Dell Engineered Systems for VMware EVO: RAIL Version 1.0
User's Guide

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

Contents

EVO:RAIL setup checklist

The following table provides the EVO:RAIL preinstallation checklist:

Table 1. EVO:RAIL preinstallation checklist

Hardware	For more information, see Hardware.
EVO:RAIL appliance	1–4 EVO:RAIL appliances
Top-of-rack (TOR) switch	- IPv6 enabled on all ports 8 ports for RJ-45 or SFP+ for each EVO:RAIL appliance - One port for a workstation or laptop for access to EVO:RAIL - IPv4 and IPv6 multicast must be enabled on the VMware Virtual SAN and management network segments
Out-of-band management switching (*optional*)	- A separate 1 GbE switch or allocate four additional ports per EVO:RAIL appliance on the TOR switch for BMC - Default BMC username: `root` and password: `root`
Workstation or laptop	Access to a browser for EVO:RAIL configuration and management

Physical	For more information, see Appendix B: Physical Requirements
Power	Two power cords for redundancy
Voltage	200–220 volts (V)
Current	10 A
Dimensions	2U rack space in a 19x30-inch cabinet, installed with a rail kit
Environmental	Lists the operating conditions and customer configuration options

Networking	For more information, see Networking.
IP Addresses and VLANs: Fill in the table in Appendix A: Network Configuration Table.	- Reserve one IP address for EVO:RAIL or vCenter Server™ - Reserve four IP addresses for ESXi hosts for each EVO:RAIL appliance (must be contiguous) - Reserve four IP addresses for VMware Virtual SAN™ for each EVO:RAIL appliance (must be contiguous)

Networking	For more information, see Networking.
	• Reserve four IP addresses for VMware vSphere® vMotion® for each EVO:RAIL appliance (must be contiguous) • *Optional*: Reserve at least four VLANs for vSphere vMotion, Virtual SAN, a VM Network, and the management VLAN for ESXi and EVO:RAIL • *Optional*: Reserve one additional VLAN for out-of-band management and also four IP addresses for BMC on each EVO:RAIL appliance
DNS Servers	Highly recommended
NTP Servers	Recommended
Proxy Servers	Optional
Logging	VMware vCenter Log Insight or an external third-party syslog server
Active Directory	Optional

Deployment, Configuration, Management	For more information, see Deployment Configuration Management.
EVO:RAIL Deployment	Rack and cable
EVO:RAIL Configuration	• Customize Me! or • Just Go! or • Upload Configuration File
EVO:RAIL Management	Capabilities: create VMs, monitor system, collect logs, select language, view tasks, upgrade software, and add new EVO:RAIL appliances

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EVO:RAIL Appliance

VMware EVO:RAIL is the first hyper-converged infrastructure appliance powered 100 percent by VMware's compute, networking, storage, and management software. EVO:RAIL Deployment, Configuration, and Management streamlines initial setup and ongoing operations, including updates with zero downtime and automatic scale-out. EVO:RAIL, is fully deployed in minutes, after the TOR switch is configured and appliance is racked, cabled, and turned on.

For more information, see *Dell PowerEdge C6220 II Systems Hardware Owner's Manual* available at **dell.com/poweredgemanuals**.

To ensure the correct functioning of EVO:RAIL and an optimal end-to-end user experience, understanding the recommendations and requirements in this User's Guide is essential.

Availability of resources and workload is critical in a hyper-converged environment because compute, networking, storage, and management are provided on the same platform.

Hardware

EVO:RAIL ships with either eight RJ-45 or SFP+ NIC ports. Each EVO:RAIL appliance requires eight corresponding ports on the top-of-rack (TOR) switch(es). To configure and manage EVO:RAIL for a workstation or laptop with a web browser requires one port, either on the TOR switch or on a management VLAN that can reach the TOR network. Any other 1 GbE port on the appliance is covered and disabled. The following figure shows an example of the physical appliance and simple network setup.

Laptop with web browser for EVO:RAIL
(direct connection or management VLAN)

10GbE Top-Of-Rack Switch

10GbE Network Interfaces

Node

Node

Node

Node

EVO:RAIL Appliance

BMC interface on each node
for remote management
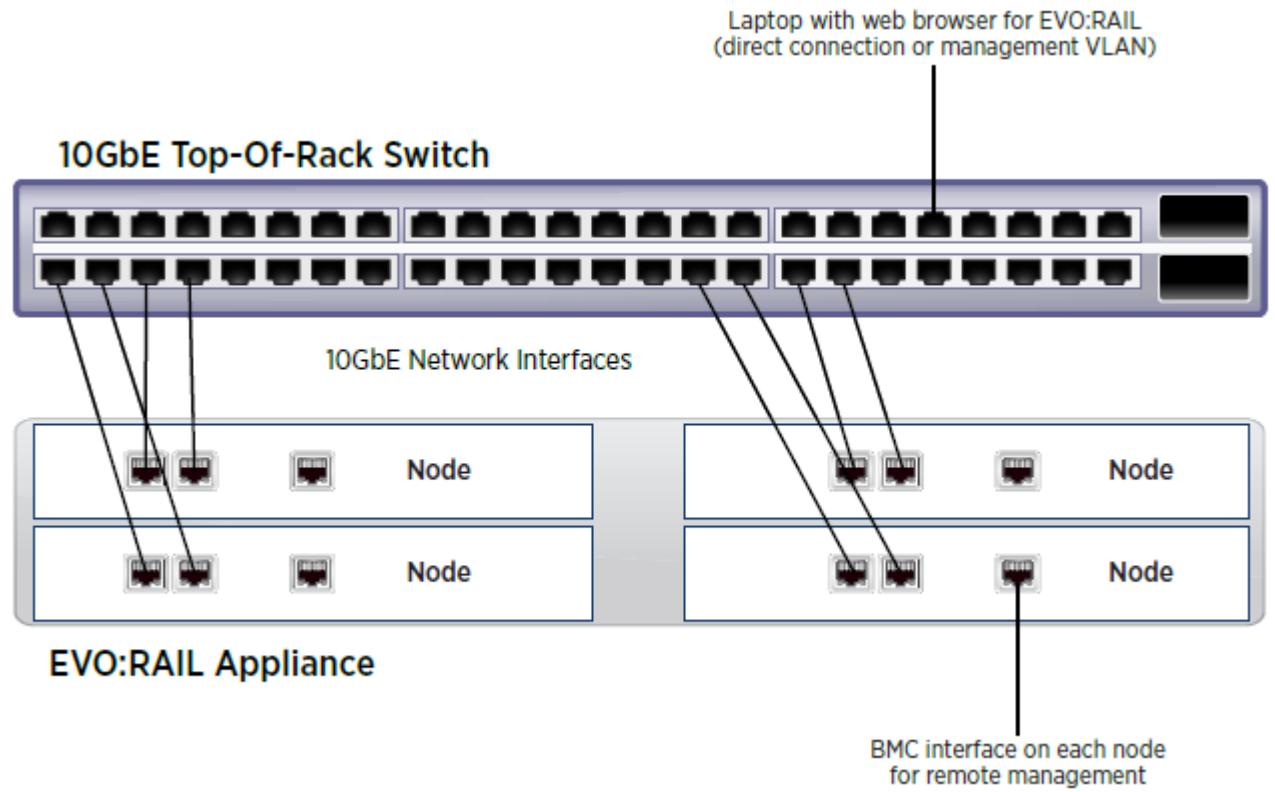
Figure 1. Rear view of one deployment of EVO:RAIL to a TOR switch

The following figure displays the EVO:RAIL cabling in Dell rack with PowerEdge C6220 II, Dell ToR switches, and out-of-band (OOB) switch.

Figure 2. EVO:RAIL configuration

For more information, see *Dell PowerEdge C6220 II Systems Hardware Owner's Manual* at **dell.com/poweredgemanuals**.

To understand the physical power and cooling facilities provided for the expected resiliency level of the appliance, see Appendix B Physical requirements.

Workstation or laptop (for configuration and management)

EVO:RAIL requires a workstation or laptop with a web browser to configure and manage. It should be either plugged in to the TOR switch or able to logically reach the TOR switch.

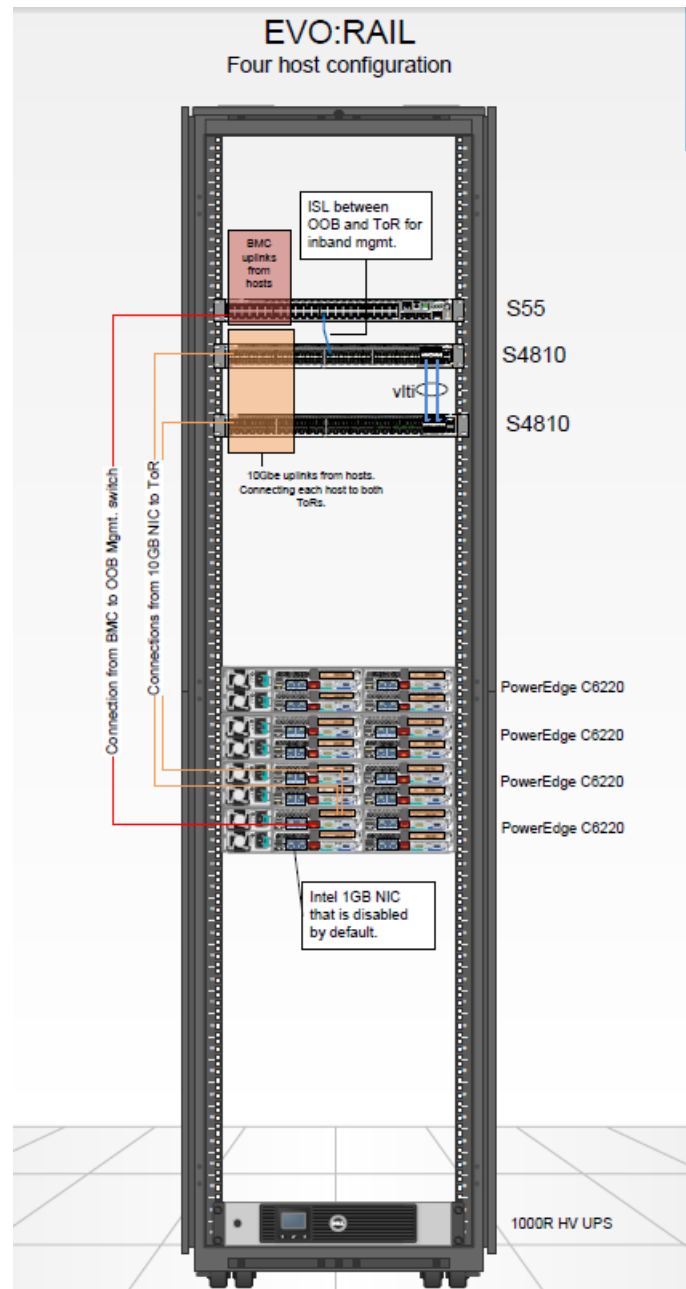EVO:RAIL uses a browser to deploy, configure, and manage the network resources. It supports the latest versions of Mozilla Firefox, Google Chrome, and Internet Explorer 10 and later. However, for Internet Explorer, after you browse to the appliance IP address, you must go to IE settings:

1. Select **Compatibility View** settings and clear both the options for the web addresses corresponding to EVO:RAIL or vCenter Server. For example, 192.168.10.200.
2. Click **Internet options** → **Security** → **Local intranet** → **Sites**. Ensure that all the options are clear and click **OK**, and then click **OK** to close the **Internet Options** dialog box..

Automatic Scale-out

EVO:RAIL provides automated scale-out functionality by detecting new EVO:RAIL appliances on the network. When a new EVO:RAIL appliance is turned on, either add it to an existing EVO:RAIL cluster or create an EVO:RAIL cluster. Minimal user inputs are required to configure. EVO:RAIL can scale up to 16 nodes in a cluster that equates to four C6220 units. For more information, see [Adding Appliances to an EVO:RAIL Cluster](#).

Fault-tolerance

EVO:RAIL conforms to standard Virtual SAN policy, one failure. It does not support more than one failure in a single appliance environment. On EVO:RAIL, an entire node can fail and the system still continue to function. One SSD or up to three HDDs on the same node can fail. Disk failures cannot affect more than one node, and the node still continues to function with one or two HDD failures. One network port on any node can fail without affecting the node.

EVO:RAIL does not support ether-channels (LACP or IP Hash). During initial setup EVO:RAIL is automatically configures when network failover occurs by using the virtual switch.

Logging in and Log Bundles

Logging consists of information about auditing and to track EVO:RAIL, vCenter, and ESXi functionalities. By default, logging is set to **vCenter Log Insight**. You may alternately select an existing third-party `syslog` server. To log in to **vCenter Log Insight** by using browser type preconfigured IP address, and then username as `admin`. To log in by using **SSH to Log Insight**, type username as `root`. The password in either case is the one you provide for vCenter Server.

Log Bundles consists of diagnostic information about vCenter Server, ESXi, and EVO:RAIL. They are generated from the EVO:RAIL Management Configuration screen. A log bundle can be uploaded to technical support as part of a support request.

Out-of-band management (optional)

Remote- or lights-out management is available on each node through one 1 GbE IPMI port that can connect to a management network. To configure out-of-band management, connect the BMC 1 GbE port on each node to a separate 1 GbE switch or use four additional ports on TOR switch.

When EVO:RAIL is shipped, BMC ports are preconfigured by using DHCP as follows:

BMC interface node 1: *hostname* = <APPLIANCE_ID>-01

BMC interface node 2: *hostname* = <APPLIANCE_ID>-02

BMC interface node 3: *hostname* = <APPLIANCE_ID>-03

BMC interface node 4: *hostname* = <APPLIANCE_ID>-04

Username: `root` **Password**: `root`

You can modify the BMC interface IP address and login or password. For more information, see *Dell PowerEdge C6220 II Systems Hardware Owner's Manual* at **dell.com/poweredgemanuals**.

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Networking

Top-of-Rack (TOR) switch

A 10 GbE TOR requires both IPv4 and IPv6 multicast support. The network can be configured flat or with VLANs.

- IPv4 and IPv6 multicast must be enabled on all ports of the TOR switch. When using multiple TOR switches, ISL multicast traffic for IPv4 and IPv6 must be able to communicate between the switches.
- To configure a management VLAN on your TOR switches, allow multicast traffic to passthrough.
- To allow multicast traffic to passthrough, there are two options for either all EVO:RAIL ports on your TOR switch or for the Virtual SAN and management VLANs (if VLANs are configured):

    a. Enable IGMP Snooping on your TOR switches, and then enable IGMP Querier.

    > **NOTE:** By default, most of the TOR switches enable IGMP Snooping, but disable IGMP Querier.

    b. Disable **IGMP Snooping** on your TOR switches. This option may lead to increased network traffic.

Table 2. VMware Network guidelines

Setting	Mandatory/ Recommended	Notes
IPv6 enabled on all ports		
Eight ports for RJ-45 or SFP+ for each EVO:RAIL appliance. One port for a workstation or laptop to access EVO:RAIL		
IPv4 Multicast	Mandatory for VSAN VLAN	Used for VSAN network for meta data and heart beat communication
IPv6 multicast	Mandatory for Management VLAN	Used for EVO RAIL discovery, update, maintenance and scaling workflows
IGMP Snooping AND IGMP Querier	**Recommended** to prevent additional Multicast traffic. Mandatory for VSAN if you are sharing VSAN VLAN with other hosts in network.	Helps restrict flooding of multicast and non-EVO Rail traffic to all ports.
MLD Snooping	Optional	EVO RAIL IPv6 multicast traffic is small and hence the flooding has little or no impact
L3 Multicast	Not needed	

For more information about **VMware Network guidelines**, go to https://www.vmware.com/files/pdf/products/evorail/vmware-evorail-network-user-guide.pdf

> **NOTE:** IGMP Snooping software examines internet group management protocol (IGMP) protocol messages within a VLAN to determine the interfaces that are connected to hosts or other devices accepted in receiving this traffic. Using the interface information, IGMP Snooping can reduce the bandwidth consumption in a multi-access LAN environment to avoid overloading the entire VLAN. IGMP Snooping tracks ports that are attached to multicast-capable routers to manage IGMP membership report forwarding. It also responds to topology change notifications. For IPv6, Multicast Listener Discovery (MLD) is essentially the same as IGMP in IPv4.

IP Addresses and VLANs

The Dell EVO:RAIL ships a default configuration, see EVO:RAIL default configuration table. In particular, management traffic is configured untagged and must be able to go into a native VLAN on your TOR switch, or unable to create the appliance and ESXi hosts successfully. (All other traffic — vSphere vMotion, Virtual SAN, and VM traffic are tagged for the VLANs you specify during configuration.)

> **NOTE:** To customize the initial management VLAN ID for EVO:RAIL, see Appendix C:EVO:RAIL Appliance Customization.

To configure EVO:RAIL or vCenter Server initially set the IP address to `192.168.10.200`, netmask to `255.255.255.0`, and gateway to `192.168.10.254`.

Before turning on your appliance, ensure that EVO:RAIL IP addresses and system IP address is not same.

Table 3. IP address and VLAN requirements

IP address	VLAN requirements
EVO:RAIL or vCenter Server	• IP address is required • Netmask and gateway addresses are automatically set to the same as the ESXi hosts
ESXi hosts	• Continuous IP range is required, with a minimum of 4 IPs • Netmask and gateway are required
vSphere vMotion	• Continuous IP range is required, with a minimum of 4 IPs • Isolated VLAN preferred (network is not routable)
Virtual SAN	• Continuous IP range is required, with a minimum of 4 IPs • Isolated VLAN preferred (network is not routable)
Virtual Machine Network	• Dedicated VLANs preferred

Network services

- **DNS server(s)**: An external DNS server is required for production use. (It is not required in a completely isolated environment). When you configure EVO:RAIL, specify the IP address of your corporate DNS servers. Also, provide the EVO:RAIL or vCenter Server, vCenter Log Insight, and ESXi host names and IP addresses in corporate DNS server tables.
- **NTP server(s)**: An external NTP server is not required, but it is recommended. If you do not provide an NTP server, EVO:RAIL uses the time that is set on ESXi host #1 (regardless whether or not this time is correct).
- **Active Directory (AD):** (*Optional*) To use Active Directory, type the AD user name, AD password, and AD domain. EVO:RAIL does not fully configure AD. Perform more tasks on the vSphere Web Client.

Networking best practices

- All network traffic (except for out-of-band management) is on the 10 GbE NICs. Each node in an EVO:RAIL appliance has two 10 GbE network ports. Each port must be connected to a 10 GbE switch that supports IPv4 and IPv6 multicast.
- EVO:RAIL supports four types of traffic network — Management, vSphere vMotion, Virtual SAN, and Virtual Machine. We recommend traffic isolation on separate VLANs. The following table lists the traffic isolation.

Table 4. Interfaces for traffic

Network	VMNIC0	VMNIC1
vSphere vMotion	Active	Standby
Virtual SAN	Standby	Active
Virtual Machines	Active	Standby
EVO:RAIL management	Active	Standby
vCenter Server or ESXi management	Active	Standby

- To ensure vSphere vMotion traffic does not consume all available bandwidth on the 10 GbE port, EVO:RAIL limits vMotion traffic to 4 Gbps.
- If you plan to scale up to four EVO:RAIL appliances in a cluster over time when you configure the first appliance, allocate all 16 IP addresses to the ESXi, vMotion, and Virtual SAN IP pools. EVO:RAIL appliance enables configuring subsequent appliances even easier.
- Dell recommends you to use a redundant switching solution for high availability. When using multiple TOR switches, multicast traffic for IPv4 and IPv6 must be able to communicate between the switches.
- It is not mandatory that all your network must support IPv6 because it applies only to the switches connected to EVO:RAIL.
- Various network topologies for TOR switches and VLANs are possible with EVO:RAIL. The following are sample scenarios that are provided in order of complexity, starting with the simplest:

  a. One TOR switch on a flat network (no VLANs)
  b. One TOR switch and multiple VLANs
  c. Two TOR switches on a flat network (no VLANs)
  d. Multiple TOR switches and multiple VLAN

e. Complex production environment with core switches, and also multiple TOR switches and VLANs

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Deployment, configuration and management

This section provides the information about the EVO:RAIL deployment, configuration and management.

EVO:RAIL Deployment

To deploy EVO:RAIL, complete the following steps:

1. Configure an EVO:RAIL network by using the information provided in this user's guide.
   - To configure the TOR switch, use the network administrator instructions. The TOR switch must enable IPv4 and IPv6 multicast.
   - Configure a management VLAN on your TOR switches and set to allow multicast traffic to passthrough.
   - To allow multicast traffic to passthrough, you have two options for either your entire TOR switch or for the Virtual SAN and management VLANs (if you have VLANs configured):
     1. Enable IGMP Snooping on your TOR switches and enable IGMP Querier.

        NOTE: By default, most switches enable IGMP Snooping, but disable IGMP Querier.
     2. Disable IGMP Snooping on your TOR switches. This option may lead to additional multicast traffic on your network.
2. Rack and cable: connect the 10 GbE adapters on EVO:RAIL to the TOR switch.
3. Turn on EVO:RAIL.
4. Connect a client workstation or laptop to the TOR switch and configure the network address to EVO:RAIL or vCenter Server. For example: IP address: `192.168.10.210`; netmask: `255.255.255.0`; gateway: `192.168.10.254`

   Access the EVO:RAIL IP address. For example `https://192.168.10.200:7443`. If you encounter a browser message about certificates, click **Proceed anyway**. It supports the latest versions of Mozilla Firefox, Google Chrome, and Internet Explorer 10 and later. However, for Internet Explorer, after you browse to the appliance IP address, go to IE settings:
   - Select **Compatibility View** settings and clear both options for the Web addresses corresponding to EVO:RAIL or vCenter server; for example, `192.168.10.200`.
   - Select **Internet options** → **Security** → **Local intranet** → **Sites**. Ensure that all the options are cleared and click **OK**, and then click **OK** to close the **Internet Options** dialog box.
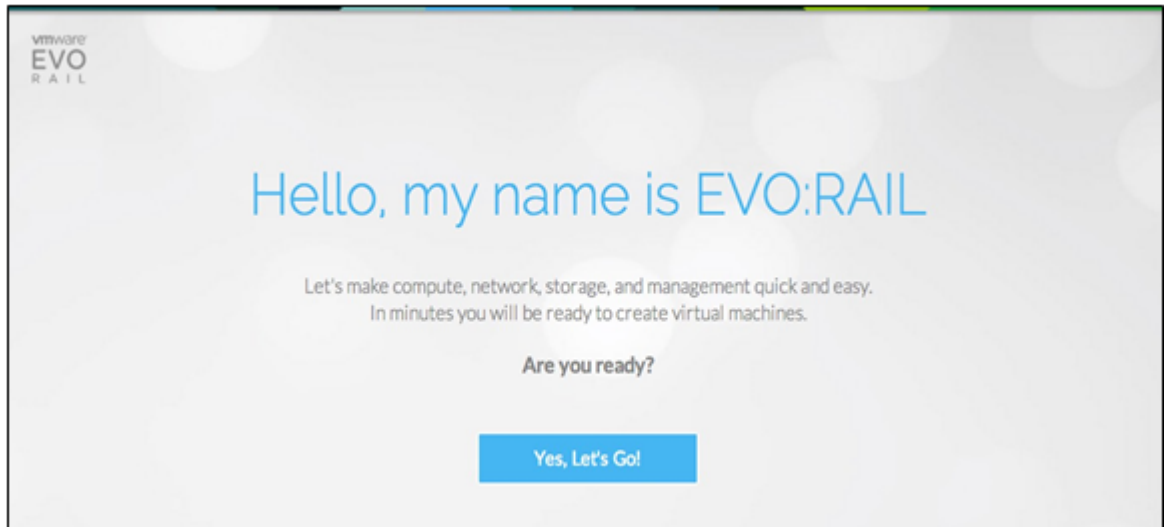
Figure 3. Initial user interface

EVO:RAIL Configuration

EVO:RAIL can be configured by using the following parameters:

- **Host names** for vCenter Server and ESXi host naming scheme
- **Networking** (IP ranges or VLAN ID): ESXi, Virtual SAN, vSphere vMotion, vCenter Server, and VM Networks
- **Passwords:** ESXi hosts and vCenter Server; optional Active Directory authentication
- **Globals:** Time zone; existing NTP, DNS, and Proxy servers; logging: vCenter Log Insight or third-party `syslog` server

Custom networking is easy with EVO:RAIL. You specify the IP or VLAN details for each network type: ESXi hosts, Virtual SAN, vSphere vMotion, vCenter Server, and VM Networks. EVO:RAIL verifies the configuration data, and then builds the appliance. EVO:RAIL implements data services, creates the ESXi hosts, and configures the vCenter Server.

> **NOTE:** Dell recommends allocating sufficient IP addresses for all the EVO:RAIL appliances. EVO:RAIL 1.0 allocate 16 IP addresses in each IP pool to make subsequent appliance configuration even easier!

EVO:RAIL can be configured by using three options.

- Just Go!
- Customize Me!
- Upload Configuration File

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Just Go!

With **Just Go!**, EVO:RAIL automatically configures default IP addresses and host names that are specified in the EVO:RAIL default configuration table. Configure your TOR switch and click **Just Go!** . Create two passwords and the default configuration is displayed.

Customize Me!

When you customize EVO:RAIL, by default, all required configuration parameters are provided, except for ESXi and vCenter Server passwords. **Customize Me!** allows easily to change the default configuration settings.
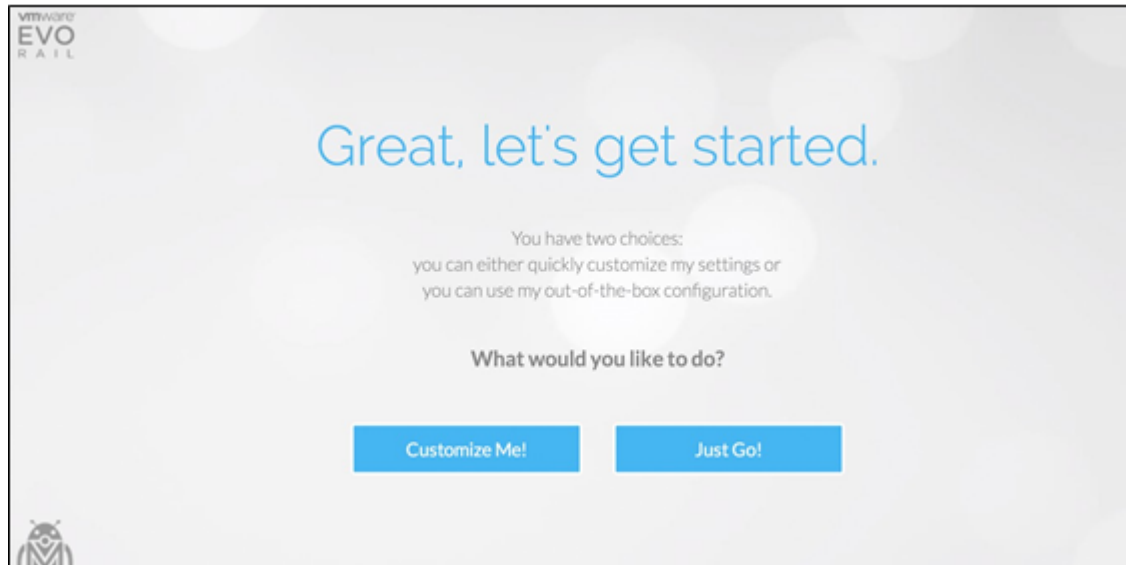

Figure 4. Let's get started

Upload Configuration File

With **Upload Configuration File**, an existing `json` configuration file can be selected and uploaded. You can view the **Upload Configuration File** in the lower right corner. For more information about format and valid properties, see Appendix A: Network Configuration Table.

Configuration Walk-Through

1. Click **Yes, Let's Go!** , and then click to accept the EVO:RAIL End-User License Agreement (EULA).
2. Click **Just Go!** to configure EVO:RAIL according to the order you placed and then go to task 11. If you click **Customize Me!**, you can configure host server names, IP addresses, VLAN IDs, and passwords. Most options have default values to make configuration quick and easy.

    📝 NOTE: There is no Save option in EVO:RAIL configuration. All configuration changes are automatically validated and saved when changing between options or screens.

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Figure 5. Configure hostnames

3. To customize EVO:RAIL, click **Hostnames** to define a naming scheme for your ESXi hosts. The host server name consists of an **ESXi hostname prefix**, a **Separator**, an **Iterator**, and a **Top-level domain (TLD)**. The **Preview** option displays an example of the result of the first ESXi host.

    • Type the ESXi hostname prefix.

    • Select the Separator ("None" or a dash "-") and the Iterator (Alpha, Num X, or Num 0X) from the drop-down menu.

    • Type the Top-level domain name.

    • Type the vCenter Server hostname. The top-level domain is automatically updated to the vCenter Server top-domain level.

4. On the **Networking** screen, provide the IP or VLAN details for each network type: ESXi hosts, Virtual SAN, vSphere vMotion vCenter Server, and VM Network.

    • On the **ESXi hosts** screen, type the Starting address for IP pool, Ending address for IP pool, Netmask, and Default gateway. The VLAN ID can only be configured at the factory.

    • On the **vMotion** screen, type the Starting address for IP pool, Ending address for IP pool, the vSphere vMotion VLAN ID, and the Netmask.

    • On the **Virtual SAN** screen, type the Starting address for IP pool, Ending address for IP pool, the Virtual SAN VLAN ID, and the Netmask.

Figure 6. Configure networking

5. *Optional:* On the **vCenter Server** screen, you can change the IP address for EVO:RAIL Management and vCenter Server. Type the new IP address. The Netmask and Default gateway are automatically copied from the ESXi hosts form.

    -   If you change the vCenter Server IP address, EVO:RAIL automatically reconfigure and provides new IP address, as described in task 10.

    -   If you change the IP address of vCenter Server, you have to change the IP address of vCenter Log Insight (in task 8, Globals) to be on the same subnet.

    -   Port numbers remain the same. EVO:RAIL — 7443 and vSphere WebClient — 9443.

    -   If you are using Internet Explorer as your browser, you must select **Compatibility View settings** and clear both options for the new web address.

6. On the **VM networks** screen, you can configure VM networks. Type a VM Network Name and VM Network VLAN ID. Click Add a VM network to add more VM network.

7. On the **Passwords** screen, you can set the passwords for the ESXi hosts and vCenter Server. Type and confirm the ESXi hosts root password and vCenter Server admin password.

    The password must be between 8 and 20 characters, with at least one uppercase, one lower case, and one special character. It cannot have any character repeated thrice.

    Optional: To use Active Directory for authentication, type AD username , AD password, and AD domain. EVO:RAIL does not fully configure AD. You must perform step 3 on the vSphere WebClient. For more information, go to **http://pubs.vmware.com/vsphere-55/topic/ com.vmware.vsphere.install.doc/GUID-B23B1360-8838-4FF2-B074-71643C4CB040.html**

Figure 7. Configure administrative passwords and Active Directory (optional)

8. On the **Globals** screen, select in the **Time Zone** and **Logging** boxes, and provide any existing DNS, NTP, or Proxy servers on your network. If you have multiple servers, separate them with commas. EVO:RAIL configures each of these services, as when needed. For example, all ESXi hosts and the vCenter Server are configured with the specified NTP server when this options is filled out.

If you do not provide a DNS server, EVO:RAIL provides this service from the vCenter Server. If you do not provide an NTP server, EVO:RAIL uses the time that is set on ESXi host #1 (regardless whether this time is correct).

Logging combines information for auditing and to track the functionality of EVO:RAIL, vCenter, and ESXi. By default, logging is set to vCenter Log Insight. You may alternately select an existing third-party `syslog` server. To use vCenter Log Insight, configured the IP address and type the username as `admin`. To log in to **SSH to Log Insight**, the username is `root`. The password in either case is the one that you provided for vCenter Server.

> **NOTE:** The default IP address for vCenter Log Insight is preconfigured; for example, `192.168.10.201`. If you change the IP address of vCenter Server in task 5, you have to change the IP address of vCenter Log Insight to be on the same subnet.

Figure 8. Configure globals

9. Click **Validate**. EVO:RAIL verifies the configuration data, and checks for conflicts. After validation is successful, click **Build Appliance**.

10. This step is only necessary if you change the IP address of vCenter Server!

    If you set a new IP address for vCenter Server or EVO:RAIL in step 5 before you proceed, you must manually change the IP address of your client workstation or laptop to a new address on the same subnet as the new management IP address. For example, if the new management IP address is `10.10.10.200`, you can set your client laptop IP address to `10.10.10.210` return to the browser window and click **Take me to it!** . If you encounter a browser message about certificates, click **Proceed anyway**.

    If you click the browser window before you reconfigure your client laptop, browser does not find EVO:RAIL. If you close the browser window and later want to go to EVO:RAIL, type the IP address you configured earlier that is `https://10.10.10.200:7443`)

Figure 9. New IP address for management, if you change the IP address of vCenter Server

11. **Finishing up: Building your appliance!**

    EVO:RAIL implements data services, creates the new ESXi hosts, and configures the vCenter Server. When you view the **Hooray!** screen, click the **IP address** to continue to EVO:RAIL Management. You should also bookmark this IP address in your browser for later use.

Figure 10. Finished configuration

EVO:RAIL Management

To view and manage VMs, EVO:RAIL Management consists of **VMS** and **Create VM** in the left pane. Users visualize the status and tasks in the EVO:RAIL system with **Health** and **Tasks** in the left pane. **Config** controls logging, licensing, updating, and language selection. To view these features, click icons in the left pane.

EVO:RAIL Management handles automatic scale-out with Add EVO:RAIL Appliance whenever a new appliance is detected.

Adding appliances to an EVO:RAIL cluster

EVO:RAIL Management revolutionizes scale-out. Increasing compute, network, and storage resources is as easy as turning on a new appliance to join an existing EVO:RAIL cluster.

Whenever EVO:RAIL detects a new appliance the following message and options are displayed on the management screen. Click **Add EVO:RAIL Appliance**.
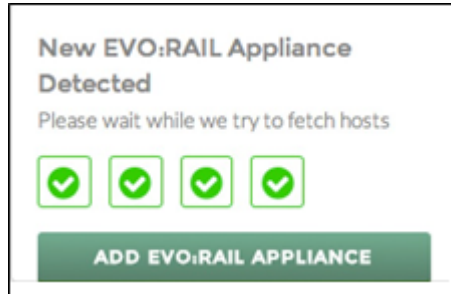
Figure 11. A new appliance is detected

EVO:RAIL automatically distributes the configuration to seamlessly add new appliances that are automatically configured and does not require any configuration. To accomplish this, you must provide the passwords that you created in EVO:RAIL configuration. Other fields on the GUI are disabled if additional IP addresses are already configured.

> **NOTE:** Only one appliance can be added at a time. To add multiple appliances, turn on one at a time, ensure that each is properly configured before turning on the next appliance.

Figure 12. EVO:RAIL Add Appliance screen during scale-out

Creating Virtual Machines

Before you view any VMs, click **Create VM** to add one or more VMs to EVO:RAIL.

EVO:RAIL streamlines virtual machine creation. Users create VMs with only a few clicks to select the guest operating system, VM size, network segment, and security options. EVO:RAIL simplifies VM sizing by offering single-click small, medium, and large configurations optimized for each guest OS with a single-click security policy.

Figure 13. Streamlined VM creation options (small, medium, large) and connecting to a network segment

Security Policies

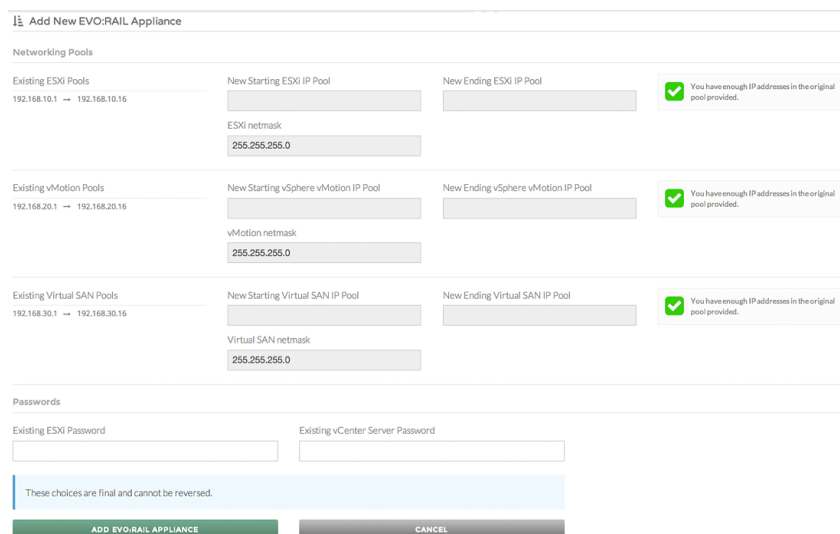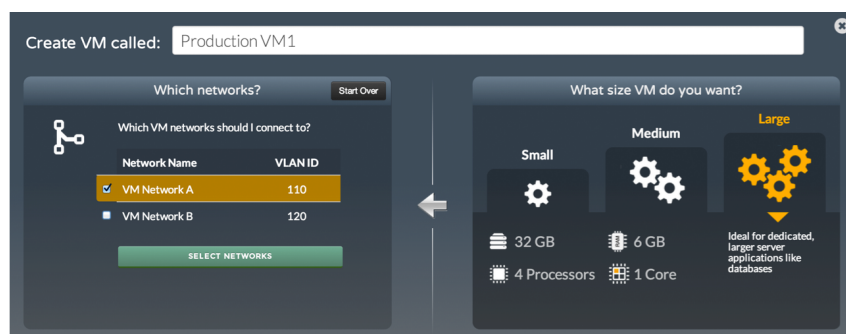Without EVO:RAIL, you must manually go through a long list of options to secure a VM. EVO:RAIL enables you to streamline this process with three pre-defined Risk Profiles to select from at the time of VM provisioning.

These profiles are a collection of VM Advanced Settings on the basis of a particular Risk Profile from the vSphere 5.5 Security Hardening Guide.

By selecting more secure policy, you lose few VM functionality, such as automated tools, inability to shrink VM disks, persistent mode only, no logging and performance information, blocked device interactions, and limited remote console connections. For more information, go to **www.vmware.com/security/hardening-guides**.

- Risk Profile 3 specifies guidelines that should be implemented in all environments. These are VMware best practices for all data centers. When creating a VM in EVO:RAIL, select **Default Policy**.

- Risk Profile 2 specifies guidelines for more sensitive environments or small, medium or large enterprises that are subject to strict compliance rules. When creating a VM in EVO:RAIL, select **Basic Policy**.

- Risk Profile 1 specifies guidelines for the highest security environments, such as top-secret government or military installations, or anyone with extremely sensitive data or in a highly regulated environment. When creating a VM in EVO:RAIL, select `**Secure Policy**.

- When creating a VM in EVO:RAIL, selecting **No Policy** means that no security configuration options are applied to the VM.

Figure 14. Selecting security options

Monitoring VMs

EVO:RAIL Management enables you to view all VMs in a grid. Use **Filter By**, and **Sort By** menus in the upper right corner to arrange the VMs. Use the **Search** option to find VMs by name.

The vSphere WebClient logo is in the upper right corner of the page. Click logo to open vSphere WebClient in a separate browser tab. Log in with the username: *root*, and the password that you configured for vCenter Server.

The screenshot here displays a list of VMs. The icons in the lower right corner of each VM enables you to open the VM console, clone the VM, and turn on or turn off the VM. When a VM is turned on, click **Open Console** , go to the console, and install the guest OS that is uploaded when you created the VM.

Click one of the VMs (Production VM1 in the figure) to access a full set of VM options:

- install VMware Tools
- rename VM
- eject ISO
- open console
- clone VM
- suspend VM
- delete VM
- turn on or off

NOTE: To install VMware tools, your guest OS must already be installed on your VM, and the guest OS ISO image disk drive must be unmounted or ejected from the virtual CD drive.
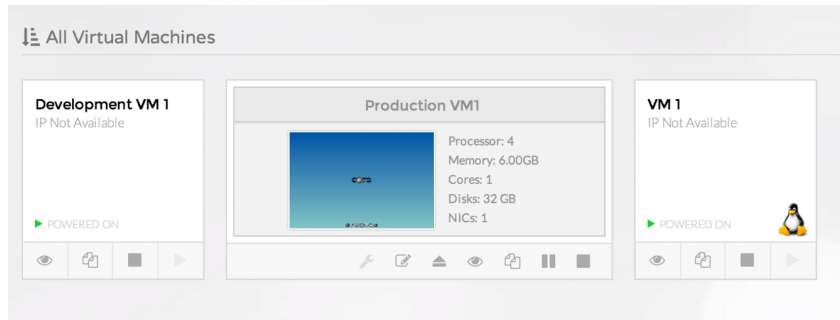
Figure 15. EVO:RAIL Management dashboard

Monitoring Health

EVO:RAIL Management simplifies live compute management with health monitors for CPU, memory, storage, and VM usage for entire EVO:RAIL clusters, individual appliances, and individual nodes.

- *Cluster information*: Click **Overall System**.
- *Appliance information*: Click an appliance - either on the menu bar of the window or in the list of **EVO:RAIL Appliances** below the **Live Usage Statistics**.
- *Node information:* To view information about a specific node, click the appliance first, and then the node.
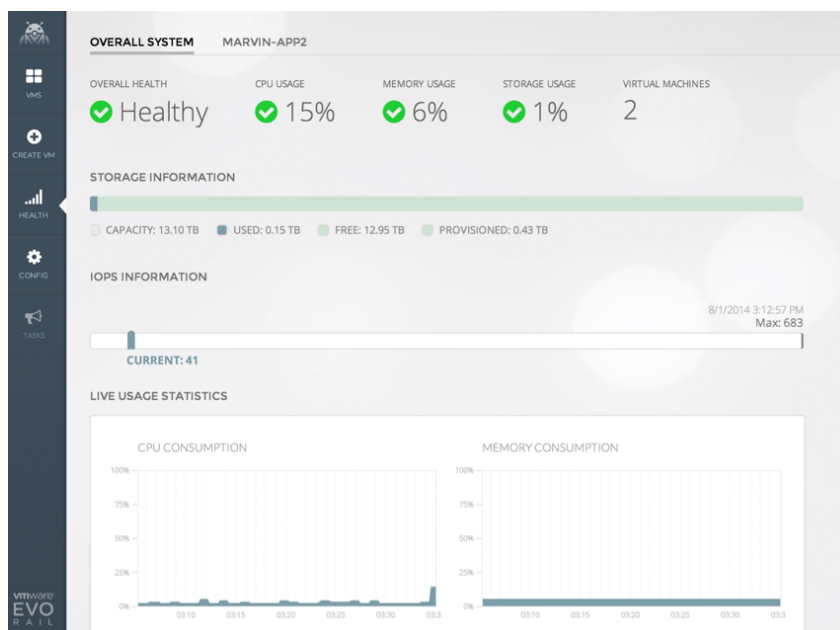
Figure 16. EVO:RAIL Management health

Logging, Licensing, Updating, and Selecting Language

EVO:RAIL Management streamlines log collection, licensing, and software updates, and offers language choice for globalization. It also provide notifications and track tasks.

- **About** displays the build numbers for vCenter Server, ESXi, and EVO:RAIL software.
- **Log Collection** allows you to generate a log bundle that combines diagnostic information for vCenter Server, ESXi, and EVO:RAIL. This bundle can be uploaded to technical support as part of a Support Request (SR).
- In **Licensing** box, type the serial key and you can view VMware EVO:RAIL license.
- **Choose Your Language** supports globalization for the EVO:RAIL user interface.

EVO:RAIL supports vCenter, ESXi, and EVO:RAIL software patch and upgrade. With a minimum of four independent ESXi hosts in an EVO:RAIL cluster, updates are non-disruptive and require zero downtime.
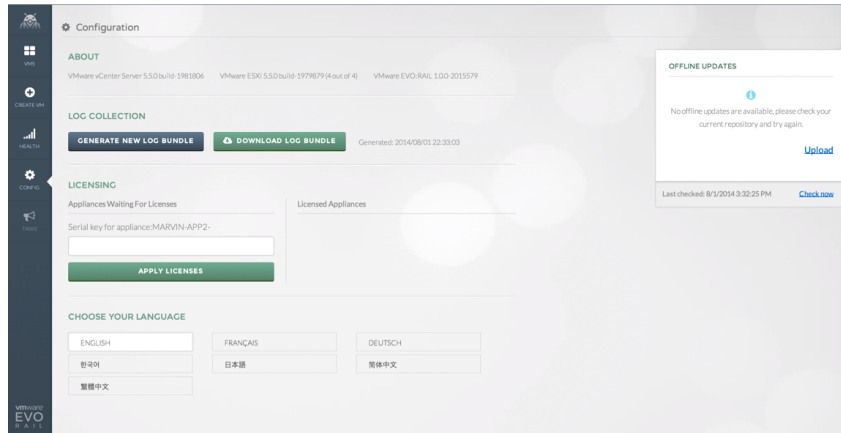
Figure 17. EVO:RAIL Management configuration

Appendix A: Network configuration table

To customize an EVO:RAIL, complete the following table with appropriate information:

Table 5. Network Configuration

NETWORK	VLAN ID	IP ADDRESS	HOSTNAME or NAMINGSCHEME	NETMASK	GATE WAY
Client workstation or laptop for EVO:RAIL configuration and management (you must configure this on your laptop)					
vCenter Server (port 9443) EVO:RAIL (port 7443)					
ESXi starting IP address					
ESXi ending IP address *Allocate 4, 8, 12, or 16 IP addresses, depending on how many EVO:RAIL appliances you plan to have*					
vSphere vMotion starting IP address					
vSphere vMotion ending IP address *Allocate 4, 8, 12, or 16 IP addresses, depending on how many EVO:RAIL appliances you plan to have*			Not applicable		Not applicable (not a routable table)
Virtual SAN starting IP address					
Virtual SAN ending IP address *Allocate 4, 8, 12, or 16 IP addresses, depending on how many EVO:RAIL appliances you plan to have*			Not applicable		Not applicable (not a routable table)

NETWORK SERVICES	VLAN ID	IP ADDRESS	VM NETWORK NAME	NETMASK	GATE WAY
DNS server					
NTP server	Not applicable		Not applicable	Not applicable	Not applicable
Time zone					
Logging					

NETWORK SERVICES	VLAN ID	IP ADDRESS	VM NETWORK NAME	NETMASK	GATE WAY
Active Directory					

NETWORK OUT-OF-BAND MANAGEMENT	VLAN ID	IP ADDRESS	HOSTNAME or NAMINGSCHEME	NETMASK	GATE WAY
BMC node 1					
BMC node 2					
BMC node 3					
BMC node 4					

EVO:RAIL default configuration table

Default values are used in **Just Go!** configuration, and are used to prepopulate fields in **Customize Me!** configuration. The values are stored in the default configuration file that is a part of the EVO:RAIL distribution, `default-config-static.json`.

The following Network Configuration table provides the default Dell EVO:RAIL configuration. The resources are allocated for one EVO:RAIL appliance.

- You reserve four IP addresses for ESXi, Virtual SAN, and vSphere vMotion.
- The naming scheme for the ESXi hosts is: *prefix*=host, *separator*=None, *iterator*=Num0X, *top-level domain*=local. Thus, the host server names are from `host01.local` through `host04.local`.
- You use five VLANs: 20, 30, 110, 120, and a VLAN configured as a native VLAN. Configure VLANs on the TOR switches before configuring EVO:RAIL.
- Logging is configured to "vCenter Log Insight" with IP address `192.168.10.201`. DNS server is not configured, so vCenter Server provides DNS service.
- For example, EVO:RAIL client workstation or laptop configures the customer with `192.168.10.210` (netmask: `255.255.255.0`, gateway: `192.168.10.254`)

Default configuration:

Table 6. Just Go! Network Configuration table

NETWORK SERVICES	VLAN ID	IP ADDRESS	HOSTNAME/ NAMING SCHEME	NETMASK	GATEWAY
Client workstation or laptop for EVO:RAIL configuration and management (you must configure on your laptop)		192.168.10.210		255.255.255.0	192.168.10.254
vCenter Server (port 9443) EVO:RAIL (port 7443)	0	192.168.10.200	vcenter.local	255.255.255.0	192.168.10.254
ESXi starting IP address	0	192.168.10.1	host01.local ... host04.local	255.255.255.0	192.168.10.254
ESXi ending IP address		192.168.10.4			
vSphere vMotion starting IP address	20	192.168.20.1	Not applicable	255.255.255.0	Not applicable (not a routable table)
vSphere vMotion ending IP address		192.168.20.4			
Virtual SAN starting IP address	30	192.168.30.1	Not applicable	255.255.255.0	Not applicable (not a routable table)
Virtual SAN ending IP address		192.168.30.4			

NETWORK SERVICES	VLAN ID	IP ADDRESS	HOSTNAME/ NAMING SCHEME	NETMASK	GATEWAY
DNS server	N/A	Not set	Not applicable	Not applicable	Not applicable
NTP server		Not set			
Time zone		UTC			
Logging: vCenter Log Insight		192.168.10.201			
Active Directory		none			

NETWORK SERVICES	VLAN ID	IP ADDRESS	HOSTNAME/ NAMING SCHEME	NETMASK	GATEWAY
BMC node 1			<ApplianceID>-01		
BMC node 2	0	By default DHCP provides the IP address or configure manually	<ApplianceID>-02	By default DHCP provides the netmask address or configure manually	By default DHCP provides the gateway address or configure manually
BMC node 3			<ApplianceID>-03		
BMC node 4			<ApplianceID>-04		

JSON configuration file format and valid values

The configuration file used for Just Go!, `default-config-static.json`, is part of the EVO:RAIL distribution. As an alternative to Customize Me!, you can upload a `json` configuration file by using **Upload Configuration File** in EVO:RAIL Configuration.

EVO:RAIL does not currently validate your `json` file. It must be properly formatted and the values must be valid for EVO:RAIL. The following list contains the field restrictions:

- **minIP, maxIP, netmask, gateway:** valid IP addresses and netmask in your network
- **vlanId:** valid numeric VLAN ID, configured on your TOR switch
- **name:** alphanumeric string to identify a VM network segment
- **prefix:** alphanumeric string for the first part of an ESXi hostname
- **separator:** "", "-"
- **iterator:** "NUMERIC_N", "NUMERIC_NN", "ALPHA"
- **tld:** valid TLD name in your network
- **vcenter:** alphanumeric string for the vCenter Server hostname
- **passwords:** Only text that has 5-20 characters and one of them must be a special character. No character must be reused for more than three or more times.(Be aware that typing a password in text-only format in a configuration file is *not* secure.)
- **logging:** "LOGINSIGHT", "SYSLOG"
- **timezone:** "UTC"
- **other fields:** alphanumeric strings

The default configuration file that is a part of the EVO:RAIL distribution, `default-config-static.json`, is given here.

```
{
    "network":{
        "dhcp": false,
        "hosts":{
            "management":{
                "pools":[{
                    "minIp": "192.168.10.1",
```

```
                "maxIp": "192.168.10.4"
            }],
        "netmask": "255.255.255.0",
        "gateway": "192.168.10.254",
        "vlanId": null
    },
    "vsan": {
        "pools": [{
            "minIp": "192.168.30.1",
            "maxIp": "192.168.30.4"
        }],
        "netmask": "255.255.255.0",
        "vlanId": 30
    },
    "vm": [{
        "name": "VM Network A",
        "vlanId": 110
    }, {
        "name": "VM Network B",
        "vlanId": 120
    }],
    "vmotion": {
        "pools": [{
            "minIp": "192.168.20.1",
            "maxIp": "192.168.20.4"
        }],
        "netmask": "255.255.255.0",
        "vlanId": 20
    }
},
    "vcenter": {
        "ip": "192.168.10.200"
    }
},
"hostnames": {
    "hosts": {
        "prefix": "host",
        "separator": "",
        "iterator": "NUMERIC _ NN"
    },
    "tld": "localdomain.local",
    "vcenter": "vcserver"
},
"passwords": {
    "esxiPassword": null,
    "esxiPasswordConfirm": null,
    "vcPassword": null,
    "vcPasswordConfirm": null,
    "activeDirectoryDomain": "",
    "activeDirectoryUsername": "",
    "activeDirectoryPassword": "",
    "activeDirectoryPasswordConfirm": null
},
"global": {
    "logging": "LOGINSIGHT",
    "timezone": "UTC",
    "loginsightServer": "192.168.10.201",
    "loginsightHostname": "loginsight",
    "ntpServerCSV": "",
    "syslogServerCSV": "",
    "dnsServerCSV": "",
    "proxyServer": "",
    "proxyPort": "",
    "proxyUsername": "",
```

```
            "proxyPassword": ""
        }
    }
```

Appendix B: Physical requirements

For more information, see *Dell PowerEdge C6220 II Systems Hardware Owner's Manual* at **dell.com/poweredgemanuals**.

For modifying BMC Interface IP address in the BIOS, refer to the Set BMC LAN configuration topic in the Server Menu section of Dell PowerEdge C6220 II Systems Hardware Owner's Manual at **dell.com/poweredgemanuals**.

- Default Username: *root*
- Default Password: *root*

Appendix C: EVO:RAIL Appliance Customization

Customization of the initial management VLAN ID for EVO:RAIL

Changes are required for two different interfaces. The first interface is the ESXi "Management Network", which must be updated on all ESXi hosts installed as part of an Appliance. The second interface is the VM Management (VM Network) on the first ESXi host where the vCenter Server and vCenter Log Insight VMs are deployed during initial configuration.

> **NOTE:** In order to properly validate customized network settings on Appliance, the OEM must configure their test environment to match the customers' network configuration.

Customizing the ESXi Management Network

> **NOTE:** This step must be performed on all nodes of the Appliance.

Option #1

1. Log in to DCUI.
2. Go to **Configure Management Network → VLAN**.
3. Specify the VLAN ID and press Enter.
4. Press Esc to exit and Y to apply changes and restart the management network.

Option #2

1. Log in to the ESXi shell (command line interface)
2. Run the following command:
   ```
   esxcfg-vswitch -p "Management Network" -v <VLAN_ID> vSwitch0
   ```

Customizing the VM Network

> **NOTE:** This step must be performed on all four nodes of the Appliance.

1. Log in to the ESXi shell (command line interface).
2. Run the following command:
   ```
   esxcfg-vswitch -p "VM Network" -v <VLAN_ID> vSwitch0
   ```

Restart all nodes after the changes are applied.

8

Getting help

Contacting Dell

Dell provides several online and telephone-based support and service options. If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer-service issues:

1. Go to **Dell.com/support**.
2. Select your country from the drop-down menu on the bottom right corner of the page.
3. For customized support:
   a. Enter your system Service Tag in the **Enter your Service Tag** field.
   b. Click **Submit**.
      The support page that lists the various support categories is displayed.
4. For general support:
   a. Select your product category.
   b. Select your product segment.
   c. Select your product.
      The support page that lists the various support categories is displayed.

Documentation matrix

The documentation matrix provides information on documents that you can refer to for setting up and managing your system.

To...	Refer to...
Install your system into a rack	Rack documentation included with your rack solution
Set up your system and know the system technical specifications	*Getting Started With Your System* that shipped with your system or see **Dell.com/poweredgemanuals**
Install the operating system	Operating system documentation at **Dell.com/operatingsystemmanuals**
Get an overview of the Dell Systems Management offerings	Dell OpenManage Systems Management Overview Guide at **Dell.com/openmanagemanuals**

To...	Refer to...
Configure and log in to iDRAC, set up managed and management system, know the iDRAC features and troubleshoot using iDRAC	Integrated Dell Remote Access Controller User's Guide at **Dell.com/esmmanuals**
Know about the RACADM subcommands and supported RACADM interfaces	RACADM Command Line Reference Guide for iDRAC and CMC at **Dell.com/esmmanuals**
Launch, enable and disable Lifecycle Controller, know the features, use and troubleshoot Lifecycle Controller	Dell Lifecycle Controller User's Guide at **Dell.com/ esmmanuals**
Use Lifecycle Controller Remote Services	Dell Lifecycle Controller Remote Services Quick Start Guide at **Dell.com/esmmanuals**
Set up, use, and troubleshoot OpenManage Server Administrator	Dell OpenManage Server Administrator User's Guide at **Dell.com/openmanagemanuals**
Install, use, and troubleshoot OpenManage Essentials	Dell OpenManage Essentials User's Guide at **Dell.com/openmanagemanuals**
Know the features of the storage controller cards, deploy the cards, and manage the storage subsystem	Storage controller documentation at **Dell.com/ storagecontrollermanuals**
Check the event and error messages generated by the system firmware and agents that monitor system components	Dell Event and Error Messages Reference Guide at **Dell.com/esmmanuals**