

VxRail Deployment with Arista Networking Best Practices Guide

CloudVision/EOS

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Introduction

Arista Universal Cloud Network (UCN) brings the designs and operational principles of the largest hyperscale cloud providers to the enterprise offering the highest levels of scale, reliability, and open automation coupled with rich observability and management through Arista CloudVision. UCN is designed to address network requirements from 10s of racks to 1000s with a consistent operating model. This paper provides deployment guidelines and best practices for customers who want to realize the operational benefits of a hyper converged solution from Dell EMC can couple this with best-in-class data center networking options from Arista.

The Dell EMC VxRail™ appliance is an HCI solution that consolidates compute and storage into a single, highly available, network-ready unit. VxRail has a simple, scale-out architecture, leveraging VMware vSphere® and VMware vSAN™ to provide server virtualization and software-defined storage.

Network connectivity is fundamental to the VxRail clustered architecture. Individual nodes act as a single system, providing scalability, resiliency and workload balancing by leveraging logical and physical networks.

A VxRail cluster consists of three or more VxRail nodes (ESXi hosts). Deployment, configuration, and management are handled by VxRail, allowing the compute capacity and the vSAN datastore to grow dynamically. VxRail Manager automatically discovers and configures each new node, and automatically adds it to the default vSphere Distributed Switch (VDS). vCenter propagates the port groups of the default VDS to the new node.

The following software versions are used to create this guide:

Solution	Product	Version
UCN for VxRail	Arista EOS	4.23.0F
	Arista CloudVision	2019.1.3
	Dell Technologies VxRail	4.5

VxRail Node Connectivity Options

VxRail Appliances come in different models, offering various uplink connectivity options as shown in the diagram below. (Please check the Dell/EMC website for the latest model offerings).

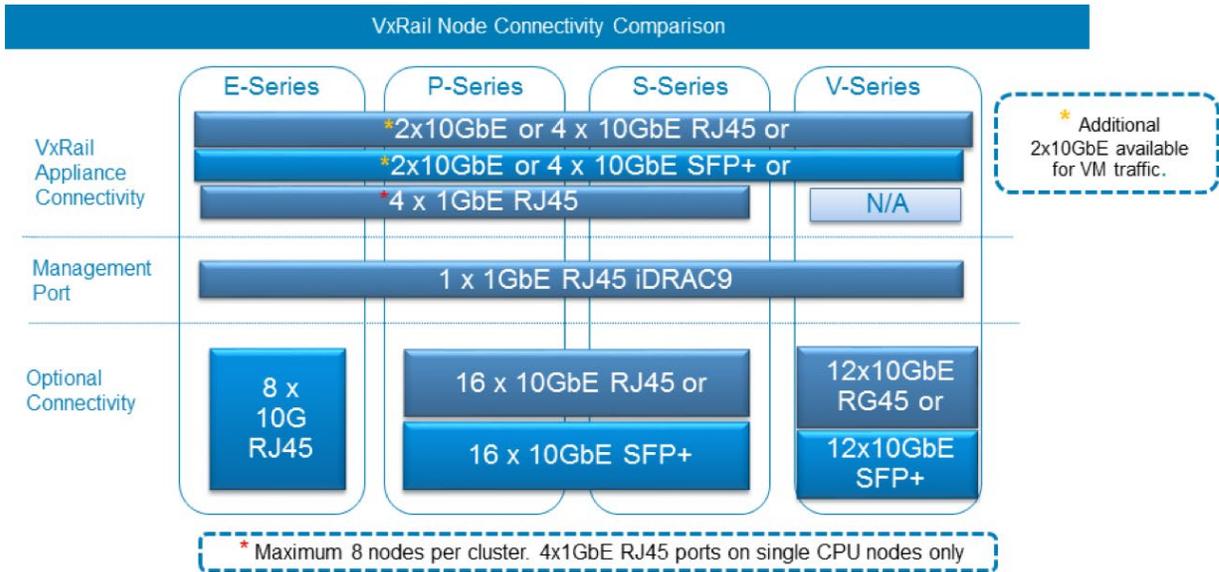


Figure 1: VxRail Connectivity Options

CloudVision and EOS Switches for VxRail Cluster

Arista’s software-first approach focuses on improving the user’s operational experience. With a single operating system across platforms and use-cases, Arista EOS (Extensible Operating System) dramatically simplifies the complexity of a myriad of OS trains that proliferate across a typical network. Built from the ground-up as a programmable software platform, EOS has established itself early-on as a preferred platform for software integration.

Arista’s CloudVision is a turnkey management plane providing a modern approach to automation and telemetry. It is a software product - available as a virtual or physical appliance - for managing any EOS instance - physical Arista switches, vEOS in the public cloud, cEOS in Kubernetes environment, EOS running on white boxes, and access points.

Leveraging this network-wide database - or NetDB - architecture, CloudVision focuses on three key pillars of functionality:

- **Telemetry and Analytics**, based on this native state-streaming for real-time and historical visibility into network state
- **Automated Provisioning** and change control workflows for cloud-like network operations
- **Orchestration**, as a single point for integration with both 3rd party ecosystem partners as well as native APIs for customer extensibility options

The following figure illustrates a three-node cluster connected to Arista 7050X3 series leaf switches using 4 X 10GE uplinks.

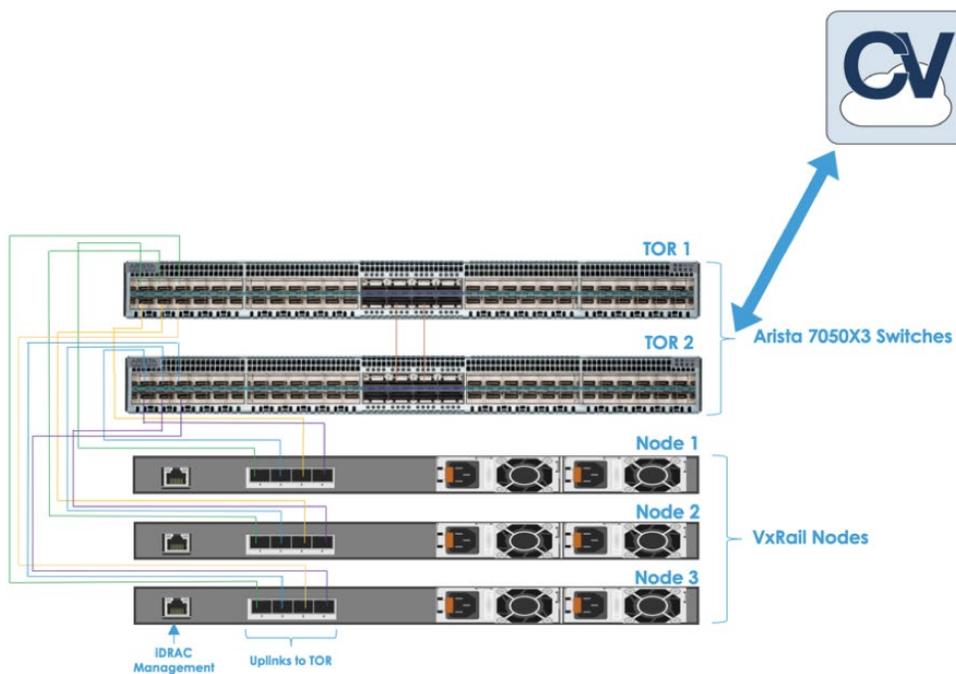


Figure 2: Three Node VxRail Deployment with Arista 7050X3 Switches

Node	Uplink 1	Uplink 2	Uplink 3	Uplink 4
Node1	TOR1-Eth1	TOR2-Eth1	TOR1-Eth2	TOR1-Eth2
Node2	TOR1-Eth3	TOR2-Eth3	TOR1-Eth4	TOR1-Eth4
Node3	TOR1-Eth5	TOR2-Eth5	TOR1-Eth6	TOR1-Eth6

The following software versions are used to create this solution:

Solution	Product	Version
UCN for VxRail	Arista EOS	4.23.0F
	Arista CloudVision	2019.1.3
	Dell Technologies VxRail	4.5

Bringing up Arista EOS switches

Arista was the first in the networking industry to deliver Zero Touch Provisioning (ZTP). ZTP allows the customer to take a switch out of the box, rack it, and automatically provision it with a machine-generated configuration, officially approved image, or script without any human intervention – similar to how an IP Phone configures itself, or how a wireless access point configures itself with no manual intervention.

To take it one step further and apply ZTP network wide, CloudVision's 'Network Provisioning' portal process allows the end user to create a logical network design diagram view to ensure devices are being provisioned with a data center leaf/spine topology view or any other network topology view, which represents the final deployment design. With a logical hierarchical inheritance, administrators can assign switches to different containers which in turn have the ability to apply settings like switch configuration, image version, and device labeling.

For more details please refer to [Arista documentation](#).

Bringing up a VxRail Cluster on Arista EOS switches

VxRail infrastructure carries traffic in the following categories:

- In-band management
- vMotion
- vSAN
- VM Traffic

In-Band Management traffic includes all VxRail, vCenter Server, and ESXi communication. The management VLAN also carries traffic for vRealize Log Insight and VMware Loudmouth node discovery traffic required for VxRail cluster initialization. All management traffic can be untagged or you can specify a VLAN tag.

Note: Connectivity between the vMotion VMkernel interfaces and the vSAN VMkernel interfaces is required when bringing up the VxRail cluster. This is achieved via the VLAN configuration covered in Step 2 below.

To deploy the VxRail solution, complete the following steps.

Procedure

Step 1: Collect the necessary information about the management and external network

Information to collect	Example
Management VLAN for ESXi, vCenter and VxRail communication	VLAN 4001
VLAN for vMotion	VLAN 4002
VLAN for vSAN	VLAN 4003
VLAN for Workload	VLAN 4004

Step 2. Create the VLANs and trunk membership on the TORs

This step can be done individually on each TOR or via CloudVision

On TOR1 and TOR2

```

vlan 4001
  name VxRail-Management
!
vlan 4002
  name VxRail-vMotion
!
vlan 4003
  name VxRail-vSAN
!
vlan 4004
  name VxRail-workload

```

The VxRail-Management VLAN carries the management traffic for vCenter and ESXi hosts. VxRail-vMotion and VxRail-vSAN VLANs carry the vMotion and vSAN traffic respectively.

For the 4x10GbE configuration, we will configure the trunk membership as per the recommendation provided in the [VxRail Network Planning Guide](#)

4x10GbE Traffic Configuration

Traffic Type	Multicast Requirements	UPLINK1 (10Gb) VMNIC0	UPLINK2 (10Gb) VMNIC1	UPLINK3 (10Gb) VMNIC2	UPLINK4 (10Gb) VMNIC3	NIOC Shares
Management	IPv6 multicast	Standby	Active	Unused	Unused	40
vSphere vMotion	None	Unused	Unused	Standby	Active	50
vSAN	None	Unused	Unused	Active	Standby	100
Virtual Machines	None	Active	Standby	Unused	Unused	60

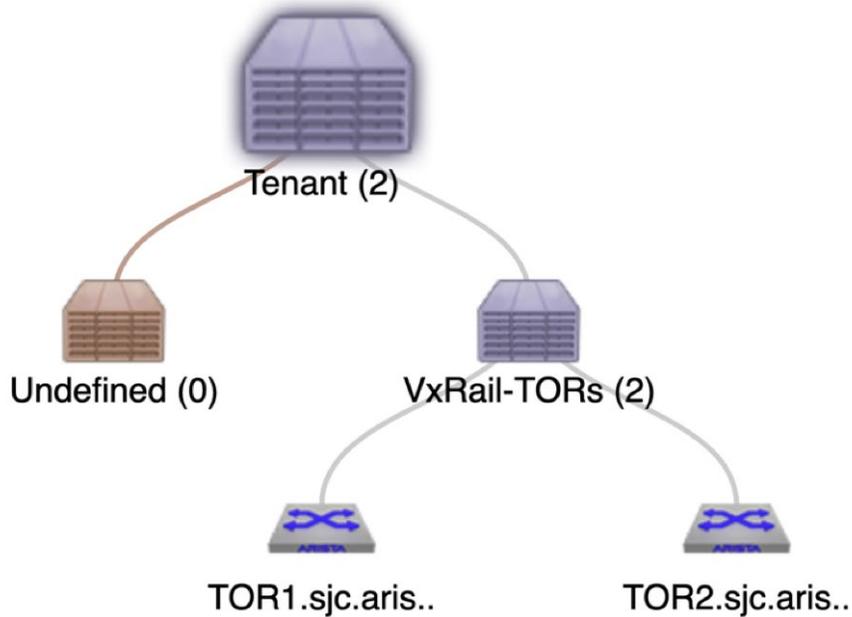
```

interface Ethernet1
  switchport trunk allowed vlan 4001,4004
  switchport mode trunk
!
interface Ethernet2
  switchport trunk allowed vlan 4002,4003
  switchport mode trunk
!
interface Ethernet3
  switchport trunk allowed vlan 4001,4004
  switchport mode trunk
!
interface Ethernet4
  switchport trunk allowed vlan 4002,4003
  switchport mode trunk
!
interface Ethernet5
  switchport trunk allowed vlan 4001,4004
  switchport mode trunk
!
interface Ethernet6
  switchport trunk allowed vlan 4002,4003
  switchport mode trunk
!
interface Ethernet49/1
  switchport trunk allowed vlan 4001,4002,4003,4004
  switchport mode trunk

```

Configuration using CloudVision

When using CloudVision, both the TORs can be placed in a configuration container. In this example we will name the container as VxRail-TORs.



The configuration from Step 2 can be placed in a configlet that can be applied to the container.

Configlets > VxRail-Bootstrap

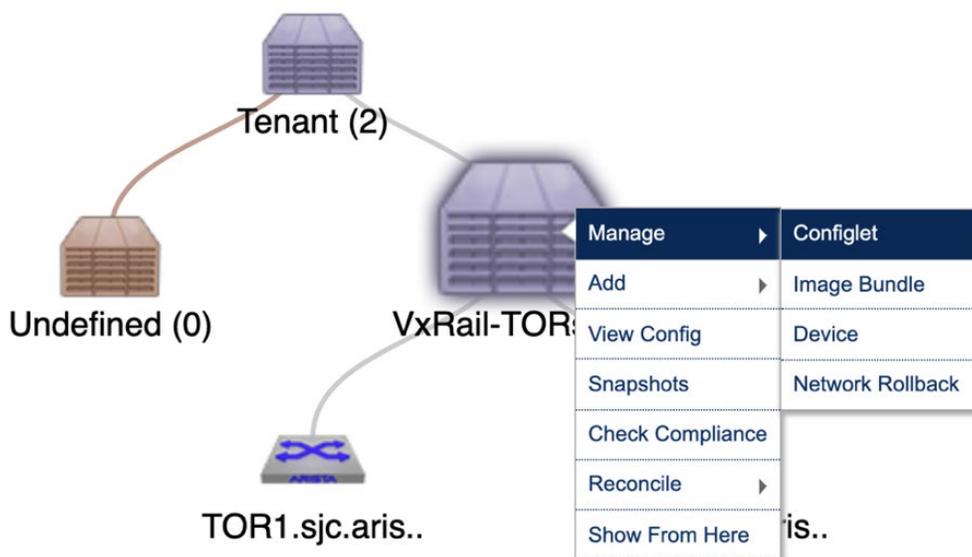
Summary | Logs | Change History | Applied Containers | Applied Devices

VxRail-Bootstrap

Configuration

```

1  vlan 4001
2  name VxRail-Management
3  vlan 4002
4  name VxRail-vMotion
5  vlan 4003
6  name VxRail-vSAN
7  vlan 4004
8  name VxRail-workload
9  interface Ethernet1
10 switchport trunk allowed vlan 4001,4004
11 switchport mode trunk
12 interface Ethernet2
13 switchport trunk allowed vlan 4002,4003
14 switchport mode trunk
15 interface Ethernet3
16 switchport trunk allowed vlan 4001,4004
17 switchport mode trunk
18 interface Ethernet4
19 switchport trunk allowed vlan 4002,4003
20 switchport mode trunk
21 interface Ethernet5
22 switchport trunk allowed vlan 4001,4004
23 switchport mode trunk
24 interface Ethernet6
25 switchport trunk allowed vlan 4002,4003
26 switchport mode trunk
27
    
```



Network Provisioning > VxRail-TORs > Configlet

Name	Notes	Type - All	Created By	Created Date
<input type="checkbox"/> SYS_TelemetryBuil...		Builder	cvp system	2020-03-10 12:05:19
<input checked="" type="checkbox"/> VxRail-Bootstrap		Static	cvpadmin	2020-03-10 21:10:09

Once applied, the configuration will go through the Change Control process within CloudVision and applied to the TORs after necessary approval.

VxRail Cluster Deployment

At this point, the network is ready for VxRail deployment. Please follow the [Dell/EMC VxRail deployment steps](#) (Chapter 9) to form the VxRail Cluster.

Enabling vCenter Integration on Arista EOS switches

Once the VxRail Cluster is up, one can enable VM Tracer functionality on the EOS switches to get following benefits

- Visibility into instantiated VMs with their network configuration (VLANs and distributed/virtual Switches)
- Visibility into server hardware IPMI data which can be shown to the network manager
- Adaptive auto-segmentation, which automatically provisions and prunes VLANs from server-switched ports as VMs are instantiated and moved within the data center.

For more details please refer to [VM Tracer documentation](#).

Technical Resources

CloudVision: <https://www.arista.com/en/products/arista-eos-cloud-vision>

EOS: <https://www.arista.com/en/products/eos>

Summary

With Arista UCN (CloudVision & EOS) for VxRail, Arista Networks offers the most comprehensive, flexible and highly automated solution in the industry. This solution has been tested and validated and is supported by Arista Networks. Customers who want to realize the operational benefits of a hyper-converged solution from Dell EMC can deploy it with Arista's best-in-class data center networking solutions.

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