Integrating the Infoblox IPAM Plug-in version 3.0.X and 2.4.X for vRealize Orchestrator (vRO) with vRealize Automation (vRA 6.2.1)

April 15th, 2014

The Infoblox Plug-in automates the processes of providing an IP address (IPv4 and IPv6) to a newly created virtual machine, updating its DNS record and configuring network devices—all in a matter of seconds instead of hours or days. The Plug-in also automates the process of de-allocating an IP address if a virtual machine is deleted.

VMware vCloud Automation Center enables rapid deployment and provisioning of cloud services across private and public clouds, physical infrastructures, hypervisors and public cloud providers. vCloud Automation Center allows authorized users access to standardized IT services through a secure self-service portal, acting as a service governor and helping enforce business and IT policies throughout the service lifecycle.

This step by step guide will show you how to configure vRA 6.0 to invoke the Infoblox IPAM plug-in for vCO workflow which then allocates a static IP address and a DNS record to a newly created VM as well as invoking a separate workflow to de-allocate the IP address and DNS record when the VM gets destroyed.

The following software was used for this POC (Proof Of Concept) lab environment: ESXi 5.5, vCenter 5.5, vRA 6.2.1, vRO 6.2.1, Infoblox IPAM Plug-in for vCO 2.4.X and 3.0.X Infoblox Trinzic DDI version 7.0.2 or greater, as well as Windows 2012 VM (needed for vRA 6 IaaS software and Active Directory)

Before getting started building the POC, here is a list of all the software that you must have:

**Infoblox Software**

- Infoblox DDI (i.e. NIOS/vNIOS 7.0.2 or above).
  - Please contact Infoblox sales sales@infoblox.com to request an eval copy
- Infoblox IPAM Plug-in 3.0.x or 2.4.X for vCenter Orchestrator which you can download from:

**VMware Software**

- vRA 6.2.1 software (i.e. the Identity appliance, the vRealize appliance, a Windows 2008/2012 VM to install IaaS software needed for vRA operation)
- vCenter Orchestrator 6.0 (embedded into the vRA appliance or stand-alone)
- vCenter Server 5.5
- ESXi 5.5
This document will show you setup by step how to setup a proof-of-concept (POC) virtual lab environment to demonstrate the integration between Infoblox Trinzic DDI (i.e. NIOS) and vRealize Automation 6.2.1 (vRA). The entire environment is setup on a single ESXi host with all appliances and VM connected to a single virtual network (i.e. VM Network).

Note: You can download the latest version of this document from: https://community.infoblox.com/resources/ipam-plug-in-for-vmware

The following is a screen shot of the ESXi host running the various appliances and Windows 2012 VM used in the POC:
The following IP addresses were used in this POC:

ESXi 5.5 host – 172.26.1.4 (esxi.poc.infobloxdemo.com)
vCenter Server 5.5 – 172.26.1.5 (vc.poc.infobloxdemo.com)
vRealize Appliance 6.2.1 – 172.26.1.51 (vra621.poc.infoblox.com)
vRealize Orchestrate 6.0 (embedded into the vRA 6.2.1 appliance) – 172.26.1.51
(https://vra621.poc.infobloxdemo.com:8283/vco-config)
SSO Appliance 2.0 – 172.26.1.50 (sso.poc.infobloxdemo.com)
vNIOS Appliance 7.0.3 – 172.26.1.2 (vnios.poc.infobloxdemo.com)
Gateway IP – 172.26.1.1
Subnet Mask – 255.255.255.0
DNS IP – 172.26.1.2 (pointing to the vNIOS appliance running NIOS 7.0.3 or above)
Authoritative Zone – poc.infobloxdemo.com
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Configuring NIOS for vRA integration

- When setting up the vNIOS VM enable licensing for #2 (DDI) and #8 (NIOS)
- Connect to the vNIOS appliance via a web browser (i.e. https://vnios.poc.infobloxdemo.com that maps to 172.26.1.2), create a DNS Authoritative Zone (i.e. poc.infobloxdemo.com) then add a host record for the identity appliance as well as the vRealize appliance (i.e. sso.poc.infobloxdemo.com → 172.26.1.50 and vra621.poc.infoblox.com → 172.26.51), add an authoritative zone named “qa.com” and then add a host record for the Windows 2012 IaaS server at 172.26.1.151 → w2012vm.qa.com as shown below:

- Add one network (172.26.1.0) which will be used in this document
- Create a DHCP range for network 172.26.1.0 (i.e., 172.26.1.1 – 172.26.1.49)

- Turn on the DNS service

Add “Cloud Only API” user (for IPAM Plug-in 3.0)

- Add new “Cloud-Only-API” user for the plugin
- Assign the new user “infobloxse” to the “cloud-api-only” admin group as shown below:

![User creation form](image)

Set permissions for the user as seen in the following picture, without the correct permissions the plugin will not be able to do anything in NIOS:

![Permission settings](image)
Adding the Cloud Network Automation (CNA) License (Plugin 3.0 only)

- Open the console for the vNIOS VM from vCenter
- Log into the console for vNIOS
- Using the “set temp_license” command enable license number 16 as seen in the following picture

```
Infoblox > set temp_license
  1. DNSone (DNS, DHCP)
  2. DNSone with Grid (DNS, DHCP, Grid)
  3. Network Services for Voice (DHCP, Grid)
  4. Add DNS Server license
  5. Add DHCP Server license
  6. Add Grid license
  7. Add Microsoft management license
  8. Add vNIOS license
  9. Add IP-MAP Federation license
 10. Add Multi-Grid Management license
 11. Add Query Redirection license
 12. Add Load Balancer license
 13. Add Response Policy Zones license
 14. Add FireEye license
 15. Add DNS Traffic Control license
 16. Add Cloud Network Automation license

Select license (1-16) or q to quit: _
```

- Allow for vNIOS to restart the interface and log back into the GUI to verify you see the “Cloud” tab
Installing and configuring the VMware Identity appliance (i.e. to enable Single Sign On)

- Upload the Identity appliance to an ESXi host and configure it using the following IP info:
  - SSO Appliance IP address: 172.26.1.50, subnet mask: 255.255.255.0
  - Default Gateway: 172.26.1.1
  - DNS: 172.26.1.2
  - Hostname: sso.poc.infobloxdemo.com

Note: Before getting started, make sure that you have NTP service running on the ESXi host where the various appliances and VMs will be running on. Make sure that the NTP service gets configured on the Identity and vRealize appliances as well as the Windows 2008/2012 VM that will be running the vRA IaaS software. If all the appliances and VMs are running on a single ESXi Host (in a POC for example), then you can simply sync-up all the appliances and VMs to the same ESXi host (which is the method using in this document).

- Set the time on the Identity appliance to synchronize with the host

- Start the appliance then connect to https://sso.poc.infobloxdemo.com:5480
- User Name: root
- Password: (use the password that was set during the configuration phase)

- Set the time zone
- Click on SSO → SSO, then type in the admin password twice and click on Apply (wait till the initialization process is completed. It will take few minutes to complete)

- Click on “Host Settings”, and make sure the “SSO Host Name” field is set to the hostname of the SSO appliance followed by :7444 (ex: sso.poc.infobloxdemo.com:7444) then click on Apply

- Click on SSL, click on “Chose Action” and select “Generate Self-Signed Certificate”, then set the following values:
  - Common Name: sso.poc.infobloxdemo.com
  - Organization: IB
  - Organizational Unit: QA
  - Country Code: US

- Click on “Apply Settings”
Verify that the network configuration is set correctly

Log out of the Identity appliance

Installing and configuring the VMware vRealize appliance

- Upload the vRealize appliance to an ESXi host and configure it using the following IP info:
  - vRealize appliance IP address: 172.26.1.51, subnet mask: 255.255.255.0
  - Default Gateway: 172.26.1.1
  - DNS: 172.26.1.2
  - Hostname: vra621.poc.infobloxdemo.com
- Set the time on the Identity appliance to synchronize with the host
Start the appliance then connect to https://vra621.poc.infobloxdemo.com:5480
- User Name: root
- Password: (use the password that was set during the configuration phase)

Set the time zone

Click “vRA Settings” → Host Settings, and click on “Resolve Automatically”, then click on “Save Settings”

Scroll down to SSL; then in the “Choose Action” field, select “Generate Self Signed Certificate” and set the following values:
- Common Name: vra621.poc.infobloxdemo.com
- Organisation: IB
- Organisational Unit: QA
- Country Code: US
Click on "Save Settings"

Click on SSO and set the following values:

- SSO Host and Port: sso.poc.infobloxdemo.com:7444
- SSO Default Tenant: vsphere.local
- SSO Admin User: administrator@vsphere.local
- SSO Admin Password: (was set during initial config of the appliance)

Click on "Save Settings" and wait for several minutes where the vRealize appliance is getting initialized.

Click on "Licensing", wait for few seconds, then type in the appropriate license key, and click on "Submit Key".
Click on “Network” and verify that the info is accurate.

Log out of the virtual appliance.

Installing and configuring IaaS software on Windows 2008/2012:

- Install and configure a Windows 2008 R2/2012 VM then install the latest service pack and updates. In this document a Windows 2012 VM was used.

- Configure the Windows 2008 R2/2012 VM to use the following IP info:
  - IP address: 172.26.1.151, subnet mask: 255.255.255.0
  - Default Gateway: 172.26.1.1
  - DNS: 172.26.1.2
  - Hostname: w2012vm.qa.com

- Boot up the Windows 2012 VM, and install Active Directory (AD).
  - Follow this step-by-step guide on how to install AD
  - In this document, we have created a domain called “qa.com”
- Install Google Chrome browser on Windows 2008 R2/2012 VM.
  - Don’t use Internet Explorer as you might encounter some issues configuring vRA later on.
- After you have successfully installed Active Directory launch Google Chrome and connect to [https://vra621.poc.infoblox.com:5480/](https://vra621.poc.infoblox.com:5480/)

  ![VMware vCloud Automation Center IaaS Installation](image)

- Click on “setup.exe” and save it to your computer’s hard drive, then double click on it.
Click on Next, then click Next again.

In the “User Name” field type **root**, and the “Password” field type the vRealize appliance password.

Click Next
Click Next

A check will be performed to make sure that you have all the prerequisites installed and configured (i.e. SQL server, IIS authentication configured properly, etc). Make sure all the requirements are met before you proceed. If not, exit the installer and address all the prerequisites then run the same installer again. Assuming all the prerequisites are met, the following screen will appear:
Click Next

Fill in all the fields as shown below and click on Next
Integrating Infoblox Trinzic DDI with vRA 6.2.1 using IPAM Plug-in 2.4.x and 3.0.x for vRO

Leave the default info as shown below and click on Next.
Click on “Load”, click on “Download” then check the “Accept Certificate” box. In the “User name:” field, type administrator@vsphere.local then type and confirm the password and click on Test. Also, click on Test to the right of the IaaS Server entry as shown below.
Click on Next and the following screen shot will appear
Click on Install and wait till the installation completes

Once the installation has successfully completed, the following message will appear
Click Next then click Finish. Exit Chrome browser.

Make sure the following VMware vRA services have started before you proceed:

- If the “VMware vCloud Automation Center Service” didn’t start, make sure to start it before you proceed with the POC.

Launch Google Chrome again and go to the following webpage:
https://vra621.poc.infoblox.com/shell-ui-app

- User name: administrator@vsphere.local
- Password: (the windows password)
Click on the + sign to the right of Tenants and fill in the fields as shown below, then click on “Submit and Next”

Click on the + sign to the right of Identity stores and fill in the field similar to the following, then click on “Test Connection”
Note: In the URL field, type in ldap://IP_address_of_the_Windows_Active_Directory_VM and in the Password field, type in the windows login password

- Assuming the test connection completed successfully, click on Add and the following screen will appear.
- Click on Next, then add the following users as shown below

![Image of vRA Tenant Administration](image)

- Click on Add

![Image of vRA Tenant Administration](image)

- Logout. Now, you need to log into the newly created “Infoblox” tenant

- Go to the following URL https://vra621.poc.infoblox.com/shell-ui-app/org/infoblox
  - User Name: administrator@infoblox.com
  - Password: (windows password)
• Click on “Infrastructure”  “Administration”  Licensing
  • Click “Add License”, type the license number and click OK.
  ○ Now, we are ready to start configuring vRA.

Installing the Infoblox vRO IPAM plug-in, installing the vRA Package for vCO and configuring vRA host in vRO.

Before starting to configure vRA, make sure that the vRO service is started on your vRA 6.2.1 Appliance. If they are, then the Infoblox IPAM Plug-in must be installed and configured properly along with the Infoblox vRA Package for vCO.

Note: If the service is not started, open the VMware console to your vRA appliance and login as root. Once logged in, at the prompt type: “service vco-configurator start”. This will start the service so you can continue with the lab.

Part I: Installing the IPAM plug-in

- Open a VMware console to your vRA appliance
- Login and get to a command prompt
- type: “service vco-configurator start”
- Open a browser to: 172.26.1.51 and the following screen will appear
Click on “vRealize Orchestrator Configurator”
- Default username: vmware
- Password: vmware

- You will be prompted to set a new password, use “Infoblox_1” when you successfully login you will see the following screen:
- Click on Plug-ins
- In the right side panel, scroll down then click on the magnifier glass icon then browse to where the IPAM plug-in is located (make sure “All Files” is selected so the “o11nplugin-ipam-dar” becomes visible)

- Select the “o11nplugin-ipam.dar” file and click Open
- Click “Upload and Install” wait few seconds then the following screen should appear
- Scroll down and you should see the following:

- Even though the Infoblox IPAM plug-in has been installed successfully, it hasn’t started yet until the vCO service has been restarted.

- Click on “Startup Options” then click on “Restart Service” as shown below
- Repeat this process few times, also try restarting the vRO configuration server and restarting the service till you eventually see the IPAM plug-in has successfully started as shown below:

![VMware vRealize Orchestrator Configuration](image)

Note: If you are still having difficulty getting the IPAM Plug-in to show “Installation OK”, simply restart the vRO appliance and that will force a load of the IPAM plug-in. Do not proceed with the POC till you see “Installation OK” to the right of “Infoblox IPAM 3.0.1.2”

- Click on “Infoblox IPAM (3.0.1.2)” and the following screen will appear:
Click on “Network” then on “SSL Trust Manager” and type in the IP address of the Infoblox DDI appliance as shown below:

- Click the “Import” button and the Infoblox DDI certificate will appear as shown below:
Click Import and a screen similar to the following will appear:

- Click on the “Infoblox IPAM (3.0.x)” button, then click on “New Connection” tab and fill-in the IP address of the DDI appliance along with the username and password as shown below, then click “Apply Changes”
Integrating Infoblox Trinzic DDI with vRA 6.2.1 using IPAM Plug-in 2.4.x and 3.0.x for vRO

Note: If you are using plugin 3.0.1 or later you will use the “cloud-api-only” user you created previously in the lab. If you are using 2.4.2 or later you can use “admin” as this is only for a PoC environment. In production you would want a user that is not “admin”.

- Assuming a successful connection has been established to the Infoblox DDI appliance, the following screen will appear:

- The IPAM plug-in has been properly configured and we can proceed to the next part which is to launch the vCO client and load the Infoblox vRA package for vCO.

Part 2: Installing the Infoblox vRA package for vCO

- Make sure that JAVA 7 is installed on your machine
- Go to http://ip_address_of_the_vCO_appliance (in this POC we are using http://172.26.1.51)
Click on “vRealize Orchestrator Client”
- Download the tiny JNLP file to the desktop, and double click on it.
- A certificate warning message will appear, just click Continue.
- The following message will appear
- If prompted, check the “Do not show this again for apps from the publisher and location above” and click on Run

- The following screen will appear (in the username field type **administrator@vsphere.local**, and in the password field type **infoblox_1**)

- Click Login

- If prompted, check the “Install this certificate and do not display any security warnings for it anymore” then click Ignore as shown below:
The following vRO client GUI will appear:

![Image of vRO client GUI]

- The following vRO client GUI will appear:
- Click on the Inventory tab, then click on the small arrow to the left of the Infoblox icon as show in the following screen shot:

![Screen Shot](image)

- The above step verified that the IPAM plug-in has been successfully installed. If it didn’t get installed correctly, an error message will appear.

- Click on the Workflows icon then click on small arrow to the left of “Administrator@172.26.1.51” then drill down to Library → IPAM → vCAC → Main, and you will see Infoblox basic vCO workflows that ship part of the IPAM plug-in as shown below.
- Now, we need to install a specific vCO package developed to work with vRA to provide an enhanced level of integration between Infoblox DDI and vRA.
- Click on Run and select Administer as shown below:

- Click on the Packages icon and the following screen will appear:
Click on "Import Package..." icon and browse to location of the vRA package (\2.3.1\vRA) and select "com.infoblox.ipam.vRA.package" as shown below.

Click Open and the following screen will appear:
Click Import and the following screen will appear:

- Click “Import selected elements” and the following screen will appear:
- Click on the “com.infoblox.ipam.vcac” package, then right click on it and select “Validate Workflows”. The validation should succeed. Click on Close.

- Click on Administer and select Run as shown below

Part 3: Adding vRA Hosts to vRO configuration

Step 1: Add an IaaS host wrapper

- In the configurator client change view to designer as shown below:
- Under the Workflows tab go to Library → IPAM → vCAC → Configuration
- Right click on “Add IaaS host Wrapper” and then select “Start Workflow...”
- Fill out the following fields as depicted below:

- Click on submit to complete
You should see the following when the workflow completes:

- [Build Profile]
- [Configuration]
- [Add an iAM host Wrapper]

### Add an iAM host Wrapper [16:07:28]
- Add a vCAC host Wrapper
- Install vCO customization Wrapper

**Step 2: Add vCAC host Wrapper (required for IPAM plug-in 3.0.1)**

- Point to Add vCAC host Wrapper, right click and select “Start workflow...”
- Fill out the following fields in the pop up window as seen below:

<table>
<thead>
<tr>
<th>Common parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Host name</strong></td>
</tr>
<tr>
<td><strong>Host URL</strong></td>
</tr>
<tr>
<td><strong>Tenant</strong></td>
</tr>
<tr>
<td><strong>Automatically install SSL certificates</strong></td>
</tr>
<tr>
<td><strong>Connection timeout</strong></td>
</tr>
<tr>
<td><strong>Operation timeout</strong></td>
</tr>
<tr>
<td><strong>Session mode</strong></td>
</tr>
<tr>
<td><strong>Authentication username</strong></td>
</tr>
<tr>
<td><strong>Authentication password</strong></td>
</tr>
</tbody>
</table>

- Click Submit to complete, if successful you should see the following screen:
Step 3: Install vCO customization Wrapper

- Point to and right click on “Install vCO customization Wrapper”, and then select “Start workflow...”
- In the pop up window fill out the following common parameters as depicted below:
  - In the vCloud Automation center Host instance click on “not set” and the following screen appears, select the w2012vm server and click select

- Complete the rest of the common parameters as seen below:
Click submit, this will take a few minutes to complete, when it does you will see the following:

- Configuration
  - Add an IsCSI host Wrapper
    - Add an IsCSI host Wrapper [4/20/05]
  - Add a vCAC host Wrapper
    - Add a vCAC host Wrapper [01/07/07]
  - Install vCO customization Wrapper
    - Install vCO customization Wrapper [01/32/06]

Creating a Customization Spec and a VM Template under vCenter Server

A Customization spec needs to be created in vCenter to be used when creating a vRA Blueprint (later in this document).

To create a customization spec, do the following:

- Launch vCenter → Inventory → Management → Customization Specification Manager (as shown in the following screen shot):
Click on New, the following screen will appear:

For “Target Virtual Machine OS” select LINUX and for the Name field type Linux as shown in the following screen shot:
Click Next

Select “Use the virtual machine name” and fill in the Domain Name as shown below:
Click Next  
Select Area, Location and Hardware Clock Set, then click Next  
Keep “Typical settings” selected by default, then click Next  
Enter the DNS Search Path (i.e. poc.infobloxdemo.com), click on Add, then click Next.  
Click Finish and the following screen will appear:

Note: You also need to create a VM template for the LINUX virtual machine. In this POC, we already created a LINUX virtual machine and called it Linux as shown in the following screen shot. The Linux
VM template will be selected during the creation of the blueprint so that new VM will be created from it. Make sure to have VMtools installed inside the Linux VM.

Configuring vRA 6 for Infoblox NIOS integration

Creating vCenter and vCenter Orchestrator endpoint credentials

- Using the Chrome browser, make sure you are logged into https://vra621.poc.infobloxdemo.com/vcac/org/infoblox/

Note make sure that vRA is licensed:

Click on Infrastructure → Administration → Licensing then click on Add License and enter the vRA license then click OK. vRA must be licensed before you can proceed with GUI configuration.

- Click on Back to Infrastructure → Endpoints → Credentials
- Click on New Credentials and fill in the fields as shown below:
Click on the green check mark to save the settings.

Click on “New Credentials” and fill in the fields as shown below:

Note: Type \texttt{administrator@vsphere.local} for the username and provide the appropriate password

Click on the green check mark to save the settings.

Creating the vCenter and vCenter Orchestrator endpoints

Click on Infrastructure \rightarrow Endpoints \rightarrow Endpoints

Click on New Endpoint \rightarrow Virtual \rightarrow vSphere (vCenter) then fill in the fields as shown below:

Edit Endpoint - vSphere (vCenter)

Make sure that the Name field is set to \texttt{vCenter} (same default name used during the initial configuration of the vRA IaaS software) and Address field is set to \url{https://172.26.1.5/sdk}

Click OK
- Wait for few minutes while the vRA Agent discovers the vCenter/ESXi resources
- Click on New Endpoint → Orchestration → vCenter Orchestrator then fill in the fields as shown below:

  ![Endpoint](image)

  - Address: **https://172.26.3.8281/vco**
  - Click on “New Property” and type in `VMware.VCenterOrchestrator.Priority` and set its value to 1, then click on the green checkmark to save the settings
  - Click OK

  ![Endpoints](image)

  **Note:** Depending on which version of vCO you are using, the vCO Endpoint address will be different

  - **When using vRO 6.0 endpoint as a service, you can use the address** http://172.26.1.51/vco (The port 8281 will be added automatically)
  - **When creating a vCO 5.5 endpoint, you must set the address to** https://172.26.1.3:8281/vco (i.e. add /vco to the end of the URL)
  - **When creating a vCO 5.1 endpoint, you must set the address to** https://172.26.1.3:8281/ (i.e. without /vco to the end of the URL)
  - **You might also have to configure vCO 5.5 to run in compatibility mode as explained in VMware Knowledge Base article 2059187**
Creating a Fabric Group

- Click on Infrastructure → Groups → Fabric Group
- Click on “New Fabric Group” then fill in the blanks as shown below and select the resource that you want to manage (i.e. 172.26.1.4 which is an ESXi host in this POC)

- Click OK and the following screen will appear

- Click on the Chrome browser refresh button (to refresh the web page)
- Click Back to Infrastructure and the following screen will appear
- Click OK and the following screen will appear (more items are now visible to the left hand side). If you don’t see them, click on the refresh button again.

Creating a Machine Prefix

- Click on Infrastructure → Blueprints → Machine Prefixes
- Click on “New Machine Prefix” and fill it as shown below: (the machine prefix will be used for virtual machine naming)
Click on the green check mark to save the settings

Creating a Business Group

- Click on Infrastructure → Groups → Business Groups
- Click on “New Business Group”
- Fill in the form as shown below:
- Click OK
Viewing the Compute Resource

- Click on Infrastructure → Endpoints → Endpoints
- Right click on vCenter and select "View Compute Resources"

- Right click on the compute resources (ex: 172.26.1.4) and select Data Collection and should a screen shot similar to this
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Creating a Reservation

- Click on Infrastructure → Reservations → Reservations
- Click on “New Reservation” → Virtual → vSphere (vCenter)

then fill in the fields as shown below

Note: If you didn’t see “Succeeded” in the status field, wait for few more minutes, do a page refresh till you see it then proceed to the next step.
Click on the “Resources” tab and fill in the field as shown below

Note: You can allocate more memory and storage as needed, but always make sure you have enough resources allocated to provision the number of VMs that you want to support at any given time

Click on the green check mark to save the Storage parameters, then click on the “Network” tab and check the box to the left of “VM Network” as shown below
Note: There is no need to create and use a Network Profile since all the IPAM data will be handled by the Infoblox DDI appliance.

- Click OK

Forcing a Resource Discovery

If certain resources are not visible during the creation of a new reservation, you must run the resource discovery process again so they become visible. To run the resource discovery click on Infrastructure → Compute Resources the right click on the compute resource (ex: 172.26.1.4) and select “Data Collection” as shown below.
Under the Inventory section, click on “Request Now” and under the State section, click on “Request Now”, then the Status will transition to “In queue” as shown below.
Click the “Refresh” button after few minutes and the discovery process should have completed successfully as shown below.
Now, you can go back to the Reservation section and verify that the new resources are visible. Note that you must do this every time you add/remove a VM template from ESXi/vCenter so you will see the most up to date templates listed when creating a new blueprint.

**Installing and configuring the LinuxVM build profile**

An LinuxVM build profile needs to be created to pass specific values through custom properties from vRA to Infoblox DDI (ex: network address, CIDR, Extensible Attributes, DNS View, Network View, etc). To load the Infoblox IPAM build profile, do the following:

- In the vCO Client software click on the workflows tab then → Library → vCAC → → Build Properties→ vCAC6.X, and select the work flow “Create Build Profile for
Reserve and IP in Network” by right clicking and choosing “Start workflow....: You will see the following pop up window

- Click on “Not set” under vcacHost and in the new pop up select the w2012vm host.
- Name your profile LinuxVM
- Click Submit
- When the workflow completes you will see the following in the vCO configurator:

  - In vRealize Automation GUI go to Infrastructure→Blueprints→Build Profiles and you will see the following:
Mouse over the “LinuxVM” build profile entry, and select Edit.

Edit the following custom properties as shown below:

- Click the green checkmark to save the changes.
- Scroll down and edit the network and CIDR field (make sure to save the changes by clicking on the green checkmarks) as shown below.
Scroll down and click OK to save the changes.

Note: By doing the above steps, we are hard coding the value for DNS, network and CIDR which will be automatically set when a user is requesting a Linux VM. Later in this document, you will see how Infoblox Extensible Attributes can be used to select a specific network for a VM without hardcoding specific values.

Creating a Blueprint

- Click on Infrastructure → Blueprints → Blueprints
- Click on “New Blueprint” → Virtual → vSphere (vCenter)

Fill the “Blueprint Information” section as shown below
Click on "Build Information" and fill in the fields as shown below:
Note that we are using the Linux VM template that was created under vCenter. If you can’t find it when you clicked on the button to the far right of “Clone from:” field, you must run the discover resource process as explained in the “Forcing a Resource Discovery” section so vRA can locate the Linux template. Also, we are using the Linux customization spec as explained in the “Creating a Customization Spec and a VM Template under vCenter Server” section.

- Click on the Properties tab
- Check the checkbox to the left of “LinuxVM”
  - You must check this box so the Infoblox Custom Properties will become visible to the user who is requesting the Linux VM.
Click OK and the following will appear:

The Linux Blueprint is now created, and the next step is to publish it and make it available for users to request it from the vRA web portal.

**Publishing the Blueprints**

- Right click on “Linux” Blueprint and select Publish as shown below

- Click OK.
The Linux Blueprint is now published as shown below.

**Blueprints**

Manage blueprints that are accessible to your business groups.

<table>
<thead>
<tr>
<th>Name</th>
<th>Published</th>
<th>Platform Type</th>
<th>Business Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux</td>
<td>Yes</td>
<td>vSphere (vCenter)</td>
<td></td>
</tr>
</tbody>
</table>

Creating Services

- Click on Administration → Catalog Management → Services
- Click on the + sign to the right of Services as shown below
- then fill in the name and set the Status to Active as shown in the screenshot below.
Click Add
- Click on "Catalog Items" and the following screen will appear

**Catalog Items**

Manage catalog items published from source providers. Use the source provider's interface to create catalog items or:

Advanced Search

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
<th>Source</th>
<th>Resource Type</th>
<th>Scope</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux</td>
<td>Published</td>
<td>Linux-service</td>
<td>Virtual Machine</td>
<td>Shared</td>
<td>Linux-service</td>
</tr>
</tbody>
</table>

- Under Actions, click on the 1st tab as show below, then select “Configure”

Advanced Search

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux</td>
<td>Published</td>
<td>Linux-service</td>
</tr>
</tbody>
</table>

- Set Service to “Linux-Service” as shown below
Integrating Infoblox Trinzic DDI with vRA 6.2.1 using IPAM Plug-in 2.4.x and 3.0.x for vRO

Configure Catalog Item

- Click on Update
- Click on Entitlements
- Click on the + sign to the right of Entitlements then fill in the fields as shown below:

- Click on Next
Fill in the fields as shown below:

- Click on Entitled Services and check the check box to the left of Linux-Service, then click OK.
- Click on “Entitled Catalog Items”, check the check box to the left of Linux, then click OK.

Click on Add and the following screen will appear

Entitlements

Create and manage entitlements to control the access to catalog items and actions, and specify the approval policies to determine which approval policy applies to a particular request.

Now, do a web browser refresh and the “Catalog” tab will appear as shown below
Creating and deleting a virtual machine while utilizing Linux VM

- Click on the “Catalog” tab and you should see the following screen shot:

Service Catalog
Browse the catalog for services you need.

linux-service (1)

- Click on “Request” for the “Linux” blueprint and a screen shot similar to the following will appear:

New Request

This request will be provisioned by using the CloneWorkflow workflow.

<table>
<thead>
<tr>
<th>Blueprint</th>
<th>Description</th>
<th>Machines</th>
<th>Daily Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux</td>
<td></td>
<td>1</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

Click on the Properties tab (and scroll down a bit) then notice that the previously set values (set in the Build Profile) for DNS, Network and CIDR are now visible as shown below.
Click on “Submit”, then click OK

Wait 30 seconds, then click on the Infrastructure → Machines → Managed Machines Request and you should see the following:

Switch to the vCO client and you should that the Infoblox “Reserve an IP for vCAC VM in Network” workflow got executed as shown below
Log into the Infoblox vNIOS appliance then click on Data Management → DHCP
→ Networks → 172.26.1.0 and should see a new host record with an IP address of 172.26.1.52 assigned to it as shown below
Shortly after that a Linux02 VM will be created under vCenter.

Log into the Linux02 VM and confirm that the hostname and IP address are set correctly (i.e. hostname = linux01 and IP= 172.26.1.52) as shown below.

What is a Virtual Machine?
A virtual machine is a software computer that runs on a physical computer and can be used to install and run operating system and applications. Every virtual machine is an isolated environment, which means you can use virtual machines to test new software without affecting the rest of your computer.
In the Orchestrator Client a second workflow to update the MAC address in the host record should have been executed as depicted below:

- Checking the record in vNIOS you can see it is updated with the MAC.
Now, you can destroy the VM to release its IP address and delete its DNS host record.

Click on Infrastructure → Machines → Managed Machines and the following screen shot will appear:

Mouse over Linux01 one and select Destroy

Then click OK as shown below
Switch over to the vCenter Orchestrator, and notice that the Infoblox "Remove Host" workflow got executed with the following outcome

Switch over to the Infoblox NIOS appliance (Data Management → DHCP → Networks → 172.26.1.0), refresh the web browser and notice that the linux01.poc.infobloxdemo.com host record is no longer available as shown below
Switch over to vCenter and notice that the Linux01 VM got deleted.

Using Extensible Attributes to automate IPAM provisioning for VMs

So far in this POC, we hardcoded the network and CIDR values needed to provision a VM. This is useful for testing purposes, but one of the main limitations with hardcoding a network value is when all the IP addresses are used up and there are no more IPs available to give out to VMs, then when a user requests a Linux VM from the vRA portal, such a request will fail. The only way around it is to either hardcode a different network value or prompt the user to enter a specific IP address of a network. Either method is not fully dynamic and doesn’t have the ability to dynamically allocate an IP address from another network when the 1st network no longer has IP addresses to give out.

Infoblox Extensible Attribute can be used to automate the process of selecting an available network and allocating an IP address from that network to a virtual machine. The LinuxVM Plug-in 3.0.x and 2.4.x supports Extensible Attributes. In this section, will show you how to enable and use Extensible Attributes.
Attributes in both the IPAM plug-in as well as Infoblox DDI, then provision the Linux VM using Extensible Attributes to determine the selection of an available network that can provide an IP address to a VM.

**Part 1: Enabling an Extensible Attributes for Cloud on the Infoblox DDI appliance**

- Log into the Infoblox DDI appliance and Go to Administration → Extensible Attributes
- Click on the Extensible Attribute Country and select Edit and you will see the following screen:

![Extensible Attributes Screen](image)

- Click on Additional Properties scroll down to the bottom of the window and select “Allow cloud members to have the following access to this extensible attribute:” and select Read/Write
- Click on “Save and Close”
- In the vCO client go to Inventory  IPAM  172.26.1.2  Extensible Attributes and right click, then from the pop up menu select “Reload” as seen below:

![Image](image1.png)

- Verify Country is now in the list of extensible attributes

**Part 2: Enabling Extensible Attributes on the Infoblox DDI appliance**

- Log into the Infoblox DDI appliance and edit the 172.26.1.0 and click on Extensible Attributes as shown below

![Image](image2.png)

- Click on the + sign and add an EA called **Country** and set its value to **USA** as shown below
- Click on General and in the Comment field type USA as shown below

- Click on Save and Close and the following will appear:
- Create a network 172.24.1.0/24, set Extensible Attributes to Country = USA, and set the Comment field to USA, then the following will appear:

- Create a DHCP range for the network 172.24.1.0 and set the range from 172.24.1.1 to 172.24.1.254 (i.e. the entire range of IP addresses is reserved) as shown below:
- Create a network 172.25.1.0/24, set Extensible Attribute **Country** = **France**, set the Comment field to France, restart IPAM services, and the following screen will appear:

- Now, edit the 172.24.1.0 network, click on “IPv4 DHCP Options” and the following screen will appear:
Click on the Override icon to the right of Routers and type 172.24.1.1
Click on the Override icon to the right of Domain Name and type poc.infobloxdemo.com
Click on the Override icon to the right of DNS Servers and type 172.26.1.2. Make sure your screen look like this:

- Click Save and Close
- Repeat the same process with the same values for Domain Name and DNS Servers for the other two networks, but different values for the Routers (i.e. 172.25.1.1, and 172.26.1.1). Note that
this IP network info will eventually get passed to the Linux VMs when it gets provisioned. A vRA Network Profile is no longer needed.

Part II: Enabling Extensible Attributes on the LinuxVM plug-in

- Make sure you are logged into the vRA Infoblox tenant (i.e. https://vra621.poc.infoblox.com/shell-ui-app/org/infoblox)
- Go to Infrastructure → Blueprints → Build Profiles then mouse over LinuxVM and select Edit.

*Note:* What we want to accomplish is to remove the DNSSuffix, Network Address and CIDR date as they are no longer needed. The DNSSuffix will be provided by the Infoblox DDI appliance (when the IPv4 DHCP Option section was configured). Moreover, the Network Address and CIDR are no longer needed since we will be using Extensible Attributes to decide which network to use when a request is made to create a new VM from a template using a Blueprint.

- Scroll down a bit and clear the content of the Infoblox.IPAM.defaultDnsSuffix, Infoblox.IPAM.networkAddress and Infoblox.IPAM.networkCidr as shown below

- Now, perform the following edits:
  - Edit “Infoblox.IPAM.searchByEa” and set the value to true and save the change.
  - Edit “Infoblox.IPAM.searchEa1Name” and set the value to Country and save the change.
  - Edit “Infoblox.IPAM.searchEa1Value” and set the value to USA and save the change.
- After the above three edits are performed your screen should look as follows:
Part II:

- Scroll down to the bottom of the page and click OK to save the changes.

Part III: Requesting a Linux VM and using Extensible Attributes to find a network with an available IP address to allocated to the VM

- Go back to the Catalog section and click on Request to request the creation of a Linux VM, then click on Properties and scroll down a bit till you see the following:
Integrating Infoblox Trinzic DDI with vRA 6.2.1 using IPAM Plug-in 2.4.x and 3.0.x for vRO

- Notice that the appropriate custom fields are set as was done in the previous section (i.e. Search by EA is enabled, EA type of Country = value of USA, no network address set and no CIDR is set and also the DNSsuffix is not set as well).

- Click on Submit, click OK, then go to Infrastructure → Machines → Managed Machines then notice that the Linux02 is in the process of getting created as shown below

  ![Managed Machines](image)

- Switch over to the vCO JAVA client and you should see the following
Notice that the workflow completed successfully. Let’s take a closer look at the above workflow.

- The IPAM plug-in was able to discover two networks (172.24.1.0 & 172.26.1.0) that were tagged with metadata (i.e. Extensible Attribute) Country = USA as expected.
- The IPAM plug-in sorted the networks in ascending order, then tried to allocate an IP address from the 1st network (i.e. 172.24.1.0), but it failed since there were no available IP addresses (this is due to the fact that we intentionally set the DHCP range from 172.24.1.1 to 172.24.1.254 on the NIOS appliance), so the IP plug-in automatically transitioned to the next available network (i.e. 172.26.1.0) and tried to get an IP address on that network. It was able to get an IP address on 2nd network (i.e. 172.26.1.52) since there was a DHCP range set from 172.26.1.1 to 172.26.1.49, as well as 172.26.1.50 and 172.26.1.51 were already allocated, so the next available IP address was 172.26.1.52.
- Moreover, if you scroll down you will notice that the VM was also passed the IP address for router, DNS as well as the DNS suffix as shown below:
Switch to the Infoblox DDI appliance and look under the poc.infobloxdemo.com Authoritative Zone and it will look like this (notice that linux02 host record is assigned 172.26.1.52)

- Go to Infrastructure ➔ Machines ➔ Managed Machines, then mouse over Linux02 and select Destroy, then click OK.
- Wait 30 seconds, go to the vCO JAVA client and you should see the following workflow executed successfully.

- Double check that the linux02 host record was also removed from the Infoblox DDI appliance.

**Working with Fixed Address**

Now that you have requested the creation of a Linux VM using host records by specifying the Network Address as well as using Extensible Attribute, let’s talk a closer look at how to request the creation of a Linux VM, but using a Fixed Address.

- Go back to the Catalog section and click on Request to provision a Linux VM.
- Click on the Properties tab and make the following changes:
  - Edit “Infoblox.IPAM.createHostRecord” set it value to false and save the change.
  - Edit “Infoblox.IPAM.createFixedAddress” set it value to true and save the change.
- Your screen should now look like this:
Go to the Infoblox DDI appliance and click DHCP then click on network 172.26.1.0 and you should see 172.26.1.52 → IPv4 Reservation as shown below.
- Select the checkbox to the left of 172.26.1.52 and click on Edit, then the following screen will appear.

- Click on Cancel and wait for the Linux VM to completely boot up.
- Switch to the vCO JAVA client, then click on small arrow to the left of “Update MAC address for vRA VM” and click on the completed workflow as shown below. This workflow will get the MAC.
address from the Linux VM once it has completely booted up and passes the MAC address to Infoblox DDI (i.e. pass the MAC address to 172.26.1.52)

- Go back to the Infoblox DDI DHCP \(\rightarrow\) 172.26.1.0 network and refresh the page, then the following screen will appear:
- Notice that the Type value for 172.26.1.52 changed from IPv4 Reserved to IPv4 Fixed Address (that occurred as soon as the “Update MAC address for vRA VM” workflow got executed).
- Edit the entry for 172.26.1.52 and you should see a screen similar to this

- The Linux VM MAC address was successfully transferred to Infoblox DDI entry for 172.26.1.52 (again right after the “Update MAC address for vRA VM” executed successfully).
- Go back to Infrastructure → Machines → Managed Machine and destroy the Linux VM which will cause the 172.26.1.52 IPv4 Fixed address to be removed as shown in the following two screen shots:
You can now conduct a similar test on A and PTR record by doing the following:

- Edit “Infoblox.IPAM.createHostRecord” set it value to false and save the change.
- Edit “Infoblox.IPAM.createAddressAandPtrRecords” set it value to true and save the change.

As shown in the following screen shot:
Then go to Catalog, request the creation of a Linux VM and monitor the vCO JAVA client workflows as well as what gets created in NIOS.

Repeat this process and experiment with other settings in the IPAM plug-in Custom Properties.

Note also that the IPAM Plug-in supports DNS View and Network View. Simply edit the Custom Properties for these two entries and enter the appropriate values then save the changes as shown below (ex: DNS View = Sales and Network View = External)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Value 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infoblox.PAM.defaultSecondaryWins</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Infoblox.PAM.dnsView</td>
<td>Sales</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Infoblox.PAM.enableDHCP</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Infoblox.PAM.fixedAddressOrReservationName</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Infoblox.PAM.netaddr</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Infoblox.PAM.networkView</td>
<td>External</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Infoblox.PAM.searchByEa</td>
<td>true</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Infoblox.PAM.searchEs10Comparison</td>
<td>EQUAL</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Infoblox.PAM.searchEs10Name</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**Passing Network Data to a VM**

There are two methods to pass network data (i.e. Router IP, DNS IP, DNS Suffix, WINS, etc) to a VM:

**Method 1: Using Infoblox DDI “IPv4 DHCP Options”**

Each time a network is created in Infoblox DDI, simply set the “IPv4 DHCP Options” values for that network and then the network data will get passed to the VM if/when that network gets used by the IPAM plug-in as shown below:
Method 2: Using the IPAM Plug-in Custom Properties

Another method is pass network data using the IPAM plug-in vRA Custom Properties (inside the Build Profile). Simply edit the “LinuxVM” build profile and enter all the Network Data values as shown below.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Encrypted</th>
<th>Prompt</th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExternalWFSubs.BuildingMachine</td>
<td>d7f6ebbf1-3a34-4e02-ac4e-f5a9c369c92b</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>ExternalWFSubs.MachineDisposing</td>
<td>75480146-937d-486c-852d-cafe52077095</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>ExternalWFSubs.Machine Provisioned</td>
<td>394f8e6-999c-448d-99ec-09049cb742de</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox: IPAM aliases</td>
<td></td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox: IPAM cidr</td>
<td>24</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox: IPAM comment</td>
<td></td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox: IPAM createAddressAndRIPRecords</td>
<td>false</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox: IPAM createAddressRecord</td>
<td>false</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox: IPAM createFixedAddress</td>
<td>false</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox: IPAM createHostRecord</td>
<td>true</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox: IPAM createReservation</td>
<td>false</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox: IPAM defer#ProcSearchCertificates</td>
<td>false</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>
Creating a pull-down menu for IPAM plug-in Custom properties

vRA is very customizable. Instead of hardcoding specific values in Custom Properties in the Build Profile as we have done in this POC so far, you can provide a pull down menu for the user to select a specific value before submitting a request to provision a VM.

Let’s say you want to provide a user with a pull down menu for the Country Extensible Attribute where the user can select if the Country value is set to USA or France before submitting a request to provision the Linux VM.

To enable this capability in vRA 6.0 do the following:

- Go to Build Profiles and Edit the “LinuxVM” build profile, then scroll down till you get to the section of “Infoblox.IPAM.searchByEa” as shown in the following screen shot:

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Type</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infoblox.IPAM.searchByEa</td>
<td>true</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Infoblox.IPAM.searchEa1Comparison</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox.IPAM.searchEa1Name</td>
<td>Country</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox.IPAM.searchEa1Value</td>
<td>USA</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox.IPAM.searchEa2Comparison</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

- Make the following changes:
  - Make sure that “Infoblox.IPAM.searchByEa” is set to **true**
  - Make sure that “Infoblox.IPAM.searchEa1Name” is set to **Country**
  - Make sure that the “Infoblox.IPAM.searchEa1Value” is **empty**

- Your screen should like similar to this:

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Type</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infoblox.IPAM.searchByEa</td>
<td>true</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Infoblox.IPAM.searchEa1Comparison</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox.IPAM.searchEa1Name</td>
<td>Country</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox.IPAM.searchEa1Value</td>
<td>USA</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Infoblox.IPAM.searchEa2Comparison</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

- Scroll down and click OK to save the changes.
- Click on Infrastructure ➔ Blueprints ➔ Property Dictionary
- Locate “Infoblox.IPAM.searchEa1Value”, click on the edit button, then fill in the following fields:
  - Name = Infoblox.IPAM.searchEa1Value
  - Display Name = Country
Integrating Infoblox Trinzic DDI with vRA 6.2.1 using IPAM Plug-in 2.4.x and 3.0.x for vRO

- Control Type = DropDownList
  - Click on the green check mark to save the config and the following screen shot will appear:

  - Click on Edit in the right most column (under Property Attributes), then click on “New Property Attribute” then fill in the following fields:
    - Type = ValueList
    - Name = Country
    - Value = USA, France
  - Click on the green check mark to save the config, and the following screen shot will appear:

    **Property Attributes**

    Manage property attributes.

```
<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ValueList</td>
<td>Infobox.IPAM.searchExtValue</td>
<td>USA, France</td>
</tr>
</tbody>
</table>
```

- Click OK
- Go to Catalog and request a Linux VM and notice that now you will see a pull down menu for Country with default value set to USA as shown below:
- Click on USA and notice that France is now visible as shown below. The user can decide which value to set the Country parameter to with the default value set to USA.

- You repeat the above steps to add more pull down menus to the vRA GUI and make it fully customizable to meet your requirements.

---

**Creating a Multi-Machine Blueprint and integration with the IPAM Plug-in**

vRA supports the creation of multiple VMs through the use of a Multi-Machine Blueprint. The IPAM plug-in supports Multi-Machine Blueprint which causes the LinuxVM workflows to be executed in succession to process VM provisioning and deprovisioning requests.

To create a Multi-Machine Blueprint for the Linux VM that we are using in this POC, do the following:

- Login to the Infoblox tenant (https://vra621.poc.infoblox.com/shell-ui-app/org/infoblox)
- Click on Infrastructure → Blueprints → Machine Prefix
- Click New Machine Prefix and fill in the fields as shown below
- Click the green check mark to save the settings
- Click on Blueprints
- Mouse over New Blueprint and select Multi-Machine as shown below

**Blueprints**
Manage blueprints that are accessible to your business groups.

- The following screen will appear

**New Blueprint - Multi-Machine**
Create a blueprint to define a catalog item for infrastructure provisioning. You also can copy an existing blueprint to use as a starter.

- In the Name field type Linux-MM and for Machine Prefix select LinuxMM as shown below
- In Archive (days) put 5
- Click on the “Build Information” tab and the following screen will appear
Click on “Add Blueprint”

Check the checkbox to the left of the Linux template as shown below

Click OK and the following screen will appear

Click on the edit icon (to the left of the trash icon) and the following screen will appear:
- In the Max field type 5 (this will set the limit to the Max number that this Multi-Machine blueprint supports. That is, a user can request a max of 5 Linux VMs in a single request)
- Click the green check mark to save the settings and the following screen will appear

New Blueprint - Multi-Machine

Create a blueprint. Begin by copying a master blueprint, or start from scratch.

Machine Resources

- Click OK and the following screen will appear

- Now, you need to publish the blueprint. Follow similar steps as described in the sections titled “Publishing the Blueprints“ and "Creating Services". Once you have done that, go to Catalog and the following screen will appear
- Click on “Request” under Linux-MM and the following screen will appear
- Click on the Linux icon as shown below
- Change the #Machines value from 1 to 2 as shown below
Click on Submit and wait 15 seconds, then go to Infrastructure → Machines → Managed Machines, mouse over LinuxMM01 and select “View Components” as shown below.

Then a screen similar to the following will appear.
The LinuxVM plug-in “Reserve an IP for vRA VM in network” will soon get invoked 2 times as shown below:
Switch to Infoblox DDI and notice that two host records (for 172.26.1.52 and 172.26.1.53) were automatically created as shown below.
- Once the two Linux VMs have booted up successfully, you can go ahead and delete LinuxMM01 from vRA which will automatically invoke the “Remove Host Record...” twice and delete the two host records from Infoblox DDI as well as delete the VMs from the ESXi host.

Troubleshooting IPAM plug-in integration with vRA

The following is a list of the most common issues that you might encounter while trying to integrate the IPAM plug-in with vRA 6.0

- Make sure that the name of the customization spec is identical to what is listed in the Blueprint as shown below
If the customization spec naming differ between what is created on vCenter Server and the vRA blueprint, the VM creation process will start then terminates.

- Make sure that vRA has the appropriate resources available to spin up the appropriate VM(s) otherwise the VM creation process will fail and the IPAM plug-in will never get invoked. For example, look at the screen below, you will notice that only 1 GB of RAM can be allocated for VMs along with 10 GB of disk space. If either of these two resources get fully consumed, there will be no resources available to spin up a VM.

- Make sure to always use the Infoblox DDI admin account during the initial POC configuration to avoid running into possible permission issues. Once the POC is fully working, you can create and use an account with minimal permissions required for the operations of the plug-in.

- Verify that the three Infoblox vRA XAML files were loaded correctly using the vRA Designer
- Verify that the three ExternalWFStubs entries were created and value =1 in the vRA blueprint
- Verify that the LinuxVM build profile has the appropriate values set correctly in it
- If an IPAM plug-in workflow fails, verify that the network data being sent to the VM are either configured in the “IPv4 DHCP Options” section of properly set in the “LinuxVM” build profile or Properties tab during the VM request process from the vRA Portal.
- Always look at the “Recent Events” tab in vRA to monitor what is going as shown in the following screen shot
Looking at the vRA log files. Click on Infrastructure → Monitoring → Log as shown below.

- Make sure that the vCenter Orchestrator Endpoint is pointing to the right vCO server with the appropriate ending of the URL depending on the version of vCO used
  - When creating a vCO 5.5 endpoint, you must set the address to https://172.26.1.3:8281/vco (i.e. add /vco to the end of the URL)
  - When creating a vCO 5.1 endpoint, you must set the address to https://172.26.1.3:8281/ (i.e. without /vco to the end of the URL)
**vCenter VA SSO & vRA Identity VA SSO:**

In order to change the vRA main in this type of configuration simply login to the VA, and replace the file located at:

```bash
1  /usr/lib/vmware-sts/webapps/websso/resources/img/vmwareLogoBigger.png
```

Simply copy your image (png) to the same folder where this file is located, make a simple change to the current file:

```bash
1  mv vmwareLogoBigger.png vmwareLogoBigger_orig.png
```

and modify your file accordingly

```bash
1  mv <myLogoFileName>.png vmwareLogoBigger.png
```

Presto! You now have a new logo for your vRA login page.

---

**SSO password expiry at 90 days**

[http://cloudrelevant.com/2014/04/07/vRA-6-x-bug-please-read/](http://cloudrelevant.com/2014/04/07/vRA-6-x-bug-please-read/)

Modify this to match the URL of your tenant

1. ssh into SSO appliance
2. run following command (this resets account control flag)

```
/opt/likewise/bin/ldapmodify -H ldap://localhost:11711 -x -D “cn=administrator,cn=users,dc=vsphere,dc=local” -W <<EOF
dn: cn=administrator,cn=users,dc=nephosoft
changetype: modify
replace: userAccountControl
userAccountControl: 0
EOF
```

modifying entry “cn=tenantadmin,cn=users,dc=qic”

3. run following command (this makes password never expired)

```
/opt/likewise/bin/ldapmodify -H ldap://localhost:11711 -x -D “cn=administrator,cn=users,dc=vsphere,dc=local” -W <<EOF
dn: cn=DCAmins,cn=builtin,dc=vsphere,dc=local
changetype: modify
add: member
member: cn=administrator,cn=users,dc=nephosoft
EOF
```

modifying entry “cn=DCAmins,cn=builtin,dc=vsphere,dc=local”
vRA6 timeout

http://clouddrelevant.com/2014/01/28/how-to-modify-or-disable-session-time-out-for-vRA-6-0/

The session time for the vRA 6.0 console is set time timeout after 30 minutes. Depending on your security needs, it may be helpful to decrease, increase or disable the session timeout.

You will need to modify a file on the vRA 6.0 virtual appliance – DO THIS AT YOUR OWN RISK and please snapshot the VM or back up the file (or both, even better). This is not an official VMware supported modification.

The file you will need to edit:

/usr/lib/vRA/server/webapps/shell-ui-app/WEB-INF/web.xml

The section you will need to edit:

```bash
sso:/opt/likewise/bin #
sso:/opt/likewise/bin # modifying
--bash: modifying: command not found
sso:/opt/likewise/bin # /ldapmodify -H ldap://localhost:389 -x -D "cn=administra
tor, cn=users, dc=vsphere, dc=local" -w <<EOF
  > dn: cn=tenantadmin, cn=users, dc=HP
  > changeType: modify
  > replace: userAccountControl
  > userAccountControl: 0
  > EOF
  Enter LDAP Password:
  modifying entry "cn=tenantadmin, cn=users, dc=HP"

sso:/opt/likewise/bin # /ldapmodify -H ldap://localhost:389 -x -D "cn=administra
tor, cn=users, dc=vsphere, dc=local" -w <<EOF
  > dn: cn=DCAAdmins, cn=builtin, dc=vsphere, dc=local
  > changeType: modify
  > add: member
  > member: cn=tenantadmin, cn=users, dc=HP
  > EOF
  Enter LDAP Password:
  modifying entry "cn=DCAAdmins, cn=builtin, dc=vsphere, dc=local"
  sso:/opt/likewise/bin #
```
Integrating Infoblox Trinzic DDI with vRA 6.2.1 using IPAM Plug-in 2.4.x and 3.0.x for vRO

As you can see, the default value is in the session-timeout section and set at 30 minutes. If you wish to disable the timeout altogether, just use -1 for the value there. (not RECOMMENDED!!!)

 Restart your vRealize appliance to effect the change.

*** shared from [http://www.storagegumbo.com](http://www.storagegumbo.com) ***

**GUI customization**


**vRA 6 Icon Pack**


**vRA Resources**


[http://vRAteam.info/](http://vRAteam.info/)


[http://dailyhypervisor.com/vRA-6-0/](http://dailyhypervisor.com/vRA-6-0/)

Integrating Infoblox Trinzic DDI with vRA 6.2.1 using IPAM Plug-in 2.4.x and 3.0.x for vRO

http://www.virtualjad.com/
http://elasticskies.com/using-vRA-6-rest-api-part-1/
http://www.jonathanmedd.net/2014/06/automating-vRA-tenant-creation-with-vco-part-1-ad-ssl.html
http://www.viktorious.nl/2014/07/09/importance-vco-error-handling-vRA-machinedisposing-stub/
http://cloudyautomation.com/
http://www.storagegumbo.com/2014/05/use-vRA-static-ip-without-vcenter.html
http://vcdx56.com/2014/02/12/add-vcenter-orchestrator-as-a-vcloud-automation-center-endpoint/
http://vimeo.com/tag:vRA
http://managesddc.com/2014/03/25/addremove-vRA-iaas-vms-tofrom-dns/
http://www.virtualizationsoftware.com/deploying-vmware-cloud-automation-center-vRA/
http://www.virtuallyghetto.com/2013/12/automating-vRA-vcloud-automation.html
http://www.pluralsight.com/training/Courses/TableOfContents/vmware-vcloud-automation-center-intro