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Lab Overview - HOL-1801-06-CMP - Introduction to vRealize Operations Assessment and Hybrid Cloud Assessment
Lab Guidance

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

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

[Lab Abstract: Here you place your topic and introduce your VMW product. Describe the general lab scenario]

Lab Module List:

- **Module 1 - Introduction to VMware Assessments** (30 minutes) (Basic) In this module, we will discuss two of VMware's Assessment Programs, the vSphere Optimization Assessment (VOA) and the Hybrid Cloud Assessment (HCA). We will look at how we can use these as tools to provide value to our customers with VMware Cloud Management Solutions
- **Module 2 - Installing the vRealize Operations Manager** (30 minutes) (Basic) In this module, we will be guided through the installation and configuration of vRealize Operations Manager
- **Module 3 - Installing vRealize Business for Cloud** (30 minutes) (Basic) In this module, we will be guided through the installation and configuration of vRealize Business for Cloud.
- **Module 4 - Showing the Value of VMware Assessments** (60 minutes) (Advanced) In this module you will gain understanding of how the VOA and HCA can be used to show the value of VMware's Cloud Management Solutions and what Business Value they can bring to the customer.
- **Module 5 - Selling VMware Cloud Management Solutions** (15 minutes) (Basic) In this module we will discuss the packaging options available to purchase VMware Cloud Management products.

Lab Captains:

- Module 1 - Peter Kieren, Sr. Systems Engineer, Canada
- Module 2 - Peter Kieren, Sr. Systems Engineer, Canada
- Module 3 - Peter Kieren, Sr. Systems Engineer, Canada
- Module 4 - Peter Kieren, Sr. Systems Engineer, Canada
- Module 5 - Peter Kieren, Sr. Systems Engineer, Canada

This lab manual can be downloaded from the Hands-on Labs Document site found here:
This lab may be available in other languages. To set your language preference and have a localized manual deployed with your lab, you may utilize this document to help guide you through the process:


Location of the Main Console

1. The area in the RED box contains the Main Console. The Lab Manual is on the tab to the Right of the Main Console.
2. A particular lab may have additional consoles found on separate tabs in the upper left. You will be directed to open another specific console if needed.
3. Your lab starts with 90 minutes on the timer. The lab can not be saved. All your work must be done during the lab session. But you can click the EXTEND to increase your time. If you are at a VMware event, you can extend your lab time twice, for up to 30 minutes. Each click gives you an additional 15 minutes. Outside of VMware events, you can extend your lab time up to 9 hours and 30 minutes. Each click gives you an additional hour.

Alternate Methods of Keyboard Data Entry

During this module, you will input text into the Main Console. Besides directly typing it in, there are two very helpful methods of entering data which make it easier to enter complex data.
Click and Drag Lab Manual Content Into Console Active Window

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

Accessing the Online International Keyboard

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

1. Click on the Keyboard Icon found on the Windows Quick Launch Task Bar.
Click once in active console window

![Online Keyboard]

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

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

Click on the @ key

![Online Keyboard]

1. Click on the "@ key".

Notice the @ sign entered in the active console window.
**Activation Prompt or Watermark**

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

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

Rest assured, VMware and the Hands-on Labs are in full compliance with Microsoft licensing requirements. The lab that you are using is a self-contained pod and does not have full access to the Internet, which is required for Windows to verify the activation. Without full access to the Internet, this automated process fails and you see this watermark.

This cosmetic issue has no effect on your lab.

**Look at the lower right portion of the screen**
Please check to see that your lab is finished all the startup routines and is ready for you to start. If you see anything other than "Ready", please wait a few minutes. If after 5 minutes your lab has not changed to "Ready", please ask for assistance.
Lab Overview

In this lab you will deploy and configure vRealize Operations in a customer’s environment. You will also generate pre-defined vSphere Optimization Assessment (VOA) reports to show the configuration, performance and capacity assessments of the environment and walk the customer through interpreting those reports.

A Readme.txt file is included on the desktop with authentication information.

Lab Module List:

• **Module 1 - Introduction to VMware Assessments** (30 minutes) (Basic) In this module, we will discuss two of VMware's Assessment programs, the vSphere Optimization Assessment (VOA) and the Hybrid Cloud Assessment (HCA) and how we can use these as tools to provide value to our customers with VMware Cloud Management solutions.

• **Module 2 - Installing vRealize Operations Manager** (30 minutes) (Basic) In this module, we will be guided through the installation and configuration of vRealize Operations Manager.

• **Module 3 - Installing vRealize Business for Cloud** (30 minutes) (Basic) In this module, we will be guided through the installation and configuration of vRealize Business for Cloud.

• **Module 4 - Showing the Value of VMware Assessments** (60 minutes) (Advanced) In this Module we will show you how to understand how the VOA and HCA can be used to show the value of VMware's IT Management Solutions.

• **Module 5 - Selling VMware Cloud Management** (15 minutes) In this module, we will discuss the packaging options available to purchase VMware Cloud Management products.

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• Module 5 - Peter Kieren, Sr. Systems Engineer, Canada

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http://docs.hol.vmware.com/

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

Module 1 - Introduction to VMware Assessments (30 Minutes)
Introduction to VMware Assessments

In this module, we will discuss two of VMware's Assessment programs, the vSphere Optimization Assessment (VOA) and the Hybrid Cloud Assessment (HCA) and how we can use these as tools to provide value to our customers with VMware Cloud Management solutions.
Overview of the VOA Program

In this Module, we will look at what the vSphere Optimization Assessment (VOA) program is, describe how it works, and provide an overview of the three phases of reporting. You will be guided through the VOA process that will help you show the value of vRealize Operations Management to your customer.

What is the vSphere Optimization Assessment?

The vSphere Optimization Assessment (VOA) is a pre-sales health check performed on a customer's vSphere environment utilizing vRealize Operations and best practices methodology.

This pre-sales assessment demonstrates to customers how operations management tools like vRealize Operations can reveal configuration issues, performance bottlenecks and capacity shortfalls and waste. Intelligently managing the operations of their vSphere environment will allow the customer to maximize their existing resources and potentially avoid future downtime and outages by uncovering issues in the environment before they develop into outright failures.

You, the Pre-Sales Engineer, will assist the customer with deploying vRealize Operations and importing the VOA custom report pack. You will help them interpret the vRealize Operations dashboards which will present rich data about their environment and help them find areas for improved performance and increased efficiency.
How Does it Work?

There are four phases to the VOA program and this lab will walk you through them:

- **Engage** the customer and determine if there is interest.
- **Install** the vRealize Operations virtual appliance with an evaluation license.
- **Show** the customer the value of the reports generated by vRealize Operations and guide them through the dashboards and help them understand the data presented about their environment.
- **Sell** the solution by helping the customer understand how vRealize Operations is available for purchase.

Three Phases of Reporting
The VOA reports were designed to allow you to produce impactful results in 3 phases over the course of the evaluation period. Due to the design of the analytics, certain performance and capacity data needs be collected for longer periods of time. For this reason we've broken VOA into 3 phases, with a report for each phase and a consolidated report that combines them.

The reports are as follows:

- The first phase and report is focused on **Configuration** and provides immediate results on Day 1 of the VOA. Within minutes of installation and configuration of vRealize Operations, you will be able to populate this report. You can use this in parallel with other built-in reports, such as the vSphere Hardening Guide to compare actual state vs. the optimal state recommended by VMware or your own internal configuration standards.

- The second phase and report is focused on **Performance** of your vSphere environment. You will be exposed to problem alerts, which provide guidance on resolving them and be able to easily identify the top consumers of resources to make informed decisions on how to redistribute workloads.

- The third phase and the first of 2 reports in this phase is focused on **Capacity** and helps you identify opportunities to optimize your resources.

- The 3rd phase also includes the **Consolidated** report, which is a consolidation of the first 3 reports. This report highlights Capacity first, which generally offers the most significant cost-savings optimization opportunities.

**VOA Flex**

Over the past couple of years, we have seen widespread adoption of the VOA within our global partner community resulting in deeper customer engagements and larger deals. At the same time, the goal at VMware is continuous improvement and we have heard from many partners that while the current 30-day engagement works, some flexibility in the engagement duration would be desirable.
We are excited to introduce VOA Flex, an enhanced Proof of Concept (POC) of vRealize Operations (vROPs) that allows you to choose the duration of the customer engagement from 3 days up to 30 days to perform the VOA.

**VOA Flex Timeline**

Duration for the VOA Flex program are guidelines as every environment is different. You can decide the duration of the VOA Flex engagement based on several factors:

- Customer Preference
- Datacenter Environment Size
- Datacenter Environment Complexity
- Datacenter Growth Rate

In general, a smaller, less dynamic environment is more suited to a short duration VOA, while a larger, more dynamic environment will benefit from the full 30 day evaluation.

**Configuration Report**

- Completed on day 1 for all environments.

**Performance Report**

- Can be completed within 1-3 days for less dynamic environments
- Can be completed after 7 days for a more dynamic environment.

**Capacity Report**

- Will provide more accurate recommendations with longer durations of data capture.

The strength of the VOA Flex program is that you are able to choose the timeline that best fits your needs while providing meaningful results to your customers with the assessment reports showcasing the full value that vRealize Operations delivers.
## Conclusion

**Get Started Today!**

<table>
<thead>
<tr>
<th>ENGAGE</th>
<th>INSTALL</th>
<th>SHOW</th>
<th>SELL</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Learn Get your Management Operations VSP/VTSP</td>
<td>• Download The Technical Toolkit and VOA license keys</td>
<td>• Generate Reports from the product Reports tab</td>
<td>• Set Up Final sales meeting; explain data</td>
</tr>
<tr>
<td>• Review Partner Central VOA Page Take the VOA Hands-on Lab (HOL)</td>
<td>• Install The trial product at your customer site and define the VOA flex delivery</td>
<td>• Touch #1 Configuration</td>
<td>• Prepare Recommendation and Quote</td>
</tr>
<tr>
<td>• Earn the new VOA Sales &amp; Tech Badges</td>
<td>• Register The opportunity in Ad+ using code VOA-INSTALL in the Project field</td>
<td>• Touch #2 Performance</td>
<td>• Close Deal</td>
</tr>
<tr>
<td>• Plan demand generation campaigns &amp; events</td>
<td>• Submit Proof of Install to get Sales Region*Partner Incentives</td>
<td>• Touch #3 Capacity</td>
<td>• Report Closed Won</td>
</tr>
<tr>
<td>• Identify Top 10 target customers “naked vSphere” or 50+ VMs</td>
<td></td>
<td>• Create Executive Summary PowerPoint</td>
<td>• Get Sales Rewards*</td>
</tr>
</tbody>
</table>

This lab will cover all four steps in the VOA process:

- Engage the customer
- Install vRealize Operations
- Show reports and dashboards to reveal the state of the environment
- Sell the solution to the customer
Overview of the HCA Program

In this Module, we will look at what the Hybrid Cloud Assessment (HCA) program is, describe how it works, and provide an overview of the reporting available. You will be guided through the HCA process that will help you show the value of vRealize Business for Cloud to your customer.

What is the Hybrid Cloud Assessment?

Cloud adoption is accelerating, and a hybrid cloud strategy is the approach enterprises are finding necessary to keep up with their business demands. IT organizations need to have tools at their disposal to make informed decisions and derive the most value from this hybrid cloud environment.

The Hybrid Cloud Assessment (HCA) is a new assessment that we can use to help the customer understand existing private cloud costs, compare public and private cloud costs and enable IT teams to confidently share information on actual costs with their lines of business.

The HCA uses vRealize Business for Cloud to analyze the cost of the customers' private clouds.
You, the Pre-Sales Engineer, will assist the customer with deploying vRealize Business for Cloud and run a report that includes public and private cloud cost comparisons, private cloud costing, and fine-grained cost analysis to address your critical cloud cost questions.

**How Does the HCA Work?**

The HCA is an enhanced proof of concept that analyzes a customers' existing data center to give them actual and "what-if" insights about their IT cost.

- **Understand** your Cloud costs and consumption
- **Communicate** your costs with your Lines of Business
- **Plan** your Cloud Spend better
The Hybrid Cloud Assessment Report

VMware Hybrid Cloud Assessment (HCA)

The HCA process is designed to provide meaningful insight into your customers IT costs in less than 3 hours. The HCA report is provided out of the box, with no need to install any additional content within vRBC.

The HCA includes the following report pages:

- **Private Cloud Expenses** - This report will show the cost of your private infrastructure and how that cost is distributed across datacenters.
- **Showback Statement** - This report includes a fine-grained cost analysis statement that provides the details necessary to implement Chargeback or Showback for the IT services your customers are using.
- **Cost Savings Opportunity** - This report contains potential cost savings opportunities for the IT services your customers are using.
- **Cloud Comparison-vSphere Private Cloud vs Public Cloud information** - This report uses What-If Scenarios to help you understand the expenses of your infrastructure in a private cloud and to help decide which, if any, of your data centers to move to the public cloud.
The HCA Complements the vSphere Optimization Assessment (VOA)

The HCA report directly complements the vSphere Optimization Assessment that we discussed in the previous module. The VOA relies on vRealize Operations Manager to analyze systems running in your data centers. If you haven't used VOA, then it's an ideal way to see your systems' consumption and infrastructure performance including:

- **Configuration** - System metering, trending, right-sizing, and resource optimization
- **Capacity** - System resourcing and utilization
- **Performance** - System health monitoring and root-cause analysis
HCA + VOA Provides Complete Cloud Cost and System Consumption Answers

Together the HCA and VOA Provide Cloud Cost & System Consumption Answers

With the introduction of the HCA, we now have the opportunity to combine HCA and VOA to showcase an even greater value of our IT management solutions. Using both vRealize Business for Cloud and vRealize Operations provides you with an understanding of reclamation opportunities of resources, along with cost analysis for private clouds.
The VOA and HCA: A Powerful Combination

The success of VMware Assessment tools is the fact that we provide answers to our customers. The assessments are a mini-POC for our customers that quickly demonstrate first hand the value of our Cloud Management platform. Let's discuss how we can use these Assessment tools together to maximize the value to our customers.

When to Use the VOA

The vSphere Optimization Assessment (VOA)

When VMware introduced the VOA, we gave you a tool that would allow you to demonstrate to customers how to optimize their private cloud environment. We can show them how using vRealize Operations Manager can help them intelligently manage the operations and use it to identify configuration issues, performance bottlenecks, and capacity waste.
Start the VOA Conversation - SLAs

Service Level Agreements (SLAs) are important deliverables all IT organizations must meet in order to provide the business with the technology services it requires in a timely and cost-efficient manner.

Ask the above questions to better understand how efficient the current environment is.
Using the VOA - Operational Efficiency

Understanding how the customer's environment is currently monitored is key to explaining how vRealize Operations might add value to existing tools and what gaps it may fill. Many customers have no operations tools in use at all.

Ask the above questions to better understand the efficiency of the current environment.
Using the VOA - Compliance

Compliance is a critical priority for IT, whether it's compliance to industry regulations, security mandates, or just internal configuration standards. vRealize Operations provides unparalleled visibility into the compliance state of a vSphere environment.

Ask the questions listed above to get a better understanding of the customer's compliance needs.
When to Use the HCA

VMware Hybrid Cloud Assessment (HCA)

The HCA is an ideal Assessment to use when the customer is looking to report on and compare private and public cloud costing. We can also demonstrate costing analysis to address critical cloud cost questions.

Start the HCA Conversation

- How do you know how much your private cloud is costing you?
- Do you need to understand your IT costs by Business Unit?
- Do you need to understand your IT costs in a more detailed fashion?
- Are you being asked if you should run workloads in the public cloud? If so, are you being asked what the cost will be?
Operational costs are always a critical factor for a business to understand. vRealize Business for Cloud offers insight into private and public cloud costs quickly and easily.

Ask the questions listed above to get a better understanding of the customer's compliance needs.

**The HCA Complements the vSphere Optimization Assessment (VOA)**

**Together the HCA and VOA Provide Cloud Cost & System Consumption Answers**

With the introduction of the HCA, we have a unique opportunity to combine the HCA and VOA to showcase even greater value of our IT management solutions. Using both vRealize Operations and vRealize Business for Cloud provides you with a complete understanding of your private and public cloud environment. The HCA will answer cloud cost questions, while the VOA will answer system efficiency and infrastructure performance questions. Together they will answer reclamation savings questions.
Module Conclusion

You have completed Module 1 - Introduction to VMware Assessments of the VMware Assessments lab. You should now have an understanding of the value of VMware Assessments.

- What the VOA and HCA programs are
- How the VOA and HCA works
- Overview of how to deliver a VOA and HCA

Proceed to any module below which interests you most.

- **Module 1 - Introduction to VMware Assessments** (30 minutes) (Basic)
- **Module 2 - Installing vRealize Operations Manager** (30 minutes) Basic
- **Module 3 - Installing vRealize Business for Cloud** (30 Minutes) Basic
- **Module 4 - Showing the Value of VMware Assessments** (60 Minutes) Advanced
- **Module 5 - Selling VMware Cloud Management** (15 Minutes) Basic
Module 2 - Installing vRealize Operations Manager (30 minutes)
Introduction to Installing vRealize Operations Manager

In this module, you will be guided through the installation and configuration of vRealize Operations Manager Appliance.

You will follow a guided simulation of the installation process. The actual time to install the appliance may take longer than the simulation.
vRealize Operations Manager
Installation Prerequisites

Before we install vRealize Operations Manager, we need to make sure that we adhere to the minimum installation prerequisites.

Installation Sizing Guidelines

<table>
<thead>
<tr>
<th>Characteristics/Node Size</th>
<th>Extra Small</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Extra Large</th>
<th>Standard Size Remote Collectors</th>
<th>Large Size Remote Collectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>uCPU</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>16</td>
<td>24</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Memory (GB)</td>
<td>8</td>
<td>16</td>
<td>32</td>
<td>48</td>
<td>120</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Maximum Memory Configuration (GB)</td>
<td>N/A</td>
<td>32</td>
<td>64</td>
<td>96</td>
<td>N/A</td>
<td>8</td>
<td>32</td>
</tr>
</tbody>
</table>

**Datastore latency**: Consistently lower than 10 ms with possible occasional peaks up to 15 ms

**Network latency for data nodes**: < 5 ms

**Network latency for remote collectors**: < 200 ms

**Network latency between agents and vRealize Operations Manager nodes and remote collectors**: < 20 ms

**vCPU: Physical core ratio for data nodes (****)**

1 vCPU to 1 physical core at scale maximums

**IOPS**

See the attached Sizing Guidelines worksheet for details.

**Disk Space**

| Single-Node Maximum: Objects     | 250     | 2,400 | 8,600 | 15,000 | 35,000 | 1,500 (****) | 15,000 (****) |
| Single-Node Maximum: Collected Metrics (****) | 70,000 | 800,000 | 2,500,000 | 4,000,000 | 10,000,000 | 600,000 | 4,375,000 |
| Multi-Node Maximum: Objects Per Node (****) | NA | 2,000 | 6,250 | 12,500 | 30,000 | NA | NA |
| Multi-Node Maximum: Collected Metrics Per Node (****) | NA | 700,000 | 1,875,000 | 3,000,000 | 7,500,000 | NA | NA |
| Maximum number of nodes in a cluster | 1 2 16 | 16 | 8 50 | 60 |
| Maximum number of End Point Operations Management agents per node | 100 | 300 | 1,200 | 2,500 | 2,500 | 250 | 2,000 |
| Maximum Objects for the configuration with the maximum supported number of nodes (****) | 250 | 4000 | 75,000 | 150,000 | 180,000 | NA | NA |
| Maximum Metrics for the configuration with the maximum supported number of nodes (****) | 70,000 | 1,400,000 | 19,000,000 | 37,500,000 | 45,000,000 | NA | NA |
Download vRealize Operations OVA

For the VOA, we generally download the vRealize Operations appliance, which is an OVA file from the VMware website (http://www.vmware.com/products/vrealize-operations.html).

Under the products tab, choose vRealize Operations, and then choose (1) "Download Free Trial" to request an evaluation license and download the vRealize Operations OVA file.

Note: we are not going to actually download vRealize Operations in this lab. Later in this module you will go through an installation demo for which the OVA has already been downloaded.

vRealize Operations Requirements

Minimum vSphere Versions

VMware distributes vRealize Operations as a virtual appliance in an OVA file format. Use the VMware vSphere Web Client to connect to a VMware vCenter Server and deploy the vRealize Operations virtual appliance. The vRealize Operations Manager virtual appliance must be deployed on an **ESX/ESXi host version 5.5 or later** that is managed by VMware **vCenter Server 5.5 or later**.

Virtual hardware:

- One IP address (static allocation preferred) for vRealize Operations Manager
- Sufficient vCPU, Memory and Storage (see sizing section later in this lab manual for more details)
Network Port Requirements

vRealize Operations requires access to the following network ports on the virtual appliance:

22 (TCP) Used for SSH access to the vRealize Operations Manager cluster.

80 (TCP) Redirects to port 443.

123 (UDP) Used by vRealize Operations Manager for Network Time Protocol (NTP) synchronization to the master node.

443 (TCP) Used to access the vRealize Operations Manager product user interface and the vRealize Operations Manager administrator interface.

1235 (TCP) Used by all nodes in the cluster to transmit resource data and key-value data for the Global xDB database instance.

Browser Support

This vRealize Operations Manager release supports all current Web browsers, although only the following browsers have been tested with this release:

- Google Chrome: Version 53 and 54
- Mozilla Firefox: Version 48 and 49
- Microsoft Internet Explorer: Version 11
Sizing vRealize Operations is very important. With a VOA, it is probably not necessary to implement a High Availability (HA) vROps cluster, however, it is still important you size correctly.

The latest sizing guidelines/spreadsheet can be found in KB 150421 - https://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=2150421

That KB article has links to Excel spreadsheet sizers for all versions of vROps. The VOA is now based on vRealize Operations Manager 6.6 so use that sizing spreadsheet.

For most VOAs you will only install the vSphere solution, so you can use the 'Sizing Guide (Basic)' worksheet. If you are installing additional management packs, you should use the 'Sizing Guide (Advanced)' worksheet.

Here are some notes to help you use the sizing worksheet:

1. **Data Retention** - a VOA is not typically installed for long term production use. You may want to change Data Retention to 2 months which matches the standard evaluation period of 60 days as this will reduce the storage requirement. If the client purchases vROps and continues use of the environment then a secondary sizing exercise should be followed, as more storage will be needed.
2. **Object count** - vRealize Operations looks at the items in your inventory as "objects". An object could be an ESXi host, a virtual switch, a virtual machine, etc. It is important to get the correct quantity of Objects for the sizing operation.

3. **Node size and count** - Generally speaking, if you have a choice of fewer, larger nodes, that will be a simpler implementation.

4. **Required resources** - If you do not deploy the correct amount of vCPU, RAM and Storage (including IOPS) then vRealize Operations Manager will not function correctly.
Hands-on Labs Interactive Simulation: Deploy the vRealize Operations Appliance

The first step in establishing a VOA is to deploy the vRealize Operations Manager Appliance.

This part of the lab is presented as a Hands-on Labs Interactive Simulation. This will allow you to experience steps which are too time-consuming or resource intensive to do live in the lab environment. In this simulation, you can use the software interface as if you are interacting with a live environment.

1. Click here to open the interactive simulation. It will open in a new browser window or tab.

Return to Your Lab

When finished, your lab may have timed out. You can click on the Return to Your Lab Button as above.
Configure the Default Policy

Now that you are familiar with the initial installation and configuration of vROps to support your VOA, it is useful to make some minor changes to the Default Policy to meet the objectives of the VOA, particularly from a Capacity Planning perspective.

Out of the box, the Default Policy in vRealize Operations is set to use a Consumed Capacity planning model for memory capacity calculations. For a VOA, it can sometimes be useful, to also get visibility of how capacity would look like with an Allocation and with a Demand policy. Don’t worry if you don’t know what all these models are at the moment - we will describe them later in this module.

Out of the box, an Allocation model is set for storage. If you are using thin provisioning then this will show incorrect results so this needs to be set to Demand.

This Lesson will show you how you can make the changes, and what difference they will make to the Capacity Planning Analysis results.

Demand vs. Allocation Policy

If your lab timed out while you were completing the offline installation, click on Return To Your Lab to go back to where you left off.

Before we edit the policies, we should quickly explain some of the terminology and the difference between a Demand and Allocation capacity planning policy.
Objects and Object Types

Everything being managed in vROps is called an Object, and every Solution and Management Pack in vROps defines the Object Types that it manages. The vSphere Solution that we just installed defines the vSphere Object types. The vSphere Object types are ones you will be familiar with and include Virtual Machine, Host System, Cluster Compute Resource and Datacenter Objects.

Resource Dimensions

Each object is made up of a number of resources. For example a Virtual machine is made up of CPU, Memory, Disk and Network resources. From a Capacity Planning perspective, when we describe Capacity, we often describe it in the context of these resource dimensions.
**Demand Policy**

<table>
<thead>
<tr>
<th></th>
<th>Total Capacity</th>
<th>Buffers</th>
<th>Usable Capacity</th>
<th>Peak Value</th>
<th>Recommended Size</th>
<th>Remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU</strong></td>
<td>468.24 GHz</td>
<td>HA (20.5%)</td>
<td>335.01 GHz</td>
<td>55.26%</td>
<td>114 Cores</td>
<td>48.98% 164.00 GHz</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>328 GB</td>
<td>HA (19.51%)</td>
<td>237.6 GB</td>
<td>89.06%</td>
<td>238.4 GB</td>
<td>15% 35.64 GB</td>
</tr>
<tr>
<td><strong>Demand</strong></td>
<td>328 GB</td>
<td>HA (19.51%)</td>
<td>237.6 GB</td>
<td>35.05%</td>
<td>182.55 GB</td>
<td>67.63% 160.46 GB</td>
</tr>
<tr>
<td><strong>Consumed</strong></td>
<td>328 GB</td>
<td>HA (19.51%)</td>
<td>237.6 GB</td>
<td>59.65%</td>
<td>213.35 GB</td>
<td>43.43% 103.19 GB</td>
</tr>
<tr>
<td><strong>Allocation</strong></td>
<td>328 GB</td>
<td>HA (19.51%)</td>
<td>237.6 GB</td>
<td>89.06%</td>
<td>288.4 GB</td>
<td>15% 35.64 GB</td>
</tr>
</tbody>
</table>

If you adopt a Demand Policy, the Capacity planning engine will only consider the resources that are actually being used, or demanded, as consumed. So if your 2x vCPU, 2GB RAM, 20GB disk VM is only actually using 0.5 vCPU, 1.2GB RAM and 4GB disk the remaining resources are reported as being capacity still available.

In the above screenshot, we are demanding 83.27GB - 160.46GB is still available for workload.
**Allocation Policy**

<table>
<thead>
<tr>
<th></th>
<th>Total Capacity</th>
<th>Buffers</th>
<th>Usable Capacity</th>
<th>Peak Value</th>
<th>Recommended</th>
<th>Remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configured</td>
<td>466.24 GHz</td>
<td>HA (20.5%)</td>
<td>335.01 GHz</td>
<td>55.26%</td>
<td>114 Cores</td>
<td>43.98 %</td>
</tr>
<tr>
<td></td>
<td>Configured</td>
<td>+10%</td>
<td>185.14 GHz</td>
<td>Demand</td>
<td>164.08 GHz</td>
<td></td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configured</td>
<td>328 GB</td>
<td>HA (19.51%)</td>
<td>237.6 GB</td>
<td>89.06%</td>
<td>211.6 GB Allocation</td>
<td>15%</td>
</tr>
<tr>
<td>(includes overcommit)</td>
<td>Overcommit 0.0%</td>
<td></td>
<td>72.44% of Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>+10%</td>
<td>211.6 GB</td>
<td>Allocation</td>
<td>35.64 GB</td>
<td></td>
</tr>
<tr>
<td><strong>Demand</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>+10%</td>
<td>83.27 GB</td>
<td>Demand</td>
<td>150.46 GB</td>
<td></td>
</tr>
<tr>
<td><strong>Consumed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>237.6 GB</td>
<td>58.63%</td>
<td>213.36 GB</td>
<td>43.43 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+10%</td>
<td>141.72 GB</td>
<td>Demand</td>
<td>103.19 GB</td>
<td></td>
</tr>
<tr>
<td><strong>Allocation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>(includes overcommit)</td>
<td>Overcommit 0.0%</td>
<td></td>
<td>72.44% of Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In vRealize Operations, if you adopt an **Allocation** Policy, the Capacity Planning engine will assume the resources you have allocated an Object are consumed. So, if you have given a VM 2x vCPUs, 2GB RAM and 20GB storage, those resources are consumed from your pool of resources from a Capacity reporting point of view.

In the above screenshot we have allocated 211.6GB RAM, therefore it is consumed and only 35.65GB is available.

**Over Allocation** - if you adopt an Allocation Policy, you have the option to specify an Over Allocation ratio. For example for vCPU you may be comfortable with an 8:1 ratio of vCPU to physical CPU. If you configure the policy to allow an 8:1 Over Allocation ratio, then vROps won't report you are out of capacity until there are more than 8 vCPUs to each physical CPU.
Consumed Policy

There is a third measure available which is now the Default when you do an Express Installation of vRealize Operations Manager, this measure is **Consumed** and is generally the best measure of Memory Demand in vSphere. This is generally a safe middle ground between pure Demand and Allocation models.

"Memory Consumed" model is a moderated approach for production environments to ensure performance. This model is based on the total amount of physical memory that has been allocated to the virtual machine(s). This is the same memory information you are used to seeing in vCenter-vSphere for vCenter, Datacenter, Cluster and Host objects.
Which Policy to Use?

![Resource Allocation Table]

What Policy should I use?

Virtualization is very good at pooling resources. If you allocate too much CPU to a VM, the unused CPU cycles are generally available for other workloads to consume. Similarly, with Disk Thin Provisioning, an individual VM will typically only consume the amount of disk it is actually using as opposed to the size of disk it has been given.

The exception is memory - although there are some great technologies available to overcommit and reclaim memory, the issue is that when memory is provisioned to a workload, even the excess memory is consumed. For example, if there is a workload with an 8GB memory allocation, but only using 2GB, it’s not practical to get back the 6GB for other workloads.

To that end, we typically recommend that a good starting point for the Capacity Policy is a Consumed model for memory and a Demand model for all the other dimensions.

For the purposes of the VOA, however, for memory, it is often useful to see Allocation, Consumed and Demand all in one place. As you settle on the model you want to adopt, you can turn the other policies off.

You don’t have to make the changes to the Default Policy that we highlight in this module, however the following scenarios will probably help you decide which policies to adopt for memory and disk:

If an environment is relatively conservative with respect to capacity planning and you are typically not over-allocating memory to VMs then turn on the Allocated, Consumed and Demand memory models. This will allow you to see how much memory you could safely get back if you relaxed your Capacity Planning policy.

If you are more aggressive in deploying workload on your hosts then turn on the Consumed and Demand memory models. This will more accurately reflect how you operate your environment.
If you do Thin Provisioning for your storage then turn off the Disk allocated model and leave only the Demand mode active. If you don't do this, vROps will almost certainly report that you are out of capacity.

The reason for this is as follows: Imagine you have 100 VMs with 40GB disks but they are only using 10GB each on average. Because you know this, you have used thin provisioning and presented 2TB of storage to the host. With the Demand model capacity used is calculated as 10GB x 100VMs, so 1TB. You've used 50%. With an Allocation model the calculation would be 40GB x 100VMs, so 4TB. You are out of capacity and vROps will report this because you have told it to by leaving the Allocation model turned on in policy.

Let's go ahead and craft an appropriate VOA policy in this lab environment. We'll use a scenario where we are relatively conservative but we have adopted thin provisioning.

**Check the Lab is Ready**

Before we start this next section, please first check the lab is Ready.

If it is not, you may need to wait a few minutes until the status shows the lab is Ready.

**Start Firefox**

Double Click on the Firefox icon on the desktop to start your browser.
Navigate to vRealize Operations Manager HVM Instance

When you open Firefox, you should land on the above page.

Select **vRealize Operations Manager - Historical Instance** from the list. Alternatively, you can use the **HVM vROps** bookmark provided.

The HVM is a virtual machine in the Historical View Mode that is used for the Hands-On Lab environment. It captures a point in time providing more data to work with in the lab.
Log into vRealize Operations Manager

1. Log into vROps using the credentials:
2. User name: admin
3. Password: VMware1!
4. Click on Login to continue.
Using vRealize Operations Manager in the Hands on Labs - Tips!

When we build labs for Hands on Labs we always default to a screen resolution of 1280*800. This is to allow the labs to work with any device, including laptops and tablets that people often bring to the BYOD section of VMWorld.

Unfortunately, vRealize Operations Manager doesn't always lend itself to such a resolution. When you are working in this lab you may optionally:

1. Click on the configure icon to configure Firefox settings.
2. Change the scaling of the browser - 80% is usually good for seeing a lot more of the screen without sacrificing too much on screen quality or text size. In some cases you may need to change this back to 100% to see the full UI.
3. Collapse and re-open panels as needed.

We will highlight in this manual when you are may have to adjust resolution or collapse panels.
Navigate to the Default Policy

First, we need to navigate to the Default Policy.

1. Click on **Administration**.
2. Click on **Policies**.
3. Click on the **Policy Library** Tab.
4. Expand **Base Settings** to see all the policies.
5. Scroll down and click on '**vSphere Solution's Default Policy (Jun 06, 2017 4:05:03PM)' - Note: the date refers to when the policy was created. This default policy gets created when you complete the initial configuration of the vSphere Solution during installation.
6. Click on the **Pencil icon** to edit the policy.
When you edit a Policy you will be taken straight to the Analysis Settings panel. This is where you can change the capacity model for each object type. We need to change the CPU and Disk models from an Allocation policy to a Demand policy.

1. The list on the left, contains the Object Types you can change policy for and you can use the selectors to add Object Types to the right hand panel as needed. For this lab, we have already added the required Object Types to the workspace.
2. Each Object Type has its own section with Policy Elements.
3. Use the arrow to open or collapse the Object Type - the first Object Type, Cluster Compute Resource, will, by default, be opened.
4. Where a Policy Element is greyed out it means no changes to the Base (default) Settings have been made to it.
5. If you want to make a change to the policy element, click on the lock icon.
6. If the Policy Element is unlocked and not greyed then changes to the base policy have been made. The Capacity Remaining Policy Element is where we set the Demand, Comsumed, and Allocated capacity models so we need to make further changes.
7. Click on the Arrow to expand the Capacity Remaining policy element.

Note: Policies are an important subject to understand. We are describing a simple default policy in this lab which is the ideal starting point for a VOA. As you become
more experienced with the product, you will start using more complex policies involving inheritance.

## Change Cluster Compute Resource Memory to Allocated, Consumed and Demand

1. **Scroll** down a bit so you can see the entire Policy Element section.
2. Tick the **Memory Demand** and **Memory Allocation** check boxes to enable those capacity models.
1. Now scroll down within the Resource Container section to see the **Disk Space models**.
2. Uncheck the **Disk Space Allocation** box to turn off the model. We are using thin provisioning so we don't want to use an allocation model.
Change the Settings for the Custom Datacenter Object Type

1. Scroll down to the next object type.
2. Select Custom Datacenter.
3. Click on the arrow to expand the policy elements.
Change the Capacity Remaining Settings

As you did with the Cluster Compute Resource:

1. **Scroll** down to the **Capacity Remaining Time Remaining** policy element.
2. Click on the arrow to expand it.
3. Tick the **Memory Demand** and **Memory Allocation** boxes to turn on these capacity models.
Change the Disk Capacity Model

1. Scroll down to the Disk capacity models.
2. Uncheck the Disk Space Allocation model.
Complete the Rest of the Object Types

For each of the remaining Object Types:

1. Scroll down to the next Object Type.
2. Expand the Policy Elements for the Object Type.
3. Scroll down and expand the Capacity Remaining policy element.
4. Ensure Memory Demand, Memory Allocation and Memory Consumed check boxes are ticked.
5. Scroll down and make sure Disk Space Allocation is unticked.

You need to do the above for Object Types:

- Datacenter - Ensure Memory Demand and Memory Allocation, uncheck Disk Space Allocation.
- Datastore - uncheck Disk Space Allocation.
• Host System - Ensure **Memory Demand, Memory Allocation, Memory Consumed and CPU Demand** are checked. Uncheck **Disk Space Allocation**.
• vCenter Server - Ensure **Memory Demand, Memory Allocation, Memory Consumed and CPU Demand** are checked. Uncheck **Disk Space Allocation**.

**Changing the 'Old Snapshot' Policy**

While we are in the policy, it is a good idea to change the setting that defines when a snapshot is considered old. Out of the box this is set to 180 days, however, most clients would consider in a production environment a snapshot to be old in just 3-7 days.

1. We need to add the Virtual Machine object type to the panel so click on the **Show Changes for** drop down to add the object type.
2. Scroll down until you see **vCenter Adapter - Virtual Machine**.
3. Click on **vCenter Adapter - Virtual Machine** to add select the object type to add.
Add the Object Type

1. Click on the **Show Object** icon to complete the operation.

Open up Virtual Machine

1. Now scroll to the bottom of the right hand panel to locate the newly added **Virtual Machine** object type.
2. Click on the **arrow** to expand it's policy elements.
Unlock Reclaimable Capacity

1. Scroll down further to locate the **Reclaimable Capacity** policy element and click on the Lock icon to unlock it.

*Note: the UI can be a bit slow with the limited resources in Hands on Labs - click on the icon **ONCE** and just wait 5-10 seconds.*

Change the Snapshot Setting

1. Scroll further down and change the **'Flag as unused'** value for snapshot space to **7 days**. We now have a policy that will alert us when a snapshot is more than 7 days old.

Cancel Saving the Policy
1. Normally, at this point, you would click on the Save button, to apply changes you have made. For our lab, we will **cancel** the Policy changes so as to not affect the lab results.

*(If you can't see the Save button you may need to change Firefox's resolution as described at the beginning of this module in step 'Using vROps in the Hands on Labs)*

**Conclusion**

You have now configured an appropriate policy for the majority of VOAs you will carry out. You will find you need to change some of the capacity policies at times - please check lab **HOL-SDC-1801-4** for more details on the capacity management capabilities. Similarly, you may or may not elect to turn on the Hardening Guidelines as it may not be relevant for your assessment.
Navigation Basics in vRealize Operations Manager

Now that vRealize Operations has been deployed and configured, we will learn how to navigate the web interface.

Home Page

By default, when you log into vROPs, you will be brought to the new Home Page. The interface of vRealize Operations has been designed to be consistent with the vSphere Web Client to make for a familiar experience.

At a glance, you will be able to quickly navigate to your area of interest. In this example, you can see that we are looking at:

1. Virtual Machine Objects - You can change the focus to other object types.
2. Health Status - Quick overall summary view of object type you are focusing on.
3. Worst Health - Identify quickly which objects have Alerts.
4. Suggested Fix - Listing of alerts applicable to the object type we are looking at.

*Note: If we were to highlight a different object type, the focus of the page would shift to that object.*
Adding a Dashboard to vRealize Operations Manager

vRealize Operations Manager comes standard with several dashboards available out of the box. We can add and subtract dashboards from our Home page list as follows:

1. Click on the **All Dashboards** Dropdown.
2. Hover over **Performance Troubleshooting** until the next window opens.
3. Click on the **Troubleshoot a Host** Dashboard.

This will add the Troubleshoot a Host Dashboard to your list of available dashboards.
Troubleshoot a Host Dashboard

The Troubleshoot a Host Dashboard give a quick view of your Host Status, Busy Status, Active Alerts and Stress on the selected host.

Alerts

The Alerts menu shows a top-level summary of alerts in the environment.
The Environment menu shows a top-level view of available views of the vSphere environment, the vRealize Operations appliance health, and other areas including network and storage.
The Home menu option from the top-level menu will show you various types of content in the vRealize Operations environment. This particular view will allow select various overviews and dashboards quickly and easily.
The Administration option from the top-level menu will show you the vCenter Server settings you specified earlier. You can use this area to change licensing, manage credentials and certificates, manage user access and many other configurations as well.
Module Conclusion

You have completed Module 2 - Installing vRealize Operations Manager of the VMware Assessments lab. You should now be familiar with the installation of vRealize Operations Manager, configuring the Default Policy, and navigating through the vRealize Operations Manager interface.

Proceed to any module below which interests you most.

- Module 1 - Introduction to VMware Assessments (30 minutes) Basic
- Module 2 - Installing vRealize Operations Manager (30 Minutes) Basic
- Module 3 - Installing vRealize Business for Cloud (30 Minutes) Basic
- Module 4 - Showing the Value of VMware Assessments (60 Minutes) Advanced
- Module 5 - Selling VMware Cloud Management (15 Minutes) Basic
Module 3 - Installing vRealize Business for Cloud (30 minutes)
Introduction to Installing vRealize Business for Cloud

In this module, you will be guided through the installation and configuration of vRealize Business for Cloud. As well, you will be walked through the management console for the vRealize Business for Cloud.
vRealize Business for Cloud Installation Prerequisites

Before we install vRealize Business for Cloud, be sure that we adhere to the minimum installation prerequisites.

Hybrid Cloud Analysis Prerequisites

Before you begin the HCA with a customer, you should validate the requirements and prerequisites with the customer. This should be done as early as possible so that the HCA will go smoothly.

Required Products

- VMware vCenter Server 5.5 or later
- VMware ESX/ESXi 5.5 or later

For HCA

- vRealize Business for Cloud 7.2 or later

For HCA + VOA

- vRealize Business for Cloud 7.2 or later
- vRealize Operations Manager 6.4 or later

As a baseline, vRealize Business for Cloud 7.2, the product used in HCA - supports collecting data from VMware vCenter Server 4.1U or later. However, the OVA install requires a minimum ESX hosts version of 5.5 and VOA will only support vCenter Server 5.5 or later. So, for simplicity it is recommended that the HCA be conducted in a 5.5 or later environment.
Download vRealize Business for Cloud OVA

For the HCA, we will need to download the vRealize Business for Cloud appliance, which is an OVA file from the VMware website.

You will need to log into your myVMware account to access the OVA file. Once logged in, click on the Products A-Z tab. Scroll down until you see VMware vRealize Business for Cloud and select the View Download Components. From here you will be able to download the vRealize Business for Cloud OVA file.

Note: we are not going to actually download vRealize Business for Cloud in this lab. Later in this module you will go through an installation demo for which the OVA has already been downloaded.

vRealize Business for Cloud Requirements

Minimum vSphere Versions

VMware distributes vRealize Business for Cloud as a virtual appliance in an OVA file format. Use the VMware vSphere Web Client to connect to a VMware vCenter Server and deploy the virtual appliance. The vRealize Operations Manager virtual appliance must be deployed on an ESX/ESXi host version 5.5 or later that is managed by VMware vCenter Server 5.5 or later.

Virtual hardware:

- One IP address (static allocation preferred) for vRealize Business for Cloud
• Sufficient vCPU, Memory and Storage (see sizing section later in this lab manual for more details)
• OVA for vRealize Business for Cloud - downloaded from www.vmware.com

**Network Port Requirements**

vRealize Business for Cloud requires access to the following network ports on the virtual appliance:

**22 (SSH)** Used for external SSH connection.

**443 (TCP)** Used by vRealize Business for Cloud data collection from multiple systems:

- vRealize Automation
- vCenter Server
- vRealize Operations Manager
- vCloud Director
- EMC SRM
- vCloud Air
- Amazon

**5480 (HTTPS)** Used for the appliance web management interface.

**10443 (HTTPS)** For vRealize Business for Cloud mobile clients and vCenter Server Inventory service.

**Sizing**

The recommended resources for the vRealize Business for Cloud appliance are as follows:

- 4 vCPU
- 8GB RAM
- 50 GB of disk space
Hands-on Labs Interactive Simulation: Deploy the vRealize Business for Cloud Appliance

The first step in establishing a HCA is to deploy the vRealize Business for Cloud Appliance.

This part of the lab is presented as a Hands-on Labs Interactive Simulation. This will allow you to experience steps which are too time-consuming or resource intensive to do live in the lab environment. In this simulation, you can use the software interface as if you are interacting with a live environment.

1. Click here to open the interactive simulation. It will open in a new browser window or tab.
2. When finished, click the “Return to the lab” link to continue with this lab.

vRealize Business for Cloud Standalone Installation

vRBC Standalone
- No integration with vRA or vIDM
- Local users only
- Proof of Concept only deployment type
- SSH to the vRBC server and run the following command:
  /usr/ITFM-Cloud/va-tools/bin/manage-local-user.sh

The standalone installation option for vRealize Business for cloud is recommended for HCA or other proof of concept engagements. It does not require integration with vRealize Automation or vRealize Identity Manager.
To use vRealize Business for Cloud in standalone mode you will need to SSH into the appliance and run a command to create a local user as shown in the Interactive Simulation: Deploy the vRealize Business for Cloud Appliance.
Navigation Basics in vRealize Business for Cloud

Now that vRealize Business for Cloud has been deployed and configured, we will learn how to navigate the web interface.

Check the Lab is Ready

Before we start this next section, please first check the lab is Ready.

If it is not, you may need to wait a few minutes until the status shows the lab is Ready.

Start Firefox

Double Click on the Firefox icon on the desktop to start your browser.
Navigate to vRBC

When you open Firefox, you should land on the above page.

Select **vRealize Business for Cloud** from the list. Alternatively, you can use the **VMware vRealize Business** bookmark provided.

The HVM is a virtual machine in the Historical View Mode that is used for the Hands-On Lab environment. It captures a point in time providing more data to work with in the lab.
Log into vRealize Business for Cloud using the credentials:

User name: hol
Password: VMware1!

Click on Login to continue.
When we build labs for Hands on Labs we always default to a screen resolution of 1280*800. This is to allow the labs to work with any device, including laptops and tablets that people often bring to the BYOD section of VMworld.

Unfortunately, vRealize Business for Cloud doesn't always lend itself to such a low resolution. When you are working in this lab you may optionally:

1. Click on the configure icon to configure Firefox settings.
2. Change the scaling of the browser - 80% is usually good for seeing a lot more of the screen without sacrificing too much on screen quality or text size. In some cases you may need to change this back to 100% to see the full UI.

We will highlight in this manual when you are may have to adjust resolution or collapse panels.
The vRealize Business for Cloud Business Management screen has been designed to be consistent with the vSphere Web Client to make for a familiar experience. Notice we land on the **Business Management** tab by default.

This Overview page yields high level information across the entire environment, which will show us operational and costing information.

*Note: Since the HOL runs in an isolated environment and cannot connect to public cloud services, we have included this screenshot from an external environment that can more fully show the features in vRealize Business for Cloud.*
Status of Capacity and Infrastructure Utilization

Here we are looking more closely at the Operational Information included on the Overview page.

1. Total number of VMs and how they are distributed across Clouds.
2. Capacity status at a Datacenter level.
3. Utilization status at a Datacenter level.

Understand the Total Cost of the Cloud Infrastructure

Here we are looking more closely at the Costing Information included on the Overview page.

1. Total cost of VMs and how those costs are distributed across Clouds.
2. Cost breakdown by Business Unit.
3. Private Cloud Reclamation Savings information.

Expenses - Private Cloud (vSphere)

Under Expenses notice that we have the option to look at expenses incurred by our Private Cloud. If we click on Private Cloud (vSphere) under Expenses, we can see costing information as it relates to our vSphere environment. If we scroll down on the page, we can see more detailed costing information with Cost Drivers broken down by resource.
We can also look at Operational Expenses in our Private Cloud environment. If we click on **Private Cloud (vSphere)** under Operational Analysis, we can see operational information broken down by resource. If we expand the dropdown box for **3 Servers**, we can see additional host details.
Navigate to Private Cloud Consumption

We can also look at Private Cloud Costing information. Click on **Pricing and Charges** under Consumption.
Private Cloud Pricing and Charges

We are forwarded to the Pricing and Charges page. Here we can view Pricing, Charges, and Business Unit information for our Private Cloud.
Navigate to What-If Analysis

We can also compare Private vs Public Cloud Costing. Click on **Public Cloud** under What-If Analysis.
Comparing Private and Public Cloud Costs

We are forwarded to the Public Cloud page. For our example, we are creating VM groups to plan our Private Cloud costs and compare those costs to Amazon Web Services and Microsoft Azure pricing.

Note: Since the HOL runs in an isolated environment and cannot connect to public cloud services, there is limited data for the cost comparison.
Navigating to Reports

Reporting is available in vRealize Business for Cloud also. Simply scroll down to the Report section and click on the desired report. It will generate the report in PDF format for you to download.
Administration

The Administration tab from the top-level menu will show you the vCenter Server settings you specified earlier. You can use this area to change licensing, manage credentials and certificates, manage user access and many other configurations as well.

Conclusion

You should now be able to navigate through the vRealize for Business Cloud interface. This will be helpful for Partners who would like to show more value than just the Hybrid Cloud Assessment. You can show your customer some real time data on their infrastructure costs!
Module Conclusion

You have completed Module 3 - Installing vRealize Business for Cloud of the VMware Assessments lab. You should now be familiar with the installation and navigation of vRealize Business for Cloud.

Proceed to any module below which interests you most.

- **Module 1 - Introduction to VMware Assessments** (30 minutes) Basic
- **Module 2 - Installing vRealize Operations Manager** (30 Minutes) Basic
- **Module 3 - Installing vRealize Business for Cloud** (30 Minutes) Basic
- **Module 4 - Showing the Value of VMware Assessments** (60 Minutes) Advanced
- **Module 5 - Selling VMware Cloud Management** (15 Minutes) Basic
Module 4 - Showing the Value of VMware Assessments (60 Minutes)
Introduction to Showing the Value of VMware Assessments

In this Module we will show you how to understand how the VOA and HCA can be used to show the value of VMware’s IT Management Solutions.

- The VOA will provide answers to system efficiency and infrastructure performance questions.
- The HCA will answer cloud cost questions.
- The VOA and HCA run together will answer all of the above, plus reclamation savings questions.
Showing the Value of the VOA

Let's look at the three phases of a VOA.

The three phases are:

• Phase 1 - Configuration Reporting
• Phase 2 - Performance Reporting
• Phase 3 - Capacity Reporting

For each Phase, a Report Template is available to you. There is also a Consolidated Report Template which you can use at the end to capture all the data from the VOA.

So let's now look at how you run the reports and analyse them. We will also look at some of the other areas to look for to help show the value of vRealize Operations Manager.
Phase 1 - Configuration Review

The first phase of a VOA can be carried out the day you install vROps and will generally involve the following activities:

1. Initial familiarization of the vROps UI. This is not covered in this lab. You can find more detail on using the vROps solution in Lab HOL-SDC-1801
2. Run the VOA Configuration Report - we will cover this next.
3. Discover Pain Points - we will highlight the key elements of the VOA Configuration Report that show some pain points commonly seen.

Check the Lab is Ready

Before we start this next section, please first check the lab is Ready.

If it is not, you may need to wait a few minutes until the status shows the lab is Ready.

Start Firefox

If Firefox is not already open, Double click on the Mozilla Firefox icon on your deskstop.

(Note: you can skip the next step to log in if you are already logged into vROps!)
Navigate to vRealize Operations Manager HVM Instance

When you open Firefox, you should land on the above page.

Select the **HVM vROps** bookmark or link provided.

The HVM is a virtual machine in the Historical View Mode that is used for the Hands-On Lab environment. It captures a point in time providing more data to work with in the lab.
Log into vRealize Operations Manager

Make sure that you are logging into https://vrops-hvm.corp.local. This is the HVM instance of vRealize Operations Manager for this lab. The HVM is a virtual machine in the Historical View Mode that is used for the Hands-On Lab environment. It captures a point in time providing more data to work with in the lab.

Log into vRealize Operations Manager using the credentials:

User name: admin
Password: VMware1!

Click on Login to continue.
Using vRealize Operations Manager in the Hands on Labs - Tips!

When we build labs for Hands on Labs we always default to a screen resolution of 1024 x 768. This is to allow the labs to work with any device, including laptops and tablets that people often bring to the BYOD section of VMworld.

Unfortunately, vROps doesn't always lend itself to such a low resolution. When you are working in this lab you may optionally:

1. Click on the configure icon to configure Firefox settings.
2. Change the scaling of the browser - 80% is usually good for seeing a lot more of the screen without sacrificing too much on screen quality or text size. In some cases you may need to change this back to 100% to see the full UI.
3. Collapse and re-open panels as needed.

We will highlight in this manual when you are may have to adjust resolution or collapse panels.
Navigate to Dashboards

To navigate to the Dashboards Page,

1. Click on Dashboards Button in the top menu.
Navigate to Reports

1. In the Dashboards Window Click on **Reports** in the left side bar.
2. Notice the four VOA reports that were installed in the Interactive Demonstration in Module 2.
Run the Phase 1 Configuration Report

Now that vROps is installed and running, we can run the Phase 1 report.

1. Click on the **[Phase 1] - Configuration Report of vSphere Optimization Assessment** row to select it.
2. Click on the Run Template icon.

Note: Occasionally in a Live Scenario, you may run the Configuration Report and the inventory displayed will be incomplete. This is due to running the report before the inventory collection of the environment is complete. Simply wait for a short time and run the report again.
Choose an Object to Run the Report Template Against

Now we need to select where we are going to run the Report Template.

In a VOA you will generally run it against the highest level object you can - you are wanting to see a single report about all the environment. You may, however, elect to run separate reports against different parts of your environment. Perhaps they have different vCenters monitoring your Test/Dev environments and your Production environment. In that case you may run reports against them separately as you may have different operational imperatives in them.

In this lab we will run the Report Template against the vSphere World object in the lab environment. Generally, this report would be run against objects in the inventory ranging from the vSphere World to a cluster object.

1. Click on the **arrow** to expand the hierarchy.
2. Click on the **vSphere World** object.
3. Click **OK** to run the Report.
Navigate to the Report

If we look at the Report Templates, you can see that the Generated reports link shows a report has been run.

Click on **Generated reports** to look at the Phase 1 reports.

Viewing the Report

The report status will show as Completed and you will see two download icons to download the report in either PDF or CSV format.

We will look at the report that we just ran in the HOL environment.

1. If the report Status shows "Processing" refresh the page until the Status shows as "Completed". The report should complete in 2-4 minutes.
2. Click on the **PDF** icon for the report that you just ran to view the report. (The CSV option is useful for very large environments, or when you want to consolidate, or manipulate, the data in large reports.)
Open the Generated Report

![Image of the generated report dialog box]

Click **OK** to view the generated report. (Note: The default reader may be SumatraPDF)
Navigating Chrome

If you need to adjust the size of the report to view it comfortably in your screen, first click within the Chrome browser window

1. Click on the Minus icon to reduce the zoom in the window.
2. To navigate through the report, use the scroll bar on the right.
Reviewing the Report

There are 9 different Views and Dashboards that make up the Configuration Assessment Report, covering all of the most important Configuration elements and values in a vSphere environment.

We won't cover every page of the report you ran in this lab, as many of them are self explanatory. We will look at some of the more relevant ones, and ones where we have made some (deliberate) mis-configurations in the lab environment.

We will also give you an example of how you could add additional detail to the report, or additional Views if the need arises.

Note: in our lab, the HVM environment has been created using a simulator tool our engineers use. This give us a lab scenario that is comparable to the 'real world'. This would be way above the normal allowable workload in Hands on Labs, if we weren't simulating the workload. As a result, some of the Metrics and Properties don't all appear in vROps, and some of the detail is a bit....well....different.
Cluster Configuration Summary Report

Scroll down to the Cluster Configuration Summary Report on page 3 and inspect the information. This report can quickly show if cluster level settings are configured correctly. In this report, we can quickly see that two of the clusters do not have HA or Admission Control enabled.
Cluster Configuration Summary Report


This gives a more detailed view of all the Clusters in the environment, how many resources they have, number of VMs and Datastores hosted. In this report, we can see that clusters **demo-comp-1** and **west-comp** do not have HA enabled.
Host Configuration Summary Report

Next scroll down to the Hosts Configuration Summary Report.

This provides some key summary information regarding your hosts. This can be particularly useful in large environments - you can see at a glance how many hosts are disconnected or in maintenance mode as well as the split of vSphere versions that your hosts are running.
Host Hardware Overview Report

Now scroll down to **Host Hardware Overview Report**.

This is a list with more detail about all the hosts in the environment, and allows you to easily see their configuration. In this report, we can see that Hyperthreading is available and enabled on all hosts.

In a very large environment, this may be useful in CSV format, as you may want to sort the columns as you analyse. The report can be saved as either PDF, or CSV within vRealize Operations Manager.
Host Status Overview Report

7. Host Status Overview Report - Key settings for the hosts in the environment including SSH and NTP

VSphere Optimization Assessment Phase 1 Summary listing the status of key settings for the hosts in the environment including SSH and NTP.

You will want to investigate each host if SSH is disabled. VMware best practice is to disable SSH for security reasons on your hosts.

Dec 26, 2016 01:02 - Jan 02, 2017 01:02 (Pacific Standard Time)

<table>
<thead>
<tr>
<th>Name</th>
<th>Version</th>
<th>Maintenance State</th>
<th>SSH Running</th>
<th>NTP Running</th>
<th>Parent vCenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>w2-mgmtmpm-1.mgmt.local</td>
<td>6.0.0-3620759</td>
<td>notInMaintenance</td>
<td>true</td>
<td>true</td>
<td>vc_mgmt</td>
</tr>
<tr>
<td>w2-mgmtmpm-10.mgmt.local</td>
<td>6.0.0-3620759</td>
<td>notInMaintenance</td>
<td>true</td>
<td>true</td>
<td>vc_east</td>
</tr>
<tr>
<td>w2-mgmtmpm-11.mgmt.local</td>
<td>6.0.0-3620759</td>
<td>notInMaintenance</td>
<td>true</td>
<td>true</td>
<td>vc_lab</td>
</tr>
<tr>
<td>w2-mgmtmpm-12.mgmt.local</td>
<td>6.0.0-3620759</td>
<td>notInMaintenance</td>
<td>true</td>
<td>true</td>
<td>vc_lab</td>
</tr>
<tr>
<td>w2-mgmtmpm-13.mgmt.local</td>
<td>6.0.0-3620759</td>
<td>notInMaintenance</td>
<td>true</td>
<td>true</td>
<td>vc_west</td>
</tr>
<tr>
<td>w2-mgmtmpm-14.mgmt.local</td>
<td>6.0.0-3620759</td>
<td>notInMaintenance</td>
<td>true</td>
<td>true</td>
<td>vc_west</td>
</tr>
<tr>
<td>w2-mgmtmpm-15.mgmt.local</td>
<td>6.0.0-3620759</td>
<td>notInMaintenance</td>
<td>true</td>
<td>true</td>
<td>vc_west</td>
</tr>
<tr>
<td>w2-mgmtmpm-16.mgmt.local</td>
<td>6.0.0-3620759</td>
<td>notInMaintenance</td>
<td>true</td>
<td>true</td>
<td>vc_west</td>
</tr>
<tr>
<td>w2-mgmtmpm-2.mgmt.local</td>
<td>6.0.0-3620759</td>
<td>notInMaintenance</td>
<td>true</td>
<td>true</td>
<td>vc_mgmt</td>
</tr>
<tr>
<td>w2-mgmtmpm-3.mgmt.local</td>
<td>6.0.0-3620759</td>
<td>notInMaintenance</td>
<td>true</td>
<td>true</td>
<td>vc_mgmt</td>
</tr>
<tr>
<td>w2-mgmtmpm-4.mgmt.local</td>
<td>6.0.0-3620759</td>
<td>notInMaintenance</td>
<td>true</td>
<td>true</td>
<td>vc_mgmt</td>
</tr>
</tbody>
</table>

Next, scroll down to **Host Status Overview Report**.

This provides information on key settings for the hosts in your environment. In this report, we can see that all hosts are running the same version of vSphere and have SSH running.
The next report is the **VM OS Summary Report** which is self-explanatory, displaying a pie chart of the Guest Operating System of Virtual Machines.

**Scroll down** to the next report, the **VM Compute Summary Report**, a dashboard showing you configuration details of the Virtual Machine Hardware as can be seen on the screenshot.

It highlights the distribution of VMs with particular vCPU and Memory configuration. It also lists the top 5 snapshots in your environment. Often when people see this, they put the report to one side and go and fix the snapshots they didn't realize existed!!
Close the Report and Go Back to vROps

We have now covered the bulk of the VOA Configuration Assessment Report. Click on the X in the corner to close Chrome and return to vROps.
Create a New View

7. Host Status Overview Report - Key settings for the hosts in the environment including SSH and NTP

Jan 24, 2018 08:17 - Jan 31, 2019 09:17 (Coordinated Universal Time)

<table>
<thead>
<tr>
<th>Name</th>
<th>Version</th>
<th>Maintenance State</th>
<th>SSH Running</th>
<th>NTP Running</th>
<th>Parent vCenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>esx-01a.corp.local</td>
<td>6.0.0.2494585</td>
<td>notInMaintenance</td>
<td>true</td>
<td>false</td>
<td>vsrx-01a.corp.local adapter</td>
</tr>
<tr>
<td>esx-02a.corp.local</td>
<td>6.0.0.2494585</td>
<td>notInMaintenance</td>
<td>true</td>
<td>false</td>
<td>vsrx-01a.corp.local adapter</td>
</tr>
<tr>
<td>vesxi-1.corp.local</td>
<td>5.5.0.1973521</td>
<td>notInMaintenance</td>
<td>true</td>
<td>false</td>
<td>vsrx-01a.corp.local adapter</td>
</tr>
<tr>
<td>vesxi-2.corp.local</td>
<td>5.5.0.1973521</td>
<td>notInMaintenance</td>
<td>true</td>
<td>false</td>
<td>vsrx-01a.corp.local adapter</td>
</tr>
<tr>
<td>vesxi-3.corp.local</td>
<td>5.5.0.1973521</td>
<td>notInMaintenance</td>
<td>true</td>
<td>false</td>
<td>vsrx-01a.corp.local adapter</td>
</tr>
<tr>
<td>vesxi-4.corp.local</td>
<td>5.5.0.1973521</td>
<td>notInMaintenance</td>
<td>true</td>
<td>false</td>
<td>vsrx-01a.corp.local adapter</td>
</tr>
<tr>
<td>vesxsi-5.corp.local</td>
<td>5.5.0.1973521</td>
<td>notInMaintenance</td>
<td>true</td>
<td>false</td>
<td>vsrx-01a.corp.local adapter</td>
</tr>
</tbody>
</table>

Let’s look at how we can create a View. The report example above shows an environment where NTP is not running on some of the hosts. This would lead you to believe that NTP is not fully configured and worth investigating in more detail.

With all the Host properties now being collected by vROps, and with the Views and Report engine, this is a very quick and simple thing to do. Lets go ahead and create a more detailed NTP View to see more detail.
Add a New View

First we need to create a new View.

1. Click on the Dashboard Menu Item in the top menu.
2. Click on Views.
3. Click on the green Plus icon to add a new View.
Name the View

My VOA Cluster Summary List View - New View

1. Add a Name for your View - My VOA Cluster Summary List View.
2. Add a Description - A list view of VOA Cluster Information.
3. Click on 2. Presentation to move to the next section.
List View

My VOA Cluster Summary List View - New View

1. Name and Description
2. Presentation
   - List
   - Summary
   - Trend
   - Distribution
   - Text
   - Image

List:
List views provide tabular data about specific objects in the monitored environment that correspond to the selected view.

Configuration
Items per page: 50

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name 1</td>
<td>Property Value 1</td>
<td>Value 1</td>
</tr>
<tr>
<td>Name 2</td>
<td>Property Value 2</td>
<td>Value 2</td>
</tr>
<tr>
<td>Object Name 3</td>
<td>Property Value 3</td>
<td>Value 3</td>
</tr>
<tr>
<td>Object Name 4</td>
<td>Property Value 4</td>
<td>Value 4</td>
</tr>
<tr>
<td>Object Name 5</td>
<td>Property Value 5</td>
<td>Value 5</td>
</tr>
</tbody>
</table>

This is going to be a list of Hosts so:

1. Click on List to select the Presentation type.
2. Click on Subjects to move to the next section.
The subject of this Report is going to be **Hosts** so:

1. Click on the **arrow** to expand the object list.
2. If necessary **Scroll down** to access the vCenter Adapter object.
3. Click on the **arrow** next to **vCenter Adapter** to open that and see the vCenter Adapter object types.
1. Click on Cluster Compute Resource to select it.
2. Click on 4. Data to move to the next section.
Find the NTP Properties

The initial tree on this screen is a list of **Metrics**, however, we want to use **Properties** in our View.

1. Click on the drop down and change the selection to **Properties**.
2. The filter box will limit the properties on display to those related to your search string. A really easy way of hunting for the Property you are looking for.
Find the Properties

Expand the tree as above until you can see the **DRS Configuration** properties.

Next we will add this into the View.
Add the DRS Enabled Property

Double Click (or drag) on **Enabled** to populate the data box.

**Rename the Label**

To make the label more meaningful type **DRS Enabled** in the Metric Label box. If you don't, the property will be called **Cluster Configuration | DRS | Enabled** in the View.
Add Another Property

We can add additional properties to the View.

1. Expand the view under **Configuration**.
2. Drag the **Name** property into the data box.
3. Change the label to **Cluster Name**.

Save the View

We don't need to make any changes to **Visibility** so click on **Save** to save your new NTP View.

*Again, as in previous steps, you may need to change Firefox's resolution to see the Save button.*
Confirm the View Has Been Created

The View you created may not show in the Views screen. To locate it we can use the Filter box. Type My VOA in the filter box and hit enter.

Looking at the new View in the vROps UI

Now let's go and look at what that new View we created looks like in the UI.
First we need to browse to an object we want to show the View against.

1. Click on the **Environment** tab.
2. Click on **vSphere Hosts and Clusters**.

**Expand the Hierarchy**

1. Click on arrow next to **vSphere World** and then the arrow next fo **VC Lab** to expand the hierarchy of vSphere objects.
2. Click on the **VC Lab** adapter vCenter object to select it.
3. This will set the context of the dashboard to that object as you can see in the screenshot.
Expand the All Metrics Tab

1. Click on the **Arrow** to expand the All Metrics Menu.
Find the View

1. Click on the **Details** tab to navigate to the Views and Heatmaps dashboard. (you may need to expand the menu by clicking **more**)

2. We need to filter the list to find the View. Enter **My VOA** into the filter box and hit Enter.

3. The view we created should appear and be selected at the top of the list.

View the Results

You will see in the bottom panel of the dashboard the results of your View.

You can see that the DRS is enabled in both of the clusters.

We could now highlight the vSphere World Object and see the results for all clusters in the environment.
This is an excellent example of using the VOA to find existing problems in your environment and then using vROps to further investigate the issue found.

That completes Phase 1 which assesses the configuration of your environment.
Phase 2 - Performance Review

The second Show phase of a VOA is generally carried out 15 days after you install vRealize Operations Manager and will generally involve the following activities:

1. Provide further User orientation of the vRealize Operations Manager UI - generally looking at how the solution can be customized to meet specific client requirements. This is not covered in this lab. You can find more detail on using the vRealize Operations Manager solution in HOL-SDC-1701 and HOL-SDC-1710 series of labs.
2. Run the VOA Performance Report - we will cover this next
3. Highlight the Health Data and talk about some of the troubleshooting capability.

Verify the Lab is Ready

Before we start this next section, please first check the lab is Ready.

If it is not, you may need to wait a few minutes until the status shows the lab is Ready.

NOTE: If you are continuing this lab from the previous module, you can skip forward to Navigate to Content.

Start Firefox

If Firefox is not already open, Double click on the Mozilla Firefox icon on your desktop.

(note: you can skip the next step to log in if you are already logged into vROps!)
Navigate to vRealize Operations Manager HVM Instance

When you open Firefox, you should land on the above page.

Select the **HVM vROps** bookmark provided.

The HVM is a virtual machine in the Historical View Mode that is used for the Hands-On Lab environment. It captures a point in time providing more data to work with in the lab.
Log into vRealize Operations Manager

Make sure that you are logging into https://vrops-hvm.corp.local. This is the HVM instance of vRealize Operations Manager for this lab. The HVM is a virtual machine in the Historical View Mode that is used for the Hands-On Lab environment. It captures a point in time providing more data to work with in the lab.

Log into vROps using the credentials:

User name: admin

Password: VMware1!
Click on Login to continue.

Using vRealize Operations Manager in the Hands on Labs - Tips!

When we build labs for Hands on Labs we always default to a screen resolution of 1024 x 768. This is to allow the labs to work with any device, including laptops and tablets that people often bring to the BYOD section of VMworld.

Unfortunately, vRealize Operations Manager doesn't always lend itself to such a low resolution. When you are working in this lab you may optionally:

1. Click on the configure icon to configure Firefox settings.
2. Change the scaling of the browser - 80% is usually good for seeing a lot more of the screen without sacrificing too much on screen quality or text size. In some cases you may need to change this back to 100% to see the full UI.
3. Collapse and re-open panels as needed.

We will highlight in this manual when you are may have to adjust resolution or collapse panels.
Navigate to Dashboards

To navigate to the Dashboards Area, click on the **Dashboards** top menu item.
Navigate to Reports

1. Click on Reports.
2. Notice the four VOA reports that were installed in the Interactive Demonstration in Module 2.

Run the Phase 2 Performance Report
Now let's run the Phase 2 report.

1. Click on the [Phase 2] - Performance Report of vSphere Optimization Assessment row to select it.
2. Click on the Run Template icon.

Choose an Object to Run the Report Template Against

Now we need to select where we are going to run the Report Template.

In a VOA you will generally run it against the highest level object you can - you are wanting to see a single report about all the environment. You may, however, elect to run separate reports against different parts of your environment. Perhaps they have different vCenters monitoring your Test/Dev environments and your Production environment. In that case you may run reports against them separately as you may have different operational imperatives in them.

In this lab we will run the Report Template against the vSphere World object in the lab environment. Generally, this report would be run against objects in the inventory ranging from the vSphere World to a cluster object.

1. Click on the arrow to expand the hierarchy.
2. Click on the **vSphere World** object.
3. Click **OK** to run the Report.

### Navigate to the Generated Reports

![Generated Reports Table]

Click on **Generated reports** to look at the Phase 2 reports.

### Viewing the Report

![Report Status]

The report status will show as Completed and you will see two download icons to download the report in either PDF or CSV format.

We will look at the report that we just ran in the HOL environment.

1. If the report Status shows "Processing" refresh the page until the Status shows as "Completed".
2. Click on the **PDF** icon for the report that you just ran to view the report. (The CSV option is useful for very large environments, or when you want to consolidate, or manipulate, the data in large reports.)

**Open the Generated Report**

![](image)

Click **OK** to view the generated report.
Navigating Chrome

If you need to adjust the size of the report to view it comfortably in your screen, first click within the Chrome browser window

1. Click on the **Minus** icon to reduce the zoom in the window.
2. To navigate through the report, use the **scroll bar** on the right.
Reviewing the Report

There are 12 Dashboards and Views that make up the Performance Review Report, covering all of the most important performance issues in your vSphere environment.

Let's have look at some of this and how you can use them.
Warning on No Data

It is quite common, particularly in well run production environments, for there not to be performance issues in particular areas. If everything was performing badly you are probably already troubleshooting it!

In this lab, due to the use of Historical View Mode (HVM) there are limitations in capturing some performance data so you will see a number of the report sections show No Data.
Host Utilization

Scroll down to the first report **Top 5 Host by Usage Report** which shows Host Utilization. This is summarizing the top 5 Hosts for the previous 7 days with respect to CPU, Memory, IOPS and Network demand.

This will show you your most utilized hosts and the metrics will let you know if they are being over worked.

*Note: Due to some limitations using vROps in HVM mode in the Hands on Lab, some of these dashboard shots do not get populated with data - if this happens in your lab we apologize - please refer to this screenshot which shows the data that should be shown.*

Stressed Hosts

Now scroll down to Stressed Host Performance Report. We can see that our host has high CPU and memory workloads. This is something we would need to investigate further to make sure we do not encounter any performance issues in our environment.
The next report is self explanatory - **Host Network Packets Drop Report.** This report will help you identify any potential network issues.

Now scroll down to **Host Storage Adapter Latency > 15 ms Report.**

We can see that we do have a hosts whose storage adapters are showing latency, which can indicate performance issues in our environment. This is a great report to show the value of vROps. Even if there are no apparent performance issues in an environment, we will be able to see if latency is starting to increase in an environment which would eventually lead to decreased performance of the VM's.
Datastore Latency

The next report, **Datastore Latency > 15ms Report** allows you to see the latency data as it pertains to a particular datastore. If we were to see latency on a particular datastore, we would want to investigate that more closely. You might show datastore latency where you are hosting two database servers, doing a Storage vMotion to move the workloads to another datastore might alleviate the issue.

**VM utilization**

8. **Top 10 VMs by Usage Report 1 (7 Days)**

Now Scroll to the **Top 10 VMs by Usage Report** which shows our VMs with highest CPU and memory usage over the last 7 days.
Scroll down and you will see the next two dashboards show the VMs with highest Disk IOPS, Network Usage and Memory Swap/Ballooning.

These dashboards will all help you focus in on the VMs that may need more resources or require further investigation.

*Note: due to some limitations using vROps in HVM mode in the Hands on Lab, some of these dashboard shots do not get populated with data - if this happens in your lab we apologize - please refer to this screenshot which shows the data that should be shown.*

### VM CPU Diagnose Report

<table>
<thead>
<tr>
<th>Name</th>
<th>Parent Host</th>
<th>Contention % (Max)</th>
<th>Swap wait % (at CPU)</th>
<th>IO Wait % (at CPU)</th>
<th>Co-stop % (at CPU)</th>
<th>Idle % (at CPU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mgmt-sqinode01</td>
<td>w2-mgmtmyn-7.mgmt.local</td>
<td>13.82 %</td>
<td>0 %</td>
<td>0.0039 %</td>
<td>0 %</td>
<td>0.53 %</td>
</tr>
<tr>
<td>vrops-hvm</td>
<td>w2-mgmtmyn-5.mgmt.local</td>
<td>8.55 %</td>
<td>0 %</td>
<td>0.0019 %</td>
<td>0.0005 %</td>
<td>0.7 %</td>
</tr>
<tr>
<td>win-apptier5</td>
<td>w2-vm-oa-idx.mgmt.local</td>
<td>8.14 %</td>
<td>0 %</td>
<td>0.0015 %</td>
<td>0 %</td>
<td>0.75 %</td>
</tr>
<tr>
<td>win-apptier3</td>
<td>w2-vm-oa-mgmt.local</td>
<td>7.82 %</td>
<td>0 %</td>
<td>0.0013 %</td>
<td>0 %</td>
<td>0.75 %</td>
</tr>
<tr>
<td>hp-oneview</td>
<td>w2-mgmtmyn-3.mgmt.local</td>
<td>7.79 %</td>
<td>0 %</td>
<td>0.0009 %</td>
<td>0 %</td>
<td>0.75 %</td>
</tr>
<tr>
<td>vrops-demo</td>
<td>w2-mgmtmyn-4.mgmt.local</td>
<td>6.74 %</td>
<td>0 %</td>
<td>0.0018 %</td>
<td>0.0002 %</td>
<td>0.72 %</td>
</tr>
</tbody>
</table>

Now Scroll to the **VM CPU Diagnose Report** which shows VMs with CPU demand higher than the usage. This can be an indication of CPU swap wait, IO wait, or co-stop issues.

Scroll down and you will see the next two reports show the VMs with memory stress and VM disk latency.

These reports will all help you focus in on the VMs that may need more resources or require further investigation.

*Note: due to some limitations using vRealize Operations Manager in HVM mode in the Hands on Lab, some of these dashboard shots do not get populated with data - if this happens in your lab we apologize - please refer to this screenshot which shows the data that should be shown.*
Finally, scroll down to page which shows us the Top 5 Health Alerts. In this environment, we only have one Health alert - we can see a Virtual Machine is running out of disk space.

In most environments, you would expect to see a few more alerts and as you can see from the above example, they are generally fairly verbose, offering remediation recommendations.
Close the Report and Go Back to vRealize Operations Manager

Click on the X in the corner to close Chrome and return to vRealize Operations Manager. That concludes the Phase 2 VOA Report.
Phase 3 - Capacity Utilization Review

The third and final phase of a VOA is generally carried out 30 days after you install vROps and will generally involve the following activities:

1. Run the VOA Capacity Report - we will cover this next
2. Run the Final Consolidated Report

Verify the Lab is Ready

Before we start this next section, please first check the lab is Ready.

If it is not, you may need to wait a few minutes until the status shows the lab is Ready.

NOTE: If you are continuing this lab from the previous module, you can skip forward to Navigate to Content.

Start Firefox

If Firefox is not already open, Double click on the Mozilla Firefox icon on your desktop.
Navigate to vRealize Operations Manager HVM Instance

When you open Firefox, you should land on the above page.

Select the **HVM vROps** bookmark provided.

The HVM is a virtual machine in the Historical View Mode that is used for the Hands-On Lab environment. It captures a point in time providing more data to work with in the lab.
Log into vRealize Operations Manager

Make sure that you are logging into https://vrops-hvm.corp.local. This is the HVM instance of vRealize Operations Manager for this lab. The HVM is a virtual machine in the Historical View Mode that is used for the Hands-On Lab environment. It captures a point in time providing more data to work with in the lab.

Log into vRealize Operations Manager using the credentials:

User name: admin
Password: **VMware1!**

Click on **Login** to continue.

## Using vRealize Operations Manager in the Hands on Labs - Tips!

![vRealize Operations Manager screenshot]

When we build labs for Hands on Labs we always default to a screen resolution of 1024 x 768. This is to allow the labs to work with any device, including laptops and tablets that people often bring to the BYOD section of VMworld.

Unfortunately, vROps doesn't always lend itself to such a low resolution. When you are working in this lab you may optionally:

1. Click on the configure icon to configure Firefox settings.
2. Change the scaling of the browser - 80% is usually good for seeing a lot more of the screen without sacrificing too much on screen quality or text size. In some cases you may need to change this back to 100% to see the full UI.
3. Collapse and re-open panels as needed.

We will highlight in this manual when you are may have to adjust resolution or collapse panels.
Navigate to Dashboards

To navigate to the Dashboard Page, click on the **Dashboard** Menu item.
Navigate to Reports

1. Click on Reports.
2. Notice the four VOA reports that were installed in the Interactive Demonstration in Module 2.
Run the Phase 3 Performance Report

Now let's run the Phase 2 report.

2. Click on the Run Template icon.

Choose an Object to Run the Report Template Against

Now we need to select where we are going to run the Report Template.
In a VOA you will generally run it against the highest level object you can - you are wanting to see a single report about all the environment. You may, however, elect to run separate reports against different parts of your environment. Perhaps they have different vCenters monitoring your Test/Dev environments and your Production environment. In that case you may run reports against them separately as you may have different operational imperatives in them.

In this lab we will run the Report Template against the vSphere World object in the lab environment. Generally, this report would be run against objects in the inventory ranging from the vSphere World to a cluster object.

1. Click on the **arrows** to expand the hierarchy.
2. Click on the **vSphere World** object.

### Navigate to the Generated Reports

![Generated Reports](image)

Click on **Generated reports** to look at the Phase 3 reports.
Viewing the Report

The report status will show as Completed and you will see two download icons to download the report in either PDF or CSV format.

We will look at the report that we just ran in the HOL environment.

1. If the report Status shows "Processing" refresh the page until the Status shows as "Completed".
2. Click on the PDF icon for the report that you just ran to view the report. (The CSV option is useful for very large environments, or when you want to consolidate, or manipulate, the data in large reports.)

Open the Generated Report

Click OK to view the generated report.
Navigating Chrome

If you need to adjust the size of the report to view it comfortably in your screen, first click within the Chrome browser window

1. Click on the **Minus** icon to reduce the zoom in the window.
2. To navigate through the report, use the **scroll bar** on the right.
Reviewing the Report

The Capacity Assessment report looks at two main areas:

How much capacity have you left for additional workload?

How much waste is there that you could claim back to provide more capacity for additional workload?

Capacity Placement Dashboard
Scroll to the Capacity Placement Dashboard.

This shows how balanced the utilisation of your Clusters and VMs is.

1. In this example, you will see that there are two clusters that are shown as 'Overutilized', with the remaining clusters considered 'Optimal'
2. With the VMs, many of them are 'Optimal' however there are several 'Underutilised' and 'Overutilized'.

We will see these in more detail later in the report. In the report, this dashboard is static, however it is interactive in the vROps UI so lets go and take a look...

**Navigate Back to vROps**

Click on the Firefox tab in your taskbar to navigate back to vROps.

**Select a New Dashboard**

1. Click on the Home icon to return to the Recommendations dashboard.
2. Click on the Dashboard Menu Item.

HOL-1801-06-CMP
Select the Capacity Placement Report

1. Click on the **All Dashboard** dropdown.
2. Click on the **VOA** dashboard list.
3. Select the **Capacity Placement Report**.
Workload Balancing

This dashboard shows how balanced your resources and workloads are. To interact with it, simply hover over the resources you are interested in and a pop up box will provide more information. You can click on the icon or 'Details' in the pop up box to drill down into the object's dashboard.

In the above example we are hovering over mgmt-mgmt Cluster and we can see it is over capacity and constrained by CPU Demand.

Return to the Report

Click on the Firefox tab in your taskbar to navigate back to the report.
Cluster Capacity Remaining

Now scroll down to the **Cluster Capacity Remaining Report**.

Here you can see in more detail the capacity of your clusters. You can see CPU, Memory and Disk Space remaining for each cluster as well as when they are going to run out of capacity.

Scroll down to the next section of the report and you will see in this environment we don't have any Datastores with low capacity.
VM Capacity Dashboard

Scrolling down and you will see a Dashboard showing the Top 5 Capacity Risk Report showing VMs with low capacity and time remaining as well as the most stressed VMs and those with the highest waste.
Wasted VM CPU

Scroll down to **VM CPU Right Sizing Report** which highlights CPU resources that can be reclaimed from VMs. You can see that the majority of the VM's have CPU resources that can be reclaimed.
## Wasted VM Memory

### VM Mem Right Sizing Report - VMs that are Oversized for Mem and Powered ON

<table>
<thead>
<tr>
<th>Name</th>
<th>Mem Provisioned</th>
<th>Mem Recommended</th>
<th>Mem Reclaimable</th>
<th>Mem Demand % Avg</th>
<th>Mem Demand % Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>bca-e-ora12c</td>
<td>64 GB</td>
<td>3.07 GB</td>
<td>60.93 GB</td>
<td>1.96 %</td>
<td>5 %</td>
</tr>
<tr>
<td>mgmt-e-eme12c</td>
<td>64 GB</td>
<td>3.66 GB</td>
<td>60.34 GB</td>
<td>2.63 %</td>
<td>6 %</td>
</tr>
<tr>
<td>BW_HANA3</td>
<td>60 GB</td>
<td>2 GB</td>
<td>58 GB</td>
<td>0.98 %</td>
<td>4 %</td>
</tr>
<tr>
<td>bwhanaapp3</td>
<td>39.06 GB</td>
<td>3.47 GB</td>
<td>35.59 GB</td>
<td>3.83 %</td>
<td>12 %</td>
</tr>
<tr>
<td>vmi-plat2</td>
<td>60 GB</td>
<td>31.86 GB</td>
<td>28.14 GB</td>
<td>5.43 %</td>
<td>75 %</td>
</tr>
<tr>
<td>vmi-plat</td>
<td>60 GB</td>
<td>31.98 GB</td>
<td>28.02 GB</td>
<td>10.38 %</td>
<td>70 %</td>
</tr>
<tr>
<td>vmi-plat3</td>
<td>60 GB</td>
<td>32.1 GB</td>
<td>27.9 GB</td>
<td>9.11 %</td>
<td>75 %</td>
</tr>
<tr>
<td>vRND2</td>
<td>64 GB</td>
<td>44.21 GB</td>
<td>19.79 GB</td>
<td>16.96 %</td>
<td>77 %</td>
</tr>
<tr>
<td>vROps6-HYM2</td>
<td>28 GB</td>
<td>12.86 GB</td>
<td>15.14 GB</td>
<td>6.67 %</td>
<td>63 %</td>
</tr>
<tr>
<td>vRNI-mgmt-plat</td>
<td>32 GB</td>
<td>17.02 GB</td>
<td>14.98 GB</td>
<td>21.21 %</td>
<td>77 %</td>
</tr>
<tr>
<td>SAP_DB</td>
<td>15.62 GB</td>
<td>2.22 GB</td>
<td>13.41 GB</td>
<td>5.69 %</td>
<td>21 %</td>
</tr>
<tr>
<td>nsx-mgr-demo</td>
<td>16 GB</td>
<td>2.65 GB</td>
<td>13.35 GB</td>
<td>3.38 %</td>
<td>30 %</td>
</tr>
<tr>
<td>vr7-01a-mgmt</td>
<td>18 GB</td>
<td>5.12 GB</td>
<td>12.88 GB</td>
<td>12.04 %</td>
<td>39 %</td>
</tr>
<tr>
<td>vr71</td>
<td>18 GB</td>
<td>5.27 GB</td>
<td>12.73 GB</td>
<td>14.71 %</td>
<td>33 %</td>
</tr>
<tr>
<td>vr7a01a-demo</td>
<td>18 GB</td>
<td>5.44 GB</td>
<td>12.56 GB</td>
<td>12.33 %</td>
<td>41 %</td>
</tr>
<tr>
<td>lab-rsmgr01</td>
<td>16 GB</td>
<td>3.55 GB</td>
<td>12.45 GB</td>
<td>8.93 %</td>
<td>29 %</td>
</tr>
<tr>
<td>nsx-mgr-wes</td>
<td>16 GB</td>
<td>3.77 GB</td>
<td>12.23 GB</td>
<td>11.72 %</td>
<td>29 %</td>
</tr>
<tr>
<td>nsx-mgr-east</td>
<td>16 GB</td>
<td>3.93 GB</td>
<td>10.97 GB</td>
<td>19.77 %</td>
<td>35 %</td>
</tr>
<tr>
<td>vrops-hvm</td>
<td>32 GB</td>
<td>22.33 GB</td>
<td>9.67 GB</td>
<td>34.53 %</td>
<td>58 %</td>
</tr>
</tbody>
</table>

Scroll down to **VM Mem Right Sizing Report** which highlights Memory resources that can be reclaimed from VMs. As you can see in the Memory right sizing report there are a large number of VMs with memory that can be reclaimed.
Under Provisioned VMs

### VMs Underprovisioned Report - Consider Adding Resources

<table>
<thead>
<tr>
<th>Name</th>
<th>CPU Provisioned</th>
<th>CPU Recommended</th>
<th>CPU Demand Avg %</th>
<th>CPU Demand Max %</th>
<th>Mem Provisioned</th>
<th>Mem Recommended</th>
<th>Mem Demand Avg %</th>
<th>Mem Demand Max %</th>
</tr>
</thead>
<tbody>
<tr>
<td>BW_HANA3</td>
<td>4 Cores</td>
<td>6 vCPUs</td>
<td>65.59 %</td>
<td>90.33 %</td>
<td>60 GB</td>
<td>2 GB</td>
<td>0.64 %</td>
<td>4.06 %</td>
</tr>
<tr>
<td>HM-Win10</td>
<td>2 Cores</td>
<td>3 vCPUs</td>
<td>23.56 %</td>
<td>97.4 %</td>
<td>4 GB</td>
<td>3.47 GB</td>
<td>15.33 %</td>
<td>92.56 %</td>
</tr>
<tr>
<td>IIS WebApp1</td>
<td>2 Cores</td>
<td>6 vCPUs</td>
<td>47.76 %</td>
<td>113.53 %</td>
<td>4 GB</td>
<td>2.5 GB</td>
<td>5.59 %</td>
<td>94.19 %</td>
</tr>
<tr>
<td>W2K8R201</td>
<td>1 Cores</td>
<td>1 vCPUs</td>
<td>14.32 %</td>
<td>94.07 %</td>
<td>4 GB</td>
<td>8.89 GB</td>
<td>16.36 %</td>
<td>80.66 %</td>
</tr>
<tr>
<td>WIN85401</td>
<td>1 Cores</td>
<td>1 vCPUs</td>
<td>4.75 %</td>
<td>11.5 %</td>
<td>4 GB</td>
<td>2.61 GB</td>
<td>18.12 %</td>
<td>55.59 %</td>
</tr>
<tr>
<td>bna-west</td>
<td>2 Cores</td>
<td>4 vCPUs</td>
<td>5.02 %</td>
<td>108.33 %</td>
<td>6 GB</td>
<td>6.41 GB</td>
<td>52 %</td>
<td>94.79 %</td>
</tr>
<tr>
<td>dhcp-eart</td>
<td>1 Cores</td>
<td>2 vCPUs</td>
<td>1.35 %</td>
<td>94.95 %</td>
<td>2 GB</td>
<td>1.83 GB</td>
<td>10.09 %</td>
<td>84.06 %</td>
</tr>
<tr>
<td>EMC-SE-MGMT</td>
<td>1 Cores</td>
<td>3 vCPUs</td>
<td>38.17 %</td>
<td>110.13 %</td>
<td>2 GB</td>
<td>512 MB</td>
<td>6.37 %</td>
<td>19.59 %</td>
</tr>
<tr>
<td>mgmt-sqnode01</td>
<td>4 Cores</td>
<td>6 vCPUs</td>
<td>17.52 %</td>
<td>96.92 %</td>
<td>4 GB</td>
<td>8.89 GB</td>
<td>48.6 %</td>
<td>98.99 %</td>
</tr>
<tr>
<td>mgmt-wa02</td>
<td>1 Cores</td>
<td>2 vCPUs</td>
<td>2.88 %</td>
<td>71.33 %</td>
<td>2 GB</td>
<td>1.46 GB</td>
<td>19 %</td>
<td>47.32 %</td>
</tr>
<tr>
<td>mgmt-wl-mbox02</td>
<td>4 Cores</td>
<td>5 vCPUs</td>
<td>7.21 %</td>
<td>99.27 %</td>
<td>8 GB</td>
<td>6.38 GB</td>
<td>17.98 %</td>
<td>88.32 %</td>
</tr>
<tr>
<td>msb-view</td>
<td>2 Cores</td>
<td>5 vCPUs</td>
<td>5.29 %</td>
<td>104.93 %</td>
<td>4 GB</td>
<td>3.37 GB</td>
<td>19.58 %</td>
<td>84.79 %</td>
</tr>
<tr>
<td>scom-mgmt</td>
<td>4 Cores</td>
<td>2 vCPUs</td>
<td>3.95 %</td>
<td>30.19 %</td>
<td>6 GB</td>
<td>13.33 GB</td>
<td>21.67 %</td>
<td>54.86 %</td>
</tr>
<tr>
<td>vRNI02</td>
<td>16 Cores</td>
<td>41 vCPUs</td>
<td>26.19 %</td>
<td>115.03 %</td>
<td>64 GB</td>
<td>44.21 GB</td>
<td>16.51 %</td>
<td>75 %</td>
</tr>
<tr>
<td>vrni-plat</td>
<td>12 Cores</td>
<td>31 vCPUs</td>
<td>38.76 %</td>
<td>115.45 %</td>
<td>60 GB</td>
<td>31.98 GB</td>
<td>9.85 %</td>
<td>75 %</td>
</tr>
<tr>
<td>w2k12-02</td>
<td>2 Cores</td>
<td>6 vCPUs</td>
<td>46.9 %</td>
<td>115.4 %</td>
<td>4 GB</td>
<td>620 MB</td>
<td>5.24 %</td>
<td>15.12 %</td>
</tr>
<tr>
<td>win-appier1</td>
<td>1 Cores</td>
<td>3 vCPUs</td>
<td>50.23 %</td>
<td>118.6 %</td>
<td>4 GB</td>
<td>3.34 GB</td>
<td>8.95 %</td>
<td>91.99 %</td>
</tr>
</tbody>
</table>

Scroll down to **VMs Underprovisioned Report** which will help identify VM's that can are running at high utilization levels. You can see in this report that there are several VM's which would benefit from additional vCPU and Memory.
Idle VMs

Scroll down to Idle VMs Details Report.

In this section you can see VMs that vROps has determined are idle and therefore probably candidates for deletion. You can see how much CPU, Memory and Disk resources you would reclaim.
The next page of the report shows **Powered Off VMs**. Again, these will be candidates for deletion. In this case you would only be reclaiming back disk space as they are not consuming CPU or Memory resources when powered off.
Reclaimable Snapshots

Scroll to **VM Snapshots Report - Potential to Reclaim Disk** to show VM's with old snapshots in the environment.

Out of the box, vROps is configured to consider a snapshot 'Old' when it is older than 180 days. Most people would consider a much shorter period as being 'Old', generally 3-7 days. You can configure this setting in the Default Policy - this is shown in Module 2 of this lab.
Total Reclaimable Resources

The final page shows a summary of the Total Reclaimable Resources available in the environment.

Close the Report and Go Back to vROps

Click on the X in the corner to close Chrome and return to vROps.
Looking at Capacity in the UI

Now, let's look a little further into Capacity:

1. Click on the Environment menu item.
2. Click on vsphere Hosts and Clusters.

Expand the All Metrics Tab
1. Click on the **Arrow** next to the vSphere World Environment.
2. Click on **VC East** to expand the vCenter.
3. Click on the **All Metrics** Item to expose the metrics.

**Looking at Overall Capacity**

1. Click on the **Analysis** tab (note: You may have to click on the More... button)
2. Click on the **Capacity Remaining** badge.
3. You can drag the **Collapse Arrow** to the left if you need additional room on the screen.
Understanding the Graphic

This screen is very powerful...but what does it show?

1. The main bar chart visualizes how much capacity is available in the Hosts, Clusters and Storage the vCenter is managing.
2. The Green section is how much of this useable capacity we have consumed (88%).
3. The Blue section is the capacity we have remaining (12%).
4. The Black section is reserved capacity used for HA in case we have a failure. The amount reserved is equivalent to the HA setting that has been allocated along with a built in buffer (10%).

In this example we are using 88% of the usable capacity of the Clusters Hosts and Storage connected to this vCenter. We have just a little bit of capacity left in this cluster!
Looking Deeper into Capacity

1. Scroll down until you can see the detailed chart.
2. Expand the Memory section. Memory is shaded slightly to show that it is the most constrained resource. The key to understanding this is that whenever a single resource dimension is out of capacity, that defines the capacity of the object we are viewing.
3. In this example, memory, based on an Consumption model is the most constrained resource.
4. Notice that the Usable Capacity of our environment is 633GB, the Allocation shows as 703 GB and a Recommended Capacity of 620 GB of memory. Since the Recommended Capacity is lower than the Usable Capacity and Allocation, we need to add memory to this environment.

What does this tell us about capacity?

In this example, we have set the Policy in vROps to calculate and report on Consumed memory. This means that from a reporting perspective we have assigned more memory to the workloads in this environment than we have physically available. There is an opportunity for us to realize value from vROps by using these recommendations and rightsizing the VM's in our environment to get the most value from our resources.
Navigate to Dashboards

To navigate to the Dashboard menu item in the top bar.
Navigate to Reports

1. Click on **Reports**.
2. Notice the four VOA reports that were installed in the Interactive Demonstration in Module 2.

Run the VOA Consolidated Report

Now let's run the Phase 3 Consolidated Report.

1. Click on the **[Phase 3] - Consolidated Report of vSphere Optimization Assessment** row to select it.
2. Click on the **Run Template** icon.

**Choose an Object to Run the Report Template Against**

Now we need to select where we are going to run the Report Template.

In a VOA you will generally run it against the highest level object you can - you are wanting to see a single report about all the environment. You may, however, elect to run separate reports against different parts of your environment. Perhaps they have different vCenters monitoring your Test/Dev environments and your Production environment. In that case you may run reports against them separately as you may have different operational imperatives in them.

In this lab we will run the Report Template against the vSphere World object in the lab environment. Generally, this report would be run against objects in the inventory ranging from the vSphere World to a cluster object.

1. Click on the **arrow** to expand the hierarchy.
2. Click on the **vSphere World** object.
3. Click **OK** to run the Report.
Open the Report

Click on **Generated Reports** to look at the Phase 3 Consolidated report.

**Viewing the Report**

The report status will show as Completed and you will see two download icons to download the report in either PDF or CSV format.

We will look at the report that has already been run in the HOL environment. Click on the **PDF** icon for the report run **13 days ago** to view the report. (The CSV option is useful for very large environments, or when you want to consolidate, or manipulate, the data in large reports.)
Open the Generated Report

Click OK to view the generated report.

Navigating Chrome
If you need to adjust the size of the report to view it comfortably in your screen, first click within the Chrome browser window

1. Click on the Minus icon to reduce the zoom in the window.
2. To navigate through the report, use the scroll bar on the right.

**Reviewing the Report**

The Consolidated Report is a summary of the three main reports.

Please take some time and review the report if you didn't have a chance to view the other reports we highlighted in this lab.

This concludes Module 3 of the VMware Assessments Lab.
Showing the Value of the Hybrid Cloud Assessment

In the first part of this Module we looked at the three phases of a VOA.

We will now continue and look at conducting the HCA.

Verify the Lab is Ready

Before we start this next section, please first check the lab is Ready.

If it is not, you may need to wait a few minutes until the status shows the lab is Ready.

Start Firefox

If Firefox is not already open, Double click on the Mozilla Firefox icon on your desktop.
Navigate to vRBC

When you open Firefox, you should land on the above page.

Launch **VMware vRealize Business** with the bookmark provided.
When we build labs for Hands on Labs we always default to a screen resolution of 1024 x 768. This is to allow the labs to work with any device, including laptops and tablets that people often bring to the BYOD section of VMworld.

If you need to adjust the display when you are working in this lab you may optionally:

1. Click on the configure icon to configure Firefox settings.
2. Change the scaling of the browser - 80% is usually good for seeing a lot more of the screen without sacrificing too much on screen quality or text size. In some cases you may need to change this back to 100% to see the full UI.
Log into vRealize Business for Cloud using the following vIDM credentials:

User name: hol
Password: VMware1!

Click on Login to continue.
The HCA is a very easy assessment to run, the reporting necessary is included as standard content, ready to use out of the box. For the HCA, we will use the Cloud Business Analysis report. This report consists of several sections providing private cloud cost, breakdown by data center and business unit, potential cost savings, and public cloud costs comparisons.

1. Select the **Reports** item from the left hand menu
2. Click on the **Hybrid Cloud Assessment Report**.
The Report has been generated and will contain all the information needed for the HCA.

For this lab, **please do not download the report**, as the HOL environment is not connected to any external cloud providers, so the information in this report would only reflect the local environment. We have included a report run in an environment with multiple cloud providers to fully demonstrate the value of vRBC.

**View the Hybrid Cloud Assessment Report**

For this portion of the lab, we will be reviewing a report that was run previously in a multiple cloud environment. To access the report, **minimize** the Firefox Browser.
Open the Cloud Business Analysis Report

Locate the Hybrid Cloud Assessment Example.pdf report in the HOL Files folder on the desktop and double click the icon.

Examine the Cloud Business Analysis Report

Hybrid Cloud Assessment

Powered by VMware vRealize Business for Cloud

Jun 15, 2017
The VMware **Hybrid Cloud Assessment** provides the operational and expenditure details of your infrastructure on private cloud environment and enables you to compare your infrastructure cost on private and public cloud environments. Using this report, you can make better decisions for infrastructure planning across private and public clouds.

- Understand the cost of your private cloud infrastructure. The report provides actual cost information of your private cloud infrastructure, using an efficient cost analysis engine.
- Compare VM cost across cloud environments The report enables you to compare the cost of VMs in the private cloud and the public cloud environment such as Amazon Web Services (AWS) and Microsoft Azure.
Private Cloud Expenses

vSphere Private Cloud Expenses

Total Infrastructure Cost (US Dollar)
33,781

Top Datacenters based on monthly expense

- mbo-east: $12,306
- mbp-east: $13,712
- mbp-west: $9,761

Total Number of virtual machines
223 VMs

Top Datacenters based on number of virtual machine

- mbo-east: 155
- mbp-east: 68
- mbp-west: 10
The **Private Cloud Expenses** table provides a high level breakdown of the customers VMware vSphere datacenters. Very quickly, you can show your customer the datacenters by cost and population. This allows your customer to start to understand how the private cloud can be viewed in business context and sets the stage for the rest of the HCA. As you review this, here are some helpful talking points:

- Cost does not always equate to density; validate if the highly populated datacenters are the most costly. For example, in this report the "msbu-east" and "msbu-demo" datacenters are are populated with differently, yet "msbu-demo" is roughly twice as expensive per vm.
- Ask your customer what they think some of the cost drivers are for the most expensive datacenters.

*Note: If your graph only has a single bar, you have inadvertently opened the report generated by the HOL environment. The report we are reviewing is located on the desktop of this virtual machine.*
The Expenses Across Datacenters table continues the private cloud expenses discussion. Here we are provided a detailed breakdown of the costs for each datacenter, sorted by population.

1. Each datacenter is listed, sorted by VM population.
2. The average VM profile for each datacenter provides a breakdown by resource.
3. The average cost per VM.
Take note of the two datacenters that we have circled. Both datacenters have the same number of VMs, but since the Average VM profile is different, the overall costs are different for each datacenter. These are good benchmarks to start to understand datacenter costs on a per-instance basis, rather than total cost. This will clarify how VM density and optimization can influence operational costs.

**Showback Statement**

The **Showback Statement** highlights the top business units based on expenses for the month. This provides a business focused way of viewing the private cloud costs. The table chart show the top business units by monthly cost. This is critical information for IT, because it helps align to the purpose and goals of their organization. For example, having the ability to show that "Administrative" costs are higher than "Marketing and Sales" may be in contrast to what the business expects IT to support.

Trending information is also provided. When you run the initial report, all trending will show an increase (because the baseline is "zero" cost). However, this is a great way to make vRealize for Business stick in your customer's environment as they can see how useful it will be to have this cost trending information available to measure the success of any cost savings or efficiency efforts they launch.
The **Cost Savings Opportunity** table shows all business units, along with their average VM profile and average VM monthly cost. This is one of the most impactful sections of the report. Now that you have set the stage for a business discussion, you are ready to respond to your customer's request to "show me the money!"

Note that the data show in this section is dependent upon integration with vRealize Operations. So, to get the reclaimable cost, you will either need to perform the HCA in conjunction with the VOA or leverage your customer's previously installed vRealize Operations instance. In the next step, we will look at a report that does not have vRealize Operations integration.

We have taken the conversation from IT cost, to business cost and now you can help your customer find out where, exactly, to go after cost reductions. In the example report above, the "Administrative" business unit consumes a large share of private cloud resources. This might be justified if this business unit is running critical systems on behalf of other business units (such as payroll, email or ERP). However, it seems that in this case, "Administrative" usage of the private cloud is quite wasteful. This leads to overall higher costs for the organization.
Spend some time here with your customer and discuss this section. Some points to consider:

- How is IT spend going towards the business goals and mission?
- How are business units held accountable for costs in other areas outside of IT?
- How is the private cloud funded?

**Cloud Comparison**

The **Cloud Comparison** is a what-if analysis report that allows you to see the costs of your private cloud infrastructure. Many businesses are considering a "cloud first" policy or at least beginning to question how they can leverage public cloud to provide IT infrastructure services to drive agility and elasticity. However, it is difficult to pin down exactly what public cloud costs in relation to the perceived benefits.

Also, your customer may be under pressure to show that the vSphere software defined datacenter (SDDC) is cost competitive with public cloud offerings. That presents two problems:

- What is the true cost of running our private cloud?
- What would it cost of moving everything to a public cloud offering?
In the Cloud Comparison section, you can quickly provide high-level understanding that gets right to the point - private cloud, particularly private cloud built on VMware vSphere, is much less expensive than public cloud.

Customers may ask where these costs come from, and that's a fair question. For the vSphere private cloud, we employ data gathered from thousands of VMware customers to provide baseline costs for hardware, software, labor and other associated costs. For public cloud, we use the public rates from each of the cloud providers.

If desired, these baseline costs can be modified to reflect more accurately your customer's costs. However, many customers find that the costs provided by vRealize Business for Cloud to be close to their own costs and understand the value in having some baseline starting point to get answers quickly.
The **Cloud Comparison** report is a detailed report that will show the expenses incurred of each datacenter in a private cloud environment along with the potential cost of running the same workloads on other public cloud environments. Of course, most customers are not considering a wholesale move to public cloud. In fact, it does make sense to consider particular workloads or environments for public cloud. The next table in the Cloud Comparison section helps with that analysis.

Again, we see the datacenters sorted by VM count with the average profile and current cost information. Next to the current cost, the public cloud costs are shown (these are monthly costs).
1. Looking at the **kubernetes** datacenter, it is easy to see that it is not suitable for public cloud, based on the dramatic increase in cost.

2. The **Lab** datacenter, however, may be a consideration for public cloud, if there are other factors that could offset the relatively modest increase in cost.

This concludes the overview of the Cloud Business Analysis report. Let's look at how we may need to adjust the report for Business Unit Display.

**Tuning the Report to Display Business Units**

By default, vRealize Business for Cloud assigns virtual machines to business units based on vCenter Server folder structure. In some cases, this does not reflect the organizational structure the customer desires. This section provides information on how to customize the business grouping of virtual machines.

When you run and view the HCA report, you will find that the business unit names reflect folders that exist in vCenter Server. For example, the report shown above shows the **bca** folder in the vSphere Web Client virtual Machines view is the basis for the **bca** Business Unit Name in the HCA report. You may find that this does not accurately reflect the business units or organizational hierarchy for your customer. In that case, you can adjust how vRealize Business for Cloud determines virtual machine business group membership.
Navigate back to the vRealize for Business Cloud interface in your web browser. Click on **Pricing and Charges** in the Consumption section of the navigation panel.
Edit the Business Hierarchy

1. In the navigation panel, click **Business Units List**
2. Click the **Edit** menu dropdown
3. Click **Edit Business Hierarchy**
Edit vCenter Business Units

Notice that the business units for vCenter are set to **Tag**. Click the **pencil icon** to edit this setting.

The vCenter Business Unit Editor

---

**vCenter Configuration**

**Group status**
- **Disabled**
- **Active**

- Categorize by folders - select the folder name that:
  - Select all folders at vCenter Server hierarchy level
  - Categorize by tags - select the VMs with tag family
  - Categorize by virtual machine name

**Format for the top level display name:**

- **Prefix**

- Categorize by uploading the configuration

**Upload a valid CSV file.**

The CSV file must contain the following headings in the first line: `vmId, vCenterUUID, businessUnitName`

You can obtain the models and vCenter UUID of all the VMs in your system by exporting VM report for current month from [here](https://example.com).

**Upload a valid CSV file:**

[Upload]
There are five different options to determine business units for vCenter virtual machines.

- **Categorize by folders** - this option allows you to filter the folder organization by using part of the folder name to determine which folders should be included in the business unit hierarchy.
- **Select all folders at vCenter Server hierarchy level** - this is the default option and is set to 1. You can determine the depth at which business unit folders are used.
- **Categorize by tags** - allows for selection of virtual machines by vCenter tag family.
- **Categorize by virtual machine name** - allows for a regular expression to determine business unit membership based on the virtual machine name.
- **Categorize by uploading the configuration** - this option allows for uploading a CSV file to set the virtual machine business unit membership.

**Global Synchronization**

If we would have updated the Business Unit hierarchy and clicked Save, vRealize Business for Cloud will automatically start a global synchronization process. After saving, wait a few minutes for the message above to appear in the lower right corner of the UI. Click **Yes** to refresh the page and you will see the business units represented with the new settings.

**Conclusion**

You should now be able to utilize the Hybrid Cloud Assessment to bring value to your customer about how and why the public and private clouds can be of use to your customers. Using vRealize Business for Cloud and the Hybrid Cloud Assessment will allow you to become a closer partner!
Module Conclusion

You have completed Module 4 - Showing the Value of VMware Assessments of the VMware Assessments lab. We have covered the three phases of the VOA, as well as the HCA and what reports that are available to you. We also learned how to run the reports and understand the data they contain.

This is the true value of the VMware Assessments, where we are presenting data to the customer form their own environment!

Proceed to any module below which interests you most.

- **Module 1 - Introduction to VMware Assessments** (30 minutes) Basic
- **Module 2 - Installing vRealize Operations Manager** (30 Minutes) Basic
- **Module 3 - Installing vRealize Business for Cloud** (30 Minutes) Basic
- **Module 4 - Showing the Value of VMware Assessments** (60 Minutes) Advanced
- **Module 5 - Selling VMware Cloud Management** (15 Minutes) Basic
Module 5 - Selling VMware Cloud Management (15 Minutes)
Introduction to Selling VMware Cloud Management

In this module, we will discuss the packaging options available to purchase VMware Cloud Management products.
Determining the Right VMware Cloud Management Solution

There are several VMware bundles and editions that contain vRealize Operations. The customer's needs as well as their existing licensing level and product entitlements will dictate which solution to position.

We will review the different ways that VMware Cloud Management Solutions can be purchased:

- vSOM - vSphere with Operations Management
- vRealize Operations Manager
- vRealize Business for Cloud
- vRealize Suite
- vCloud Suite

Recommended Timeline

At this point in the Assessment process, we have deployed vRealize Operations and/or vRealize Business for Cloud and data has been collected and analyzed. You have generated reports and guided the customer through the user interfaces for vRealize Operations and vRealize Business for Cloud to give the customer insight into their environment. During this process you have conveyed to the customer the value of the VMware Cloud Management platform. Well done!
The next step is to **position the right solution to the customer**. We will review the different options available to purchase VMware Cloud Management.

### Start with Cloud Maturity

Where is the customer on their journey to the cloud? Have they just begun to virtualize? Are they heavily virtualized and looking to introduce automation? We'll look at the different bundles and editions and what capabilities exist in each to better understand what will be the best fit for the customer.
vSOM - vSphere with Operations Management

What is vSphere with Operations Management?

Stated simply, vSphere with Operations Management (vSOM) is a single license that combines vSphere Enterprise+ edition with vRealize Operations Standard edition. Customers can upgrade their existing vSphere Enterprise+ edition licenses directly to a vSOM license that will entitle them to vRealize Operations Standard edition. The primary benefit with this approach is that the customer will have unlimited usage of vRealize Operations Standard edition across every vSphere host they have licensed with vSOM. The more hosts the customer has and the more VMs per host, the greater the value of this licensing model.

vRealize Operations Standalone

vRealize Operations is available in three standalone editions.

- Standard - per CPU and per 25 pack
- Advanced - per CPU and per 25 pack
- Enterprise - per 25 pack

The per CPU licensing refers to licensing on a per host basis. The 25 pack licensing model refers to VMs and OSIs (operating system instances, in the case of physical servers and endpoints being managed/monitored).
The 25 pack licensing model would require that the customer purchase additional licenses (25 pack) when they expand their environment beyond their current licensing. Purchasing vRealize Operations with the previously mentioned vSOM and Suite methods would give the customer the benefit of no additional licensing needed when new VMs are introduced to their existing vSOM or vCloud Suite licensed hosts.

**vRealize Business for Cloud**

vRealize Business for Cloud is available in two editions, Standard and Advanced.

- vRealize Business for Cloud Standard is available as part of vRealize Suite Standard.
- vRealize Business for Cloud Advanced is part of vRealize Suite (Advanced and Enterprise) and is also available as a standalone product.
vRealize Suite

What is the vRealize Suite?

VMware vRealize Suite is a cloud management platform purpose-built for the hybrid cloud. It provides a comprehensive management stack for IT services on vSphere and other hypervisors, physical infrastructure and external clouds, all with a unified management experience.

The vRealize Suite is targeted at customers who are interested in managing a significant amount of resources residing outside of the vSphere environment, including other virtualization platforms as well as public cloud computing platforms.
vRealize Suite Portable License Unit

The vRealize Suite Portable License Unit (PLU) makes procurement decisions and estimating license requirements easier for the customer.

- The same license can be used to manage across either the customers Private or Public Cloud.
- Simplifies procurement decisions. Customer can reuse un-used vRS/vCS licenses in hybrid mode
- Allows usage of vRealize Cloud Management to be used as the single tool to manage their environment as capacity grows to public cloud and other hypervisors
What is the vCloud Suite?

VMware vCloud Suite is an integrated offering for building and managing a VMware vSphere-based private cloud that can dramatically improve efficiency, agility and control for IT organizations.

This suite is aligned to vRealize Suite and is available in three editions, Standard/Advanced/Enterprise which all contain vSphere Enterprise+ for vCloud Suite and vRealize Operations Advanced.

Customers can upgrade from existing vSphere editions or vSOM editions directly into the vCloud Suite.

The primary advantage of the vCloud Suite is that the licensing allows for unlimited usage of the included products across each host that has a vCloud Suite license. As VMs get introduced and VM/host density increases, there is no additional cost to the customer.
vRealize Suite versus vCloud Suite

Positioning vRealize Suite and vCloud Suite
Gives Customers Flexibility to Manage vSphere, Off-premises and Non-VMware Infrastructures

<table>
<thead>
<tr>
<th>Same buyer</th>
<th>vCloud Suite</th>
<th>vRealize Suite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Account Type</td>
<td>Large enterprises, Building private cloud, Standardized on vSphere</td>
<td>Large, distributed, Building hybrid/hetero clouds, Tech early-adopters</td>
</tr>
<tr>
<td>Primary Use Case</td>
<td>vSphere-based private cloud</td>
<td>Unified enterprise-wide management and automation for hybrid/hetero cloud, Ability to burst to cloud/most seasonal demand, Flexibility to expand capacity using public cloud, Optimize workload placement with service costing insight, Governance over dev/test workloads on public cloud, Workload mobility</td>
</tr>
<tr>
<td>Management Capabilities</td>
<td>For vSphere, Performance, capacity, config, compliance mgmt, Automated provisioning and self-service delivery of infra and apps</td>
<td>For Hetero/Hybrid cloud, Performance, capacity and config, compliance mgmt, Log management and analytics, Automated provisioning and self-service delivery of infra and apps, Service costing insight on multi-clouds, show/charge back</td>
</tr>
</tbody>
</table>

Questions often arise as to when vRealize Suite should be positioned instead of the vCloud Suite. The updated packaging simplifies this decision, vRealize Suite is aligned to manage all SDDC platforms and hybrid cloud. For vSphere hosted private cloud, we can add position vCloud Suite. But a good rule of thumb is if the customer's private cloud environment is primarily vSphere-based, then the vCloud Suite is the best solution.
Here are some specific questions that will help determine if the vCloud Suite is a better option than the vRealize Suite, given the customer's environment.

**On-Going Benefits**

Congratulations! You have delivered a VMware Assessment and conveyed the value of VMware Cloud Management to your customer.

Through this assessment, you have accomplished quite a few things:

- You have gained significant insight into the customers environment and very likely found opportunities for compute/storage/networking optimization and expansion.
- You have also potentially revealed to the customer issues and misconfigurations that they are now able to address.
- In the process of all of this you have demonstrated value as a trusted advisor.

Life is good for everyone when intelligent operations management solutions are utilized to deliver a 360 degree view of the entire environment!
Module Conclusion

There are several VMware Suites and Editions that contain VMware Cloud Management products. This module has given you the knowledge to help you determine which vRealize Solution is the best fit for your customer.

If you wish to review, proceed to any module below which interests you most.

- **Module 1 - Introduction to VMware Assessments** (30 minutes) Basic
- **Module 2 - Installing vRealize Operations Manager** (30 Minutes) Basic
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- **Module 5 - Selling VMware Cloud Management** (15 Minutes) Basic
Thank you for participating in the VMware Hands-on Labs. Be sure to visit http://hol.vmware.com/ to continue your lab experience online.

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