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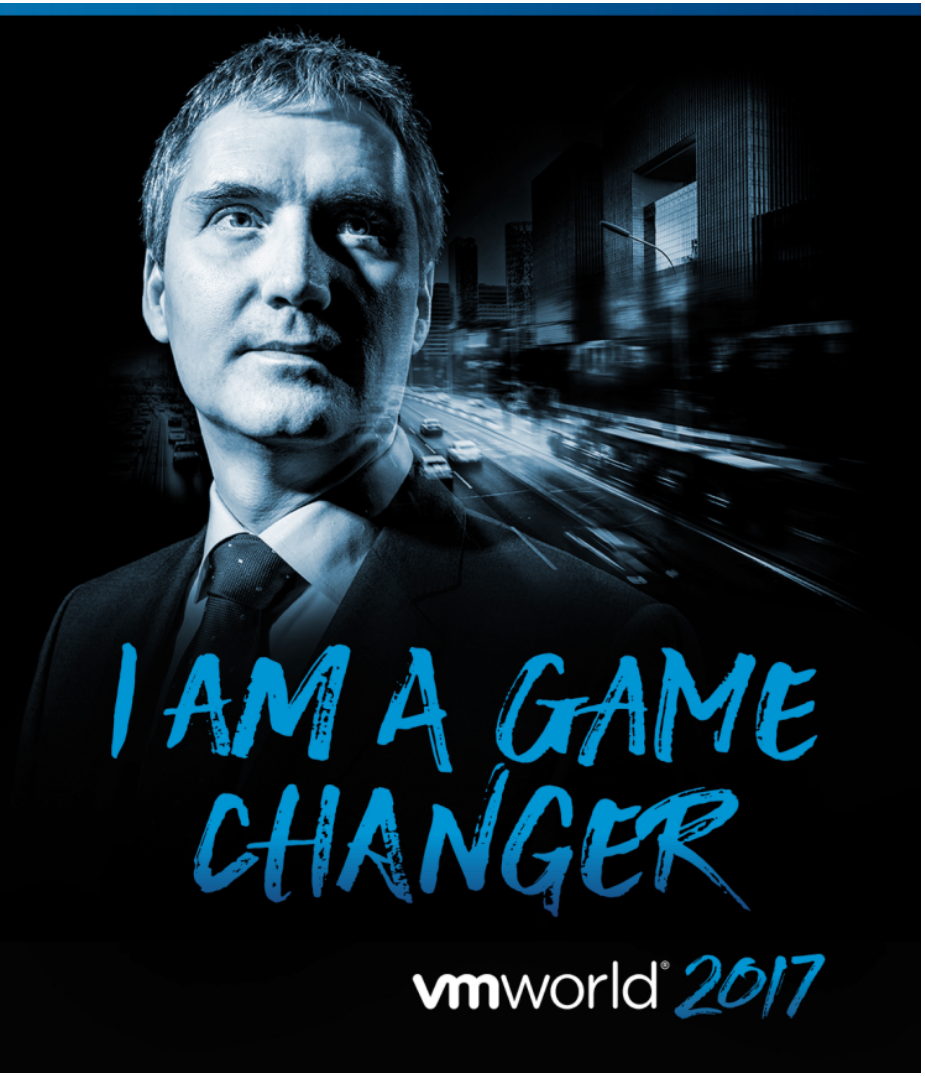
Automating Disaster Recovery with vCloud Availability for vCloud Director and vRealize Orchestrator



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Disclaimer

- This presentation may contain product features that are currently under development.
- This overview of new technology represents no commitment from VMware to deliver these features in any generally available product.
- Features are subject to change, and must not be included in contracts, purchase orders, or sales agreements of any kind.
- Technical feasibility and market demand will affect final delivery.
- Pricing and packaging for any new technologies or features discussed or presented have not been determined.

VMware Cloud Provider Name Change

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vCloud Air™ Network

Is Now

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CLOUD PROVIDER™
PROGRAM

Agenda Slide

1	vCloud Availability and Orchestrator Overview
2	Configuring Orchestrator for vCloud Availability
3	Automating vCloud Availability

Unplanned outages happen

- You need an plan
- A plan with as MUCH AUTOMATION as possible
- Implement DR automation using vCloud Availability & vRealize Orchestrator

Agenda

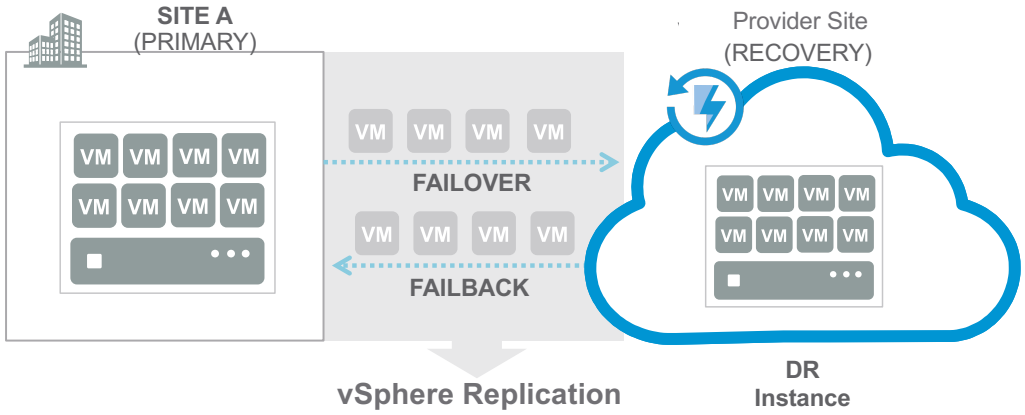
1	vCloud Availability and Orchestrator Overviews
2	Configuring Orchestrator for vCloud Availability
3	Automating vCloud Availability

vCloud Availability for vCloud Director

What is it?

Simple and secure asynchronous replication and failover for vSphere

- Warm standby capacity on:
  - VMware Cloud Service Provider
  - vCloud Director add on Service for DR
- Self-service protection, failover and failback workflows per VM
- A multi-tenant implementation of vSphere replication on vCloud Director
- 15 min[1] – 24 hr. recovery point objective (RPO)
- Initial data seeding by shipping a disk



[1]Dependent on available bandwidth

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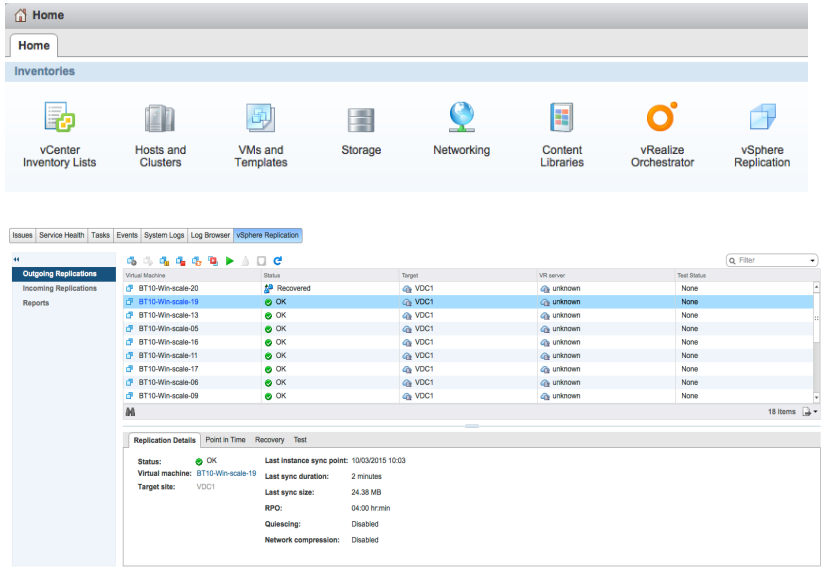
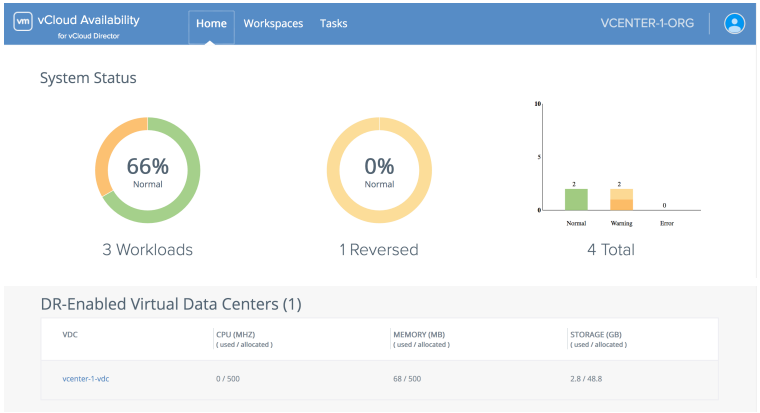
On Premises and Cloud Web Interfaces

- On premises:
  Managed through vCenter Web Client



- In the Cloud:
  Managed using vCloud Availability Portal



DR Automation Feature Comparison

Vcloud Availability natively delivers a subset of SRM features.

Feature	SRM	vCloud Availability
Async Host Based Replication	Yes	Yes
Multi-Tenant	No	Yes
On demand Failover Tests	Yes	Yes
Protect Single Virtual Machines	Yes	Yes
Protect Group of Virtual Machines	Yes	***No** *
Ordered Recovery	Yes	***No** *
Set IP on Recovered VMs	Yes	***No** *

* Possible with vRealize Orchestrator

vRealize Orchestrator can extend and automate vCloud Availability

vRealize Orchestrator can add additional use cases such as:

- Protect and Recover groups of VMs.
- Order VM recovery.
- Initiate DR workflows using REST calls.
- Customize failed over VM network settings.
- Customize the target failover environment.
- Custom workflows you can develop

Orchestrator Overview

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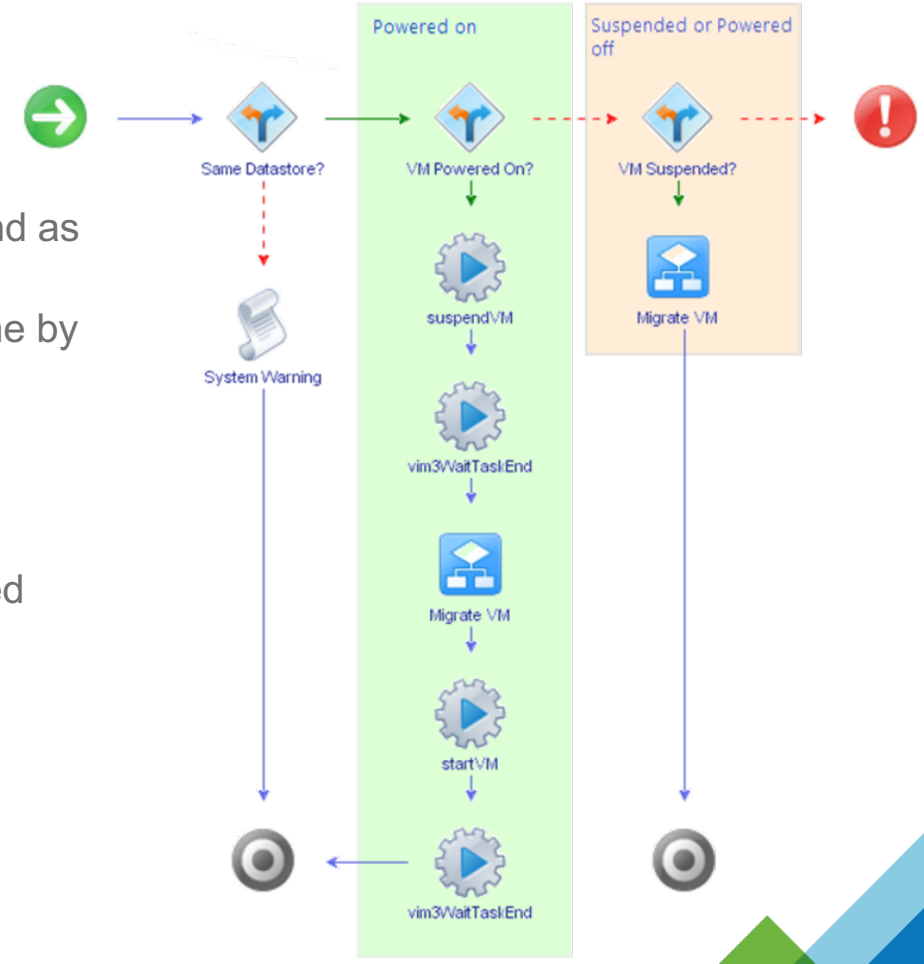
vRealize Orchestrator

Integrate | Automate | Orchestrate

- Included with VMware vRealize Automation and as standalone appliance to enable automation
- Makes IT operations faster and less error-prone by facilitating the automation of IT processes
- Facilitates the development of workflows
- Provides a graphical integrated development environment (IDE)
- Enables workflows to be exported and imported through packages
- Provides a workflow engine
- Offers multiple ways to run workflows



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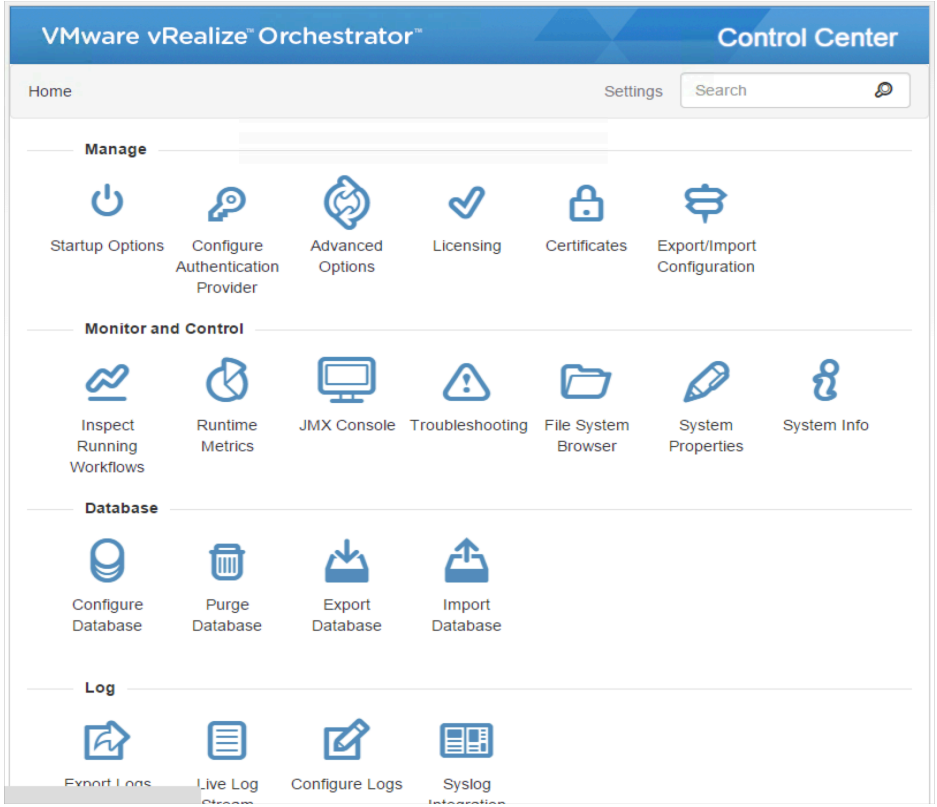
vRO Control Center

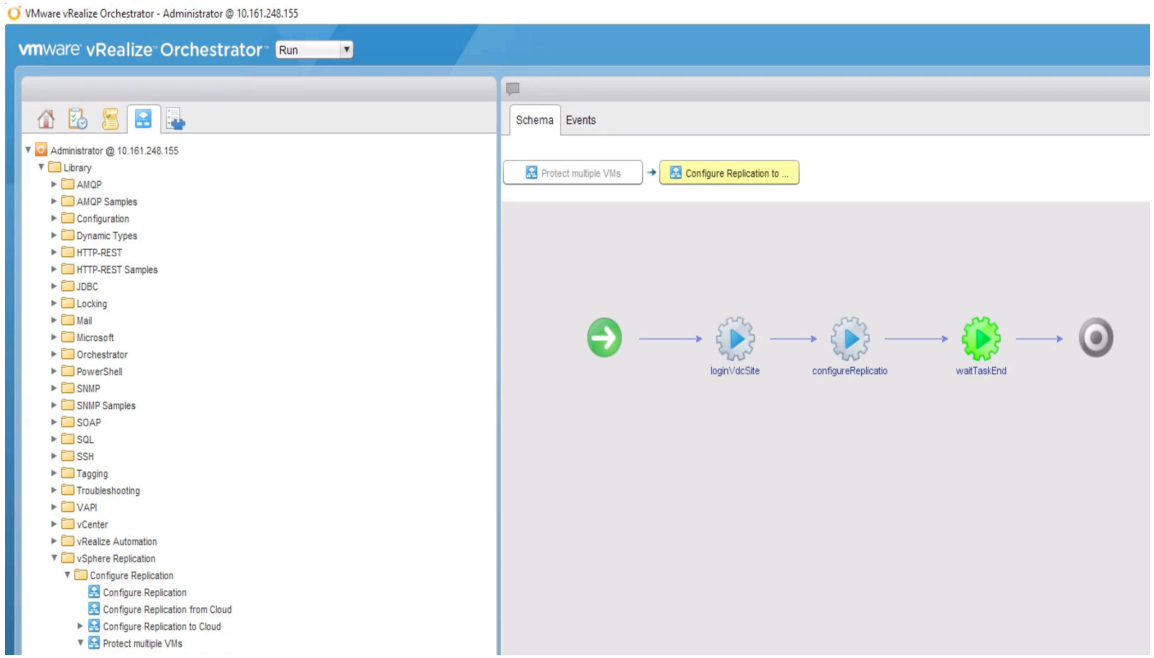


The vRO Control Center

- Centralized Server administration.
  - UI for vRO setup, configuration, workflow monitoring, troubleshooting, and other useful information.
  - Easy cluster configuration.
  - Manage, Import/Export central DB
- Collect metrics for workflow execution
  - Direct correlation of system properties and workflow performance through the embedded JMX console integration.
  - Analyze running workflows
- Easy workflow troubleshooting and runtime metrics.
  - Enhanced log monitoring, log persistency and added ability to export logs for a particular workflow run.

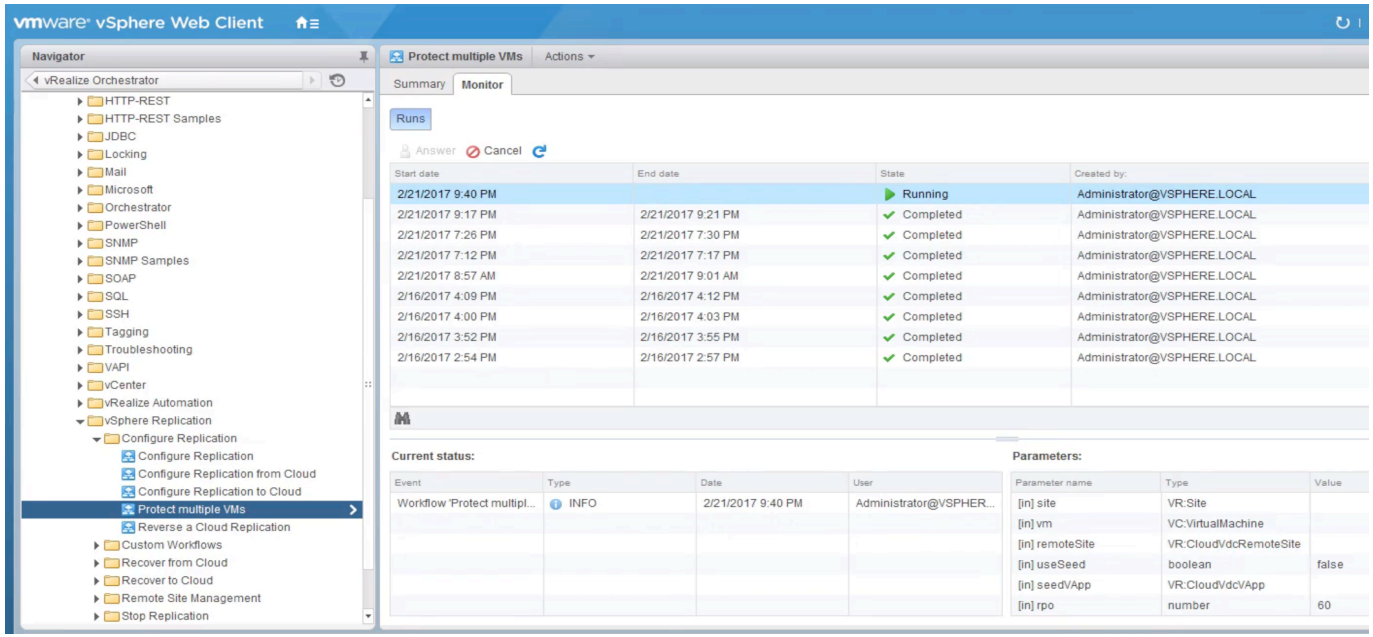
vRO Workflow Designer

- Java Client
- Supports
  - Inventory Management
  - Creation and execution of workflows.



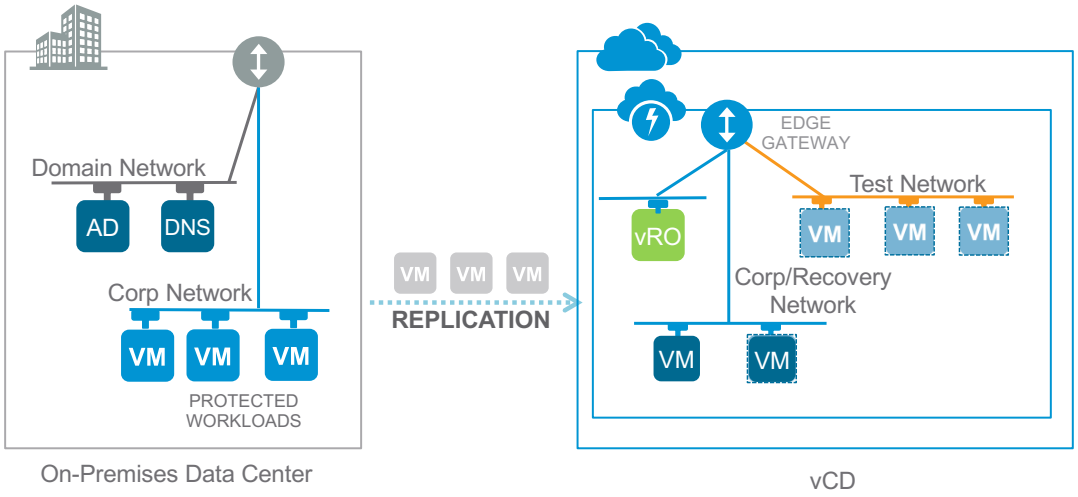
vRO vSphere Web Client Extension

- Add on to vSphere Web Client
- Supports execution of workflows.



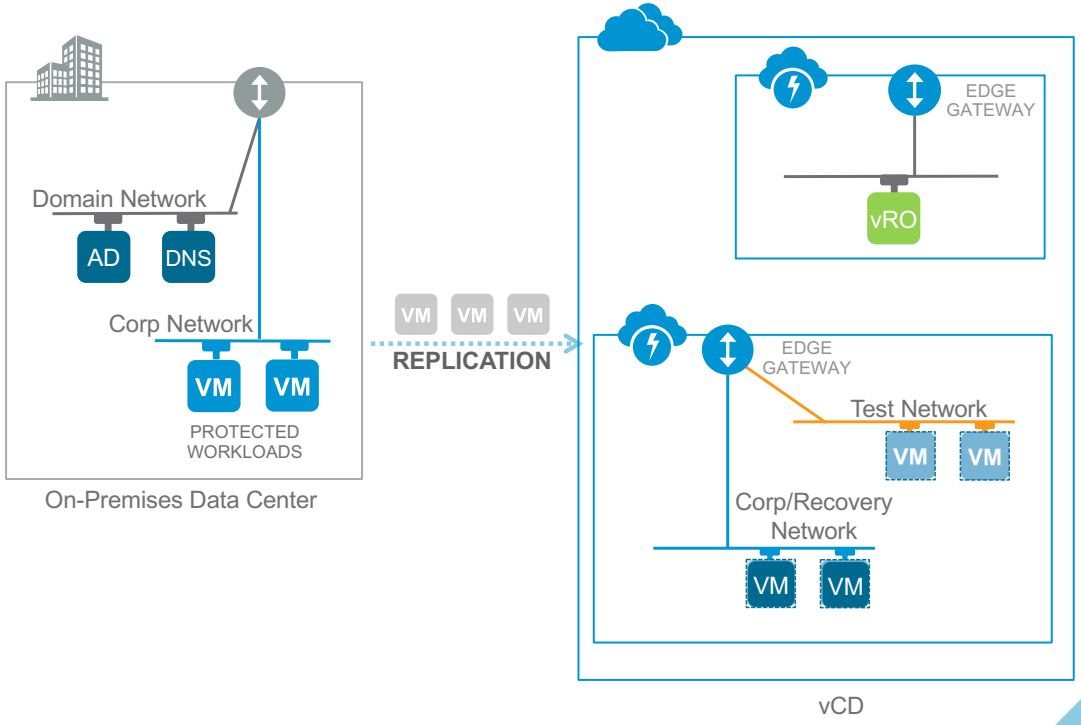
Deployment Options:
Cloud deployment managed by Tenant

- Installed by Tenant in Tenant virtual data center.
- Supports DR automation against both Cloud and On Premises Data Center.
- Authentication against both tenant vCenter and vCloud director Organization



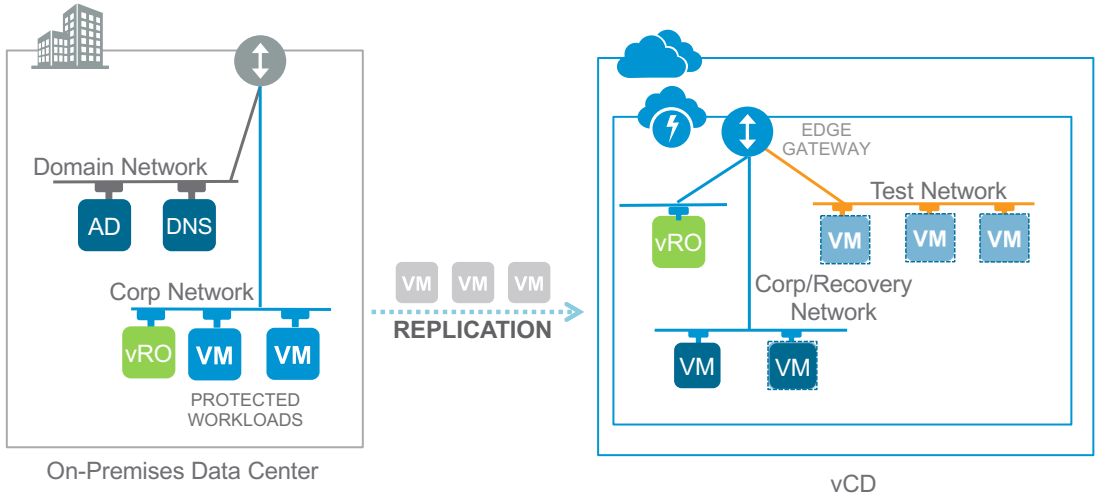
Deployment Options:
Cloud deployment managed by provider

- Installed and managed by Service provider in provider virtual data center.
- Authentication against both tenant vCenter and vCloud director Organization
- Supports DR automation against both Cloud and On Premises Data Center.



Deployment Options: Dual deployment

- Installed in both locations.
- Local orchestrator can be used for DR and general workflows.
- Authentication against both tenant vCenter and vCloud director Organization
- Synchronize workflows using Import / Export or configure as Master Slave



Agenda

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2	Configuring Orchestrator for vCloud Availability
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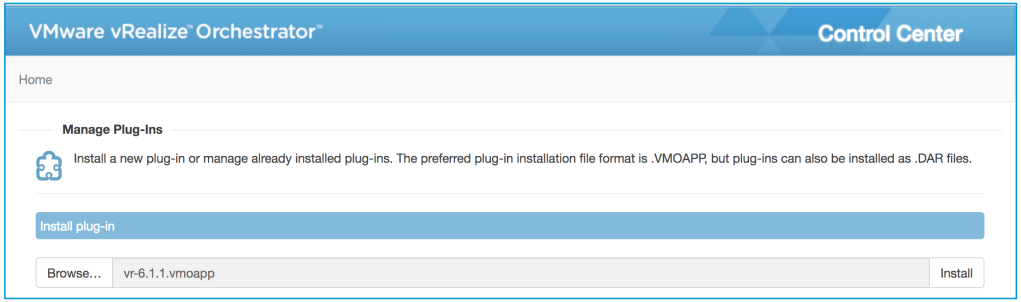
Install required plugins

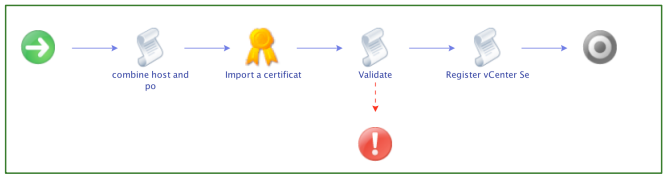
- Workflows use plugins to communicate with external APIs
- One time installation of required vRealize Orchestrator plugins
- Download plugins from https://my.vmware.com
- Install through vRealize Orchestrator control center

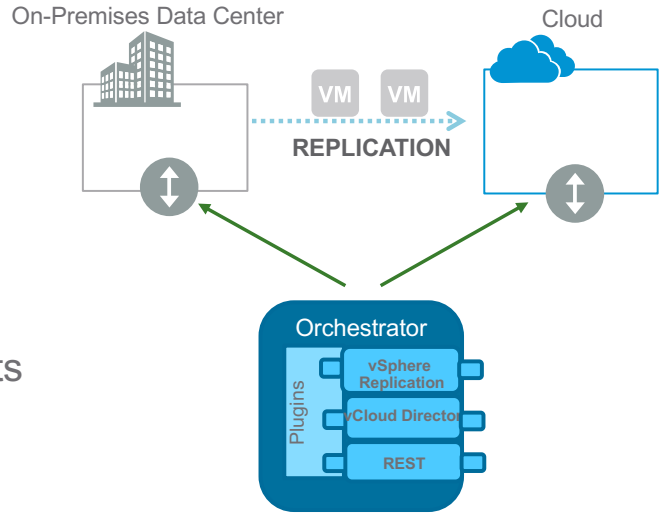


Plugin	Usage with vCAV
vSphere Replication Plugin	Primary plugin used for vCAV DR workflows.
vCloud Director Plugin (Optional)	Used to configure the vCloud Director cloud target environment and Virtual Machines after failover
REST Plugin (Optional)	Used to connect to the vCAV REST API. Provides access to more replication information that vSphere replication plugin.

Orchestrator Workflows

Types of workflows for vCloud Availability





- Configuration workflows add endpoints to Orchestrator Inventory
- Workflows perform automation against inventory endpoints
- Two types of vCAV related workflows:
  - **On-Premises Target workflows**:
    - target the on premises vCenter and
  - **Cloud target workflows**
    - Target vCloud Director
- Many sample workflows included with vSphere Replication Plugin

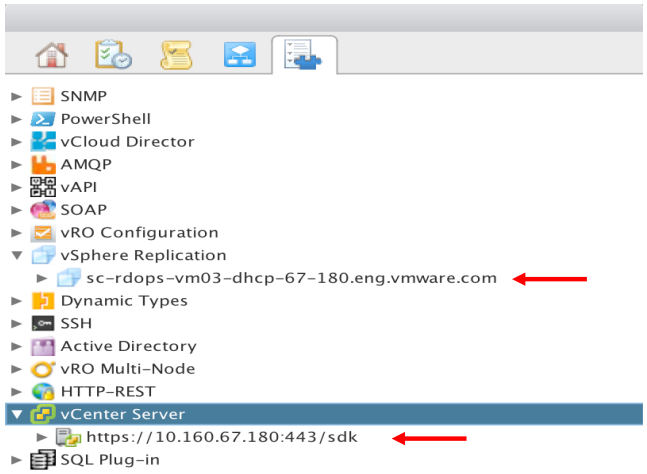
Configuration Workflows

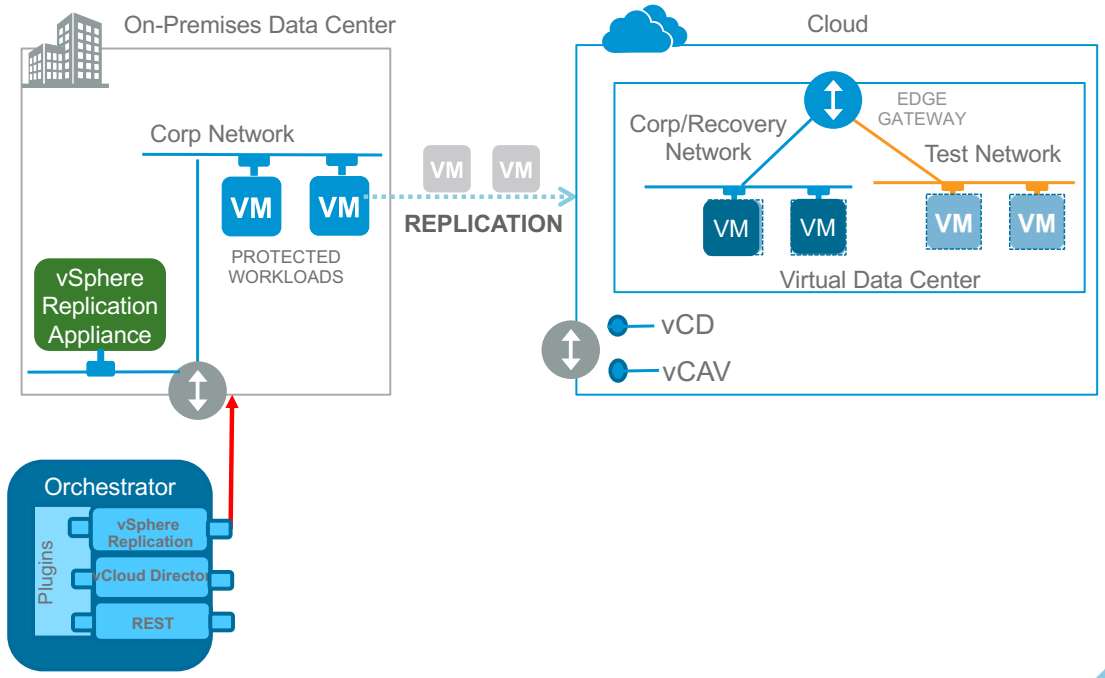
Configuration workflows included with vCenter and vSphere replication plugins.

Add a vCenter Server Instance	Adds an on-premises vCenter to the inventory
Register Standalone Org	Register the URL and credentials for a cloud organization.
Register Cloud Site	Register login credentials for a cloud site that is paired with a local site.
Register vCenter Site	Register login credentials for a vCenter Server site that is paired with a local site.

Initial Configuration: Register vCenter

- Run ‘Add a vCenter’ Workflow
  - Adds vCenter to Orchestrator Inventory
  - Adds vSphere Replication Server registered with vCenter





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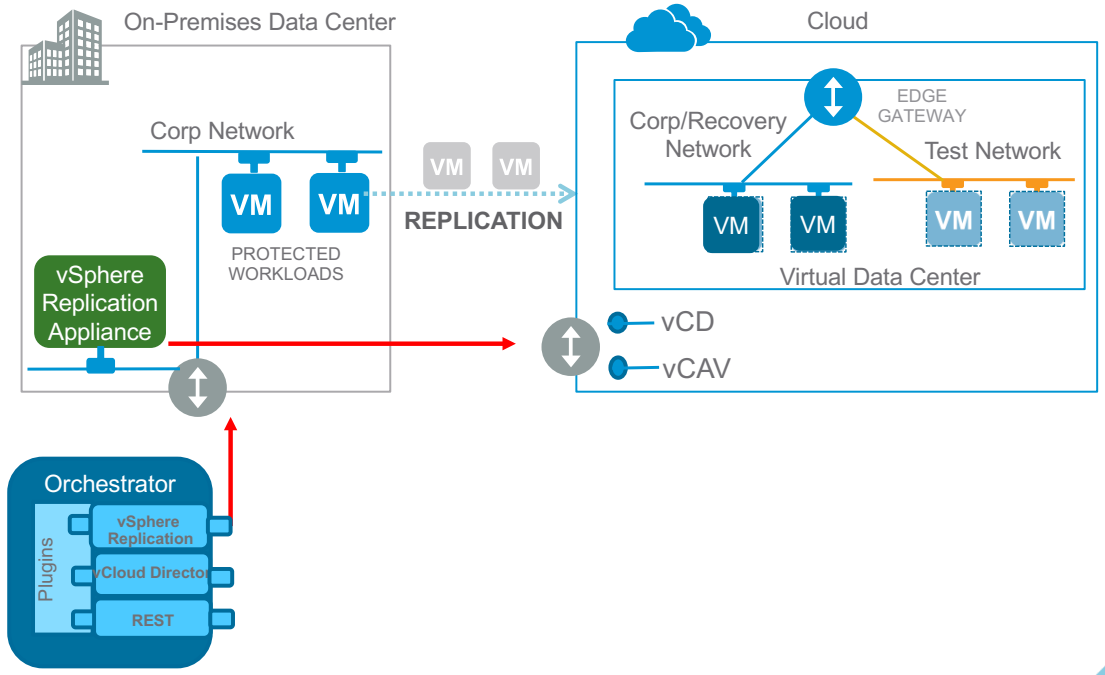
Initial Configuration: Register Cloud Site Credentials

- Register Cloud Site Credentials

  Provides cloud credentials to on-Premises vSphere Replication Appliance.

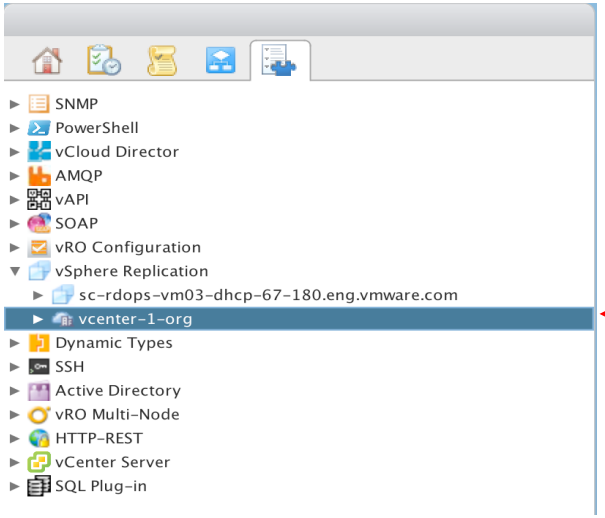
  – Enables vSphere Replication on-Premises to authenticate with vCAV Cloud Service / Replication Service.

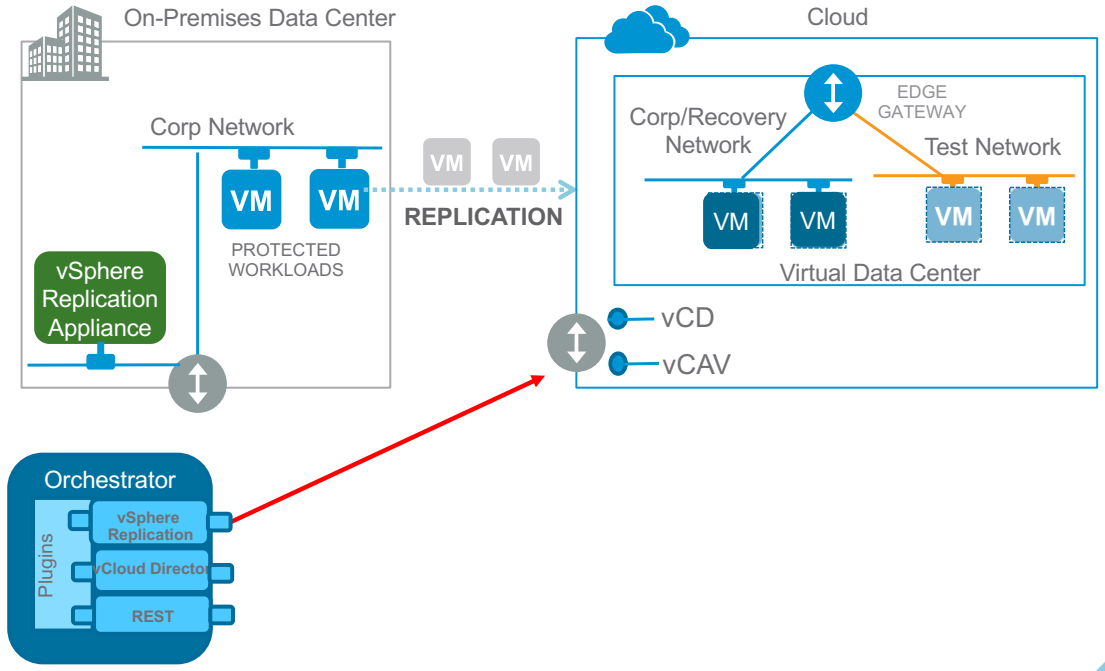
  – Prerequisite: Administrator must first manually define cloud endpoint in on-premises vCenter.



Register Standalone Organization

- Register Standalone Org
  - Adds a vCD Organization in the cloud to the Orchestrator Inventory





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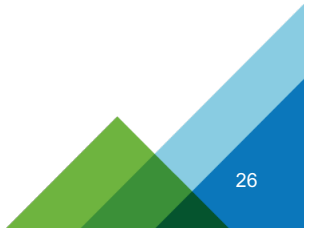
Demo



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Automating vCloud Availability

Using Built-in Workflows

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vSphere Replication Plugin
'Configure Replication' Workflows

Configure Replication from Cloud	Configure a virtual machine for replication from a Cloud site to on-premises site.
Configure Replication to Cloud	Configure a virtual machine replication from On-premises site to a registered Cloud site
Protect Multiple VMs	Configure multiple Virtual Machines for Replication to a cloud site.
Reverse a Cloud Replication	Reverse a replication recovered at the cloud site and start copying data from the cloud site to the local site.

VM Protection Workflow
(vSphere Replication Plugin)

- Workflow included with vSphere Replication Plugin
- Input parameter types
  - **VR:Site**
    (vSphere Replication Server on-premises Site)
  - **VR:CloudVdcRemoteSite**
    (vSphere Replication Server on Cloud Site retrieved / registered with on-premises vSphere replication server)
- Can be a foundation of reuse for other plugins.

Configure Replication to Cloud

vSphere Replication Plugin ‘Recovery to Cloud’ Workflows

Run Planned Migration to Cloud	Migrate a replicated virtual machine to the Cloud.
Run Real Recovery to Cloud *	Recover a replicated virtual machine at the Cloud site.
Run Test Cleanup at the Cloud Site *	Clean up test recovery results for a replication to cloud.
Run Test Cleanup to Cloud	Cleanup test recovery results for a replication to the Cloud.
Run Test Recovery at the Cloud Site *	Run a test recovery for a replication to the Cloud at the cloud site. *
Run Test Recovery to Cloud	Run a test recovery for a replication to the Cloud.

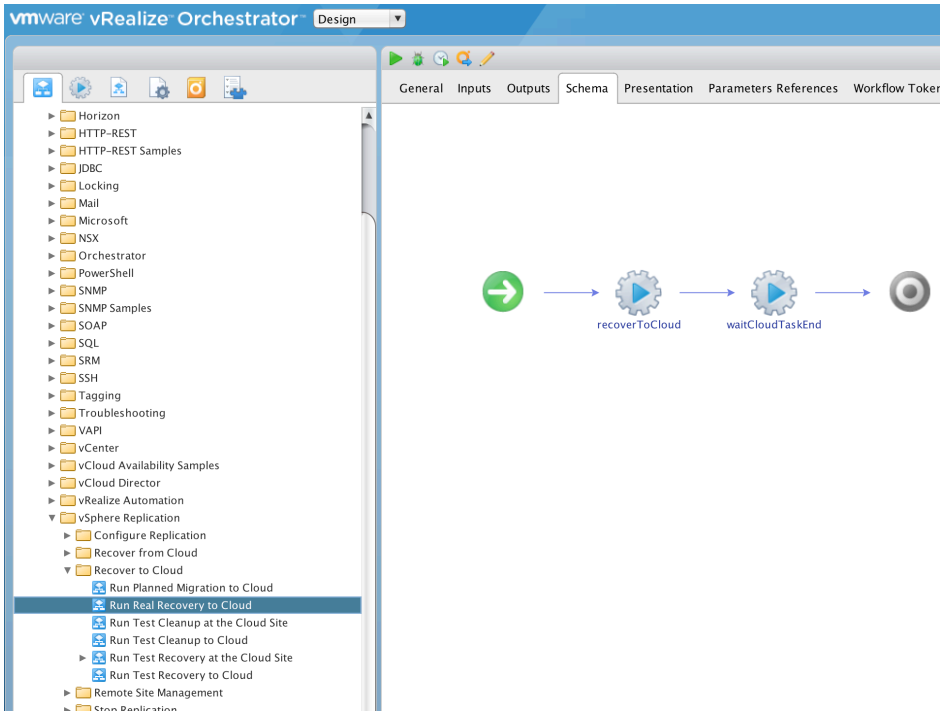
* Workflows target the cloud site and do not require access to an on-premises site.

Run Recovery to Cloud

(vSphere Replication Plugin)

- Failover of protected VM to cloud.
- VM previously replicated / protected.
- Workflow connects to Cloud site, does not require access to on-premises vSphere replication appliance.
- Input Type
  - **VR:VcToCloudTargetGroup**
    (vSphere Replication Server on Cloud Site)

Run Real Recovery to Cloud



Automating vCloud Availability

Custom Automations

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Custom Automation
Protect / Failover Grouped VMs

- Workflow 1: **Create a DR Plan**
  - Creates list of protected VMs at Cloud Site
  - Specify start order by group
  - Saves List in Orchestrator DB

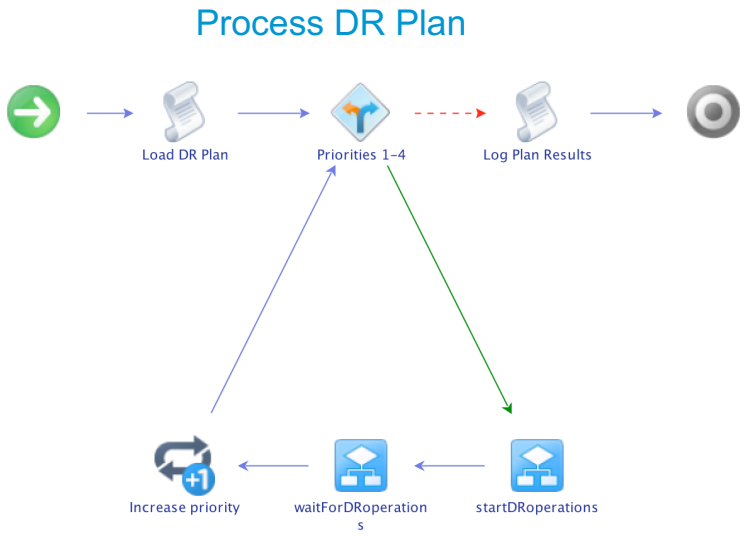
- Workflow 2: **Process DR Plan**
  - Retrieves plan by name
  - Performs specified operation against VMs observing groups and order

Execute from vRO Client or REST Client.

Single REST call to recover groups of VMs

Tenant DC connection not required

REST based, no reliance on vSphere Replication plugn



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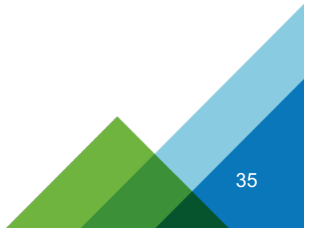
Demo



Post Failover Automation

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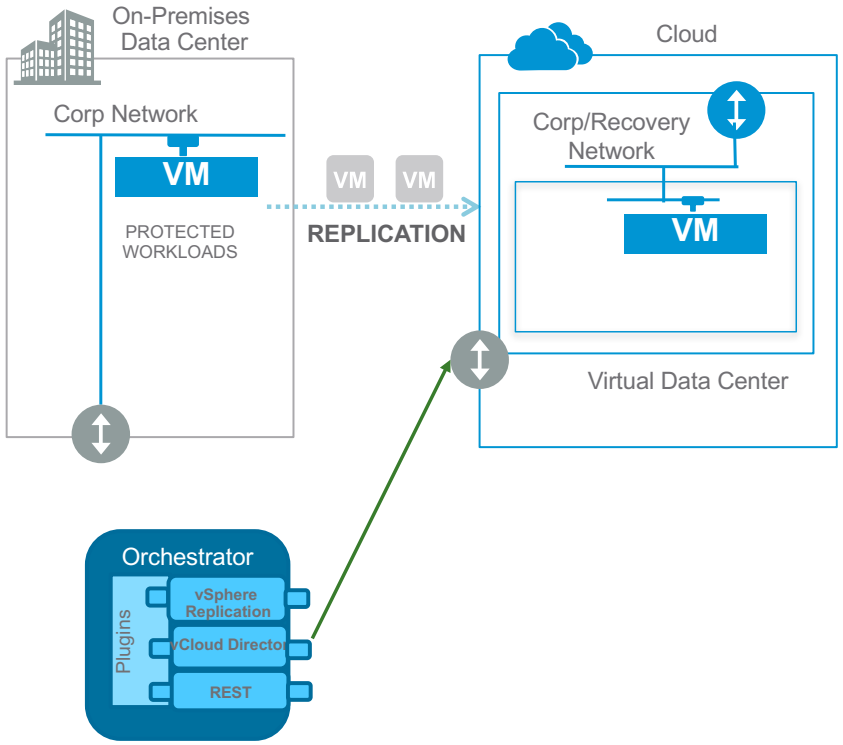
Modify Failover environment
(vCloud Director Plugin)

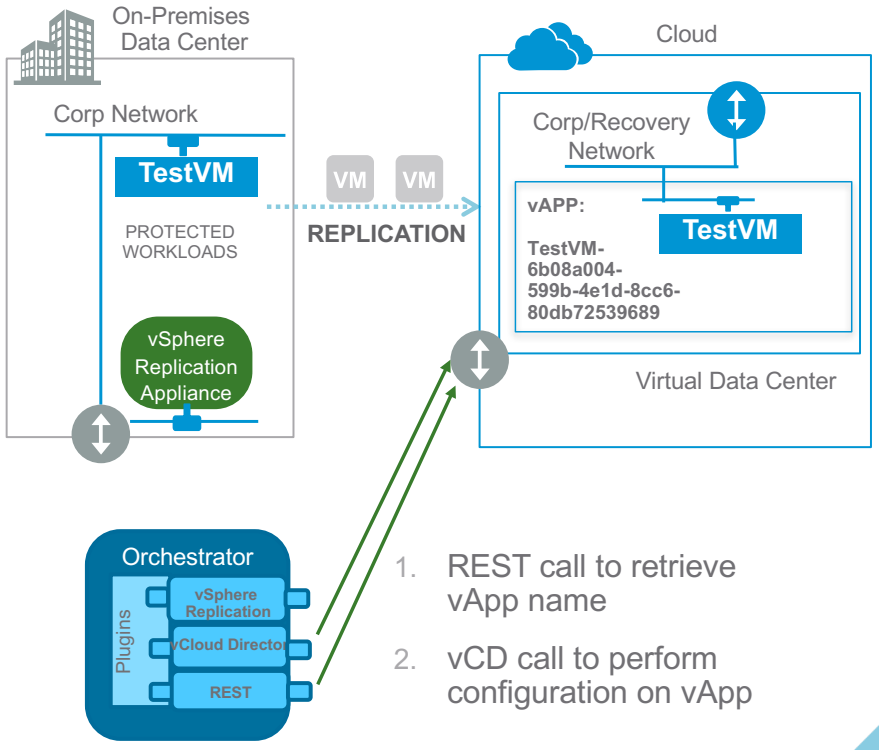
- Workflows can be created to modify the target failover environment.

  For Example
  - Modify Load Balancers
  - Flush DNS Cache
- Workflows can also be created to modify the vCloud director vApp, VM or virtual data center after failover.
- Changes must be made post failover, changes made to the vApp before failover will be overwritten by replication process.
- Changes to the placeholder vApp containing the protected VM require the vApp name.



Retrieving the placeholder VM name from the cloud
(REST Plugin)

- When a VM is protected a placeholder VM is created in vCD and wrapped in a vApp.
- The vApp name is based on the VM name with a GUID suffix.
- The vCD plugin can modify a VM's configuration after failover, but the vApp name is not available through the vSphere Replication Plugin.
- The REST plugin can retrieve the placeholder vApp name from vCAV.
- The vCD plugin is then used to modify the vApp
- Both plugins can be used in the same workflow.

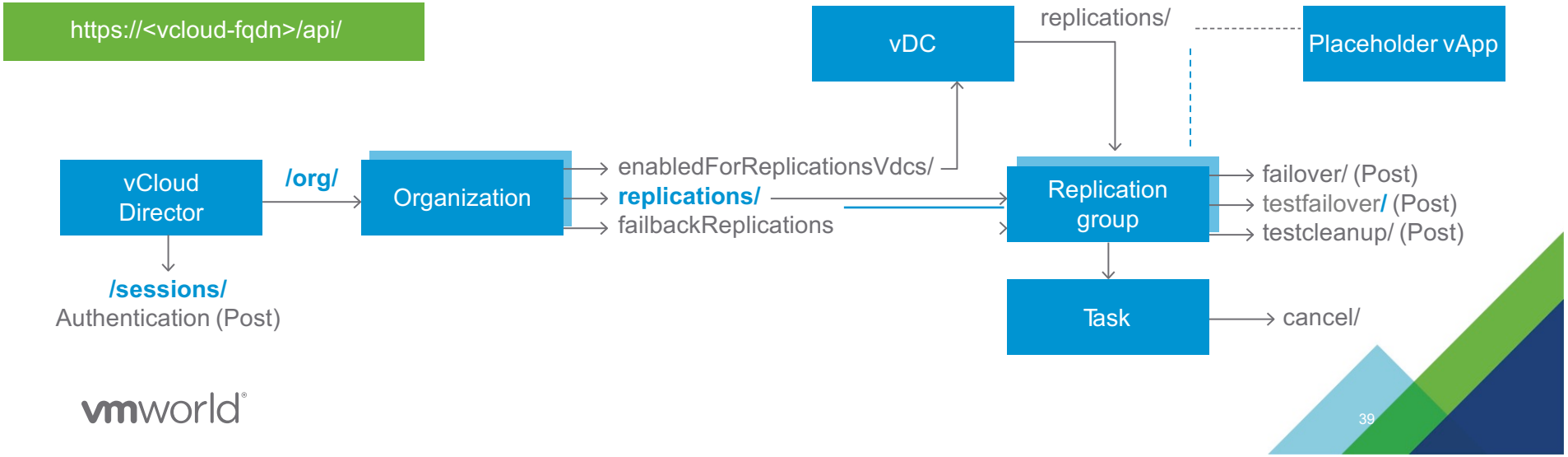


API navigation

Sample navigation to retrieve Placeholder vApp

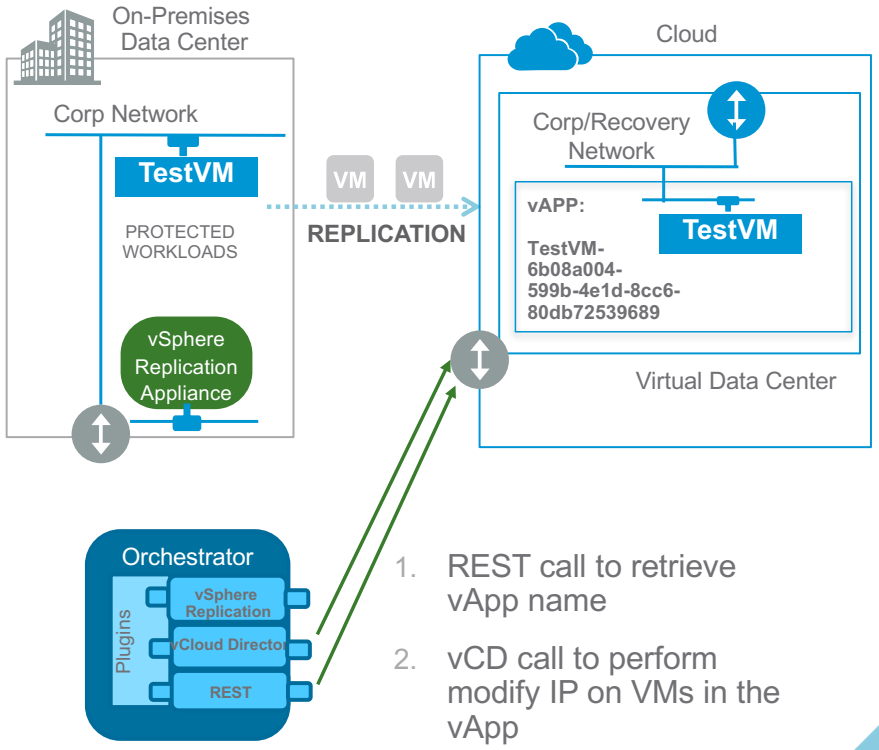
- Object graph is a combination of existing vCD objects and new vCloud Availability objects
- For example: the organization object is extended to include new links for Replication enabled VDCs, Replications (to cloud) and failback-replications from cloud)

- Replication group is an example of a new object that represents a pairing of a tenant VM with a cloud VM nested in a placeholder vApp.



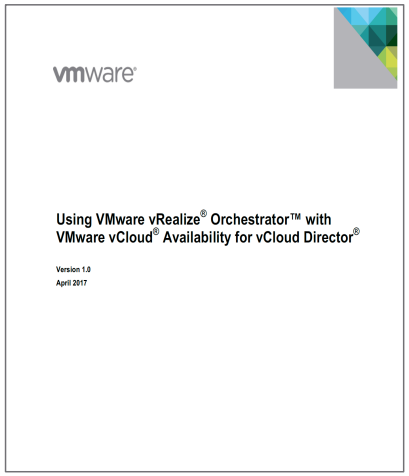
Custom IP Automation
Change VM IP after failover

- vCloud Availability will place VMs in specified target network, but natively does not modify the IP
- A custom workflow can re-IP the VM,
  - REST Plugin retrieves placeholder vApp name.
  - vCD plugin modifies vApp and VM IP

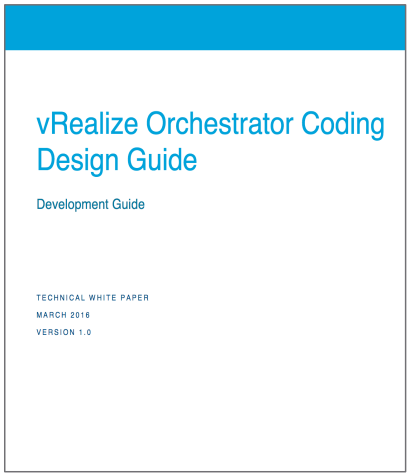


Additional Resources:

- **White Paper:**
- Using VMware vRealize¨ Orchestrator™ with VMware vCloud¨ Availability for vCloud Director¨



- **White Paper:**
- vRealize Orchestrator Coding Design Guide



- **Samples:**
- Orchestrator – vCloud Availability Examples on GitHub:

GitHub

vmware / **vcloud-availability-examples**

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