

Dell EMC VxRail vCenter Server Planning Guide

Abstract

This planning document provides guidance for various vCenter Server deployment options supported on VxRail appliances.

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Executive summary

vCenter Server is the centralized platform for managing a VMware environment. It is the primary point of management for both server virtualization and vSAN and is the enabling technology for advanced capabilities such as vMotion, Distributed Resource Scheduler (DRS) and HA. vCenter scales to enterprise levels where a single vCenter can support up to 1000 hosts (VxRail nodes) and 10,000 virtual machines. vCenter supports a logical hierarchy of datacenters, clusters, and hosts, which allow resources to be segregated by use cases or lines of business and allow resources to be moved as needed dynamically. This is all done from a single interface.

Intended Use and Audience

This guide discusses various VMware vCenter Server™ deployment scenarios supported to manage your VxRail clusters. It is intended for customers, Dell EMC Sales teams and field engineers involved in selling, planning and installing VxRail, including Dell EMC sales and support personnel.

1 vCenter Server

vSphere v6.0 introduced vCenter Server with embedded Platform Services Controller (PSC) as well as vCenter Server with an external PSC. The following components are included in the vCenter Server installations:

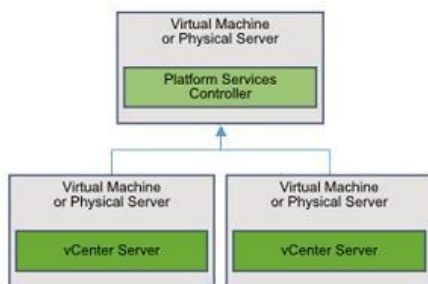
- The PSC group of infrastructure services contains vCenter Single Sign-On, License service, Lookup service, and VMware Certificate Authority.
- The vCenter Server group of services contains vCenter Server, vSphere Web Client, Inventory Service, vSphere Auto Deploy, vSphere ESXi Dump Collector, VMware vSphere Syslog Collector on Windows and VMware Sphere Syslog Service for the vCenter Server appliance.

1.1 vCenter Server with an Embedded PSC



The vCenter Server and the PSC are deployed on a single virtual machine or physical server.

1.2 vCenter Server with an External PSC



The vCenter Server and the PSC are deployed as separate virtual machines or physical servers. The PSC can be shared across several vCenter Server instances. You can install a PSC and then install several vCenter Server instances and register them with the PSC. You can then install another PSC, configure it to replicate data with the first PSC, and then install vCenter Server instances and register them with the second PSC.

For details, refer to [vCenter Server Installation and Setup](#) for VxRail 4.7.0+, [vSphere Installation and Setup Guide VMware vSphere 6.5](#) for VxRail 4.5.0+, or [vSphere Installation and Setup Guide Update 2 VMware vSphere 6.0](#) for VxRail 3.5 and VxRail 4.0.x.

2 VxRail Appliances

VxRail was jointly developed by Dell EMC and VMware and is the only fully integrated, pre-configured, and tested HCI appliance powered by VMware Virtual SAN (vSAN). Managed through the 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 appliances are managed using VxRail Manager software for hardware and appliance maintenance tasks as well as software lifecycle management. VxRail Manager incorporates ESRS and other serviceability capabilities. Additionally, VxRail appliances are discoverable and visible in Dell EMC Vision™ Intelligent Operations.

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- **Note:** For day-to-day VM management, you manage the VMware stack on the VxRail appliance directly through vCenter server.
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The VxRail software bundle is preloaded and licensed onto hardware and consists of the following components (specific software versions not shown):

- VxRail Manager
- VMware vCenter Server
- VMware vRealize Log Insight™¹
- VMware vSAN™
- EMC Secure Remote Support (ESRS)/VE

Also preloaded is VMware vSphere®; however, licenses are required and can be purchased through Dell EMC, VMware or your preferred VMware reseller partner.

The VxRail clusters also include licenses for software that can be downloaded, installed and configured:

- Dell EMC Recover Point for Virtual Machines (RP4VM) - 15 Full licenses per G-series appliance chassis or 5 Full licenses per all other single node VxRail series appliances.

VxRail is fully compatible with other software in the VMware ecosystem, including VMware NSX. Refer to the [VMware Product Interoperability Matrices](#) for specific versions of NSX supported on specific versions of vSphere.

2.1 VxRail vCenter Server Options

The initial releases of VxRail deployed a vCenter Server appliance on the VxRail appliance. The license for this vCenter Server appliance was included with VxRail. This vCenter Server deployment has been referred to as “internal” vCenter Server or “embedded” vCenter Server. For consistency, the term used throughout this guide will be VxRail vCenter Server. VxRail orchestrates the deployment and lifecycle management of the VxRail vCenter Server. This VxRail vCenter Server can only manage the VxRail cluster on which it is deployed.

Beginning with release 3.5, a VxRail appliance can optionally join a compatible vCenter Server environment, hosted outside of the VxRail cluster. This allows for a central vCenter Server instance to manage multiple VxRail clusters. Each VxRail environment appears within vCenter Server as a cluster of hosts configured with a vSAN datastore. This has been referred to “external” vCenter Server or “existing” vCenter Server. For consistency, the term used throughout this guide will be Customer-Supplied vCenter Server. This instance of vCenter Server must exist before you deploy the VxRail appliance and requires a separate customer provided license. You are responsible for deployment, configuration and lifecycle management of the customer-supplied vCenter Server.

¹ Log Insight is a configuration option only if VxRail vCenter Server is used.

A VxRail cluster's virtual infrastructure is managed by a single vCenter Server instance, either VxRail vCenter Server or customer-supplied vCenter Server. When a VxRail appliance is deployed, the vCenter deployment type is selected and **is difficult to change**. Making a change, for VxRail 3.5 and 4.0.1 requires a factory reset and all data to be wiped from the VxRail appliance and reinstalled. Migrating a VxRail 4.0.2 vCenter Server to a customer-supplied vCenter requires a Request for Product Qualification (RPQ). Starting with VxRail 4.0.301 your Dell EMC service team can perform this procedure.

Notes:

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- The customer-supplied vCenter Server provides more configuration options and is recommended.
 - The virtual machine name and IP address of the customer-supplied vCenter Server and PSC cannot be modified after VxRail deployment.
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2.2 VxRail vCenter Server

As part of a VxRail deployment, a vCenter Server instance with an external PSC is configured. The vCenter Server and the PSC are separate Linux-based virtual machines. Both the VxRail vCenter Server and PSC are deployed on the VxRail appliance cluster it is managing and cannot be moved off the cluster after deployment.

The VxRail vCenter license is for the VxRail vCenter Server and is not transferable to be used for a customer-supplied vCenter Server. As such, it can be considered a limited or restricted use vCenter Server license.

2.2.1 Use Cases

A VxRail vCenter Server is an ideal choice for:

- Small configurations
- Standalone environments

2.2.2 Limitations

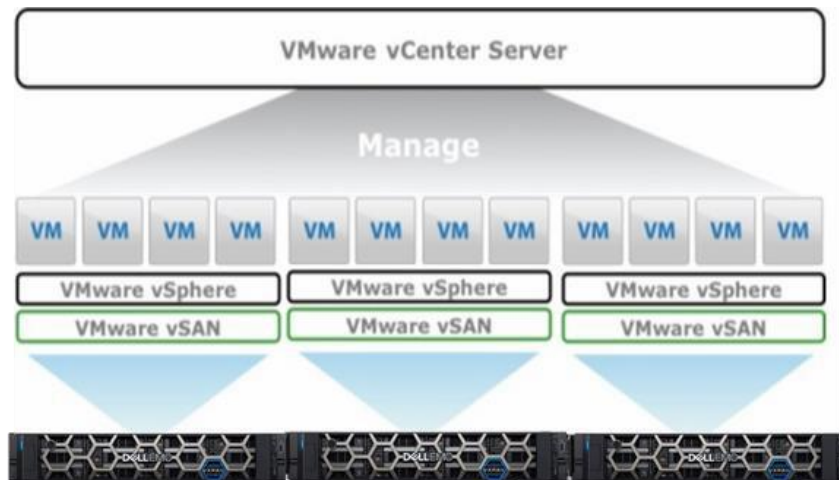
- The VxRail vCenter Server will only manage its own VxRail cluster.
 - It cannot manage other VxRail clusters.
 - It cannot manage any other ESXi hosts.
 - It cannot be used as a customer-supplied vCenter Server.
- Enhanced link mode is not supported.
- Single Sign-On domain cannot be customized and will be *vsphere.local*.

Prior to VxRail 4.5.200, VxRail vCenter Server does **NOT** support encryption.

With Stretched clusters, if an Inter-Switch Link (ISL) failure occurs, all virtual machines that are not on the same site as the vCenter will be powered off. Thus, special attention is needed when planning to deploy an *internal* vCenter.

2.3 Customer-Supplied vCenter Server

The following figure shows an example where multiple VxRail clusters are part of a customer-supplied vCenter environment. Each cluster appears as a separate cluster within vCenter. In addition to centralized management, being part of the same vCenter environment allows VMs to be easily migrated into and between vSAN environments for optimal workload balance and simplifies VxRail appliance upgrades and expansion.



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- Note: The customer-supplied vCenter Server deployment can be a physical server or a virtual server running on either a vCenter Server appliance or in a Windows environment with embedded or external PSC.
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2.3.1 Use Cases

A customer-supplied vCenter Server solution is required when:

- Enhanced link mode is desired.
- VxRail is being added to an existing VMware platform and a single management instance is desired.
- Multiple VxRail clusters are deployed and a single management interface is desired.

Prior to VxRail 4.5.200, customer-supplied vCenter Server solution is required when:

- Stretched clusters are part of the solution.
- vSAN encryption is desired. When enabling Data At Rest Encryption (DARE) in a vSAN cluster, the Key Management Server (KMS) must be external to the vSAN cluster.

2.3.2 Limitations

- VxRail Manager does not upgrade the customer-supplied vCenter Server. Before an upgrade of VxRail appliance software, refer to the release notes to verify the required vCenter Server release number. It might be necessary to upgrade the customer-supplied vCenter Server prior to the VxRail upgrade.
- Prior to VxRail 4.7, special approval is required if the customer-supplied vCenter Server is hosted on a VxRail cluster.


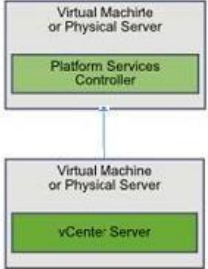
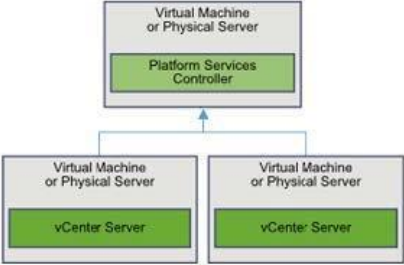
- The VxRail cluster Shutdown function will require you to power off all VMs manually. We highly recommend the vCenter be backed up to a remote site in case of vSAN failure.

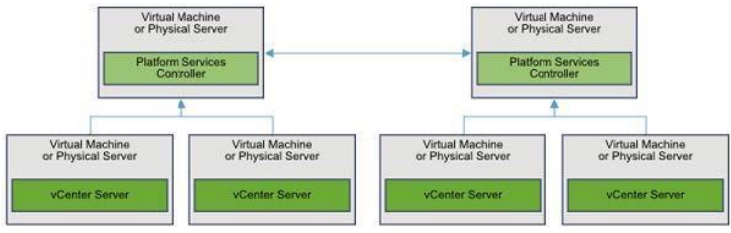
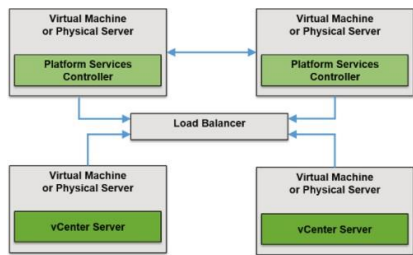
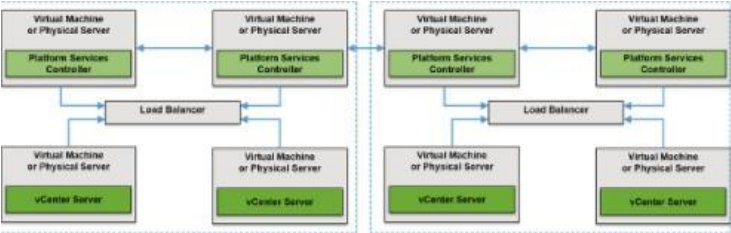
2.3.3 Notes

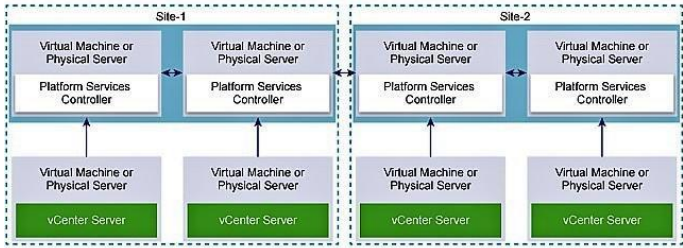
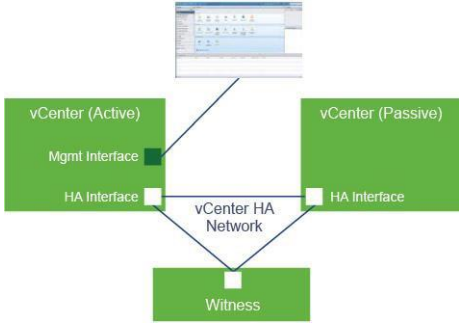
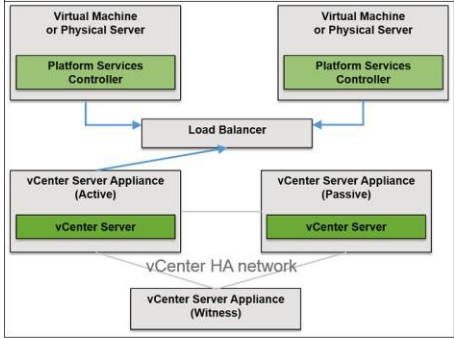
- You are responsible for the customer-supplied vCenter Server license.
- Log Insight is not activated when using a customer-supplied vCenter Server.
- Only one public IP address for the vCenter HA network is supported.

3 VMware vSphere Recommended Topologies for vCenter Server

VMware provides a list of recommended topologies for VMware vCenter Server deployments. For vSphere 6.5, the vCenter Server topologies are described in VMware KB article [2147672](#). For vSphere 6.0 the vCenter Server topologies are described in VMware KB article [2108548](#). The following table indicates whether a VxRail vCenter Server or a customer-supplied vCenter Server could support a particular topology.

Recommended Topology	VxRail vCenter Server	Customer-Supplied vCenter Server * requires a vCenter Server license
 <p>1 Single Sign-On domain 1 Single Sign-On Site 1 vCenter Server with embedded PSC</p> <p>Limitations: Does not support enhanced linked Mode does not support PSC replication</p>	<p>No</p> <p>If you want an embedded PSC, you cannot use the VxRail vCenter Server.</p>	<p>Yes</p> <p>You must have a customer-supplied vCenter Server with an embedded PSC deployed to achieve this topology.</p>
 <p>1 Single Sign-On domain 1 Single Sign-On site 1 vCenter Server with PSC on a different machine</p>	<p>Yes</p> <p>Note: There is only one vCenter Server</p>	<p>Yes</p>
 <p>1 Single Sign-On domain 1 Single Sign-On site More than 1 vCenter Server(s) with PSC on a different machine</p>	<p>No</p>	<p>Yes</p>

 <p>1 Single Sign-On domain 2 or more Single Sign-On sites 2 or more vCenter Server with external PSCs</p>	No	Yes
 <p>1 Single Sign-On domain 1 Single Sign-On site 2 or more external PSC(s) 1 or more vCenter Server with external PSCs using 1 third-party load balancer</p>	No	Yes
 <p>1 Single Sign-On domain 2 Single Sign-On sites 1 or more external PSCs per Single Sign-On Site 1 or more vCenter Server with external PSC(s) 2 third-party load balancers (1 per site)</p>	No	Yes

 <p>1 Single Sign-On domain 2 Single Sign-On sites 2 or more external PSCs per Single Sign-On site 1 or more vCenter Server with external PSC(s)</p>	<p>No</p>	<p>Yes</p>
 <p>1 Single Sign-On domain 1 Single Sign-On site vCenter Server with PSC on same vCenter Server appliance 3 vCenter Server appliances are used (1 Active, 1 Passive, and 1 Witness connected to the vCenter HA network).</p> <p>Limitations: Does not support Enhanced Linked Mode Does not support PSC replication</p>	<p>No</p>	<p>Only vCenter Server 6.5, which requires VxRail 4.5.x.</p> <p>Note: Only one public IP address for the vCenter HA network is supported.</p>
 <p>1 Single Sign-On domain 1 Single Sign-On site 2 or more external PSCs vCenter Server connected to PSC using 1 third-party load balancer vCenter Server appliances are used (1 Active, 1 Passive, and 1 Witness connected to the vCenter HA network).</p>	<p>No</p>	<p>Only vCenter Server 6.5, which requires VxRail 4.5.x</p> <p>Note: Only one public IP address for the vCenter HA network is supported.</p>

4 VxRail vCenter Server Deployment Details

Following are the high-level details of each deployment option. It is important to understand the pre-requisites before deployment. This document covers the requirements related to vCenter Server only. See the [Dell EMC VxRail Network Guide](#) for complete VxRail implementation requirements.

4.1 VxRail vCenter Server

- **Note:** The vCenter license included with the VxRail appliance is for use of the VxRail vCenter Server only and is not transferable for use as a customer-supplied vCenter Server.
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4.1.1 Requirements

This scenario requires:

- A reserved vCenter Server hostname
- A reserved IP address for the VxRail vCenter Server
- A reserved PSC hostname
- A reserved IP address for the new VxRail vCenter Server Platform Service Controller
- DNS names to be configured correctly.

4.2 Customer-Supplied vCenter Server

When deploying a VxRail appliance into an existing VMware virtualization infrastructure, use the customer-supplied vCenter Server that is managing the current environment to also manage the VxRail appliance. This allows a remote central vCenter Server to manage multiple VxRail clusters in a single management instance.

The customer-supplied vCenter Server can be:

- Standalone with an embedded PSC or external PSC
- A vCenter Server appliance virtual machine or vCenter Server for Windows²
- Using Enhanced Linked Mode

4.2.1 Requirements

- Prior to VxRail 4.5.200, the customer-supplied vCenter can **NOT** be hosted on the VxRail cluster it is managing.
- Starting with VxRail 4.5.200, the customer-supplied vCenter Server can be hosted on the VxRail cluster it is managing. A Request for Product Qualification (RPQ) is required if you are not hosting it in a VVD or VCF VxRail environment.
- Check the VxRail Release Notes to determine the proper version numbers. In addition, the ESXi version of the cluster hosting the customer-supplied vCenter should be identical to the ESXi host version of the VxRail cluster.

² Starting after vCenter Server 6.5, VMware plans to deprecate vCenter Server for Windows with the next numbered release (not update release) of vSphere.

- VxRail 3.5 and vSphere 6.0, version details can be found in [VxRail Appliance Software 3.5 Release Notes](#).
- VxRail 4.0.x and vSphere 6.0, version details can be found in [VxRail Appliance Software 4.0.x Release Notes](#).
- VxRail 4.5.x and vSphere 6.5, version details can be found in [VxRail Appliance Software 4.5.x Release Notes](#).
- VxRail 4.7.x and vSphere 6.7, version details can be found in [VxRail Appliance Software 4.7.x Release Notes](#).
- You must provide the vCenter Server license.

If you want VxRail to join a customer-supplied vCenter Server, you will need to:

- Know the customer-supplied vCenter Server FQDN.
- Know whether your customer-supplied vCenter Server has an embedded or non-embedded PSC. If the PSC is non-embedded, you will need the PSC FQDN.
- Know the *Existing* Single Sign-On domain (SSO) (for example, *vsphere.local*)
- Create a VxRail management user and password for this VxRail cluster on the customer-supplied vCenter Server. This user must be:
 - Created with no permissions
 - Created with no roles assigned to it

▪ **Note:** If a previous VxRail cluster has been deployed on the customer-supplied vCenter Server, the VxRail Management User can be re-used if you so choose.

- Create or select a datacenter on the customer-supplied vCenter Server for the VxRail cluster to join.
- Specify the name of the cluster that will be created by VxRail in the selected datacenter when the cluster is built. This will also be the name of the distributed switch. This name must be unique and not used anywhere in the datacenter on the customer-supplied vCenter Server.
- Verify that the DNS server can resolve all VxRail ESXi hostnames before deployment.
- (Optional) Create a VxRail non-admin user and password for VxRail on the customer-supplied vCenter Server. The following will be performed by your Dell EMC Representative:
 - Create two new roles, VxRail Initial Global and VxRail Datacenter Global.
 - Assign each of these roles to the new VxRail admin user.

▪ **Note:** Starting with VxRail 4.5.200, you can deploy a customer-supplied vCenter Server on an existing VxRail cluster, even the one it is managing. You must still provide a vCenter Server license.

5 Conclusion

During the planning stage of a VxRail cluster configuration, careful planning should take place to determine the best vCenter Server deployment topology for your environment. VxRail gives you the option of using a Customer-Supplied vCenter Server so that more topologies can be supported. The VxRail vCenter Server has very limited use case application. Since the decision for the topology is not changeable after deployment for any use case, careful planning is essential.

For further details about the best vCenter deployment options, contact your Dell EMC sales team or your VMware representative.