

VMware Cloud Experience: Consuming VMware Cloud with vRealize Cloud Assembly – Holodeck

Part 1 – Fixed Networks

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VCF Experience Program Lab Overview

The VMware Cloud Foundation (VCF) Experience Program is designed to provide a hands-on experience highlighting how VCF delivers a *Cloud Operating Model* for customer managed on premises environments, capable of hosting traditional and modern applications. This Experience Program guide is intended for use with a VCF Lab Constructor (VLC) based nested environment built using the Automated Holodeck config.

Credentials

The following credentials are used in this lab. For your convenience, links to all management interfaces are in the bookmark bar of Google Chrome in your lab environment.

- **SDDC Manager**
 - Username: administrator@vsphere.local
 - Password: VMware123!
- **SDDC Manager as Sam Jones**
 - Username: sam@vcf.sddc.lab
 - Password: VMware123!
- **vCenter Server Admin Console**
 - Username: root
 - Password: VMware123!
- **vSphere Web Client**
 - Username: administrator@vsphere.local
 - Password: VMware123!
- **VMware NSX Manager**
 - Username: admin
 - Password NSX-T: VMware123!VMware123!
- **vRealize Operations Manager**
 - Username: admin
 - Password: VMware123!
- **vRealize Automation Cloud Assembly**
 - Username: configadmin
 - Password: VMware123!
- **Windows Console (Jump Host)**
 - Username: administrator
 - Password: VMware123!
- **Opencart Apache and MySQL VMs**
 - Username: ocuser
 - Password: VMware123!

VCF Experience Program: Consuming VMware Cloud Resources with vRealize Cloud Assembly

Overview

This session introduces consumption of a VCF based VMware Cloud using vRealize Cloud Assembly. Participants will gain experience with:

- Using vRealize Automation Cloud Assembly to deploy application workloads onto preconfigured NSX Segments and firewall policies

This section relies on:

1. Holodeck Opencart SDN lab completed
2. Holodeck VRA initial setup complete (On Prem or Cloud)

Deploying Opencart to pre-existing NSX Segments – Holodeck Config

Lab Overview

It is anticipated that this module will take ~XX minutes to complete.

In this lab we show how to use vRealize Automation Cloud Assembly to deploy an Opencart instance to pre-defined NSX networks configured on the Cloud Foundation management domain.

This module consists of the following exercises

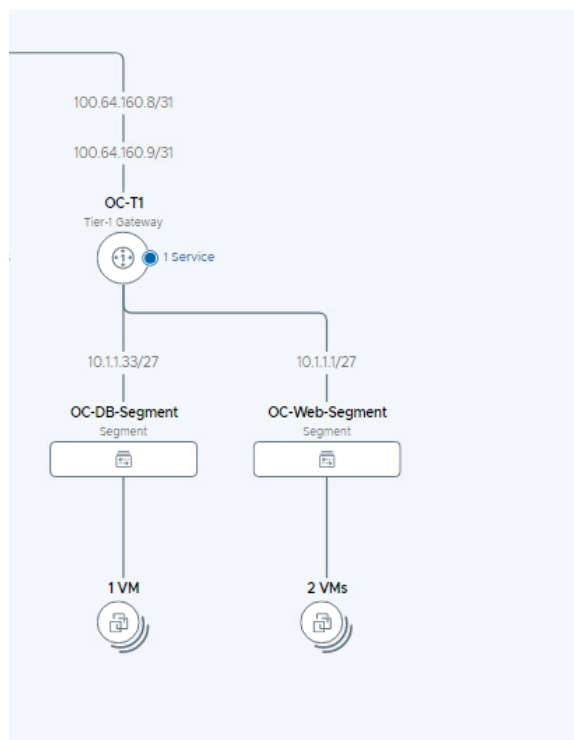
1. Create NSX Segments with DHCP services, and connect to OC-T1 Tier-1 router
2. Create Cloud Assembly Network Profile for OC-DB-Auto-Seg
3. Create Cloud Assembly Network Profile for OC-Web-Auto-Seg
4. Review vRealize Cloud Template
5. Deploy Opencart from Cloud Template
6. Review Provisioning Diagram
7. Review Deployed Application
8. Delete Deployed Application

Exercise 1: Create NSX Segments with DHCP Server

In this exercise we will create two new NSX segments to host Opencart web and database servers. Each segment will use a /24 subnet and reserve a part of the address space for VRA deployed services like load balancers and the remainder for DHCP boot of hosts.

[Step 1] Logging in to the environment

- A. Open a new tab in the Chrome browser
- B. Click the Management NSX-T shortcut in the bookmark bar (click advanced / proceed to nsx-mgmt.vcf.sddc.lab, if required to accept the certificate)
- C. Log into NSX Manager as user: **admin** with the password: **VMware123!VMware123!**
- D. From the NSX-T Manager interface click the **Networking** tab
- E. Select **Network Topology**



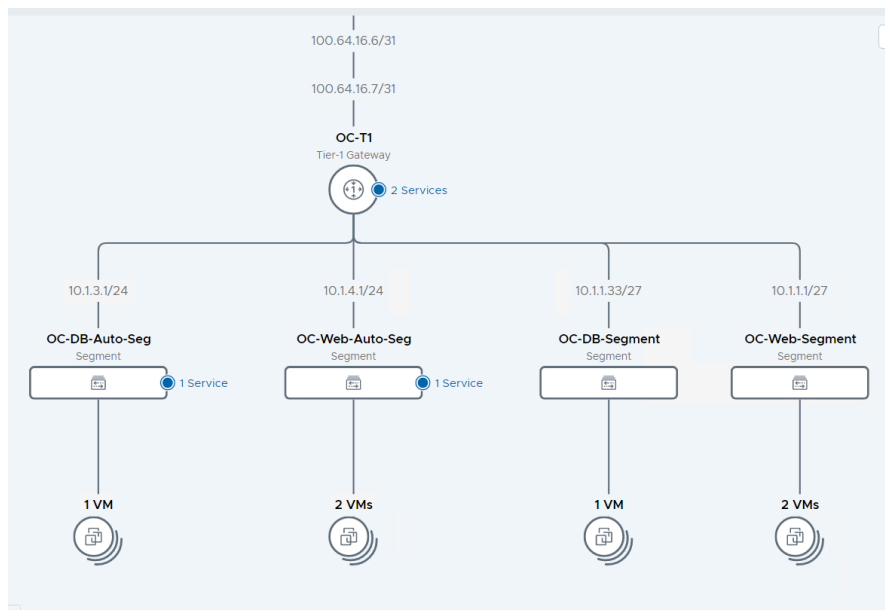
On the right side of the topology view you should see the OC-T1 router and OC-DB-Segment and OC-Web-Segment from the previous module. We are going to add additional segments to this Tier-1 router for use by vRealize Cloud Assembly. The next steps will create the following networks

OC-DB-Auto-Seg

- 10.1.3.0/24
- Gateway 10.1.3.1/24
- DHCP Server 10.1.3.254
- DHCP Range 10.1.3.100-10.1.3.253
- VRA Address space 10.1.3.2-10.1.3.99

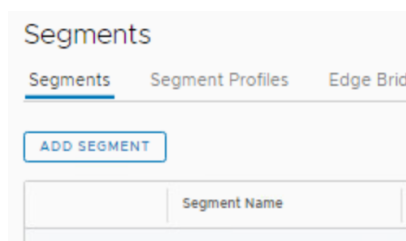
OC-Web-Auto-Seg

- 10.1.4.0/24
- Gateway 10.1.4.1/24
- DHCP Server 10.1.4.254
- DHCP Range 10.1.4.100-10.1.4.253
- VRA Address space 10.1.4.2-10.1.4.99

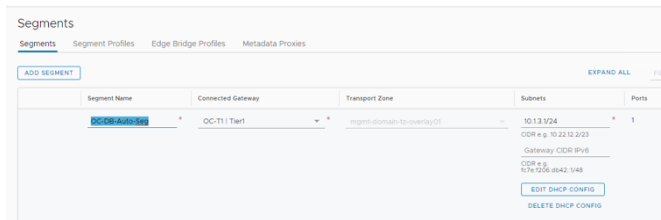


[Step 2a] Create the OC-DB-Auto-Seg

- From the NSX-T Manager interface click the **Networking** tab at the top of the screen
- Click **Segments** in the left pane.
- Click **ADD SEGMENT** button



- In the **Segment Name** field, enter **OC-DB-Auto-Seg**
- Set **Connected Gateway** to OC-T1
- In the **Transport Zone** dropdown, select **mgmt-domain-tz-overlay01**
- Add IPv4 gateway 10.1.3.1/24



- H. Click SET DHCP CONFIG
- I. Set DHCP Type to Local DHCP Server
- J. Under IPv4 Server set DHCP Config Enabled
- K. Set DHCP Server Address 10.1.3.254/24
- L. Set DHCP Ranges 10.1.3.100-10.1.3.253
- M. Set DNS to 10.0.0.221

Set DHCP Config

Segment: OC-DB-Auto-Seg

IPv4 Gateway: 10.1.3.1/24 #DHCP Ranges ⓘ IPv6 Gateway: Not Set #DHCP Ranges ⓘ

DHCP Type: Local DHCP Server ⓘ DHCP Profile: DHCP config domain-c8:5fa5e60a-6b...

IPv4 Server: IPv4 Server

Settings | Options

DHCP Config: ☒ Enabled ⓘ

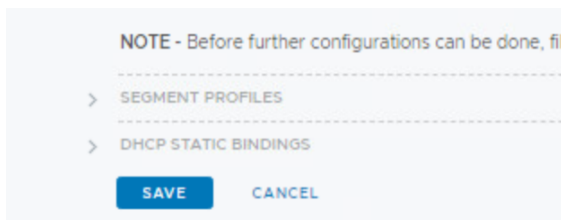
DHCP Server Address: 10.1.3.254/24
CIDR e.g. 10.22.12.2/23

DHCP Ranges: 99 Maximum | Format 172.16.14.10-172.16.14.100 or 172.16.14.0/24 | Please verify that IP addresses in this range are not in use prior to modifying the DHCP range to avoid duplicate IP address allocation
10.1.3.100-10.1.3.253 ⓘ
Enter DHCP Ranges

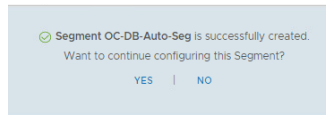
Lease Time (seconds): 86400

DNS Servers: 10.0.0.221 ⓘ
Enter IP Addresses
e.g. 10.10.10.10

- N. Leave all IPv6 settings Not Set
- O. Click Apply
- P. At bottom of the Segments screen, click Save

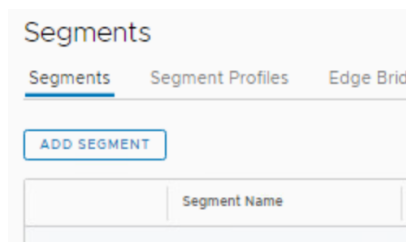


- Q. You will see your segment has been successfully created. Click **NO** on the Want to continue configuring this segment?

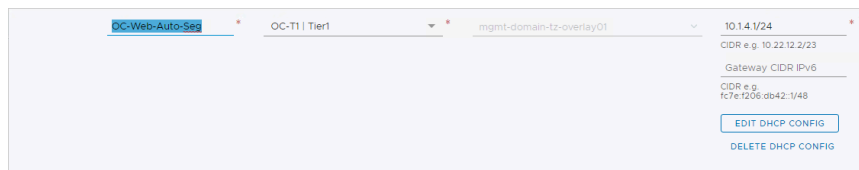


[Step 2a] Create the OC-Web-Auto-Seg

- A. From the NSX-T Manager interface click the **Networking** tab at the top of the screen
- B. Click **Segments** in the left pane.
- C. Click **ADD SEGMENT** button



- D. In the **Segment Name** field, enter **OC-Web-Auto-Seg**
- E. Set **Connected Gateway** to OC-T1
- F. In the **Transport Zone** dropdown, select **mgmt-domain-tz-overlay01**
- G. Add IPv4 gateway 10.1.4.1/24



- H. Click SET DHCP CONFIG
- I. Set DHCP Type to Local DHCP Server
- J. Under IPv4 Server set DHCP Config Enabled
- K. Set DHCP Server Address 10.1.4.254/24
- L. Set DHCP Ranges 10.1.4.100-10.1.4.253
- M. Set DNS to 10.0.0.221

Set DHCP Config

Segment: OC-Web-Auto-Seg

IPv4 Gateway: 10.14.1/24 #DHCP Ranges ⓘ IPv6 Gateway: Not Set #DHCP Ranges ⓘ

DHCP Type: Local DHCP Server ⓘ DHCP Profile: DHCP config domain-c8.5fa5e60a-6b ⓘ

IPv4 Server | IPv6 Server

Settings | Options

DHCP Config: ☒ Enabled ⓘ

DHCP Server Address: 10.14.254/24
CIDR e.g. 10.22.12.2/23

DHCP Ranges: 99 Maximum | Format 172.16.14.10-172.16.14.100 or 172.16.14.0/24 | Please verify that IP addresses in this range are not in use prior to modifying the DHCP range to avoid duplicate IP address allocation
10.14.100-10.14.253 ⓘ
Enter DHCP Ranges

Lease Time (seconds): 86400

DNS Servers: 10.0.0.221 ⓘ
Enter IP Addresses
e.g. 10.10.10.10

- N. Leave all IPv6 settings Not Set
- O. Click Apply
- P. At bottom of the Segments screen, click Save

NOTE - Before further configurations can be done, fill

> SEGMENT PROFILES

> DHCP STATIC BINDINGS

SAVE **CANCEL**

- Q. You will see your segment has been successfully created. Click **NO** on the Want to continue configuring this segment?

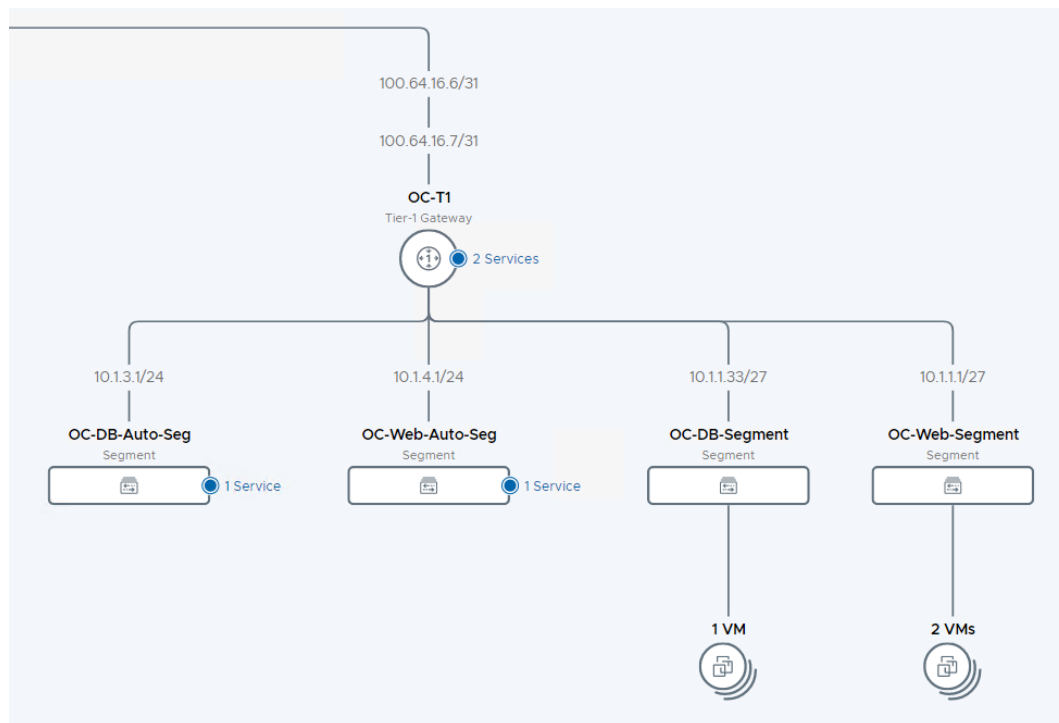
✔ Segment OC-Web-Auto-Seg is successfully created.

Want to continue configuring this Segment?

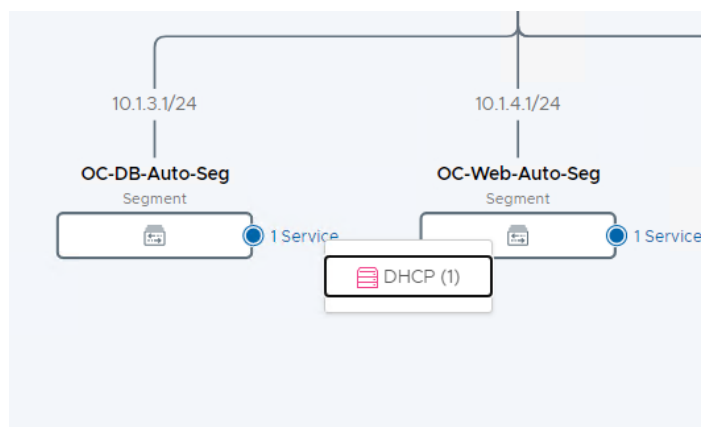
YES | **NO**

[Step 2c] Review the network topology

- A. From the NSX-T Manager interface click the **Networking** tab at the top of the screen
- B. Click **Network Topology** in the left pane.
- C. Scroll to the right
- D. Your topology should look like the following



E. Click on 1 Service on OC-DB-Auto-Seg. Notice the DHCP service



Exercise 2: Create OC-DB-Auto-Seg Cloud Assembly Network Profile

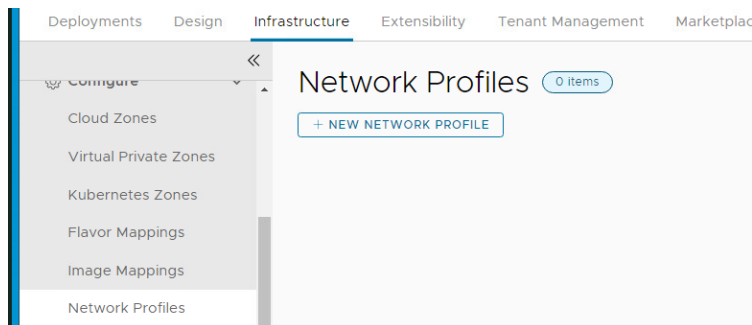
In this exercise we will configure a new Network Profile in Cloud Assembly for the OC-DB-Auto-Seg segment and associated DHCP Server that was created earlier

[Step 1] Connect to vRealize Cloud Assembly (if necessary)

- A. Click **+** in the Chrome browser to open a new window
- B. Click the **vRealize** bookmark folder and select **vra.vcf.sddc.lab**
- C. Click **GO TO LOGIN PAGE**
- D. Login: Username: **configadmin** Password: **VMware123!**
- E. Click **Cloud Assembly**

[Step 2] Create OC-DB-Auto-Seg Network Profile

- A. Click Infrastructure -> Network Profiles



- B. Click New Network Profile
- C. On the Summary tab, Click on Account/Region and select VLC-Holodeck-Mgmt / mgmt-datacenter-01
- D. Set the name to OC-DB-Auto-Seg
- E. Add the tag oc-fixed-network:oc-db
- F. Add the tag DeploymentType:Holodeck

OC-DB-Auto-Seg DELETE

Summary Networks Network Policies Load Balancers Security Groups

A network profile defines a group of networks and network settings used when machines are provisioned.

Account / region [VLC-Holodeck-Mgmt / mgmt-datacenter-01](#)

Name * OC-DB-Auto-Seg

Description

Capabilities

Capability tags listed here are matched to constraint tags in the cloud template.

Capability tags [DeploymentType:Holodeck](#) [oc-fixed-network-oc-db](#) [Enter capability tags](#)

SAVE CANCEL

[Step 2.1] Add Networks on Networks Tab

- Click on Networks tab, then Add Network
- Click in the filter area and type OC-
- Select the OC-DB-Auto-Seg

Add Network

VIEW NSX NETWORKS [Any](#) [OC](#) [Add filter...](#)

<input type="checkbox"/>	Name	Account / Region	Zone	Network Domain	CIDR	Support Public IP	Default for Zone	Origin	Tags
<input type="checkbox"/>	OC-Web-Auto-Seg	VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab		mgmt-domain-tz-overlay01	10.14.0/24	--	--	Discovered	
<input type="checkbox"/>	OC-Web-Segment	VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab		mgmt-domain-tz-overlay01	10.11.0/27	--	--	Discovered	
<input checked="" type="checkbox"/>	OC-DB-Auto-Seg	VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab		mgmt-domain-tz-overlay01	10.13.0/24	--	--	Discovered	
<input type="checkbox"/>	OC-DB-Segment	VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab		mgmt-domain-tz-overlay01	10.11.32/27	--	--	Discovered	

4 networks

CANCEL **ADD**

- Click Add. Your output should look like this

New Network Profile

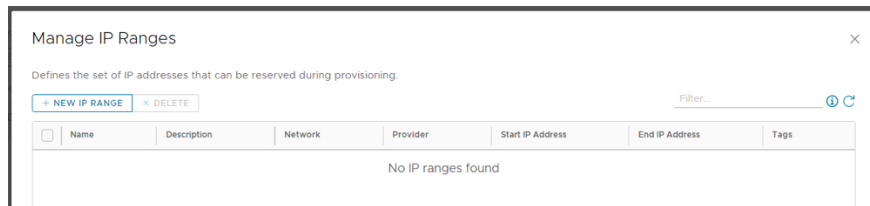
Summary Networks Network Policies Load Balancers Security Groups

Networks listed here are used when provisioning to existing, on-demand, or public networks.

[+ ADD NETWORK](#) [TAGS](#) [MANAGE IP RANGES](#) [REMOVE](#)

<input checked="" type="checkbox"/>	Name	Account / Region	Zone	Network Domain	CIDR	Support Public IP	Default for Zone	Origin	Tags
<input checked="" type="checkbox"/>	OC-DB-Auto-Seg	VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab		mgmt-domain-tz-overlay01	10.13.0/24	--	--	Discovered	

- Click Manage IP Ranges -> New IP Range



- F. Set Source Internal
- G. Name OC-DB-Auto-IP
- H. Network OC-DB-Auto-Seg should already be selected
- I. Start address 10.1.3.2
- J. End IP address 10.1.3.99

An IP range can contain a single network or multiple networks with CIDRs that intersect.

Source: ☒ Internal ☐ External

Name: OC-DB-Auto-IP

Description:

Network: OC-DB-Auto-Seg

Start IP address: 10.1.3.2

End IP address: 10.1.3.99

CANCEL ADD

- K. Click Add.
- L. Your output should look like this

Name	Description	Network	Provider	Start IP Address	End IP Address	Tags
OC-DB-Auto-IP		OC-DB-Auto-Seg	Cloud Assembly	10.1.3.2	10.1.3.99	

- M. Note: In a previous exercise we created a DHCP server for this NSX segment and assigned it the IP address range 10.1.3.100-10.1.3.253. The NSX range represents the IPs that can be assigned to VMs that get deployed on the OC-Web-Auto-Seg segment. Here we are assigning a different IP range (10.1.3.2-10.1.3.99) to Cloud Assembly. This range represents the IPs that Cloud Assembly will assign to NSX services that get created as part of the cloud template deployments. For example, IPs in this range will be assigned to any virtual servers created on an NSX load balancer
- N. Click Close

[Step 2.2] Add Network Policy on Network Policies Tab

- A. Click **Network Policies**
- B. Leave **Isolation Policy** setting default as 'None'.
- C. Set Tier-0 to VLC-Tier-0 and Edge Cluster to **EC-01**

OC-Web-Auto-Seg DELETE

Summary Networks **Network Policies** Load Balancers Security Groups

Use these settings when creating outbound, private and routed networks. ⓘ

Isolation policy None ⓘ

Network Resources
Provide on-demand network resources.

Tier-0 logical router Q VLC-Tier-0 ⓘ

Edge cluster Q EC-01 ⓘ

SAVE CANCEL

[Step 2.3] Load Balancers Tab

- A. Leave Load Balancers tab empty

[Step 2.4] Security Groups Tab

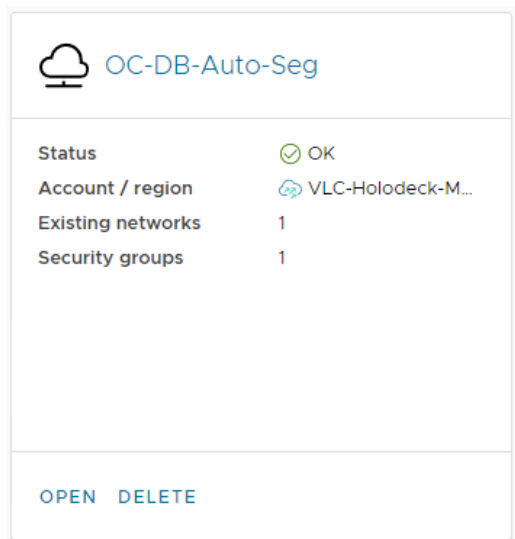
- A. Click on Security Groups tab, then Add Security Group
- B. Click on Filter, properties Any and type OC-DB

Add Security Group

Any OC-DB x Add filter ⓘ ⓘ ↺

<input checked="" type="checkbox"/>	Name	Description	Account / Region	Origin	Tags
<input checked="" type="checkbox"/>	OC-DB-Group		VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab	Discovered	

- C. Select OC-DB-Group and then click Add
- D. Note: This will add anything deployed on this network to the OC-DB-Group NSX security group, which will make VM's deployed subject to NSX security rules set for that group
- E. Click **Create**
- F. Your result should look like



Exercise 4: Create OC-Web-Auto-Seg Cloud Assembly Network Profile

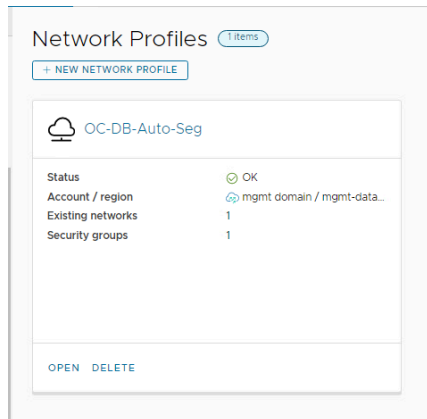
In this exercise we will configure a new Network Profile in Cloud Assembly for the OC-Web-Auto-Seg segment load balancer and associated DHCP Server that was created earlier

[Step 1] Connect to vRealize Cloud Assembly (if necessary)

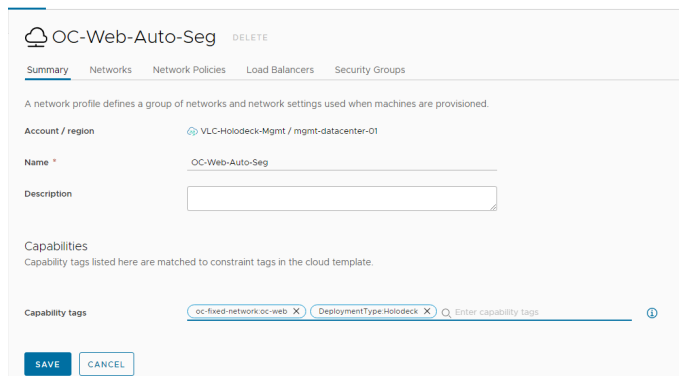
- Click **+** in the Chrome browser to open a new window
- Click the **vRealize** bookmark folder and select **vra.vcf.sddc.lab**
- Click **GO TO LOGIN PAGE**
- Login: Username: **configadmin** Password: **VMware123!**
- Click **Cloud Assembly**

[Step 2] Create OC-Web-Auto-Seg Network Profile

- Click Infrastructure -> Network Profiles

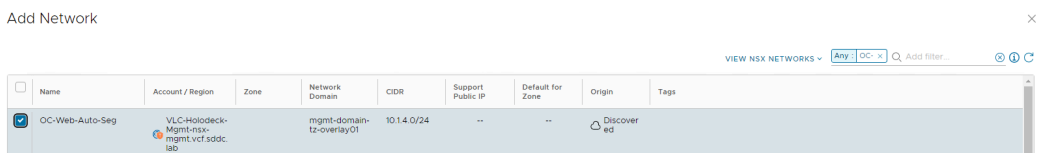


- B. Click New Network Profile
- C. On the Summary tab, Click on Account/Region and select VLC-Holodeck-Mgmt / mgmt-datacenter-01
- D. Set the name to OC-Web-Auto-Seg
- E. Add the tag oc-fixed-network:oc-web
- F. Add the tag DeploymentType:Holodeck

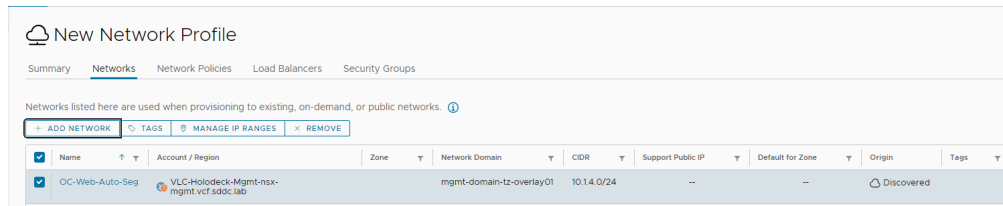


[Step 2.1] Add Networks on Networks Tab

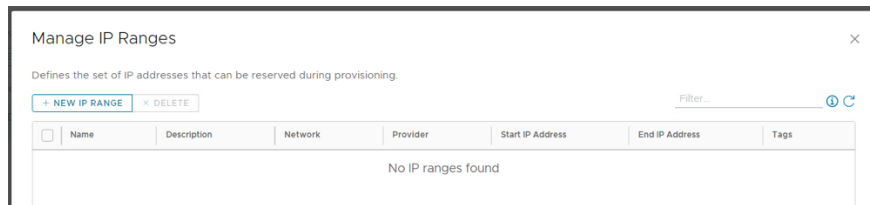
- A. Click on Networks tab, then Add Network
- B. Filter for OC-



- C. Click Add. Your output should look like this



D. Click Manage IP Ranges -> New IP Range



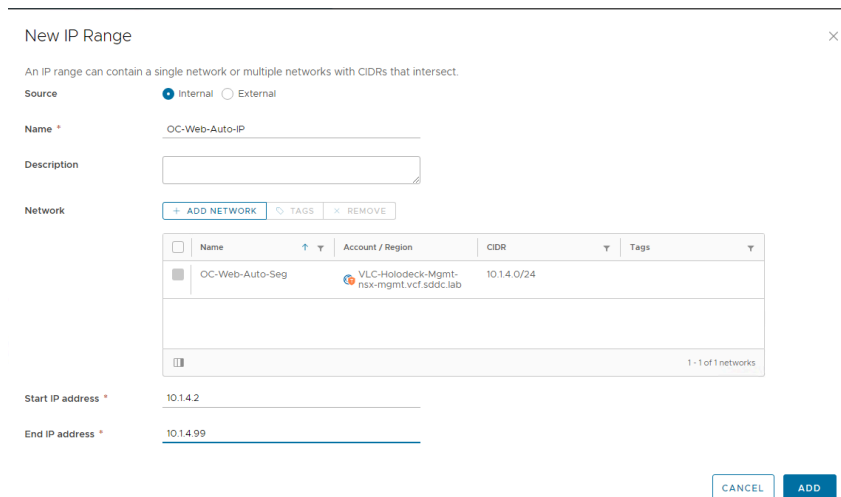
E. Set Source Internal

F. Name OC-Web-Auto-IP

G. Network OC-Web-Auto-Seg should already be selected

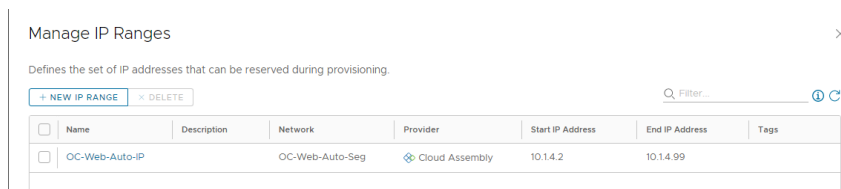
H. Start address 10.14.2

I. End IP address 10.14.99



J. Click Add.

K. Your output should look like this



- L. Click **Close**

[Step 2.2] Add Network Policy on Network Policies Tab

- A. Click **Network Policies**
- B. Set Tier-0 to VLC-Tier-0 and Edge Cluster to **EC-01**

The screenshot shows the 'New Network Profile' dialog box with the 'Network Policies' tab selected. The 'Isolation policy' is set to 'None'. Under 'Network Resources', the 'Tier-0 logical router' is set to 'Q_VLC-Tier-0' and the 'Edge cluster' is set to 'Q_EC-01'. There are 'CREATE' and 'CANCEL' buttons at the bottom.

[Step 2.3] Add Load Balancer on Load Balancers Tab

- A. Click Load Balancers
- B. Click Add Load Balancer

The screenshot shows the 'OC-Web-Auto-Seg' page with the 'Load Balancers' tab selected. It displays a table with columns: Name, Description, Account / Region, and Interr. The table is currently empty, and a message at the bottom right states 'No load balancers assigned'. There is an '+ ADD LOAD BALANCER' button and 'TAGS' and 'REMOVE' buttons above the table.

- C. Scroll down and select OC-LB

Add Load Balancer

Name	Description	Account / Region	Internet Facing	Origin	Tags
<input type="checkbox"/> clusterip-domain-c85f5d65a-6ba3-449c-a30f-a449a0ce29f-998	VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab	--	Discover ed	nspxcluster-domain-c85f5d65a-6ba3-449c-a30f-a449a0ce29f-998	external_id:4332642c-c9e-530e-895-af493af... nspcreated_for:DLB nspversion:1.2.0
<input type="checkbox"/> domain-c85f5d65a-6ba3-449c-a30f-a449a0ce29f-998	VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab	--	Discover ed	nspxcluster-domain-c85f5d65a-6ba3-449c-a30f-a449a0ce29f-998	nspxcluster-domain-c85f5d65a-6ba3-449c-a30f-a449a0ce29f-998 nspcreated_for:DLB nspversion:1.2.0
<input type="checkbox"/> domain-c85f5d65a-6ba3-449c-a30f-a449a0ce29f-998	VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab	--	Discover ed	nspxcluster-domain-c85f5d65a-6ba3-449c-a30f-a449a0ce29f-998	nspxcluster-domain-c85f5d65a-6ba3-449c-a30f-a449a0ce29f-998 nspcreated_for:DLB nspversion:1.2.0
<input checked="" type="checkbox"/> OC-LB	VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab	--	Discover ed	nspxcluster-domain-c85f5d65a-6ba3-449c-a30f-a449a0ce29f-998	nspxcluster-domain-c85f5d65a-6ba3-449c-a30f-a449a0ce29f-998 nspcreated_for:DLB nspversion:1.2.0

4 load balancers

CANCEL ADD

D. Click Add

[Step 2.4] Add Security Group on Security Groups Tab

- Click on Security Groups tab, then Add Security Group
- Click on Filter, properties Any and type OC-

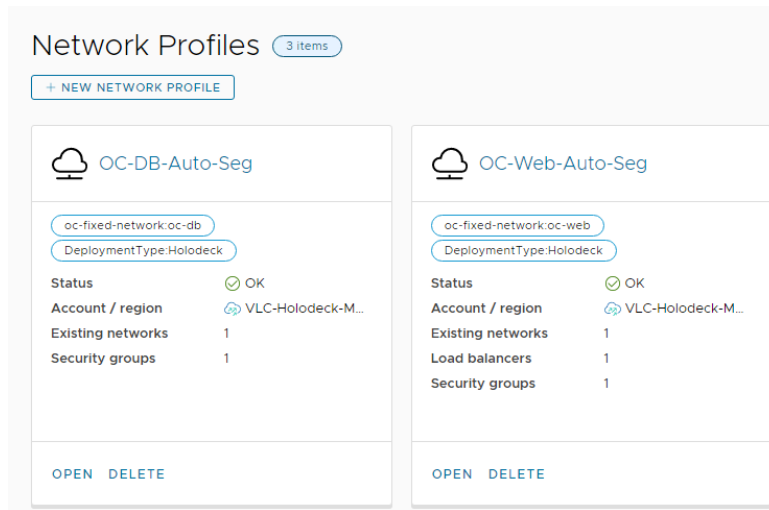
Add Security Group

Name	Description	Account / Region	Origin	Tags
<input type="checkbox"/> NLB-PoolLB [OC-LB-Pool] [OC-LB]	System PoolLB group used for security policies with VirtualServer as a source.	VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab	Discovered	NLB-Pool_ID:OC-LB-Pool NLB-LB-ID:OC-LB
<input type="checkbox"/> NLB-VIP [OC-VIP]	System VIP group used for security policies with VirtualServer as a destination.	VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab	Discovered	NLB-VIP_ID:OC-VIP
<input type="checkbox"/> OC-DB-Group		VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab	Discovered	
<input checked="" type="checkbox"/> OC-Web-Group		VLC-Holodeck-Mgmt-nsx-mgmt.vcf.sddc.lab	Discovered	

4 security groups

CANCEL ADD

- Select OC-Web-Group and then click Add
- Note: This will add anything deployed on this network to the OC-Web-Group NSX security group, which will make VM's deployed subject to NSX security rules set for that group
- Click **Create**



Exercise 5: Upload and Review “Holodeck-OC-Fixed Network” Cloud Template

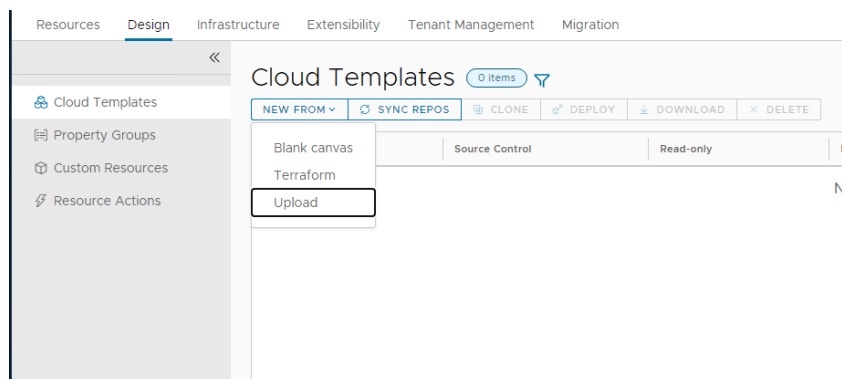
This exercise will upload the cloud template that will deploy an instance of the Opencart demo application to the networks you created in the previous exercises.

[Step 1] Connect to vRealize Cloud Assembly (if necessary)

- Click **+** in the Chrome browser to open a new window
- Click the **vRealize** bookmark folder and select **vra.vcf.sddc.lab**
- Click **GO TO LOGIN PAGE**
- Login: Username: **configadmin** Password: **VMware123!**
- Click **Cloud Assembly**

[Step 2] Upload Cloud Template

- Click **Design**
- Click New From -> Upload



- C. Name the template Holodeck-OC-Fixed-Network
- D. Select VLC-Holodeck for project

Upload Cloud Template

×

Name *

Holodeck-OC-Fixed-Network

Description

Project *

VLC-Holodeck

Cloud template sharing in Service Broker

☒ Share only with this project
 ☐ Allow an administrator to share with any project in this organization

Upload file

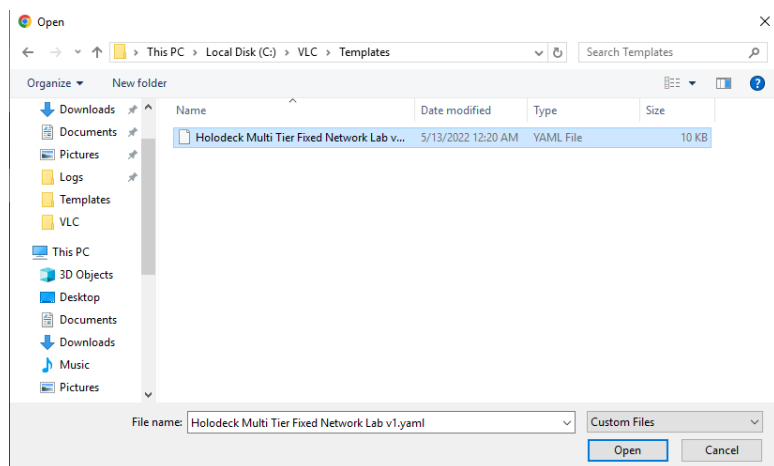
SELECT FILE

No file selected

CANCEL

UPLOAD

- E. Click Select File
- F. Select the C:\VLC\Templates directory
- G. Select Holodeck Multi Tier Fixed Network Lab v2.yaml file then click Open



H. Click upload

 A screenshot of the 'Upload Cloud Template' dialog box. It has a close button (X) in the top right. The 'Name' field is labeled 'Name *' and contains 'Holodeck-OC-Fixed-Network'. The 'Description' field is empty. The 'Project' field is labeled 'Project *' and contains 'VLC-Holodeck'. Under 'Cloud template sharing in Service Broker', there are two radio buttons: 'Share only with this project' (selected) and 'Allow an administrator to share with any project in this organization'. The 'Upload file' section has a 'SELECT FILE' button and the text 'Holodeck Multi Tier Fixed Network Lab v1.yaml'. At the bottom are 'CANCEL' and 'UPLOAD' buttons.

[Step 3] Review Cloud Template

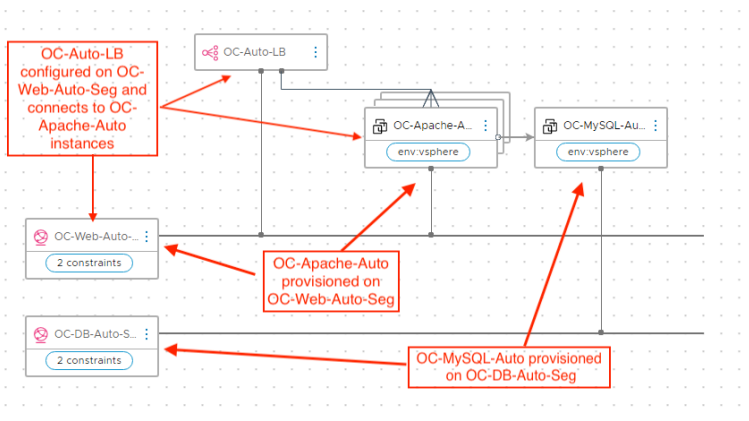
Prior to deployment, we will take a quick look at what the template will deploy. As this is now an active template, please be careful to not make any changes.

- A. Click on the link for the Holodeck-OC-Fixed-Network template uploaded in the previous step

Cloud Templates 1 items						
<div> NEW FROM SYNC REPOS CLONE DEPLOY DOWNLOAD DELETE </div> <div>Filter...</div>						
<input type="checkbox"/>	Name	Source Control	Read-only	Project	Last Updated	Updated By
<input type="checkbox"/>	Holodeck-OC-Fixed-Network			VLC-Holodeck	May 16, 2022, 12:31:33 PM	configadmin
						Released Versions
						0 out of 0

B. Click on the Holodeck-OC-Fixed-Network template. Note we have five resources.

- 2 Network resources which connect deployed virtual machines to the correct networks
- A Cloud NSX Load Balancer which configures the virtual server for this instance of Opencart on the existing OC-LB load balancer specified as part of the
- 1 or more Apache web servers (number of servers set when the user deploys the template)
- An instance of MySQL for this Opencart application



C. Click on the **OC-Web-Auto-Seg** resource

- This highlights the relevant part of the yaml file for this cloud template
- Note the OC-Web-Auto-Seg resource is looking for an existing network with a capability tags of oc-fixed-network:oc-web and DeploymentType:Holodeck. These are known as “constraints”. Cloud Assembly needs to find a Network Profile with Capabilities that meet these Constraints when deploying this template

```

243 OC-Web-Auto-Seg:
244   type: Cloud.NSX.Network
245   properties:
246     networkType: existing
247     constraints:
248       - tag: 'oc-fixed-network:oc-web'
249       - tag: 'DeploymentType:Holodeck'

```

D. Click on the **OC-DB-Auto-Seg** resource

- The DB_NSX-Network has constraints of oc-fixed-network:oc-db and DeploymentType:Holodeck.


```

250 | OC-DB-Auto-Seg:
251 |   type: Cloud.NSX.Network
252 |   properties:
253 |     networkType: existing
254 |     constraints:
255 |       - tag: 'oc-fixed-network:oc-db'
256 |       - tag: 'DeploymentType:Holodeck'
257 |

```

E. Click on the OC-Auto-LB load balancer resource.

- The Load balancer resource will create virtual server resources on the OC-Web-Auto-Seg segment, with members of the server pool (instances) based on the number of OC-Apache-Auto web servers this template deploys. The load balancer is configured to listen on Port 80 Protocol and Port), and talk to the backend Apache server on Port 80 (InstanceProtocol and InstancePort)

```

143 | OC-Auto-LB:
144 |   type: Cloud.NSX.LoadBalancer
145 |   properties:
146 |     routes:
147 |       - protocol: HTTP
148 |         port: 80
149 |         instanceProtocol: HTTP
150 |         instancePort: 80
151 |     network: '${resource["OC-Web-Auto-Seg"].id}'
152 |     instances: '${resource["OC-Apache-Auto"][*].id}'
153 |     # instances: '${resource.OC-Apache-Auto[*].id}'

```

F. Click on the OC-Apache-Auto resource

- This resource creates an Apache server from a basic Ubuntu template using extensive “Cloud Init” functionality built into Cloud Assembly. Notice this resource uses both Flavor and Image mapping.
- The remainder of the Apache resource definition will add needed Linux packages, configure users, and then configure the Apache Webserver for our Opencart application
- Feel free to review the entire OC-Apache-Auto Cloud.Machine resource definition.

```

25 | OC-Apache-Auto:
26 |   type: Cloud.Machine
27 |   dependsOn:
28 |     - OC-MySQL-Auto
29 |   properties:
30 |     flavor: '${input.size}'
31 |     image: Ubuntu
32 |     name: '${self.resourceName}'

```

G. Click on the OC-MySQL-Auto resource

- This resource creates the MySQL database server from a basic Ubuntu template using extensive “Cloud Init” functionality built into Cloud Assembly. Notice this resource uses both Flavor and Image mapping.
- For additional info on Cloud Init see <https://cloudinit.readthedocs.io/en/latest/>
- For more information on vRealize Cloud Assembly see <https://docs.vmware.com/en/vRealize-Automation/index.html>

```

154 | OC-MySQL-Auto:
155 |   type: Cloud.Machine
156 |   properties:
157 |     flavor: '${input.size}'
158 |     image: Ubuntu
159 |     tags:
160 |       - key: OC Deployment
161 |         value: '${env.deploymentId}'
162 |       - key: Application-Tier
163 |         value: MySQL
164 |       - key: Application-Name
165 |         value: '${env.deploymentName}'
166 |     name: '${self.resourceName}'
167 |     networks:
168 |       - network: '${resource["OC-DB-Auto-Seg"].id}'

```

Exercise 6: Deploy Holodeck-OC-Fixed-Network Cloud Template

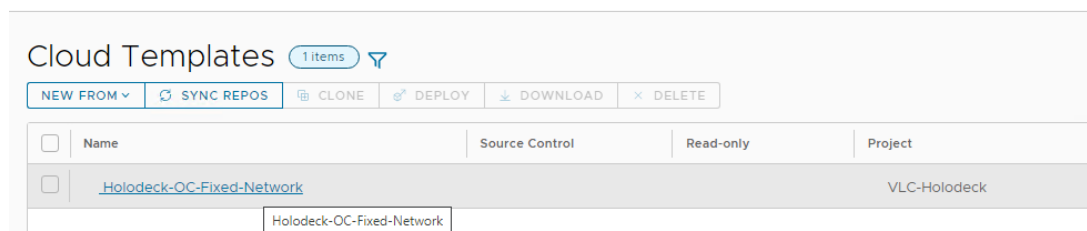
This exercise will deploy an instance of the Opencart demo application to the networks you created in the previous exercises.

[Step 1] Connect to vRealize Cloud Assembly (if necessary)

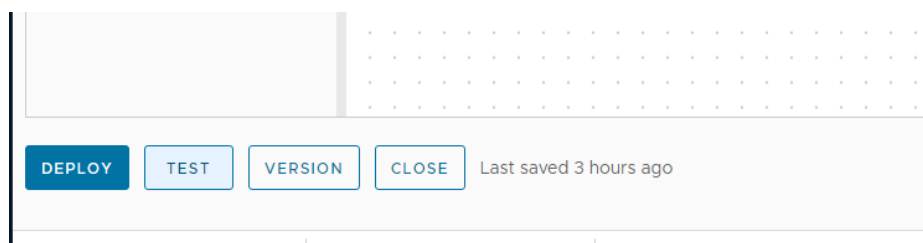
- Click **+** in the Chrome browser to open a new window
- Click the **vRealize Suite** bookmark folder and select **VMware Cloud Services**
- Click **GO TO LOGIN PAGE**
- Login: Username: **configadmin** Password: **VMware123!**
- Click **Cloud Assembly**

[Step 2] Test Cloud Template

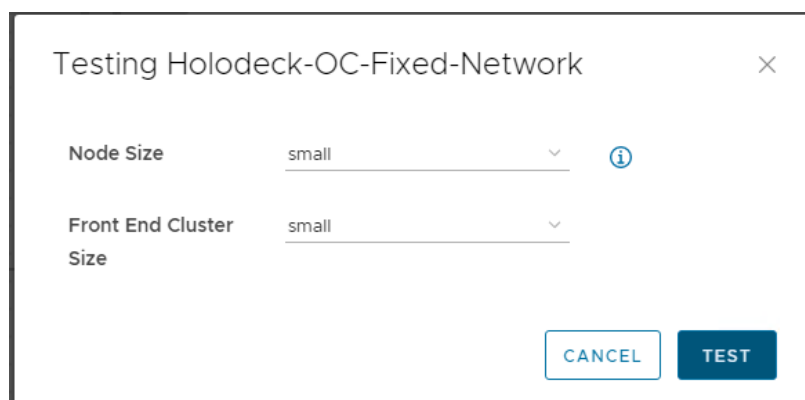
- If necessary, click **Design**
- Click on the **Holodeck-OC-Fixed-Network** link



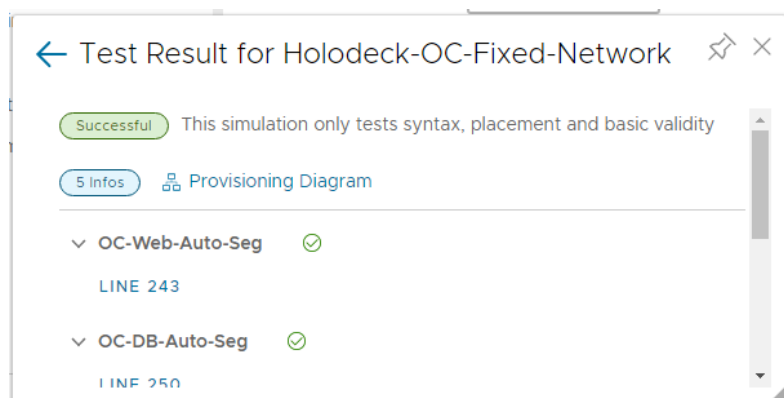
- Click **Test**



D. Click test



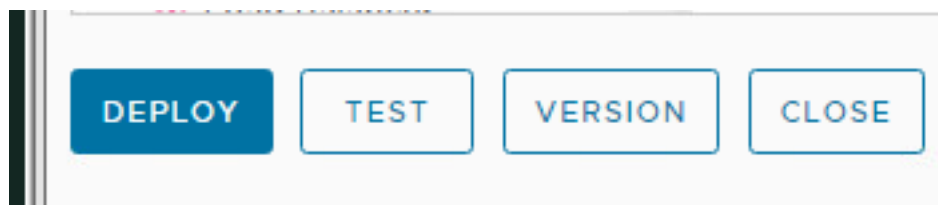
E. Your result should be



F. Click the X to close the test window

[Step 3] Deploy Cloud Template

A. Click Deploy



- B. Leave as **Create a new deployment**
- C. Name the deployment Opencart Fixed Network
- D. Leave Cloud Template Version as Current Draft
- E. Click Next

Deploy Holodeck-OC-Fix...

1 Deployment Type
2 Deployment Inputs

Deployment Type

Create a new deployment

Deployment Name *
Opencart Fixed Network

Cloud Template Version *
Q Current Draft

Description

- F. Leave Node Size as small
- G. Set Front End Cluster Size to medium
- H. Click Deploy

Deploy Holodeck-OC-Fix...

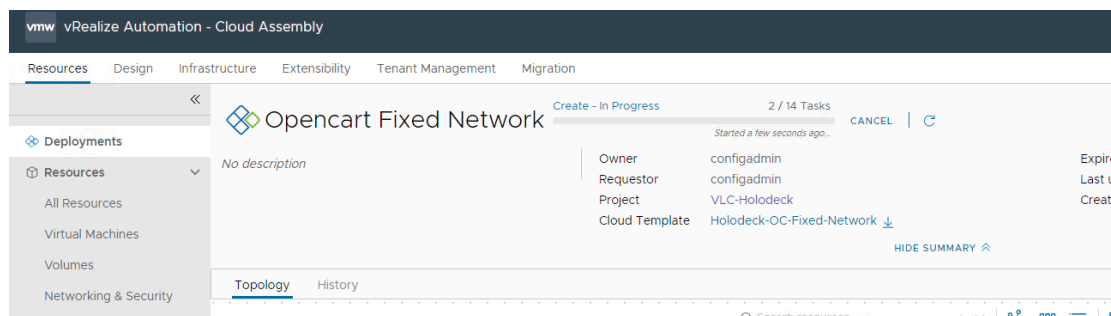
1 Deployment Type
2 Deployment Inputs

Deployment Inputs

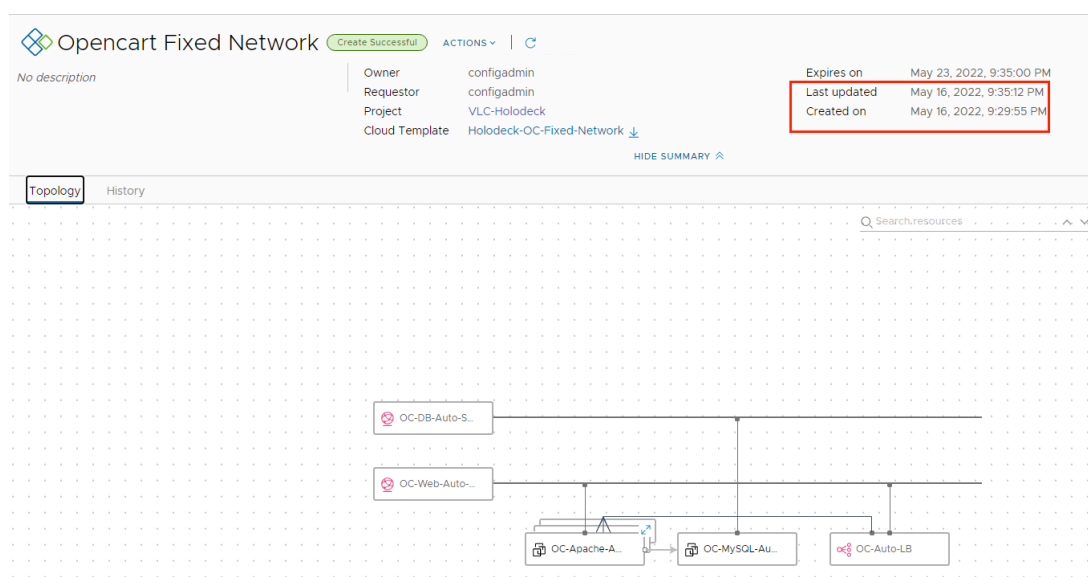
Node Size
small

Front End Cluster Size
medium

- I. Observe the deployment process beginning



J. In about 10-15 minutes you should see a **Create Successful** status



K. Notice that this deployment took approximately 7 minutes

L. Click History

M. Scroll back and review the sequence of resource creation

Toplogy **History**

May 16, 2022, 9:35:12 PM **CREATE** configadmin

Create **Successful** Requested by: configadmin Provisioning diagram

Events Request details

Timestamp	Status	Resource type	Resource name	Details
May 16, 2022, 9:30:29 PM	ALLOCATE_FINISHED	Cloud Machine	OC-Apache-Auto	
May 16, 2022, 9:30:22 PM	ALLOCATE_IN_PROGRESS	Cloud Machine	OC-Apache-Auto	
May 16, 2022, 9:30:22 PM	ALLOCATE_FINISHED	Cloud Machine	OC-MySQL-Auto	
May 16, 2022, 9:30:15 PM	ALLOCATE_IN_PROGRESS	Cloud Machine	OC-MySQL-Auto	
May 16, 2022, 9:30:15 PM	ALLOCATE_FINISHED	Cloud NSX Network	OC-DB-Auto-Seg	
May 16, 2022, 9:30:00 P..	ALLOCATE_IN_PROGRESS	Cloud NSX Network	OC-DB-Auto-Seg	
May 16, 2022, 9:30:00 P..	ALLOCATE_FINISHED	Cloud NSX Network	OC-Web-Auto-Seg	
May 16, 2022, 9:29:58 PM	ALLOCATE_IN_PROGRESS	Cloud NSX Network	OC-Web-Auto-Seg	
May 16, 2022, 9:29:58 PM	INITIALIZATION_FINISHED			
May 16, 2022, 9:29:56 PM	INITIALIZATION_IN_PROGRESS			
May 16, 2022, 9:29:55 PM	REQUEST_IN_PROGRESS			CREATES OC-Auto-LB of type Cloud NSX LoadBalancer and OC-Web-Auto-Seg, OC-DB-Auto-Seg of type Cloud NSX Network and OC-MySQL-Auto, OC-Apache-Auto(0), OC-Apache-Auto(1) of type Cloud Machine

32 Events

Exercise 7: Review Provisioning Diagram

This exercise will review the Cloud Assembly Provisioning Diagram following a deployment. This is one of the best troubleshooting tools available for diagnosing failing deployments. This exercise will only show the initial network allocation to familiarize you with navigating the provisioning diagram

[Step 1] Access Provisioning diagram

- A. If your deployment history is still on screen, simply click on the Provisioning diagram link

Opencart Fixed Network **Create Successful** ACTIONS |

No description

Owner	configadmin	Expires on	May 23, 2022, 9:35:00 PM
Requestor	configadmin	Last updated	May 16, 2022, 9:35:12 PM
Project	VLC-Holodeck	Created on	May 16, 2022, 9:29:55 PM
Cloud Template	Holodeck-OC-Fixed-Network ↓		

HIDE SUMMARY

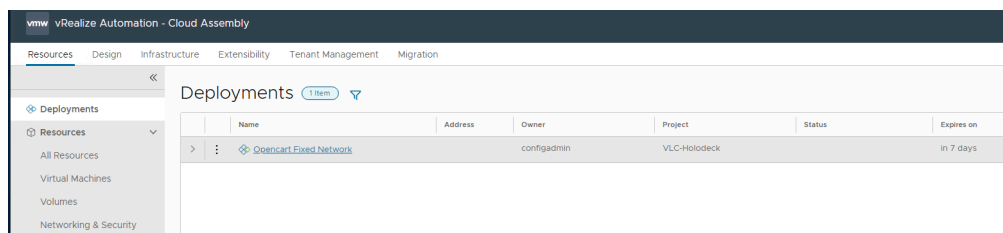
Toplogy **History**

May 16, 2022, 9:35:12 PM **CREATE** configadmin

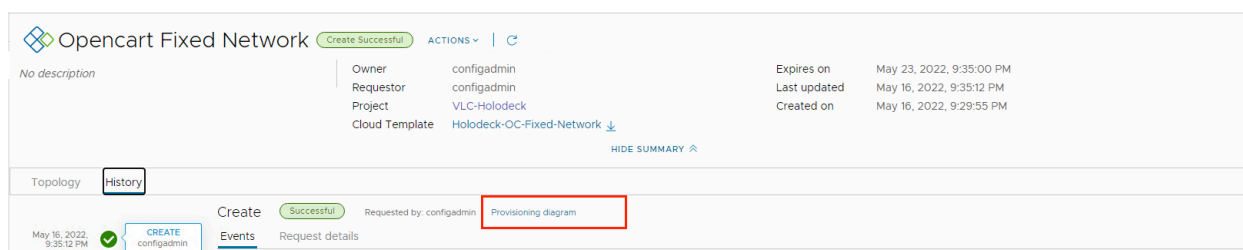
Create **Successful** Requested by: configadmin **Provisioning diagram**

Events Request details

- B. Alternately access the diagram from Resources->Deployments, and selecting your deployment



C. Then click History and Provisioning Diagram



[Step 2] Review Network Allocation for OC-Web-Auto-Seg

- The initial screen presented will default to the first network provisioned, which in this lab is OC-Web-Auto-Seg
- The top most box describes the item to be created. In this case we are allocating network space from an existing segment
- The second box shows the project that this template is a part of. Access to resources can be controlled with projects
- The bottom row shows the process Cloud Assembly walks through to choose where to allocate this network. In effect, Cloud Assembly chooses the first Network Profile it finds that meets the constraints of the object being provisioned.
 - Network Profile OC-Web-Auto-Seg meets the constraints of this resource
 - The remaining two Network Profiles do not meet the constraints and are ineligible

Request Details EXPORT

Request: OC-Web-Auto-Seg

Request type: Allocation
Network type: EXISTING
Constraints: oc-fixed-network-oc-web-hard, DeploymentType.Holodeck-hard

Project: VLC-Holodeck

Network constraints: None
Storage constraints: None
Extensibility constraints: None
Placement policy: Default

Region: VLC-Holodeck-Mgmt-vcenter-mgmt.vcf.sdc.lab/mgmt-datacenter-01

Profile: OC-Web-Auto-Seg (Selected for allocation)

Network policies: None
Profile aggregated tags: DeploymentType.Holodeck, oc-fixed-network-oc-web
Network: ✓ OC-Web-Auto-Seg

Profile: VLC-Holodeck-Mgmt / mgmt-datacenter-01-2

No networks selected that satisfy network type EXISTING
Hard constraints cannot be matched.

Network policies: None
Profile aggregated tags: account.VLC-Holodeck-Mgmt / mgmt-datacenter-01-2
Unmatched constraints: DeploymentType.Holodeck-hard, oc-fixed-network-oc-web-hard

Profile: OC-DB-Auto-Seg

Hard constraints cannot be matched.
NSX-T network must be used to assign machine NIC to a security group on an NSX-T endpoint. Select an NSX-T created network in the network profile. If you wish to use a VLAN based network, please create an NSX-T network with a VLAN based transport zone.

Network policies: None
Profile aggregated tags: DeploymentType.Holodeck, oc-fixed-network-oc-db
Unmatched constraints: oc-fixed-network-oc-web-hard

[Step 3] Review Network Allocation for OC-DB-Auto-Seg

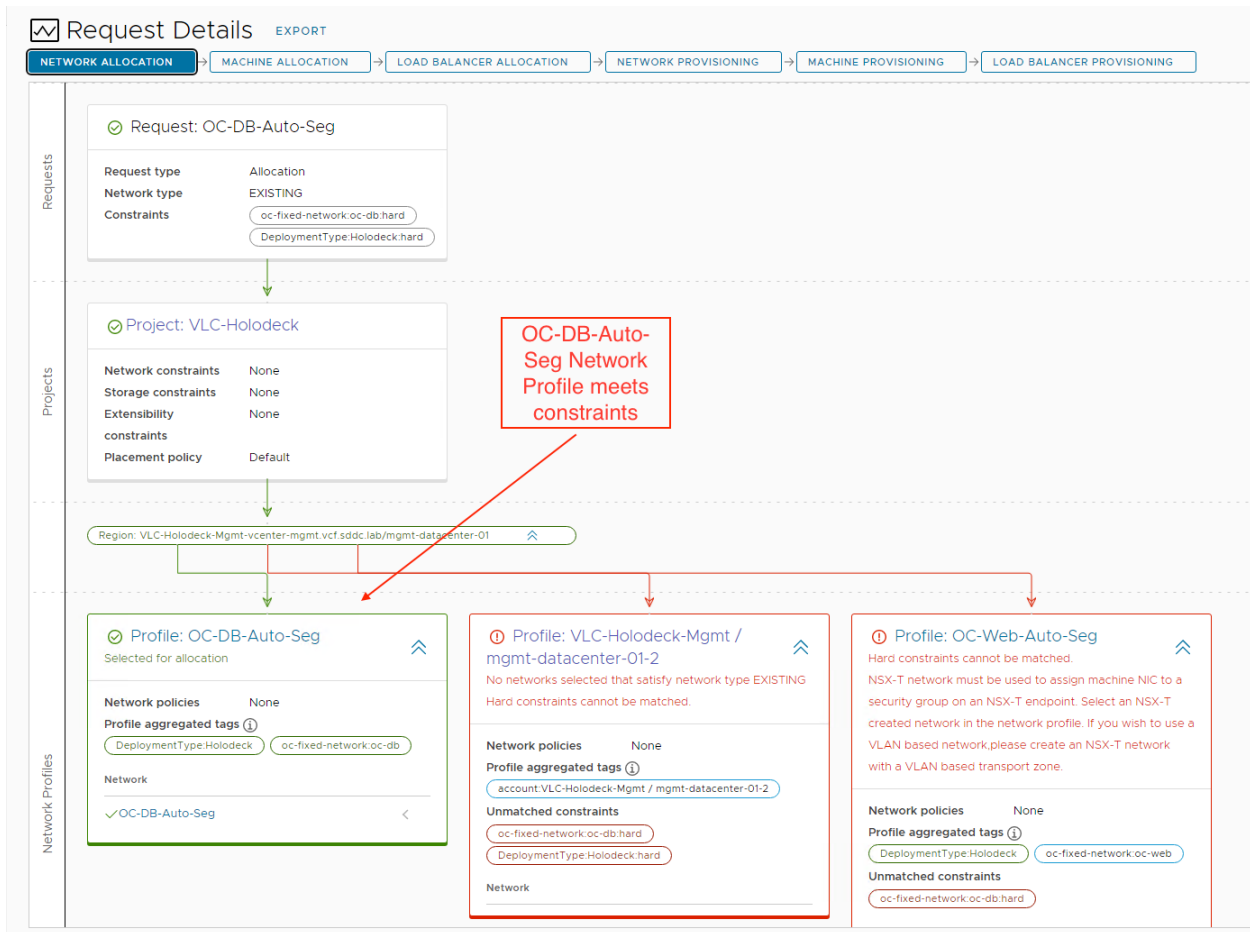
- A. Click on the blue Network Allocation box and select the OC-DB-Auto-Seg

Request Details EXPORT

Request: OC-Web-Auto-Seg

Request type: Allocation
Network type: EXISTING
Constraints: oc-fixed-network-oc-web-hard, DeploymentType.Holodeck-hard

- B. Notice how the Network Profile that meets the constraints for OC-DB-Auto-Seg changes



Exercise 8: Review deployed Opencart application

This exercise will review the components deployed by the Cloud Template.

[Step 1] Test web servers

- Select Resources-> Deployments
- Click the > next to Opencart Fixed Network
- Note the following
 - Two deployed OC-Apache-Auto-XXX web servers on the 10.1.4.x network, with IP addresses in the range controlled by NSX for DHCP on the OC-Web-Auto-Seg. (Note: The numeric suffix after the resources name is set by Cloud Assembly to keep resource names unique. This naming mechanism was chosen during initial Cloud Assembly setup in this environment).
 - An OC-MySQL-Auto-XXX resource in the 10.1.3.x network
 - An NSX Load Balancer on the 10.1.4.x network, with IP address in the range controlled by Cloud Assembly on the OC-Web-Auto-Seg

Deployments 1 item

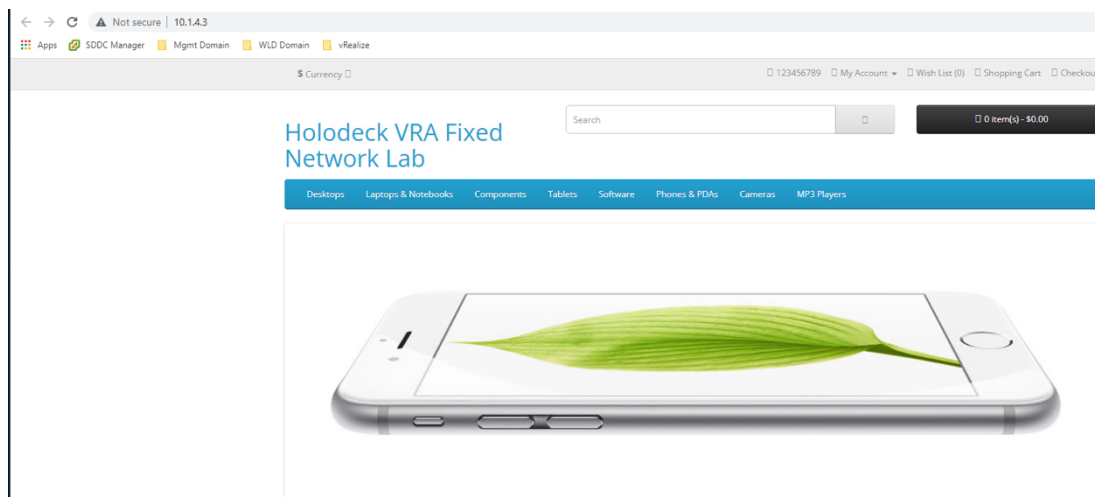
	Name	Address	Owner	Project	Status
▼	Opencart Fixed Network		configadmin	VLC-Holodeck	
⋮	OC-Apache-Auto-056	10.1.4.125	Web Servers		► On
⋮	OC-Apache-Auto-057	10.1.4.201			► On
⋮	OC-MySQL-Auto-055	10.1.3.238	MySQL server		► On
⋮	OC-Auto-LB-058	10.1.4.3	NSX Load Balancer		
⋮	OC-DB-Auto-Seg				
⋮	OC-Web-Auto-Seg				

- D. Double click on the OC-Auto-LB-XXX IP and go to that IP address (or open a new browser window to that IP address)

Deployments 1 item

	Name	Address	Owner	Project	Status
▼	Opencart Fixed Network		configadmin	VLC-Holodeck	
⋮	OC-Apache-Auto-056	10.1.4.125			► On
⋮	OC-Apache-Auto-057	10.1.4.201			► On
⋮	OC-MySQL-Auto-055	10.1.3.238			► On
⋮	OC-Auto-LB-058	10.1.4.3			
⋮	OC-DB-Auto-Seg				
⋮	OC-Web-Auto-Seg				

- E. You should open a page that looks like this

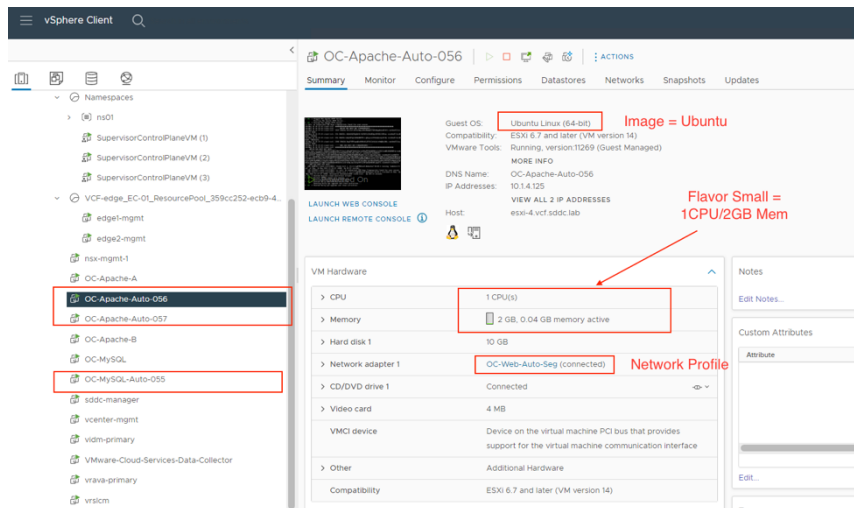


[Step 2] Review in vCenter Server

- Click **+** in the Chrome browser to open a new window if necessary
- Click the **Mgmt Domain** Folder then **vCenter** bookmark in the bookmark bar
- Login: Username: **administrator@vsphere.local** Password: **VMware123!**

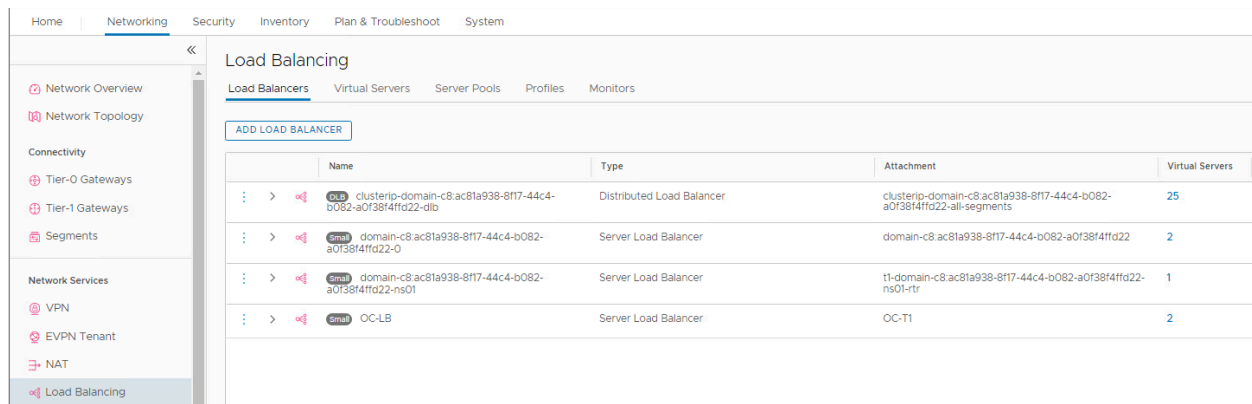
D. From hosts and clusters view, Select one of the OC-Apache-Auto webserver identified in the Cloud Assembly Deployment Summary. In this example the machines are OC-Apache-Auto-056 and OC-Apache-Auto-057

- Notice:
- CPU and Memory sizes match “Flavor = Small” from Cloud Assembly Flavor Mapping
- The VM is connected to OC-Web-Auto-Seg based on the OC-Web-Auto-Seg Network Profile selected for this VM. This was selected by the constraint oc-fixed-network:oc-web being matched in the network profile



[Step 3] Review in NSX Manager

- Open a new tab in the Chrome browser (If needed)
- Click the Mgmt Domain folder and Mgmt NSX shortcut in the bookmark bar (click advanced / proceed to nsx-mgmt.vcf.sddc.lab, if required to accept the certificate)
- Log into NSX Manager as user: **admin** with the password: **VMware123!VMware123!**
- From the NSX-T Manager interface click the **Networking** tab
- Select **Load Balancing**











- F. Click on the Virtual Servers link for OC-LB. Notice where Cloud Assembly has created a second Virtual Server for this instance of Opencart

View Virtual Servers ×

Load Balancer OC-LB

[EXPAND ALL](#) [Filter by Name, Path and more](#) ☰

	Name	IP Address	Ports	Type	Server Pool	Status	Alarms
 > 	OC-Auto-LB-058-server-1	10.14.3	80	L7 HTTP	OC-Auto-LB-058-pool-1	● Success 	0 
 > 	OC-VIP	10.11.2	80	L7 HTTP	OC-LB-Pool	● Success 	0 

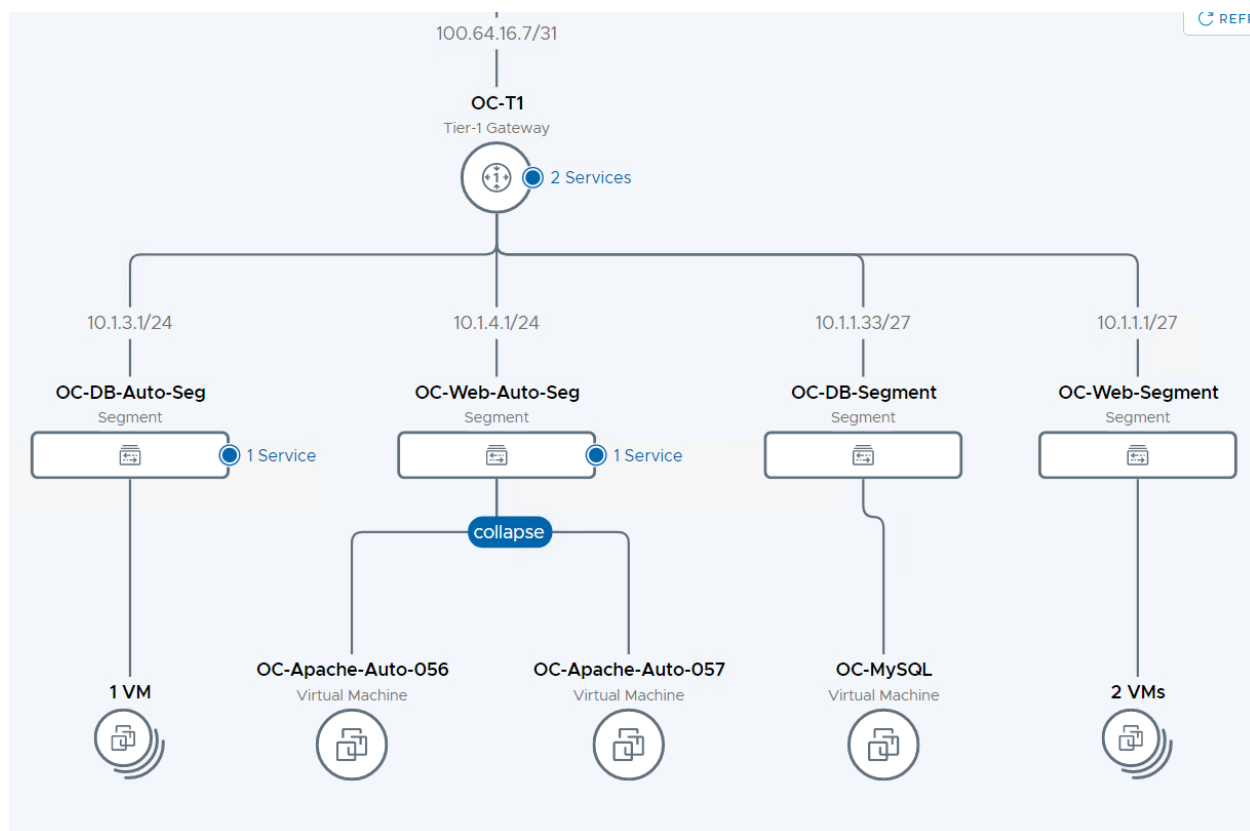
- G. Click on the Server Pool link for this Virtual Server. Notice the two Apache servers deployed by Cloud Assembly

Server Pool Members ×

Server Pool - OC-Auto-LB-058-pool-1

Name	IP	Port	Weight	State	Backup Member	Max Concurrent Connections
OC-Apache-Auto-057	10.14.201	80	1	Enabled	● Disabled	
OC-Apache-Auto-056	10.14.125	80	1	Enabled	● Disabled	

- H. Click **Close -> Close**
- I. Click Networking -> Network Topology
- J. Scroll the view to the right to expand OC-T1
- K. Expand virtual machines under the OC-DB-Auto-Seg and OC-Web-Auto-Seg. Notice the Virtual Machines placed on these segments by Cloud Assembly



Exercise 8: Delete deployed Opencart application

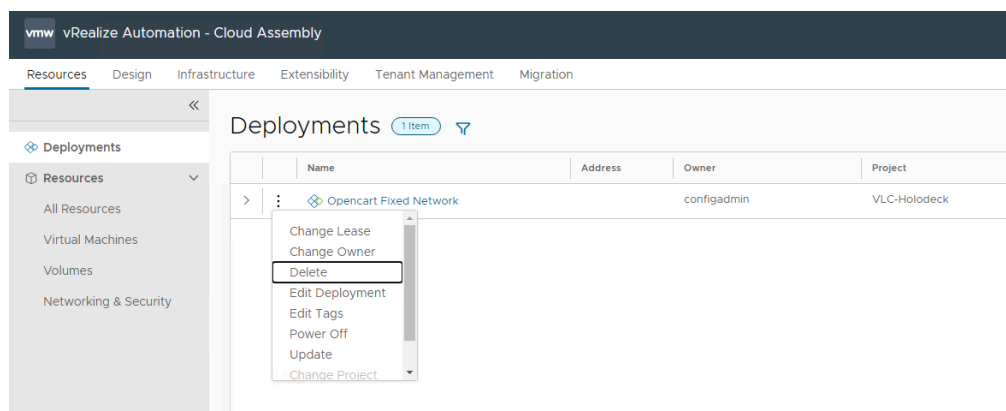
This exercise will delete the components deployed by Cloud Assembly.

[Step 1] Connect to vRealize Cloud Assembly (if necessary)

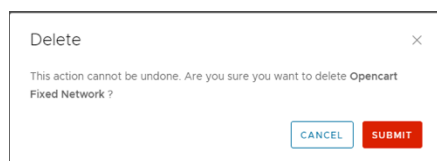
- Click **+** in the Chrome browser to open a new window
- Click the **vRealize** bookmark folder and select **vra.vcf.sddc.lab**
- Click **GO TO LOGIN PAGE**
- Login: Username: **configadmin** Password: **VMware123!**
- Click **Cloud Assembly**

[Step 2] Delete Deployment

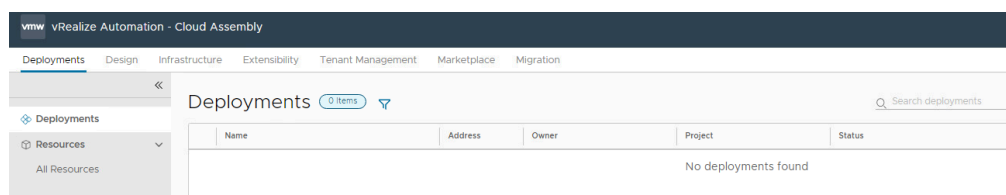
- A. Click **Close** on the deployment history if needed
- B. Click the **three dots** next to Opencart Fixed Network
- C. Click Delete



- D. Click Submit



- E. The delete process usually takes 2-3 minutes to complete



- F. Optional: If you have a vCenter Server window open during the delete process, you will see virtual machines power off and being deleted

Task Name	Target	Status	Details	Initiator	Queued For	Start Time	Completion Time	Server
Delete virtual machine	OC-Apache-Auto-0...	Completed		VSPHERE.LOCAL\Administrator	2 ms	05/16/2022, 11:55:21 P.	05/16/2022, 11:55:22	vccenter-mgmt vct sddc lab
Delete virtual machine	OC-Apache-Auto-0...	Completed		VSPHERE.LOCAL\Administrator	2 ms	05/16/2022, 11:55:20	05/16/2022, 11:55:21 P.	vccenter-mgmt vct sddc lab
Power Off virtual machine	OC-Apache-Auto-0...	Completed		VSPHERE.LOCAL\Administrator	11 ms	05/16/2022, 11:55:19 P.	05/16/2022, 11:55:21 P.	vccenter-mgmt vct sddc lab
Power Off virtual machine	OC-Apache-Auto-0...	Completed		VSPHERE.LOCAL\Administrator	8 ms	05/16/2022, 11:55:19 P.	05/16/2022, 11:55:20	vccenter-mgmt vct sddc lab

Module summary



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All other marks and names mentioned herein may be trademarks of their respective companies. Item No: vmw-wp-temp-uslet-word-101-proof 6/20