embotics
the cloud automation company

Bring Your Own Cloud

Embotics vCommander

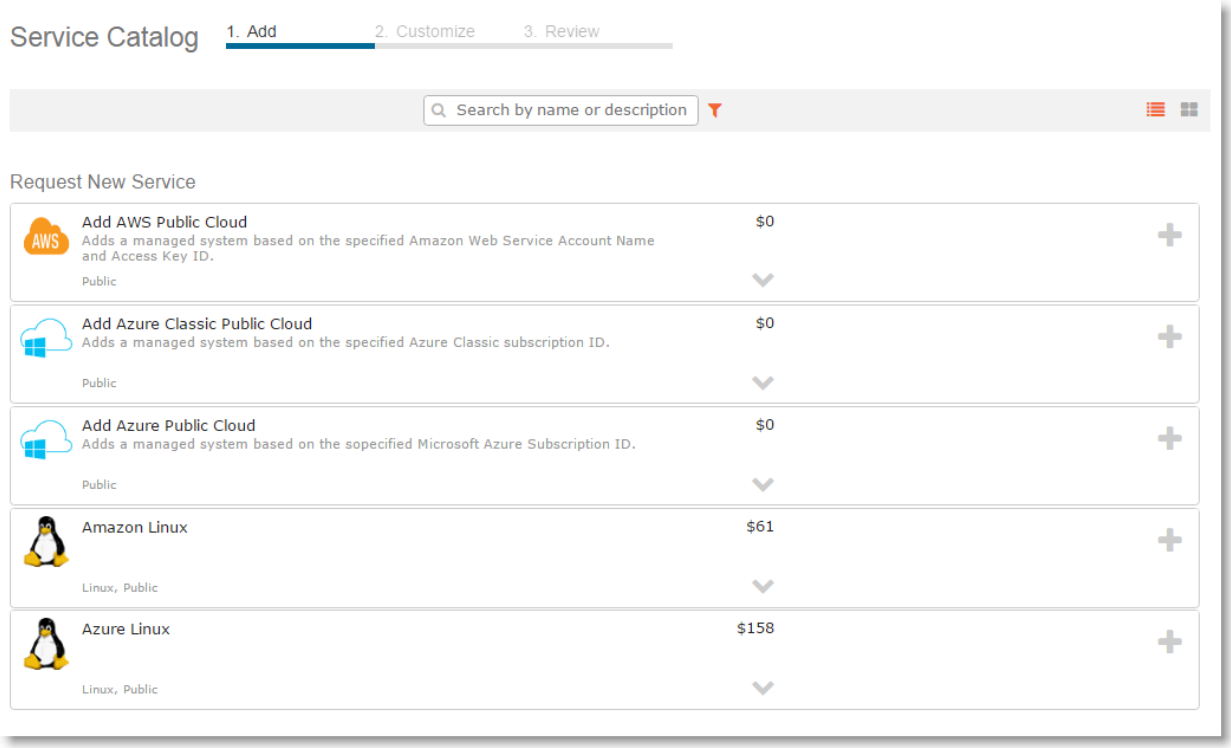
Solution Guide

Executive Summary

Embotics® vCommander™ provides self-service provisioning automation across private, public and hybrid clouds in single or multi-tenant environments. Leveraging a comprehensive set of multi-hypervisor and cloud management capabilities, organizations at any stage of cloud adoption can build and implement the framework, process automation, and policies that will result in an optimized hybrid cloud environment.

Using the solution described in this document, vCommander administrators can offer public cloud services to Service Portal consumers who are adding their own Amazon Web Services or Azure subscriptions, rather than simply deploying workloads on an existing, integrated subscription.

The focus of this document is on the configuration requirements to allow the addition of the subscriptions to occur. Any other Approval Workflow configuration you wish to configure to enact appropriate governance is beyond the scope here, but you can contact support@embotics.com if you wish to discuss this topic further.



Contents

Requirements

Find below the requirements necessary to fulfill the solution as described in this document.

- Embotics vCommander 6.0.3 or later
- Embotics vCommander REST API Powershell client (2.8) & libraries
- PowerShell v5 installed on the vCommander application server
- vCommander scripts
- Encrypted vCommander credentials with REST API access

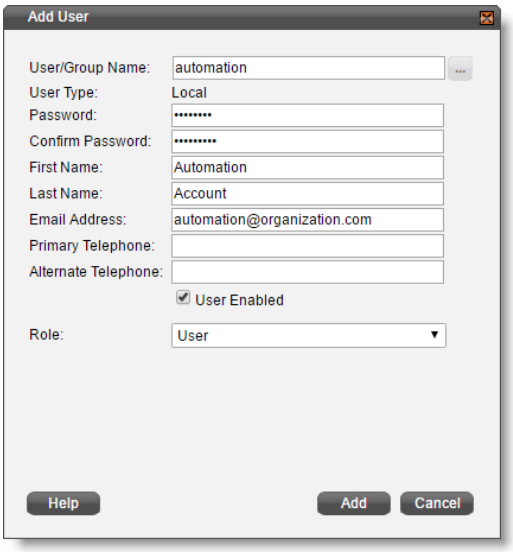
Before You Begin

As when making any substantial change to a production system, Embotics strongly recommends taking measures to ensure a successful roll-back is possible in case unexpected failures occur. These include making sure there are current backups of the vCommander SQL database and snapshots of the vCommander application server.

Additionally, you may want to implement and test the integration in a staging environment to make sure it operates as expected prior to putting it into production. Embotics provides customers with staging or lab licenses upon request. Contact your Customer Advocate for more information about these limited, supplementary licenses.

Creating an Automation User

As a best practice, you should create a specific user account to handle the automation activity. Doing so makes it easy to track actions undertaken by this solution by parsing the vCommander events for the account, and provides and account to use for form assignment.



- In most cases, simply using a local vCommander account with the User role will be sufficient. However, you can use directory services (AD/LDAP) accounts and/or Service Portal accounts as necessary.
- Provide a name that will be recognizable in events and logs as being the automation user.
- Provide an email address that will contact an appropriate person should there be any request failures.

vCommander Scripts

You should already have downloaded and extracted the scripts to your vCommander application server as detailed in the Requirements section. Embotics recommends storing all scripts called by vCommander in a single location, using sub-folders to identify the functions of scripts. With the scripts used for this solution extracted to C:\ on the vCommander server, the file system will look like this:

- `C:\scripts\addcloud\addAWSPublicCloud.ps1`
- `C:\scripts\addcloud\addARMPublicCloud.ps1`
- `C:\scripts\addcloud\addAzurePublicCloud.ps1`

These scripts require minor edits before they will work in your system.

Setting	Description
$vCommanderServer	The hostname or IP address of the vCommander server.
$CredFile	The credentials file which handles access to your vCommander. For more details, refer to this knowledgebase article.

addAzurePublicCloud.ps1

```
1  <#
2   Requires vCommander Release 5.7.7
3   Run Syntax in vCommander completion workflow
4   powershell.exe  -ExecutionPolicy Bypass  &{C:\Scripts\addcloud\addAZUREpubliccloud.ps1 '#{request.id}' '#{request.requester.organization.name}'}
5  #>
6
7  [CmdletBinding()]
8      param(
9          [Parameter(Mandatory=$true)]
10         [Int] $requestid,
11         [String] $requesterorg
12         )
13
14 $vCommanderServer = "your.vcommander.com" #address of your vCommander server
15 $CredFile = 'c:\scripts\automation.xml'  #Credential file to access your vCommander
16
17 #Remove and re-add the modules
18         Write-Host "Loading Modules"
19         $moduleName = "VCommanderRestClient"
```

Brokering Amazon Web Services

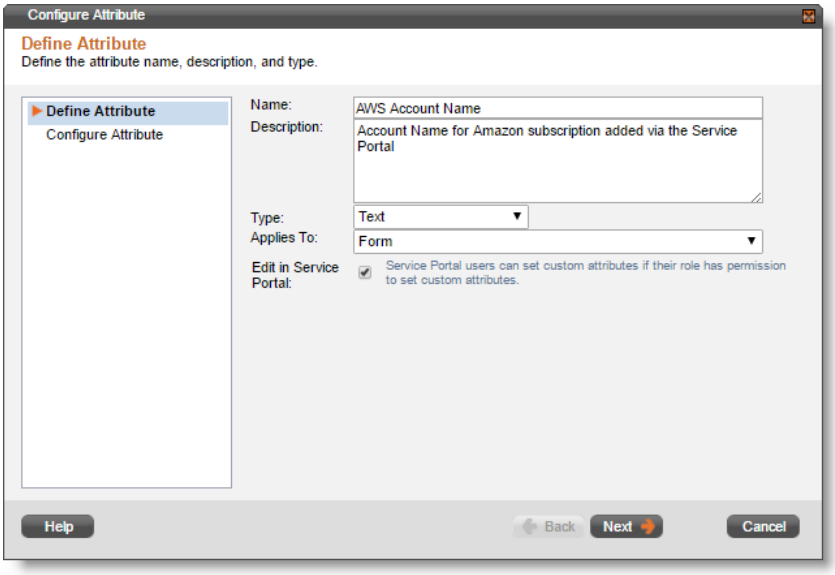
This section covers the configuration needed to allow Service Portal users to add their own Amazon Web Services managed system to vCommander.

Creating the vCommander Custom Attributes

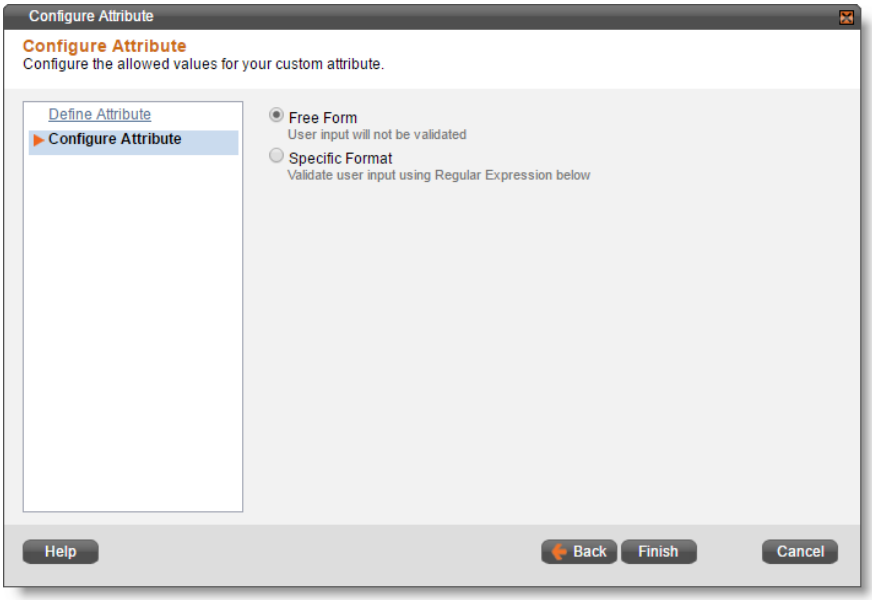
This solution uses custom attributes to capture the account Name and Access Key ID. Follow the steps below to create these.

1. Under the **Configuration** menu, choose **Custom Attributes**.
2. Click **Add**.
3. Enter *AWS Account Name* as the **Name** and optionally add a meaningful **Description**. Configure as follows, then click **Next**:

   Type: Text
   Applies To: Form
   Edit in Service Portal: Enabled

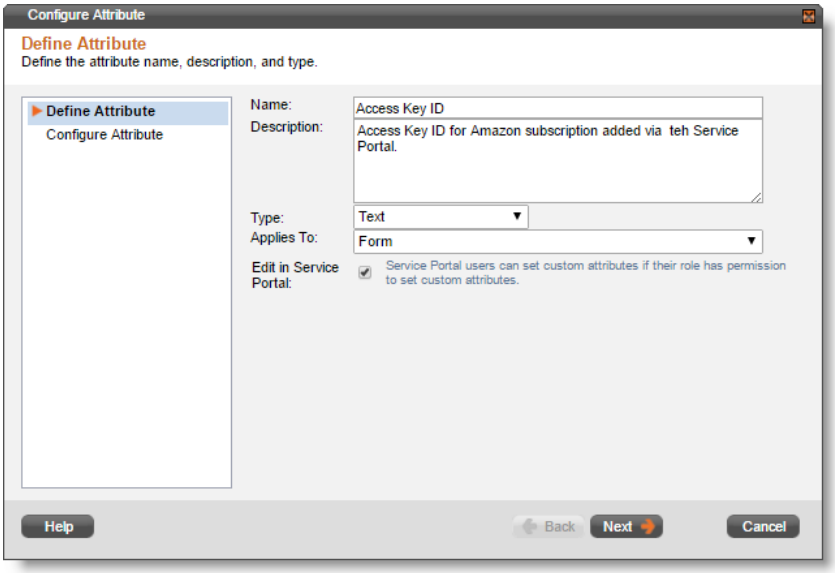


4. Choose **Free Form** and click **Finish**.



5. Back on the **Custom Attributes** page, click **Add**.
6. Enter *Access Key ID* as the **Name** and optionally add a meaningful **Description**. Configure as follows, then click **Next**:

   Type: Text
   Applies To: Form
   Edit in Service Portal: Enabled



7. Choose **Free Form** and click **Finish**.

Creating the Service Catalog Entry

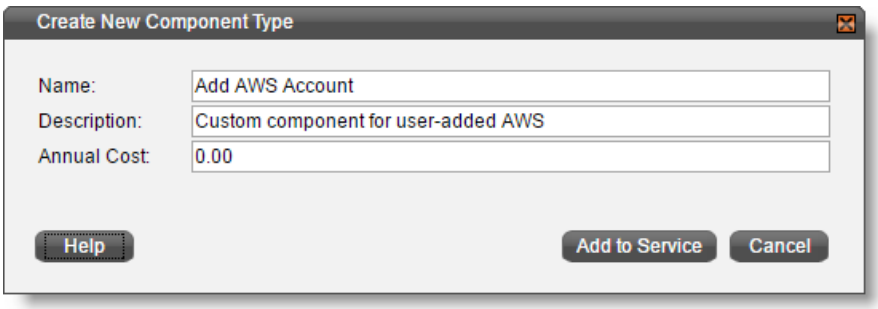
Next, create the service catalog entry so that your users have access to the forms they need to request that their AWS subscription be added.

1. Under the **Configuration** menu, choose **Service Request Configuration**.
2. Switch to the **Service Catalog** tab.
3. Click **Add Service**.
4. Configure the options on the **Service Description** page as follows, then click **Next**:

   Name: Add AWS Public Cloud
   Description: Adds a managed system based on the specified Amazon Web Services account name and access key ID.
   Icon: Choose as appropriate.
   Categories: Choose as appropriate.

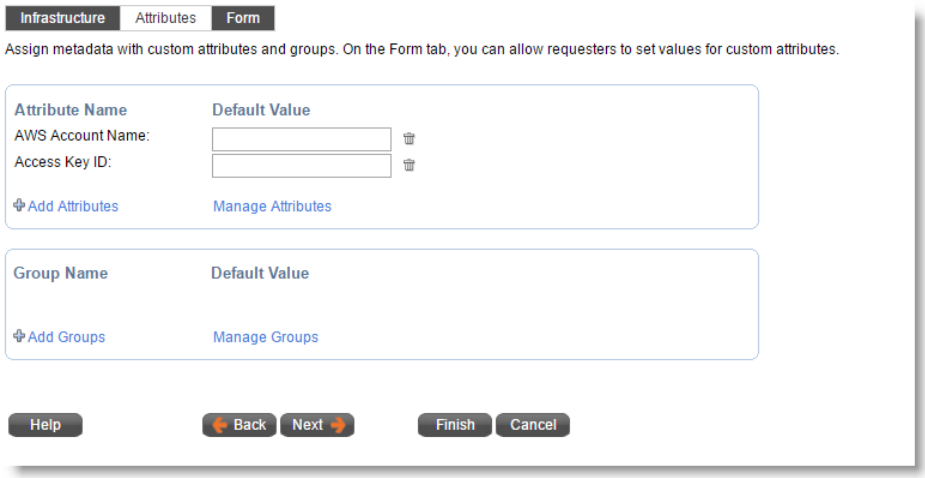
5. Now we will use a custom component to add the AWS account to the catalog. On the **Components** page, click **Add** > **New Component Type**.
6. Configure the new component type as follows, then click **Add to Service**:

   Name: Add AWS Account
   Description: Custom component for user-added AWS account.
   Annual Cost: Set as appropriate (you must use 0.00 to not apply a cost.)

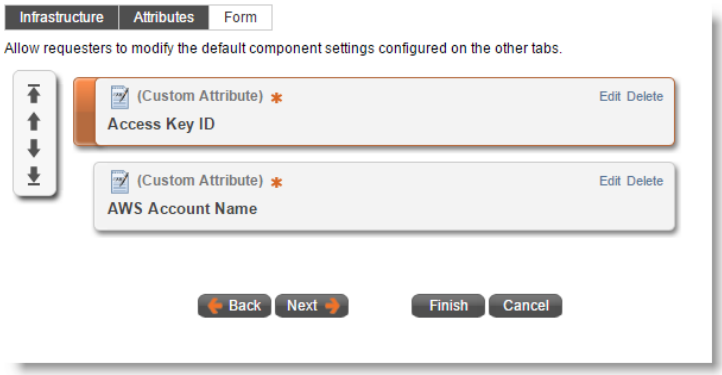


7. Click **Next** and then switch to the **Attributes** tab.

8. Click **Add Attributes** and select **Access Key ID** and **AWS Account Name**. Click **OK**.

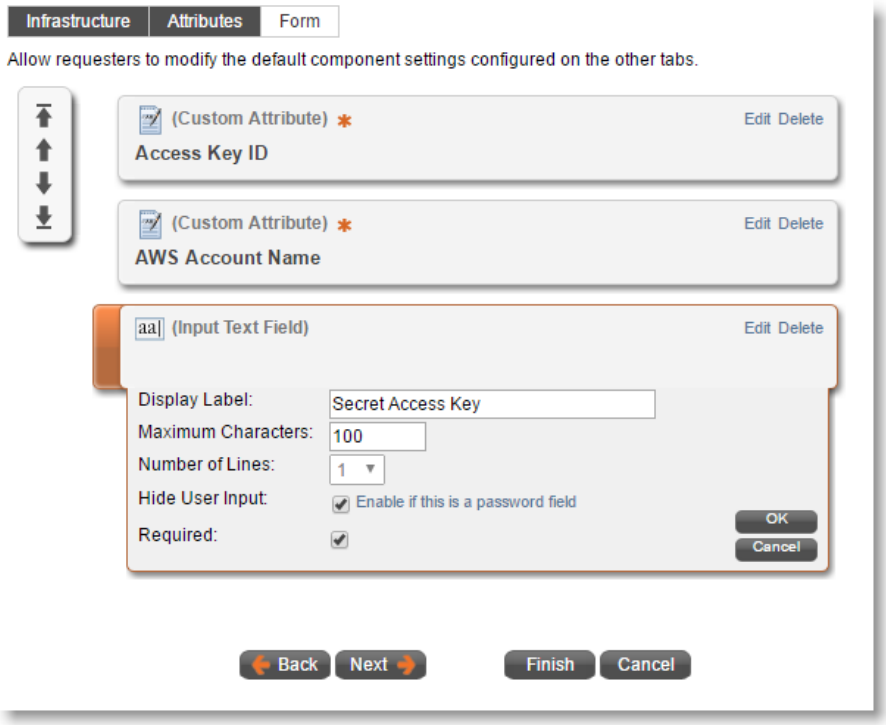


9. Switch to the **Form** tab.
10. In the **Toolbox** section, under Custom Attributes, click **AWS Account Name** and **Access Key ID** to add them to the form.
11. **Edit** each of the attributes and check the **Required** checkbox.



12. Now use an Input Text Field to capture the Secret Access Key. Add an **Input Text Field** element to the form, configured as follows:

    Display Label: Secret Access Key
    Maximum Characters: 100
    Number of Lines: 1
    Hide User Input: Enabled
    Required: Enabled

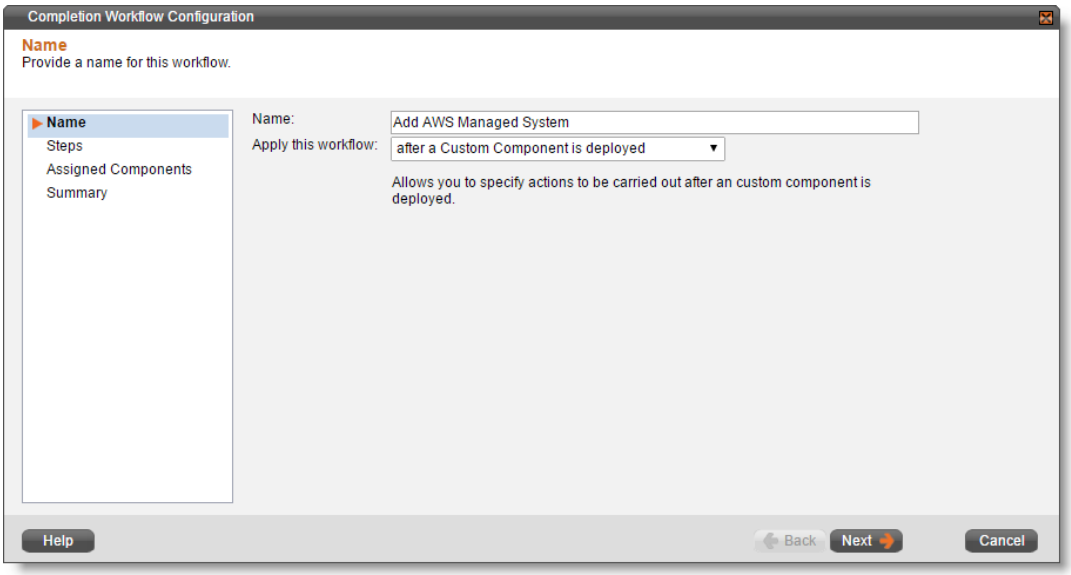


13. Add other elements to the form as appropriate for your use.
14. Sort the form elements using the arrow controls and click **Next**.
15. On the **Deployment** page, choose **None** for the **Completion Workflow**. Click **Next**.
16. On the **Visibility** page, choose to publish globally or to specific organizations, groups and users. Click **Next**.
17. Click **Finish.**

Creating the Completion Workflow

Finally, create a completion workflow to link to the service. The completion workflow references a script which adds the managed system as requested.

1. Under the **Configuration** menu, click **Service Request Configuration**.
2. Switch to the **Completion Workflow** tab.
3. Click **Add**.
4. Set the **Name** as *Add AWS Managed System* and choose to **Apply this workflow**: **after a Custom Component is deployed**. Click **Next**.

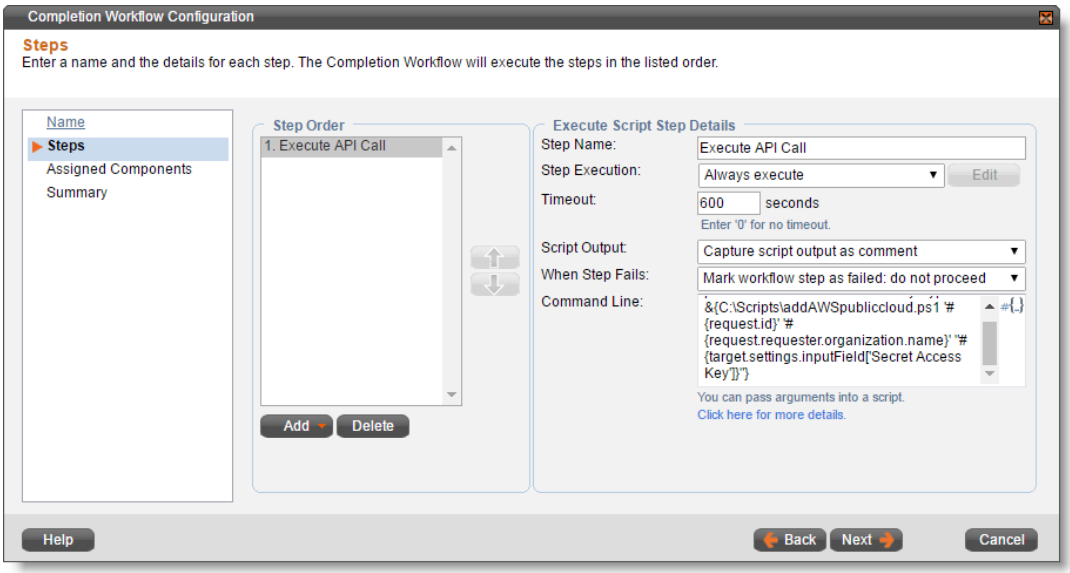


5. Click **Add** > **Execute Script** and configure the step as follows, then click **Next**:

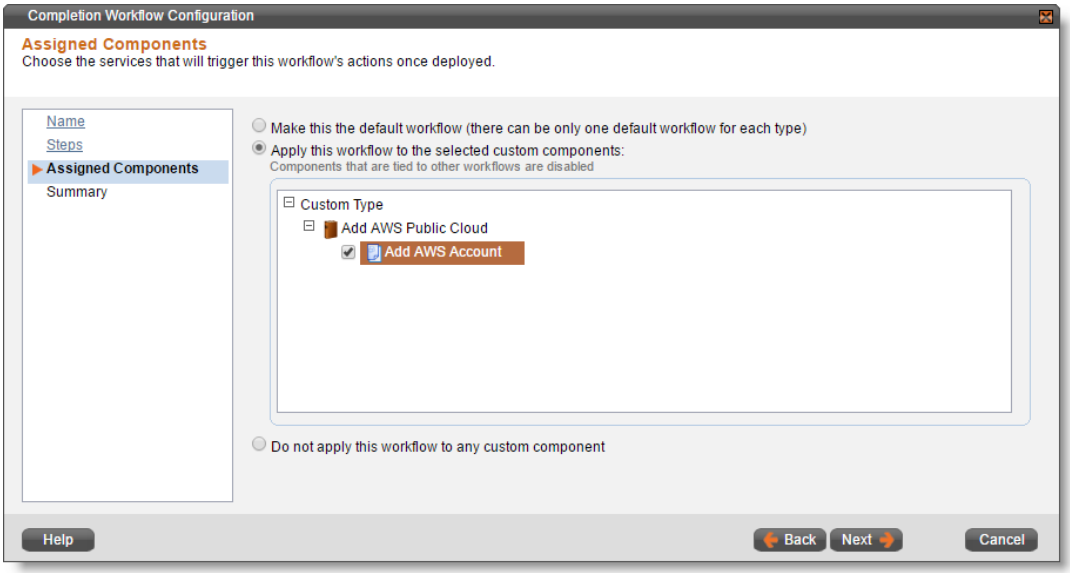
   Name: Execute API Call
   Step Execution: Always Execute
   Timeout: 600 seconds
   Script Output: Capture script output as comment
   When Step Fails: Mark workflow step as failed: do not proceed
   Command Line:

```
powershell.exe -ExecutionPolicy Bypass
&{C:\Scripts\addcloud\addAWSpubliccloud.ps1 '#{request.id}'
'#{request.requester.organization.name}'
"#{target.settings.inputField['Secret Access Key']}"}
```

   ⚠ Note that the **inputField** value is case sensitive. In this case, capitalization of Secret Access Key must match the form label exactly.



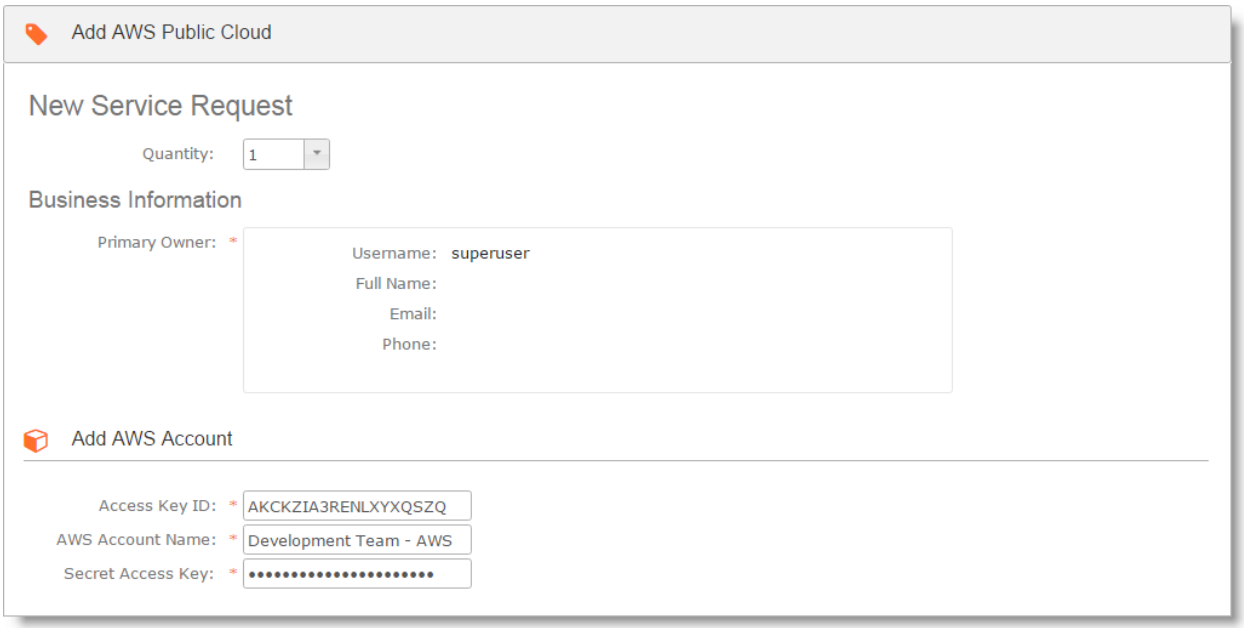
6. Check **Apply this workflow to the selected custom components** and enable **Add AWS Account**. Click **Next**.



7. Click **Finish**.

Requesting the Service

When users request the service, they will use the forms as designed in the previous steps.



The **AWS Account Name** will be used as the label for the managed system wherever it appears in vCommander. Typically, Service Portal users will not often see this label. The **Access Key** ID and **Secret Access Key** are used to connect vCommander to AWS.

Once the completion workflow finishes, the managed system appears in vCommander. All VMs in the managed system are assigned to the requester's organization. This means that any user who does not have the Service Portal permission **Show All Organization Services** will not be able to view the VMs, as users are not assigned individual ownership. If individual ownership is required, it must be assigned afterwards.

Brokering Microsoft Azure

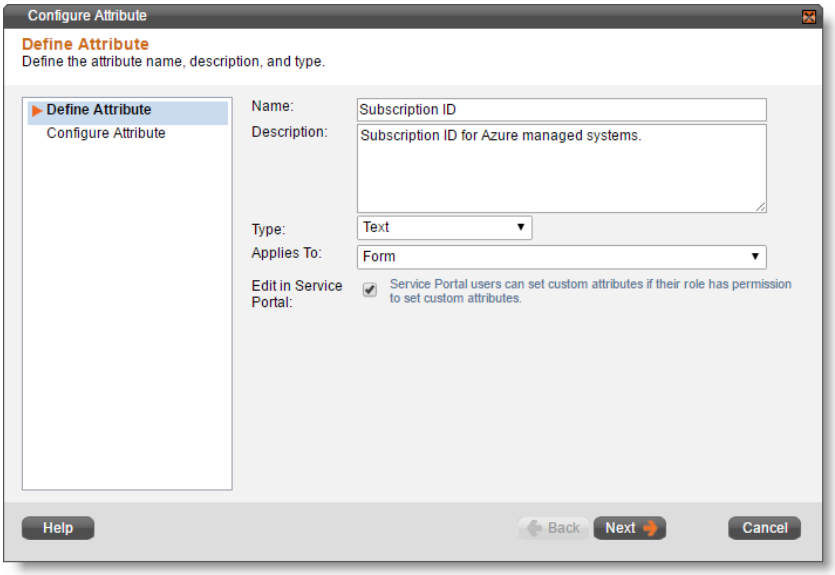
This section covers the configuration needed to allow Service Portal users to add their own Microsoft Azure managed system to vCommander.

Creating the vCommander Custom Attributes

This solution uses custom attributes to capture the Subscription Name and Subscription ID. Follow the steps below to create these.

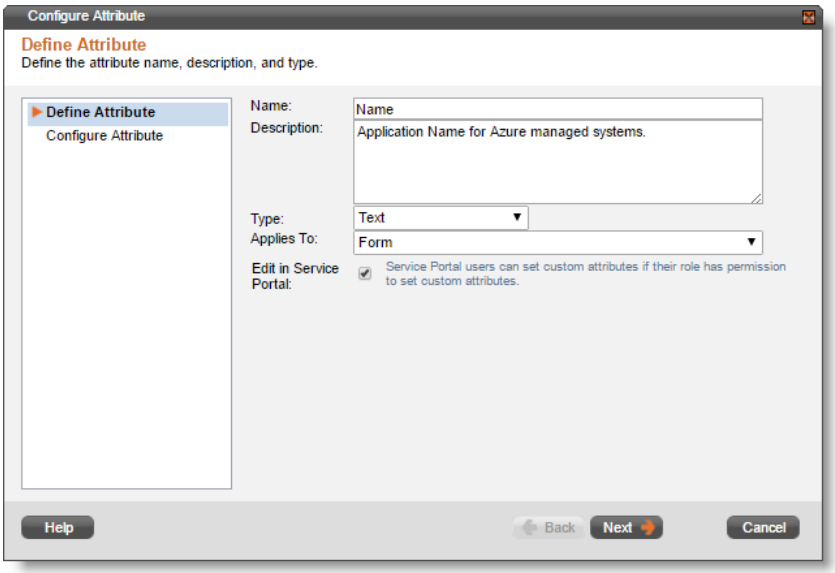
1. Under the **Configuration** menu, choose **Custom Attributes**.
2. Click **Add**.
3. Enter *Subscription ID* as the **Name** and optionally add a meaningful **Description**. Configure as follows, then click **Next**:

   Type: Text
   Applies To: Form
   Edit in Service Portal: Enabled



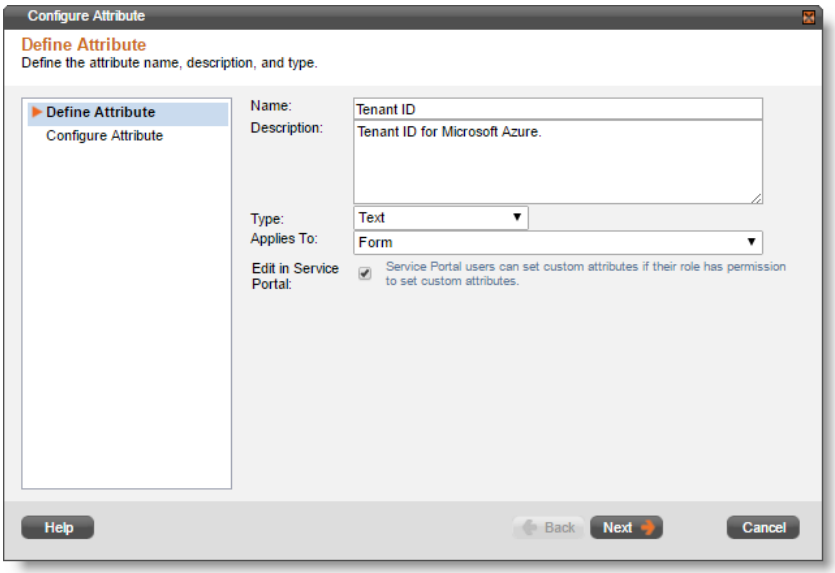
4. Choose **Free Form** and click **Finish**.
5. Back on the **Custom Attributes** page, click **Add**.
6. Enter *Name* as the **Name** and optionally add a meaningful **Description**. Configure as follows, then click **Next**:

   Type: Text
   Applies To: Form
   Edit in Service Portal: Enabled



7. Choose **Free Form** and click **Finish**.
8. Back on the **Custom Attributes** page, click **Add**.
9. Enter *Tenant ID* as the **Name** and optionally add a meaningful **Description**. Configure as follows, then click **Next**:

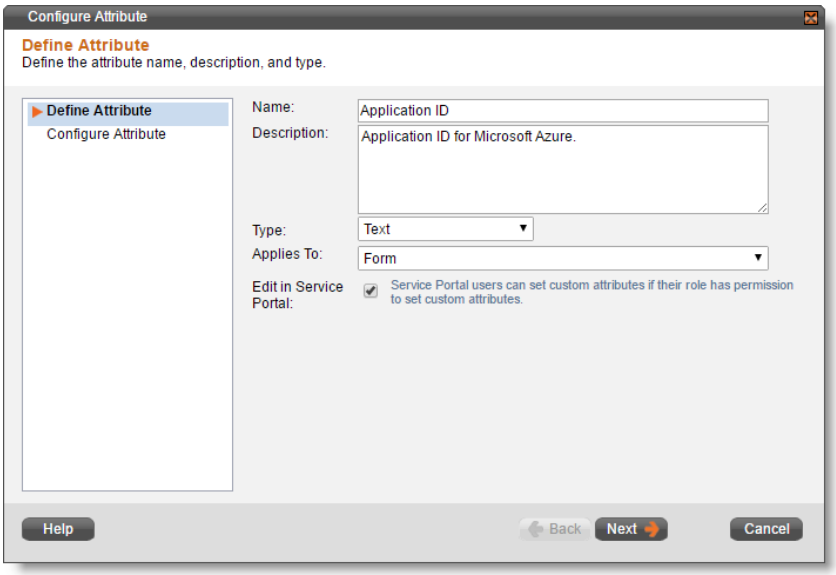
   Type: Text
   Applies To: Form
   Edit in Service Portal: Enabled



10. Choose **Free Form** and click **Finish**.
11. Back on the **Custom Attributes** page, click **Add**.
12. Enter *Application ID* as the **Name** and optionally add a meaningful **Description**. Configure as follows, then click **Next**:

    Type: Text

Applies To: Form
Edit in Service Portal: Enabled



13. Choose **Free Form** and click **Finish**.

Creating the Service Catalog Entry

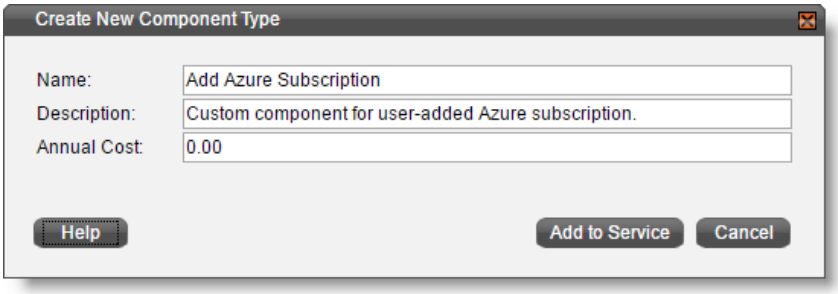
Next, create the service catalog entry so that your users have access to the forms they need to request that their Azure subscription be added.

1. Under the **Configuration** menu, choose **Service Request Configuration**.
2. Switch to the **Service Catalog** tab.
3. Click **Add Service**.
4. Configure the options on the **Service Description** page as follows, then click **Next**:

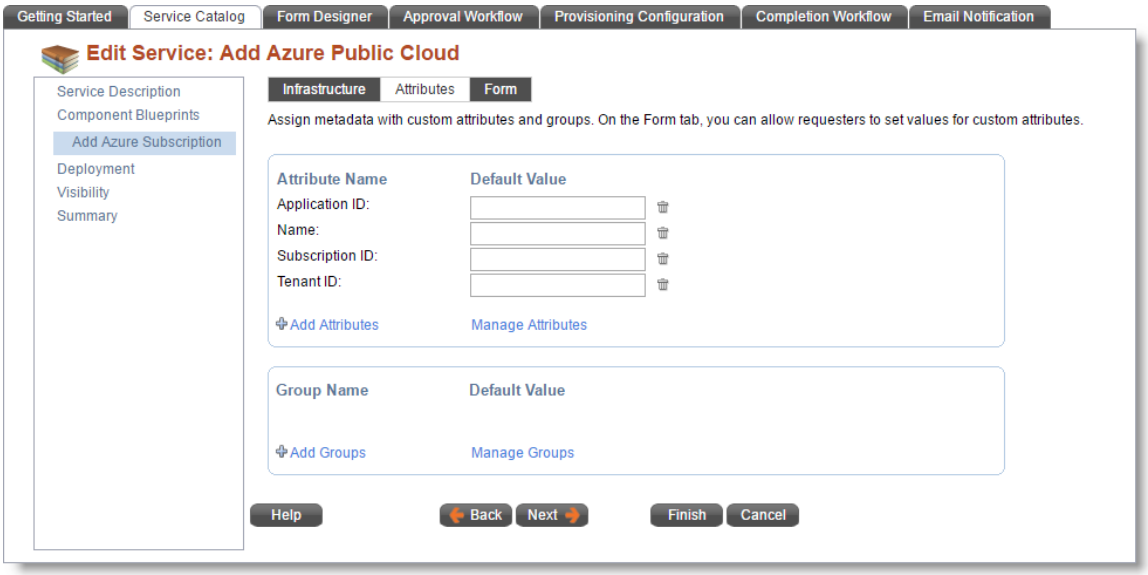
   Name: Add Azure Public Cloud
   Description: Adds a managed system based on the specified Azure subscription ID.
   Icon: Choose as appropriate.
   Categories: Choose as appropriate.

5. On the **Components** page, click **Add** > **New Component Type**.
6. Configure the new component type as follows, then click **Add to Service**:

   Name: Add Azure Subscription
   Description: Custom component for user-added Azure subscription.
   Annual Cost: Set as appropriate (you must use 0.00 to not apply a cost.)



7. Click **Next** and then switch to the **Attributes** tab.
8. Click **Add Attributes** and select **Application ID**, **Name**, **Subscription ID** and **Tenant ID**. Click **OK**.



9. Switch to the **Form** tab.
10. Under the **Toolbox** section click **Name**, **Application ID, Subscription ID** and **Tenant ID** to add them to the form. Mark them as **Required**.
11. Again, under the **Toolbox**, click **Input Text field.** Enter the **Display Label** *API Key*, and enable **Hide User Input** and **Required**.

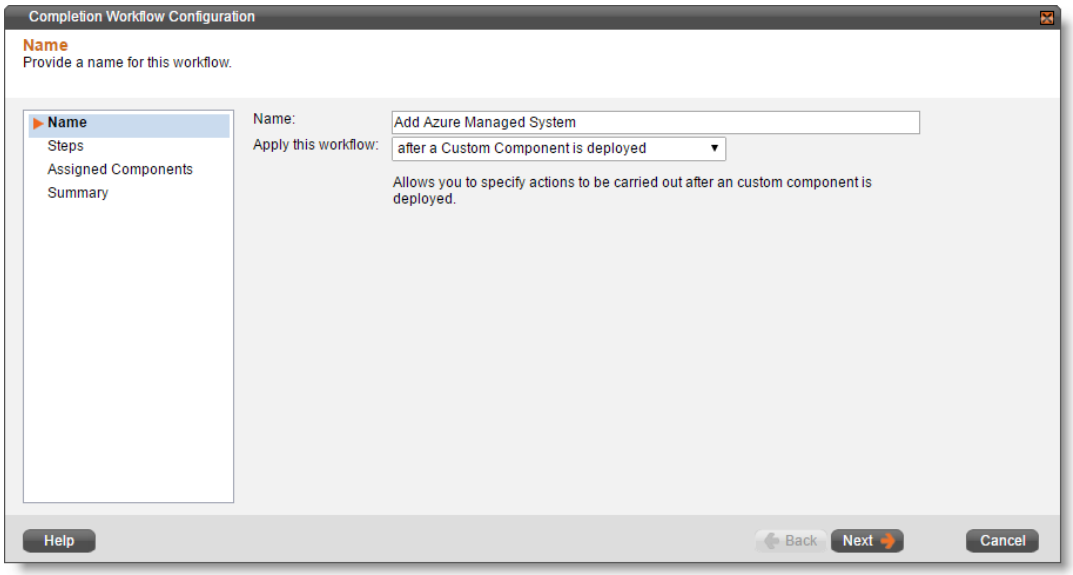
12. Sort the form elements using the arrow controls and click **Next**.
13. On the **Deployment** page, choose **None** for the **Completion Workflow**. Click **Next**.

14. On the **Visibility** page, choose to publish globally or to specific organizations, groups and users. Click **Next**.
15. Click **Finish.**

Creating the Completion Workflow

Finally, create a completion workflow to link to the service and perform automation.

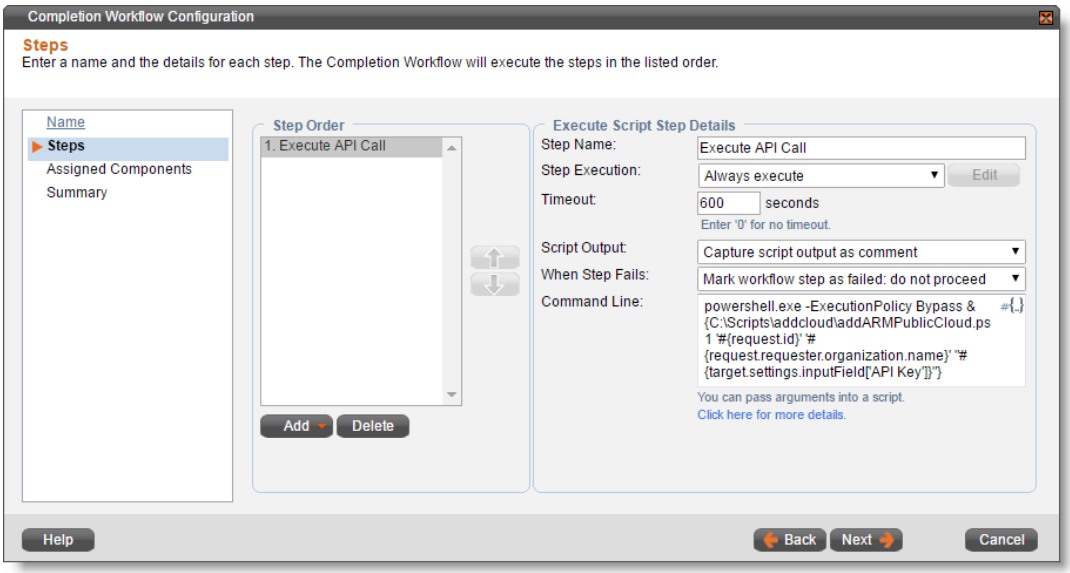
1. Under the **Configuration** menu, click **Service Request Configuration**.
2. Switch to the **Completion Workflow** tab.
3. Click **Add**.
4. Set the **Name** as *Add Azure Managed System* and choose to **Apply this workflow**: **after a Custom Component is deployed**. Click **Next**.



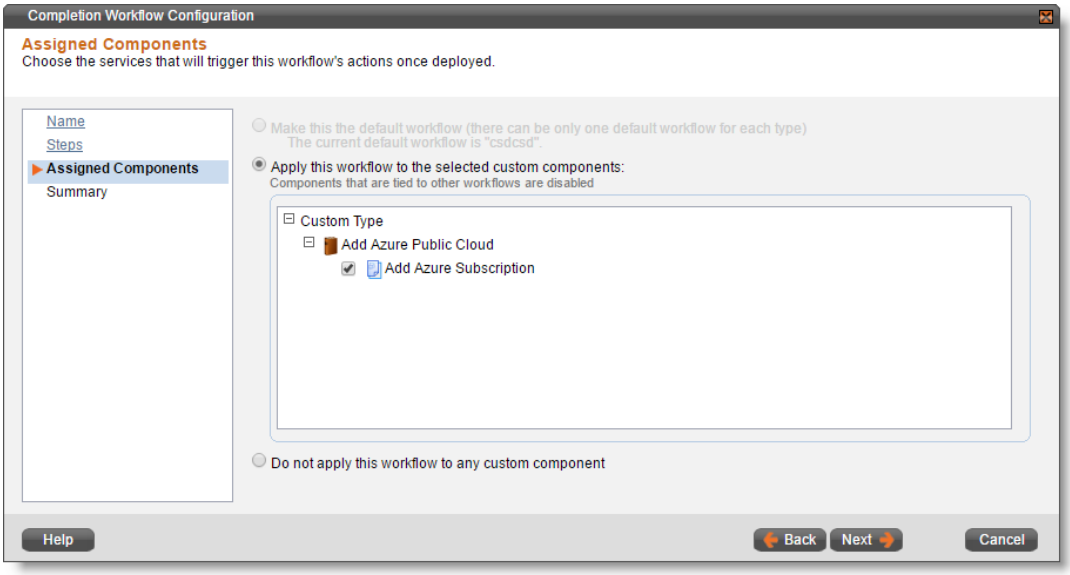
5. Click **Add** > **Execute Script** and configure the step as follows, then click **Next**:

   Name: Execute API Call
   Step Execution: Always Execute
   Timeout: 600 seconds
   Script Output: Capture script output as comment
   When Step Fails: Mark workflow step as failed: do not proceed
   Command Line:

```
powershell.exe -ExecutionPolicy Bypass
&{C:\Scripts\addcloud\addARMPublicCloud.ps1 '#{request.id}'
'#{request.requester.organization.name}'
"#{target.settings.inputField['API Key']}"}
```



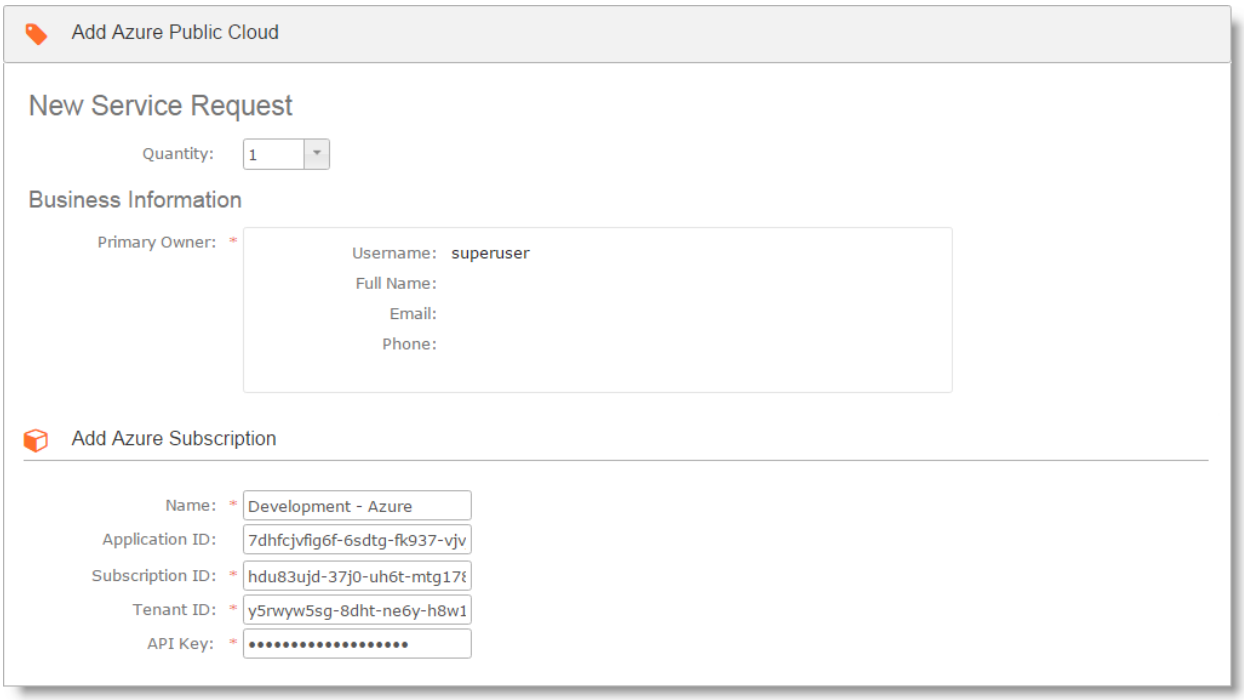
6. Check **Apply this workflow to the selected custom components** and enable **Add Azure Subscription**. Click **Next**.



7. Click **Finish**.

Requesting the Service

When users request the service, they will use the forms as designed in the previous steps.



The **Name** will be used as the label for the managed system wherever it appears in vCommander. Typically, Service Portal users will not often see this label. The other values are used to connect vCommander to Azure.

Once the completion workflow finishes, the managed system appears in vCommander. All VMs in the managed system are assigned to the requester's organization. This means that any user who does not have the Service Portal permission **Show All Organization Services** will not be able to view the VMs, as users are not assigned individual ownership. If individual ownership is required, it must be assigned afterwards.

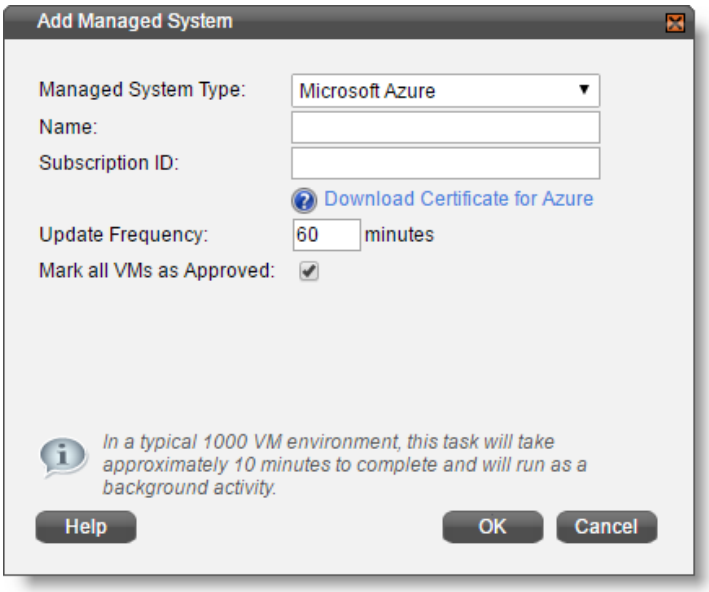
Brokering Microsoft Azure Classic

This section covers the configuration needed to allow Service Portal users to add their own Microsoft Azure Classic managed system to vCommander.

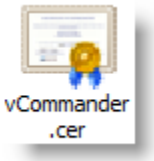
Downloading the vCommander Azure Certificate

The approval workflow for this solution requires that you provide the vCommander certificate to the Service Portal user, so that they may upload it to the ASM portal to confirm the identity of the vCommander application server. Download the certificate by following the procedure below. You only need do so once, because the certificate does not change.

1. Login to vCommander using a **superuser** account.
2. Under the **Views** menu, choose **Operational**.
3. Right-click the top level of the tree and choose **Add Managed System**.
4. Select **Microsoft Azure** as the **Managed System Type**.
5. Click **Download Certificate for Azure**.



6. Save the **vCommander.cer** file to a known location, where vCommander admins approving the requests will be able to access it.

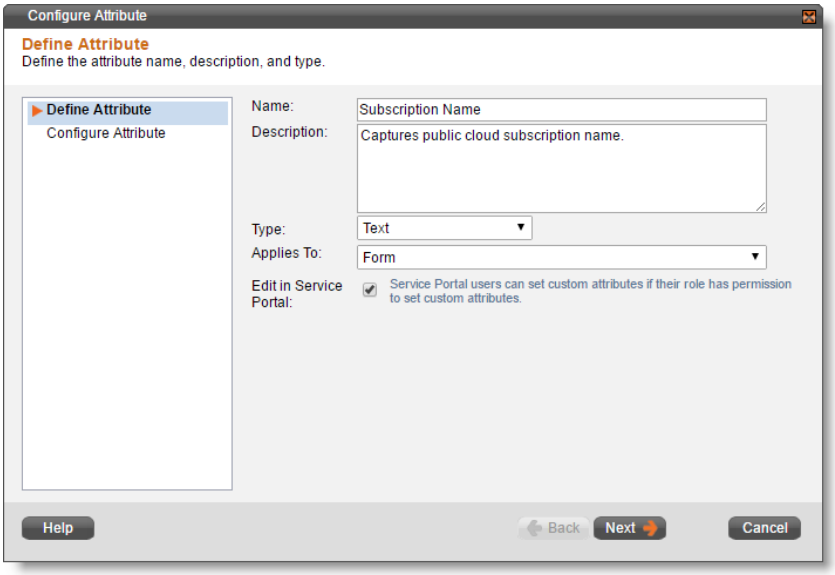


Creating the vCommander Custom Attributes

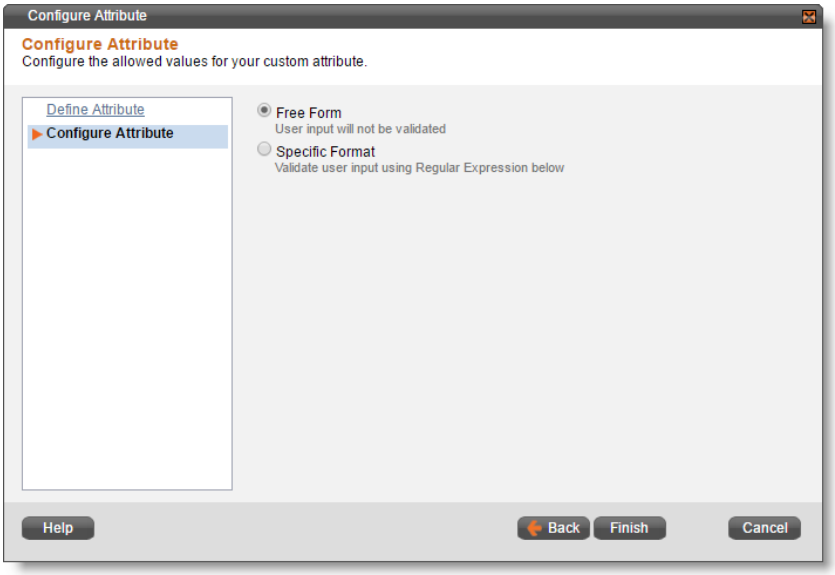
This solution uses custom attributes to capture the Subscription Name and Subscription ID. Follow the steps below to create these.

1. Under the **Configuration** menu, choose **Custom Attributes**.
2. Click **Add**.
3. Enter *Subscription Name* as the **Name** and optionally add a meaningful **Description**. Configure as follows, then click **Next**:

   Type: Text
   Applies To: Form
   Edit in Service Portal: Enabled



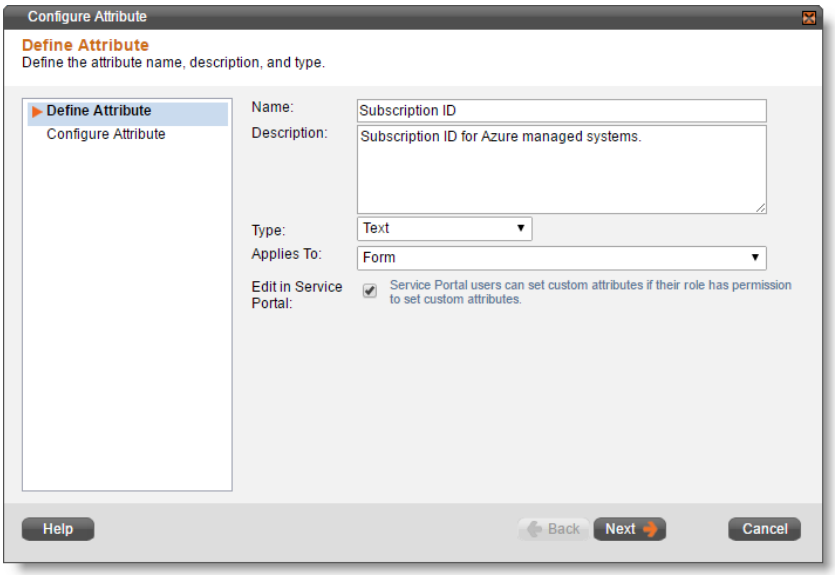
4. Choose **Free Form** and click **Finish**.



5. Back on the **Custom Attributes** page, click **Add**.
6. Enter *Subscription ID* as the **Name** and optionally add a meaningful **Description**. Configure as follows, then click **Next**:

   Type: Text

Applies To: Form
Edit in Service Portal: Enabled



7. Choose **Free Form** and click **Finish**.

Creating the Service Catalog Entry

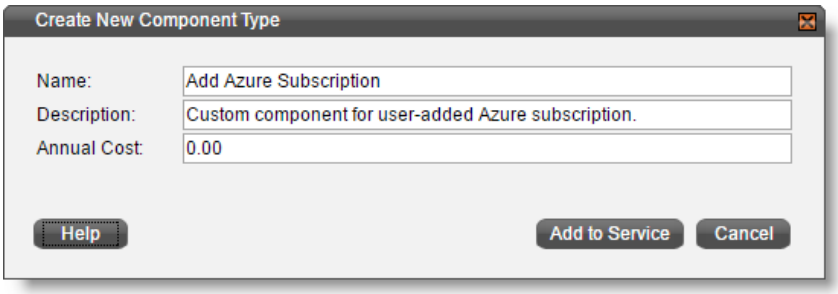
Next, create the service catalog entry so that your users have access to the forms they need to request that their Azure subscription be added.

1. Under the **Configuration** menu, choose **Service Request Configuration**.
2. Switch to the **Service Catalog** tab.
3. Click **Add Service**.
4. Configure the options on the **Service Description** page as follows, then click **Next**:

   Name: Add Azure Classic Public Cloud
   Description: Adds a managed system based on the specified Azure subscription ID.
   Icon: Choose as appropriate.
   Categories: Choose as appropriate.

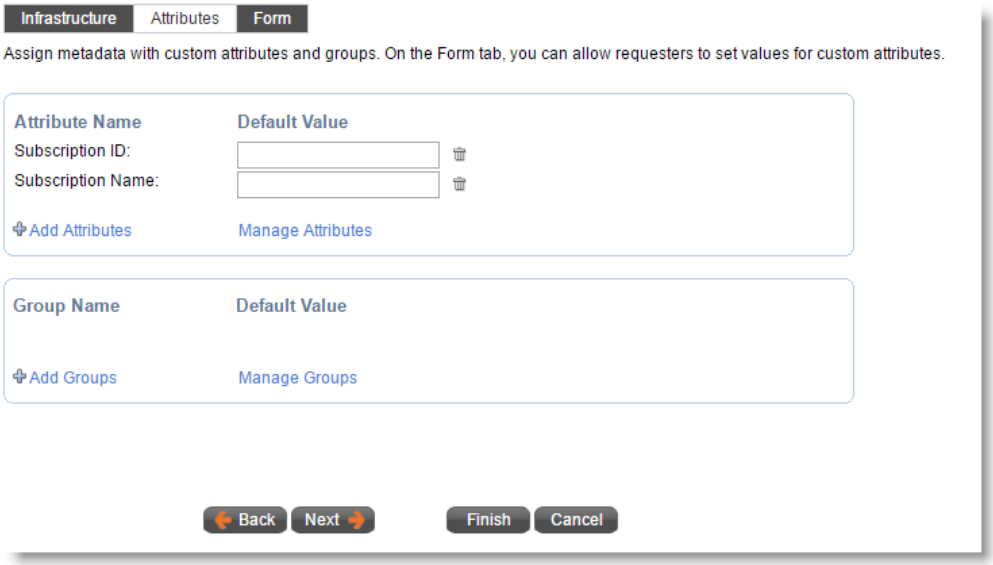
5. On the **Components** page, click **Add** > **New Component Type**.
6. Configure the new component type as follows, then click **Add to Service**:

   Name: Add Azure Classic Subscription
   Description: Custom component for user-added Azure subscription.
   Annual Cost: Set as appropriate (you must use 0.00 to not apply a cost.)

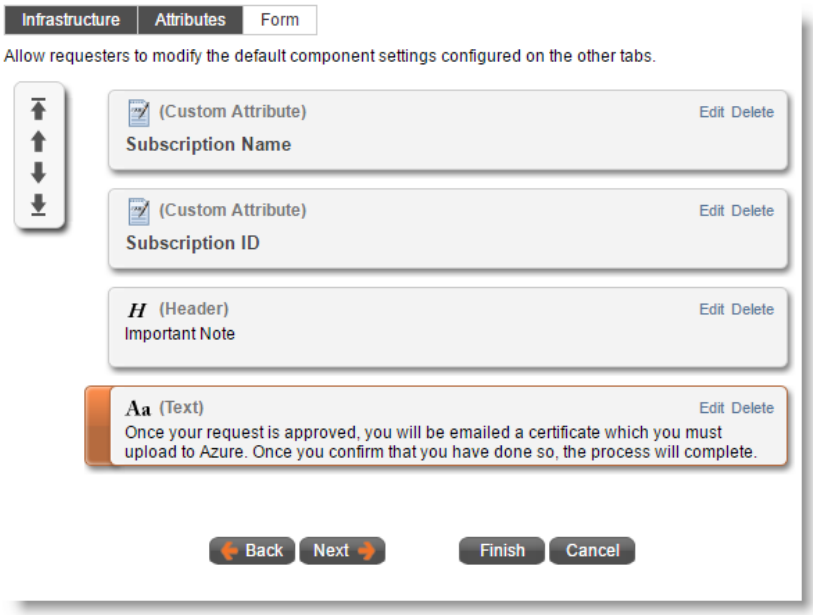


7. Click **Next** and then switch to the **Attributes** tab.

8. Click **Add Attributes** and select **Subscription Name** and **Subscription ID**. Click **OK**.



9. Switch to the **Form** tab.
10. Under the **Toolbox** section, click **Subscription Name** and **Subscription ID** to add them to the form. Mark them as **Required**.
11. Add a **Header** with the text *Important Note*.
12. Add a **Text** element with the following content: *Once your request is approved, you will be emailed a certificate which you must upload to Azure, using the legacy portal. Once you confirm that you have done so, the process will complete*.



13. Sort the form elements using the arrow controls and click **Next**.
14. On the **Deployment** page, choose **None** for the **Completion Workflow**. Click **Next**.

15. On the **Visibility** page, choose to publish globally or to specific organizations, groups and users. Click **Next**.
16. Click **Finish.**

Creating the Approval Workflow

Next, you need to make sure you have configured two extra steps in the approval workflows that will cover some manual actions which must be performed:

1. A vCommander administrator downloading an Azure certificate and delivering the certificate to the requester.
2. The requester acknowledging that they have uploaded the Azure certificate.

Within the relevant approval workflow(s):

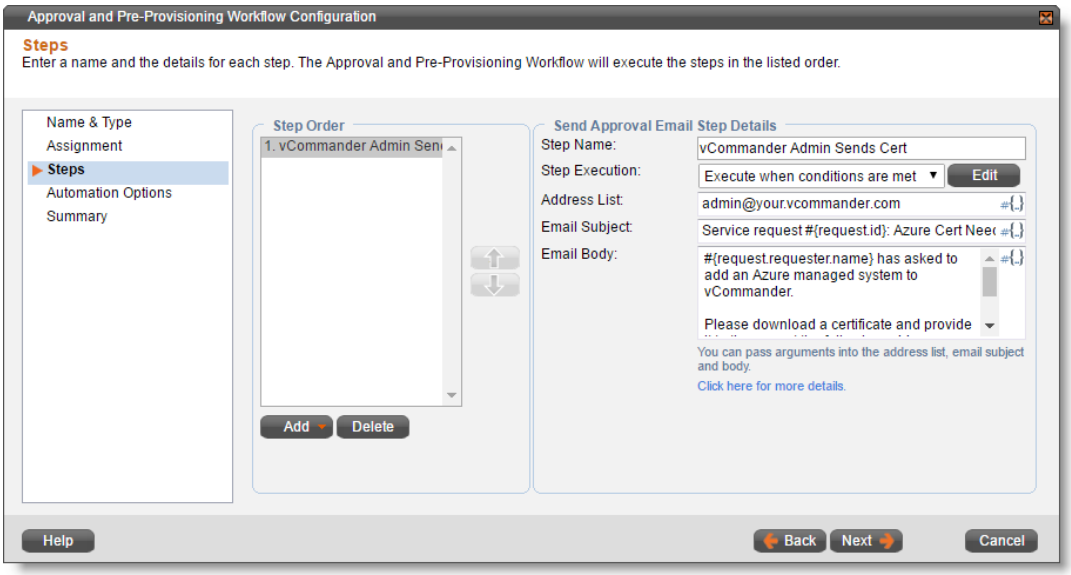
1. Click **Add** > **Send Approval Email**.
2. Configure the step as follows, then click **Next**:

   Step Name: vCommander Admin Sends Cert
   Step Execution: Execute when conditions are met:
   `#{request.services[1].components[1].settings.componentName} -eq "Add Azure"`
   Address List: Enter an email address for one or more vCommander administrators.
   Email Subject: Service request #{request.id}: Azure Cert Needed
   Email Body:

   #{request.requester.name} has asked to add an Azure managed system to vCommander.

   Please send the vCommander certificate to the following email address before approving this request:

   #{request.requester.email}



3. Configure the step as follows, then click **Next**:

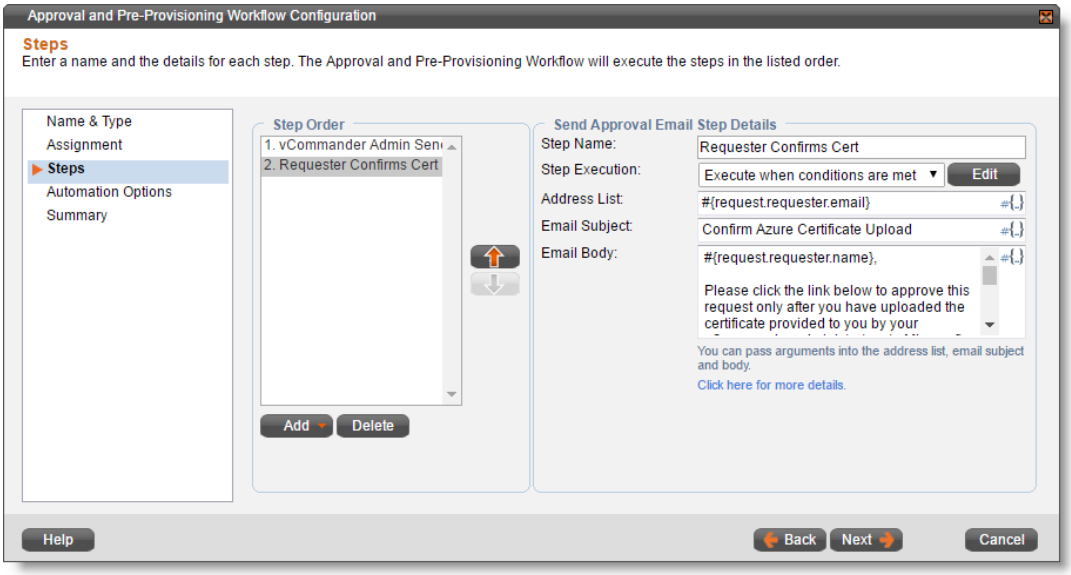
   Step Name: Requester Confirms Cert
   Step Execution: Execute when conditions are met:
   `#{request.services[1].components[1].settings.componentName} -eq "Add Azure"`
   Address List: #{request.requester.email}
   Email Subject: Confirm Azure Certificate Upload
   Email Body:

   #{request.requester.name},

   Please click the link below to approve this request only after you have uploaded the certificate provided to you by your vCommander administrators to Microsoft Azure's legacy portal.

   Refer to the documentation available here:

   http://docs.embotics.com/index.html?adding_a_managed_system.htm#add_azure

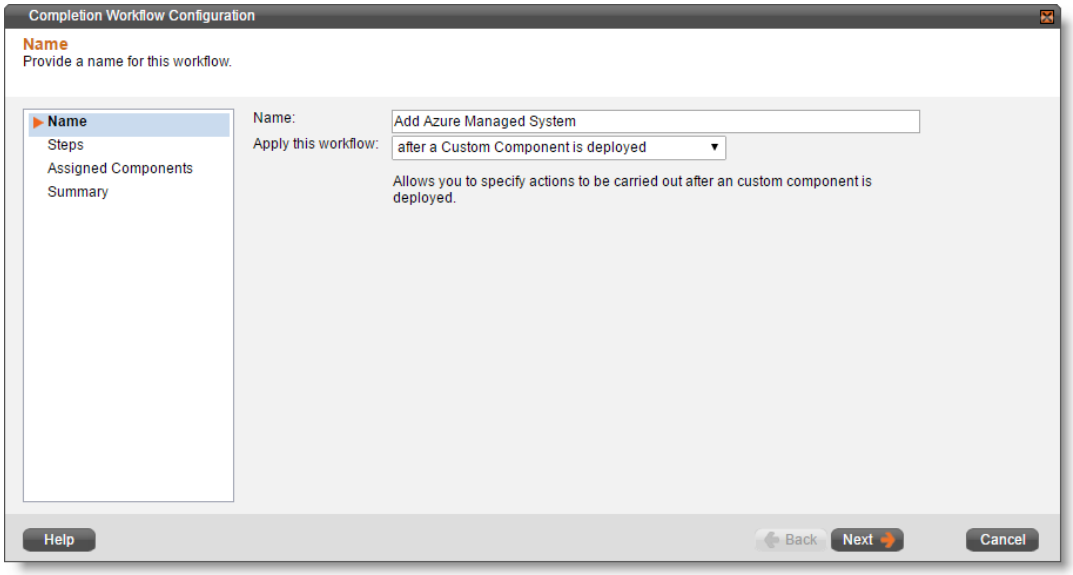


4. Complete the wizard making any other necessary changes as appropriate, and save.

Creating the Completion Workflow

Finally, create a completion workflow to link to the service and perform automation.

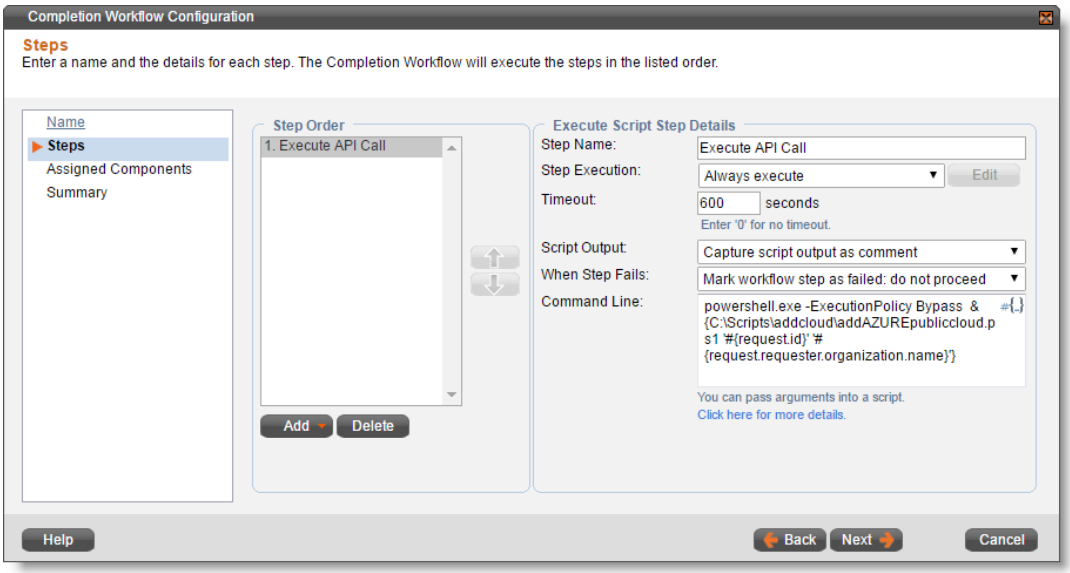
1. Under the **Configuration** menu, click **Service Request Configuration**.
2. Switch to the **Completion Workflow** tab.
3. Click **Add**.
4. Set the **Name** as *Add Azure Managed System* and choose to **Apply this workflow**: **after a Custom Component is deployed**. Click **Next**.



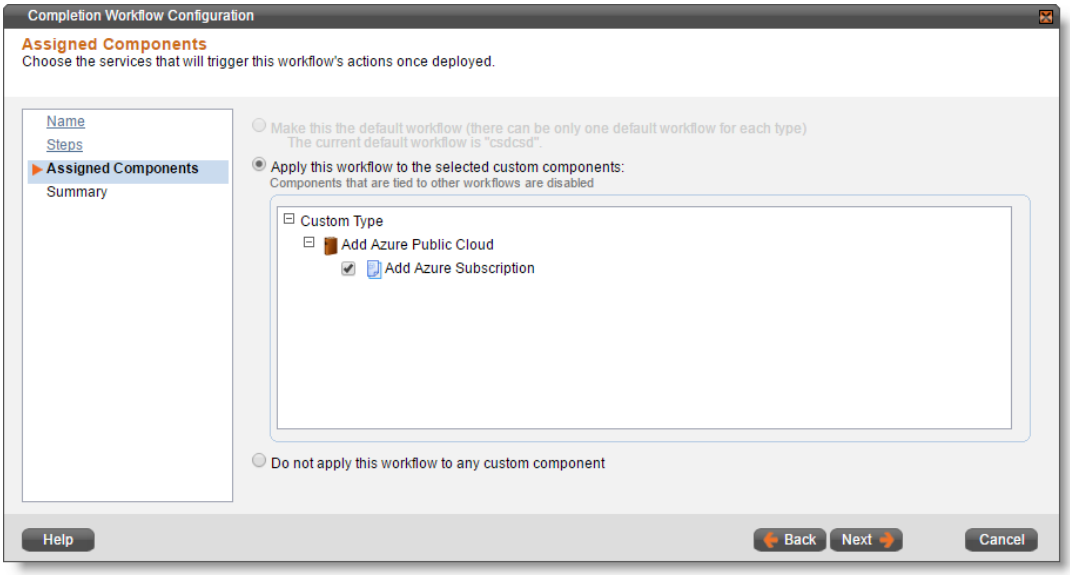
5. Click **Add** > **Execute Script** and configure the step as follows, then click **Next**:

   Name: Execute API Call
   Step Execution: Always Execute
   Timeout: 600 seconds
   Script Output: Capture script output as comment
   When Step Fails: Mark workflow step as failed: do not proceed
   Command Line:

```
powershell.exe -ExecutionPolicy Bypass
&{C:\Scripts\addcloud\addAZUREpubliccloud.ps1 '#{request.id}'
'#{request.requester.organization.name}'}
```



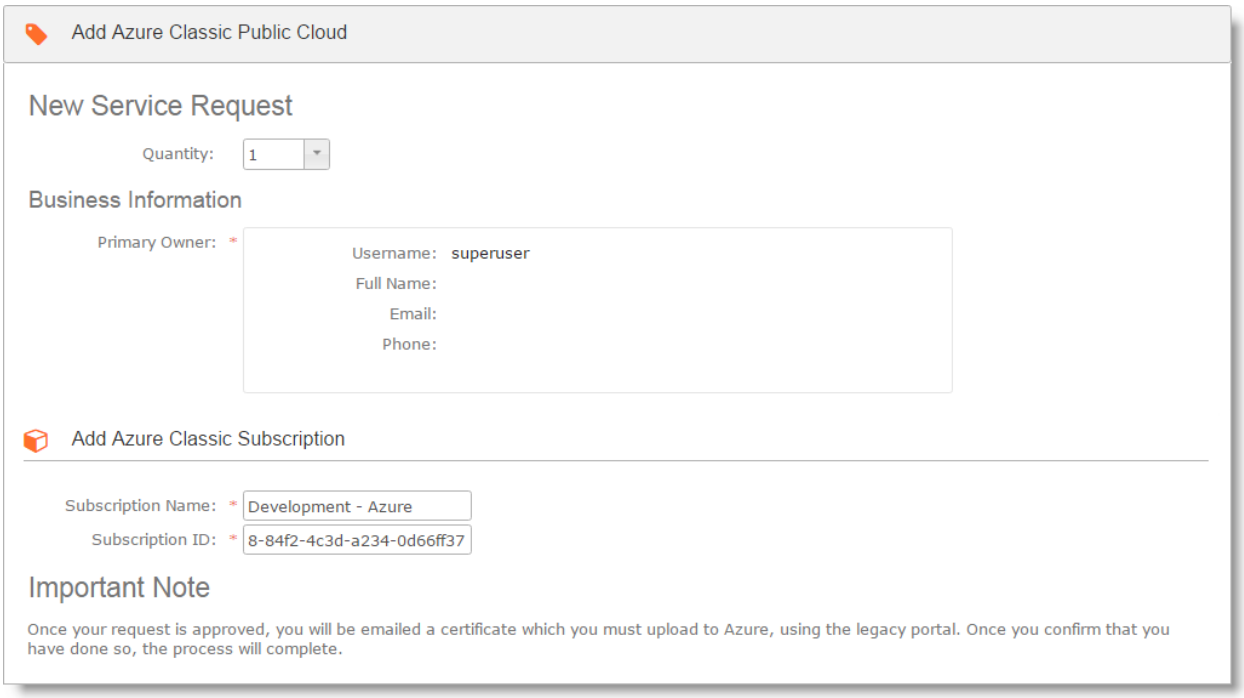
6. Check **Apply this workflow to the selected custom components** and enable **Add Azure Subscription**. Click **Next**.



7. Click **Finish**.

Requesting the Service

When users request the service, they will use the forms as designed in the previous steps.



The **Azure Subscription Name** will be used as the label for the managed system wherever it appears in vCommander. Typically, Service Portal users will not often see this label. The **Subscription ID** is used to connect vCommander to Azure.

Once the completion workflow finishes, the managed system appears in vCommander. All VMs in the managed system are assigned to the requester's organization. This means that any user who does not have the Service Portal permission **Show All Organization Services** will not be able to view the VMs, as users are not assigned individual ownership. If individual ownership is required, it must be assigned afterwards.