Introduction to VMware EVO: RAIL

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Introducing VMware EVO: RAIL

VMware EVO: RAIL™ combines compute, networking, and storage resources into a hyper-converged infrastructure appliance to create a simple, easy to deploy, all-in-one solution offered by VMware qualified partners.

Simplicity Transformed
EVO: RAIL enables power-on to VM creation in minutes, radically easy VM deployment, one-click non-disruptive patch and upgrades, simplified management…you get the idea.

Software-Defined Building Block
EVO: RAIL is a scalable Software-Defined Data Center (SDDC) building block that delivers compute, networking, storage, and management to empower private/hybrid-cloud, end-user computing, test/dev, and branch office environments.

Trusted Foundation
Building on the proven technology of VMware vSphere®, vCenter Server™, and VMware Virtual SAN™, EVO: RAIL delivers the first hyper-converged infrastructure appliance 100% powered by VMware software.
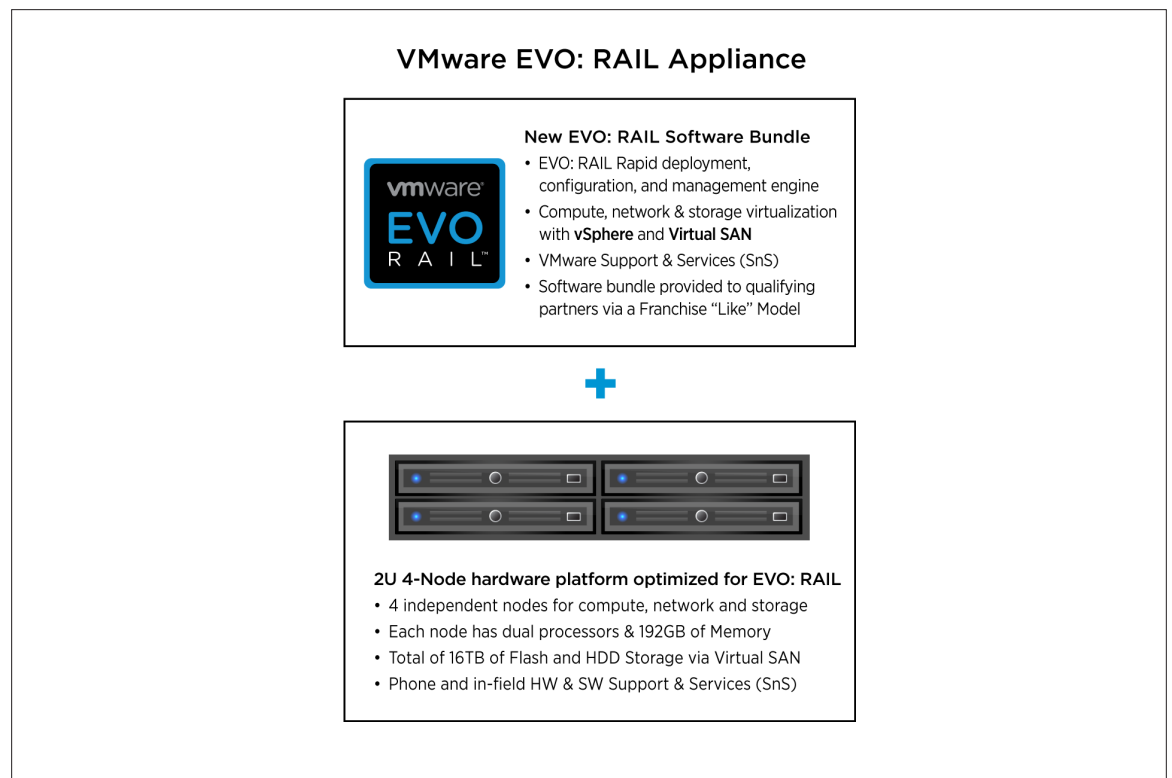
Highly Resilient by Design
Resilient appliance design starting with four independent hosts and a distributed Virtual SAN datastore ensures zero application downtime during planned maintenance or during disk, network, or host failures.

Infrastructure at the Speed of Innovation
Meet accelerating business demands by simplifying infrastructure design with predictable sizing and scaling, by streamlining purchase and deployment with a single appliance SKU, and by reducing CapEx and OpEx.

Freedom of Choice
EVO: RAIL is delivered as a complete appliance solution with hardware, software, and support through leading systems vendors; customers choose their preferred brand.

VMware EVO: RAIL Appliance

New EVO: RAIL Software Bundle
- EVO: RAIL Rapid deployment, configuration, and management engine
- Compute, network & storage virtualization with **vSphere** and **Virtual SAN**
- VMware Support & Services (SnS)
- Software bundle provided to qualifying partners via a Franchise "Like" Model

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2U 4-Node hardware platform optimized for EVO: RAIL
- 4 independent nodes for compute, network and storage
- Each node has dual processors & 192GB of Memory
- Total of 16TB of Flash and HDD Storage via Virtual SAN
- Phone and in-field HW & SW Support & Services (SnS)

Hardware

VMware is not entering the hardware market. The EVO: RAIL software bundle is available to qualifying EVO: RAIL partners. The partner, in turn, sells the hardware with integrated EVO: RAIL software, and provides all hardware and software support to customers.

Appliance

Each EVO: RAIL appliance has four independent nodes with dedicated computer, network, and storage resources and dual, redundant power supplies.

Nodes

Each of the four EVO: RAIL nodes have:

- Two Intel E5-2620v2 six-core CPUs
- 192GB of memory
- One SLC SATADOM or SAS HDD for the ESXi™ boot device
- Three SAS 10K RPM 1.2TB HDD for the VMware Virtual SAN™ datastore
- One 400GB MLC enterprise-grade SSD for read/write cache
- One Virtual SAN-certified pass-through disk controller
- Two 10GbE NIC ports (configured for either 10GBase-T or SFP+ connections)
- One 1GbE IPMI port for remote (out-of-band) management

Fault Tolerance and Reliability

Each EVO: RAIL appliance has the following hardware components and reliability features:

- Four ESXi hosts in a single appliance enables resiliency for hardware failures or maintenance
- Two fully redundant power supplies
- Redundant 2 x 10GbE NIC ports per node for all communication
- ESXi boot device, HDDs, and SSD are all enterprise-grade

Automatic Scale-Out

EVO: RAIL Version 1.0 can scale out to four appliances – for a total of 16 ESXi hosts, 1 Virtual SAN datastore backed by a single vCenter Server and EVO: RAIL instance. EVO: RAIL handles deployment, configuration, and management, 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 with a few mouse clicks.

Software

EVO: RAIL delivers the first hyper-converged infrastructure appliance 100% powered by VMware's proven suite of core products. The EVO: RAIL software bundle is fully loaded onto the EVO: RAIL qualified partner's hardware. This software bundle is comprised of:

- EVO: RAIL Deployment, Configuration, and Management
- VMware vSphere® Enterprise Plus, including ESXi for compute
- Virtual SAN for storage
- vCenter Server™
- vCenter Log Insight™

EVO: RAIL is optimized for the new VMware user as well as for experienced administrators. Minimal IT experience is required to deploy, configure, and manage EVO: RAIL, allowing it to be used where there is limited or no IT staff on-site. As EVO: RAIL utilizes VMware's core products, administrators can apply existing VMware knowledge, best practices, and processes.

EVO: RAIL leverages the same database as vCenter Server, so any changes in EVO: RAIL configuration and management are also reflected in vCenter Server and vice-versa.

Compute, Networking, Storage, and Management

EVO: RAIL Compute
Virtual Machine Density
• EVO: RAIL is sized to run approximately 100 average-sized, general-purpose, data center VMs. Actual capacity varies by VM size and workload. There are no restrictions on application type. EVO: RAIL supports any application that a customer would run on vSphere.

   General-purpose VM profile: 2 vCPU, 4GB vMEM, 60GB of vDisk, with redundancy

• EVO: RAIL is optimized for VMware Horizon® View with configuration options that allow up to 250 View VMs on a single EVO: RAIL appliance. Actual capacity varies by desktop size and workload.

   Horizon View virtual desktop profile: 2vCPU, 2GB vMEM, 32GB vDisk linked clones

EVO: RAIL Network
Connections
• Each node in EVO: RAIL has two 10GbE network ports. Each port must be connected to a 10GbE top-of-rack switch that has IPv4 and IPv6 multicast enabled.

• Remote/lights out management is available on each node through a 1GbE IPMI port that can connect to a management network. NOTE: In some configurations, there may be additional 1GbE ports that are covered and disabled.

Traffic
• EVO: RAIL supports four types of traffic: Management, vSphere vMotion®, Virtual SAN, and Virtual Machine. Traffic isolation on separate VLANs is recommended for vSphere vMotion, Virtual SAN, and VMs. EVO: RAIL Version 1.0 does not put management traffic on a VLAN.

• IPv4 and IPv6 multicast must be enabled on the top-of-rack switch(es). EVO: RAIL's automated scale-out feature uses IPv6. (It is not required for your complete network to support IPv6.)

• VLANs are not required when customizing a EVO: RAIL configuration; however, they are highly recommended. When using the *Just Go!* option, it is assumed VLANs are configured.

EVO: RAIL Storage
EVO: RAIL creates a single Virtual SAN datastore from all local HDDs on each ESXi host in a EVO: RAIL cluster. Virtual SAN read caching and write buffering uses SSD capacity. Total storage capacity is 16TB per EVO: RAIL appliance:

• 14.4TB HDD capacity (approximately 13TB usable) per appliance, allocated to the Virtual SAN datastore for virtual machines

• 1.6TB SSD capacity per appliance for read/write cache

• Size of pre-provisioned management VM: 30GB

EVO: RAIL Management
EVO: RAIL enables deployment, configuration, and management through a new, intuitive HTML5-based user interface showcased in the next section. EVO: RAIL provides new non-disruptive updates for VMware software with zero downtime and automatic scale-out of EVO: RAIL appliances.

Deployment, Configuration, and Management

EVO: RAIL Deployment
EVO: RAIL deployment is simple, with just four steps:

Step 1. Decide on EVO: RAIL network topology (VLANs and top-of-rack switch). Important instructions for your top-of-rack switch are provided in the EVO: RAIL User Guide.

Step 2. Rack and cable: connect the 10GbE adapters on EVO: RAIL to the 10GbE top-of-rack switch.
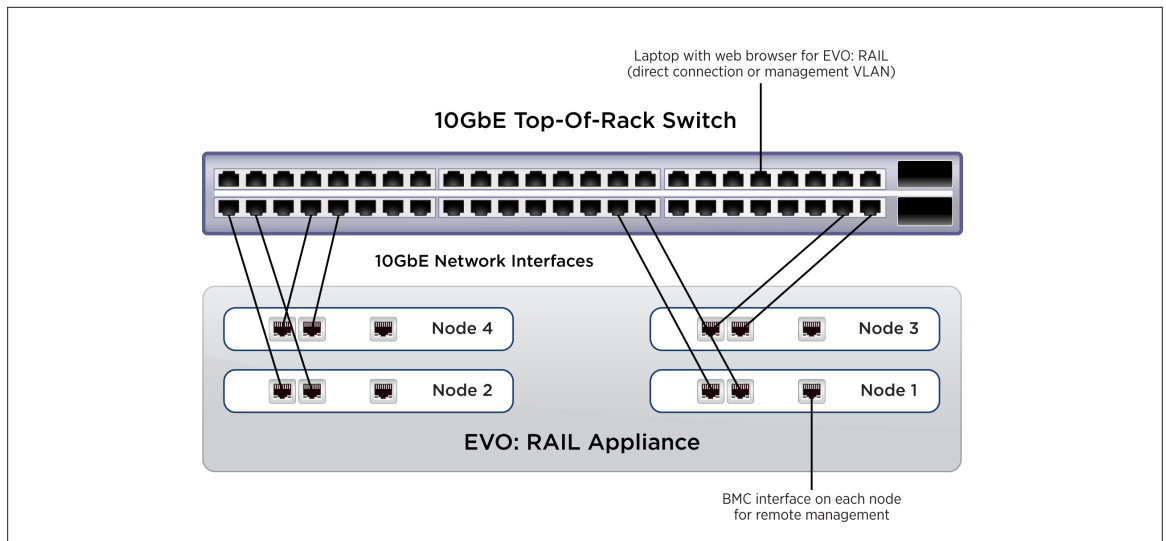
Step 3. Power on EVO: RAIL.

Figure 1. Rear view of one deployment of EVO: RAIL to a top-of-rack switch (varies by appliance vendor)

Step 4. Connect a client workstation/laptop to the top-of-rack switch and configure the network address to talk to EVO: RAIL. Then browse[1] to the EVO: RAIL IP address, for example https://192.168.10.200:7443.
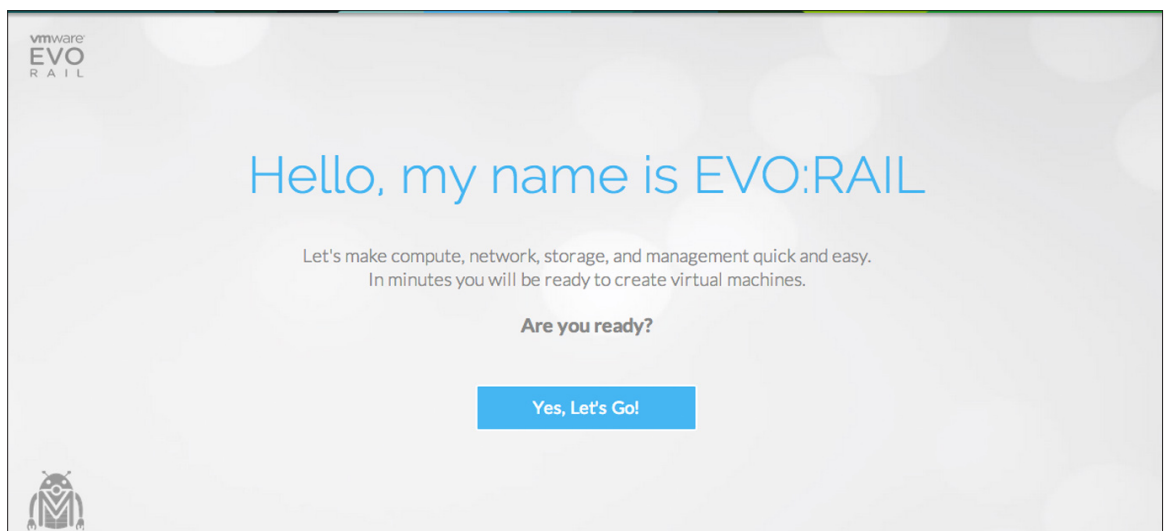

Figure 2. Initial user interface

1 Firefox, Chrome, and IE 10+ are all supported. For specific IE instructions, see the EVO: RAIL User Guide.

EVO: RAIL Configuration

EVO: RAIL Configuration has three options: *Just Go!* or *Customize Me!* or *Upload Configuration File.*

With *Just Go!,* EVO: RAIL automatically configures a default set of IP addresses and hostnames for extremely fast deployment in a green-field scenario. Configure your TOR switch and click the *Just Go!* button. All you have to create are two passwords.

With *Customize Me!,* customers can specify the following configuration parameters:

• **Hostnames** for vCenter Server and ESXi hosts naming scheme

• **Networking** (IP ranges and/or VLAN ID): ESXi, Virtual SAN, vSphere vMotion, vCenter Server, VM Networks

• **Passwords**: ESXi hosts and vCenter Server; optional Active Directory authentication

• **Globals**: Time zone; your existing NTP, DNS, and Proxy servers; logging: vCenter Log Insight or third-party syslog server

With *Upload Configuration File*, an existing `json` configuration file can be selected and uploaded.

EVO: RAIL verifies the configuration data, and then builds the appliance. EVO: RAIL implements data services, creates the new ESXi hosts, and configures vCenter Server. The final screen contains the link to EVO: RAIL Management.

EVO: RAIL Management

EVO: RAIL Management provides a dashboard to view all virtual machines and arrange them with sorting and filtering. Users create virtual machines with only a few clicks to select the guest OS, VM size, VLAN, and security options. EVO: RAIL simplifies virtual machine sizing by offering single-click small, medium, and large configurations, as well as single-click security policies.

EVO: RAIL Management revolutionizes live compute management with health monitors for CPU, memory, storage, and VM usage for entire EVO: RAIL clusters, individual appliances, and individual nodes. EVO: RAIL Management streamlines log collection, licensing, and offers language choice for globalization. It also provides notifications and tracks tasks.

EVO: RAIL Management radically simplifies scale-out. Increasing compute, networking, and storage resources is as easy as powering up a new appliance to join an existing EVO: RAIL cluster. EVO: RAIL automatically distributes the configuration to seamlessly add new appliances with zero additional configuration.

EVO: RAIL Management allows users to check for vCenter, ESXi, and EVO: RAIL software upgrades. EVO: RAIL downloads and installs any patches for these VMware products. With a minimum of four independent ESXi hosts in an EVO: RAIL cluster, updates are non-disruptive and require zero downtime.
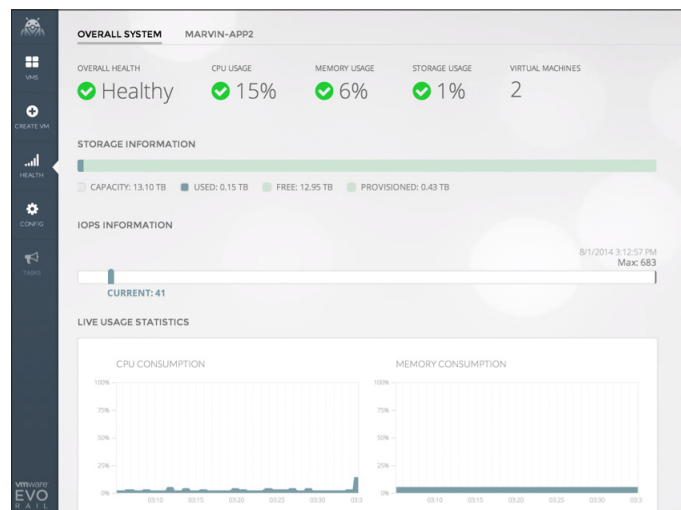

Figure 3. Health monitoring

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