



VMware EVO:RAIL Network User Guide

EVO:RAIL Release 1.1.0 and 1.2.0

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VMware EVO:RAIL Setup Checklist

Read the VMware EVO:RAIL Network User Guide and fill in the EVO:RAIL Network Configuration Table	
10GbE Top-of-rack (TOR) switch(es)	<ul style="list-style-type: none"> <input type="checkbox"/> Eight 10GbE ports (SFP+ or RJ-45) for each EVO:RAIL Appliance <input type="checkbox"/> Disable link aggregation (LACP/EtherChannel) on TOR ports connected to EVO:RAIL
VLANs (<i>Best practice</i>)	<p>Important: <i>Read the entire section on VLANs in this user guide!</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Configure one management VLAN for EVO:RAIL™, vCenter Server™, ESXi™, and vRealize Log Insight™ and enable IPv4 multicast and IPv6 multicast <input type="checkbox"/> Configure one VLAN for Virtual SAN™ and enable IPv4 multicast <input type="checkbox"/> On interfaces between switches, be sure to configure the management and Virtual SAN VLANs to follow the same multicast rules <input type="checkbox"/> Configure one VLAN for vSphere® vMotion™ <input type="checkbox"/> Configure at least one VM Network <input type="checkbox"/> Optional: Configure one VLAN for out-of-band management
IP Addresses	<ul style="list-style-type: none"> <input type="checkbox"/> Reserve one IP address on the management VLAN for EVO:RAIL / vCenter Server <input type="checkbox"/> Reserve one IP address on the management VLAN for vRealize Log Insight <input type="checkbox"/> Reserve four contiguous IP addresses on the management VLAN for ESXi hosts for each Appliance <input type="checkbox"/> Reserve four contiguous IP addresses for Virtual SAN for each Appliance <input type="checkbox"/> Reserve four contiguous IP addresses for vSphere vMotion for each Appliance <input type="checkbox"/> Reserve four IP addresses for out-of-band management for each Appliance (optional)
Additional Information	<ul style="list-style-type: none"> <input type="checkbox"/> The IP address of a DNS server(s) on your network (required, except in totally isolated environments) <input type="checkbox"/> The IP address or hostname of an NTP server(s) on your network (recommended) <input type="checkbox"/> Optional: The hostname, port, and username/password of your proxy server <input type="checkbox"/> Optional: The hostname of your third-party syslog server instead of vRealize Log Insight <input type="checkbox"/> Optional: The IP address of your Qualified EVO:RAIL partner solution, if supplied with EVO:RAIL
Make sure you have all of the following ready	
EVO:RAIL Appliance(s)	<ul style="list-style-type: none"> <input type="checkbox"/> Your EVO:RAIL Appliance(s) <input type="checkbox"/> 2U rack space is required in a 19x30-inch cabinet for each Appliance <input type="checkbox"/> Power and cooling specifications, operating conditions, and hardware configuration options are provided by your Qualified EVO:RAIL Partner <input type="checkbox"/> A custom management VLAN can optionally be created, as described in this user guide, before you deploy your EVO:RAIL Appliance; it cannot be added after the appliance is configured
EVO:RAIL Configuration and Management workstation/laptop	<ul style="list-style-type: none"> <input type="checkbox"/> Client workstation/laptop (any operating system) that is able to communicate on the EVO:RAIL management VLAN <input type="checkbox"/> Access to a browser for EVO:RAIL Configuration and Management. The latest versions of Firefox, Chrome, and Internet Explorer 10+ are all supported
Out-of-band management switch (optional)	<ul style="list-style-type: none"> <input type="checkbox"/> A separate switch with four ports per Appliance or <input type="checkbox"/> Enough extra capacity on the TOR switch (contact your Qualified EVO:RAIL Partner for support requirements)
Deploy EVO:RAIL	
<ul style="list-style-type: none"> <input type="checkbox"/> Rack and cable: connect the 10GbE ports on EVO:RAIL to the TOR switch(es) <input type="checkbox"/> Power on each node on your EVO:RAIL appliance <input type="checkbox"/> Configure the network address of a workstation/laptop to talk to EVO:RAIL/vCenter Server on the management VLAN <input type="checkbox"/> Browse to the EVO:RAIL IP address (for example, https://192.168.10.200:7443) - when you encounter browser messages about certificates, proceed anyway 	
You are now ready to configure your EVO:RAIL Appliance(s) - in minutes you will create your first VM!	

Table 1. EVO:RAIL Setup Checklist

EVO:RAIL Network Configuration Table

Row	Category	Description	VMware Sample Defaults		Customer Values
1	Client workstation/laptop for EVO:RAIL Configuration and Management	Pre-configuration IP address, netmask, gateway	Example: 192.168.10.210, 255.255.255.0, 192.168.10.254		
2		Post-configuration IP address, netmask, gateway			
3	Management VLAN ID	VLAN ID for EVO:RAIL, ESXi, and vCenter Server	Native VLAN (no tagging)		
4	vCenter Server (port 9443) EVO:RAIL (port 7443)	Hostname and top-level domain	vcenter.local		
5		Pre-configuration IP address	192.168.10.200		
6		Post-configuration IP address	192.168.10.200		
7	ESXi Hosts	Host naming scheme	host01.local		
8		Gateway	192.168.10.254		
9		Starting IP address	192.168.10.1		
10		Ending IP address	192.168.10.4		
11		Netmask	255.255.255.0		
12	vSphere vMotion	VLAN ID for vMotion	20		
13		Starting IP address	192.168.20.1		
14		Ending IP address	192.168.20.4		
15		Netmask	255.255.255.0		
16	Virtual SAN	VLAN ID for Virtual SAN	30		
17		Starting IP address	192.168.30.1		
18		Ending IP address	192.168.30.4		
19		Netmask	255.255.255.0		
20	VM Networks (for example, to separate traffic by department)	Name and VLAN ID	VM Network A	110	
21		Name and VLAN ID	VM Network B	120	
22		Name and VLAN ID	No default		
23		Name and VLAN ID	No default		
24		Name and VLAN ID	No default		
25	Passwords	ESXi "root"	*****		*****
		vCenter Server "administrator@vsphere.local"	*****		*****
26	Active Directory (optional)	AD domain	No default		
		AD username and password	No default		
27	Global settings	Time zone - required	UTC		
28		Existing NTP server(s) - recommended	No default		
29		Existing DNS server(s) - required	No default		
30	Proxy settings (optional)	Existing proxy server	No default		
		Port	No default		
		Username and password	No default		
31	Logging (either vRealize Log Insight or existing syslog server)	Log Insight hostname and IP address	loginsight	192.168.10.201	
		Existing syslog server(s) - optional	No default		
32	QEP Solution (optional)	Primary VM IP address	No default		
		Secondary VM IP address	No default		
33	Out-of-band Management (optional – configurable only in server BIOS)	Username and password	Userld	Passw0rd!	*****
		Hostname for each node	<ApplianceID>-01 <ApplianceID>-02 etc.		
		IP address for each node	DHCP provided		

Table 2. EVO:RAIL Network Configuration Table

- The Sample Default configuration values represent VMware defaults – Qualified EVO:RAIL Partners may provide alternate default values.
- Please note that in Rows 1 and 2, users must configure their own EVO:RAIL Configuration and Management workstation/laptop. This is an example of how you could configure your laptop to work with the default values shown in this table.
- Additional information about each Row is described in this User Guide.

EVO:RAIL Networking

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

EVO:RAIL Appliance

EVO:RAIL consists of four nodes. **Figure 1** shows an example of the physical appliance and simple network setup. The exact appliance configuration will vary, depending on the Qualified EVO:RAIL Partner (QEP) that is selected.

EVO:RAIL ships with either eight RJ-45 or SFP+ NIC ports. Eight corresponding ports are required for each EVO:RAIL appliance on the top-of-rack (TOR) switch(es). One port, either on the TOR switch or on a management VLAN that can reach the TOR network, is required for a workstation/laptop with a web browser for EVO:RAIL Configuration and Management. Any other ports on the appliance will be covered and disabled.

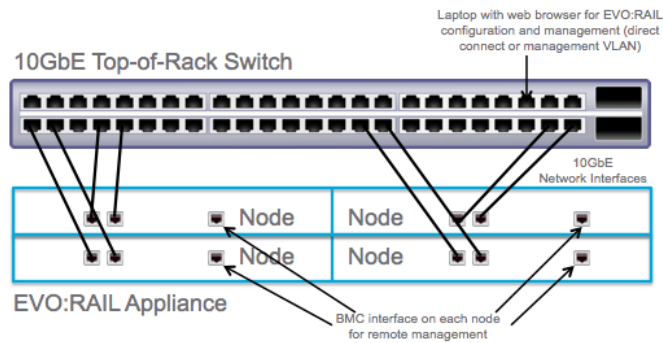


Figure 1. Rear view of one deployment of EVO:RAIL connected to one TOR switch. Appliance port locations vary by Qualified EVO:RAIL Partner.

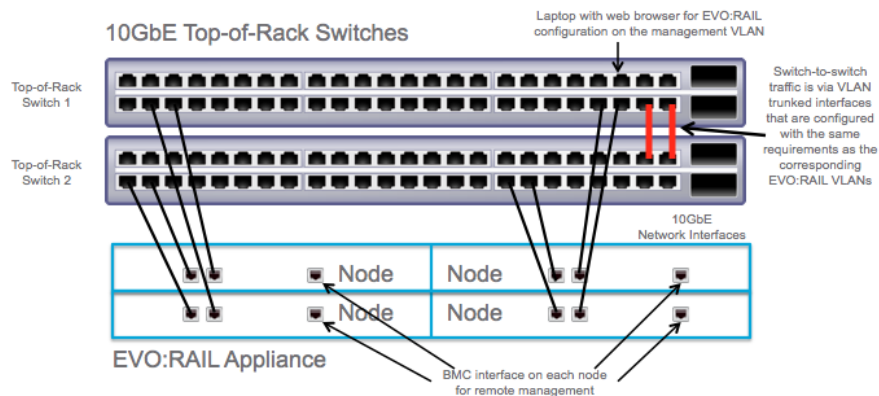


Figure 2. Rear view of one deployment of EVO:RAIL connected to two TOR switches, which can be used for redundancy.

Many of the hardware components in EVO:RAIL are driven by VMware Virtual SAN™ requirements, although EVO:RAIL is more prescriptive than Virtual SAN in order for customers to have a true “appliance” experience.

EVO:RAIL network requirements are driven by VMware Loudmouth auto-discovery capabilities, based on the RFC-recognized "Zero Network Configuration" protocol. New EVO:RAIL appliances advertise themselves on a network using the VMware Loudmouth service, which uses IPv6 multicast. The first EVO:RAIL node in a cluster creates a new instance of vCenter Server, and all additional EVO:RAIL nodes in one or more appliances join that first instance.

EVO:RAIL network requirements are also driven by Virtual SAN, which uses IPv4 multicast.

Top-of-Rack Switch

A 10GbE TOR switch that is correctly configured to carry IPv4 multicast and IPv6 multicast traffic is required. IPv4 multicast and IPv6 multicast traffic must be carried to all ports connected to EVO:RAIL on the TOR switch. Multicast is *not* required on your entire network, just on the ports connected to EVO:RAIL. Please read the section on VLANs in this document for additional information you will need to configure your TOR switch.

Link aggregation, including protocols such as LACP and EtherChannel, must be disabled on all ports connected to EVO:RAIL on the TOR switch(es) because VMware Standard Switch (VSS) does not support this feature.

Two or more TOR switches can be used for high availability/failover. When using multiple TOR switches, multicast traffic for IPv4 and IPv6 must be enabled on ports used for inter-switch communication.

The network can be configured flat or with VLANs, but it is recommended to deploy EVO:RAIL with VLANs. All VLANs must be configured on the TOR switch(es), as described in the section on VLANs in this document.

Understanding Switch Configuration

In order for EVO:RAIL to function properly, you must configure your TOR switch as instructed by your switch manufacturer. Sample output configuration for common switch modes are provided in the VMware Knowledge Base as examples. Go to <http://kb.vmware.com> for the EVO:RAIL product.

Ports on a switch operate in one of the following modes:

- *Access mode* – The port accepts only untagged packets and distributes the untagged packets to all VLANs on that port. This is typically the default mode for all ports.
- *Trunk mode* – When this port receives a tagged packet, it passes the packet to the VLAN specified in the tag. To configure the acceptance of untagged packets on a trunk port, you must first configure a single VLAN as a “Native VLAN”. A “Native VLAN” is when you configure one VLAN to use as the VLAN for all untagged traffic.
- *Tagged-access mode* – The port accepts only tagged packets.

Workstation/Laptop (for configuration and management)

A workstation/laptop with a web browser for EVO:RAIL Configuration and Management is required. It must be either plugged into the TOR switch or able to logically reach the EVO:RAIL management VLAN on the TOR switch.

For example, with the default pre-configuration IP address shown in the **EVO:RAIL Network Configuration Table** on Row 5, you *could* configure your workstation/laptop to an IP address of 192.168.10.210, netmask 255.255.255.0, gateway 192.168.10.254. If you assign a new vCenter Server IP address during EVO:RAIL Initial Configuration, you will have to reconfigure your workstation/laptop to reach the post-configuration IP address (same subnet).

In Windows, it is possible to give your workstation/laptop two IP addresses, which allows for a smoother experience. With MacOS or Linux, you will have to change your IP address when instructed during EVO:RAIL Initial Configuration.

The **EVO:RAIL Network Configuration Table** is shown in Table 2 of this document. It is also available separately. References to rows in this document are to rows in this table.

Network Configuration Table ✓ Row 1	Please fill in the pre-configuration IP address, netmask, and gateway for your EVO:RAIL Configuration and Management workstation/laptop.
Network Configuration Table ✓ Row 2	Please fill in the post-configuration IP address, netmask, and gateway for your EVO:RAIL Management workstation/laptop.

You will use a browser to talk to EVO:RAIL. The latest versions of Firefox, Chrome, and Internet Explorer 10+ are all supported.

If you are using Internet Explorer 10+ and an administrator has set your browser to “compatibility mode” for all internal websites (local web addresses), you will get a warning message from EVO:RAIL. Contact your administrator to whitelist URLs mapping to the EVO:RAIL user interface. Alternately, connect to the EVO:RAIL user interface using either an IP address or a fully-qualified domain name (FQDN) configured on the local DNS server (e.g. <http://evorail.yourcompany.com:7443>).¹

✓ EVO:RAIL Management workstation/laptop	Configure your workstation/laptop with the pre-configuration IP address that you decided on and entered in the EVO:RAIL Network Configuration Table on Row 1. Decide which browser you will use.
--	--

VLANs

All vSphere vMotion, Virtual SAN, and VM traffic is tagged for the VLANs you specify during EVO:RAIL Initial Configuration. For your convenience, the EVO:RAIL user interface pre-populates VLAN ID fields, but you can easily change them to coordinate with the values on your TOR switch.

VLANs are highly recommended (but not required) in EVO:RAIL. The vSphere vMotion and Virtual SAN networks cannot be routed. Dedicated VLANs are preferred to divide VM traffic. For example, you could have one VLAN for Development, one for Production, and one for Staging. Each VM can be assigned to one or more VLANs.

Multicast Traffic

IGMP Snooping software examines IGMP protocol messages within a VLAN to discover which interfaces are connected to hosts or other devices interested in receiving this traffic. Using the interface information, *IGMP Snooping* can reduce bandwidth consumption in a multi-access LAN environment to avoid flooding an entire VLAN. *IGMP Snooping* tracks ports that are attached to multicast-capable routers to help manage IGMP membership report forwarding. It also responds to topology change notifications. Disabling *IGMP Snooping* may lead to additional multicast traffic on your network.

IGMP Querier sends out IGMP group membership queries on a timed interval, retrieves IGMP membership reports from active members, and allows updates to group membership tables. By default, most switches enable *IGMP Snooping*, but disable *IGMP Querier*.

For IPv6, *MLD* (Multicast Listener Discovery) is essentially the same as *IGMP* (Internet Group Management Protocol) in IPv4.

To enable IPv6 multicast on a TOR switch, choose one of the following:

- Enable *MLD Snooping* on your TOR switch(es) AND enable *MLD Querier*.
- Disable *MLD Snooping* on your TOR switch(es).

To enable IPv4 multicast on a TOR switch, choose one of the following:

- Enable *IGMP Snooping* on your TOR switch(es) AND enable *IGMP Querier*.
- Disable *IGMP Snooping* on your TOR switch(es).

Configure VLANs on your TOR Switch(es)

1. Configure a **management VLAN** on your TOR switch(es) and set it to allow IPv4 multicast and IPv6 multicast traffic to pass through.

- Default Management VLAN:

Unless your QEP pre-configured otherwise, all management traffic is untagged and must be able to go over a Native VLAN on your TOR switch or you will not be able to create the appliance and configure ESXi hosts. Management traffic includes all EVO:RAIL, vCenter Server, ESXi, and vRealize Log Insight (optional) communication.

¹ Port 7443 reaches the EVO:RAIL user interface and port 9443 reaches the vSphere Web Client on vCenter Server.

- Custom Management VLAN:

To customize the management VLAN on-site (but before EVO:RAIL is initially configured), changes are required for two different portgroups on all ESXi hosts in an EVO:RAIL cluster. The first portgroup is the ESXi “Management Network”, and the second portgroup is the vCenter Server management network (“VM Network”).

Login to every ESXi host via the command line interface², and execute the following commands:

```
esxcli network vswitch standard portgroup set -p "Management Network" -v <VLAN_ID>
esxcli network vswitch standard portgroup set -p "VM Network" -v <VLAN_ID>
```

To verify the VLAN ID was set correctly, run the following command:

```
esxcli network vswitch standard portgroup list
```

NOTE: If your management VLAN is customized on-site, your backup configBundle will not include the new VLAN. If your appliance is ever reset, the management VLAN will have to be reconfigured.

2. Configure a **vSphere vMotion VLAN** on your TOR switch(es).
3. Configure a **Virtual SAN VLAN** on your TOR switch(es) and set it to allow IPv4 multicast traffic to pass through.
4. Configure the VLANs for your **VM Networks** on your TOR switch(es).

Network Configuration Table ✓ Row 3	Enter your management VLAN for EVO:RAIL, ESXi, vCenter Server, and Log Insight. If you or your QEP have not already ³ set a tagged VLAN, enter “Native VLAN”.
Network Configuration Table ✓ Row 12	Enter a VLAN ID for vSphere vMotion.
Network Configuration Table ✓ Row 16	Enter a VLAN ID for Virtual SAN.
Network Configuration Table ✓ Rows 20-24	Enter a VLAN ID and Name for each VM network you want to create. You may create up to five VM networks.
✓TOR switch(es)	Configure your TOR switch(es) with these VLANs. Configure the corresponding VLANs between TOR switches and/or core switches.

IP Addresses

EVO:RAIL ships with a default set of IP addresses unless you have worked with your QEP to pre-configure your appliance or it is configured on-site. For your convenience, the EVO:RAIL user interface pre-populates IP address fields, but you can change them to coordinate with your network. When selecting your IP addresses, you must make sure that none of them conflict with existing IP addresses in your network.

This section describes the IP addresses for EVO:RAIL/vCenter Server, ESXi, vSphere vMotion, Virtual SAN, and the network services supported by EVO:RAIL.

² Documentation for vSphere CLI: <http://pubs.vmware.com/vsphere-55/index.jsp#com.vmware.vsphere.scripting.doc/GUID-7F7C5D15-9599-4423-821D-7B1FE87B3A96.html>

³ The management VLAN cannot be changed in EVO:RAIL Initial Configuration. It must be changed on each ESXi host with the command line interface (CLI) *before* configuring EVO:RAIL.

EVO:RAIL / vCenter Server IP Address

EVO:RAIL and vCenter Server share an IP address. This is where you point the browser on your EVO:RAIL Configuration and Management workstation/laptop to reach the EVO:RAIL user interface. EVO:RAIL is accessible on port 7443 (<https://<evorail-ip-address>:7443>) and vCenter Server is accessible via the vSphere Web Client on port 9443 (<https://<evorail-ip-address>:9443>). EVO:RAIL, vCenter Server, and the ESXi hosts all share the same netmask (Row 11) and gateway (Row 8).

- **Pre-configuration EVO:RAIL / vCenter Server IP address:**

This is the IP address that you will use to reach EVO:RAIL Initial Configuration (on port 7443). The VMware default for EVO:RAIL / vCenter Server is initially set to IP address 192.168.10.200, netmask 255.255.255.0 and gateway 192.168.10.254. To configure EVO:RAIL, you will need to point your browser to this address.

If you cannot reach the pre-configuration address, check the configuration of your EVO:RAIL Configuration and Management workstation/laptop. If your network does not support access to this address, contact your QEP.

- **Post-configuration EVO:RAIL / vCenter Server IP address:**

This is the IP address that you will use to reach EVO:RAIL Management (on port 7443) and vCenter Server (on port 9443) in your production network. If you do not want to change the EVO:RAIL / vCenter Server IP address, enter the same IP address that was entered in Row 5.

If you change this IP address during initial configuration, EVO:RAIL will instruct you to change the IP address of your workstation/laptop to reach the new EVO:RAIL address (<https://<new-ip-address>:7443>) To change the post-configuration vCenter Server IP address *after* EVO:RAIL Initial Configuration, contact you QEP.

NOTE: EVO:RAIL will revert to the original IP address if it is not contacted at the new IP address within *20 minutes* in Release 1.1+.

Network Configuration Table ✓ Row 5	Please enter the pre-configuration IP address for EVO:RAIL / vCenterServer. This can be either the VMware default IP address or a custom-configured IP address.
Network Configuration Table ✓ Row 6	Please enter the post-configuration IP address for EVO:RAIL / vCenterServer. If the IP address will not be changed during configuration, enter the same IP address as Row 5.
✓Your Network	Validate that none of your EVO:RAIL IP addresses collide with any IP addresses used in your local network.

ESXi, vSphere vMotion, Virtual SAN IP Addresses

For ESXi, vSphere vMotion, and Virtual SAN, you will be allocating 12 IP addresses per appliance. If you allocate more IP addresses for future scale-out, you will be able to add EVO:RAIL appliances with no additional configuration; otherwise, you can enter additional IP addresses when you expand EVO:RAIL.

Network	IP Requirements
ESXi hosts	Continuous IP range is required, with a minimum of 4 IPs. You can allocate up to 32 IP addresses for future EVO:RAIL appliances in a cluster. Netmask and gateway are required.
vSphere vMotion	Continuous IP range is required, with a minimum of 4 IPs. You can allocate up to 32 IP addresses for future EVO:RAIL appliances in a cluster. Netmask is required. These IP addresses cannot be routed.
Virtual SAN	Continuous IP range is required, with a minimum of 4 IPs. You can allocate up to 32 IP addresses for future EVO:RAIL appliances in a cluster. Netmask is required. These IP addresses cannot be routed.

Table 3. IP address requirements

Network Configuration Table ✓ Rows 8-10	Enter the starting and ending IP addresses, the netmask, and the gateway for ESXi.
Network Configuration Table ✓ Rows 13-15	Enter the starting and ending IP addresses and netmask for vSphere vMotion.
Network Configuration Table ✓ Rows 17-19	Enter the starting and ending IP addresses and netmask for Virtual SAN.

Hostnames

Hostnames are specified for vCenter Server and for each ESXi host in EVO:RAIL Initial Configuration. For your convenience, the EVO:RAIL user interface pre-populates the hostname fields, but you can easily change them.

ESXi hostnames are defined by a naming scheme that comprises: an ESXi hostname prefix (an alphanumeric string), a separator (“None” or a dash “-”), an iterator (Alpha, Num X, or Num 0X), and a top-level domain. The Preview field in the EVO:RAIL user interface shows an example of the result for the first ESXi host. For example, if the prefix is “esxihost”, the separator is “None”, the iterator is “Num 0X”, and the top-level domain is “local”, the first ESXi hostname would be “esxihost01.local”

The vCenter Server hostname is an alphanumeric string. The top-level domain is automatically applied to the vCenter Server hostname. (Example: vcenter.local)

You must add your EVO:RAIL hostnames to your DNS server, unless you are in a totally isolated environment.

Network Configuration Table ✓ Row 7	Enter an example of your desired ESXi host-naming scheme. Be sure to show your desired prefix, separator, iterator, and top-level domain.
Network Configuration Table ✓ Row 4	Enter the vCenter Server hostname; the top-level domain is automatically copied from the ESXi host-naming scheme.

Passwords

Passwords are required for ESXi host “root” access and vCenter Server “admin” access. These passwords must contain between 8 and 20 characters, with at least one uppercase, one lower case, and one special character. No character can be repeated three times consecutively.

Network Configuration Table ✓ Row 25	Please check that you know your passwords in these rows, but for security reasons, we suggest that you do not write them down.
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Active Directory can optionally be used to access EVO:RAIL and vCenter Server. To use this feature, you will need to supply the AD domain and an AD username and password with privileges that allow the user to join that domain. EVO:RAIL does not fully configure Active Directory. You must perform additional steps⁴ on the vSphere Web Client.

Network Configuration Table ✓ Row 26	If you will be using Active Directory, please enter the domain, username, and password, then perform the additional steps for Active Directory after EVO:RAIL is configured.
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⁴ <http://pubs.vmware.com/vsphere-55/topic/com.vmware.vsphere.install.doc/GUID-B23B1360-8838-4FF2-B074-71643C4CB040.html>

Additional Configuration

EVO:RAIL configures network services on all ESXi hosts in a cluster based on the following parameters:

- **NTP server(s)**

An NTP server is not required, but it is recommended. If you do not provide at least one NTP server, EVO:RAIL uses the time that is set on ESXi host #1 (regardless of whether the time is correct or not). The default time zone is UTC and you can change it during EVO:RAIL Initial Configuration.

Network Configuration Table ✓ Row 27	Enter your time zone.
Network Configuration Table ✓ Row 28	Enter the name(s) of your NTP server(s).

- **DNS server(s)**

One or more DNS servers are required for production use (it is not required in a completely isolated environment). You must specify the IP address of your corporate DNS server(s) when you configure EVO:RAIL. In addition, you must enter the EVO:RAIL / vCenter Server, Log Insight, and ESXi hostnames and IP addresses in your corporate DNS server tables.



Make sure that the DNS IP address is accessible from the network to which EVO:RAIL is connected and functioning properly. If the DNS server requires access via a gateway, the gateway must be EVO:RAIL, do not enter a DNS IP address. To add a DNS server after you have configured EVO:RAIL, see the VMware Knowledge Base (<http://kb.vmware.com/kb/2107249>).

Network Configuration Table ✓ Row 29	Enter the IP address(es) for your DNS server(s).
✓ Your DNS server	Add all EVO:RAIL IP addresses and hostnames to your corporate DNS server(s).

- **Proxy Server**

A proxy server is optional in EVO:RAIL. If you have a proxy server on your network and vCenter Server needs to access services outside of your network, you will need to supply the hostname of the proxy server, a port, username, and password.

Network Configuration Table ✓ Row 30	Enter the proxy server hostname, port, username, and password.
---	--

- **Logging**

EVO:RAIL is deployed with vRealize Log Insight. However, you may choose to use your own third-party syslog server(s). To use vRealize Log Insight, point your browser to the configured IP address; the username is **admin**. If you ssh to Log Insight, the username is **root**. The password, in either case, is the one you specified for vCenter Server.

NOTE: The default IP address for Log Insight is pre-configured; for example, 192.168.10.201. If you change the IP address of vCenter Server, you must change the IP address of Log Insight to be on the same subnet.

Network Configuration Table ✓ Row 31	Enter the hostname and IP address for Log Insight OR the name(s) of your existing syslog server(s).
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- **Qualified EVO:RAIL Partner Integrated Solution**

The EVO:RAIL Configuration user interface supports deployment of up to two VM(s) for an optional QEP-specific integrated solution. Users specify the IP address of a primary VM and optional secondary VM. EVO:RAIL deploys and configures the VM(s) on the management VLAN (i.e., the same VLAN that EVO:RAIL, vCenter Server, the ESXi hosts, and Log Insight communicate on, as noted in the **EVO:RAIL Network Configuration Table** Row 3).

Network Configuration Table ✓ Row 32	If your EVO:RAIL appliance has a QEP integrated solution, please enter the IP address(es) for the primary VM and secondary VM (if there is one).
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Out-of-Band Management (optional)

Remote / lights out management is available on each node through a BMC port. To use out-of-band management, connect the BMC port on each node to a separate switch to provide physical network separation. Although you could use four additional ports on your TOR 10GbE switch (if the TOR supports your BMC ports), it is more economical to use a lower bandwidth switch.

When EVO:RAIL is shipped, the BMC ports are preconfigured by DHCP. The <ApplianceID> can be found on a pull out tag located in front of the physical appliance. The defaults are as follows:

```
BMC interface node 1: hostname = <ApplianceID>-01
BMC interface node 2: hostname = <ApplianceID>-02
BMC interface node 3: hostname = <ApplianceID>-03
BMC interface node 4: hostname = <ApplianceID>-04
```

Unless your QEP has set other values, the default username and password are:

Username: UserId Password: Passw0rd!

The password is case sensitive and this default password uses a zero in place of a lowercase 'o'.

The BMC interface IP addresses can be assigned manually and the username and password can be modified according to directions provided by the hardware manufacturer. Your QEP may have additional recommendations for out-of-band management, such as a dedicated VLAN.

As an example, the instructions for BIOS changes on Intel-based appliances are as follows:

- 1) Navigate to the Server Management tab and then scroll down to BMC LAN Configuration. Press <Enter>.
- 2) Scroll down to Intel® RMM4 IPv4 LAN configuration > IP source and select either Static or Dynamic. The default is Dynamic and the BMC interfaces obtain their IP address through DHCP. If you select Static, you will need to set the IP address, Netmask, and Gateway IP.
- 3) Optionally set the User ID, User status, User name, and User password.
- 4) Press <F10> and select save and exit. Your server will reboot with the new settings.

Network Configuration Table ✓ Row 33	If you want to change the default BMC interface values, enter the username, password, hostnames and/or IP addresses.
✓ Each EVO:RAIL appliance node	Then configure any changes on each node per hardware manufacturer instructions.

Networking Best Practices

- Various network topologies for TOR switch(es) and VLANs are possible with EVO:RAIL. Complex production environments will have multiple core switches, TOR switches, and VLANs.
- For high-availability, use two TOR switches and connect one port from each node to each TOR switch. Connect multiple TOR switches via VLAN trunked interfaces, and ensure that all VLANs used for EVO:RAIL are carried across the trunk following the requirements in this user guide.
- If you plan to scale out to multiple EVO:RAIL appliances in a cluster over time, allocate extra IP addresses for each of the ESXi, vMotion, and Virtual SAN IP pools when you configure the first appliance (twelve extra IP addresses per appliance). Then when you add appliances to a cluster, you will only need to enter the ESXi and vCenter Server passwords.
- Only one appliance can be added at a time. To add multiple appliances, power on one at a time, making sure that each is properly configured before powering on the next appliance.
- All network traffic (except for out-of-band management) is on the 10GbE NICs. Each node in an EVO:RAIL appliance has two 10GbE network ports. Each port must be connected to a 10GbE switch that supports IPv4 multicast and IPv6 multicast.
- Although EVO:RAIL uses IPv6 traffic between nodes, your network does not need to be explicitly configured for IPv6, other than fulfilling the multicast requirements for EVO:RAIL ports and VLANs described in this user guide.
- EVO:RAIL supports four types of traffic: Management, vSphere vMotion, Virtual SAN, and Virtual Machine. Traffic isolation on separate VLANs is highly recommended. EVO:RAIL traffic is separated as follows:

Network	1 st 10GbE NIC	2 nd 10GbE NIC
Management (EVO:RAIL, vCenter Server, ESXi, Log Insight)	Active	Standby
vSphere vMotion	Active	Standby
Virtual SAN	Standby	Active
Virtual Machines	Active	Standby

Table 4: Interfaces for traffic

- To ensure vSphere vMotion traffic does not consume all available bandwidth on the 10GbE port, EVO:RAIL limits vMotion traffic to 4Gbps.
- We recommend using different VLAN IDs for Virtual SAN traffic and for management across multiple EVO:RAIL clusters. Otherwise, all appliances on the same network will see all multicast traffic.

Avoiding Common Mistakes

Here's how to avoid common network mistakes:

1. Follow all of the network prerequisites described in this document; otherwise EVO:RAIL will not be installed properly, and it will not function correctly in the future. You must fill in the **EVO:RAIL Network Configuration Table**.
2. If you have separate teams for network and servers in your data center, you will need to work together to design the network and configure the switch(es).
3. Read your vendor instructions for your TOR switch.
 - a. Remember to configure multicast and don't block IPv6 on your TOR switch. Re-read the sections on TOR switches and VLANs in this document.
 - b. Remember to configure your TOR switch to allow untagged management traffic to go over a **native VLAN**, unless your appliance has been customized for a specific management VLAN.
 - c. Remember to connect and enable the ports.
 - d. If you have two or more switches you must make sure that IPv4 multicast and IPv6 multicast traffic is transported between them, as described in the VLAN section.
4. Make sure your gateway IP address is accessible (VMware KB #2107249)
5. You must determine all static IP addresses before you can configure EVO:RAIL. *You cannot change the IP addresses after you have configured EVO:RAIL.*
6. Some network configuration errors cannot be recovered from and you will need your QEP to reset your appliance to factory defaults. When EVO:RAIL is reset to factory defaults, all data is lost.
7. Make sure you can reach your DNS server from the EVO:RAIL network addresses you are proposing. Then configure your EVO:RAIL hostnames on your DNS server.
8. Don't try to plug your management workstation/laptop directly into a server node on EVO:RAIL; plug it into your network/TOR switch and make sure that it is logically configured to reach EVO:RAIL. (<http://kb.vmware.com/kb/2099966>)
9. Remember to disable link aggregation on your TOR switch.
10. If you copy a switch configuration, either ensure the port layout matches exactly or make the necessary changes. For example, the layout is not the same if you move from a TOR to blades.
11. If you have configured Active Directory, NTP servers, proxy servers, or a third-party syslog server, you must be able to reach them from the EVO:RAIL IP addresses.
12. If you are using SFP+, NIC and switch connectors and cables must be on the same wavelength. Contact your QEP for the type of SFP+ connector on your appliance.