HOL-0301-01 - VxRail - Simplifying IT through Standardization and Automation (8.0.000)
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Lab Overview - HOL-0301-01 - VxRail - Simplifying IT through Standardization and Automation (8.0.000)
Lab Modules

Lab Module List:

Module 1: **Getting Started** (5-10 min / Basic) - The aim of this module is to get the lab up and running and ensure that the environment is ready for the next modules.

- Connect to vCenter
- Verify current configuration
- Access VxRail Manager
- See VxRail Manager plugin user interface - a short overview

Module 2: **Monitoring and Maintenance** (20-30 min / Intermediate) - In this module we will navigate the VxRail Manager, to become more familiar with the options available to monitor the health indicators of the VxRail cluster. There will also be a number of maintenance tasks, that will show how these functions can simplify the management of your environment.

- Monitoring the health of a VxRail cluster:
  - Check the cluster’s overall health
  - Check the health of the nodes
  - Check the individual components of a node

- Maintenance of a VxRail cluster:
  - Add storage (a new disk) to a node
  - Change the name or management IP address of a VxRail node
  - Collect a log bundle of the VxRail cluster
  - Cluster shutdown

Module 3: **Using the VxRail Public REST API** (3-5 min / Advanced) - This module will introduce to you the VxRail public REST API. With tasks being available in the REST API, it means that there is a choice to perform management in a scripted fashion. This can make cluster management at scale more efficient and shows that you can now, for example, integrate certain VxRail tasks in your automated environment.

Module 4: **Add & Update VxRail Satellite Nodes** (30-40 min / Intermediate) - In this module you will experience how easy it is to add and perform updates on satellite nodes.

- Add a satellite node linked to the existing VxRail cluster
- Update the satellite node

Module 5: **Cluster Expansion or Scaling Out** (15-20 min / Intermediate) - In this module you will experience how easy it is to expand the cluster with an extra node.

- Add a node to the existing VxRail Cluster
• Verify cluster state after expansion

Module 6: Lifecycle Management or LCM (5-10* min / Intermediate) - Lastly, this module will show that providing credentials and a few clicks are all it takes to update VxRail cluster software, firmware, and drivers.

• Update the cluster - Apply a software update bundle to bring it to the next VxRail software version.

*Does not include the actual update time, which could be 90+ min
Lab Guidance

This lab is designed to take up to 2 hours to complete, excluding the time needed for the cluster update to complete.

The VxRail Series delivers virtualization, compute, and storage in a scalable, easy-to-manage, hyper-converged infrastructure (HCI). This lab introduces VxRail 8.0.000, which uses VMware vSAN 8.0.

The lab modules show how easy it is to manage a VxRail cluster. The VxRail Manager UI is integrated in the vSphere Client using a plugin, resulting in a single pane of glass to manage the cluster. To introduce the new VxRail plugin and show where the VxRail functionality can be found, the first module provides a short overview.

In this lab you will gain hands-on experience with the following:

- How to verify the set-up and configuration of the VxRail with vSAN Cluster
- How to use VxRail Manager services to monitor the health of the system
- How to service the hardware, for example add or replace a disk in an existing cluster
- How to expand the cluster by adding a node or satellite node
- How to update cluster or satellite node software

The time for each module varies depending on if you choose to complete all available tasks.

You can use the Table of Contents to quickly access any module.

Lab Environment

This lab provides you with a hands-on functional experience with VxRail 8.0.000 features. It is not designed to demonstrate the performance of VxRail. It is built on a virtualized VMware environment instead of the normal physical environment, but it provides an operational VxRail cluster.

While production environments would be built on physical VxRail nodes, this lab contains only virtual nodes and relatively low resources. This is done to allow many to enjoy the hands-on labs simultaneously.

Network Diagram

The general lab layout consists of the following virtual elements:

- 1x Windows Server 2022 client host ("launchpad")
- 1x vCenter Server
- 1x VxRail Manager VM
- 3x VxRail nodes
## Lab Credentials

This table lists the credentials for this lab.

<table>
<thead>
<tr>
<th>Server / VM / Appliance Name</th>
<th>Use</th>
<th>IP Address / FQND in DNS</th>
<th>Credentials</th>
</tr>
</thead>
<tbody>
<tr>
<td>VxRail Manager Appliance</td>
<td>OS Login</td>
<td>192.168.1.19 / vcluster202-vxm.demo.local</td>
<td>root / Testvxrail123! mystic / Vxrailtest123!</td>
</tr>
<tr>
<td>vCenter Appliance</td>
<td>vSphere Client</td>
<td>192.168.1.20 / vcluster202-vcsa.demo.local</td>
<td><a href="mailto:administrator@vsphere.local">administrator@vsphere.local</a> / P@ss0rd123!</td>
</tr>
<tr>
<td>vCenter Appliance</td>
<td>OS Login</td>
<td>192.168.1.20 / vcluster202-vcsa.demo.local</td>
<td>root / P@ss0rd1234</td>
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<td>ESXi Node 1</td>
<td>VxRail Node</td>
<td>192.168.1.21 / vcluster202-esx01.demo.local</td>
<td>root / P@ss0rd1234</td>
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<td>VxRail Node</td>
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<td>root / P@ss0rd1234</td>
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<tr>
<td>ESXi Node 3</td>
<td>VxRail Node</td>
<td>192.168.1.23 / vcluster202-esx03.demo.local</td>
<td>root / P@ss0rd1234</td>
</tr>
<tr>
<td>Server / VM / Appliance Name</td>
<td>Use</td>
<td>IP Address / FQND in DNS</td>
<td>Credentials</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------------------</td>
<td>-------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Satellite Node</td>
<td>Adding Satellite Node</td>
<td>192.168.1.25 / vcluster202-esx05.demo.local</td>
<td>root / Passw0rd!</td>
</tr>
</tbody>
</table>
Key Solution Benefits

Dell VxRail systems are the standard for simplifying and modernizing VMware environments regardless of where an organization starts or ends their IT transformation. VxRail systems are jointly developed by Dell and VMware and are the only fully integrated, pre-configured, and tested HCI system optimized for VMware vSAN technology for software-defined storage. Managed through the ubiquitous VMware vCenter Server interface, VxRail provides a familiar vSphere experience that enables streamlined deployment and the ability to extend the use of existing IT tools and processes.

VxRail systems offer a choice of PowerEdge servers, powered by latest generation Intel Scalable processors and AMD EPYC processors, variable RAM configurations, and storage capacity, allowing customers to size and buy what they need now. The VxRail system uses a modular, distributed system architecture that starts with as few as two nodes and scales near linearly up to 64 nodes. Single-node scaling and storage capacity expansion provide a predictable, “pay-as-you-grow” approach for future scale up and out as business and user requirements evolve.

VxRail HCI System Software

VxRail HCI System Software, the VxRail management software, is a strategic advantage for VxRail and further reduces operational complexity. It is the software running atop the vSAN stack and encapsulates much of the key VxRail differentiation over other vSAN Ready Nodes and other HCI solutions in the market. VxRail HCI System Software provides out-of-the-box automation and orchestration for deployment to day-to-day system-based operational tasks, which reduces the overall IT OpEx required to manage the stack. No build-it-yourself HCI solution provides this level of lifecycle management (LCM), automation, and operational simplicity.
With VxRail HCI System Software, updates are simple and automated with a single-click. Customers can sit back and relax knowing they are going from one continuously validated state to the next, inclusive of all the managed software and PowerEdge server hardware component firmware. No longer do they need to verify hardware compatibility lists, run test and development scenarios, sequence and trial updates, and so on. The heavy lifting of maintaining continuously validated states for the life of the cluster is already done for them. In short, VxRail creates IT certainty.

VxRail cluster management is integrated into the vCenter Server interface via the VxRail Manager plug-in to provide a fully integrated experience that is familiar to VMware users. The benefits of LCM services are extensible using a RESTful API to position the VxRail as the platform of choice for SDDC deployments, Infrastructure as Code (IaC) cloud deployments, or for customers that prefer to manage clusters at scale through scripts or custom automation solutions.

Within VxRail HCI System Software, SaaS multi-cluster management provides global visualization, simplified health monitoring, and multi-cluster management via a cloud-based web portal. These features build upon the LCM services to increase operational efficiency, especially for customers with a large footprint of VxRail clusters and managing at scale has been challenging.

To learn more about the VxRail, please visit: https://www.delltechnologies.com/vxrail.

For more technical information about the VxRail advantage, check out the VxRail Interactive Journey experience: https://infohub.delltechnologies.com/l/related-resources-17/vxrail-interactive-journey.

**Flexibility and Choice**

As the world’s most configurable system, VxRail provides extreme flexibility with purpose-built nodes that are designed to address any use case, including big data, analytics, 2D/3D visualization, data inferencing, graphics rendering, or collaboration applications. VxRail systems, built with the latest PowerEdge servers based on latest generation Intel Xeon Scalable processors or 2nd Generation AMD EPYC processors, deliver more predictable high performance. The VxRail family offers Nvidia
GPU optimized, storage dense, high performance computing, and entry level options - to give you the perfect match for your specific HCI workload requirements.
Module 1 - Getting Started
(5-10 min / Basic)
Getting connected to the lab environment

This lesson will set up the connectivity to the lab environment.

This lab begins immediately after the configuration of the VxRail system, so the cluster is now up and running with 3 nodes.

💡 You can copy and paste text from the manual into the demo environment, by selecting it, followed by drag and drop.

Step 1 Start the browser

You will use the Brave browser throughout the lab.

Click on the Brave icon located on the Windows Taskbar or on the Desktop.
Step 2 Sign On to the VMware vCenter Server Appliance

The browser now opens the default URL, which is set to the vSphere client UI:

Use the following credentials to login

- User name: administrator@vsphere.local
- Password: P@ssw0rd123!

Click Login

Note: You can always browse to the vSphere UI by simply clicking the vCenter bookmark and click the Launch vSphere Client button.

Adjusting the browser UI zoom level

Once logged in, the vSphere UI will present the cluster information on screen. To optimize your viewing experience, the window can be zoomed in or out at any time, to adjust the resolution.

To zoom, click the Brave menu button and use the Zoom Out (-) or In (+) buttons.
Verifying the Current Configuration

Verify the vCenter Server version

Where: In the vSphere Client > ☰ > Inventory

Where: vCenter object vcluster202-vcsa.demo.local > Summary

Note that the vCenter in this lab environment is running version 8.0.000 Build 20519528:
Now make sure that the vCenter, the datacenter and the vSAN cluster are expanded in the navigation pane on the left. Observe that in vCenter Server `vcluster202-vcsa.demo.local` there is one datacenter **VxRail-Datacenter**, and this datacenter has one cluster, **VxRail-Virtual-SAN-Cluster-xxx**.

This is the VxRail cluster. This cluster is built as a 3-node cluster. The 3 ESXi hosts are called: `vcluster202-esx##.demo.local` (## is the host number).

### Verify the ESXi hypervisor version

Where: Host `vcluster202-esx##.demo.local` > Summary
Note that the VxRail nodes in this lab environment are running VMware ESXi version 8.0.0 Build 20513097.
vCenter plug-in for VxRail user interface - a short overview

VxRail Dashboard

Where: ☑ > VxRail

The VxRail dashboard provides the following:

- Cluster Name
- System Health status
- Notification whether any new nodes are available to add to the cluster
- Support links:
  - Chat with support
  - Open a service request
  - Download documentation, KB articles, software, etc.
- VxRail Community info (showing latest items)
- VxRail Knowledge Base info (showing latest items)

Note that the components that need internet connectivity and/or a support login or Secure Connect Gateway setup are only showing content when these prerequisites are configured. In the above image, there is internet connectivity, but Secure Connect Gateway has not been configured.
VxRail Cluster Basics

Where: ☑️ > Inventory

Cluster VxRail-Virtual-SAN-Cluster-xxxx > Summary > Custom Attributes (pane)
The cluster’s custom attributes provide the following VxRail specific information:

- VxRail cluster tag (showing the deployment type)
- VxRail IP address
- VxRail primary storage type
- VxRail SSL thumbprint
- VxRail version

**VxRail Cluster Monitoring**

Where: Cluster **VxRail-Virtual-SAN-Cluster-yyyy** > Monitor > VxRail > Physical View
Physical View: A physical view of the cluster. This provides detailed physical component information and node level functions, such as adding a disk, node shutdown and removal of a node from the cluster.

VxRail Cluster Configuration

Where: Cluster VxRail-Virtual-SAN-Cluster-xxxx > Configure > VxRail
This menu contains the bulk of the functionality and provides the following options:

- **System:**
  - Version and installation date information
  - Links to the product documentation, privacy statement
  - **Update link.** This is a link to the Updates entry of the VxRail menu.
  - Convert vCenter Mode. This process can change the vCenter on the cluster from internal/embedded (VxRail-managed) to external (customer-managed).
  - Shows the last configuration data sent to Dell using the Secure Connect Gateway connection (if configured).

- **Updates:** This is the Lifecycle Management (LCM) page for the VxRail cluster. It will show all component version information and allows for initiating the VxRail LCM functionality (covered in a later module).

- **Certificate:** Update and refresh of the VxRail Manager certificates is supported by the VxRail UI.

- **Market:** The VxRail Market lets you download, install and upgrade qualified software products for your system.

- **Hosts:** Overview of the hosts in the cluster, providing information such as: service tag, appliance id, model, operation status, ESXi host management IP, hostname. Changing the hostname or management IP, adding a host is now possible from this host overview.

- **Managed Folders:** Manage and show information about the satellite nodes.

- **Support:** Shows information about (and allows setting of) the Dell Support Account and the Dell Secure Connect Gateway. It also shows a pane with information about SaaS multi-cluster management, which is part of the VxRail HCI System Software. SaaS multi-cluster management allows you to monitor and manage (upgrade) all of your VxRail clusters in a centralized cloud-based web interface. This web portal is called CloudIQ. It has a link to the online documentation (the circled question mark button). Clicking the pane (it is a button) will open a browser with the
CloudIQ login page at [https://cloudiq.dell.com/](https://cloudiq.dell.com/). (Note that the CloudIQ portal is not available in this Hands-on Lab.)

- **Networking:** Allows setting of the Internet Connection Status, Proxy Setting Status and Traffic Throttle Configuration. This last item sets the communication frequency between VxRail Manager and vCenter. This determines how frequent the collected telemetry data gets communicated to the CloudIQ's back-end (via Secure Connect Gateway).
- **Health Monitoring:** Allows enabling/disabling of the VxRail cluster's health monitoring, which can be helpful while certain planned maintenance tasks are performed.
- **Troubleshooting:** Allows creation and download of log bundles for the VxRail cluster. The following data can be collected into a log bundle:
  - VxRail Manager
  - vCenter
  - ESXi*
  - iDRAC*
  - PTAgent*
  
(*)These options require selection of which hosts to include.

**VxRail Cluster context actions**

Where: Cluster *VxRail-Virtual-SAN-Cluster-xxxx > Actions > VxRail*

Note: the Actions button is the same in each screen as long as the cluster is selected

The VxRail cluster actions provide this option:
• **Shutdown**: Allows graceful shutdown of the VxRail cluster.

## VxRail Node Configuration

Where: Host `vcluster202-esx##.demo.local` > Configure > VxRail > iDRAC Configuration

![iDRAC Configuration screenshot](image)

**iDRAC Configuration**: Configure the iDRAC information for this node.

Note that the above screenshot, it won't be able to show any iDRAC Users because this is a virtual environment.

## VxRail Node context actions

Where: Host `vcluster202-esx##.demo.local` > Actions > VxRail
The VxRail cluster node actions provide the following options:

- **Shutdown**: Shutdown the node.
- **Remove VxRail Host**: Allows the user to remove a node from the cluster.

[Click here to jump straight back to the Lab Modules overview.]
Module 2 - Monitoring & Maintenance (15-30 min / Intermediate)
Monitoring a VxRail Cluster

In this portion of the module we will learn how to monitor the VxRail cluster's health. We will navigate the VxRail Manager to perform the following tasks:

1. Access SaaS multi-cluster management
2. VxRail Manager Dashboard - overall cluster health
3. Cluster Level Physical View
4. Node Level Physical View
5. Component Level Physical View

Access SaaS multi-cluster management

SaaS multi-cluster management, also referred to as AIOps cloud-based management, is one of the components in the VxRail HCI System Software, as shown in the diagram below. It provides you with a cloud-based single pane of glass, to view all your VxRail clusters. So instead having to go to every vCenter Server, or every VxRail Manager individually to view overall system health and capacity details, it provides you a single consolidated view of the entire VxRail estate. The web portal that comes with SaaS multi-cluster management is called CloudIQ.

![VxRail HCl System Software Diagram]

To access CloudIQ, internet access is required. Unfortunately the portal is not available in this hands-on lab. However, when internet access is available, the CloudIQ portal can be accessed using either of the following ways:

- Open a browser and go to the following URL: [https://cloudiq.dell.com](https://cloudiq.dell.com)
- Where: Cluster VxRail-Virtual-SAN-Cluster-xxxx > Configure > VxRail > Support
The area is one big button. When the VxRail is connected to the internet, you can simply click it, which will open the browser and show the CloudIQ portal.

Note: The UI still has references to MyVxRail which was the web portal for VxRail SaaS multi-cluster management. Now that MyVxRail has been retired, the latest versions of VxRail has references to CloudIQ and provides a link to its web portal.

An example of the CloudIQ portal UI (HCI System Inventory view) is shown below.
VxRail Manager Dashboard - overall cluster health

To check the cluster’s overall health, we can use the VxRail dashboard.

Where: ☰ > VxRail

The dashboard shows the VxRail cluster state in a glance:
• The vCenter Server that manages the VxRail cluster: vcluster202-vcsa.demo.local
• The name of the VxRail cluster: VxRail-Virtual-SAN-Cluster-xxxx
• If any new hosts are available: the dashboard shows a new host has been detected for node expansion
• The overall system health: the cluster is currently healthy

We will expand the cluster with the available new host in the next module.

Cluster Level Physical View

You can monitor the physical view of your cluster right here in the vSphere Client, using the VxRail Manager plugin.

First navigate back to the inventory view.

Where: Cluster VxRail-Virtual-SAN-Cluster-xxxx > Monitor > VxRail > Physical View
The upper part of the Physical View pane shows the high level **cluster information**:

- Cluster ID
- Connected
- Last Timestamp
- Cluster Health
- Number of Chassis
- Operational State

Below this information, we can see a visual image of each physical host, with its Appliance ID.
Click on the image of any host to see its high level **node information**, showing the following:

- Service Tag
- Appliance ID
- Appliance PSNT
- Host PSNT
- Model
- ESXi IP Address
- iDRAC IP Address
- Any alerts found

You can see in the selected node's detail information that this is a **VxRail E660.** This is a VxRail model based on **15th generation Dell PowerEdge** servers.
Node Level Physical View

To see more detailed information for a node, click ACTIONS > View Host Details.

The vSphere Client now changes focus to Host vcluster202-esx##.demo.local > Monitor > VxRail > Physical View. This displays the host's detail information again. A graphical representation of the node in your cluster makes it easy to navigate for event and status information.
It now also shows more detailed information in the **Overview** tab, such as firmware and component versions. Having this so easily available right there in the vSphere Client makes it so much easier for an administrator to look-up or check when needed.

In the upper area of the screen you can see **Service Tag: V020201** and **Model: VxRail E660**

In case of problems with any of the "**Customer Replaceable**" hardware components, the failed component is highlighted to facilitate identification.
You can drill down on a node, to see more detailed information for components such as disks, NIC ports, and power supplies. Simply click the desired component and a pane with its details will show up.

For example, after clicking the disk in slot 0:

Note that both the node level information pane as well as the component (in this case: disk) level information pane each have *Actions* button drop-downs.
Each information pane also has multiple tabs. The main tab, called **Overview** or **Information**, will show detail information for the node or component. There is also an **Alerts** tab, which will show any alerts that are found. For each node, there will also be a **Boot Device** tab, showing all information for the boot device.
The Actions drop-down will only show actions relevant to the particular item type it belongs to. So for example the node drop-down will show node type actions:

![Node Actions Drop-down](image)

If instead the disk actions button is selected, the drop-down will show disk type actions:

![Disk Actions Drop-down](image)

**Component Level Physical View**

The **front view** provides disk drive information.

To simplify serviceability, VxRail running vSAN Original Storage Architecture has pre-defined slots for the capacity drives as well as cache drives of each disk group.

In the E660 models there can be up to 2 Disk Groups per node with a maximum of 4 capacity disks per group.

The first 8 slots that we see in the front view image are reserved for capacity drives and the last 2 slots are reserved for cache drives.

You can observe that you only have 1 capacity disk in your first disk group, and the cache disk slot for disk group 1 (slot 8) is populated.
Component Level - Front View - Capacity drives

Click on the slot 0 disk to see its details.

Once a disk has been selected, its details will be displayed under the image.

Observe that the disk in slot 0 is a SAS HDD drive, and the available capacity is 400.0GB. Drive manufacturer information is also displayed.

Component - Front View - Cache drives

Click on the disk in slot 8. This is the cache drive of disk group 1.
Observe that this is a SAS SSD flash drive. Drive manufacturer information is also displayed.

VxRail also supports a choice of Intel Optane based NVMe cache drives, as well as NVMe and SAS SSDs for caching.

Note that the 'Remaining Write Endurance' is displayed for all flash drives.

Monitoring of the wear level of the flash drives is done automatically by VxRail Manager. If the endurance of any flash drive falls below a predetermined threshold, the system will log an event and use Secure Connect Gateway (if configured) to send alert messages to the support center.

**Component Level - Back view - Network Interface Controller Information**

Click the **Network Interface Controller**

The details shown provide information such as the MAC addresses, link speed and status of the ports.

The easy access to all this information greatly enhances serviceability.
Component Level - Back view - Power Supply Information

Click the Power Supply

The details shown will include information such as the serial number, revision number and part number.
Maintaining a VxRail Cluster

In this module section we will learn how to maintain a VxRail cluster. The ease and simplicity of these maintenance procedures significantly enhances serviceability.

We will navigate the VxRail Manager to perform the following tasks:

1. Add storage (a new disk) to a node
2. Change the management IP address (or name) of a VxRail node
3. Collect a log bundle of a VxRail cluster
4. Cluster shutdown*

   Note: Node expansion (scaling out) and Lifecycle Management (upgrading) will be done in later modules in this lab.

   * Note that we will not actually execute step 4 Cluster shutdown, for reasons to do with the fact that this is a virtual hands-on lab environment. It is however included in this guide, to show that these procedures automate many steps and make serviceability significantly better.

Add storage (a new disk) to a node

We will now learn how to add a capacity drive to an existing disk group on a node. To initiate the add disk procedure, we need to go to the node’s physical view. This will visually show us the drives in the node, which helps serviceability. For this task we will use node vcluster202-esx03.demo.local.

In the vSphere Client, click host vcluster202-esx03.demo.local > Monitor > VxRail > Physical View

Slot 1 has the new disk, that has been inserted, but has not been added yet.
Click the **ACTIONS** drop-down in the host’s detail information pane, and select **Add Disk**.

This will start the Add Disk dialog. In step 1 Insert New Disk, the user has a choice: to simply confirm that a new disk is already inserted and continue to the next step, or the user can choose to get suggestions on disk slots for the new disks.
The wizard can guide the user here and suggest the exact disk slot(s) to use, depending on the type of disk(s) that the user selects.

This support significantly reduces the chances of issues further down the line as a result of using either incorrect disk types or incorrect disk slots in the procedure. This is again part of the enhanced serviceability that the VxRail Manager plugin provides.

For this task we have already made a new disk available, so select "Yes, I have inserted new disk(s)" and click Next.
This will skip **Step 2 Disk Suggestions** and go straight to **Step 3 Verify Disk**. It will now scan the node for any new disks, and present the result. It will present information on each new disk found, such as slot, id, type, capacity, etc.

Click **Next** to go to step 4 Validation.
Step 4 Validate will execute a set of pre-checks to determine whether the environment is ready to go ahead with adding the disk.

Once the validation is finished successfully, click **Next**.

The **Step 5 Complete Addition** process will then run adding the disk to the vSAN cluster.

The disk addition procedure is now executing and shows some information on screen to indicate its progress. This may take about 2-3 minutes. A green status bar will be displayed once the disk has been successfully added.

Click **FINISH**. This is all there is to it, to insert a new drive and add it into a VxRail cluster with vSAN. The dialog has guided you through all required steps, ensuring that you can be confident of the result.
Change the management IP address (or name) of a VxRail node

Sometimes an occasion arises where a VxRail cluster is up and running, and we need to change the name or the management IP address of a host in the cluster. This procedure can be initiated and managed via the same vSphere Client user interface. A dialog will again guide you through all required steps to ensure a successful outcome.

Note: In this virtual environment you will perform the host re-IP. The workflow for the host rename however, would be the same.

Where: Cluster VxRail-Virtual-SAN-Cluster-xxxx > Configure > VxRail > Hosts

Select the desired host, in this case Host vcluster202-esx03.demo.local (Service Tag: V020203) and click Edit.
Note that if you select a host that currently has no VM's running on it, that the process will be a bit faster as there is no need for any VM's to be migrated off first, before the IP change takes place.

Select **ESXi Host Management IP**.

The form presents a few warnings, to inform us of the requirements and of the steps that need to be performed outside of the vSphere Client user interface.
In preparation, we can scroll down in the dialog, and enter the required information as shown in the image:

1. New Host Management IP: 192.168.1.123
2. ESXi Root Password: P@ssw0rd123!
3. vCenter Username: administrator@vsphere.local
4. vCenter Password: P@ssw0rd123!

Click **VERIFY CREDENTIALS** to ensure we entered the correct vCenter credentials.

Upon successful validation, click **APPLY** to start the process.
This process will migrate any virtual machines off the host and remove it from the cluster. Any such tasks can be seen in the Recent Tasks list.

After a short while, the process will pause:

```
<table>
<thead>
<tr>
<th>Hostname</th>
<th>vcluster202-esx03.demo.local</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Host Management IPv4</td>
<td>192.168.1.123</td>
</tr>
<tr>
<td>ESXi Root Password</td>
<td>p@sswOrd123!</td>
</tr>
<tr>
<td>vCenter Username</td>
<td><a href="mailto:administrator@vsphere.local">administrator@vsphere.local</a></td>
</tr>
<tr>
<td>vCenter Password</td>
<td>p@sswOrd123!</td>
</tr>
</tbody>
</table>
```

At this point the node has been taken out of the cluster and the workflow waits for you to update the host's IP in DNS and flush the vCenter and VxRail Manager DNS cache.
Update DNS configuration

Use the DNS Manager to modify the host's IP, using the following steps:

1. Open the DNS Manager (find the icon on the task bar)
2. In the navigation pane on the left, expand LAUNCHPAD > Forward Lookup Zones
3. Click demo.local.
4. Double Click vcluster202-esx03 with IP address 192.168.1.23

In the Properties dialog, change the IP address:

- IP address: 192.168.1.123

Click OK to close the Properties dialog window.
Now we will return to the vSphere Client.

**Flush DNS cache**

Flush the cache as advised in the warning. This needs to be done on the VMware vCenter Server Appliance (vCSA) and on the VxRail Manager.

Where: vCSA > Summary > Web Console
Click into the console screen.

Press **Alt+F1** to show the console and type in **root** and press **ENTER**.

Type in the password: **P@ssw0rd123!** and press **ENTER**.
Once logged on as root, flush the cache by restarting the local dns service:

Type `systemctl restart dnsmasq` and press ENTER.

Where: VxRail Manager > Summary > Web Console

Click into the console screen.
Type in username: **root** and press **ENTER**.

Type in password: **Vxrailtest123!** and press **ENTER**.

Once logged on as root, flush the VxRail Manager DNS cache:

Type **systemctl restart dnsmasq** and press **ENTER**.
Continue the host re-IP process in the VxRail UI

With the new IP address for this host in DNS, and the cache flushed, you can now go back to the Edit ESXi Host dialog in the browser.

Where: Cluster **VxRail-Virtual-SAN-Cluster-xxxx** > Configure > VxRail > Hosts

Click **Continue**.

The host configuration will be shown in two places.
You can view the Recent Tasks pane to see all the steps being taken to perform this process.

**Note:** During this process you will see the node being taken out of the cluster and being put back in to the cluster. This process may take around 2 minutes to complete. The process can be followed in the Recent Tasks list.

**Operation verification**

When done, two messages will display showing successful configuration.

The list will now be updated and show the new IP address:
Collect a log bundle of a VxRail cluster

There can always be a scenario where things don't go as expected and eventually there is the need to collect information from the log files.

Logging and log bundles are provided through VxRail Manager. These logs provide operation and event information about VxRail Manager. This function allows collection of data to include in the log bundle file from all sources:

- VxRail Manager
- vCenter
- ESXi*
- iDRAC*
- PTAgent*

* These sources require host selection, which enables limiting the log collection to only the relevant hosts.

You will now go through the steps for collecting the log bundle. Being able to pick and choose your sources makes it incredibly easy to create the right log bundle, even when you're investigating events. Since this is a virtual environment with limited resources, we will only select the VxRail Manager and no other log sources.

This function is available on the Troubleshooting page in the VxRail cluster configuration menu.

Where: Cluster VxRail-Virtual-SAN-Cluster-xxxx > Configure > VxRail > Troubleshooting

Click Create to start the log collection dialog:
In the Create Log Bundle dialog, the required data sources can be selected.

Select **VxRail Manager** and Click **GENERATE** to start the process:

The Log Collection form will show that the creation of the log bundle is in progress...
Note: This may take a few minutes, feel free to move on while this process is creating the bundle and check back later.

When done, it will show as available for download. Expanding the line in the Log Collection window will show further metadata for the log bundle.

If there is a list of multiple log bundles, each entry in the list will show exactly what was collected and when. In this case, it will show that data was collected only for VxRail Manager:

If required, the log bundle can now be transferred from the VxRail Manager VM to the Windows client by simply clicking the Download button.

**Cluster shutdown (Not executed)**

Note: We will not actually execute this step, as we wouldn't be able to switch it back on in this virtual hands-on lab environment.
There are situations in which the shutdown of the entire VxRail cluster is required, for example when the nodes are being physically relocated.

For these situations VxRail Manager provides a cluster shutdown function, which provides a simplified and automated procedure for this entire process. This can be quite useful, especially when the VxRail cluster has a large number of hosts.

Note: In this step we will show all steps and screenshots for the VxRail cluster shutdown procedure, but we will not actually execute those steps now. It is here to show that this procedure automates many more steps and validations, which significantly helps serviceability.

Where: Cluster VxRail-Virtual-SAN-Cluster-xxxx > Actions Menu > VxRail > Shutdown

First a set of pre-checks is executed to ensure that the VxRail cluster and nodes are in the proper state for a normal shutdown.

One check in particular is that all customer virtual machines have been shut down, to ensure a graceful cluster shutdown and a clean restart afterward.
An extra confirmation step in the wizard double checks if we actually want to shut down all the physical nodes of the VxRail cluster:

Once confirmed, the shut down procedure will start and show the progress of each step in the dialog window:
When the shutdown procedure is in the final step, a message displays that the shutdown operation has initiated successfully.

This concludes the Maintaining a VxRail Cluster section of this module.
Module Conclusion

In this module you looked at the VxRail Manager plugin, to become more familiar with the options available to monitor the health indicators of the VxRail cluster, and how these functions can simplify the management of your environment.

The VxRail Manager operations and events are now all integrated in vCenter, where all information is centralized. All VxRail functionality can be easily found at the cluster and host level. You have seen that maintenance operations like adding or replacing disks are well supported by the VxRail Manager plugin, and the visual guidance significantly reduces the risk and effort needed and to perform these tasks.

In the next module, you will look at the VxRail public REST API.

Click here to jump straight back to the Lab Modules overview.
Module 3 - Using the VxRail Public REST API (3-5 min / Advanced)
VxRail Public REST API Overview

This API exposes the VxRail cluster’s web services and allows it to be managed via that API, in an automated fashion. This enables enterprises to orchestrate their cluster management and reduce the administrator’s time spent monitoring their VxRail clusters in the vSphere Client UI.

The VxRail API provides all functionality that the VxRail Manager plugin offers via the vCenter UI. This enables enterprises to do cluster management via this API and for example check the health of the cluster or just a node, see the firmware versions on a host, orchestrate LCM operations across the enterprise, etc.

Here we are only introducing the topic. There is a separate VxRail RESTful API Hands on Lab, where you will be able experience our VxRail RESTful API documentation, execute API calls, and experiment with PowerShell.

The VxRail RESTful API Hands on Lab is called: Scalable Virtualization, Compute, and Storage with the VxRail REST API.

In this module, we will provide a quick introduction to the VxRail REST API by viewing the API documentation that is available via the web browser and executing an API call.

First, open a new browser tab on your current browser window.

The REST API documentation can be accessed via VxRail Manager.

- Enter the following URL: https://192.168.1.19/rest/vxm/api-doc.html.
- You may get a certificate invalid warning. For the purpose of this lab, you can click on the Advanced button, and then click on Proceed to 192.168.1.19 (unsafe).
The VxRail REST API guide provides information on all the available API calls that can be used to monitor, report, and manage the VxRail cluster. The documentation shows you the available input parameters and the response format. You can also use this interface to execute API calls.
Let’s run an API command as an example. On the left-hand panel, expand cluster information and select **Get VxRail cluster information**.

On the Get VxRail cluster information page, we can see:

- a short description of what this API call does
- the response types
To run this API call, you need to authenticate using the vCenter Server administrator credentials.

Username: **administrator@vsphere.local**

Password: **P@ssw0rd123!**

Then click **Send Request**.
In the response, you learn that the API request was successful. In the response body, the health status, hardware information, PSNT number, etc. are provided.

This concludes the VxRail Public REST API Overview section of the module.
Module Conclusion

Congratulations on completing Module 3.

In this module, we touched on VxRail RESTful API and where to find the in-depth VxRail RESTful API Hands on Lab.

In the next module, you will experience the simplicity of adding and updating VxRail satellite nodes.
Module 4 - Add & Update VxRail Satellite Nodes (30-40 min / Intermediate)
Add a VxRail Satellite Node

Introduction

Satellite nodes are a great extension to the VxRail portfolio, empowering deployments at the edge. Satellite nodes are deployed as single nodes but are centrally managed by a VxRail cluster that can be located at a regional hub or datacenter where there is available IT expertise. Unique from standard VxRail nodes, satellite nodes (except the VD-4000 nodes) include a PowerEdge RAID Controller for local RAID protection (due to it being a single node). Satellite nodes are great for edge deployments because of their smaller footprint and lower costs (hardware and licensing).

In this module, you will see how simple it is to deploy a satellite node. First, a new managed folder has to be created within vCenter.

Create Managed Folder

Where: Cluster VxRail-Virtual-SAN-Cluster-xxxx > Configure > VxRail > Managed Folders

Click ADD to create a managed folder.

Select Create a new folder.

Type Satellite Nodes to name the folder.

Click ADD AND CLOSE.
While VxRail 8.0.000 does not support the management of satellite nodes with a VxRail-managed vCenter Server, this lab uses a VxRail-managed vCenter Server strictly for the purpose of demonstrating satellite node functionality in this lab environment. This configuration is supported in future versions of VxRail software. Check the software release notes for the latest support details.

Add Satellite Node

Where: Managed folder **Satellite Nodes** > **Configure** > **VxRail** > **Satellite Hosts**

Click **ADD** to open the **Add VxRail Hosts wizard**.
Click **ADD**

Note: up to 6 hosts can be added at a time.

**Step 1 Discovered Hosts**
Un-check the **Use default credentials** box.

Type in the ESXi IP Address and ESXi Root Password

- **ESXi IP Address:** 192.168.1.25
- **ESXi Root Password:** Passw0rd!

Click **VALIDATE**, a green check mark will appear in the compatible column once complete.

Click **ADD** after the validation is complete.

Check the box for each node you want to add.

Click **NEXT**.
Step 2 vCenter User Credentials

Type in vCenter credentials

- Username: administrator@vsphere.local
- Password: P@ssw0rd123!

Click NEXT.
Step 3 Host Settings

Type in Host details

- ESXi Hostname: **vcluster202-esx05**
- ESXi Management Username: **management**
- ESXi Management Password: **P@ssw0rd123!**

IP address and Root information will be pre-populated.

Click **NEXT**.
Step 4 Host Location

Here you can enter a **Rack Name** and **Rack Position** but they are optional.

Click **NEXT**.
Step 5 Network Settings

One final review of the Management Gateway, Management Subnet Mask, and Management VLAN ID.

Click NEXT.
Step 6 Server Settings

The DNS and NTP server IP addresses will be pre-populated using information from the managing VxRail cluster.

Click NEXT.

Step 7 Validate

Verify satellite node information is correct.

Click VALIDATE.
Once complete a message will show success.

Click **FINISH**.
Completing the Process

Clicking finish will begin the adding process and progress will be shown in the status bar.

This process will take ~5 minutes.

A completion message will display once complete.

The satellite node will now appear in the navigation pane, where you can select and manage the node.

Congratulations, you have now completed the process of adding a managed folder and satellite node!
Update a VxRail Satellite Node

Introduction

Updating a satellite node is slightly different from updating a VxRail cluster. The update bundle for satellite nodes is based on the recovery bundle of the managing cluster. The recovery bundle can include firmware, drivers, software, and PERC controller updates. The satellite node update will not include vCenter or VxRail Manager updates because those are only run on the cluster and not on the satellite node. Another major difference is that satellite nodes are not part of a cluster. VMs on the satellite node will be shutdown during the update and will not be migrated. Up to 20 satellite nodes can be updated in parallel.

Note: The recovery bundle is automatically created on the cluster anytime a cluster update is performed. In this lab an update bundle will already be in place.

Updating a VxRail Satellite Node

Where: Managed folder Satellite Nodes > Configure > VxRail > Updates

VxRail Manager will compare all satellite node software versions in the folder with available recovery bundle on the managing VxRail cluster and provide update options when node versions are behind.

Note: All nodes in a managed folder will be updated to the same software version. If different versions between nodes are desired, create multiple folders and group nodes by desired software version.

To upload the recovery bundle onto the satellite nodes in the managed folder, click SELECT and TRANSFER.
Now you can monitor the progress of the recovery bundle transfer onto the satellite node. If there were multiple satellite nodes in the folder, you can see the progress for each transfer job.

Once the job is completed, click NEXT.

Click PRECHECK
After running the pre-check we can begin the update process.

Click NEXT.

The update can be performed now or scheduled for a future time. In this lab we will check **Update Now**.

Check the box acknowledging that the VMs will be shutdown and restarted as part of the update process.

Click **OK**.
The automated update process will now begin. This process will take ~5 minutes.

Progress can be monitored as shown below.

The process will progress through the following steps:

- Check node compatibility
- Transfer recovery bundle to node
- Shut down VMs
- Put node in maintenance mode
- Update node
- Exit maintenance mode
- Restart VMs
Status will be indicated once complete.

**Verify Completion**

Where: Satellite node `vcluster202-esx05.demo.local` > Monitor > VxRail > Physical View

Check the node information pane on the right and scroll down for the updated Component Versions.

Congratulations, you have successfully updated the VxRail satellite node!
Module Conclusion

Congratulations on completing Module 4.

In this module, we covered:

• How to add a VxRail Satellite Node
• How to update a VxRail Satellite Node

Satellite nodes are a great addition to the VxRail family, empowering deployments at the edge. Satellite nodes are great for edge deployments because of their smaller footprint and lower costs (hardware and licensing).

In the next module, we will experience the simplicity of the VxRail cluster expansion process.

Click here to jump straight back to the Lab Modules overview.
Module 5 - Cluster Expansion or Scaling Out (15 min / Intermediate)
Add Nodes to a Cluster

Cluster Expansion (Scaling Out)

In this module you will learn the ease and simplicity of adding a node to your VxRail cluster. This is a very simple process. One of the core benefits provided by VxRail is to allow a configuration to start small, at the right cost to satisfy the current demands, and then grow the configuration as needed, in small increments.

The expansion requires that the new node has been physically cabled to the cluster. When you power on a new node that is connected to the same network as the VxRail cluster, this node is automatically discovered by VxRail Manager. You can then start the wizard that will guide you through the steps to add the node to the cluster.

Note: Only the first 3 nodes in a cluster need to be identical. Additionally, VxRail clusters must be entirely all flash or entirely hybrid.

The Add Node Wizard

There are several navigational ways to get to the Add Node function including:

Where: Click ☰ > VxRail > Add to Cluster

Note: This option will navigate to the option shown below.

Where: Cluster VxRail-Virtual-SAN-Cluster-xxxx > Configure > VxRail > Hosts

Click Add to start the Add VxRail Hosts wizard.
Step 1 Discovered Hosts

Select the new node to be added V020204.

Click NEXT.
Up to 6 nodes can be selected at a time for the cluster expansion procedure.

**Step 2 vCenter User Credentials**

Enter the vSphere credentials for the user that will be performing this operation.

- **Username:** administrator@vsphere.local
- **Password:** P@ssw0rd123!

Click **NEXT**.

**Step 3 NIC Configuration**

Under **Select Configuration** select the host configuration to duplicate from the drop-down.

In this case select any host because they are all configured the same.
Under **Select NICs and VMNICs** the selected configuration can be further customized by changing the VMNICs that are assigned to the Uplinks. In this case no change is required.

Click **NEXT**.
Step 4 Host Settings

You now need to provide host configuration settings for the new host. Provide a hostname and IP address and provide credential values for the ESXi management account.

The following hostname and IP address have already been put in DNS and now need to be entered here:

- Hostname: **vcluster202-esx04**
- IP address: **192.168.1.24**

Enter the following ESXi credential information:

- ESXi Management Username: **management**
- ESXi Management Password: **P@ssw0rd123!**
- ESXi Root Password: **Passw0rd!**

Click **NEXT**.

Step 5 Host Location

Host Location (optional) can be used to enter a rack name and position of the node. This information is shown in the physical view of the cluster, where the view can be ordered by node position. This is very useful in larger environments.

Enter a rack name and position (optional).
Step 6 Network Settings

In step 6 we need to provide the vSAN and vSphere vMotion network addresses for the node.

When the cluster was deployed, there were 4 IP addresses assigned to each network, but only configured 3 hosts.

This means that there is an extra IP address still available in each network, so we can proceed without any changes.

However, if only 3 IP addresses had been provisioned, you would have to extend the IP pools for Management, vMotion and vSAN first.

Enter:

- vSAN IP address: 192.168.2.24
- vMotion IP address: 192.168.3.24

Click NEXT.
Step 7 Validate

The wizard now has all required information to autonomously add the new node into the VxRail cluster.

Click VALIDATE, to first perform a final validation of the node expansion process.
During the validation process the wizard shows a progress bar and the steps it is processing. The validation process will take a few minutes to complete.

The final step of the node expansion process, once the validation is successfully finished, is to confirm the expansion request.
We have the option to select yes or no for placing the new node into maintenance mode. We will leave it as **No**.

Click **FINISH**.

Putting a node in maintenance mode is only useful if other steps need to be performed after it has been added, but before it is made operational. This is used for VMware Cloud Foundation on VxRail environments, when SDDC Manager adds a node to an existing Workload Domain.

After clicking finish it will build the node and add it to the cluster. While in progress, you can monitor the expansion process in the Hosts window. This process will take ~5 minutes to complete.
When finished, a message will briefly be displayed to notify the user that the node expansion has completed.

When the node has been added to the cluster, a warning may be showing on the node that the host has no management network redundancy. This is unique behavior as a result of running a virtual VxRail for this hands-on lab. It has no further impact to this hands-on lab.

The VxRail cluster will now reflect the host expansion in the VxRail Hosts window.

Where: Cluster VxRail-Virtual-SAN-Cluster-xxxx > Configure > VxRail > Hosts
The health and other information about the new node can be observed as already demonstrated in the previous module **Monitoring and Maintenance**.

Congratulations you've now successfully expanded the VxRail cluster!
Module Conclusion

Congratulations on completing Module 5.

In this module, you explored a key enabling aspect of the VxRail platform: its scale out functionality. This underpins the capability to start small and grow when needed. The procedure is straightforward and basically consists of the following steps:

1. Navigate to the Add Hosts function which will show the newly discovered and available hosts.
2. Start the Add Hosts Wizard.
3. Provide required credentials.
4. Validate the input.
5. Start the cluster expansion process.

In the next and last module, you will see how easy it is to perform the Lifecycle Management (LCM) process and upgrade the VxRail cluster with a few simple clicks.

Click here to jump straight back to the Lab Modules overview.
Module 6 - Lifecycle Management or LCM (10 min / Intermediate)
VxRail Lifecycle Management Introduction

VxRail Lifecycle Management Overview

In this module you will learn and experience the ease and simplicity of updating the system software of your VxRail cluster. This is again a very easy process. One of the strengths of VxRail is the full-stack LCM functionality, which makes updating the cluster a simple and automated process.

The software that makes the VxRail system includes: VxRail Manager, VMware vCenter, vSAN and VMware ESXi. The composite update bundle will also include firmware of components for which an update is required (if LCM is supported for that component).

VxRail LCM has some great features including the Compliance Report (shows where your system is out of compliance against the Continuously Validated State), the Update Advisory Report (shows what your future state would look like if the selected update is performed and which components would need to be updated), and estimated update duration (to help you determine the maintenance window).

Executing the update process is quite long for a hands-on lab experience, so there is also the option to go through the time-lapsed LCM experience by choosing to use the interactive demo link below. The VxRail interactive demo, demonstrates how to upgrade the cluster in a streamlined experience.

Link to the Interactive Demo (select "Start" > "LCM Update")

Predictably evolve with full stack integrations

VxRail allows you to predictably evolve by providing full stack upgrades via a singular unified update experience. VxRail is sustained as a single product. That means no more managing multiple tiers of infrastructure and the associated complexity of manually ensuring a continuously validated state across all components in the system whenever any component update is needed. With VxRail, simply download and install the pre-tested, validated, engineered, single software package to update. Whether the update included critical hypervisor fixes, BIOS updates, new firmware, or support for new hardware platforms to be used in the same cluster, it is a single package with everything that will simply work...taking you from one continuously validated state to the next continuously validated state. Best of all, the releases of VxRail software packages are synchronized to align with the delivery of VMware software within 30 days of their release. This synchronization ensures VxRail customers can stay current with the latest features and security fixes. Below is a snapshot of what a VxRail continuously validated state consists of and how VxRail ensures this integrity as users update their clusters.
Testing the validated state
Example upgrade cadence

### SOFTWARE

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>VxRail</td>
<td>7.0.329</td>
</tr>
<tr>
<td>ESXi</td>
<td>7.0 U3c</td>
</tr>
<tr>
<td>vSAN</td>
<td>7.0 U3c</td>
</tr>
</tbody>
</table>

### HARDWARE

<table>
<thead>
<tr>
<th>Component</th>
<th>Version/Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS</td>
<td>1.3.8 (CNDYYW)</td>
</tr>
<tr>
<td>HBA350</td>
<td>FW: 17.15.08.00 (4CJY8) Driver: 19.00.03.00</td>
</tr>
<tr>
<td>PERC H755</td>
<td>FW: 52.16.1-4074 (KVRMT) Driver: 7.716.03.00</td>
</tr>
<tr>
<td>Intel X710 DP/QP</td>
<td>FW: 20.5.13 (MD070) Driver: 2.1.5.0 (Ethernet)</td>
</tr>
<tr>
<td>Intel X710-T2L</td>
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<tr>
<td>Intel X710-T4L</td>
<td>FW: 20.5.13 (MD070) Driver: 2.1.5.0 (Ethernet)</td>
</tr>
<tr>
<td>Intel E810-XXV</td>
<td>FW: 20.5.13 (MVXXIX) Driver: 1.8.2 (Ethernet)</td>
</tr>
<tr>
<td>BCM 57412 SF</td>
<td>FW: 21.85.21.91 (YPXWJ) Driver: 218.0.21.0 (RDMA)</td>
</tr>
<tr>
<td>BCM 57414 SF</td>
<td>FW: 21.85.21.91 (YPXWJ) Driver: 218.0.21.0 (RDMA)</td>
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<tr>
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<tr>
<td>ISM</td>
<td>4.1.6 (CRYWG)</td>
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<tr>
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<td>2.5.1,13,3204 (3P3IV), 1660/FN, PV6780F</td>
</tr>
<tr>
<td>BOSS-S2</td>
<td>2.5.13.4608 (BTV3IP)</td>
</tr>
<tr>
<td>Expander</td>
<td>1.17 (GKRX8), PV6780F</td>
</tr>
</tbody>
</table>
Performing the full-stack update of the VxRail System Software

Where: Cluster VxRail-Virtual-SAN-Cluster-xxxx > Configure > VxRail > Updates

We will focus on the first 3 tabs.

Compliance Tab

The Compliance Status section shows cluster compliance status and options to view/generate the Compliance Report, which we will cover in more detail below.

The Installed Components and Versions section shows current versions of the key software on the VxRail cluster.
Generating & Viewing the Compliance Report

Click **CREATE NEW REPORT**

Click **CREATE**
The report will then be generated

Click **View the report** to open the report

This opens the **Compliance Report**, which will show where the cluster may have drifted out of compliance with the current desired state. The report will detail things such as: Timestamp, Desired State, and Component/Subcomponent compliance status.

In this case all components are compliant. More detail can be seen by expanding components or changing the grouping.

Click **CLOSE** when finished.
Internet Updates Tab

This tab is only relevant if the cluster has internet connectivity. If a VxRail cluster has connectivity to the internet, then it will automatically indicate when a new version is available for a cluster update. Without connectivity, the update bundle would need to be downloaded first onto a local client and provided uploaded to the VxRail Manager (Local Updates tab). In this hands-on lab, we will have to provide the bundle locally.

Below is an example of a cluster with internet connectivity. This guide will walk you through the steps of generating an update advisory report from the Internet Updates tab.

This tab can be filtered to show the recommended updates, or it can show all available updates.

This tab is also the place where an Advisory Report can be generated.
Generating & Viewing the Advisory Report

Click **CREATE ADVISORY REPORT**

Click **CREATE**

Once the report is generated Click **VIEW REPORT**

The **Advisory Report** will look very similar to the **Compliance Report** but it shows where components will be non-compliant compared to a **FUTURE** desired state or continuously validated state. This is
powerful for understanding the scope of the change required and using the information to build the change report.

Local Updates Tab

The **Local Updates** can be used when no internet connection is available.

This is useful for example at dark sites, where the Internet Updates tab cannot be used. The update bundle can be provided locally and then uploaded to the VxRail Manager.

**Option 1** is to download the update bundle and stage its contents for a cluster update.

**Option 2** is to first generate an advisory report before proceeding with a cluster update.

Note: You will not see this screen below as Option 1 was already chosen to avoid having you wait for a long upload operation to complete.
The bundle upload and extraction process takes a while to complete due to the large bundle size (more than 10GB). Because we have already performed this step for you, you can start the update wizard right away and experience exactly what it is like to kick off the LCM process on an actual physical VxRail environment.

**LCM Pre-Check**

The window is showing some informational messages, to inform that you can run a pre-check and that the estimated update time is 1.7 hours (this may take a minute to appear). This time estimate is calculated, and is dependent for example on the source and target version, the underlying VxRail models and the included components.

Click **PRE-CHECK**

Click **RUN PRE-CHECK**
Type in credentials:

VxRail Manager root account

- username: root
- password: Vxrailtest123!

vCenter administrator account

- username: administrator@vsphere.local
- password: P@ssw0rd123!

Note: there is an option to skip a node during a cluster update. When enabled, this feature allows for the cluster update to continue onto the next node if a node fails to enter maintenance mode. One common reason is when there is a host affinity rule applied to VMs that prevents them from being migrated onto another node.

Click VALIDATE
Once the credentials are successfully validated, Click **CONFIRM**.

The pre-check will then run and display errors or warnings that are generated.

Note: the warnings generated in the lab are due to the structure of the lab.

Click **CLOSE PRE-CHECK**

Click **NEXT** to begin update process.
LCM Change Report

The LCM Change Report lists all the components in a table. The table shows the current version that is running on the component as well as the target version that the component will be running after the cluster update. It also shows whether the component update requires a node reboot. This report helps the administrator understand the scope of the changes required in the VxRail cluster to perform an update.

The Scan button on the right would look for user-managed items such as FC HBA firmware and drivers that can be uploaded and updated as part of the VxRail LCM process for a simpler and faster update experience. Items here are not part of the VxRail Continuously Validated State and requires the user to separately validate and qualify the firmware and drivers. For the purposes of this lab, we will be skipping this step.

Click NEXT to continue the update process.
LCM Update

Some warnings are displayed before continuing the update, they are a good reference of things to be aware of before updating.

Click CONTINUE UPDATE

Note: Since we are in a virtualized environment and also due to some time constraints, VxRail Manager and vCenter are the only components included in our bundle. In a real, physical VxRail environment, the bundle will also contain any required upgrades for other HCI system software and component types such as:

- ESXi host, Dell PTAgent, BIOS, HBA, iDRAC, NIC, SSD, Backplane, BOSS, etc.

The LCM cluster update is the last operation to run before completing this hands-on lab.

Step 1 Schedule

The first step in the Update VxRail wizard allows the administrator to update the VxRail cluster now or schedule the update for a later point in time. With the provided estimated duration, the administrator can now take an informed decision.

Select Update Now and click NEXT
Step 2 Specification

The specification step requests the administrator to enter the credentials required for the update process.

Note: It may take a few extra seconds in this virtual environment to populate the Specification tab in the UI.

VxRail Manager root account credentials:

- username: root
- password: Vxrailtest123!

vCenter administrator account credentials:

- username: administrator@vsphere.local
- password: P@ssw0rd123!

Once again, you will be given an option to have VxRail skip a node if it fails to enter maintenance mode and continue updating the remaining nodes in the cluster. For this lab, we will keep the option disabled.

Click NEXT
Step 3 Summary

The update process now has all required information to start and presents the target version and minimum estimated time again for confirmation.

Click **FINISH** to start the VxRail cluster update process.

Note: it may take a little bit of time for the screen to start showing progress.
Monitor progress

The time to execute this update will vary depending on the amount of resources available in the virtual lab infrastructure. It will take over an hour for this update to complete. For a faster experience feel free to experience the full update process using the VxRail interactive demo!

As shown below, the update progress is shown and the estimated time remaining adjusts accordingly. (Remember that in this virtual lab we are only updating the VxRail Manager and vCenter.)

Note: During the update the VxRail Manager VM will be rebooted, which will result in the UI losing connection.
Note: Due to the complexity of the underlying unique virtual environment, an issue *may* arise during the many different steps that the update performs. The reason that the update is in the guide, is that it does allow the user to go through the exact same few steps that it takes to upgrade a physical VxRail cluster and once running, it is a fully automated experience until it is finished. The [online interactive demo](#) can always provide an alternative route to further explore the VxRail automated workflows, including the full LCM process.

Once the process is finished, it will show a "successfully updated" message.

Click **FINISH**

Once finished it will return you to the COMPLIANCE tab where you can see the updated versions.

We can see that the **VxRail System**, **VxRail Manager**, and **VMware vCenter Server Appliance** versions have been updated. The install date and time has also been updated.

Where: Cluster **VxRail-Virtual-SAN-Cluster-xxxx** > **Configure** > **VxRail** > **Updates**
That's all there is to it!

We just updated a VxRail cluster, which in a real environment can be full-scale and consist of a large number of nodes, but it would still go through the exact same process.
Module Conclusion

Congratulations on completing Module 6.

In this module, you have experienced the simplicity of the VxRail *full-stack* Lifecycle Management procedure. This procedure updates the complete VxRail cluster, from system software to firmware. Whether it is 2 nodes or 64 nodes, it significantly reduces the effort to do this manually, which can be painstaking due to number of components, vendors and -last but not least- the amount of testing required.

The administrator is now more empowered than ever, with tools like the compliance and advisory reports, estimated update duration, and the ability to schedule updates. These tools enable the administrator to perform updates with even more confidence.

You went through the following steps to perform the update of the VxRail cluster:

1. Access the LCM functionality
2. Provide credentials for the update and start the process
3. Monitor update progress

This was the last module and finishes the VxRail Hands-On Lab. Thank You!

Click here to jump straight back to the Lab Modules overview.