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Meet VMware EVO:RAIL

EVO:RAIL™ is not a server. It is an appliance that consists of four nodes. VMware® and Intel® have collaborated to create VMware EVO:RAIL, the industry’s first hyper-converged infrastructure appliance for the Software-Defined Data Center, powered by VMware software and Intel architecture.

This document is designed to set up EVO:RAIL Release 2.x, but you can still use it to set up EVO:RAIL Release 1.x appliances. We note the differences as required in this document. The most notable difference is that vCenter Server and EVO:RAIL have separate IP addresses and hostnames in Release 2.x. We provide simple instructions for you to handle this in Release 1.x.

Space, Power, Cooling

You will need 2U rack space in a 19x30-inch cabinet for each EVO:RAIL appliance (4 server nodes). Power and cooling specifications, operating conditions, and hardware configuration options are provided by your selected EVO:RAIL partner. A 10GbE switch and a workstation/laptop for the EVO:RAIL user interface are also required.

Software

The EVO:RAIL software bundle is preloaded onto hardware and consists of the following components:

- EVO:RAIL Engine
- VMware vSphere® Enterprise Plus
- VMware vCenter Server™
- VMware vRealize Log Insight™
- VMware Virtual SAN™

EVO:RAIL Setup Workflow

To successfully set up EVO:RAIL you must complete the steps in the setup workflow in this order:

Before cabling EVO:RAIL

1. PLAN
   Meet with your team to plan the network architecture including 10GbE switch configuration, VLANs, and IP addresses.

2. SET UP SWITCH
   Configure your 10GbE switch. This must be done BEFORE you connect or power on EVO:RAIL.

3. HANDS-ON LAB

After Planning and Switch Setup

4. CABLE & ON
   1. Cable appliance to switch(es) as shown in cabling diagram.
   2. Turn on all four EVO:RAIL nodes.

5. MANAGEMENT VLAN
   EVO:RAIL’s management traffic is untagged by default. Use the ESXi command-line interface to customize the management VLAN for all four appliance nodes.

6. CONNECT & CONFIGURE
   Connect to EVO:RAIL initial IP address via workstation/laptop. Launch the EVO:RAIL user interface to create your software-defined data center.

Figure 1. EVO:RAIL setup workflow.
Before Cabling EVO:RAIL

To ensure the correct functioning of EVO:RAIL, understanding the recommendations and requirements in this user guide is essential.

Step 1: Plan

EVO:RAIL is not a simple server but is an entire data center in a box. Consequently, the network and virtualization teams need to meet in advance to plan EVO:RAIL’s network architecture.

Use the EVO:RAIL Setup Checklist and the EVO:RAIL Network Configuration Table to document your network plan. References to rows in this document are to rows in this table.

NOTE: In Release 2.0, we re-ordered the rows in the Network Configuration Table to reflect the new user interface design.

Once you set up EVO:RAIL, the configuration cannot be changed easily. Consequently, we strongly recommend that you take care during this planning phase to decide on the configurations that will work most effectively for your organization. We want you to set up EVO:RAIL correctly when it arrives.

An EVO:RAIL cluster consists of one or more EVO:RAIL appliances. Your plan can include multiple appliances. Up to 16 appliances (64 server nodes) can be joined together in one EVO:RAIL cluster. If you have already configured enough IP addresses for expansion (which we recommend), all you do is supply the passwords that you created for the first appliance in the EVO:RAIL cluster. If you do not have enough IP addresses, follow the section at the end of this document, Adding Appliances to EVO:RAIL Clusters. The EVO:RAIL user interface will prompt you to add the new IP addresses and the passwords – nothing else!

You will be making decisions in the following areas:

Step 1A. 10GbE switch
Step 1B. Reserve VLANs (best practice)
Step 1C. System
Step 1D. Management
Step 1E. vMotion and Virtual SAN
Step 1F. Solutions
Step 1G. Workstation/laptop
Step 1H. Out-of-band management (optional)

Step 1A. 10GbE Switch

Each EVO:RAIL appliance ships with either eight SFP+ or RJ-45 NIC ports. Eight corresponding ports are required for each EVO:RAIL appliance on one or more 10GbE switch(es). One port on the 10GbE switch or one logical path on the EVO:RAIL management VLAN is required for a workstation/laptop to access the EVO:RAIL user interface.

The 10GbE switch(es) must be correctly configured to carry IPv6 multicast traffic on the management VLAN. IPv4 multicast must be carried on the Virtual SAN VLAN. Multicast is not required on your entire network, just on the ports connected to EVO:RAIL.

1 Release 1.x scales to 8 appliances (32 nodes).
Why multicast? EVO:RAIL has no backplane, so communication between its four nodes is facilitated via the 10GbE switch. This communication between the four nodes uses 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. This IPv6 multicast communication is strictly limited to the management VLAN that the nodes use for communication.

One or two switches? Decide if you plan to use one or two 10GbE switches for EVO:RAIL. One switch is acceptable and is often seen in test/development or remote/branch office (ROBO) environments. However, two or more 10GbE switches are used for high availability and failover in production environments. Because EVO:RAIL is an entire software-defined data center in a box, if one switch fails you are at risk of losing availability of hundreds of virtual machines.

Step 1B. Reserve VLANs (Best Practice)

EVO:RAIL groups traffic in the following categories: management, vSphere vMotion, Virtual SAN, and Virtual Machine. Partners may provide other types of traffic in their solutions. Traffic isolation on separate VLANs is highly recommended (but not required) in EVO:RAIL. If you are using multiple 10GbE switches, connect them 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.

By default, all management traffic is untagged and must be able to go over a Native VLAN on your 10GbE switch or you will not be able to create the appliance and configure the ESXi hosts. Management traffic includes all EVO:RAIL, vCenter Server, and ESXi communication. The management VLAN also carries traffic for optional solutions such as vRealize Log Insight and partner solution VMs.

Alternately, you can configure a custom management VLAN to allow tagged management traffic. When you receive the appliance, please follow the instructions in Step 5 to change the management VLAN.

vSphere vMotion and Virtual SAN traffic cannot be routed. This traffic will be tagged for the VLANs you specify in the EVO:RAIL initial configuration user interface.

Dedicated VLANs are preferred to divide virtual machine 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.

| Network Configuration Table ✓ Row 1 | Enter the management VLAN ID for EVO:RAIL, ESXi, vCenter Server, and Log Insight. If you do not plan to have a dedicated management VLAN and will accept this traffic as untagged, enter “0” or “Native VLAN”. |
| Network Configuration Table ✓ Row 30 | Enter a VLAN ID for vSphere vMotion. (Enter a 0 in the VLAN ID field for untagged traffic) |
| Network Configuration Table ✓ Row 34 | Enter a VLAN ID for Virtual SAN. (Enter a 0 in the VLAN ID field for untagged traffic) |
| Network Configuration Table ✓ Rows 35-38 | Enter a VLAN ID and Name for each VM network you want to create. You must create at least one VM Network. (Enter a 0 in the VLAN ID field for untagged traffic) |

Step 1C. System

EVO:RAIL can configure connections to external servers in your network. The only required selection is the time zone. An NTP server is highly recommended and a DNS server is required except in isolated environments. Active Directory and proxy servers are optional.
Time zone
A time zone is required. It is configured on vCenter Server and each ESXi host.

<table>
<thead>
<tr>
<th>Network Configuration Table</th>
<th>Enter your time zone.</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Row 3</td>
<td></td>
</tr>
</tbody>
</table>

NTP server
An NTP server is not required, but it is recommended. If you provide an NTP server, vCenter Server will be configured to use it. 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).

<table>
<thead>
<tr>
<th>Network Configuration Table</th>
<th>Enter the hostname(s) or IP address(es) of your NTP server(s).</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Row 4</td>
<td></td>
</tr>
</tbody>
</table>

DNS server
One or more external DNS servers are required for production use (it is not required in a completely isolated environment). During initial configuration, EVO:RAIL sets up vCenter Server to resolve hostnames to the DNS server. If you have an external DNS server, enter the EVO:RAIL, vCenter Server, Log Insight, and ESXi hostnames and IP addresses in your corporate DNS server tables in Step 6D.

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 that is not reachable during initial configuration, do not enter a DNS IP address. Instead, add a DNS server after you have configured EVO:RAIL using the instructions in the VMware Knowledge Base (http://kb.vmware.com/kb/2107249).

<table>
<thead>
<tr>
<th>Network Configuration Table</th>
<th>Enter the IP address(es) for your DNS server(s). Leave blank if you are in an isolated environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Row 5</td>
<td></td>
</tr>
</tbody>
</table>

Active Directory
Active Directory can optionally be entered in EVO:RAIL initial configuration. However, to use Active Directory, you must perform the steps on the vSphere Web Client, as documented in vSphere:

ESXi and vCenter Server 6.0 Documentation ➔ Add a vCenter Single Sign-on Identity Source

<table>
<thead>
<tr>
<th>Network Configuration Table</th>
<th>If you will be using Active Directory, perform the steps on the vSphere Web Client after EVO:RAIL is configured. Values entered in the EVO:RAIL user interface are not used.</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Rows 6-8</td>
<td></td>
</tr>
</tbody>
</table>

Proxy server
A proxy server is optional. If you have a proxy server on your network and vCenter Server needs to access services outside of your network, you can supply the IP address of the proxy server, a port, username, and password.

<table>
<thead>
<tr>
<th>Network Configuration Table</th>
<th>Enter the proxy server IP address, port, username, and password.</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Rows 9-12</td>
<td></td>
</tr>
</tbody>
</table>
**Step 1D. Management**

An EVO:RAIL cluster consists of one or more appliances, each with four ESXi hosts. The cluster is managed by a single instance of EVO:RAIL and vCenter Server. After initial configuration, you will access EVO:RAIL to manage your cluster at the hostname or IP address that you specify.

**Hostnames**

Since EVO:RAIL is an appliance with four server nodes, it does not have a single hostname. The asset tag attached to each appliance is used to display the identity of the appliance in the EVO:RAIL user interface. Asset tags are 11 alphanumeric characters where the first three characters identify your selected EVO:RAIL partner and the remaining characters uniquely identify the appliance.

You must configure hostnames for EVO:RAIL, vCenter Server, and your ESXi hosts. All ESXi hostnames in an EVO:RAIL cluster 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 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 "host", the separator is "None", the iterator is "Num 0X", and the domain is "local", the first ESXi hostname would be "host01.local". The domain is also automatically applied to the vCenter Server and EVO:RAIL virtual machines. (Example: my-vcenter.local)

**Examples:**

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Example 1</th>
<th>Example 2</th>
<th>Example 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>host</td>
<td>myname</td>
<td>esxi-host</td>
</tr>
<tr>
<td>Separator</td>
<td>None</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Iterator</td>
<td>Num 0X</td>
<td>Num X</td>
<td>Alpha</td>
</tr>
<tr>
<td>Domain</td>
<td>local</td>
<td>mydomain</td>
<td>company</td>
</tr>
<tr>
<td>Resulting hostname</td>
<td>host01.local</td>
<td>myname-1.mydomain</td>
<td>esxi-host-a.company</td>
</tr>
</tbody>
</table>

**Network Configuration Table**

<table>
<thead>
<tr>
<th>Rows</th>
<th></th>
<th>Enter an example of your desired ESXi host-naming scheme. Be sure to show your desired prefix, separator, iterator, and domain.</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-16</td>
<td></td>
<td>Enter an alphanumeric string for the vCenter Server hostname.</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>Enter an alphanumeric string for the EVO:RAIL hostname. (In Release 1.x only, enter the same hostname that is in Row 17.)</td>
</tr>
</tbody>
</table>

**IP Addresses**

You must configure the IP addresses for EVO:RAIL, vCenter Server, and your ESXi hosts. When selecting your IP addresses, you must make sure that none of them conflict with existing IP addresses in your network. Also make sure that these IP addresses can reach other hosts in your network.

There are four ESXi hosts per appliance and each requires an IP address. We recommend that you consider allocating additional ESXi IP addresses for future appliances to join your EVO:RAIL cluster. If you have already configured enough IP addresses for expansion, all you do is supply the passwords that you created for the first appliance in the cluster. Because EVO:RAIL supports up to sixteen appliances in a cluster, you can allocate up to 64 ESXi IP addresses.

EVO:RAIL, vCenter Server, and the ESXi hosts all share the same subnet mask and gateway. EVO:RAIL leverages the same database as vCenter Server, so any changes in EVO:RAIL are reflected in vCenter Server and vice-versa.
In Release 2.x, EVO:RAIL and vCenter Server are separate virtual machines and thus have separate IP addresses. They both use default ports (443), so you do not specify a port number when you point a browser to reach them.

In Release 1.x, EVO:RAIL and vCenter Server share an IP address because they are contained in one virtual machine. 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).

| Network Configuration Table | Rows 19 and 20 | Enter the starting and ending IP addresses for the ESXi hosts - a continuous IP range is required, with a minimum of 4 IPs. |
| Network Configuration Table | Row 21 | Enter the IP address for vCenter Server. |
| Network Configuration Table | Row 22 | Enter the IP address for EVO:RAIL after it is configured. (In Release 1.x only, enter the same IP address that is in Row 21.) |
| Network Configuration Table | Rows 23 and 24 | Enter the subnet mask and gateway for all management IP addresses. |

**Passwords**

Passwords are required for ESXi hosts and for the EVO:RAIL / vCenter Server virtual machines. Passwords must contain between 8 and 20 characters with at least one lowercase letter, one uppercase letter, one numeric character, and one special character. For more information about password requirements, see the vSphere password documentation and vCenter Server password documentation.

For ESXi hosts, the username is root; the pre-configuration password is Passw0rd! and the post-configuration password is the one you set in the EVO:RAIL user interface (Row 25).

For vCenter Server and EVO:RAIL, the username for both user interfaces is administrator@vsphere.local and the console username is root. The pre-configuration password for EVO:RAIL is Passw0rd! and the post-configuration password for both is the one you set in the EVO:RAIL user interface (Row 26).

| Network Configuration Table | Rows 25 and 26 | Please check that you know your passwords in these rows, but for security reasons, we suggest that you do not write them down. |

**Step 1E. vMotion and Virtual SAN**

vSphere vMotion and Virtual SAN each require at least four IP addresses per appliance. We recommend that you consider allocating additional IP addresses for future appliances to join your EVO:RAIL cluster. If you have already configured enough IP addresses for expansion, all you do is supply the passwords that you created for the first appliance in the cluster.

Because EVO:RAIL supports up to sixteen appliances in a cluster, you can allocate up to 64 vMotion IP addresses and 64 Virtual SAN IP addresses.

| Network Configuration Table | Rows 27 and 28 | Enter the starting and ending IP addresses for vSphere vMotion – a continuous IP range is required, with a minimum of 4 IPs. Routing is not configured for vMotion. |
| Network Configuration Table | Row 29 | Enter the subnet mask for vMotion. |
Network Configuration Table

| Rows 31 and 32 | Enter the starting and ending IP addresses for Virtual SAN – a continuous IP range is required, with a minimum of 4 IPs. Routing is not configured for Virtual SAN. |

| Row 33 | Enter the subnet mask for Virtual SAN. |

**Step 1F. Solutions**

EVO:RAIL supports initial configuration for solutions both from VMware and from EVO:RAIL partners.

**Logging Solution**

EVO:RAIL is deployed with VMware vRealize Log Insight. Alternately, you may choose to use your own third-party syslog server(s). If you choose to use vRealize Log Insight, it will always be available by pointing a browser to the configured IP address with the username, admin. (If you ssh to Log Insight instead of pointing your browser to it, the username is root.) The password, in either case, is the same password that you specified for vCenter Server/EVO:RAIL (Row 26).

*NOTE:* The IP address for Log Insight must be on the same subnet as EVO:RAIL and vCenter Server.

| Rows 39 and 40 or Row 41 | Enter the hostname and IP address for vRealize Log Insight or the hostname(s) of your existing third-party syslog server(s). |

**Other Solutions**

EVO:RAIL supports the deployment of up to two VM(s) for other optional solutions provided by VMware or VMware partners. 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).

*NOTE:* The IP address(es) must be on the same subnet as EVO:RAIL and vCenter Server.

| Rows 42 and 43 | If your EVO:RAIL appliance has any optional solutions, please enter the IP address(es) for the primary VM and secondary VM (if there is one). |

**Step 1G. Workstation/Laptop**

A workstation/laptop with a web browser for the EVO:RAIL user interface is required. It must be either plugged into the 10GbE switch or able to logically reach the EVO:RAIL management VLAN from elsewhere on your network; for example, a jump server (https://en.wikipedia.org/wiki/Jump_server).

**Reaching EVO:RAIL for the First Time**

To access the first appliance in an EVO:RAIL cluster for the first time, you must use the temporary EVO:RAIL initial IP address that was pre-configured on the appliance, typically 192.168.10.200/24. You will change this IP address in the EVO:RAIL initial configuration user interface to your desired permanent address for your new EVO:RAIL cluster.

If you cannot reach the EVO:RAIL initial IP address, you will need to follow the instructions in **Step 6A** to configure a custom IP address, subnet mask, and gateway.

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We do not recommend using the default EVO:RAIL initial IP address (192.168.10.200/24) as your permanent EVO:RAIL IP address, because if you later add more appliances to the EVO:RAIL cluster or if you create more clusters, the initial IP addresses will conflict with the existing cluster’s IP address.

**NOTE:** If you later need to change the EVO:RAIL IP address, contact your selected EVO:RAIL partner.

Your workstation/laptop will need to be able to reach both the EVO:RAIL initial IP address and the permanent IP address. The EVO:RAIL user interface will remind you that you may need to reconfigure your workstation/laptop network settings to access the new IP address. See the instructions in **Step 6B**.

<table>
<thead>
<tr>
<th>Network Configuration Table</th>
<th>Please enter the EVO:RAIL initial IP address. Enter 192.168.10.200/24 if you can reach this address on your network. Otherwise, enter the custom IP address, subnet mask, and gateway that you will configure in <strong>Step 6A</strong>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Row 2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Network Configuration Table</th>
<th>Check the permanent EVO:RAIL IP address that you entered in <strong>Step 1D</strong>. We recommend that you do not use the default 192.168.10.200/24</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Row 22</td>
<td></td>
</tr>
</tbody>
</table>

**Browser Support**

You will use a browser for the EVO:RAIL user interface. 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.

**Step 1H. Out-of-Band Management (optional)**

If your EVO:RAIL appliance will be located at a data center that you cannot access easily, we recommend setting up an out-of-band management switch to facilitate direct communication with the appliance. 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 10GbE switch (if the 10GbE switch supports your BMC ports), it is more economical to use a lower bandwidth switch.

Ask your selected EVO:RAIL partner for default values, capabilities, and recommendations for out-of-band management. The default configuration may be via DHCP with:

Username: UserId  
Password: Passw0rd!

**NOTE:** Case sensitive and using a zero in place of a lowercase ‘o’ in the password

The <ApplianceID> can be found on a pull out tag located in front of the physical appliance. The default hostnames should be as follows:

<table>
<thead>
<tr>
<th>BMC interface node 1: hostname = &lt;ApplianceID&gt;-01</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMC interface node 2: hostname = &lt;ApplianceID&gt;-02</td>
</tr>
<tr>
<td>BMC interface node 3: hostname = &lt;ApplianceID&gt;-03</td>
</tr>
<tr>
<td>BMC interface node 4: hostname = &lt;ApplianceID&gt;-04</td>
</tr>
</tbody>
</table>
Step 2: Set Up Switch

In order for EVO:RAIL to function properly, you must configure the ports that EVO:RAIL will use on the 10GbE switch before you plug in EVO:RAIL and turn it on.

Understanding Switch Configuration

Various network topologies for 10GbE switch(es) and VLANs are possible with EVO:RAIL. Complex production environments will have multiple core switches and VLANs. For high-availability, use two 10GbE switches and connect one port from each node to each 10GbE switch.

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.

Network Traffic

All EVO:RAIL 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. To ensure vSphere vMotion traffic does not consume all available bandwidth on the 10GbE port, EVO:RAIL limits vMotion traffic to 4Gbps.

EVO:RAIL traffic is separated as follows:

<table>
<thead>
<tr>
<th>Traffic Type</th>
<th>Requirements</th>
<th>1st 10GbE NIC</th>
<th>2nd 10GbE NIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management (EVO:RAIL, vCenter Server, ESXi, Log Insight, Solution VMs)</td>
<td>IPv6 multicast</td>
<td>Standby</td>
<td>Active</td>
</tr>
<tr>
<td>vSphere vMotion</td>
<td></td>
<td>Standby</td>
<td>Active</td>
</tr>
<tr>
<td>Virtual SAN</td>
<td>IPv4 multicast</td>
<td>Active</td>
<td>Standby</td>
</tr>
<tr>
<td>Virtual Machines</td>
<td></td>
<td>Standby</td>
<td>Active</td>
</tr>
</tbody>
</table>

Out-of-band traffic is optionally used to manage hardware on the 1GbE port on each node.

Multicast Traffic

IPv4 multicast support is required for the Virtual SAN VLAN. IPv6 multicast is required for the EVO:RAIL management VLAN. The 10GbE switch(es) that connect to EVO:RAIL must allow for pass-through of multicast traffic on these two VLANs.

EVO:RAIL creates very little traffic via IPv6 multicast for autodiscovery and management. It is optional to limit traffic further on your 10GbE switch by enabling MLD Snooping and MLD Querier.
There are two options to handle Virtual SAN IPv4 multicast traffic. Either limit multicast traffic by enabling both IGMP Snooping and IGMP Querier or disable both of these features. We recommend enabling both IGMP Snooping and IGMP Querier, if your 10GbE switch supports them.

**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**.

**vSphere Security Recommendations**

Security recommendations for vSphere are found here:


In particular, ensure that physical switch ports are configured with Portfast if spanning tree is enabled. Because VMware virtual switches do not support STP, physical switch ports connected to an ESXi host must have Portfast configured if spanning tree is enabled to avoid loops within the physical switch network. If Portfast is not set, potential performance and connectivity issues might arise.

**Configure VLANs on your 10GbE Switch(es)**

The EVO:RAIL network can be configured with or without VLANs. For performance and scalability, it is highly recommended to configure EVO:RAIL with VLANs. Refer to the plan that you created in **Step 1B** for your VLAN IDs.

Configure the VLANs on your 10GbE switch as listed in the **EVO:RAIL Setup Checklist**:

- Configure your selected management VLAN (default is untagged/native).
- Make sure that IPv6 multicast is configured/enabled on the management VLAN (regardless of whether tagged or native).
- Configure your selected VLAN for Virtual SAN.
- Make sure that IPv4 multicast is configured/enabled on the Virtual SAN VLAN (enabling IGMP snooping and querier is highly recommended).
- Configure your selected VLAN for vSphere vMotion.
- Configure your selected VLANs for VM Networks.
Using the EVO:RAIL Network Configuration Table:

1. Configure the management VLAN (Row 1) on your 10GbE switch ports. If you entered “Native VLAN”, then set the ports on the 10GbE switch to accept untagged traffic. This is the default management VLAN setting on EVO:RAIL appliances.

2. Regardless of whether you are using an untagged Native VLAN or a tagged VLAN, you must set the management VLAN to allow IPv6 multicast traffic to pass through. Depending on the type of switch you have, you may need to turn on IPv6 and multicast directly on the port or on the VLAN. Be sure to read the previous sections on Understanding Switch Configuration and Multicast Traffic, and consult the switch manufacturer for further instructions on how to configure these settings.

3. Configure a vSphere vMotion VLAN (Row 30) on your 10GbE switch ports.

4. Configure a Virtual SAN VLAN (Row 34) on your 10GbE switch ports and set it to allow IPv4 multicast traffic to pass through.

5. Configure the VLANs for your VM Networks (Rows 35-38) on your 10GbE switch ports.

Inter-switch Communication

In a multi-switch environment, configure the ports used for inter-switch communication to carry IPv6 multicast traffic for the EVO:RAIL management VLAN. Likewise, carry IPv4 multicast traffic between switches for the Virtual SAN VLAN. Consult your switch manufacturer’s documentation for how to do this.

Disable Link Aggregation

Do not use link aggregation, including protocols such as LACP and EtherChannel, on any ports directly connected to EVO:RAIL. The EVO:RAIL engine uses active/standby configuration (NIC teaming) for network redundancy, as discussed in the section on Network Traffic.
Step 3: Hands-on Lab

As you wait for your appliance to arrive, test drive the EVO:RAIL user interface using the Hands-on Lab: https://www.vmware.com/go/evorail-lab

In EVO:RAIL initial configuration, you will:

- Learn how to configure and build a newly deployed EVO:RAIL appliance

In EVO:RAIL management, you will:

- Create virtual machines and manage lifecycle operations
- Explore management features, such as system health
- Simulate appliance discovery and scale out
- Simulate hardware failure and node replacement

After Planning and Switch Setup

Step 4: Cable & On

Rack and cable your EVO:RAIL appliance as shown Figure 3 if you are using one 10GbE switch. Use Figure 4 if you are using two 10GbE switches for redundancy. The figures illustrate a vendor-independent, simple network setup. The exact hardware configurations will vary, depending on your selected EVO:RAIL partner and switch manufacturer. After the appliance is cabled, power on all four nodes on the first appliance in an EVO:RAIL cluster.

Do not turn on any nodes in other appliances in an EVO:RAIL cluster until you have completed the full configuration of the first appliance. Each appliance must be added to an EVO:RAIL cluster one at a time. See Adding Appliances to an EVO:RAIL Cluster.
Single Switch Cabling Diagram
Can be used in a non-production environment when redundant switches are not essential such as test, development or remote/branch offices (ROBO).

![Single Switch Cabling Diagram](image)

**Figure 3.** Rear view of one deployment of EVO:RAIL connected to one 10GbE switch. Port locations may vary by selected EVO:RAIL partner.

Dual Switch Cabling Diagram
Recommended for redundancy in production environments.

![Dual Switch Cabling Diagram](image)

**Figure 4.** Rear view of one deployment of EVO:RAIL connected to two 10GbE switches, recommended for redundancy.
Step 5: Management VLAN

If you have decided to use a tagged management VLAN for EVO:RAIL, you will need to customize the management VLAN directly on each ESXi host via the ESXi Command Line Interface (CLI) before using the EVO:RAIL user interface to configure the appliance.

To customize the management VLAN before EVO:RAIL is initially configured, changes are required for two different portgroups on all ESXi hosts. The first portgroup is the ESXi "Management Network", and the second portgroup is the initial EVO:RAIL management network, called "VM Network". During configuration the second portgroup is renamed "vCenter Server Network".

Login to each of the four ESXi hosts via the console interface, DCUI.

- Press <F2> to login with the username root and the password Passw0rd!
- Go to “Troubleshooting Options” and press <Enter> to select.
- Go to “Enable ESXi Shell” and press <Enter> to change.
- Press <ESC> to save.
- Press <ALT-F1> to get to the ESXi shell.
- Login to the shell with the username root and the password Passw0rd!
- Execute the following ESXi commands with the <VLAN_ID> from Row 1 in the EVO:RAIL Network Configuration Table:

```
esxcli network vswitch standard portgroup set -p "Management Network" -v <VLAN_ID>
esxcli network vswitch standard portgroup set -p "VM Network" -v <VLAN_ID>
/etc/init.d/loudmouth restart
```

- 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.

Documentation for vSphere/ESXi command line interface is provided at [http://pubs.vmware.com/vsphere-60/index.jsp#com.vmware.vsphere.scripting.doc/GUID-7F7C5D15-9599-4423-821D-7B1FE87B3A96.html](http://pubs.vmware.com/vsphere-60/index.jsp#com.vmware.vsphere.scripting.doc/GUID-7F7C5D15-9599-4423-821D-7B1FE87B3A96.html)

Step 6: Connect & Configure

If you have successfully followed all of the previous steps, your network setup is complete and you are ready to connect to EVO:RAIL from your workstation/laptop. This section is only used for the first appliance in an EVO:RAIL cluster.

**Step 6A.** Connect a workstation/laptop to access the EVO:RAIL initial IP address on your selected management VLAN. It must be either plugged into the 10GbE switch or able to logically reach the EVO:RAIL management VLAN from elsewhere on your network.

Use the temporary EVO:RAIL initial IP address that was pre-configured on the appliance, 192.168.10.200/24 (Row 2 in the EVO:RAIL Network Configuration Table).

However, if you cannot reach 192.168.10.200/24, you can change the initial IP address directly on ESXi host #1, following the instructions in Appendix C.

**Step 6B.** Configure the network settings on your workstation/laptop to talk to EVO:RAIL

⚠️ Your workstation/laptop will need to be able to reach both the EVO:RAIL initial IP address and your selected permanent EVO:RAIL IP address.
Example:

<table>
<thead>
<tr>
<th></th>
<th>EVO:RAIL</th>
<th>Workstation/laptop</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IP address/netmask</td>
<td>IP address</td>
</tr>
<tr>
<td>Initial (temporary)</td>
<td>192.168.10.200/24</td>
<td>192.168.10.150</td>
</tr>
<tr>
<td>Post-configuration (permanent)</td>
<td>10.10.10.100/24</td>
<td>10.10.10.150</td>
</tr>
</tbody>
</table>

It may be possible to give your workstation/laptop or your jump server two IP addresses, which allows for a smoother experience. Depending on your workstation/laptop, this can be implemented in several ways (such as dual-homing or multi-homing). Otherwise, change the IP address on your workstation/laptop when instructed to in the EVO:RAIL user interface and then return to the EVO:RAIL user interface.

**Step 6C.**

In the next section, *EVO:RAIL Initial Configuration*, you will browse to the EVO:RAIL initial IP address to configure and build your appliance.

**Step 6D.**

Configure your corporate DNS server for all EVO:RAIL hostnames and IP addresses unless you are in an isolated environment.

DNS is required for EVO:RAIL because some management operations, such as importing an OVA file, require a FQDN for direct host access. To add a DNS server after you have configured EVO:RAIL, see the VMware Knowledge Base ([http://kb.vmware.com/kb/2107249](http://kb.vmware.com/kb/2107249)).

If you are in an isolated environment, you will need to use the DNS server that is built into vCenter Server. To manage EVO:RAIL via your workstation/laptop, configure your laptop’s network settings to use the vCenter Server IP address (Row 21) for DNS. EVO:RAIL’s IP addresses and hostnames are configured for you.

If you are using your corporate DNS server(s) for EVO:RAIL (Row 5), add the hostnames and IP addresses for EVO:RAIL, vCenter Server, Log Insight, and each ESXi host (see the naming scheme in **Hostnames**).

**NOTE:** vMotion and Virtual SAN IP addresses are not configured for routing by EVO:RAIL and there are no hostnames.

**Example** of EVO:RAIL hostnames and IP addresses for Release 2.x configured on a DNS server (Release 1.x would not have a evorail.*.* entry):

- esxi-host01.localdomain.local 192.168.10.1
- esxi-host02.localdomain.local 192.168.10.2
- esxi-host03.localdomain.local 192.168.10.3
- esxi-host04.localdomain.local 192.168.10.4
- evorail.localdomain.local 192.168.10.100
- vcservr.localdomain.local 192.168.10.101
- loginsight.localdomain.local 192.168.10.102

**Step 6E.**

When your appliance is ready, refer to the *EVO:RAIL Management & Maintenance User Guide*. From now on, you will connect to the EVO:RAIL user interface using either the EVO:RAIL IP address (Row 22) or the fully-qualified domain name (FQDN) (Row 18) that you have configured on your DNS server (e.g. https://evorail.yourcompany.com). In Release 2.x, do not specify a port because the default (443) is used. In Release 1.x, you must specify port 7443 to reach the EVO:RAIL user interface and port 9443 to reach the vSphere Web Client on vCenter Server.

When you add more appliances to an EVO:RAIL cluster, be sure to follow the steps in **Adding Appliances to an EVO:RAIL Cluster** in this document.
EVO:RAIL Initial Configuration

Prerequisites

Before you proceed with the initial configuration of your new EVO:RAIL appliance:

- Please review the physical power, space and cooling requirements for the expected resiliency level of the appliance. This information is available from your selected EVO:RAIL partner.
- Please review the EVO:RAIL Setup Checklist and fill in the EVO:RAIL Network Configuration Table. This is essential to help ensure smooth deployment and configuration.
- If you have not done so before, double-check your Network Configuration. Procedures to confirm each of the following will vary according to your network architecture:
  - Confirm that you can ping or point to the EVO:RAIL initial IP address (Row 2). If not, return to Step 6.
  - Confirm that your gateway is reachable (Row 24)
  - Confirm that your DNS server(s) are reachable unless you are in an isolated environment (Row 5)
  - Confirm that IPv4 multicast and IPv6 multicast are enabled for the VLANs described in this document.

How to Configure EVO:RAIL

There are two ways to configure EVO:RAIL:

- **Step-by-step**: Using the step-by-step user interface (or "customize" in Release 1.x)
- **Configuration File**: Uploading a JSON-formatted configuration file that you created. See Appendix B for the file format and valid values.

EVO:RAIL verifies the configuration data, and then builds the appliance. EVO:RAIL implements data services, creates the new ESXi hosts, and sets up vCenter Server, EVO:RAIL, vMotion and Virtual SAN.

Release 2.x

Use values from the rows of your EVO:RAIL Network Configuration Table as follows in the user interface:

- **System**
  Enter your time zone and your existing NTP and DNS server(s) from Rows 3-5. Enter the Active Directory (optional) domain, username and password from Rows 6-8. Enter the IP address, port, username, and password for your proxy server (optional) from Rows 9-12.

- **Management**
  Enter the ESXi host naming scheme from Rows 13-16, vCenter Server hostname from Row 17, and EVO:RAIL hostname from Row 18. Enter the IP addresses, subnet mask, and gateway for ESXi, vCenter Server, and EVO:RAIL from Rows 19-24. Enter the ESXi hosts and vCenter Server/EVO:RAIL passwords from Rows 25-26.

- **vSphere vMotion**
  Enter the VLAN ID, IP addresses, and subnet mask for vSphere vMotion from Rows 27-30.

- **Virtual SAN**
  Enter the VLAN ID, IP addresses, and subnet mask Virtual SAN from Rows 31-34.
• **VM Networks**
  Enter the VLAN IDs and names for the VM Networks from Rows 35-38.

• **Solutions (optional)**
  For logging, enter the IP address and hostname for vRealize Log Insight or for an existing third-party syslog server (optional) in your network (Rows 39-41). Enter one or two IP addresses from Rows 42-43 for the virtual machines required by any optional VMware or partner solution.

**Release 1.x**

Use values from the rows of your EVO:RAIL Network Configuration Table as follows in the user interface:

• **Hostnames**
  Enter the ESXi host naming scheme from Rows 13-16 and the vCenter Server hostname from Row 17.

• **Networking**
  Enter the VLAN IDs, IP addresses, subnet mask, and gateway for ESXi, Virtual SAN, vSphere vMotion, vCenter Server, and VM Networks from Rows 19-24 and 27-38.

• **Passwords**
  Enter the ESXi hosts and vCenter Server passwords from Rows 25-26. Enter the Active Directory (optional) domain, username and password from Rows 6-8.

• **Globals**
  Enter your time zone and your existing NTP and DNS server(s) from Rows 3-5. For logging, enter the IP address and hostname for Log Insight or for an existing third-party syslog server (optional) in your network (Rows 39-41). Enter the IP address, port, username, and password for your proxy server (optional) from Rows 9-12.

• **EVO:RAIL Partner Solution (optional)**
  Enter one or two IP addresses from Rows 42-43 for the virtual machines required by a partner solution.

**Initial Configuration User Interface**

Use the information from your EVO:RAIL Network Configuration Table as you follow these steps in the EVO:RAIL user interface.

**Step 1.** Browse to the EVO:RAIL initial IP address; for example, https://192.168.10.200 (Release 2.x), or https://192.168.10.200:7443 (Release 1.x). Ignore any browser warnings about security (for example, by clicking “Advanced” and “Proceed”). You will then see the EVO:RAIL welcome splash page.

**Step 2.** Click Get Started (or Yes, Let's Go in Release 1.x). Then if you agree, accept the EVO:RAIL End-User License Agreement (EULA).

**Step 3.** In Release 2.x, we ask you if you have read this document and setup your network correctly. If you have done so, check the following boxes and then click next.

  - I set up my switch
  - I set up my management VLAN

**Step 4.** Click Step-by-step (or Customize in Release 1.x) to configure hostnames, IP addresses, VLAN IDs, and passwords. Using one of the two previous sections to guide you, enter your values from the EVO:RAIL Network Configuration Table.

Alternately, click Configuration File to upload a JSON-formatted configuration file that you have created. In Release 1.x, click Customize first, then Upload Configuration File in the lower right part of the webpage.

**Step 5.** Carefully enter your data or review each configuration field.

**Step 6.** Click the Review First (Release 2.x only) or Validate button. EVO:RAIL verifies the configuration data, checking for conflicts.

**Step 7.** After validation is successful, click the Build EVO:RAIL button.

**Step 8.** The new IP address for EVO:RAIL will be displayed.
Click Start Configuration (or Continue in Release 1.x). Ignore any browser messages about security (for example, by clicking “Advanced” and “Proceed”).

**NOTE:** You may need to manually change the IP settings on your workstation/laptop to be on the same subnet as the new EVO:RAIL IP address (Row 2).

**NOTE:** If your workstation/laptop cannot connect to the new IP address that you configured, you will get a message to fix your network and try again. If you are unable to connect to the new IP address after 20 minutes, EVO:RAIL will revert to its un-configured state and you will need to re-enter your configuration at the initial IP address (Row 2).

**NOTE:** After the appliance build process starts, if you close your browser, you will need to browse to the new IP address (Row 2).

**Step 9.** Progress is shown as your appliance is built.

When you see the Hooray! page, click the Manage EVO:RAIL button to continue to EVO:RAIL management. You should also bookmark this IP address in your browser for future use.

From now on, refer to the EVO:RAIL Management & Maintenance User Guide.

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**Adding Appliances to an EVO:RAIL Cluster**

EVO:RAIL can scale out to sixteen appliances for up to 64 ESXi hosts all on one Virtual SAN datastore, backed by a single vCenter Server and EVO:RAIL instance. Deployment, configuration, and management are handled by EVO:RAIL, allowing the compute capacity and the Virtual SAN datastore to grow automatically. New appliances are automatically discovered and easily added to an EVO:RAIL cluster.

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 EVO:RAIL / vCenter Server passwords.

**NOTE:** If you have multiple independent EVO:RAIL clusters, 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.

**Step 1: Plan**

Use the EVO:RAIL Setup Checklist to make sure you are ready for additional appliances. Work with your team to make any decisions that were not made earlier.

- Eight 10GbE ports for each EVO:RAIL appliance on your 10GbE switch(es)
- Four contiguous IP addresses on the management VLAN for ESXi hosts for each appliance
- Four contiguous IP addresses on the Virtual SAN VLAN for each appliance
- Four contiguous IP addresses on the vSphere vMotion VLAN for each appliance
- Optional: Extra capacity and IP addresses for four out-of-band management ports for each appliance
- Be sure you know the ESXi host and vCenter Server/EVO:RAIL passwords that were configured on the first EVO:RAIL appliance in the cluster

**Step 2: Set Up Switch**

Before you plug in your new EVO:RAIL appliance, configure each port that will be used by the new appliance just like you configured the switch for the first EVO:RAIL appliance. Configure the management VLAN, Virtual SAN VLAN, vMotion VLAN, and VM Network VLANs on each EVO:RAIL 10GbE port, including IPv4 multicast and IPv6 multicast. Disable link aggregation (LACP/EtherChannel) on each EVO:RAIL 10GbE port.
**Step 3: Hands-on Lab**

If you haven’t done so already, you can test-drive “Add Appliance” in the EVO:RAIL Hands-on Lab.

**Step 4: Cable & On**

Rack your new appliance and connect the 10GbE ports on EVO:RAIL to the 10GbE switch(es). Power on all four nodes on your new EVO:RAIL appliance.

- Only one appliance can be added at a time. To add multiple appliances, power on one appliance at a time, making sure that each is properly configured before powering on the next appliance. Remember that powering on an appliance consists of powering on all four nodes in the appliance.

- An EVO:RAIL Release 2.x appliance cannot be added into an existing EVO:RAIL Release 1.x cluster. An EVO:RAIL Release 1.x appliance cannot be added into an existing EVO:RAIL Release 2.x cluster. Please contact your selected EVO:RAIL partner to upgrade your EVO:RAIL appliance or cluster from 1.x to 2.x. EVO:RAIL prevents these possibilities and does not display Add EVO:RAIL Appliance.

**Step 5: Management VLAN**

If you have decided to use a tagged management VLAN for your EVO:RAIL cluster, you must customize the management VLAN directly on each appliance via the ESXi Command Line Interface.

- The first appliance will not discover any ESXi hosts that are not on the same management VLAN.

Login to each ESXi host in the new appliance and follow the management VLAN instructions for the first appliance in the cluster.

**Step 6: Add EVO:RAIL Appliance**

Go to the EVO:RAIL user interface to see the first EVO:RAIL appliance in the cluster detect each node in the new appliance. If you have enough IP addresses, all you do is enter the passwords and click the Add EVO:RAIL Appliance button. EVO:RAIL will seamlessly configure all services on the new appliance and fully integrate it into the cluster.

- Be sure to add any ESXi hostnames that were not previously entered in your corporate DNS, unless you are in a totally isolated environment.
Appendix A. 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. Some network configuration errors cannot be recovered from and you will need your selected EVO:RAIL partner to reset your appliance to factory defaults. When EVO:RAIL is reset to factory defaults, all data is lost.

4. Read your vendor instructions for your 10GbE switch.
   a) Remember to configure multicast and don’t block IPv6 on your 10GbE switch. Re-read the sections on 10GbE switches and VLANs in this document.
   b) Remember that management traffic will be untagged on the native VLAN on your 10GbE switch, unless your appliance has been customized for a specific management VLAN.
   c) If you have two or more switches you must make sure that IPv4 multicast and IPv6 multicast traffic is transported between them.

5. Network design and accessibility:
   a) Make sure your management gateway IP address is accessible. It is used for vSphere High Availability (HA) to work correctly. You can use a corporate gateway on your EVO:RAIL network segment or you may be able to configure your 10GbE L3 switch as the gateway. When vSphere HA is not working, you will see a "network isolation address" error. EVO:RAIL will continue to function, but it will not be protected by the vSphere HA feature. http://pubs.vmware.com/vsphere-60/index.jsp#com.vmware.vsphere.avail.doc/GUID-5432CA24-14F1-44E3-87FB-61D937831CF6.html
   b) Make sure you can reach your DNS server from the EVO:RAIL, vCenter Server, and ESXi network addresses. Then update your DNS server with all EVO:RAIL hostnames and IP addresses.
   c) If you have configured Active Directory, NTP servers, proxy servers, or a third-party syslog server, you must be able to reach them from all of your configured EVO:RAIL IP addresses.
   d) You must determine all IP addresses before you can configure EVO:RAIL. You cannot easily change the IP addresses after you have configured EVO:RAIL.

6. Don’t try to plug your workstation/laptop directly into a server node on EVO:RAIL; plug it into your network or 10GbE switch and make sure that it is logically configured to reach EVO:RAIL.

7. If you are using SFP+, NIC and switch connectors and cables must be on the same wavelength. Contact your selected EVO:RAIL partner for the type of SFP+ connector on your appliance.
Appendix B: JSON Configuration File

Before configuring EVO:RAIL, customers must read this setup guide and fill out the EVO:RAIL Network Configuration Table. A JSON Configuration file can be uploaded in the EVO:RAIL initial configuration user interface. Sample JSON configuration files such as the one listed in this appendix are found in VMware Knowledge Base articles.

Important Notes:

• The JSON file format may change throughout EVO:RAIL releases. Please get the sample JSON file that corresponds to the software release that your appliance was built with at the selected EVO:RAIL partner factory; then edit the sample file for your configuration.
• EVO:RAIL expects the data in the configuration file in a specific format. Any changes to the JSON format will result in unexpected results and/or crashes.
• There is no built-in capability to generate and export an updated copy of an EVO:RAIL JSON configuration file from the user interface.

Create a custom configuration file with the following steps:

Step 1. Obtain a sample json file for the EVO:RAIL release that you will be configuring from VMware Knowledge Base: http://kb.vmware.com/kb/2106961
Step 2. Edit your new configuration file to insert the values from the EVO:RAIL Network Configuration Table.
Step 3. Make sure that the filename has a ".json" extension.
Step 4. Make sure that the file is in valid JSON format because EVO:RAIL will not validate the syntax (e.g., a missing comma will cause the configuration file to fail). EVO:RAIL will validate the content of a correctly formatted JSON file in the same manner that it validates manual entries, verifying data entry and performing deep validation prior to building the appliance.
Step 5. Make this file accessible from your workstation/laptop.

Deploy EVO:RAIL as usual by configuring your 10GbE switch, racking and cabling your new EVO:RAIL appliance, and powering on all four EVO:RAIL nodes.

Step through the Initial Configuration User Interface section to upload your JSON configuration file.

JSON File Format and Valid Values

The JSON configuration file must be properly formatted and the values must be valid for EVO:RAIL and for your network. The following list contains the fields and restrictions, both color-coded and in list format.

1. Variables in red can be replaced with custom names or IP addresses. All red fields are required.
   • minIP, maxIP, ip, gateway, netmask: valid IP addresses and subnet mask in your network
   • vlanId: valid numeric VLAN ID, configured on your 10GbE switch
   • name: alphanumeric string to identify a VM network segment
   • prefix: alphanumeric string for the first part of an ESXi hostname
   • tld: valid domain name in your network
   • vcenter, evorail: alphanumeric strings for the vCenter Server and EVO:RAIL hostnames

2. Fields in purple contain multiple options. All purple fields are required.
   • separator: "" (no separator) or "," (dash)
   • The general formula for the FQDN (fully qualified domain name) of an ESXi host is: <hostname><separator><iterator>.<domain>
   • When using "," as the separator, the FQDN of an ESXi host is: <hostname>-<iterator>.<domain> (i.e. host-01.vsphere.local)
• When using "" as the separator, the FQDN of an ESXi host is: <hostname><iterator>.<domain> (i.e. host01 vsphere.local)

iterator: "NUMERIC_N" or "NUMERIC_NN" or "ALPHA"

• ALPHA means that the first host starts with A, the second host with B, etc
• NUMERIC_N means that the first host starts with "1", the second host with "2", etc
• NUMERIC_NN means that the first host starts with "01", the second host with "02", etc

logging: "LOGINSIGHT" or "SYSLOG"

• LOGINSIGHT means that Log Insight will be used as the log collection server. When this option is used, "loginsightServer" and "loginsightHostname" must be filled out.
• SYSLOG means that an external log collection server will be used as the log collection server. When this option is used, "syslogServerCSV" must be filled out.

timezone:

• Any value listed in http://en.m.wikipedia.org/wiki/List_of_tz_database_time_zones in the TZ column is accepted as valid input.

3. Fields in green are optional. If the field is not used, it should be left unfilled with just opening and closing quotes, i.e. "".

• activeDirectoryDomain, activeDirectoryUsername, proxyUsername: alphanumeric strings
• proxyServer, proxyPort: IP address and port identifier
• ntpServerCSV, dnsServerCSV: a comma-separated list of IP addresses or hostnames (ntp only)

4. The field in brown, syslogServerCSV, is required if the "logging" field is set to "SYSLOG". Up to two IP addresses (or FQDNs) are supported in this field. Otherwise, if the "logging" field is set to "LOGINSIGHT", syslogServerCSV must be left blank.

5. Fields in yellow, loginsightServer and loginsightHostname, are required if the "logging" field is set to "LOGINSIGHT". Otherwise, if the "logging" field is set to "SYSLOG", loginsightServer and loginsightHostname must be left blank.

6. Fields that contain passwords should only be filled out by a customer from the EVO:RAIL user interface. They should not be pre-filled in the clear-text JSON file for security reasons.

7. Do not modify the JSON syntax or any other fields.
The following is a sample JSON file based on EVO:RAIL Release 2.0.0. Data is mapped to the rows in the EVO:RAIL Network Configuration Table.

```json
{
    "version": "2.0.0",
    "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"
            },
            "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"
        },
        "evorail": {
            "ip": "192.168.10.201"
        }
    }
}
```
Sample JSON file (continued):

```
"hostnames": {
    "hosts": {
        "prefix": "host",
        "separator": ",",
        "iterator": "NUMERIC_NN"
    },
    "tld": "localdomain.local",
    "vcenter": "vcservr",
    "evorail": "evorail"
},
"passwords": {
    "esxiPassword": 
    "esxiPasswordConfirm": 
    "vcPassword": 
    "vcPasswordConfirm": 
    "activeDirectoryDomain": "optional_leave_blank_if_not_needed",
    "activeDirectoryUsername": "optional_leave_blank_if_not_needed",
    "activeDirectoryPassword": 
    "activeDirectoryPasswordConfirm": 
},
"global": {
    "logging": "LOGINSIGHT",
    "timezone": "UTC",
    "loginsightServer": "required_if_logging_is_LOGINSIGHT-otherwise_it_must_be_blank",
    "loginsightHostname": "required_only_if_logging_is_LOGINSIGHT-otherwise_it_must_be_blank",
    "ntpServerCSV": "optional_leave_blank_if_not_needed",
    "syslogServerCSV": "required_only_if_logging_is_SYSLOG-otherwise_it_must_be_blank",
    "dnsServerCSV": "optional_leave_blank_if_not_needed",
    "proxyServer": "optional_leave_blank_if_not_needed",
    "proxyPort": "optional_leave_blank_if_not_needed",
    "proxyUsername": "optional_leave_blank_if_not_needed",
    "proxyPassword": 
},
"vendor": {
    "ovfs": []
}
```
Appendix C: Customizing the EVO:RAIL Initial IP Address

To customize the EVO:RAIL initial IP address, follow these instructions to set the IP address, subnet mask, and gateway for the EVO:RAIL appliance instead of the default initial address, 192.168.10.200/24.

You do not need to follow these instructions if you can reach the default EVO:RAIL initial IP address and merely wish to change the post-configuration IP address to something else. Instead, use the EVO:RAIL user interface to enter the new IP address.

It will be easiest to select the IP settings that you want to use permanently for your EVO:RAIL cluster. Then all you need to do is configure your workstation/laptop once. Otherwise, just follow the notes in Step 8 of the Initial Configuration user interface.

Step 1. From your workstation/laptop, connect a VMware vSphere (C#) Client to the IP address of ESXi host #1 using the root user and the password specified during factory ESXi software installation, Passw0rd!

Step 2. Click the Virtual Machines tab and select “EVO:RAIL Orchestration Appliance” (Release 2.x) or “VMware vCenter Server Appliance” (Release 1.x). The VM should already be powered on. If not, click the green play button to power it and wait for it to boot.

Step 3. Open the Console and login as root with the default password Passw0rd!

Step 4. Stop vmware-marvin:

```
/etc/init.d/vmware-marvin stop
```

Step 5. Using the vami_set_network command, change the default IP address to a custom IP address, subnet mask, and gateway using the syntax shown below (all arguments are required).

Use the EVO:RAIL Network Configuration Table, Row 2 for the <new_IP>, <new_subnet mask>, and <new_gateway>.

```
/opt/vmware/share/vami/vami_set_network eth0 STATICV4 <new_IP> <new_subnet mask> <new_gateway>
```

Step 6. This one step is only performed on EVO:RAIL Release 1.x appliances:

Use an editor (such as vi) to change the IP address, subnet mask and gateway in /usr/lib/vmware-marvin/marvind/webapps/ROOT/WEB-INF/classes/application.properties.

```
applicationProperties.config.vc.initialIP=<custom_IP>
applicationProperties.config.vc.initialnetmask=<custom_netmask>
applicationProperties.config.vc.initialGateway=<custom_gateway>
```

Then delete all files in /var/lib/vmware-marvin directory. Ignore the expected error message that the dnsmasq directory cannot be deleted - it is needed for EVO:RAIL to function properly.

```
rm /var/lib/vmware-marvin/*
```

Step 7. Restart vmware-marvin and vmware-loudmouth on the EVO:RAIL Orchestration Appliance in Release 2.x or on vCenter Server in Release 1.x:

```
/etc/init.d/vmware-marvin restart
/etc/init.d/vmware-loudmouth restart
```