vRealize Automation 8.0 Reference Architecture Guide

March 2020
vRealize Automation 8.0

You can find the most up-to-date technical documentation on the VMware website at:

https://docs.vmware.com/

VMware, Inc.
3401 Hillview Ave.
Palo Alto, CA 94304
www.vmware.com

Contents

vRealize Automation 8.x Reference Architecture

<div align="right">1</div>

The Reference Architecture describes the structure and configuration of typical vRealize Automation deployments.

The Reference Architecture also provides information about high availability, scalability, port requirements, and deployment profiles for these components:

- vRealize Lifecycle Manager

- VMware Identity Manager

- vRealize Automation

For software requirements, installation, and support platforms, refer to the individual product documentation on docs.vmware.com.

Deployment and Configuration Recommendations

<div style="text-align: right">2</div>

This chapter includes the following topics:

- Configuring Deployments
- Authenticating vRealize Automation 8.0
- Configuring Load Balancers
- Configuring vRealize Orchestrator
- Configuring High Availability

Configuring Deployments

Deploy and configure all VMware vRealize Automation components in accordance with VMware recommendations.

The clocks for vRealize Lifecycle Manager, VMware Identity Manager, vRealize Automation, and vRealize Orchestrator components must be synced to the same timezone. UTC+0 is recommended.

Install vRealize Lifecycle Manager, VMware Identity Manager, vRealize Automation, and vRealize Orchestrator components on the same management cluster. Machines should then be provisioned on a separate cluster to keep user and server workloads isolated.

Authenticating vRealize Automation 8.0

vRealize Automation 8.0 requires an external VMware Identity Manager instance.

You can use an existing VMware Identity Manager instance or deploy a new one by using vRealize Lifecycle Manager. For information on how to deploy a new VMware Identity Manager instance, refer to Deployment of VMware Identity Manager.

Configuring Load Balancers

vRealize Automation 8.0 requires a configured load balancer to direct and manage traffic.

If you are deploying a large vRealize Automation 8.0 instance, you must configure two load balanced VIPs. However, no session persistence is required.

For detailed configuration information, refer to the Load Balancing Guide for vRealize Automation 8.0.

vRealize Automation and VMware Identity Manager appliances require and use these ports:

- vRealize Automation

  - Port: 443

  - Health Monitor Port: 8008

  - Health Monitor URL: /health

- VMware Identity Manager

  - Port: 443

  - Health Monitor Port: 443

  - Health Monitor URL: /SAAS/API/1.0/REST/system/health/heartbeat

Configuring vRealize Orchestrator

vRealize Automation 8.0 requires a configured vRealize Orchestrator instance for extensibility functionality.

vRealize Automation 8.0 supports both an external and embedded vRealize Orchestrator instance. For optimized performance with vRealize Automation 8.0, configure an embedded vRealize Orchestrator instance.

Configuring High Availability

You can configure high availability on VMware components by deploying clusters full stop. However, not all VMware components support high availability.

Table 2-1. Component High Availability

Product	High Availability Support
vRealize Lifecycle Manager	vRealize Lifecycle Manager does not support a highly available deployment.
VMware Identity Manager	Content is replicated in a VMware Identity Manager cluster. Deploy a cluster behind a load balancer to enable high availability.
vRealize Automation	Content is replicated in a vRealize Automation cluster. Deploy a cluster behind a load balancer to enable high availability.

Hardware Requirements

3

Use these hardware specifications when configuring your system.

Table 3-1. Hardware Requirements

Component	vCPU	Memory (GB)	Storage (GB)
vRealize Lifecycle Manager	2	6	33
VMware Identity Manager	4	18	60
vRealize Automation	8	32	222

Scalability Support

4

The scalability limit tables outline the component metrics for single node and three node environments.

Table 4-1. 3 Node (HA) Scalability Limits

Component	3 Node Scale (HA)
Cloud Accounts Private endpoints: vCenter, NSX-V, and NSX-T Public endpoints: AWS, Azure, GCP, and VMC	70 (50 Private Endpoints, 20 Public Endpoints)
Compute resources (ESXi Hosts across all vCenters)	1,100
Cloud Zone (for all endpoints)	100
Data collected machines (includes private and public cloud)	170,000
Maximum managed VMs per endpoint	Private Endpoint: 10,000 Public Endpoint: 5,000
Images collected (AWS has 90,000+ images)	150,000
Image and Flavor Mapping	150
Cloud zones and images per image mapping	100
Cloud zones and flavors per flavor mapping	100
Concurrent deployment requests Private cloud including NSX resources (With blocking ABX on-prem actions and vRO workflows)	1000/hour; 50/minute
Concurrent deployment requests Public cloud (With blocking AWS action)	3000/hour; 500/minute
Concurrent Day 2 actions on deployments (Private Cloud)	1000/hour; 20/minute
Concurrent Day 2 actions on deployments (Public Cloud)	1000/hour; 300/min
Max resources per deployment	100
Blueprints	Blueprints: 8000

Table 4-1. 3 Node (HA) Scalability Limits (continued)

Component	3 Node Scale (HA)
Catalog	Catalog items (Blueprints: 8000; CFT: 1000) Content sources: 1000
Projects	5000
Users per project	5000
Projects per user	1000
Workload placement through vROPs	300 deployments/hour, per endpoint
Bulk-Imported machines using Workload Onboarding	17,000/hour with multiple plans 3,500/hour with a single plan
Published events	200,000
Subscriptions	3,000
ABX	Concurrent simple Action Runs: 2400 Concurrent complex Flows: 150
Maximum number of Pipelines	2400
Pipeline execution Includes Jenkins, REST, and SSH	50,000 execution with 200 pipeline concurrency 5 stages/pipeline, 10 tasks/stage

Table 4-2. Single Node Scalability Limits

Component	Single Node Scale
Cloud Accounts Private endpoints: vCenter, NSX-V, and NSX-T	25 (15 Private Endpoints, 10 Public Endpoints)
Compute resources (ESXi Hosts across all vCenters)	200
Cloud Zone (for all endpoints)	100
Data collected machines (includes private and public cloud)	50,000
Maxiumum managed VMs per endpoint	Private endpoint: 5,000 Public endpoint: 2,000
Images collected (AWS has 90,000+ images)	100,000
Image and Flavor Mapping	150
Cloud zones and images per image mapping	100
Cloud zones and flavors per flavor mapping	100
Concurrent deployment requests Private cloud including NSX resources (With blocking ABX on-prem actions and vRO workflows)	200/hour; 30/minute

Table 4-2. Single Node Scalability Limits (continued)

Component	Single Node Scale
Concurrent deployment requests Public cloud (With blocking AWS action)	1000/hour; 200/minute
Concurrent Day 2 actions on deployments (Private Cloud)	100/hour; 10/minute
Concurrent Day 2 actions on deployments (Public Cloud)	500/hour; 50/min
Max VMs per blueprint	100
Blueprints	4000
Catalog	Catalog items (Blueprints: 5000, CFT: 500) Content sources: 500
Projects	2000
Users per project	500
Projects per user	200
Workload placement through vROPs	200 deployments/hour, per endpoint
Bulk-Imported machines using Workload Onboarding	7,000/hour with multiple plans 1,500/hour with a single plan
Published events	70,000
Subscriptions	1,000
ABX	Concurrent simple Action Runs: 800 Concurrent complex Flows: 50
Maximum number of Pipelines	1300
Pipeline execution Includes Jenkins, REST, and SSH	10,000 executions with 150 pipeline concurrency 5 stages/pipeline, 10 tasks/stage

Network and Port Communication

5

This chapter includes the following topics:

- Network Requirements
- Port Requirements

Network Requirements

Use these network requirements with your vRealize Automation 8.0 components.

All vRealize Automation 8.0 components must be deployed layer 2 adjacent. vRealize Automation 8.0 cannot be deployed with an IP address or access external services with IP addresses in these ranges.Reserve these network ranges for intra-service communication:

- 10.244.0.0/22
- 10.244.4.0/22

Port Requirements

The inbound and outbound ports for VMware components with vRealize Automation 8 are outlined in the Port Requirements table.

To view all vRealize Automation ports in a single dashboard, refer to the Ports and Protocols tool.

Table 5-1. Port Requirements

Component	Inbound Ports	Outbound Ports
VMware Identity Manager Load Balanced VIP	User - HTTPS 443 vRealize Automation Appliance - HTTPS 443 vRealize Lifecycle Manager Appliance - HTTPS 443	VMware Identity Manager - HTTPS 443
vRealize Automation Appliance Load Balanced VIP	User - HTTPS 443	vRealize Automation - HTTPS 443 - Health Monitor 8008

Table 5-1. Port Requirements (continued)

Component	Inbound Ports	Outbound Ports
VMware Identity Manager Appliance	User ■ *HTTPS 443 VMware Identity Manager Load Balanced VIP ■ HTTPS 443 vRealize Automation Appliance ■ *HTTPS 443 vRealize Lifecycle Manager Appliance ■ *HTTPS 443 Identity Manager Appliance ■ **	VMware Identity Manager Load Balancer ■ **HTTPS 443
vRealize Lifecycle Manager Appliance	User ■ HTTPS 443	VMware Identity Manager Load Balanced VIP ■ HTTPS 443 vRealize Automation Appliance Load Balanced VIP ■ HTTPS 443 VMware Identity Manager Appliance ■ SSH 22 ■ HTTPS 443 vRealize Automation Appliance ■ SSH 22 ■ HTTPS 443
vRealize Automation Appliance	User ■ *HTTPS 443 vRealize Automation Appliance Load Balancer VIP ■ HTTPS 443 ■ Health Monitor 8008 vRealize Lifecycle Manager Appliance ■ SSH 22 ■ HTTPS 443 vRealize Automation Appliance ■ **10250 ■ **6443 ■ **UDP 8285 ■ **2379 ■ **2380 ■ **UDP 500 ■ **UDP 4500	VMware Identity Manager Appliance ■ *HTTPS 443 VMware Identity Manager Load Balanced VIP ■ HTTPS 443 vRealize Automation Appliance ■ **10250 ■ **6443 ■ **UDP 8285 ■ **2379 ■ **2380 ■ **UDP 500 ■ **UDP 4500

* Direct access only. Required only in deployments that are not load balanced.

** Intra-cluster communication.

Deployment Configurations

6

The components and communication ports in your deployment depend on the deployment's size.

Both large and small deployments require these components:

- Identity Manager Appliance Load Balanced VIP
- vRealize Automation Appliance Load Balanced VIP
- vRealize Lifecycle Manager Appliance

In addition, large deployments also require three vRealize Identity Manager Appliances and three vRealize Automation appliances.

This chapter includes the following topics:

- Small Deployment Configuration
- Large (Clustered) Deployment Configuration

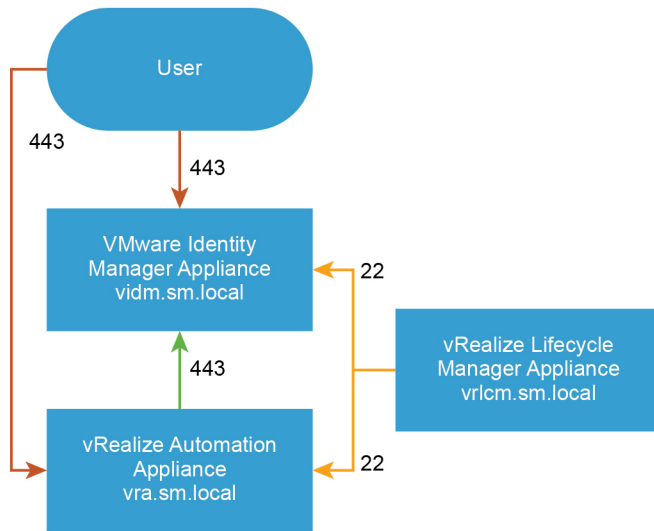## Small Deployment Configuration

Table 6-1. Small Deployment Hostnames

Component	Hostname
vRealize Lifecycle Manager Appliance	vrlcm.sm.local
VMware Identity Manager Appliance	vidm.sm.local
vRealize Automation Appliance	vra.sm.local

Table 6-2. Certificates

Server Role	Common Name or Subject Alt Name
VMware Identity Manager	Common name contains the hostname vidm.sm.local
vRealize Lifecycle Manager	Common name contains the hostname vrlcm.sm.local
vRealize Automation	Common name contains the hostname vra.sm.local

Large (Clustered) Deployment Configuration

Large (clustered) deployments include several component types and communication ports.

Large (clustered) deployments are comprised of these components:

- Identity Manager Appliance Load Balanced VIP

- vRealize Automation Appliance Load Balanced VIP

- vRealize Lifecycle Manager Appliance

- VMware Identity Manager Appliance x3

- vRealize Automation Appliance x3

Table 6-3. Large Deployment Hostnames

Components	Hostname
Identity Manager Appliance Load Balanced VIP	vidmlb.lg.local
vRealize Automation Appliance Load Balanced VIP	vralb.lg.local
vRealize Lifecycle Manager Appliance	vrlcm.lg.local
VMware Identity Manager Appliance	■ vidm1.lg.local ■ vidm2.lg.local ■ vidm3.lg.local
vRealize Automation Appliance	■ vra1.lg.local ■ vra2.lg.local ■ vra3.lg.local

Table 6-4. Certificates

Server Role	Common Name or Subject Alt Name
VMware Identity Manager Appliance	Subject Alt name contains the hostnames: ■ vidmlb.lg.local ■ vidm1.lg.local ■ vidm2.lg.local ■ vidm3.lg.local
vRealize Lifecycle Manager	Common name contains the hostname vrlcm.lg.local
vRealize Automation	Subject Alt name contains the hostnames: ■ vralb.lg.local ■ vra1.lg.local ■ vra2.lg.local ■ vra3.lg.local

The diagram outlines the communication ports between large deployment components.