

VMware Certified Implementation Expert 6 – Cloud Management and Automation Deploy Exam

Exam Preparation Guide

Exam Code: 3V0-633

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Disclaimer:

This preparation guide is intended to provide information about the objectives covered by this exam, as well as related resources. The material contained within this guide is not intended to guarantee that a passing score will be achieved on the exam. VMware recommends that a candidate thoroughly understands the objectives indicated in this guide and utilizes the resources recommended in this guide where needed to gain that understanding.

Exam Preparation Guide Authors:

Joshua Andrews

Dave Davis

Exam Preparation Guide Contributors:

Andrew Ellwood

Brian Watrous

Joe Sarabia

Colin Marks

Jonathan Loux

Brett Guarino

Carl Paterik

Chris McCain

David Johnston

John Davis

Frank Buechsel

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1. The Exam

1.1 Purpose of Exam

The VMware Certified Implementation Expert 6 – Cloud Management and Automation Deployment Exam (3V0-633) tests candidates on their skills and abilities in implementation of a vRealize Automation solution, including deployment, administration of users and groups, maintenance, application design, external integration, task analysis, operations, security, costing and cloud bursting. Successful candidates demonstrate mastery of these skills and abilities.

1.2 Intended Audience

A typical candidate for the VCIX6-CMA certification has two years of experience working with VMware Cloud Automation implementations. They are typically infrastructure personnel, who are capable of installing and configuring, managing and troubleshooting a vRealize Automation solution running on vSphere 6.x architecture. The candidate possesses an understanding of basic cloud concepts including public/private/hybrid clouds, multi-tenancy and cloud security. The candidate is capable of using vRealize Automation to automate the deployment of workloads, vRealize Business Standard to establish cost reporting and vRealize Orchestrator to create and manage common workflows.

2. Objectives covered in the VCAP6-CMA Exam

2.1 Introduction

It is recommended that candidates have the knowledge and skills necessary to install, configure and administer a vRealize Automation environment before taking the VCAP6-CMA Exam. While there is no course requirement, VMware recommends that candidates complete the [VMware Cloud Automation: Design and Deploy Fast Track \[V6.0\]](#) course. It is recommended that the candidate utilize this course and/or other materials where needed to provide background information on the objectives in the exam.

2.2 Objectives

Prior to taking this exam, candidates should understand each of the following objectives. Each objective is listed below; along with related tools the candidate should have experience with, and related documentation that contains information relevant to the objective. All objectives may also be referenced in other product documentation not specifically highlighted below. The candidate should be familiar with all relevant product documentation or have an equivalent skillset.

Section 1 – Deploy and Manage vRealize Automation Components

Objective 1.1 – Deploy and Manage a vRA Appliance and IaaS Server as single nodes

Knowledge

- Acquire IaaS installation media from the virtual appliance
- Perform initial configuration of appliance and IaaS
 - Configure NTP server for vRealize Appliances
 - Assign appropriate IP address to vRealize Appliance
- Enable Microsoft Distributed Transaction Coordinator (MSDTC) to communicate between all servers in deployment.
- Configure Windows Firewall to allow vRA components to communicate Tools

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation System Administration](#)
- [vRealize Automation \(Reference Architecture\)](#)
- [IaaS - Configuration for Virtual Platforms](#)
- vRealize Identity Appliance Management Web Console
- vRealize Automation Management Web Console
- vRealize Automation Web Console
- vRealize Automation IaaS Installation Webpage

Objective 1.2 - Deploy and Manage vRA Appliances and IaaS Servers in a Distributed Configuration

Knowledge

- Deploy vRA Appliances in a distributed / highly available configuration
- Deploy virtual appliance in segregated role configuration(s)
- Acquire IaaS installation media from the virtual appliance
- Configure IaaS in segregated role configuration(s)
- Perform initial configuration of vRealize Appliances and IaaS Servers
- Enable Microsoft Distributed Transaction Coordinator (MSDTC) to communicate between all servers in deployment.
- Configure Windows Firewall to allow vRA components to communicate

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation System Administration](#)

- [vRealize Automation Load Balancing](#)
- [vRealize Automation \(Reference Architecture\)](#)
- [IaaS - Configuration for Virtual Platforms](#)
- [Configuring appliance database server for replication in VMware vRealize Automation](#)
- vRealize Identity Appliance Management Web Console
- vRealize Automation Management Web Console
- vRealize Automation Web Console
- vRealize Automation IaaS Installation Web Page

Objective 1.3 – Deploy and Manage vRealize Automation Center Infrastructure Components

Knowledge

- Implement DNS requirements for load balancer integration according to a deployment plan
- Install certificates on each relevant vRA component in standard and distributed model
- Configure SSO Identity Source for use with vRealize Automation
- Configure components using FQDN via CNAME definitions before load balancer is available
- Configure SMTP notifications

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation System Administration](#)
- [vRealize Automation \(Reference Architecture\)](#)
- vSphere Client and Web Client
- vRealize Automation Web Console

Objective 1.4: Configure Infrastructure/Cloud-based Endpoints

Knowledge

- Create credentials with vRealize roles assigned according to a deployment plan
- Manage credentials for endpoints according to a deployment plan
- Edit Data Collection intervals for specific resources
- Configure endpoint parameters (credentials, hostname, etc...) for infrastructure and cloud endpoints

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation System Administration](#)
- [vRealize Automation \(Reference Architecture\)](#)
- [IaaS - Configuration for Virtual Platforms](#)

- [IaaS Configuration for Cloud Platforms](#)
- [IaaS Configuration for Physical Machines](#)

Objective 1.5: Create fabric groups utilizing reservations and reservation policies

Knowledge

- Configure fabric group(s) for specific tenants
- Allocate resources to a fabric group
- Assign users the necessary permissions to provision reservations
- Configure reservations for Business Groups
- Configure reservation policies for all resource types

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation System Administration](#)
- [IaaS Configuration for Cloud Platforms](#)
- [IaaS Configuration for vCloud Air and vCloud Director](#)
- vRealize Automation Web Console

Section 2 – Configure Tenant Properties

Objective 2.1 – Configure Tenant Properties

Knowledge

- Configure the default Tenant
- Create Tenants according to a deployment plan
- Configure an Identity Store for a Tenant
- Create Tenant Roles to meet deployment requirements
- Configure the branding for the default tenant
- Configure the branding for a non-default tenant
- Set Approval Policies for different departments

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation System Administration](#)
- [vRealize Automation Tenant Administration](#)
- vRealize Automation Web Console

Objective 2.2 – Create/Modify a Business Group

Knowledge

- Determine the use cases for business groups versus tenants
- Apply the three roles defined in a business group (Admin, support, user)
- Create a new business group
- Modify an existing business group

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation System Administration](#)
- [vRealize Automation Tenant Administration](#)
- vRealize Automation Web Console

Section 3 – Configure Network and Security Automation

Objective 3.1 – Configure and Manage NSX Integration with vRealize Automation

Knowledge

- Implement machine blueprints that use:
 - External network profiles
 - Routed network profiles
 - NAT network profiles
 - Private network profiles
- Deploy applications using a pre-configured networking model
- Deploy applications using a fully automated networking model
- Configure static and dynamic routing
- Deploy an application that uses an automatically provisioned load balancer
- Apply a security policy to elements of a multi-machine blueprint
- Automate the application of a security policy to new machines provisioned from a blueprint

Tools

- [VMware NSX and vRealize Automation](#)
- [IaaS Integration for Multi-Machine Services](#)
- [vCAC and NSX – Dynamically Configure Application Specific Network Services](#)
- vSphere Web Client

- vRealize Automation Web Console

Objective 3.3 – Deploy and Manage Certificates and Access Control

Knowledge

- Deploy and Update certificates for multiple vRealize appliances
- Create/add/modify users and groups for specific roles
- Configure user access to Identity Store Groups, Custom Groups, Business Groups, and Entitled Items according to a deployment plan
- Assign a user to specific Custom Groups and Business Groups
- Generate new certificate requests
- Replace self-signed certificates with signed certificates
- Assign new administrative users to different Business Groups
- Create custom groups that grant users/groups multiple roles

Tools

- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation System Administration](#)
- [vRealize Automation Tenant Administration](#)
- [IaaS Integration for Multi-Machine Services](#)
- [Organizing for the Cloud](#)
- vRealize Automation Web Console

Section 4 – Create and Manage Machine Blueprints

Objective 4.1: Create and Configure vRealize Automation Machine Blueprints

Knowledge

- Create and Configure Machine Blueprints according to a deployment plan:
 - Assign reservation policy
 - Define instance types
 - Define build profiles/custom properties
 - Create machine prefixes
 - Create multi-machine blueprints
 - Create lease policies
 - Create machine resource allocations (min/max)
 - Define actions
 - Create shared blueprints
 - Create master blueprints

Tools

- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation System Administration](#)
- [Tenant Administration](#)
- [Cloud Properties Reference](#)
- vRealize Automation Web Console

Objective 4.2: Publish a Machin Blueprint to a Service Catalog

Knowledge

- Publish Machine blueprints
- Add/Remove catalog items to/from a service
- Create/Configure an approval policy
- Create an entitlement
- Manage entitlements for specific users or groups
 - Entitle a user to a service
 - Entitle a user to a catalog item
 - Entitle a user to a resource action
- Prioritize entitlements according to a deployment plan
- Attach approval policy for specific entitled catalog items

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Tenant Administration](#)
- [IaaS - Configuration for Virtual Platforms](#)
- [IaaS Configuration for Cloud Platforms](#)
- [IaaS Configuration for Physical Machines](#)
- vRealize Automation Web Console

Objective 4.3: Manage custom properties and build profiles

- Add / edit Custom Properties to add new attributes or override default attributes
- Create a Build Profile according to Custom Properties from a deployment plan
- Use Property Dictionary to define new Custom Properties

Tools

- [IaaS - Configuration for Virtual Platforms](#)
- [Custom Properties Reference](#)
- vRealize Automation Web Console

Objective 4.4: Import existing workloads

Knowledge

- Set Global Properties according to a deployment plan
- Locate log files for the appropriate user
- Generate a log support bundle for all vRealize Automation components
- View and export log data for further analysis
- Configure database log file rollover

Tools

- [vRealize Automation System Administration](#)
- [vRealize Automation Installation and Configuration](#)
- vRealize Automation Web Console

Section 5: Deploy and Manage vRealize Orchestrator

Objective 5.1 – Configure vRO for vRA

Knowledge

- Configure vRealize Orchestrator:
 - Install and configure plug-ins
 - Import an SSL certificate
- Add a vRA server and an IaaS server to vRO.
- Enable custom integrations between vRA and vRO.
- Install and configure a vRO plug-in
- Import a SSL certificate in vRO configurator

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Tenant Administration](#)
- [IaaS Integration for Multi-Machine Services](#)
- [vRealize Orchestrator Plug-Ins Documentation Center](#)
- [Installing and Configuring VMware vRealize Orchestrator](#)
- [Using the VMware vRealize Orchestrator Client](#)
- vRealize Orchestrator Appliance Management Web Console
- vRealize Orchestrator Configuration Web Page
- vRealize Automation Management Web Console
- Orchestrator Client

Objective 5.2 – Modify a blueprint to invoke a workflow during a lifecycle change

Knowledge

- Configure vRealize Orchestrator plug-in for vRA
- Associate a vRO workflow with a specific lifecycle state change for a machine blueprint
- Associate a vRO endpoint with a machine blueprint

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Tenant Administration](#)
- [IaaS Integration for Multi-Machine Services](#)
- [vRealize Orchestrator Plug-Ins Documentation Center](#)
- [vRealize Automation Machine Extensibility](#)
- vRealize Automation Web Console
- vRealize Orchestrator Configuration Web Page
- Orchestrator Client

Objective 5.3 – Create/Modify/Execute a vRealize Orchestrator Workflow

Knowledge

- Install/launch/use the vRO client
- Configure variable binding in a vRO workflow
- Perform logging from a vRO workflow
- Add schema elements to a vRO workflow
- Create/modify/troubleshoot actions
- Create/modify/execute vRO workflows
- Run workflow(s) in the vRO HTTP-REST plug-in to invoke a REST operation
- Modify a workflow to display a non-default icon
- Create a configuration element
- Modify a workflow to use to a configuration element

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Tenant Administration](#)
- [IaaS Integration for Multi-Machine Services](#)
- [vRealize Orchestrator Plug-Ins Documentation Center](#)
- [vRealize Automation Machine Extensibility](#)
- vRealize Automation Web Console
- vRealize Orchestrator Configuration Web Page
- Orchestrator Client

Section 6 – Configure and Deploy XaaS Components

Objective 6.1 – Configure Advanced Service Designer

Knowledge

- Determine the appropriate vRO server deployment according to a deployment plan
- Assign the Service Architect role to a user or group
- Configure an external vRO server to run workflows
- Create a vCO endpoint to enable vRA to communicate with an external vRO server
- Configure advanced endpoints in ASD (vCenter, AD, SOAP, REST, PowerShell)

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation Advanced Service Design](#)
- vRealize Automation Web Console

Objective 6.2 – Create and publish a service blueprint

Knowledge

- Configure ASD to enable vRA/vRO communication
- Configure advanced endpoints in ASD to enable communication with AD
- Create and Publish a service blueprint
- Modify fields and field properties for Form Designer form

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation Advanced Service Design](#)
- vRealize Automation Web Console

Objective 6.3 – Create custom resources and actions

Knowledge

- Create a custom resource according to a deployment plan
- Create a service blueprint specifying a provisioned resource
- Design a custom resource form according to a deployment plan
 - Edit a custom resource element
 - Add a custom resource form page
- Add/Edit/Delete a resource action form

- Add/Edit/Delete a custom resource form
- Create and publish a custom action for:
 - o Machine blueprint
 - o Service blueprint

Tools

- [vRealize Automation Foundations and Concepts](#)
- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation Advanced Service Design](#)
- vRealize Automation Web Console

Section 7 - Deploy vRealize Application Services

Objective 7.1 – Deploy and Manage a vRealize Application Services Appliance

Knowledge

- Assign a user the necessary permissions to gain access to Application Services
- Install and set up the Application Services virtual appliance
- Configure Application Services to use a proxy
- Register a cloud provider with Application Services
- Map a cloud template to a logical template
- Map Application Services to a vRA reservation policy

Tools

- [vRealize Automation Using Application Services](#)
- [vRealize Automation Using Application Services Library Services](#)
- [vRealize Automation Application Services Troubleshooting](#)
- vRealize Automation Web Console
- SSH console access to vRealize Automation Application Services

Objective 7.2 - Create and Publish an Application Blueprint

Knowledge

- Create an Application according to a deployment plan
- Add Application Versioning
- Model and Configure an Application Blueprint
- Delete an Application Version
- Configure an Application blueprint according to a deployment plan
- Create an Advanced Blueprint with Application Services
- Create an Artifact Repository specification
- Create/Map an Artifact specification

- Deploy an Application with Artifacts
- Publish and Entitle an Application to the vRealize Automation Service Catalog

Tools

- [vRealize Automation Using Application Services](#)
- [vRealize Automation Using Application Services Library Services](#)
- [vRealize Automation Application Services Troubleshooting](#)
- vRealize Automation Web Console

Section 8 - Deploy vRealize Business Standard

Objective 8.1 – Deploy and Manage a vRealize Business Standard Appliance

Knowledge

- Deploy vRealize Business Standard appliance
- Integrate vRealize Business Standard with vRealize Automation:
 - Add vRealize Automation Hostname
 - Configure SSO Default Tenant
 - Configure SSO Admin User
 - Configure SSO Admin Password
 - Set Time Sync Mode
- Create a tenant in vRealize Automation that leverages vRealize Business Standard:
 - Specify an Identity Source
 - Specify a tenant admin
- Assign vRealize Business roles:
 - Business Management Administrator
 - Business Management Read only
 - Business Management Controller
- Add one or more virtual environments to vRealize Business Standard
- Add one or more vCenter Server instances to vRealize Business Standard
- Update the Reference Database

Tools

- [vRealize Business Standard Installation and Administration Guide](#)
- [vRealize Business Standard User's Guide](#)
- [Managing the Business of IT in the Cloud Era](#)
- [Real IT Transformation Requires a Real IT Service Costing Process](#)
- vRealize Automation Web Console
- vRealize Business Standard Management Web Console

Objective 8.2 - Configure vRealize Business Standard

Knowledge

- Configure cost drivers according to a deployment plan:
 - Assign cost for operating system licensing
 - Edit cost for server hardware, storage, and network
 - Create a monthly cost for facilities and maintenance
- Configure CPU and memory utilization costs
- Configure Consumption Analysis:
 - Edit consumer hierarchy
 - Edit price value according to a deployment plan
 - Edit/Import budget to estimate your cost
- Generate vRealize Business vCenter Server report
- Generate a vRealize Automation Report
- Select and export the appropriate report
- Filter and Search for specific reports based on customer requirements

Tools

- [vRealize Business Standard Installation and Administration Guide](#)
- [vRealize Business Standard User's Guide](#)
- [Managing the Business of IT in the Cloud Era](#)
- [Real IT Transformation Requires a Real IT Service Costing Process](#)
- vRealize Automation Web Console

Section 9 - Troubleshoot a vRealize Automation Deployment

Objective 9.1 - Troubleshoot Catalog Issues

Knowledge

- Resolve catalog entitlement issues for:
 - Services
 - Catalog items
 - Catalog item actions
- Interpret vRealize Automation infrastructure log
- Troubleshoot endpoint system resources
- Troubleshoot reservation capacity for memory and storage
- Troubleshoot individual component blueprints in a multi-machine blueprint

Tools

- [vRealize Automation Tenant Administration](#)
- [vRealize Automation Installation and Configuration](#)

- [vRealize Automation System Administration](#)
- vRealize Automation Web Console

Objective 9.2 – Configure, Manage and Collect vRA and Application Services Logs

Knowledge

- Collect logs for vRealize Application Services
- Enable and configure global properties to control how vRA retains legacy data
- Retrieve Logs from the user interface
- Collect Logs from the Application Services Appliance
- Generate a log support bundle for all vRealize Automation components
- Export log data
- Configure database log file rollover

Tools

- [vRealize Automation Tenant Administration](#)
- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation Application Services Troubleshooting](#)
- [vRealize Automation System Administration](#)
- vRealize Automation Web Console

Objective 9.3 – Troubleshoot Approval Policy Issues

Knowledge

- Troubleshoot vRealize Automation catalog item approval policy issues:
 - o Determine use case of Pre-Approval vs Post-Approval
 - o Verify the status of an Approval Policy
- Troubleshoot and assign the correct policy types according to a deployment plan
- Configure approval policy to require approval for specific conditions according to a deployment plan

Tools

- [vRealize Automation Tenant Administration](#)
- [vRealize Automation Installation and Configuration](#)
- vRealize Automation Web Console

Objective 9.4 - Troubleshoot Distributed Execution Manager Issues

Knowledge

- Interpret the distributed execution manager (DEM) status log
- Determine and resolve cause for failed install of WAPI and DEMs
- Determine the status for IaaS components
- Filter the workflow history for a specific workflow
- Export vRA log to include a particular severity level
- Export vRA audit log

Tools

- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation System Administration](#)
- vRealize Automation Web Console

Objective 9.5 - Troubleshoot Endpoint Issues

Knowledge

- Interpret vRA log files to determine issue with a specific endpoint
- Resolve connection issue between vRA and vRO
- Enable network and security platform for vCenter endpoint
- Edit endpoint credentials associated with a specific endpoint

Tools

- [vRealize Automation Tenant Administration](#)
- [vRealize Automation Installation and Configuration](#)
- [vRealize Automation System Administration](#)
- vRealize Automation Web Console

Objective 9.6 - Troubleshoot vRealize Orchestrator Workflow Issues

Knowledge

- Interpret vRealize Orchestrator log files
- Troubleshoot and edit existing vRO workflows for functionality
- Troubleshoot variable binding issues with vRealize Orchestrator workflows
- Determine root cause of an exception message

Tools

- [vRealize Automation Application Services Troubleshooting](#)
- [Installing and Configuring VMware vRealize Orchestrator](#)
- vRealize Automation Web Console
- vRealize Orchestrator Configuration Web Page
- Orchestrator Client

3. Additional Resources

3.1 VCAP/VCIX Community

VMware provides an online community for VCAP/VCIX candidates. This community contains valuable information from other candidates and senior VCAPs/VCIXs, and is moderated by VMware certification staff. The community is located at: <http://communities.vmware.com/community/vmtn/certedu/certification/vcix>

3.2 Test Driving a VMware vRealize environment

VMware provides Hands-on Labs for Cloud Management and Automation. These labs provide an environment where you can work with the products covered in this exam. The labs can be accessed by going here: <http://www.vmware.com/go/try-vrac-hol>

Version	Change Notes	Date
1.0	Initial Prep Guide Creation	10/15/2015
1.1	Added cognitive complexity information	10/17/2015
1.2	Added Exam Dev Activity and SME Involvement	10/23/2015
1.3	Renamed to VCAP6-CMA	12/1/15
1.4	Added designation	12/4/15
1.5	Add additional documentation links	6/5/2016