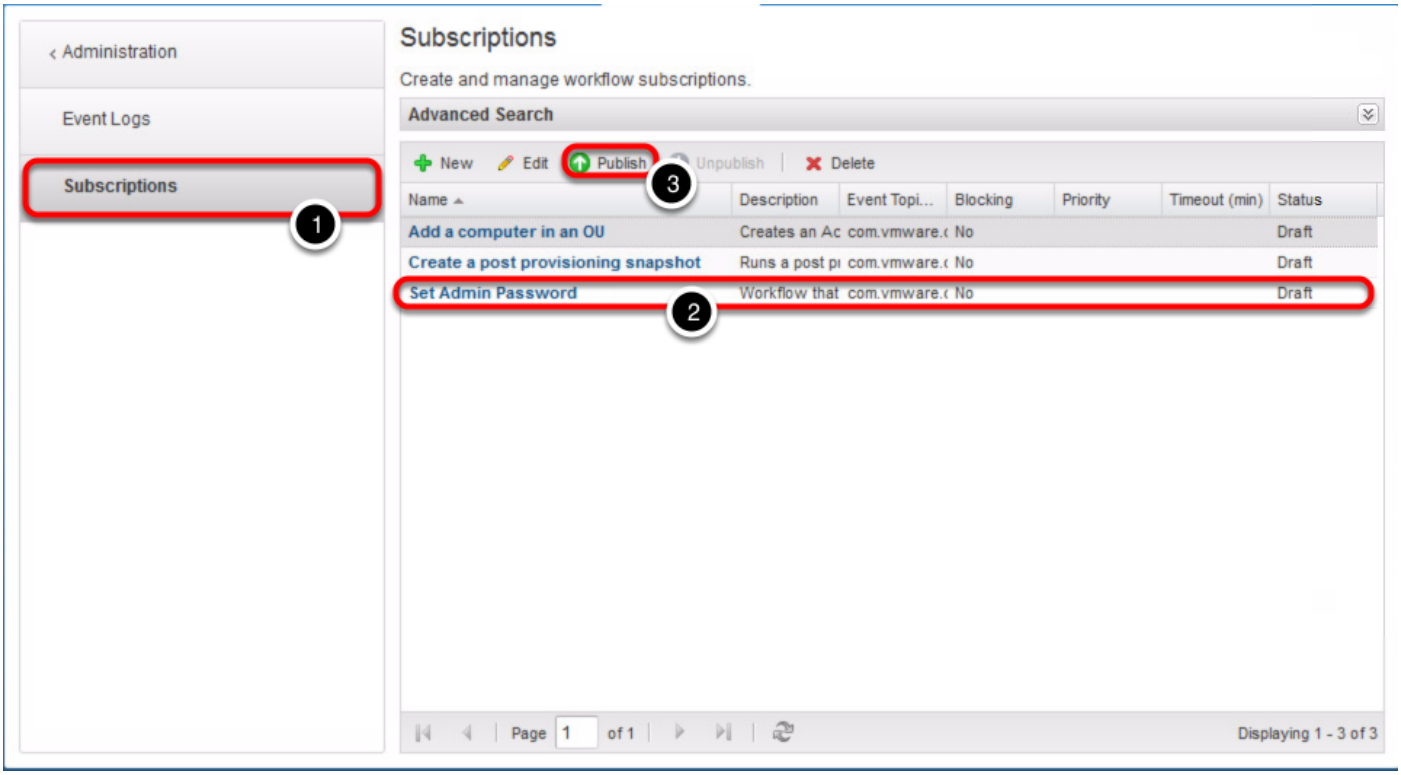

Click on the "Administration" tab

# Click on Events




Click on "Events"

## Accessing subscriptions created




1. Click on "Subscriptions"
2. Select the "Set Admin Password" subscription
3. Click "Publish"

NOTE: This step activates the workflow subscription that will invoke the vRealize Orchestrator workflow "Change admin password" which you previously saw in the vRealize Orchestrator client.

## Open Firefox Browser from Windows Quick Launch Task Bar

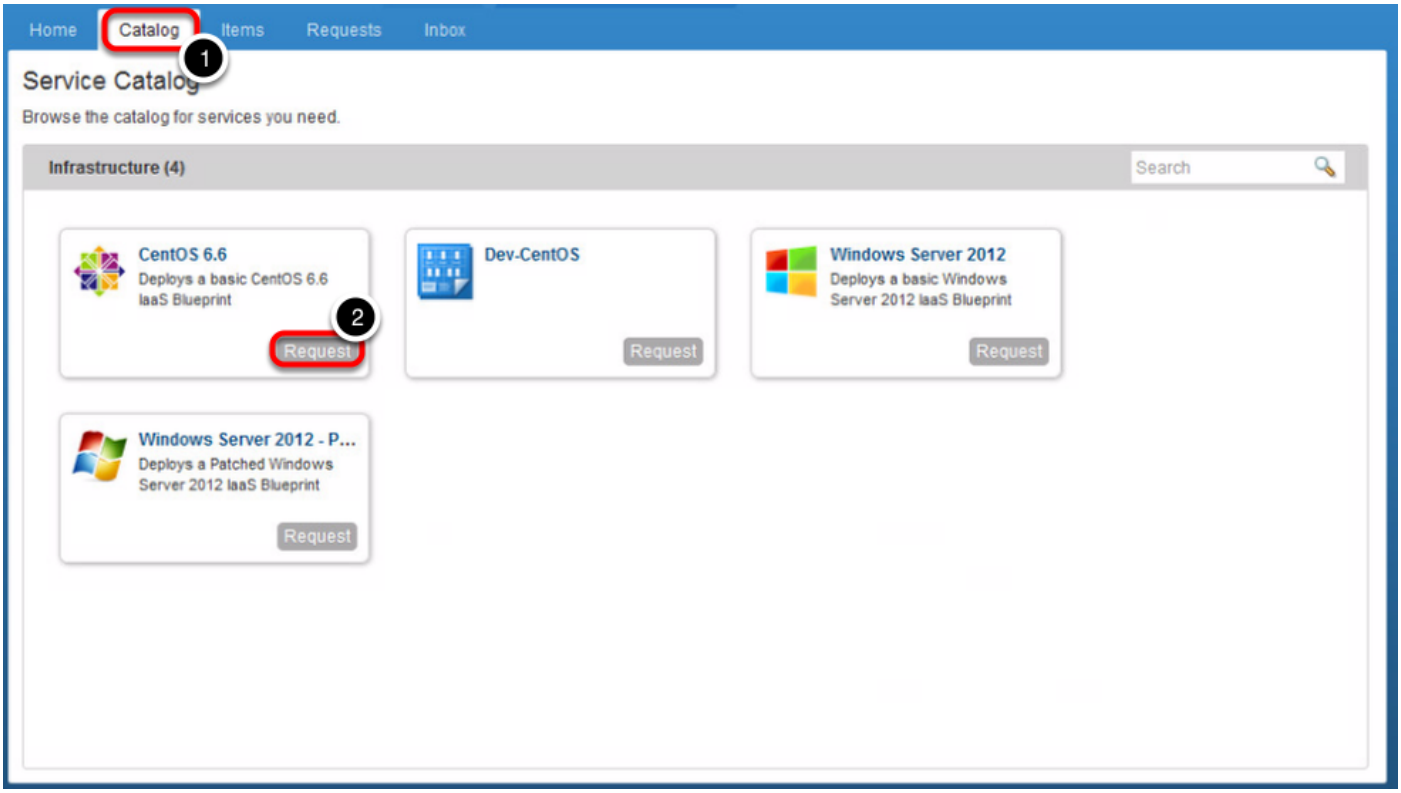
1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar.

# Login to vRealize Automation as Dev User

1. User Name: devuser
2. Password: VMware1!
3. Click on "Sign in" button

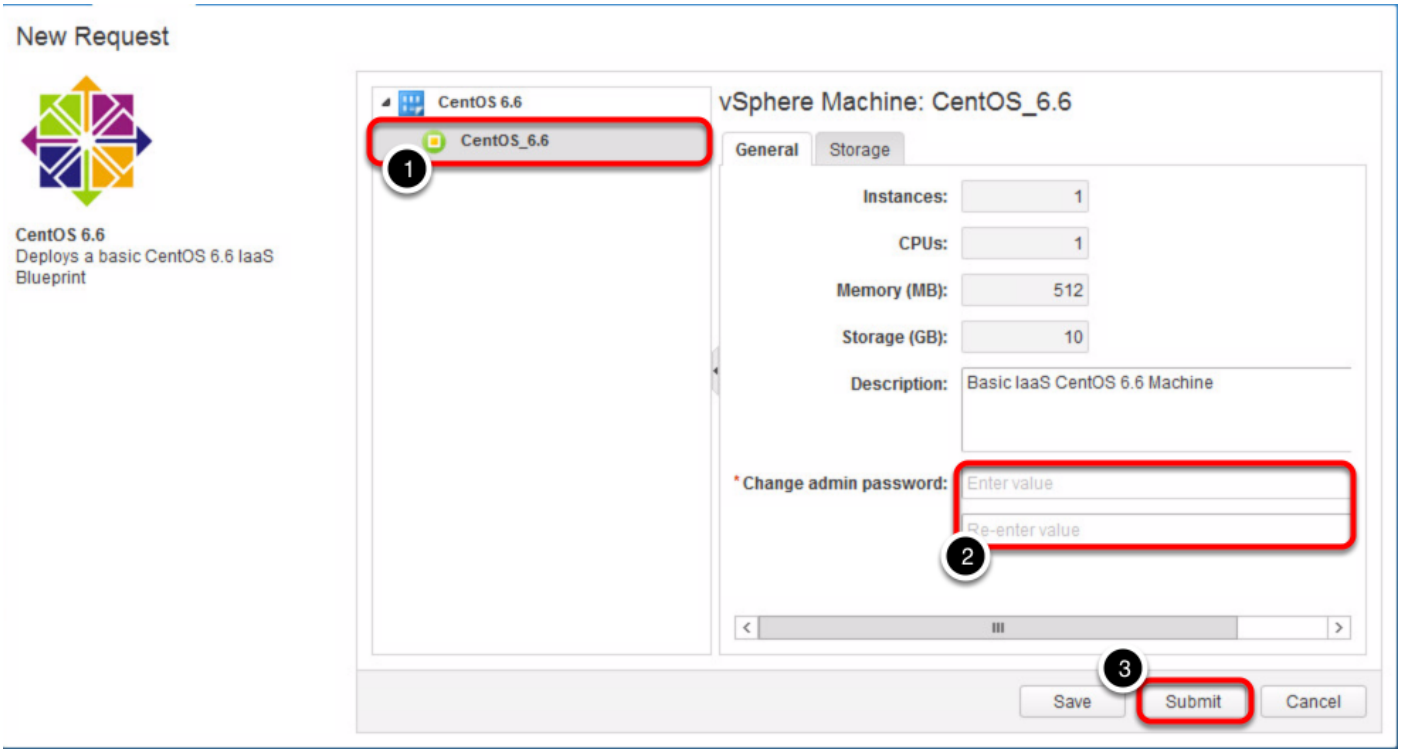
NOTE: You would need to log out from cloudadmin user in order to log in as devuser

## Select catalog item




1. Click on "Catalog" tab
2. "Request" for a CentOS 6.6 catalog item

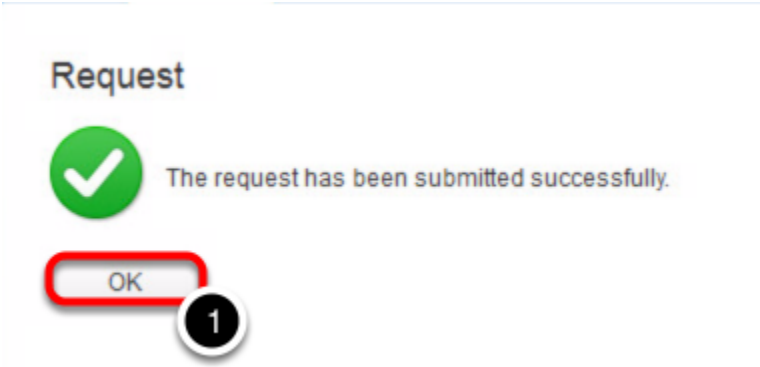
## Submit a Request




1. Click on CentOS_6.6

1. Click on CentOS_6.6
2. Change the admin password (e.g. VMware2!)
3. Click "Submit"

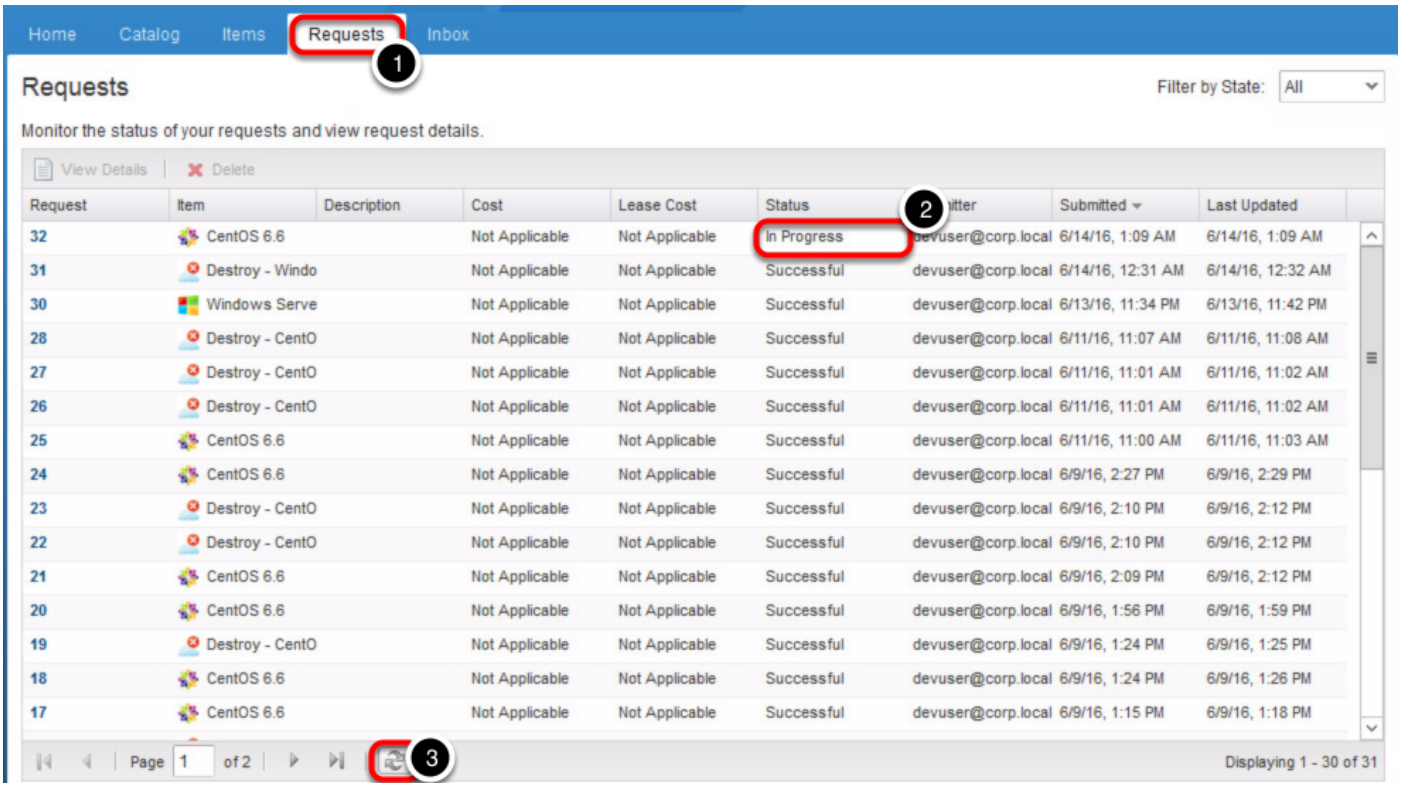
## Request Submission status




A request acknowledgement will be displayed once you have submitted the request form.

1. Click "OK"

## Monitoring the progress of request

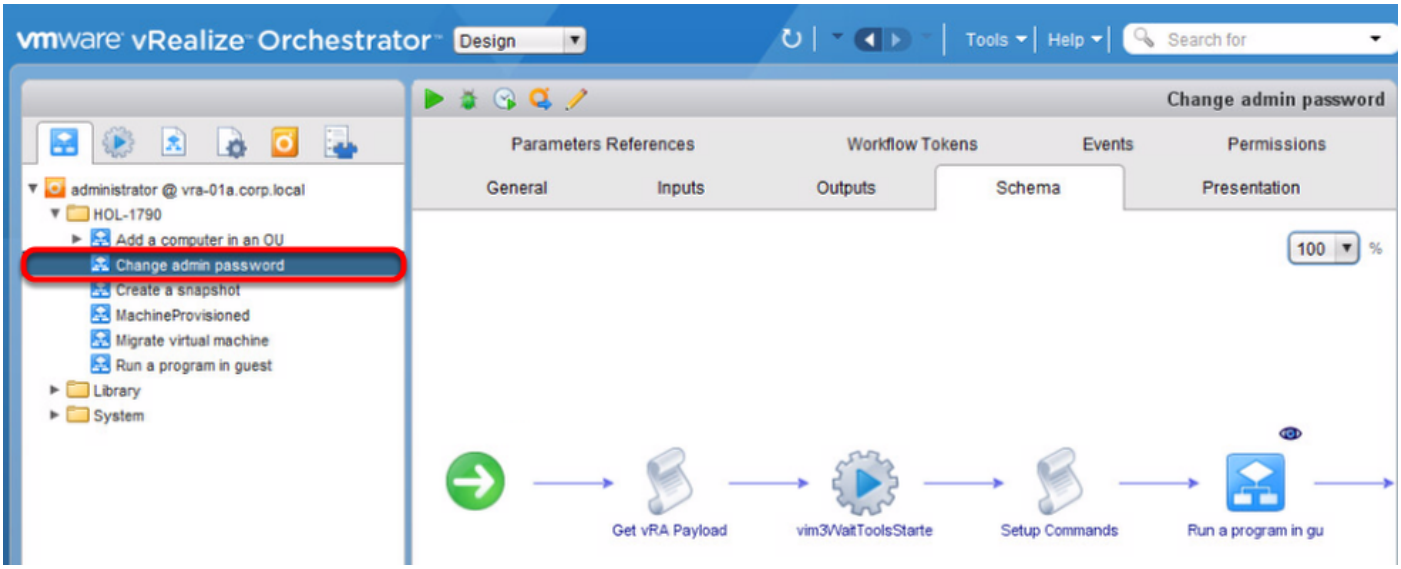



You can monitor the progress of your request:

1. Click on "Requests"
2. Wait for your request to update its Status from "In Progress" to "Successful"
3. You can hit the "Refresh" button to get an update of the status

This usually takes 2-5 mins to complete.

## Viewing the workflow run in vRealize Orchestrator




1. Expand the workflow "Change admin password" to view the workflow execution history.

For this challenge:

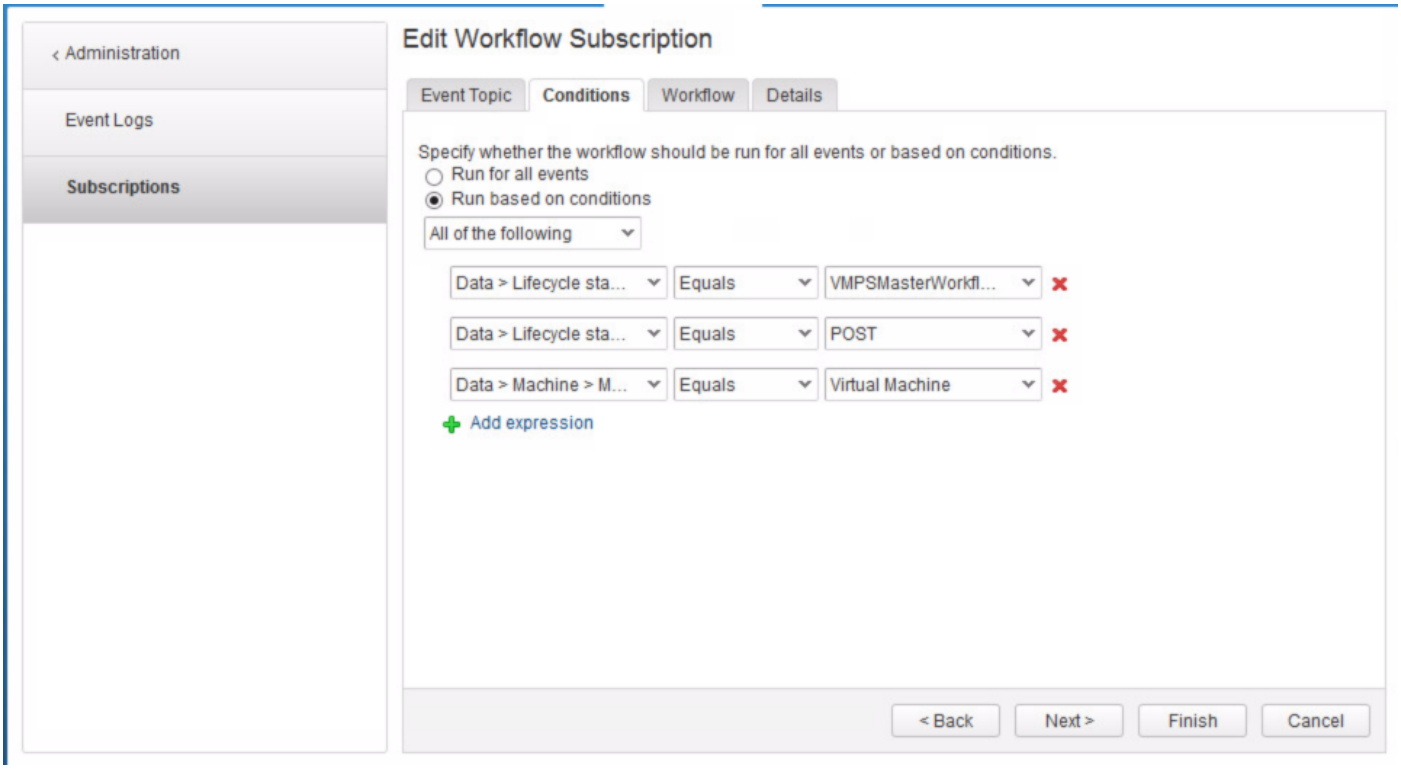
1. You are to investigate why did the workflow did not run at all even though an event subscription has been created for it in vRealize Automation
2. Fix the issue where the "Change admin password" workflow is did not invoked during a the **VMPSMasterWorkflow32.MachineProvisioned** phase for a vRealize Automation request for a **Virtual Machine**.
3. This workflow should be invoked during the **POST** state phase of **VMPSMasterWorkflow32.MachineProvisioned**

Need hints?

View Hint #1

View Hint #2

# Solution




Many a times, when setting up subscription events, workflows do not run or behave as they should if:

1. Subscription events do not have conditions setup
2. Conditions defined are not correctly configured
3. Workflows that was developed has errors

To solve this challenge:

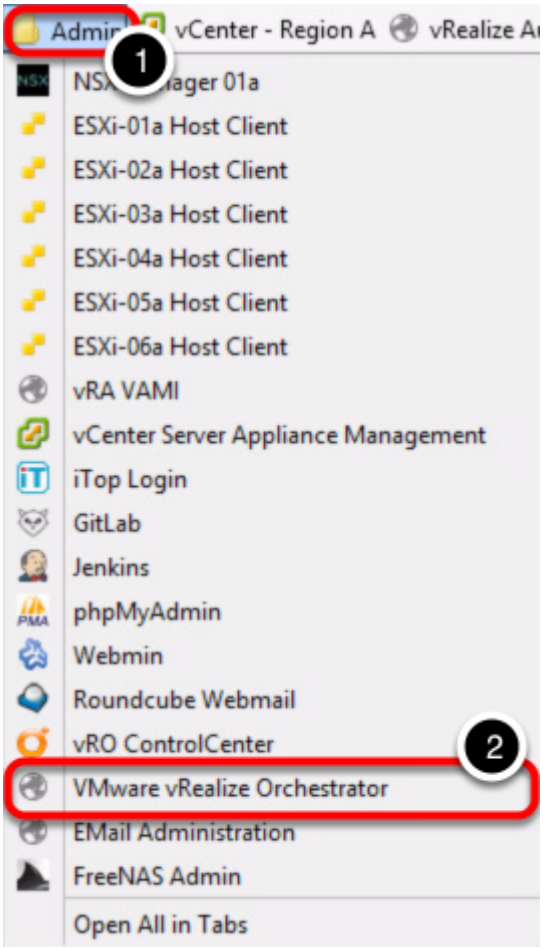
1. Login to vRealize Automation as cloudadmin
2. Click on Adminstration -> Events -> Subscriptions
3. Edit "Set Admin Password" subscription
4. Click Next
5. Select the last condition **Data -> Machine -> Machine type**
6. For the value, change to **Constant -> Virtual Machine**
7. Click **Finish**

You can now try to request for the same machine, and the workflow will be invoked during the post-stage of MachineProvisioned.

# Assigning a new workflow as an action that could be triggered by user

One of your clients has requested for a custom action that allows them to migrate their virtual machines from one esxi host to another. And your integration engineers has implemented that workflow in vRealize Orchestrator. It is now time for you to publish this action and entitle your user to it.

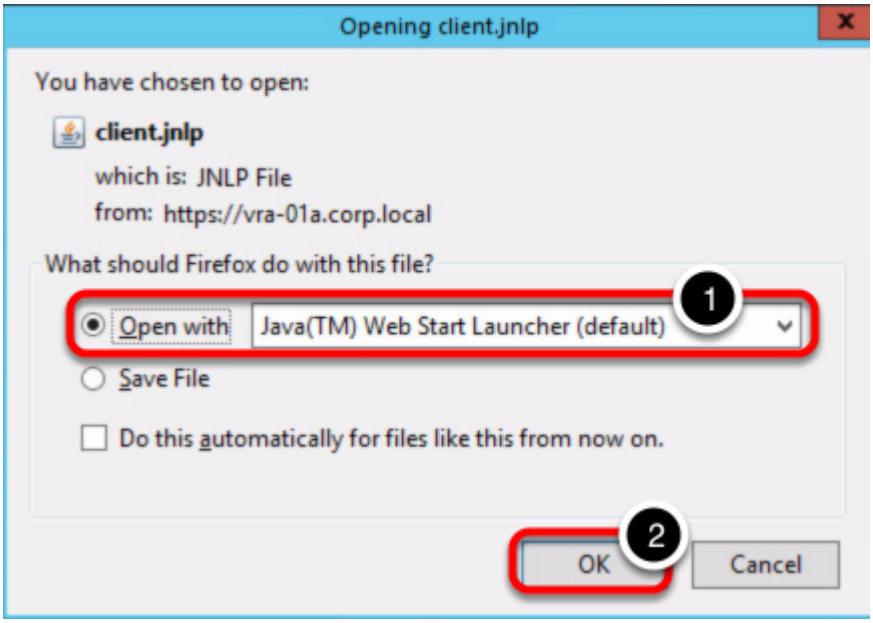
## Launch vRealize Orchestrator Client




To launch vRealize Orchestrator:

1. Click on "Admin" folder bookmark
2. Click on "VMware vRealize Orchestrator"

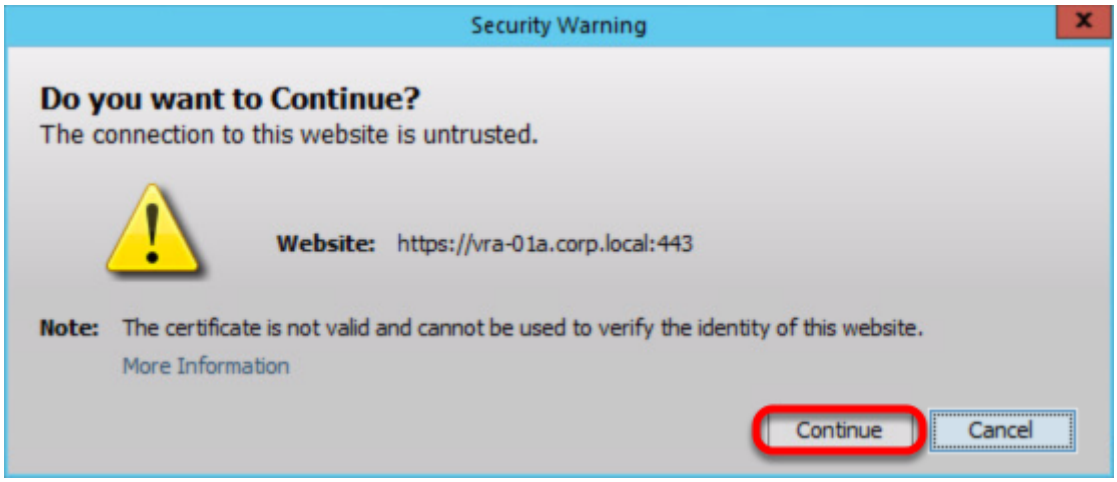
## Open vRealize Orchestrator Client




You will be presented with a popup dialog

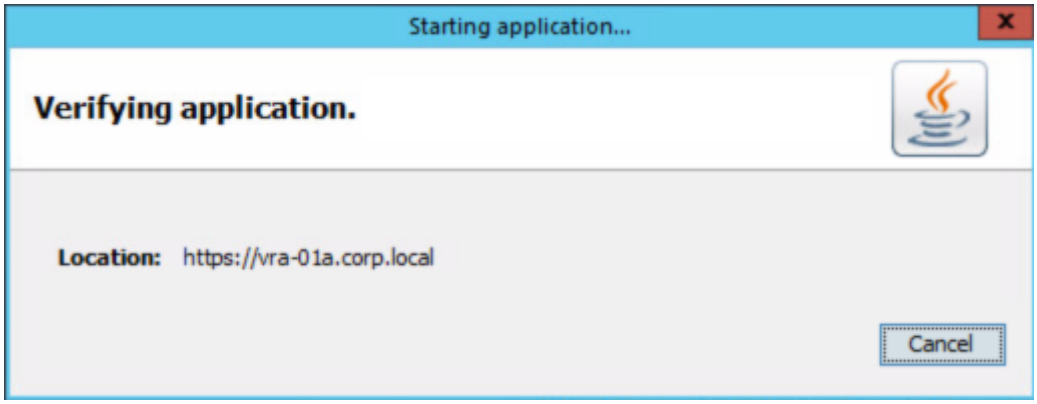
1. Select "Open with .. Java(TM) Web Start Launcher (default)"
2. Click "OK" button

## Accept Security Warning




You may be presented with a security warning, this is normal. Click "Continue" to proceed

## Verifying application notification



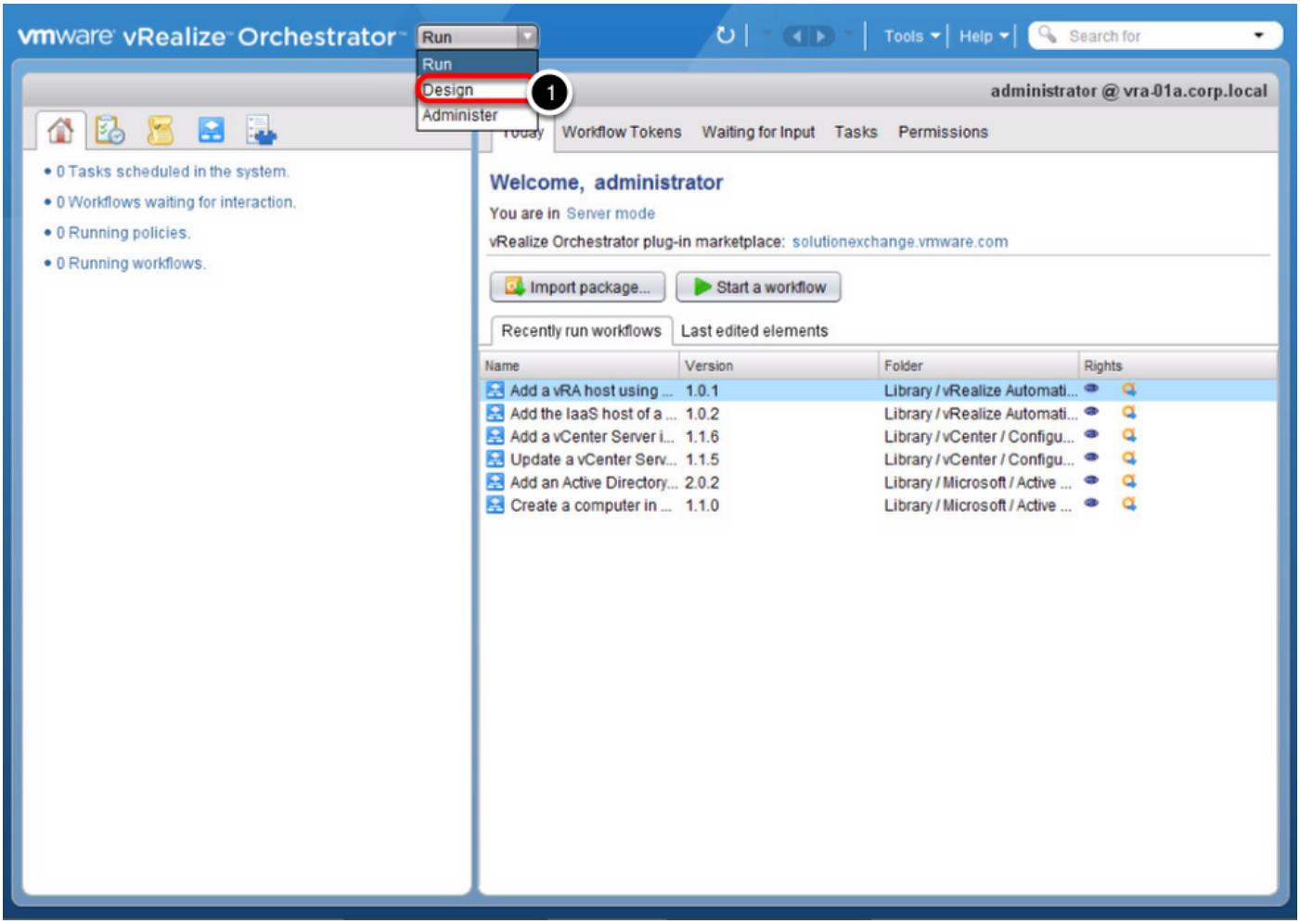

You will be presented with a dialog that is verifying and staring the application. **DO NOT** click "Cancel". The dialog will automatically close once application has been verified.

## Login to vRealize Orchestrator

To login to vRealize Orchestrator:

1. Ensure that the Host name is vra-01a.corp.local:443
2. User name: administrator@vsphere.local
3. Password: VMware1!
4. Click "Login"

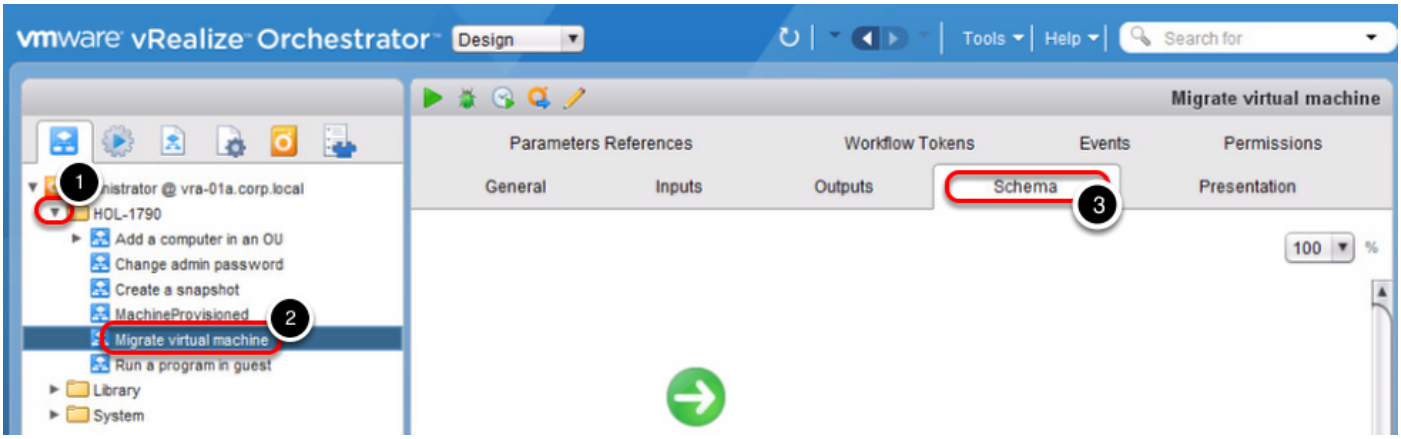
# Switching to Design mode in vRealize Orchestrator




Once vRealize Orchestrator client has been successfully launched, you need to switch to "Design" mode:

1. Click on the dropdown list and select "Design"

## Exploring vRealize Orchestrator workflow

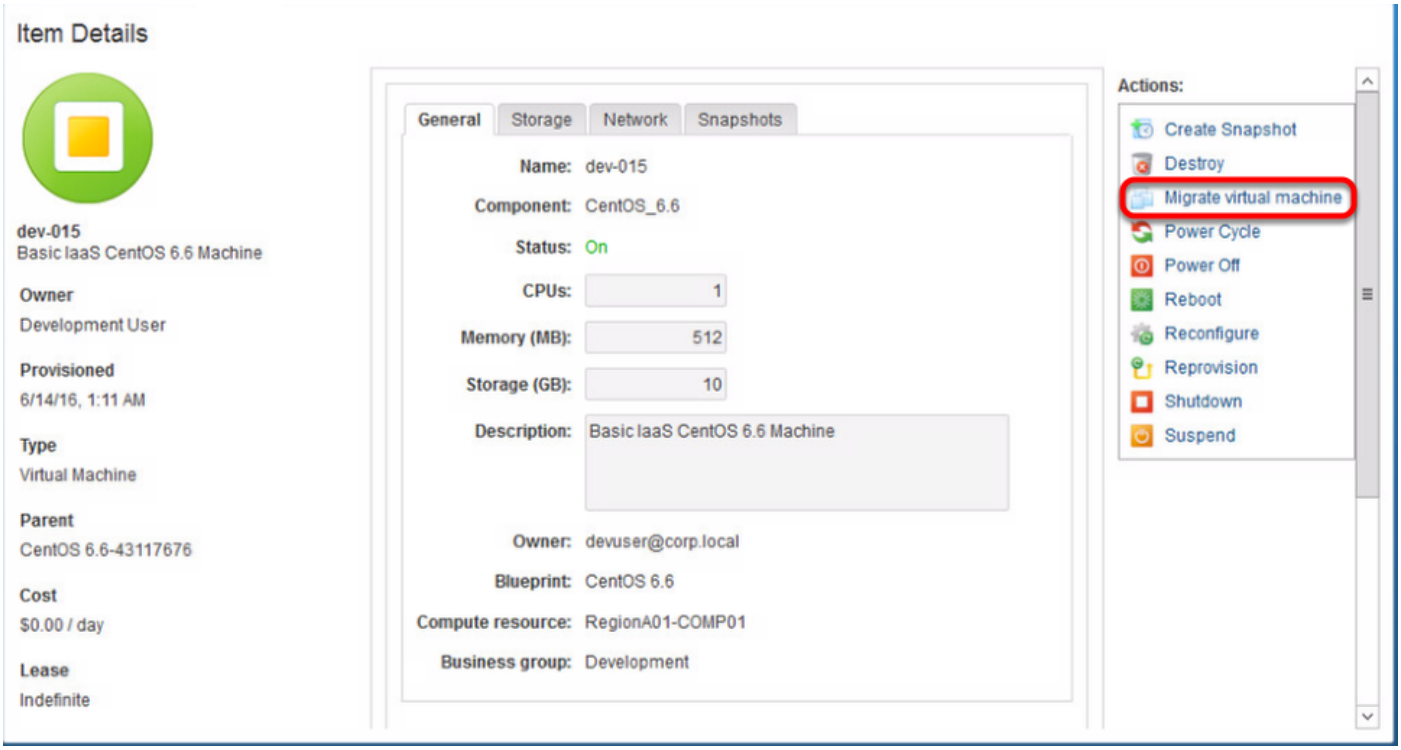



One of your integration engineer have built a workflow that will allow the user to change the admin/root password when they are submitting a request through vRealize Automation. To find out more about what the workflow operates:

1. Expand the "HOL-1790" folder
2. Click on the workflow "Migrate virtual machine"
3. Click on "Schema" to show details on the execution steps in the workflow

NOTE: Do not close the vRealize Orchestrator Client, you will need it later.

## Adding a custom action into vRealize Automation




Your users want an action that allows them to migrate their virtual machine from one host to another. Your integration engineers have already built that workflow for you.

It is up to you now, to make it happen for your users.

For this challenge:

1. You are to take the workflow "Migrate virtual machine" that has been built by your integration engineers and map it into a resource action in vRealize Automation
2. You are then required to only entitle this resource action to the "Development Services" entitlements in vRealize Automation

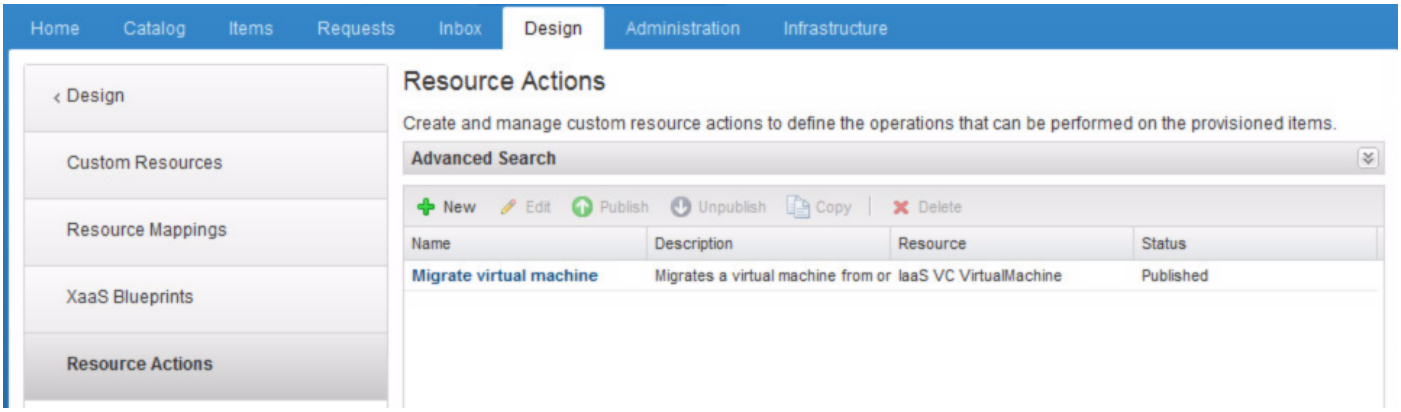
Need hints?

View Hint #1

View Hint #2

View Hint #3

## Solution




To solve this challenge:

1. Login to vRealize Automation as cloudadmin
2. Navigate to Design -> XaaS -> Resource Actions
3. Click on **New** to create a new resource action
4. Select **Orchestrator -> HOL-1790 -> Migrate virtual machine**
5. Click **Next**
6. Leave everything as default and click **Next**
7. **Check** Hide catalog request information page and click **Next**
8. Leave the form as default and click **Finish** (You can modify the form if you know what you doing)
9. Click **Publish** to publish your newly created resource action **Migrate virtual machine**
10. Navigate to Administration -> Catalog Management -> Entitlements
11. **Edit** the Development Services entitlement
12. Click **Next**
13. Click on the plus icon next to **Entitled Actions**
14. In the Name search field, **type** in **Migrate virtual machine**
15. **Check the box** next to Migrate virtual machine
16. Click **OK**
17. Click **Finish**

You can log into vRealize Automation as devuser, browse to any virtual machines, and you will be able to see a new resource action Migrate virtual machine. Try it!

# Module 4: Cloud Administration, Advanced Challenge

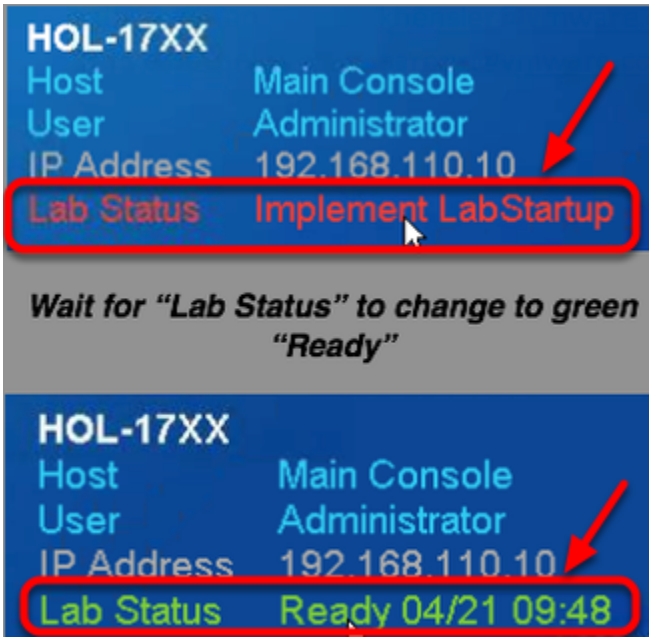
# Introduction

This module will challenge you to bring your private cloud back to operational ready state by fixing operational issues like constant service request failures, requests being stuck in "In Progress" state, and others.

This Module contains the following lessons:

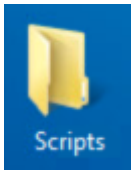
- [Lesson 1] User requests are constantly failing.
- [Lesson 2] Requests left in "In Progress" state for extended period of time.
- [Lesson 3] Users complaining of a Repo404 error.
- [Lesson 4] Unable to manage existing virtual machines in vRealize Automation portal.

## Look at the lower right portion of the screen



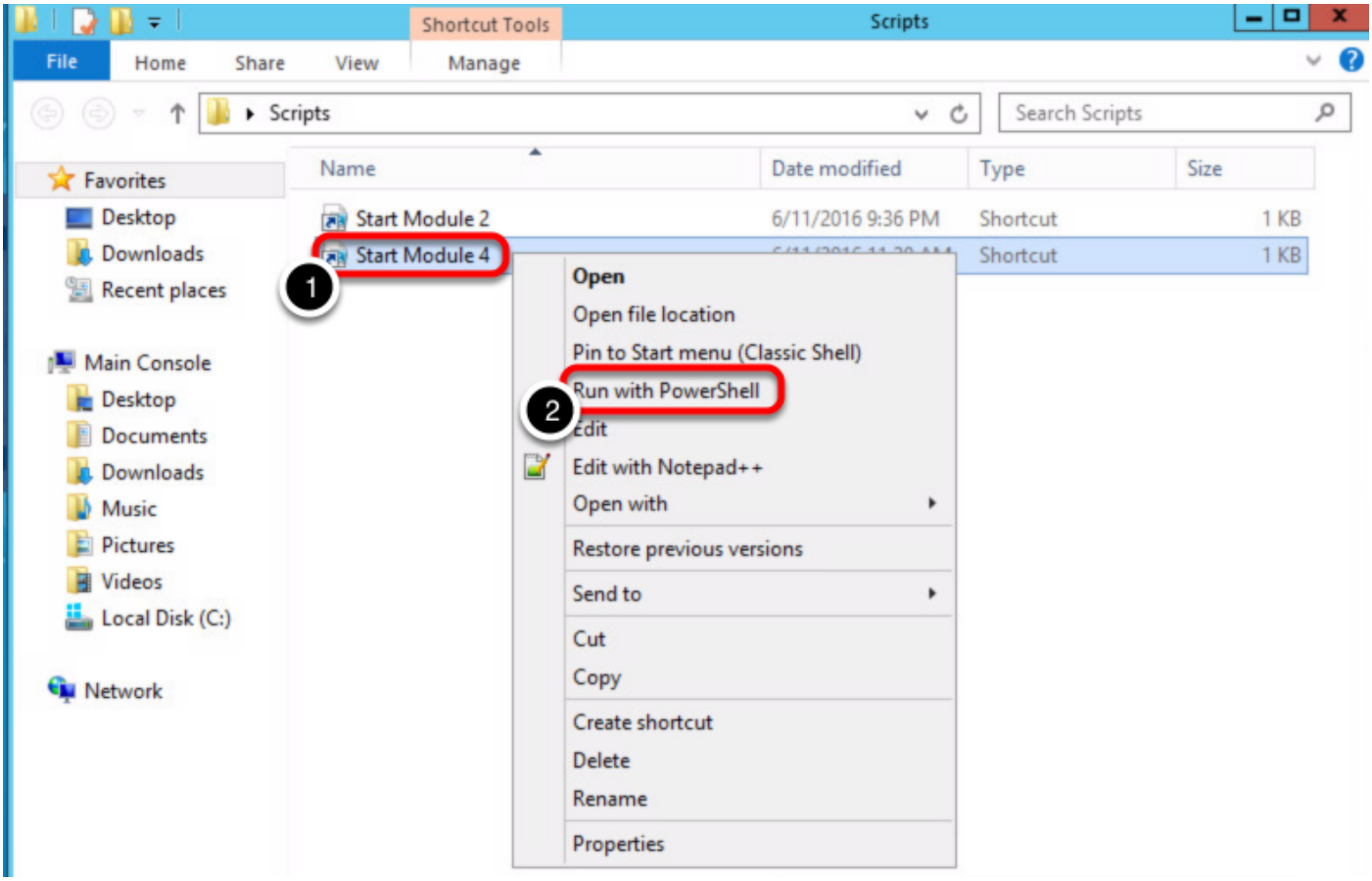

Please check to see that your lab is finished all the startup routines and is ready for you to start. If you see anything other than "Ready", please wait a few minutes.  If after 5 minutes you lab has not changed to "Ready", please ask for assistance.

## Open Scripts Folder on Desktop



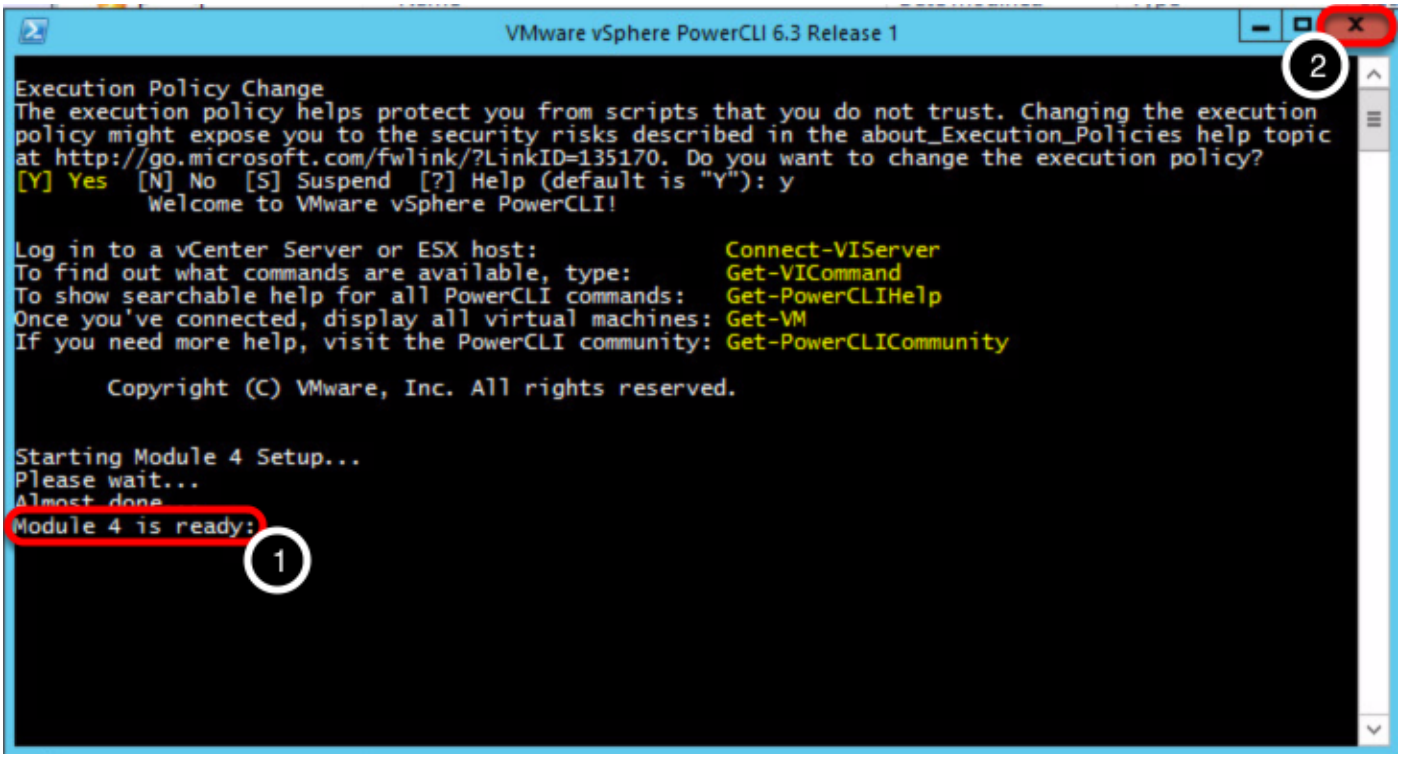

1. Open Scripts folder on the Desktop

# Start Module 4 script




1. ***Right*** click on **Start Module 4**
2. From the context menu, click on **Run with Powershell**

# Module 4 script Starts




The script will take around 1 minute to execute.

When the script is finished, it will read "**Module 4 is ready:**". Press enter twice to close the window or use the close button in the top right hand corner.

# Some users noticed that they are not entitled to perform certain actions on their VMs

Just as you are about to have a short coffee break, you get another complain from a user that he is not able to launch a remote console from vRealize Automation into his virtual machine. Well, with great power, comes great responsibility. And off you go to investigate further.

## Open Firefox Browser from Windows Quick Launch Task Bar

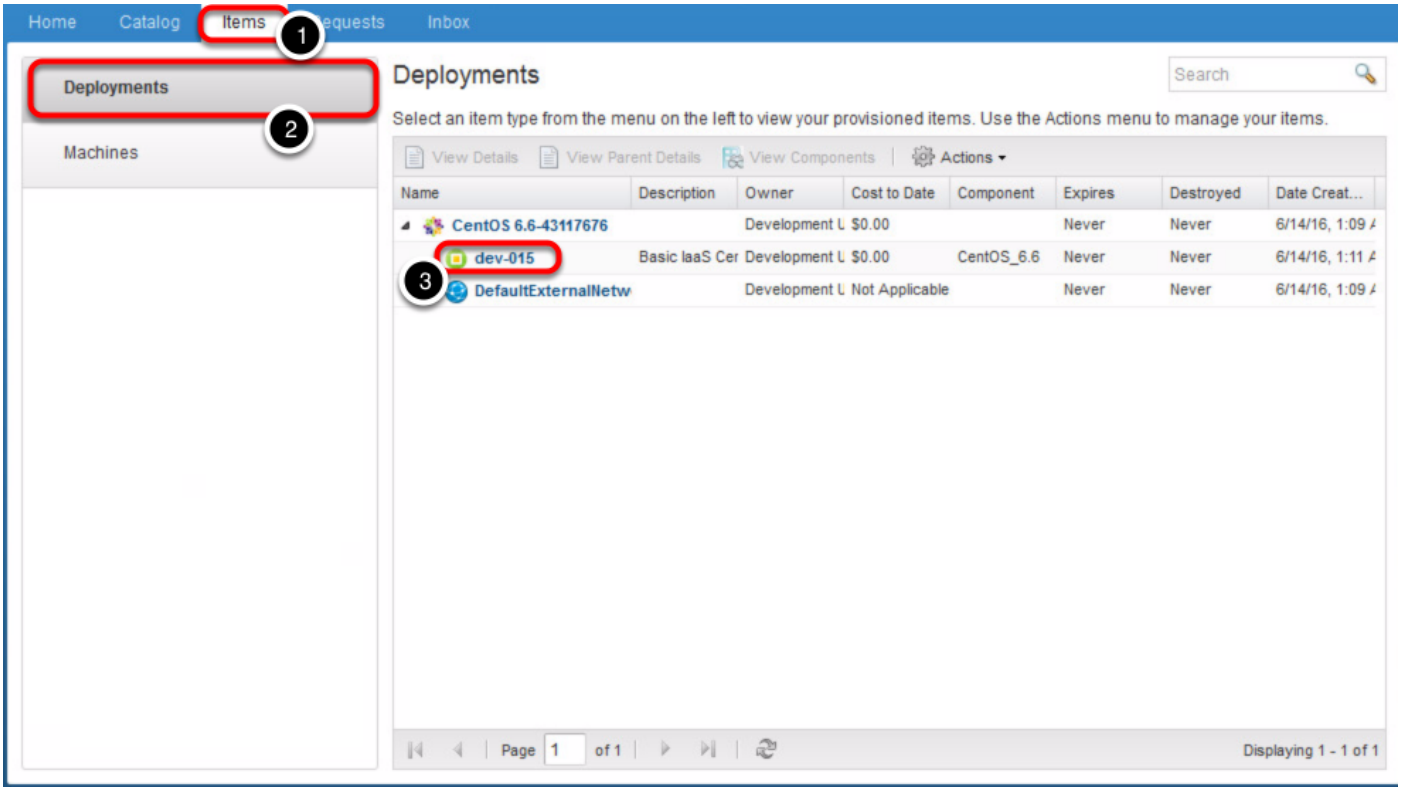
1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar.

## Login to vRealize Automation as Dev User

1. User Name: devuser
2. Password: VMware1!
3. Click on "Sign in" button

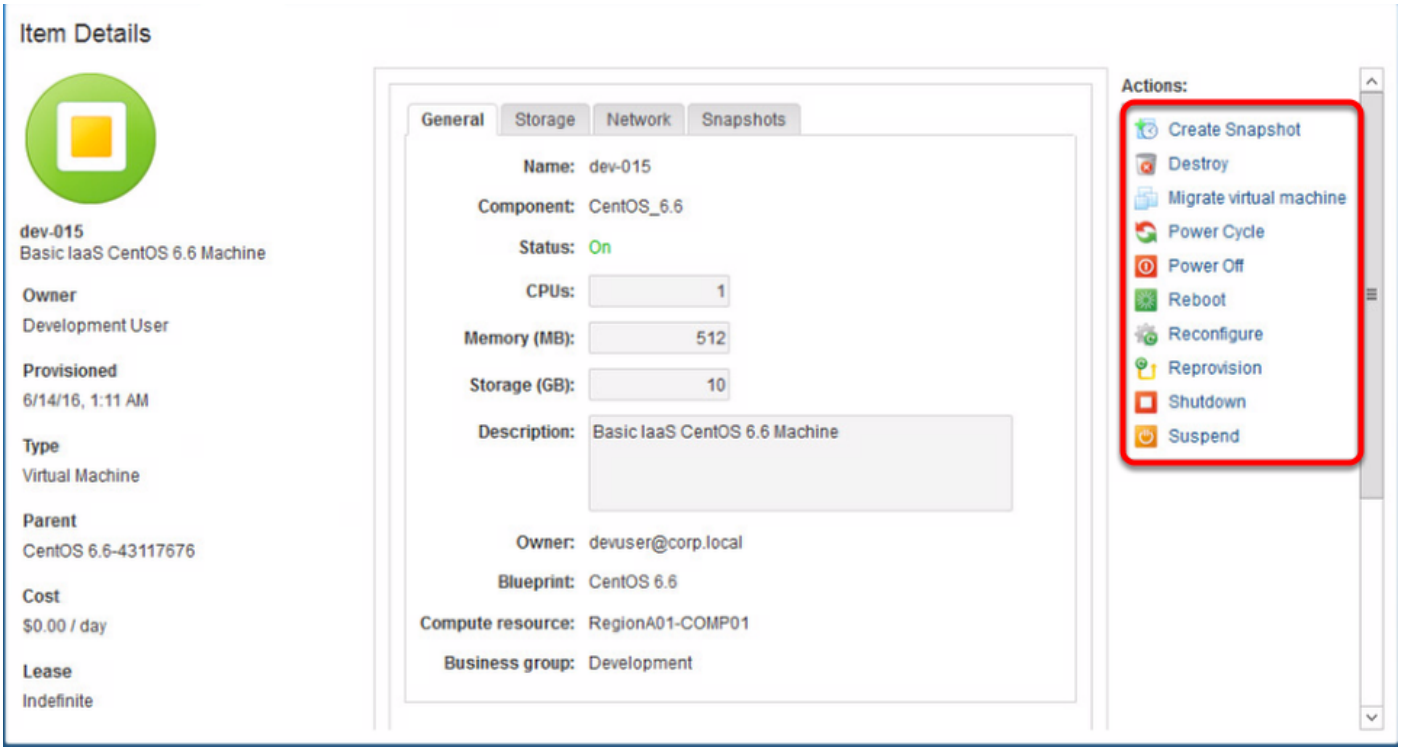
NOTE: You would need to log out from cloudadmin user in order to log in as devuser

# View Items




1. Click on **Items**
2. Click on **Deployments**
3. Click on the **machine name** to find out more information

# View entitled actions




Your user (devuser) is having issues trying to launch a remote console connection to access his virtual machine operating system. From the above, it seems that it is missing from his list of available actions.

For this challenge:

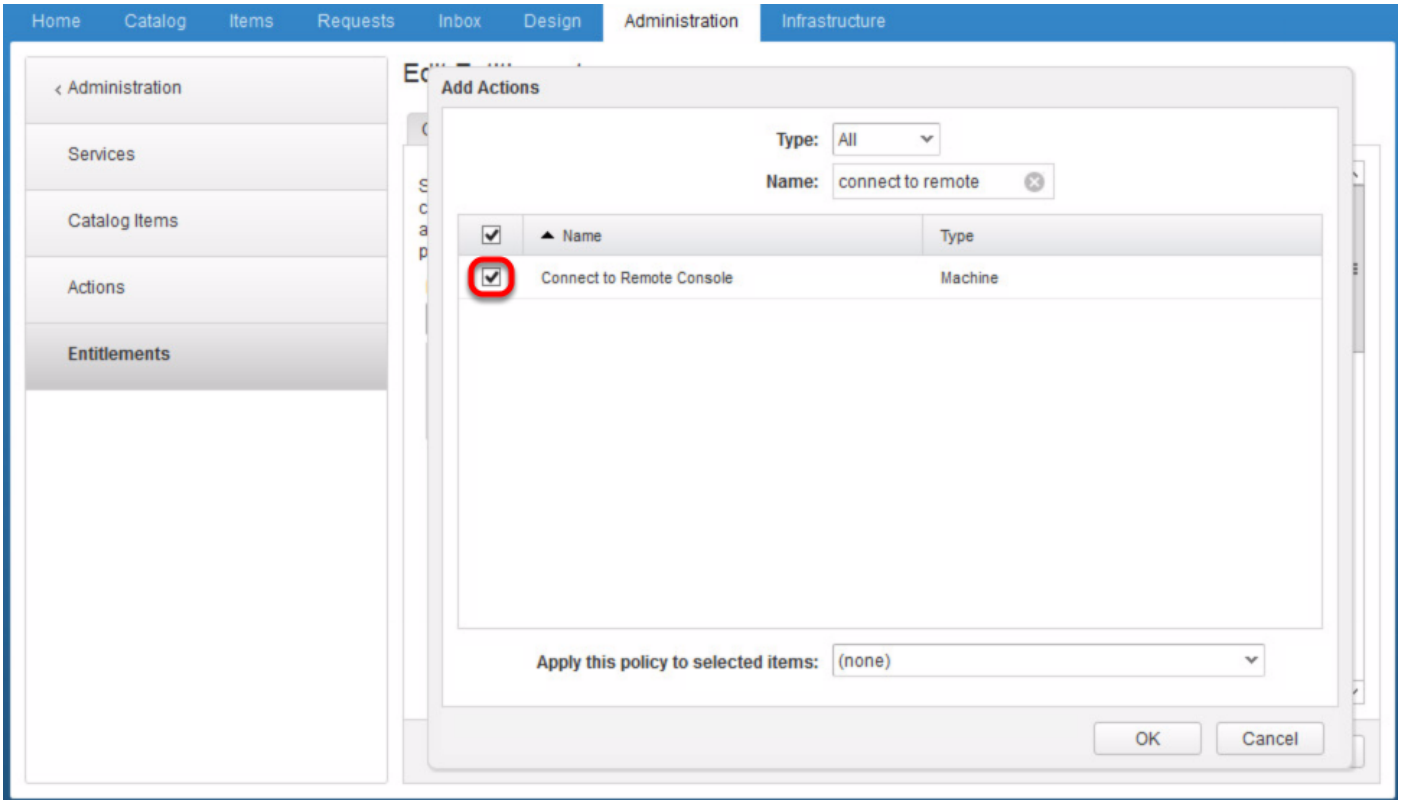
1. You are to investigate why the user (devuser) is not able to see "**Connect to remote console**" action when viewing his virtual machine details
2. Provide a way for the user to be able to access his virtual machine operating system from vRealize Automation

Need a hint?

View Hint #1

View Hint #2

# Solution




vRealize Automation allows you to have very granular entitlement policies to control and govern the types of actions or activities users are able to perform. In this challenge, users do not have the entitlement to perform remote console connection to their virtual machines.

To solve this challenge:

1. Login to vRealize Automation as cloudadmin
2. Navigate to Administration -> Catalog Management -> Entitlements
3. Edit the Development Services entitlement
4. Click Next
5. Click on the plus icon next to Entitled Actions
6. **Search** for "**connect to remote console**" under **Name** field.
7. **Check** the box next to "**Connect to remote console**"
8. Click OK
9. Click Finish

Now you can log in as devuser, and you will see that "Connect to remote console" action will appear when viewing a machine's available list of actions.

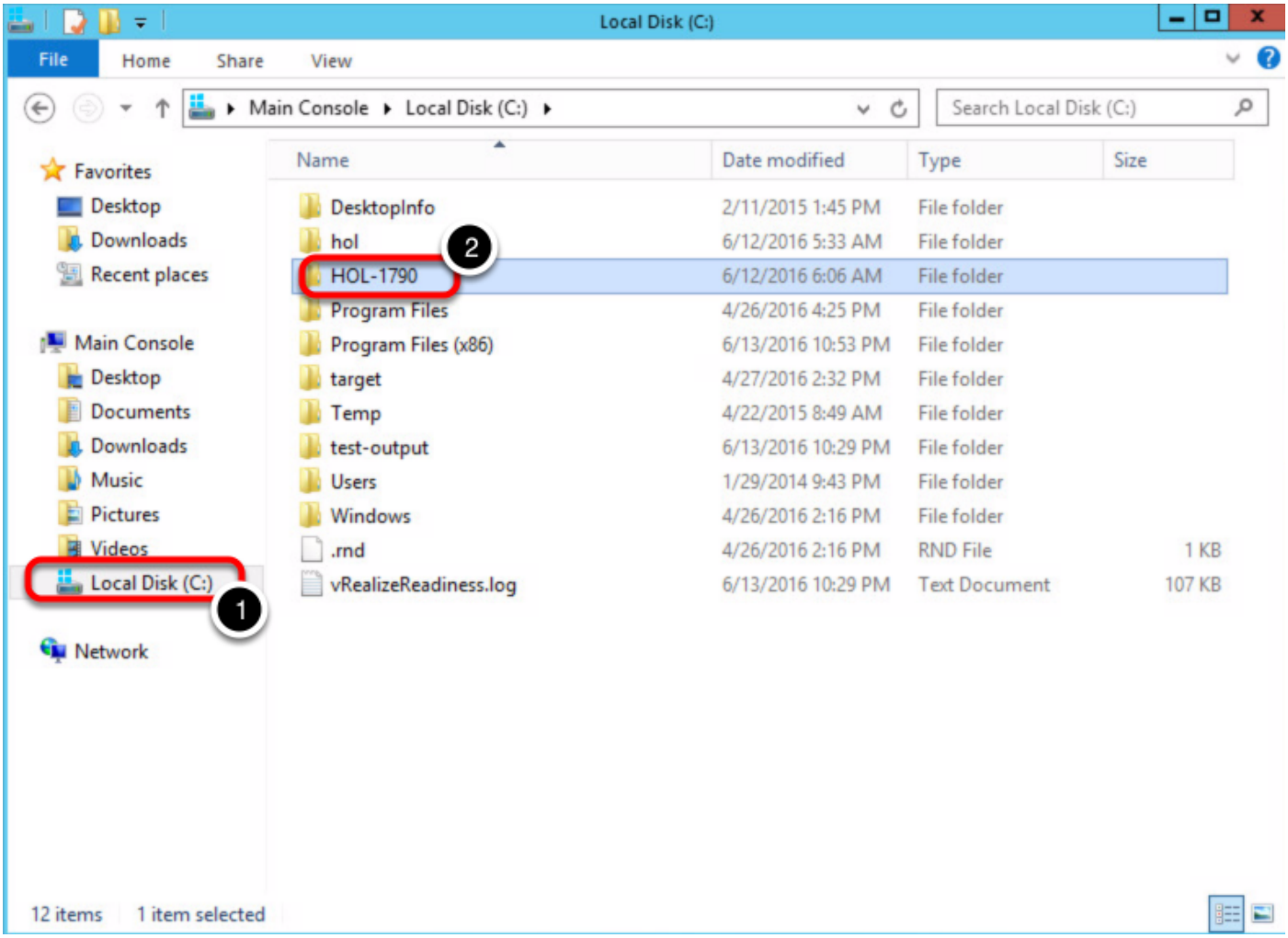
# Importing new content into catalog

One of your service architect has exported a blueprint that he wants you to publish into vRealize Automation. He has sent you the exported zip package that you can readily import into vRealize Automation without asking you to manually recreate the blueprint from scratch. How thoughtful! It is up to you now to as a vRealize Automation guru to complete this challenge. Are you up for it?

## Launch Windows Explorer

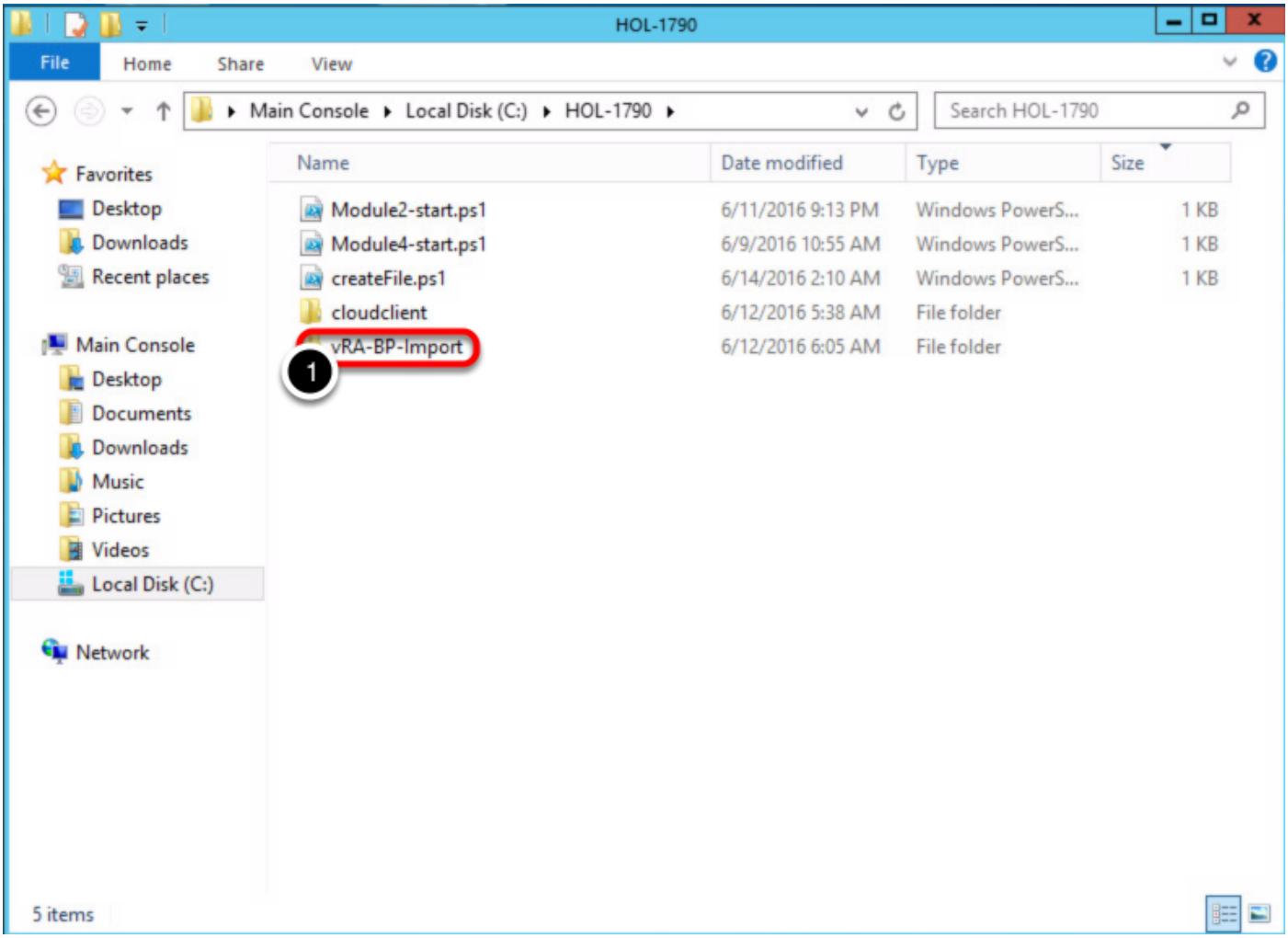
1. Click on the **Windows Explorer icon** on the Windows Quick Launch Task Bar.

## Open HOL-1790 folder



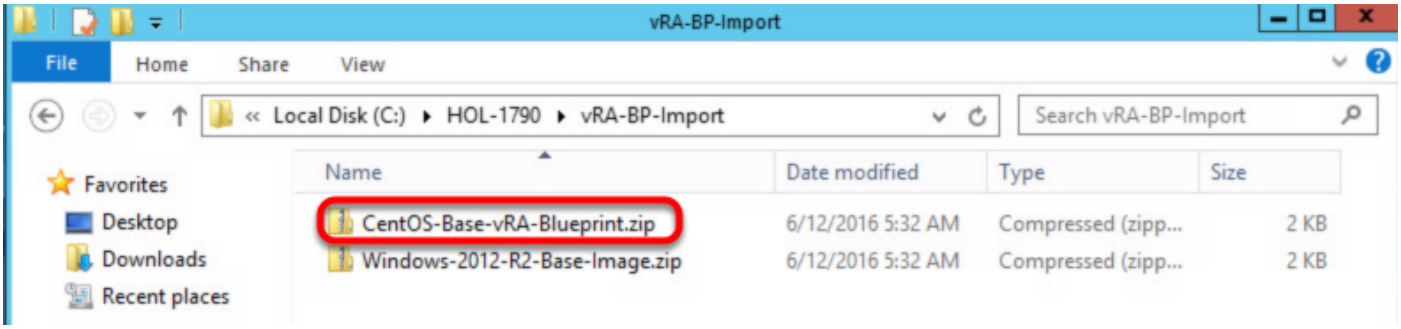

1. Click on **Local Disk (C:)**
2. **Double click** on HOL-1790

## Explore the vRA-BP-Import folder




1. **Double click** on vRA-BP-Import folder

## Import content into vRealize Automation




Your service architect has kindly exported the blueprint (CentOS-Base-vRA-Blueprint.zip) from a test environment and placed it into a folder that you see now.

For this challenge:

1. You are to import the blueprint package (CentOS-Base-vRA-Blueprint.zip) into vRealize Automation

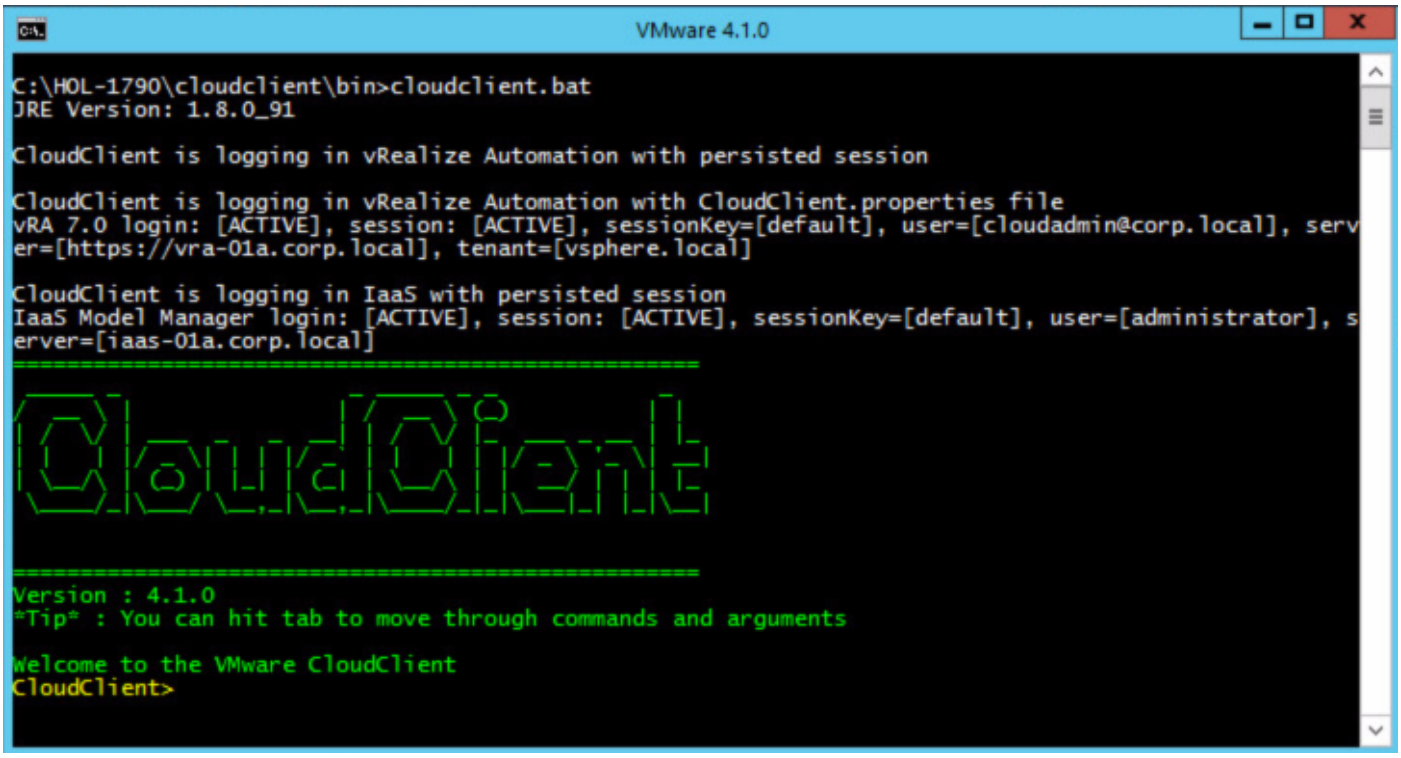
2. Once your blueprint has been imported, you are to map the correct vSphere template for the blueprint according to the operating system
3. Ensure that the blueprint is published
4. Add this blueprint as a catalog item to Infrastructure service category

Need a hint?

View Hint #1

View Hint #2

## Solution - Import content from Cloud Client




vRealize Automation allows you to easily import and export content by using vRealize CloudClient. It is a command line interface to provide an easy way for administrators to perform tasks.

To solve this challenge:

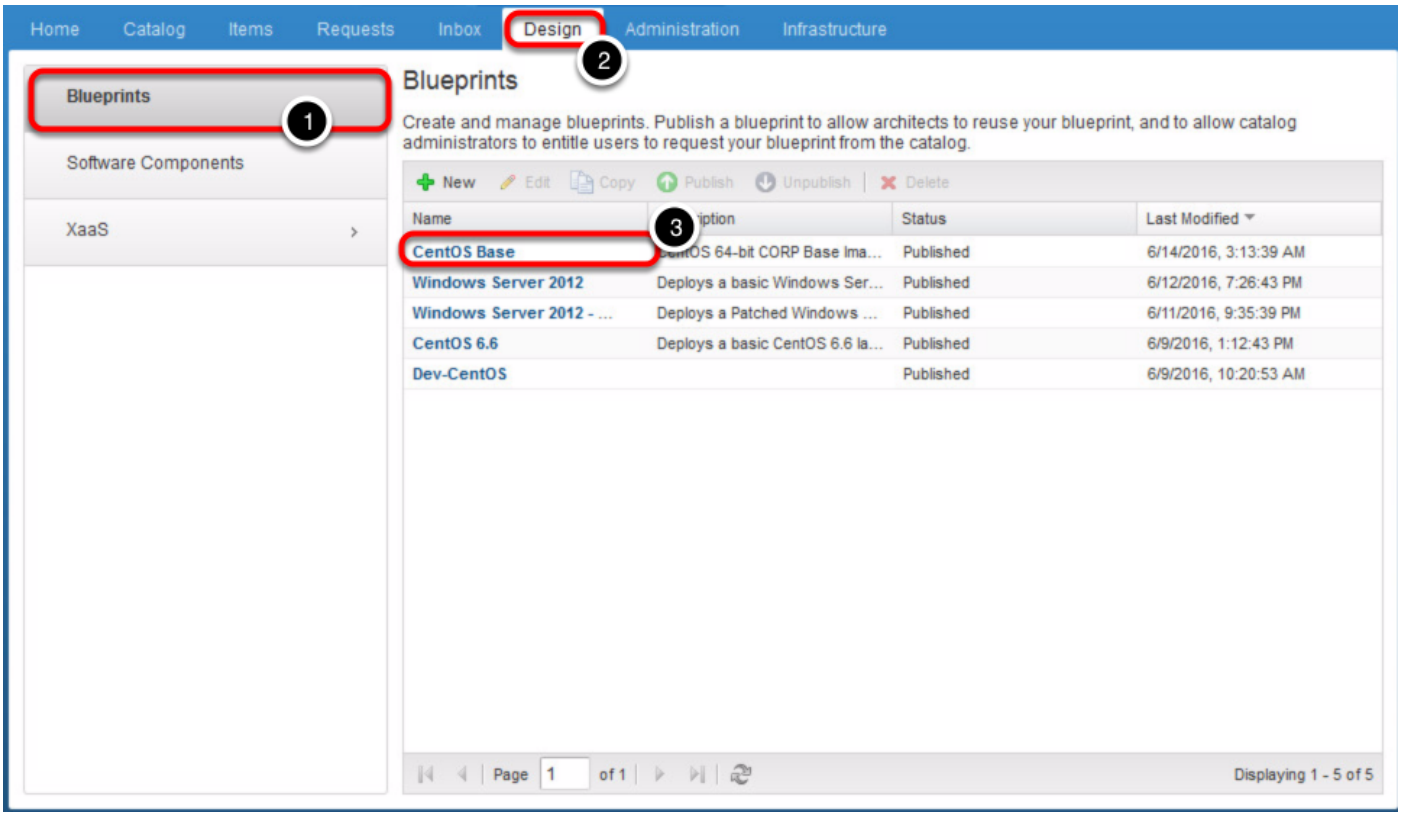
1. Launch Windows Explorer from your desktop
2. Navigate to C:\HOL-1790\cloudclient\bin folder
3. Hold Shift key and right click together and click on "**Open command window here**" inside windows explorer
4. Type in cloudclient.bat in the command prompt and hit Enter
5. CloudClient will automatically log you into vRealize Automation
6. Type in this command once you have successfully logged into CloudClient

```
vra content import --path C:\HOL-1790\vRA-BP-Import\CentOS-Base-vRA-Blueprint.zip --precheck
WARN --resolution OVERWRITE --dry-run no
```

1. You should see that the import task has been completed successfully

Proceed to next step

## Solution - Verifying imported content



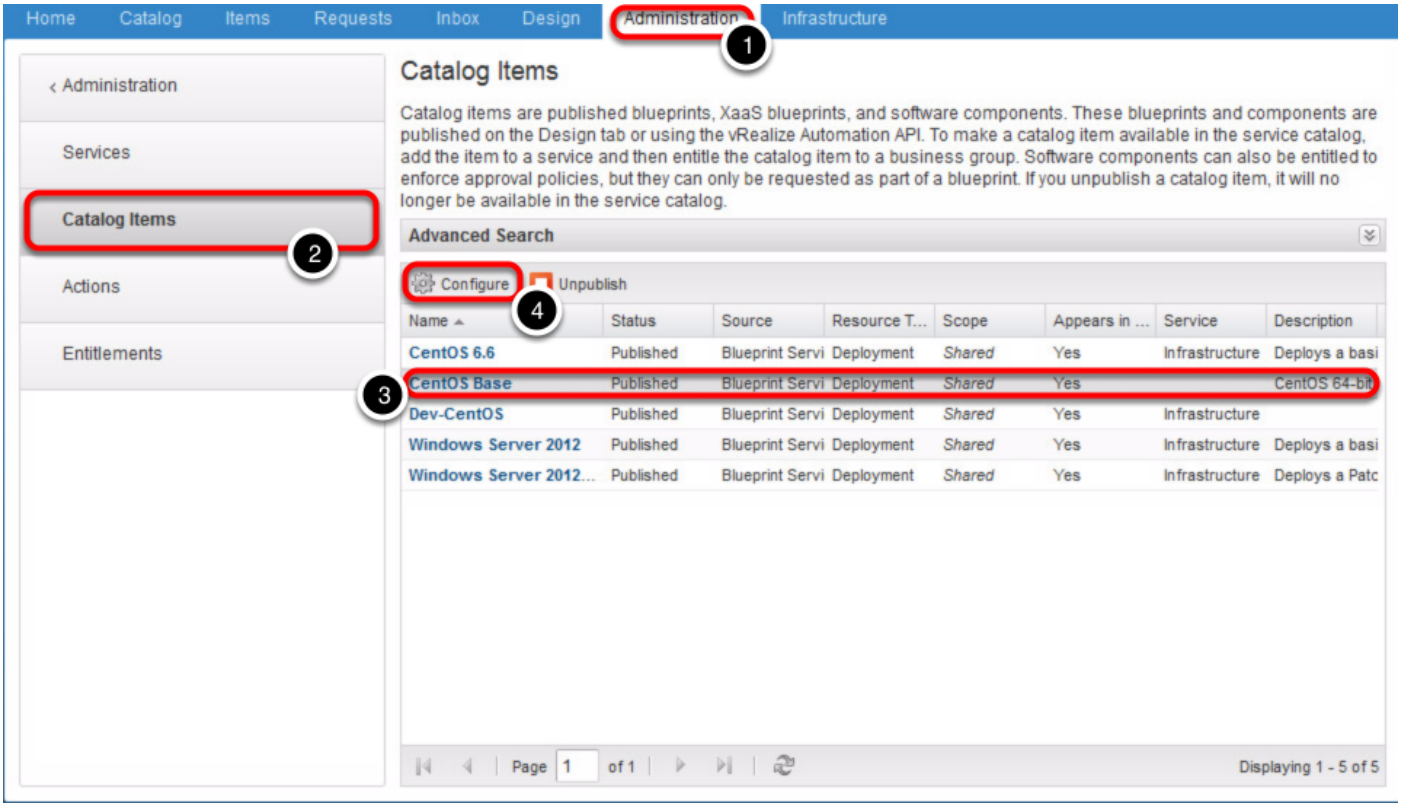

You can now log in back to vRealize Automation as cloudadmin to view the imported blueprint.

1. Click on Design
2. Click on Blueprints
3. You should see a new blueprint named "CentOS Base"
4. Ensure that the blueprint is Published

Your next steps would be to entitle users to request for this blueprint.

Please proceed to next step.

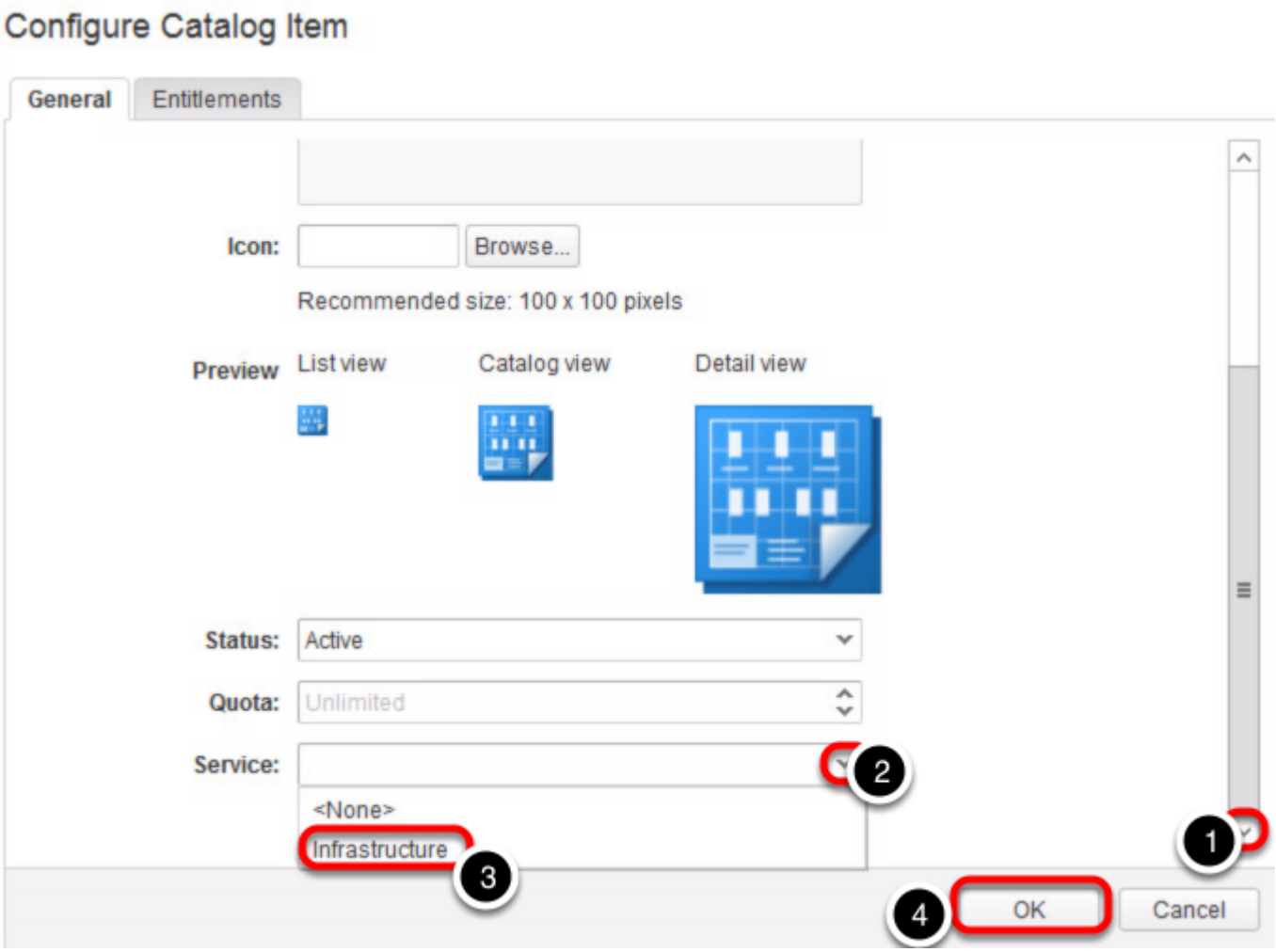
# Solution - Customizing content catalog




1. Select Administration -> Catalog Management
2. Click on Catalog Items
3. Select CentOS Base
4. Click Configure

Please proceed to next steps

# Solution - Customizing content




1. Scroll down to the bottom of the page by clicking on the arrow down
2. Click on the dropdown list under Service
3. Select Infrastructure
4. Click OK

You are now be able to request for this catalog item when you login as devuser.

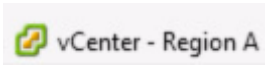
# Unable to manage existing virtual machines in vRealize Automation portal

You walk into office today, and was approached by one of your client saying that he could not see one of his virtual machine when he is logged into vRealize Automation. Upon further clarification, you realised that this machine was provisioned before Rainpole Enterprise Inc implemented vRealize Automation. Your client is now requesting that you import that virtual machine into vRealize Automation so that he could continue to manage his machines on his own.

## Open Firefox Browser from Windows Quick Launch Task Bar

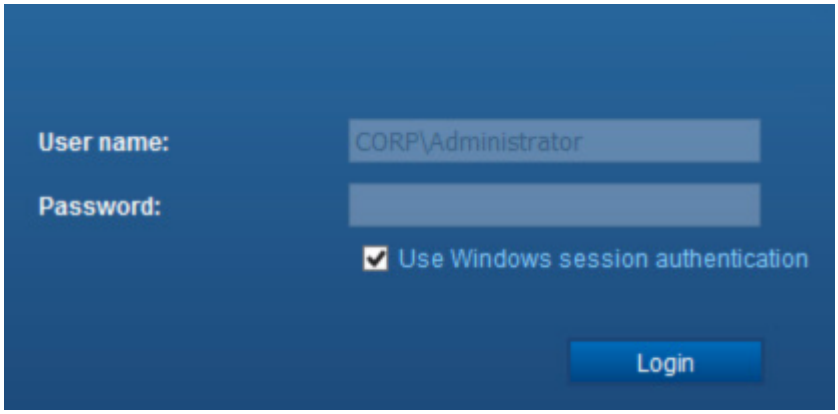
1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar.

## Open the vSphere Web Client



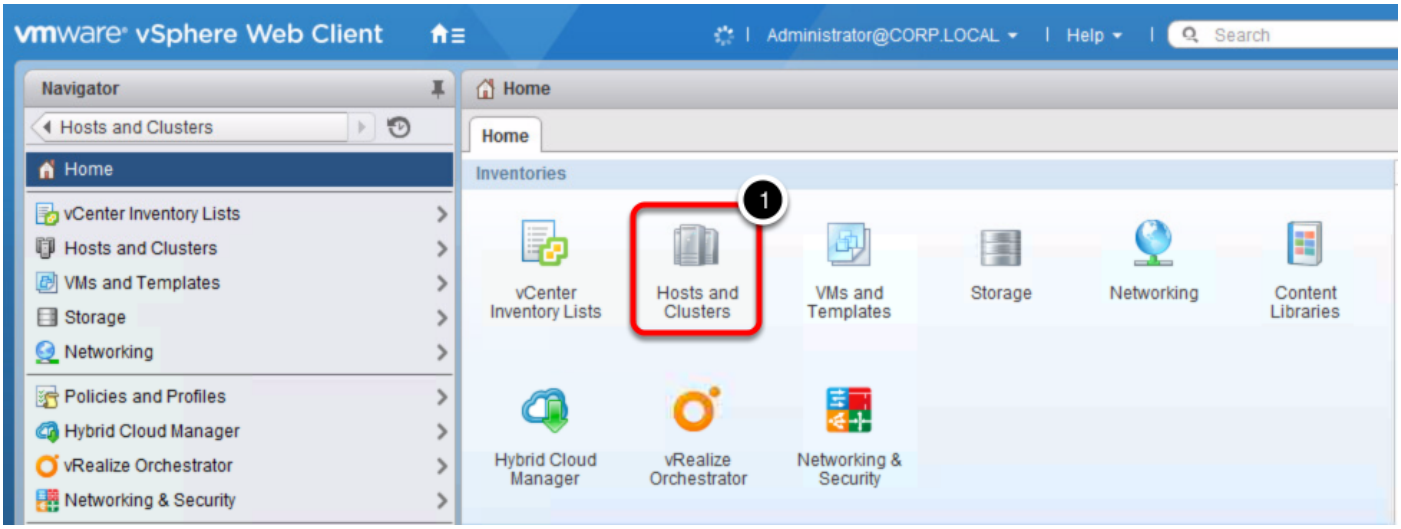

Click on the bookmark "vCenter - Region A".

## Login to vSphere Web Client



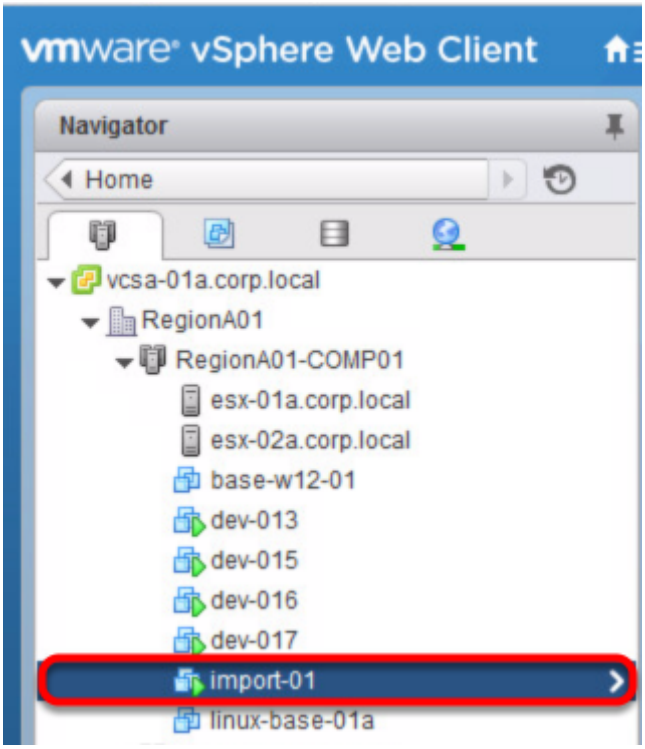

Select "**Use Windows session authentication**" and click **Login**.

## Host and Cluster view




1. Navigate to the Host and Cluster view

## Locate the VM to be imported




Your user (devuser) is requesting for you to import the virtual machine (import-01) into vRealize Automation. This will allow your users to be able to manage all their machines directly from vRealize Automation.

For this challenge:

1. You have to import virtual machine (import-01) into vRealize Automation as a managed machine
2. This machine belongs to the Development Business group

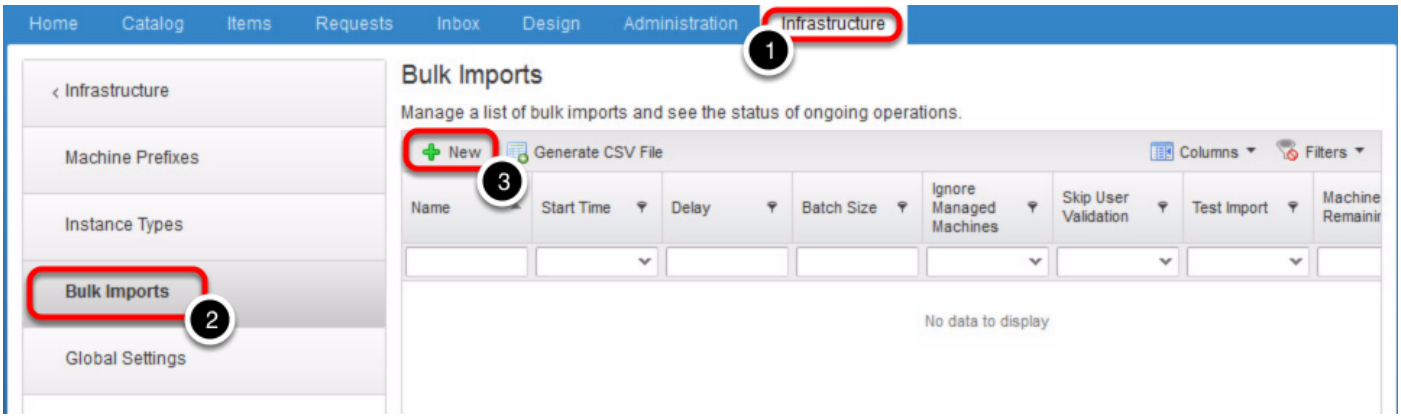
3. It is mapped to a converged blueprint called Dev-CentOS
4. And the component machine to be used is CentOS
5. You have to ensure that after the import, ownership of the imported machine is assigned to devuser@corp.local

Need a hint?

View Hint #1

View Hint #2

## Solution - Create New Import Job




vRealize Automation allows you to perform bulk imports of existing virtual machines to be managed by vRealize Automation by uploading a CSV file. In order to make this process much easier, you can generate a CSV file from vRealize Automation by doing so:

**NOTE:** We have already a working CSV file generated for you that is located in **C:\HOL-1790\BulkExport.csv**

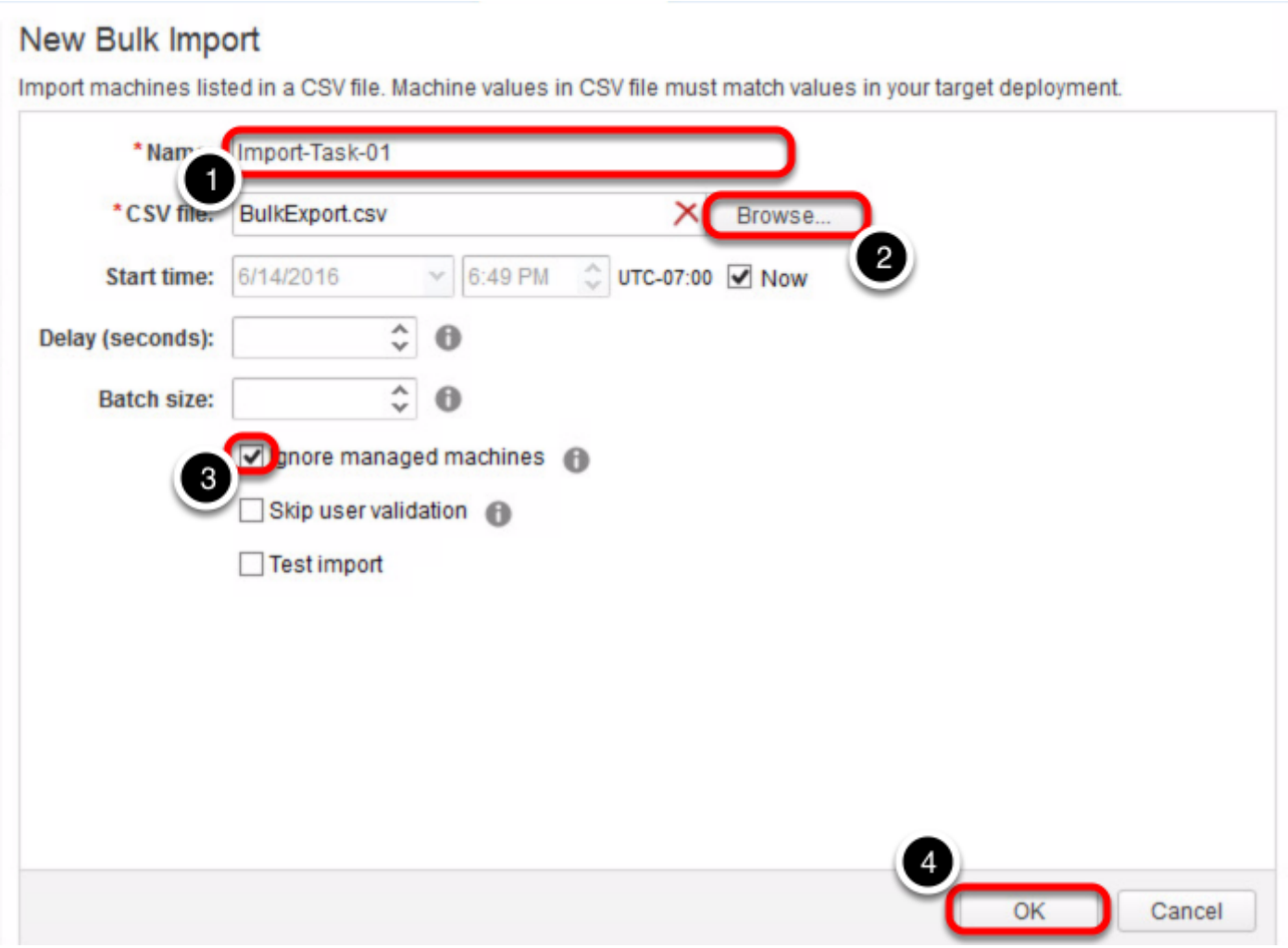
If you want to find out how to generate your own csv file for bulk importing virtual machines, you can find out more information here. (opens in a new window)

From vRealize Automation portal:

1. Navigate to Infrastructure -> Administration
2. Click on Bulk Imports
3. Click New

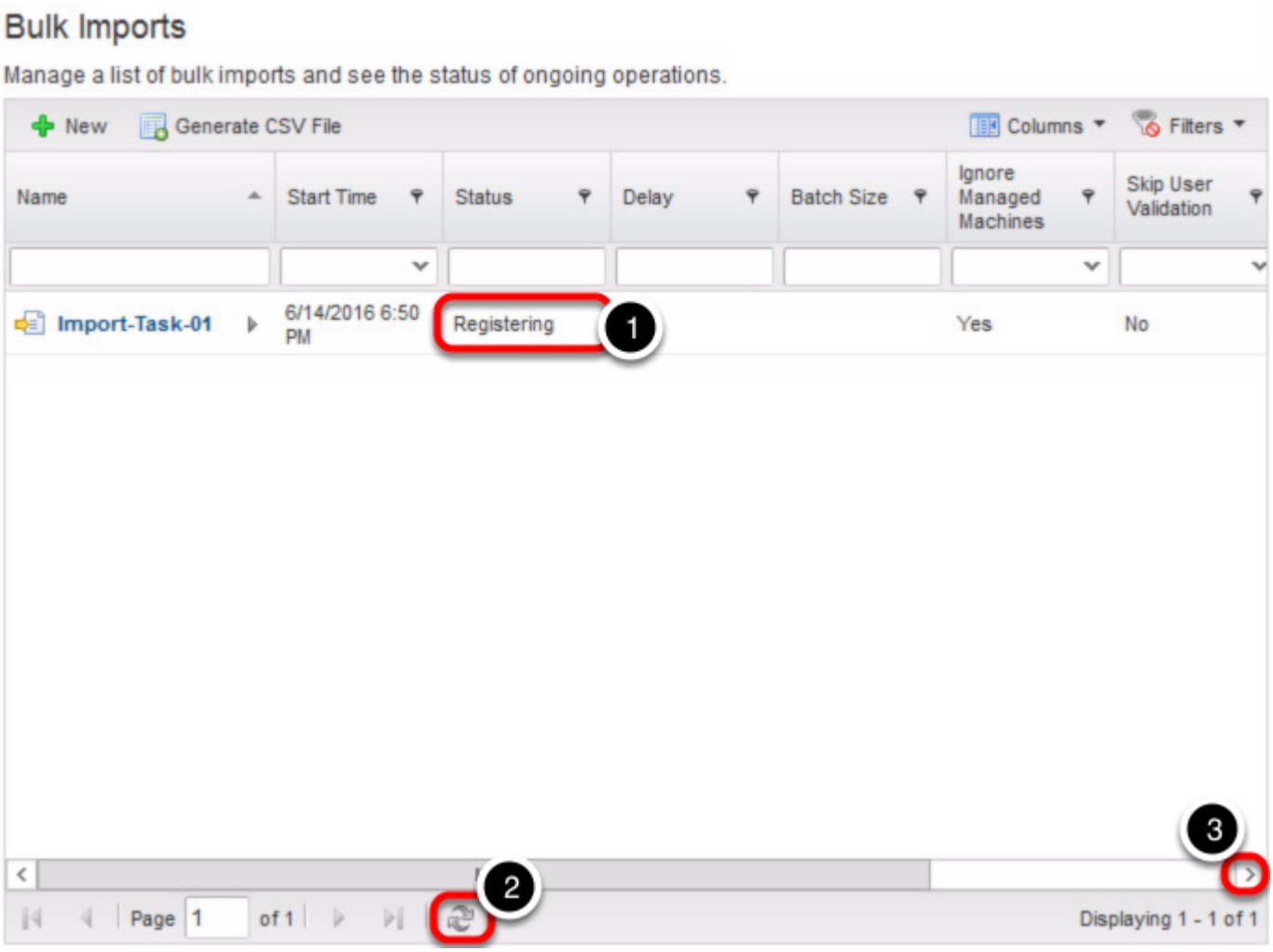
Please proceed to next step

# Solution - Submit CSV




1. Give your import task a name (e.g. Bulk Import 01)
2. Browse the CSV file that was created (C:\HOL-1790\BulkExport.csv)
3. Check Ignore managed machines
4. Click OK

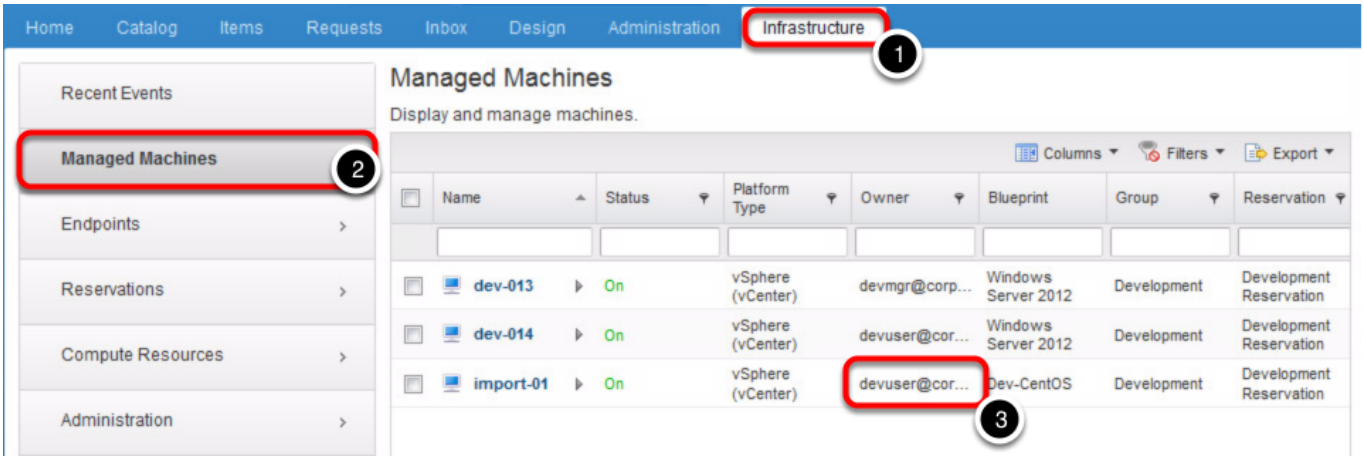
# Solution - Check Import status




1. You can check the status of the request here
2. You can also refresh the status
3. Click the arrow to scroll back and view more information of the import task

Only proceed when Status is "Completed"

# Solution - Import Verification




In order to verify that the machine has been imported successfully and assigned to the correct owner:

1. Click on "**Infrastructure**"
2. Click on "**Managed Machines**"
3. You will see that the virtual machine (import-01) has been successfully imported from vCenter into vRealize Automation and assigned to devuser@corp.local

NOTE: Alternatively, you can login as devuser and you will see import-01 VM in the "**Items**" tab

For more information on Bulk Importing virtual machines into vRealize automation, please refer to this document here.

# Module 5: Cloud Extensibility, Advanced Challenge

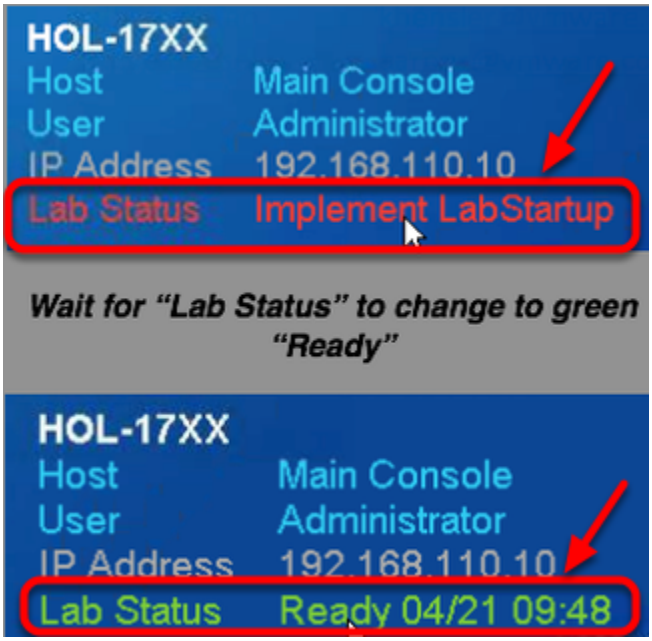
# Introduction

We tip our hat to you if you can resolve this module's challenge around fixing vRealize Automation's cloud extensibility issues. You will be faced with integration issues between vRealize Automation's Event Broker and vRealize Orchestrator workflows.

This Module contains the following lessons:

- [Lesson 1] Provisioning process is not stopping when an event broker error occurs.
- [Lesson 2] Post provisioning task extensibility.

## Look at the lower right portion of the screen




Please check to see that your lab is finished all the startup routines and is ready for you to start. If you see anything other than "Ready", please wait a few minutes.  If after 5 minutes you lab has not changed to "Ready", please ask for assistance.

# Provisioning process is not stopping when an event broker error occurs

You have just recently implemented a use case where a user's request for a virtual machine would have its snapshot taken as a post provisioning task. This actual workflow was created by the integration engineers, while you are responsible for integrating that workflow into vRealize Automation using Event Broker.

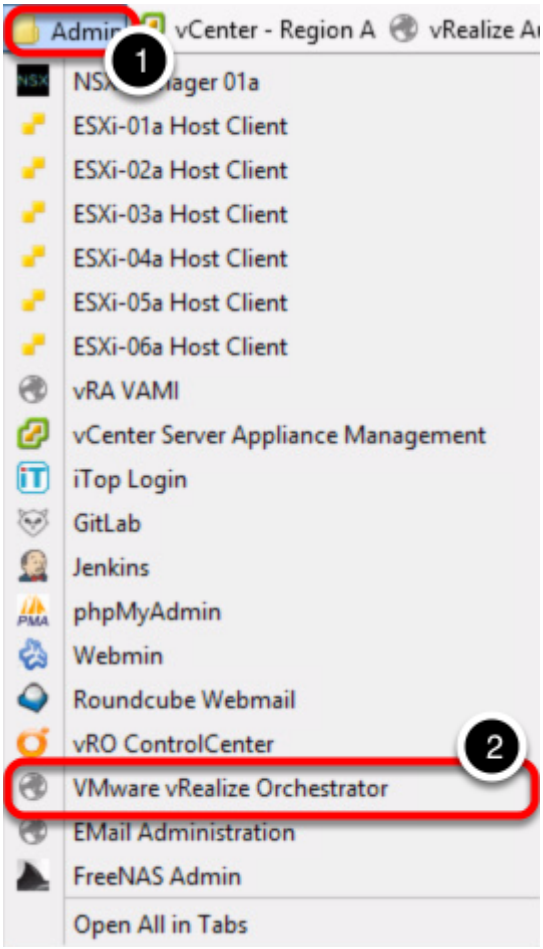
Just as you are about to sit back and relax for the day, you got a user running up to you saying his machines that he requested for from vRealize Automation have got no snapshots! You immediately got to work and decided to research and investigate more.

After reading more on vRealize Automation 7's Event Broker functionality here and here, you decided to fix it on your own.

## Open Firefox Browser from Windows Quick Launch Task Bar

1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar. here

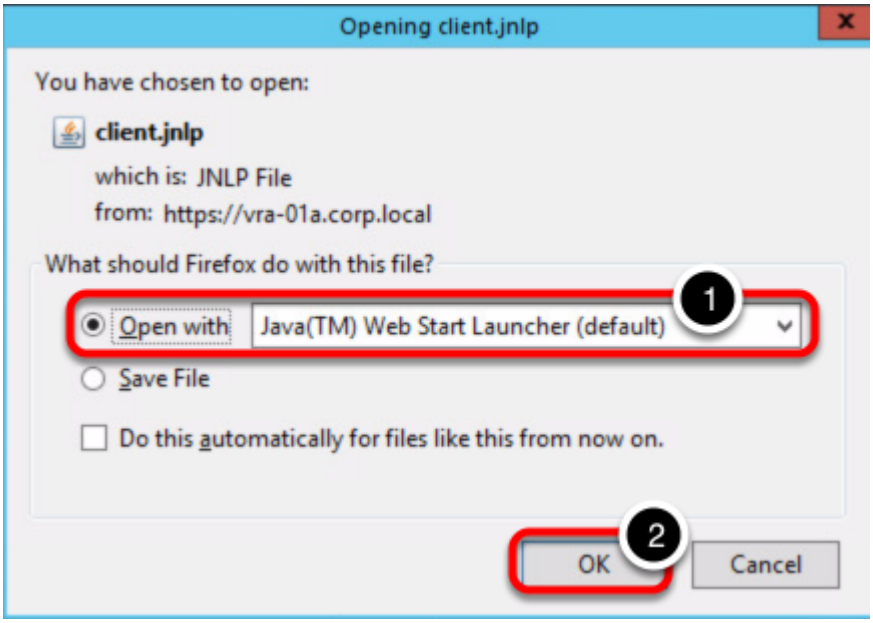
# Launch vRealize Orchestrator Client




To launch vRealize Orchestrator:

1. Click on "Admin" folder bookmark
2. Click on "VMware vRealize Orchestrator"

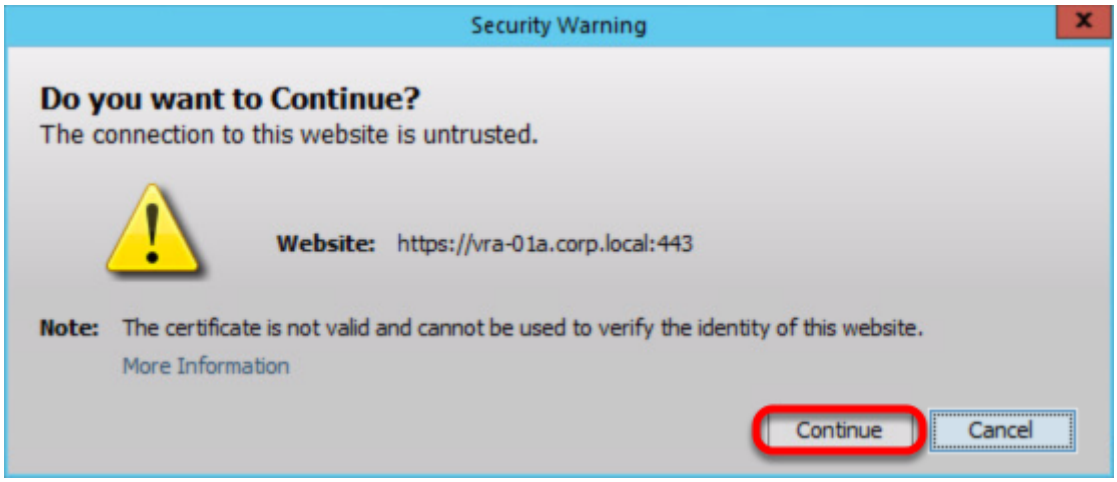
## Open vRealize Orchestrator Client




You will be presented with a popup dialog

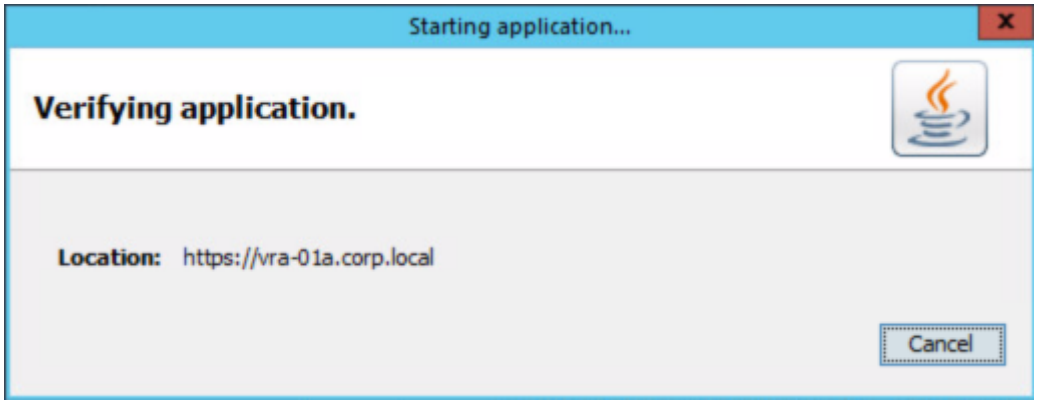
1. Select "Open with .. Java(TM) Web Start Launcher (default)"
2. Click "OK" button

## Accept Security Warning




You may be presented with a security warning, this is normal. Click "Continue" to proceed

## Verifying application notification



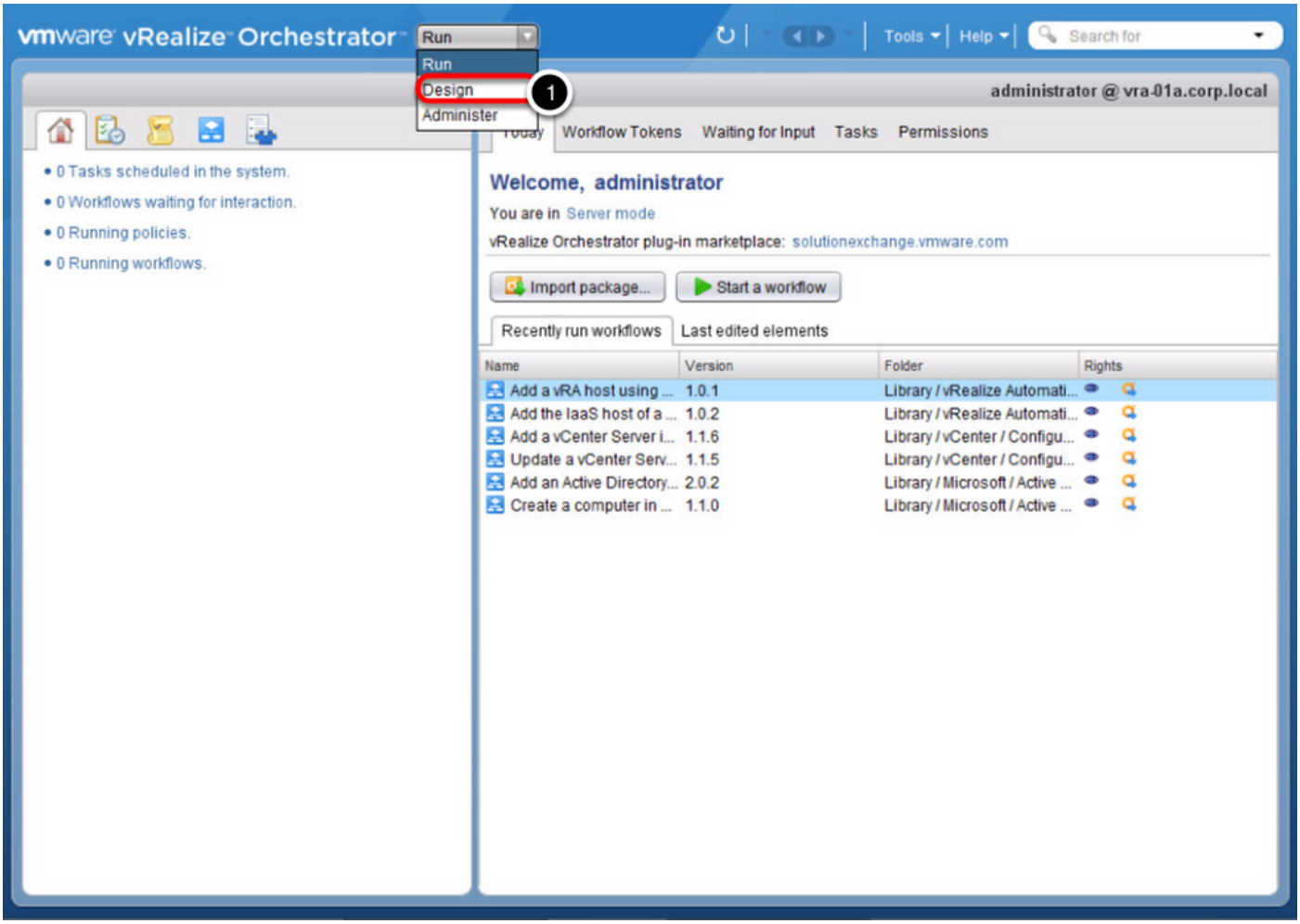

You will be presented with a dialog that is verifying and staring the application. **DO NOT** click "Cancel". The dialog will automatically close once application has been verified.

## Login to vRealize Orchestrator

To login to vRealize Orchestrator:

1. Ensure that the Host name is vra-01a.corp.local:443
2. User name: administrator@vsphere.local
3. Password: VMware1!
4. Click "Login"

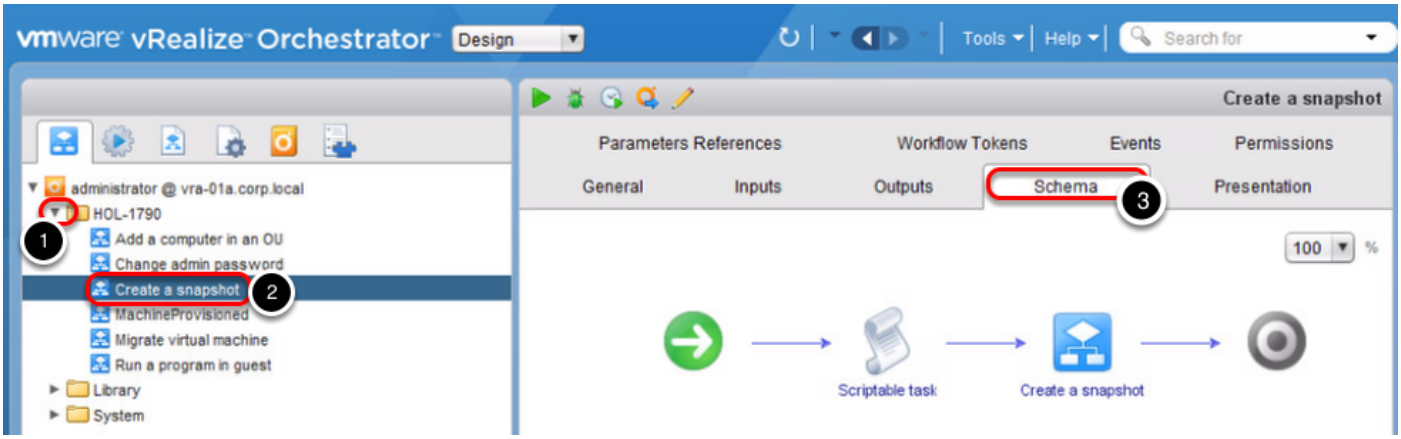
# Switching to Design mode in vRealize Orchestrator




Once vRealize Orchestrator client has been successfully launched, you need to switch to "Design" mode:

1. Click on the dropdown list and select "Design"

## Exploring vRealize Orchestrator workflow




One of your integration engineer have built a workflow that will take a snapshot of a virtual machine after it has been provisioned by vRealize Automation. To find out more about what the workflow operates:

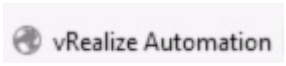
1. Expand the "HOL-1790" folder
2. Click on the workflow "Create a snapshot"
3. Click on "Schema" to show details on the execution steps in the workflow

NOTE: Do not close the vRealize Orchestrator Client, you will need it later.

## Open Firefox Browser from Windows Quick Launch Task Bar

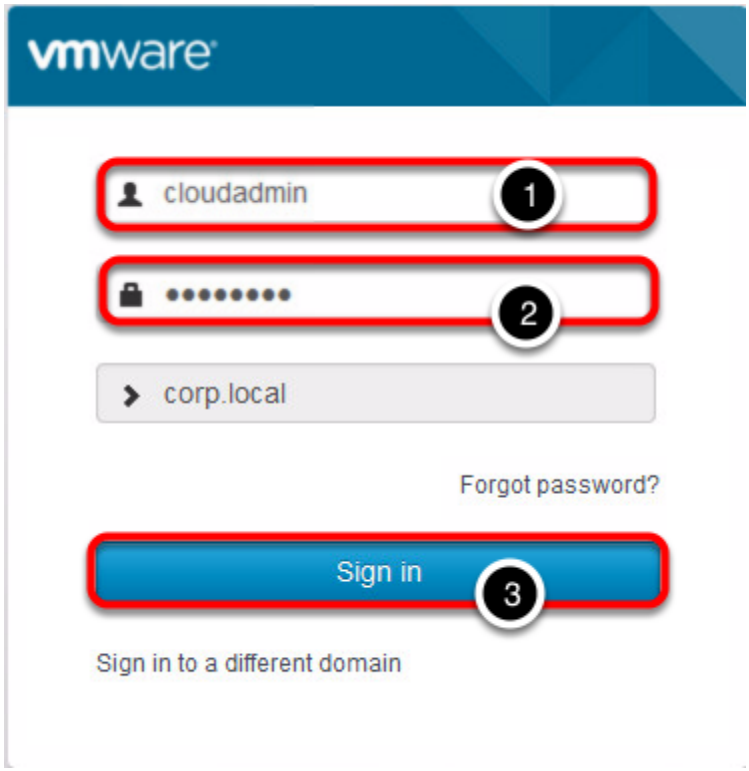
1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar.

## Launch vRealize Automation



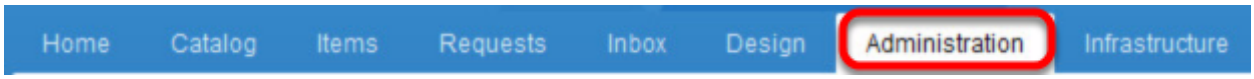

Click on the "vRealize Automation" bookmark

## Log into vRealize Automation



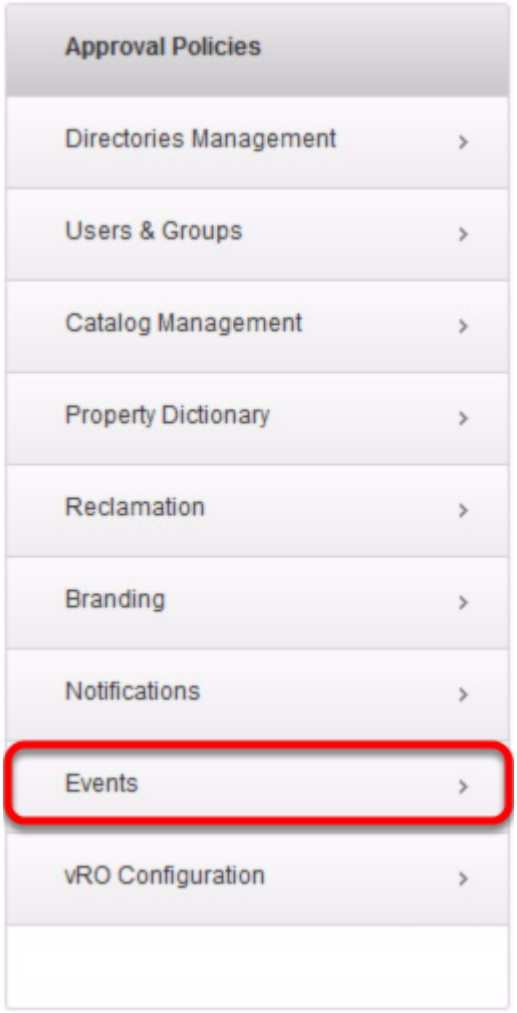

1. User Name: cloudadmin
2. Password: VMware1!
3. Click on "Sign in" button

## Accessing Administration options



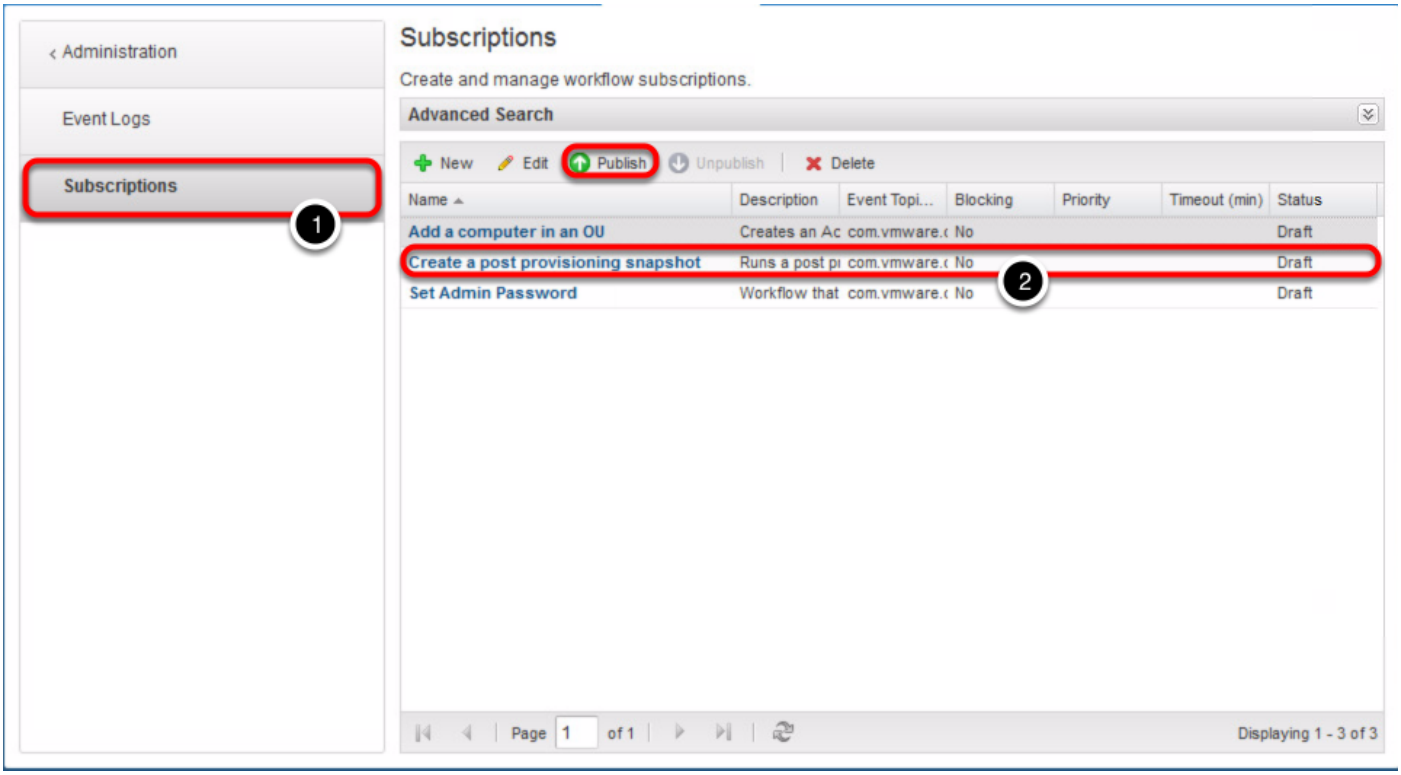

Click on the "Administration" tab

# Click on Events




Click on "Events"

## Accessing subscriptions created




1. Click on "Subscriptions"
2. Select the "Create a post provisioning snapshot" subscription
3. Click "Publish"

NOTE: This step activates the workflow subscription that will invoke the vRealize Orchestrator workflow "Create a snapshot" which you previously saw in the vRealize Orchestrator client.

## Open Firefox Browser from Windows Quick Launch Task Bar

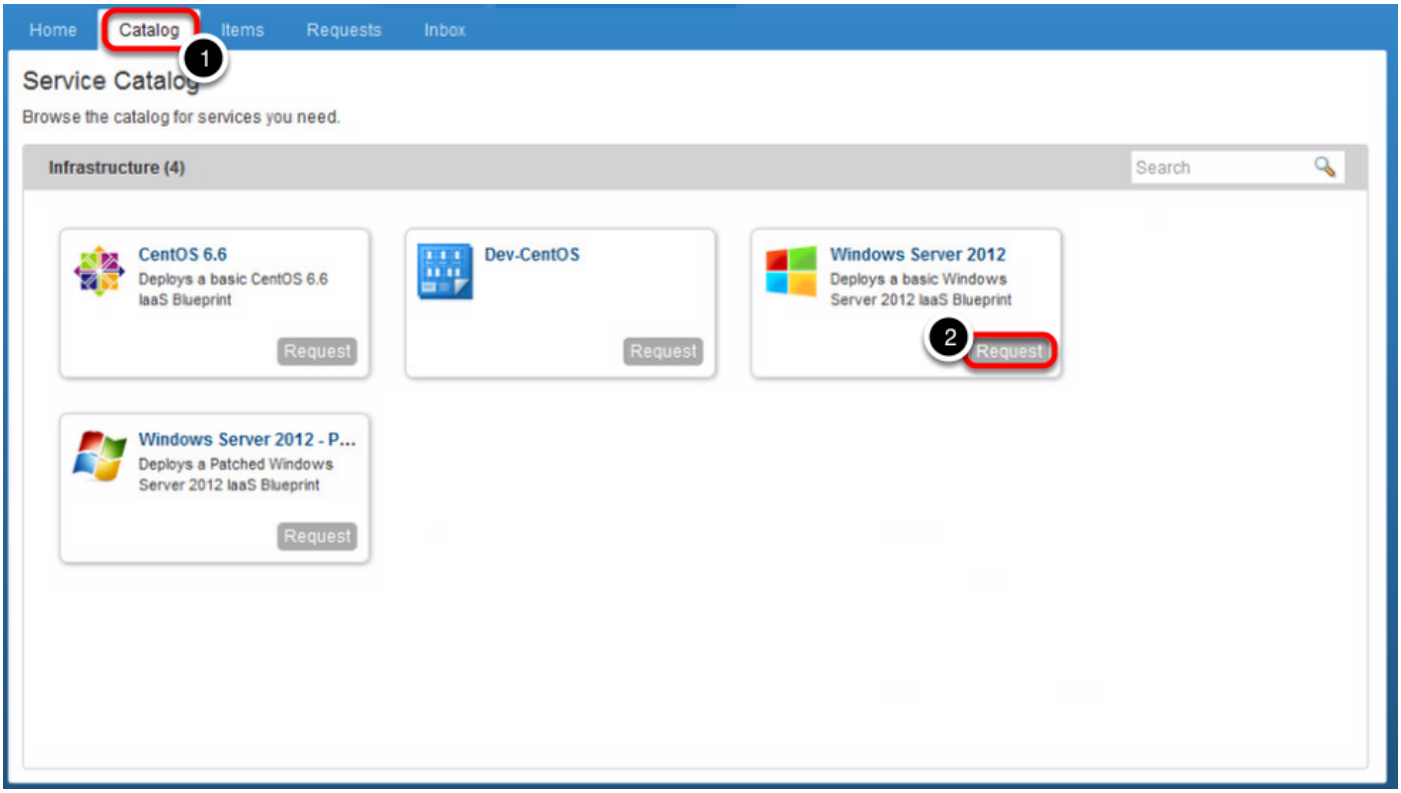
1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar.

# Login to vRealize Automation as Dev User

**NOTE**: You would need to **log out from cloudadmin** user in order to log in as devuser

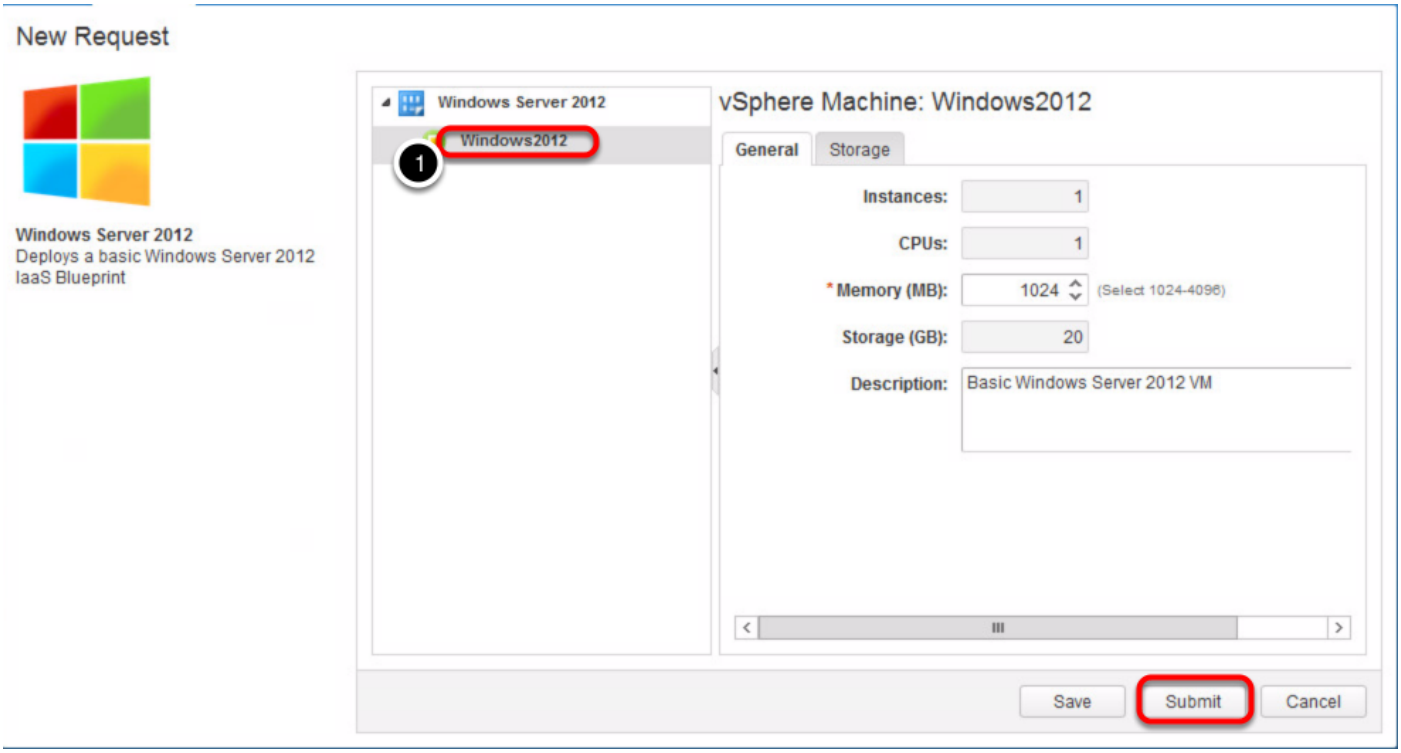
1. User Name: devuser
2. Password: VMware1!
3. Click on "Sign in" button

## Select catalog item




1. Click on "Catalog" tab
2. "Request" for a CentOS 6.6 catalog item

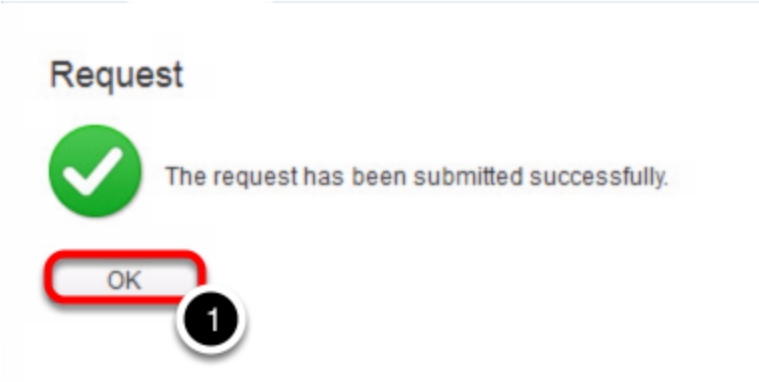
## Submit a Request




1. Click on Windows2012

2. Click "Submit"

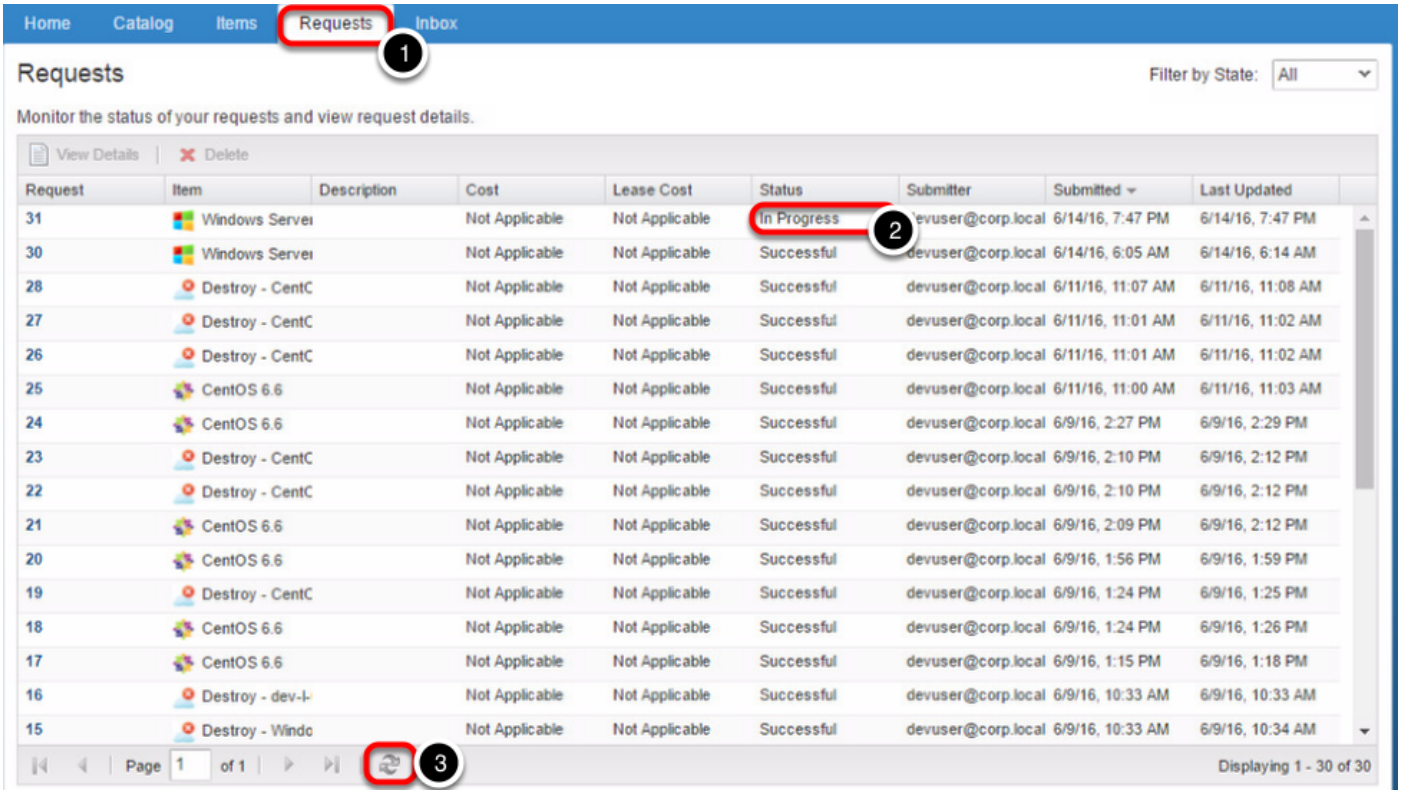
## Request Submission status




A request acknowledgement will be displayed once you have submitted the request form.

1. Click "OK"

## Monitoring the progress of request

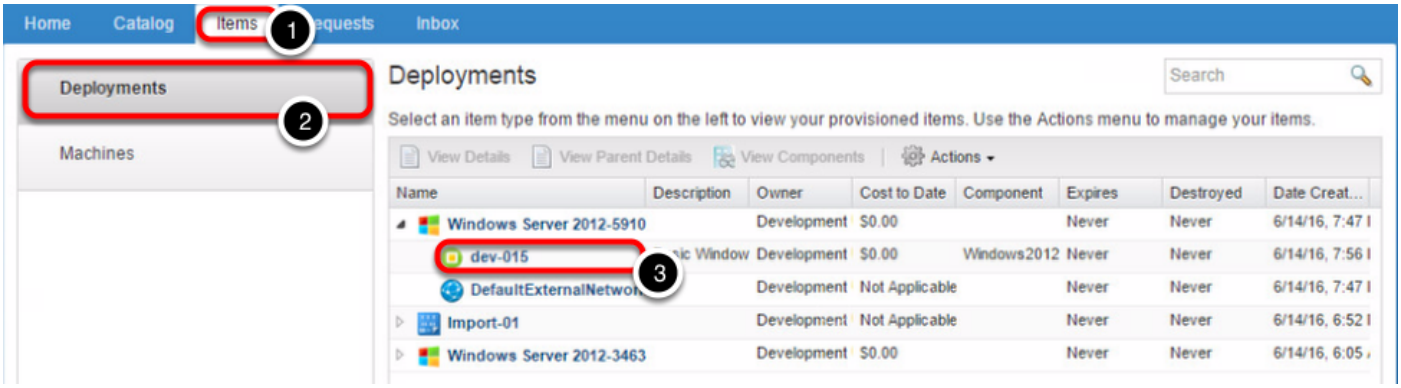



You can monitor the progress of your request:

1. Click on "Requests"
2. Wait for your request to update its Status from "In Progress" to "Successful" or "Failed"
3. You can hit the "Refresh" button to get an update of the status

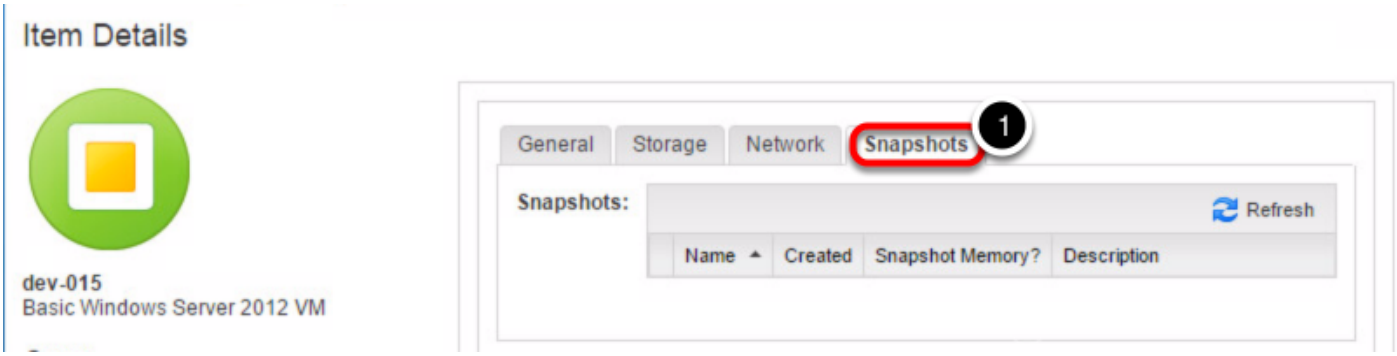
This usually takes 2-5 mins to complete.

## Viewing Items




1. Click on "**Items**"
2. Click on "**Deployments**"
3. Click on the **machine name** to view details

## Viewing Machine Details

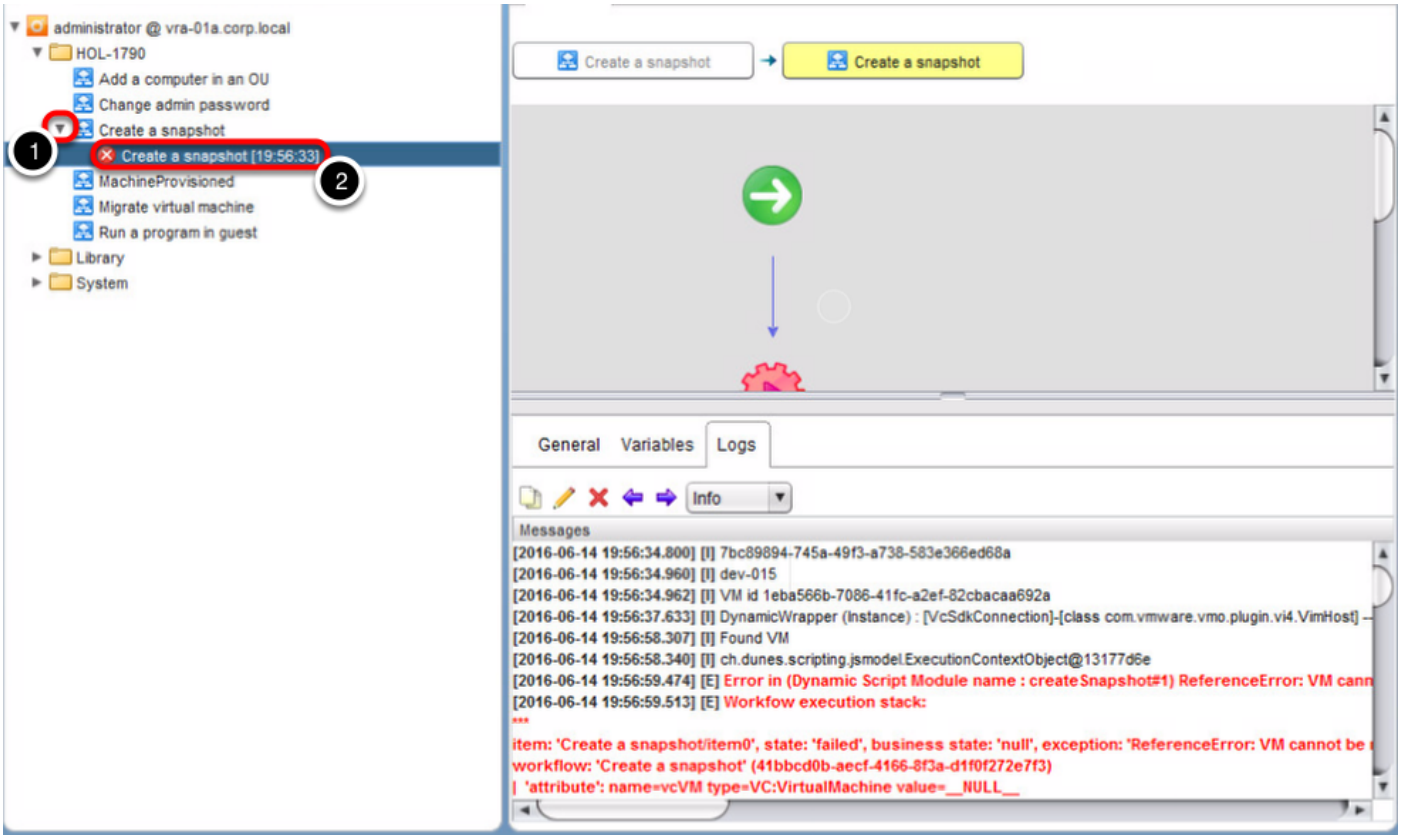



1. Click on "**Snapshots**"

You would see that there is no snapshot available. Why would that be? Let's have a look at the workflow run from vRealize Orchestrator.

Please proceed to next step.

# Viewing the workflow run in vRealize Orchestrator




NOTE: Please restore your vRealize Orchestrator window if it was minimized previously.

1. Expand the workflow "Create a snapshot" to view the workflow execution history
2. Click on the execution details to find out if the workflow ran successfully or failed

NOTE: This should not happen, if the workflow failed, the provisioning task should also fail. Instead what you are seeing is that vRealize Automation marked the provisioning as "Successful"

For this challenge:

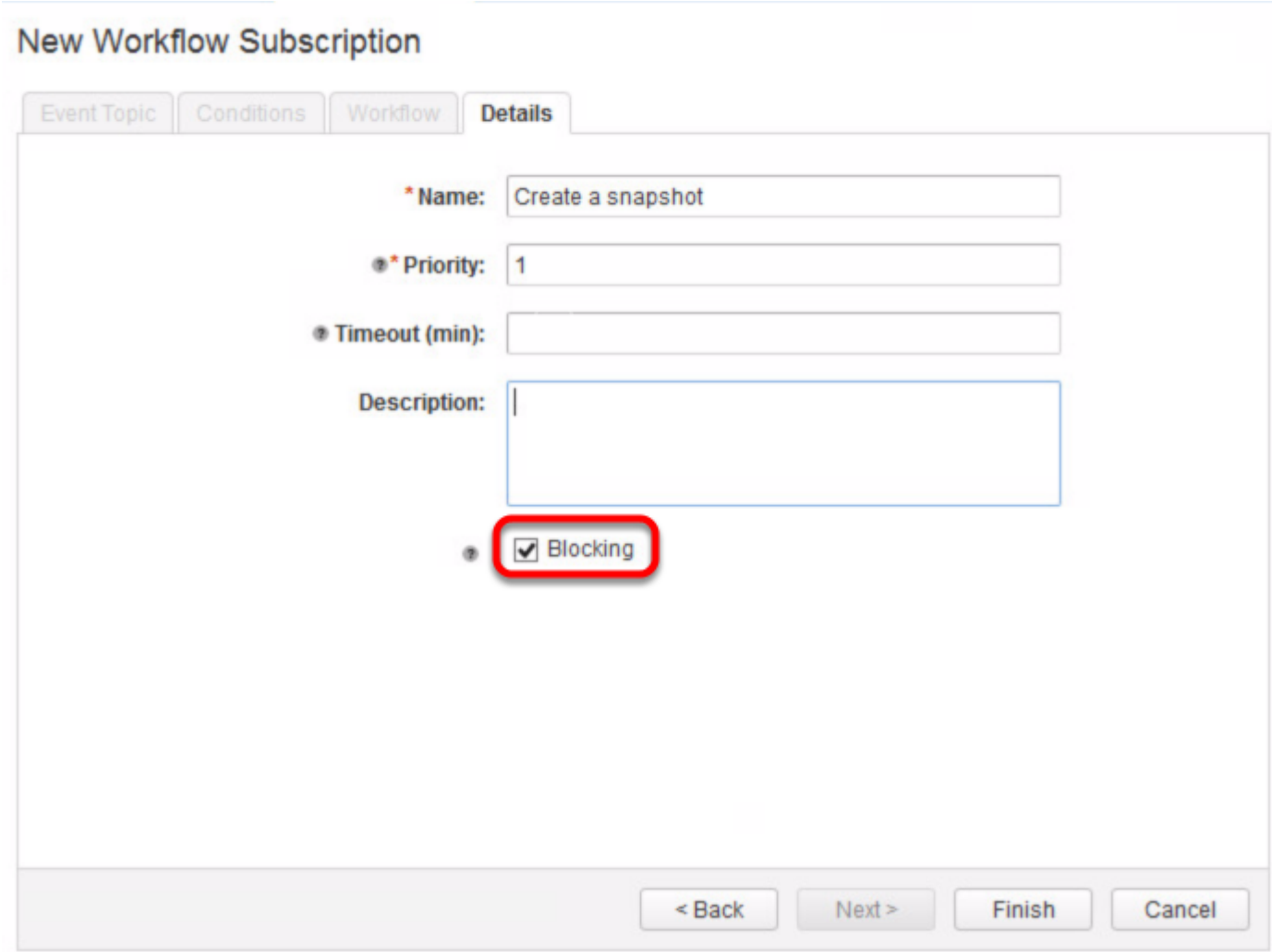
1. You are to investigate why did the provisioning task completed even though the "Create a snapshot" workflow failed
2. Fix the issue where if the workflow "Create a snapshot" failed, the provisioning task should fail too

Need a hint?

View Hint #1

View Hint #2

# Solution - Mark event subscription as blocking task




In order for a workflow to determine if it should block subsequent workflows, we need to enable blocking on the event subscription that is being created. We are able to set priority for blocking subscriptions if there are more than 1 blocking workflows in an event.

To solve this challenge:

1. You need to create a new subscription event
2. Login to vRealize Automation as **cloudadmin**
3. Navigate to **Adminstration -> Events -> Subscriptions**
4. Click "**New**"
5. Under event topic, choose "**Machine provisioning**" and click "**Next**"
6. Select **Run based on conditions**
7. Select **All of the following** to match against ALL conditions in the subscription
8. Select **Data -> Lifecycle state -> Lifecycle state name** from the menu
9. Select **Equals** as the Operator
10. In the 3rd dropdown, select **Constant -> VMPSMasterWorkflow32.MachineProvisioned**
11. Click **Add Expression** to add another expression
12. Select **Data -> Machine -> Machine type**
13. Select **Equals** as the Operator
14. For the value, choose **Constant -> Virtual Machine**
15. Click **Add Expression** to add one more expression

16. Select **Data -> Lifecycle state -> State phase**
17. Select **Equals** as the Operator
18. For the value, choose **Constant -> PRE**
19. Click "**Next**"
20. Under "**Select a Workflow**", choose **Orchestrator -> HOL-1790 -> Create a snapshot** workflow
21. Click "**Next**"
22. Name your new subscription (can be any name you like) and remember to **check** "Blocking"
23. Click "**Finish**"
24. **Publish** the new subscription and **unpublish** "**Create a post provisioning snapshot**" subscription

You can now request for a new catalog item, and if the workflow fails, the provisioning will be marked as failed too.

For more information about blocking subscription, you can read in details over here. (open in new window)

# Post provisioning task extensibility

Alright, you've solved the previous challenge and now your event broker subscriptions are working properly. However, there's still something wrong with the workflow. The integration engineer that built the workflow, unfortunately is on vacation and you should probably wait for him to come back and fix it.

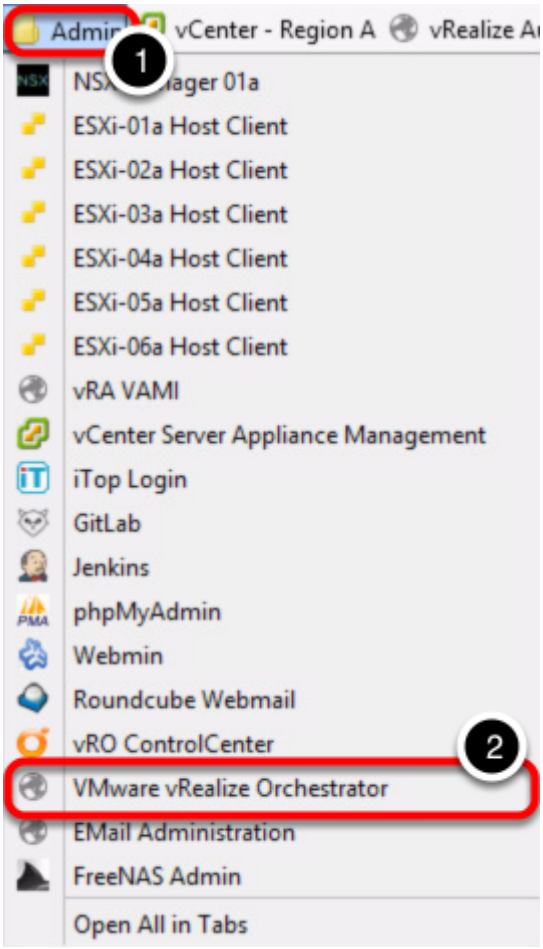
However, your boss is pressuring you to get this fixed as soon as you can since you are the VMware expert within Rainpole Enterprise Inc. And without a doubt, you are going to take a look at the problem.

NOTE: **Do not attempt** this challenge if you have **not completed** "Provisioning process is not stopping when an event broker error occurs" challenge.

## Open Firefox Browser from Windows Quick Launch Task Bar

1. Click on the **Firefox Icon** on the Windows Quick Launch Task Bar. here

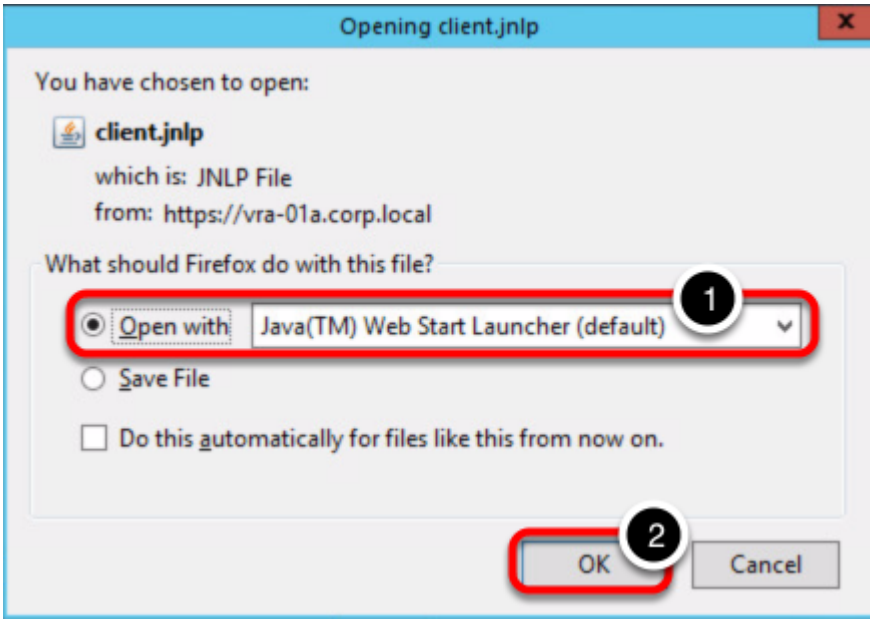
# Launch vRealize Orchestrator Client




To launch vRealize Orchestrator:

1. Click on "Admin" folder bookmark
2. Click on "VMware vRealize Orchestrator"

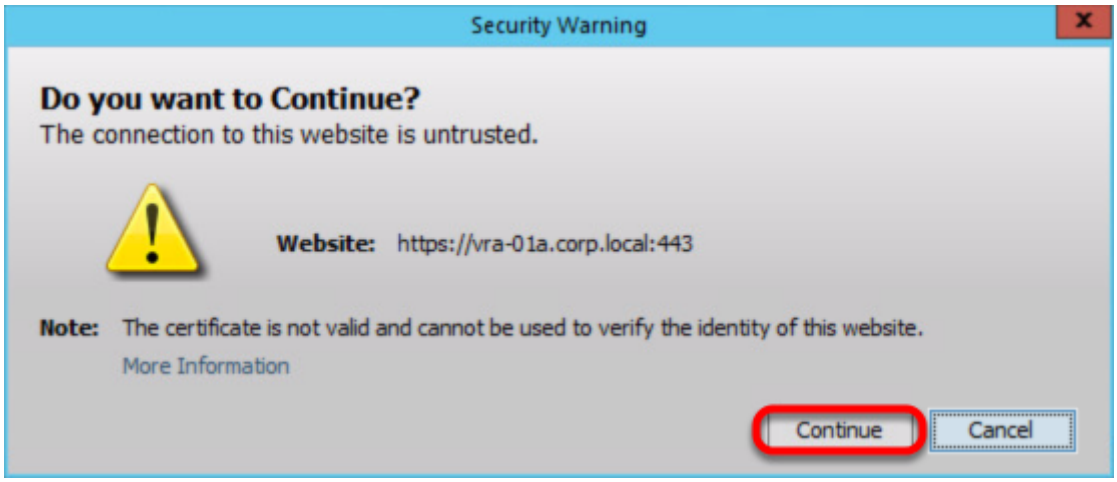
## Open vRealize Orchestrator Client




You will be presented with a popup dialog

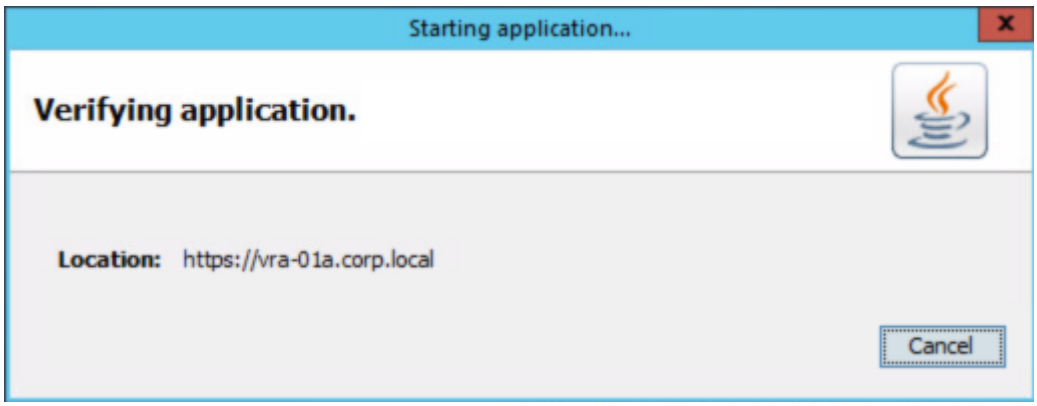
1. Select "Open with .. Java(TM) Web Start Launcher (default)"
2. Click "OK" button

## Accept Security Warning




You may be presented with a security warning, this is normal. Click "Continue" to proceed

## Verifying application notification



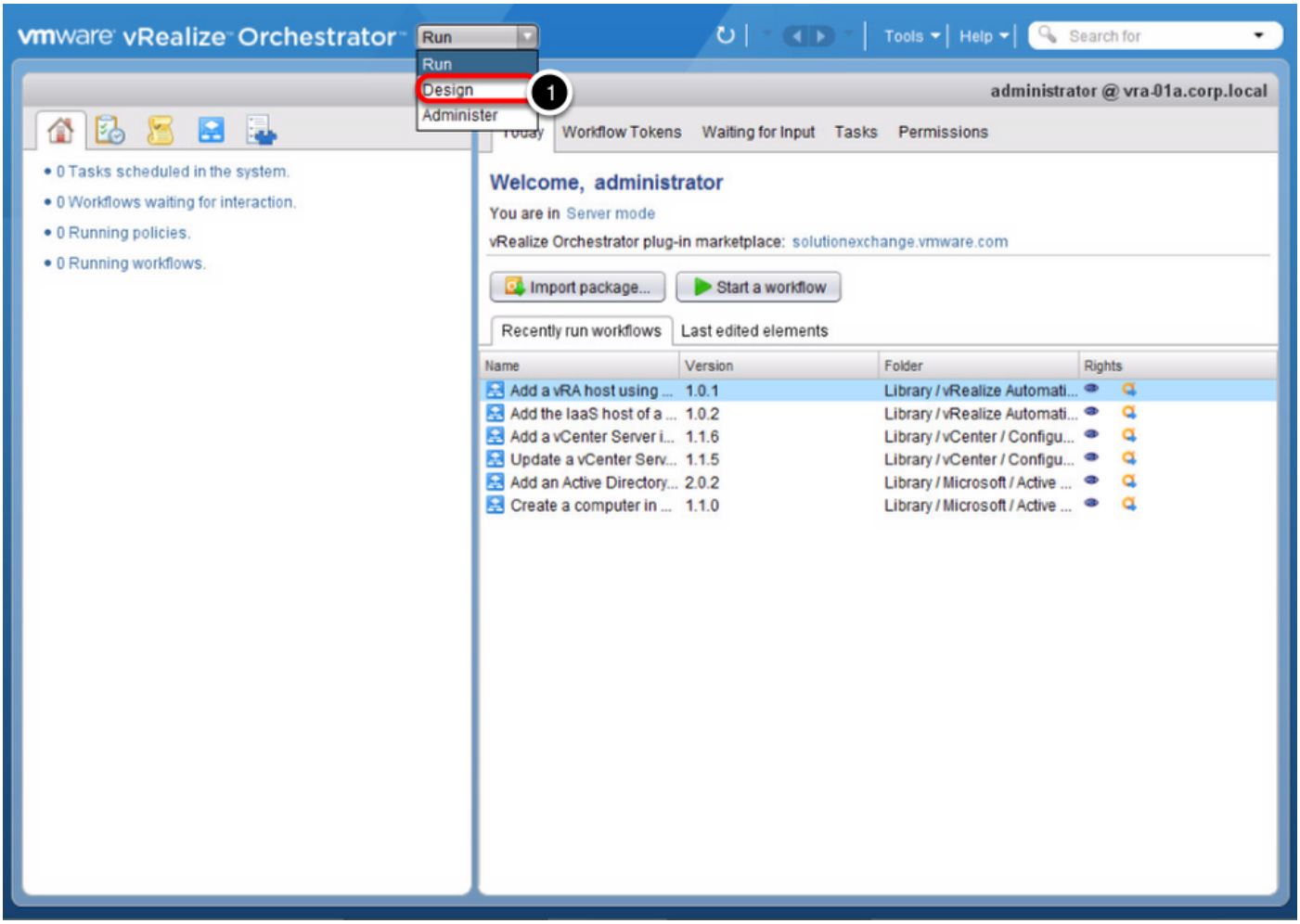

You will be presented with a dialog that is verifying and staring the application. **DO NOT** click "Cancel". The dialog will automatically close once application has been verified.

## Login to vRealize Orchestrator

To login to vRealize Orchestrator:

1. Ensure that the Host name is vra-01a.corp.local:443
2. User name: administrator@vsphere.local
3. Password: VMware1!
4. Click "Login"

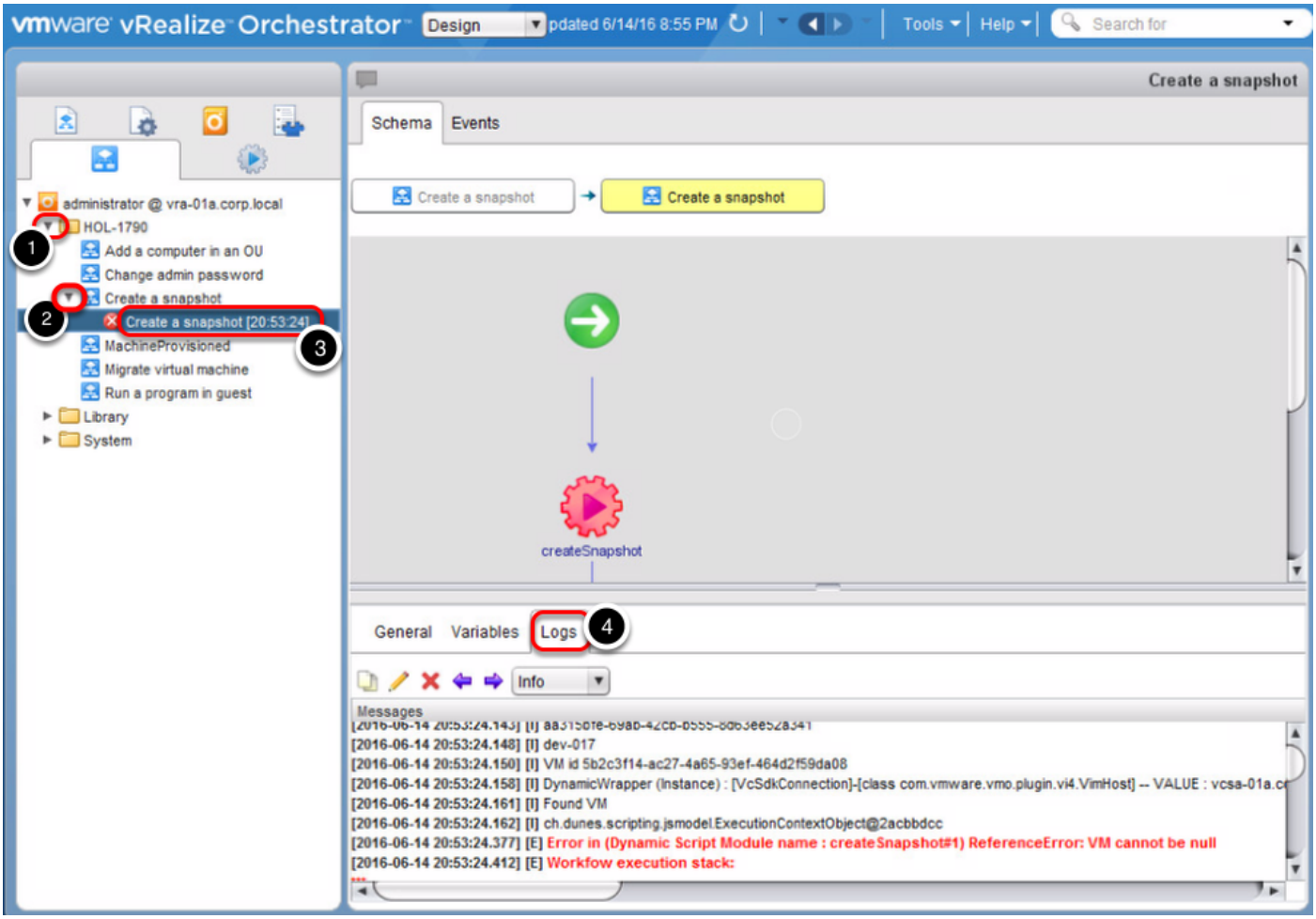
# Switching to Design mode in vRealize Orchestrator




Once vRealize Orchestrator client has been successfully launched, you need to switch to "Design" mode:

1. Click on the dropdown list and select "Design"

# Exploring vRealize Orchestrator workflow




You know from previous challenge that the workflow does not work properly, therefore you are to investigate what went wrong:

1. Expand the "HOL-1790" folder
2. Expand "Create a snapshot"
3. Click on the execution history to view details of the workflow task
4. Click on "Logs" to show the error log of the workflow execution

For this challenge:

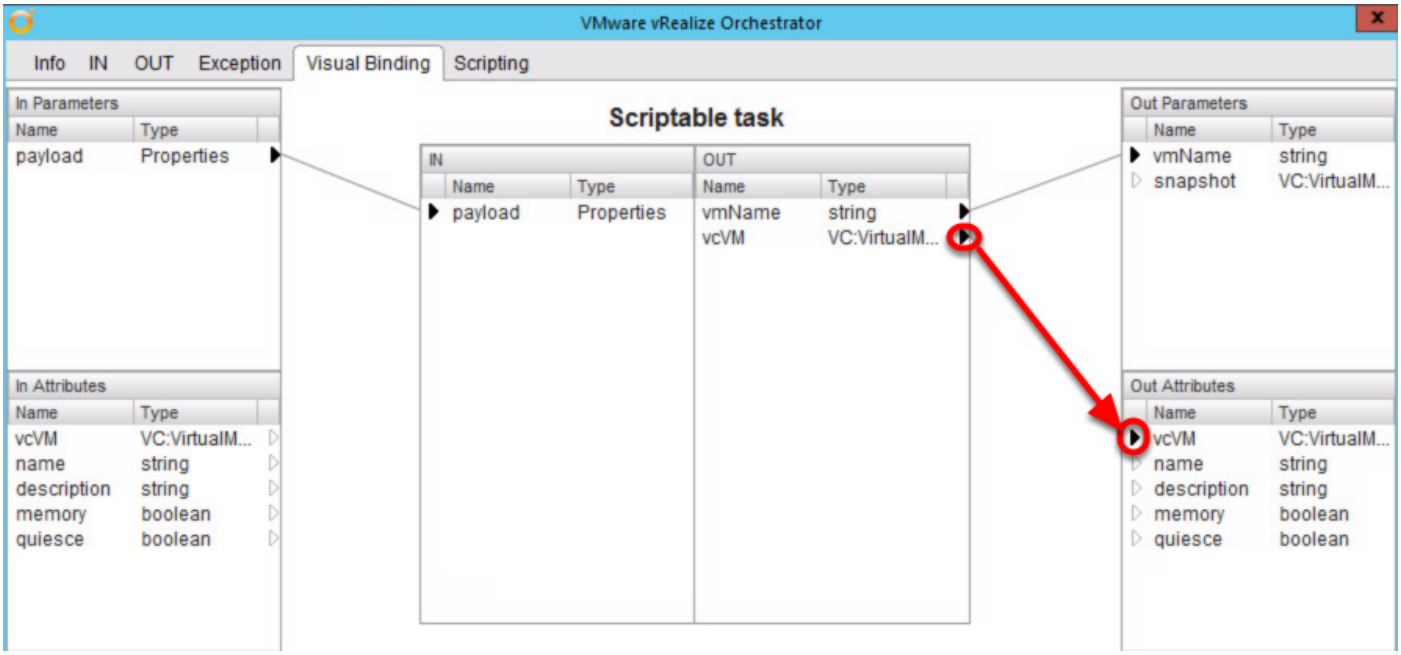
1. You are to investigate and identify what is wrong with the workflow
2. Fix the workflow so that after the machine has been provisioned from vRealize Automation, a snapshot will be taken from the virtual machine

Need a hint?

View Hint #1

View Hint #2

# Solution




In this particular challenge, it seems that when we are getting the virtual machine object from vRealize Automation using a scriptable task, we failed to pass this object to the next workflow task, which requires an input type of virtual machine in order to create a snapshot.

To solve this challenge:

1. Login to vRealize Orchestrator as administrator@corp.local
2. Switch to "**Design Mode**"
3. **Navigate** to Orchestrator -> HOL-1790 -> Create a snapshot
4. **Edit** the workflow
5. Click on "**Schema**"
6. Edit the "**Scriptable task**"
7. Click on "**Visual Binding**"
8. Drag **vcVM** from **Scriptable task** to **vcVM** of **Out Attributes** (see above)
9. Click "**Close**"
10. Click "**Save and Close**"
11. Click "**Continue anyway**"

You may now login as devuser to request for a new virtual machine and the workflow should now be able to take a proper snapshot once the machine have been provisioned.

# Appendix

# Module 2: Cloud Administration, Basic Challenge

# Module 3: Cloud Extensibility, Basic Challenge

The following pages contain hints for Module 3: Cloud Extensibility, Basic Challenge.

## Module 3, First Challenge, Hint 1

There is nothing wrong with the vRealize Orchestrator workflow "Add a computer in an OU".

You might want to try looking elsewhere.

Click here to return.

## Module 3, First Challenge, Hint 2

You might want to look into the "Add a computer in an OU" event subscription.

Do the conditions makes sense to you?

Click here to return.

## Module 3, Second Challenge, Hint 1

If you are trying to troubleshoot the vRealize Orchestrator workflow "Change admin password". You should trust your integration engineers more, look elsewhere.

Click here to return.

## Module 3, Second Challenge, Hint 2

Look more carefully into the conditions of the event subscription, do you see something amiss?

Click here to return.

## Module 3, Third Challenge, Hint 1

You might want to log in as cloudadmin into vRealize Automation and navigate to Design -> XaaS -> Resource Actions.

Click here to return.

## Module 3, Third Challenge, Hint 2

Remember to check the mapping of the vRealize Orchestrator input parameter, to the vRealize Automation object when you are creating the resource action.

Click here to return.

# Module 3, Third Challenge, Hint 3

You are almost there. But do not forget to publish the resource actions that you just created.

And also remember that you also need to entitle the "Development Services" entitlement to the action.

Click here to return.

# Module 4: Cloud Administration, Advanced Challenge

The following pages contain hints for Module 4: Cloud Administration, Advanced Challenge.

## Module 4, First Challenge, Hint 1

Only a user with the tenant admin role can make grant permissions to resource actions. You might want to log in as cloudadmin since this account holds the tenant admin role.

Click here to return.

## Module 4, First Challenge, Hint 2

Are you looking at vRealize Automation entitlements? If you are not, you might want to go there and have a look.

Click here to return.

## Module 4, Second Challenge, Hint 1

Have you heard of vRealize CloudClient? That is a tool you might want to check out. It is located in C:\HOL-1790\cloudclient

Click here to return.

## Module 4, Second Challenge, Hint 2

Not seeing the catalog item appear? Have you published the blueprint after you imported? What about assigning the catalog item to a service?

Click here to return.

## Module 4, Third Challenge, Hint 1

Lost? You can have a look at the documentation here.

Click here to return.

## Module 4, Third Challenge, Hint 2

Still struggling with creating the csv file? We already have one pre-generated for you. You can locate the CSV at C:\HOL-1790\BulkExport.csv

Click here to return.

# Module 5: Cloud Extensibility, Advanced Challenge

The following pages contain hints for Module 5: Cloud Extensibility, Advanced Challenge.

## Module 5, First Challenge, Hint 1

Do not troubleshoot the workflow, you are supposed to ensure that if the workflow fails, the provisioning process should fail as well.

Click here to return.

## Module 5, First Challenge, Hint 2

Try looking into defining an event broker subscription as blocking. You can find more documentation help here.

Click here to return.

## Module 5, Second Challenge, Hint 1

You do not need to modify any of the javascript.

Click here to return.

## Module 5, Second Challenge, Hint 2

Try looking into the **Visual Bindings** of the "Scriptable Task" within the workflow. You might find something out of place.

Click here to return.