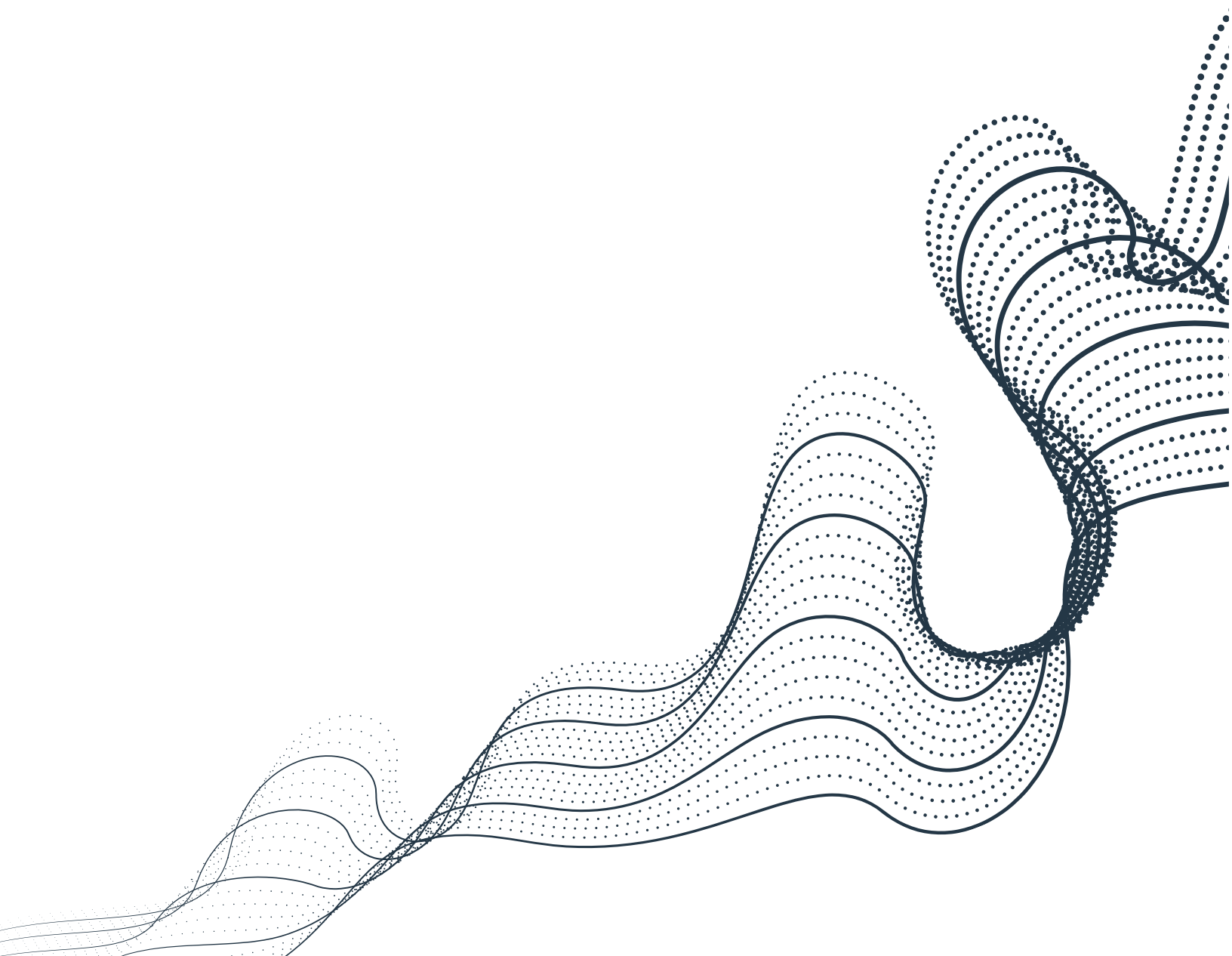

Release Notes



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What's New in This Release

Embotics vCommander 7 continues to deliver market innovation in its award-winning Cloud Management Platform (CMP). In this release, vCommander supports the full range of application types with IaaS/PaaS and now CaaS (Containers as a Service), as well as significantly enhancing orchestration to enable DevOps automation. vCommander continues to expand on its integrated cloud governance capabilities, delivering a true CMP 2.0 platform with release 7. Read on to learn more about improvements in these areas:

- [Support for Kubernetes Container Management](#)
- [DevOps and Workflow Orchestration](#)
- [Multi-Cloud Catalog and Intelligent Placement](#)
- [Cloud Expense Management](#)
- [Cost Optimization and Cloud Governance](#)
- [Additional Enhancements](#)
- [New Supported Platforms](#)
- [REST API Enhancements](#)

If you're upgrading, see also [Upgrade Notes](#) and [Issues Resolved in This Release](#).

Support for Kubernetes Container Management

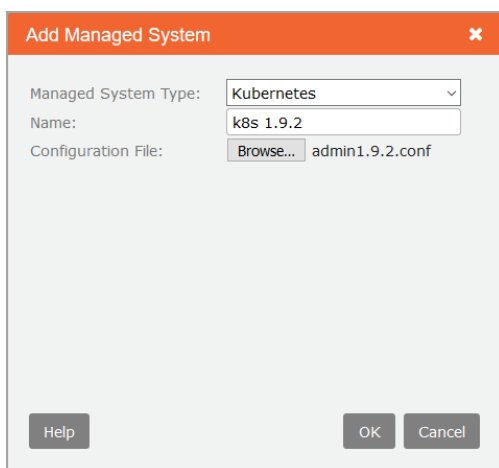
vCommander now provides management and automation for microservices applications. Use vCommander's real-time inventory and workflow orchestration features to deploy and manage Kubernetes clusters. Kubernetes (commonly represented as K8s) is an open-source container-orchestration system for automating the deployment, scaling and management of containerized applications. vCommander interacts with the Kubernetes API, providing distribution-independent management, governance and visibility for Kubernetes clusters and containerized workloads.

In this section:

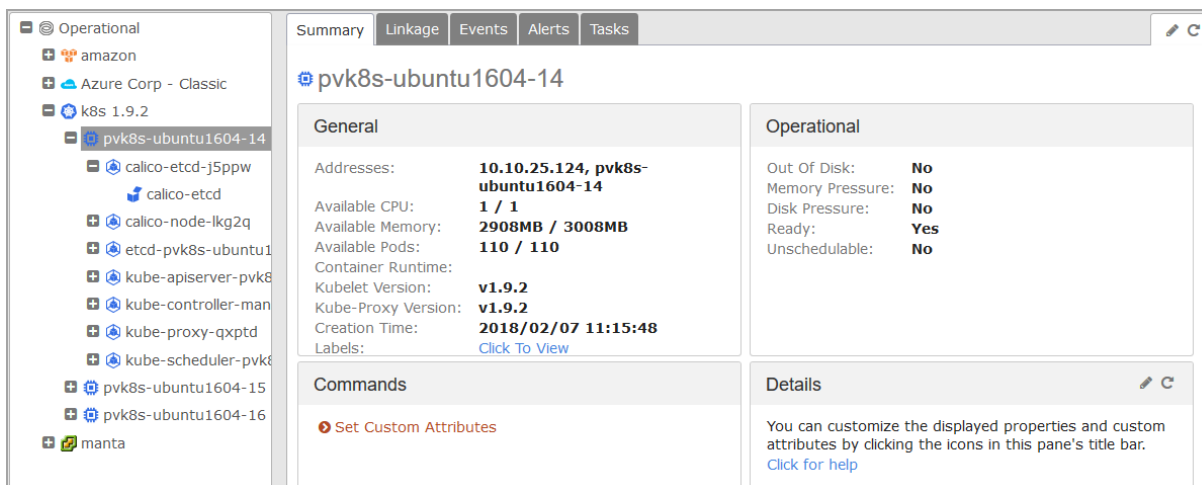
- [Brownfield discovery of existing Kubernetes clusters](#)
- [Deploy a new Kubernetes cluster](#)
- [Deploy applications into an existing Kubernetes cluster](#)
- [Run a Kubernetes best practices report](#)

[Brownfield discovery of existing Kubernetes clusters](#)

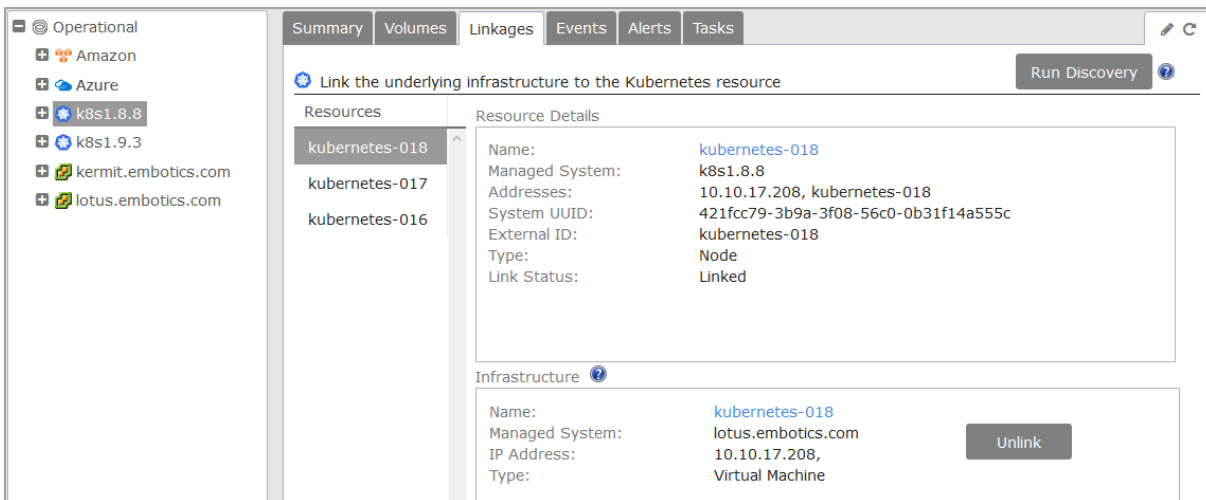
You can add an existing Kubernetes cluster to vCommander's inventory. All you need as input is the configuration (kubeconfig) file for the Kubernetes cluster.



Once you've added a Kubernetes cluster to vCommander's inventory, you can view all its resources. In the Operational view (shown below), you see an infrastructure view detailing the resources deployed on each node in the cluster. In the Deployed view, you see an application-centric view, composed of pods and containers, broken down by namespace.



If vCommander is also managing the cloud infrastructure where the cluster resides, vCommander automatically links Kubernetes resources to the underlying infrastructure; as you can see in the image below, for example, vCommander links Kubernetes nodes to the underlying VMs.



Once vCommander is managing both the cluster and the underlying infrastructure, you can benefit from the complete range of vCommander's orchestration, self-service, cloud governance and cost optimization features.

Deploy a new Kubernetes cluster

You can download and import a workflow that deploys a Kubernetes cluster on vSphere, AWS or Azure and then automatically adds the cluster to vCommander's inventory with no intervention from an administrator. You can also enable your end users to submit a service request that kicks off this process, with the option to allow them to choose the Kubernetes version. Learn how to set up this scenario on our [Knowledge Base](#).

Deploy applications into an existing Kubernetes cluster

You can use vCommander workflows and orchestration to deploy Kubernetes applications. Embotics provides a workflow extension that supports the deployment of applications into an existing Kubernetes cluster. By tying deployments to your CI/CD pipeline and including workflow steps for approval and inspection of resources to be deployed, you can ensure that your applications meet internal standards and established best practices. Learn how to set up this scenario on our [Knowledge Base](#).

Run a Kubernetes best practices report

To ensure that the resources (such as pods and containers) deployed on a Kubernetes cluster adhere to best practices and corporate standards, you can configure a best practices report that compares the current state of a Kubernetes cluster against a set of checks. Once you've configured the report, you can kick it off thanks to the [new orchestration capabilities for managed systems](#) in this release. Learn how to set up this scenario on our [Knowledge Base](#).

Embotics Kubernetes Best Practices Report EMBOTICS* **vCommander***

Summary

Tests	Failures	Errors	Skipped	Success rate
163	36	0	0	77.91%

Note: *failures* are anticipated and checked for with assertions while *errors* are unanticipated.

Resources

Note: package statistics are not computed recursively, they only sum up the numbers from the children.

Name	Tests	Errors	Failures	Skipped
Cluster	3	0	0	0
Daemon Set	2	0	0	0
Deployment	8	0	0	0
Namespace	9	0	9	0
Node	27	0	9	0
Pod	106	0	18	0
Replica Set	5	0	0	0
Service	3	0	0	0

Resource Cluster

Name	Tests	Errors	Failures	Skipped
https://jesse-aks-87b8a167.hcp.eastus.azmk8s.io:443	3	0	0	0

[Back to top](#)

To learn more about our Kubernetes support, see [Adding a Kubernetes Managed System](#) and [Managing Kubernetes](#).

DevOps and Workflow Orchestration

vCommander 7 provides a wide range of DevOps and Workflow enhancements to assist you with all of your automation needs and related integration to third-party systems or CI/CD pipelines.

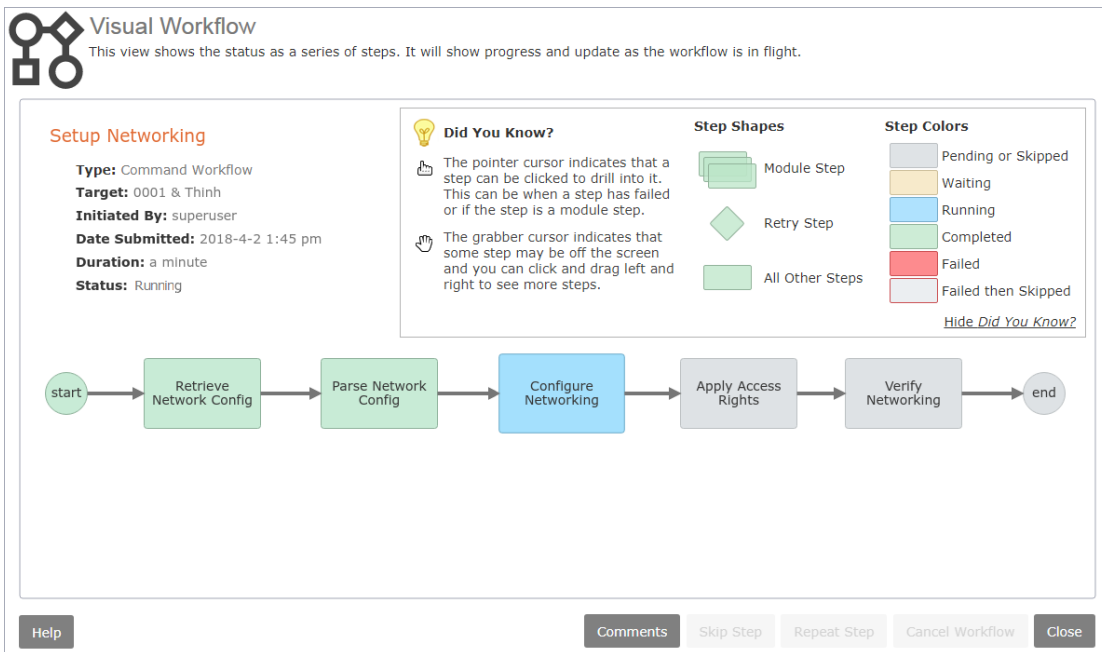
In this section:

- [Visualize your workflows in real time](#)
- [Track workflow revisions and revert to an earlier revision](#)
- [Embed scripts directly in a workflow step](#)
- [Automatically retry failed workflow steps](#)
- [Execute REST calls in a workflow step](#)
- [Reuse groups of workflow steps as workflow modules](#)
- [Export and import workflows and workflow modules](#)

- Extend your workflows with plug-in steps
- Integrate vCommander with Jenkins
- Run an Ansible playbook on a target VM
- Deploy Terraform templates
- Create and schedule command workflows
- Submit change requests and run command workflows against managed systems

Visualize your workflows in real time

vCommander now provides real-time workflow visualization for running workflows, which enables improved tracking and troubleshooting of a workflow's status. From the Visual Workflow page, details for the workflow now appear in a visual pipeline (as shown below). This new display provides a quick view of the workflow's steps, and each step in the workflow is color-coded so that you can easily determine its status.



The new Visual Workflow page allows you to monitor the progress of a workflow in real-time – for an active workflow step, step colors change as their status changes. For example, as the workflow progresses, a step may change from gray (pending), to blue (running), then green (completed). Red indicates that the step has failed. When the workflow is working on a step or waiting for something related to the step (for example, a response for an approval email step), that step will be animated with a heartbeat.

From the flowchart, you can also edit failed or waiting steps, if required. For example, you may skip or repeat the current step, or even skip the workflow. You can also double-click the current step to make adjustments after the workflow has already started.

To learn more, see [Viewing the Status of Workflows](#).

Track workflow revisions and revert to an earlier revision

When you create a workflow or workflow module, the definition for that workflow or module is saved to the vCommander database. Any subsequent changes are then captured as revisions of that definition. By keeping track of the changes made to workflow definitions, vCommander allows you to view workflow and module revisions and, if required, revert to prior revisions.

You can also export and import specific workflow and workflow module revisions through the Definition Revisions dialog.

To learn more, see [Managing Workflow Revisions](#).

Embed scripts directly in a workflow step

You can add a step to a workflow or a workflow module that executes a script provided directly in the workflow definition. Compared to the existing Execute Script step, which references a script that resides on disk, the new Execute Embedded Script step offers a few advantages:

- It makes the step portable – if you export the workflow or module and use it in another vCommander installation, you don't have to upload a separate script file for the new vCommander installation.
- Rather than passing variables in on the command line, at runtime, variables in the script can be resolved, and the actual data is added to the script contents.
- Environment variables can be used to provide the required credentials to the script instead of hard-coding them in.
- The embedded script is versioned, so if you modify the script contents and save the step, each new revision of the workflow or module will preserve your script changes. You can then go back to a previous version if required.

For these reasons, the Execute Embedded Script step is now the recommended method to use for scripted integrations.

The screenshot shows the 'Command Workflow Configuration' dialog box. On the left, a sidebar lists 'Steps', 'Permissions', 'Options', and 'Summary'. The 'Steps' section is active, showing a list of steps: '1. Send Email' and '2. Execute Embedded Script'. Below the list are 'Add' and 'Delete' buttons. The main area is titled 'Execute Embedded Script Step Details' and contains the following fields:

- Step Name:** Execute Embedded Script
- Step Execution:** Always execute (with an 'Edit' button)
- Timeout:** 300 seconds (with a note: 'Enter '0' for no timeout.')
- Script Output:** Capture script output as comment
- When Step Fails:** Mark workflow step as failed: do not proceed
- Credentials:** (with an 'Add Credentials' button)
- Executable:** C:\python37\python.exe -v
- Script Contents:**

```
import requests
url = 'http://crm.corporate.com/rest/customers'
...

```
- Script Arguments:** -displayall

At the bottom, there are 'Help', '< Back', 'Next >', and 'Cancel' buttons.

To learn more, see [Adding Execute Embedded Script Workflow Steps](#).

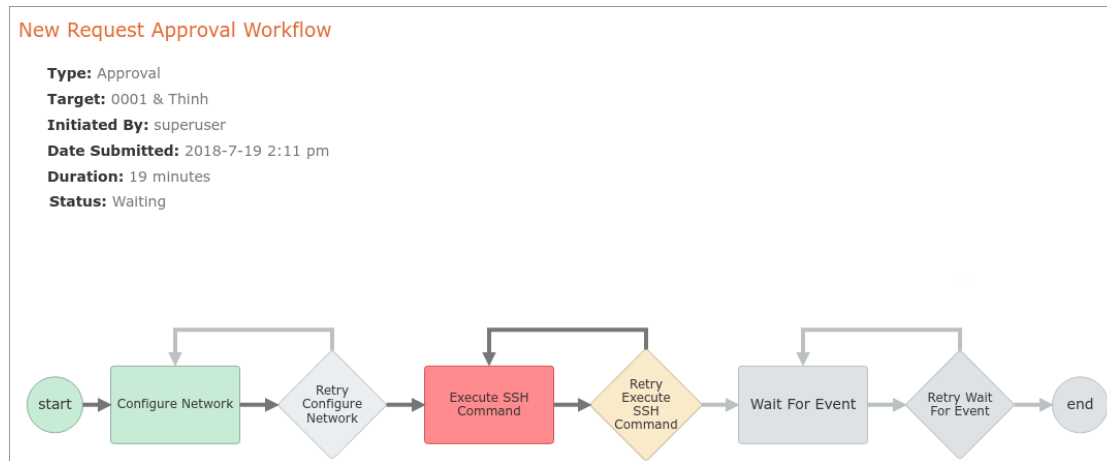
Automatically retry failed workflow steps

The new Retry workflow step allows vCommander to automatically retry any step that may have trouble completing because of infrastructure issues. Adding Retry steps allows you to tune and "harden" a workflow.

For example, a workflow step to establish a secure network connection may fail if the step experiences poor network connectivity. However, if you add a retry for that step, the workflow will repeat the step a set number of times. If the network connectivity is sufficient on a subsequent attempt, the step will complete and the workflow will continue.

In the figure below, each workflow step has been assigned a supporting Retry Step. The "Execute SSH Command" step has failed (as indicated by its red color), so the workflow has moved to the Retry Step that follows it. The Retry Step instructs the workflow to wait a set amount of time and then retry the failed step. You can configure the number of retries and how long to wait between retries.

If the workflow step successfully completes, the workflow will skip its associated Retry Step and will begin processing the next step in the workflow.



To learn more, see [Adding Retry Steps to Workflows](#).

Execute REST calls in a workflow step

You can use the new Execute REST Call workflow step to perform REST Get, Post, Put, Patch and Delete actions in workflows.

By supporting REST actions, your workflows can interact with third-party REST servers or with vCommander installations.

Some example use cases for this step include:

- making a request to an IPAM server to get an available IP. When the IP is returned in the response, it can be passed to a subsequent workflow step that assigns the IP address to the VM to be deployed.
- making a REST request to a third-party server for a specific attribute (for example, getting a VM attribute from vCenter). When the VM attribute is returned in the response, it can be passed to another workflow step that sets the attribute on the VM.

Command Workflow Configuration

Steps
 Enter a name and the details for each step. The Command Workflow will execute the steps in the listed order.

Name & Type	Step Order	Execute REST Call Step Details
Steps	1. Send Email	Step Name: Execute REST Call
Permissions	2. Execute Embedded Script	Step Execution: Always execute
Options	3. Execute REST Call	Response: Capture response
Summary	4. Execute Approval Script	When Request Fails: Mark workflow step as failed: do not
	5. Execute SSH Command	Credentials: superuser
	6. Perform Power Action	URL: https://#{system.address}/rest/v3/wc
	7. Migrate VM	Action: PUT
		Content Format: JSON
		Header: { }
		Payload: { "id" : 123, }
		Result Filter:
		Success Codes: 200-300

Help < Back Next > Cancel

To learn more, see [Making REST Calls through Workflow Steps](#).

Reuse groups of workflow steps as workflow modules

Workflow modules are one or more ordered workflow steps that are configured and saved together as a single, reusable component.

As reusable components, workflow modules can enhance productivity. If you frequently use a common set of steps in your workflows, you can configure and save those steps as a module, then add the module to your workflows, as required, instead of recreating each step every time. They also make maintenance easier – you only have to change a single module that is embedded in many workflows, instead of modifying each of the workflows directly.

To learn more, see [Using Workflow Modules](#).

Export and import workflows and workflow modules

You can now export and import complete workflows and workflow modules as workflow definitions in standard JSON or YAML file formats.

The ability to import and export workflow and workflow modules allows you to reuse workflows and modules between environments. You can share important workflows between separate vCommander installations, so that you can easily move workflows from a staging environment to a production environment. You can also download and install workflows that Embotix publishes externally.

Workflows and modules can be imported from any of the workflow creation pages in vCommander: Approval and Pre-Provisioning, Completion and Command workflows. Workflows can also be imported and exported through the REST API v3.

Import Workflow ✕

Browse to a workflow in JSON or YAML format.

+ Browse Deploy_on_k8s.yaml

Description of Changes: Initial version ?

Messages:

- ✓ Importing VM Completion workflow 'Deploy on K8s', overwriting existing workflow named 'Deploy on K8s'.
- ✓ You are importing a Completion Workflow, not a Command Workflow. After the Completion Workflow is imported, vCommander will display the Completion Workflow page.

Help Import Cancel

To learn more, see [Exporting and Importing Workflow Definitions](#).

Extend your workflows with plug-in steps

This release introduces the concept of plug-in workflow steps – steps that you can add to your

vCommander installation on-the-fly by simply copying a JAR file and restarting vCommander. When you're creating or editing a workflow, the new workflow steps will appear as available steps in the Workflow configuration dialog.

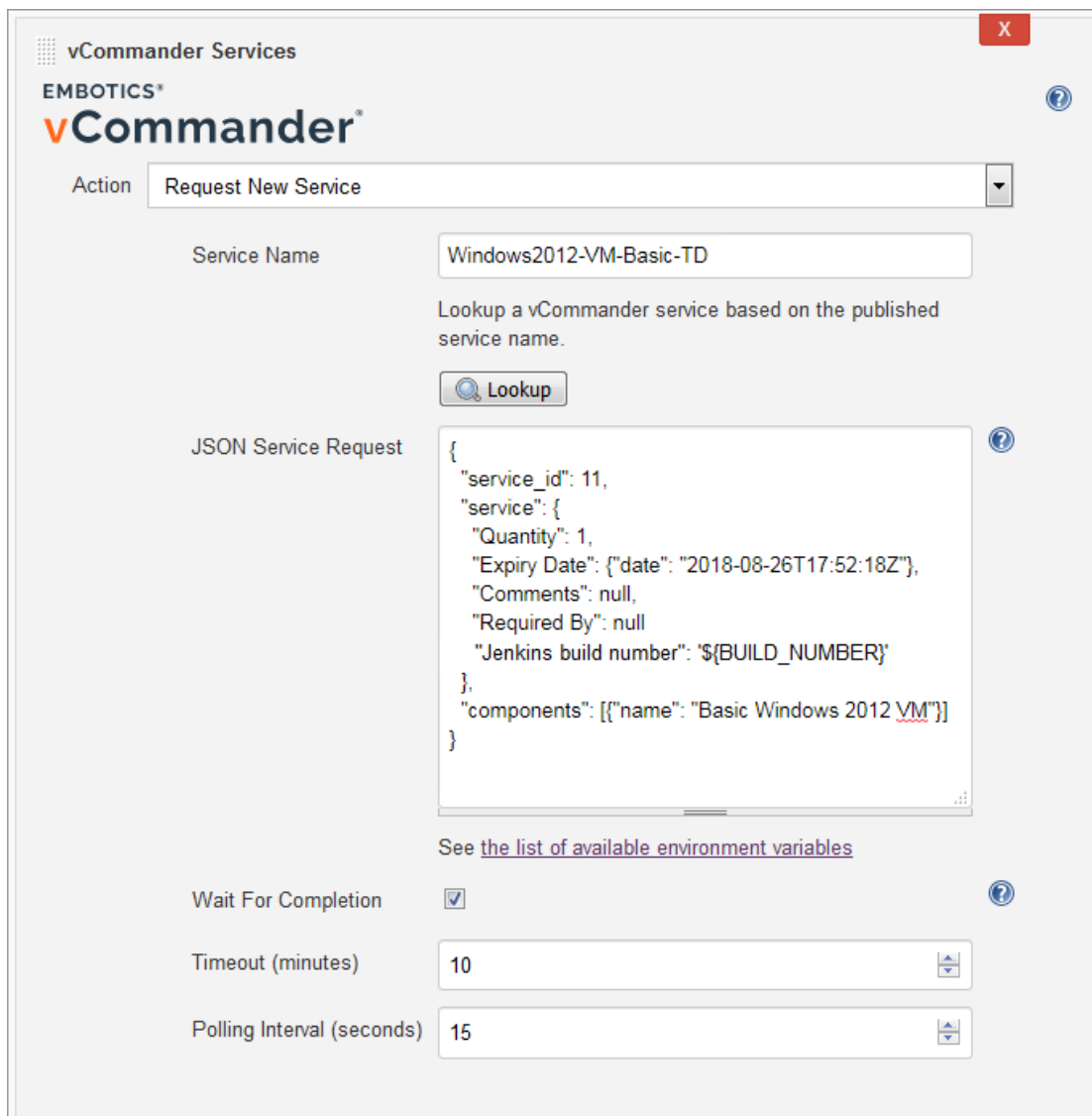
With our new pluggable orchestration architecture, you won't have to wait for new vCommander releases in order to take advantage of these new step types. We're delivering plug-in workflow steps and publishing them to our GitHub repository at <https://github.com/Embotics/Plug-in-Workflow-Steps>. Currently available plug-in steps enable Kubernetes deployments, Ansible playbook installation, triggering Jenkins jobs and more.

To learn more, see [Using Plug-In Workflow Steps](#).

Integrate vCommander with Jenkins

Embotics provides two separate integrations with Jenkins: one that's inbound to vCommander, and one that's outbound from vCommander.

The inbound integration involves a plug-in for Jenkins automation servers that allows you to add vCommander steps in freestyle and multi-configuration Jenkins projects. You can use the vCommander Jenkins Plugin to configure a Jenkins build job that provisions environments from the vCommander service catalog, and you can run workflows on managed infrastructure as part of building, testing and deploying your application code. The ability to add vCommander steps to Jenkins jobs provides provisioning automation for private, public and hybrid cloud infrastructure, including orchestrated setup and configuration, while ensuring proper lifecycle management. You can get the vCommander Jenkins Plugin directly through the Jenkins Plugin Manager or <https://plugins.jenkins.io>.



The screenshot shows the vCommander Services interface. At the top, there's a header with the vCommander logo and a close button (X). Below the header, there's a dropdown menu for 'Action' set to 'Request New Service'. The 'Service Name' field contains 'Windows2012-VM-Basic-TD'. Below this, there's a description: 'Lookup a vCommander service based on the published service name.' and a 'Lookup' button. The 'JSON Service Request' field contains a JSON object:

```
{
  "service_id": 11,
  "service": {
    "Quantity": 1,
    "Expiry Date": {"date": "2018-08-26T17:52:18Z"},
    "Comments": null,
    "Required By": null,
    "Jenkins build number": "${BUILD_NUMBER}"
  },
  "components": [{"name": "Basic Windows 2012 VM"}]
}
```

. Below the JSON field, there's a link: 'See the list of available environment variables'. At the bottom, there are three fields: 'Wait For Completion' (checked), 'Timeout (minutes)' (10), and 'Polling Interval (seconds)' (15).

To learn more, see [vCommander Jenkins Plugin](#).

The outbound Jenkins integration involves a workflow plug-in step that allows you to trigger Jenkins jobs directly from vCommander. To enable this scenario, you must download and install a workflow plug-in step package from our GitHub repository at <https://github.com/Embotics/Plug-in-Workflow-Steps/>.

Run an Ansible playbook on a target VM

A new workflow extension scenario enables you to run Ansible playbooks using the `ansible-playbook` command. Our scenario provides considerable flexibility – you can run a playbook through a completion workflow on a VM that's just been deployed, through a change request, or directly on a target VM through a command workflow. You can enable your users to select one or more playbooks from a list on a new service request or change request form, or you can enable them to upload their own playbook file.

To enable this functionality, you need to download additional files. Go to our [Knowledge Base](#) to learn how to set up this scenario.

Deploy Terraform templates

A new workflow extension scenario enables you to deploy infrastructure components that are defined

through Terraform templates. When you configure this extension, a Service Portal user can upload a Terraform template, which vCommander can then deploy. An administrator can also create a service catalog item tied to a specific Terraform template, which Service Portal users can then request. In both of these cases, you can enable users to provide input parameters to the Terraform template (similar to AWS CloudFormation templates and ARM templates). Optionally, you can create an approval process that runs the Terraform `plan` command and sends the output to an approver, to validate what will be deployed. You can apply tags such as ownership, cost center and project code to the Terraform deployment, ensuring that important business information is tracked. Once ownership and an organization are assigned during deployment, vCommander quota limits are also supported.

To enable this functionality, you need to download additional files. Go to our [Knowledge Base](#) to learn how to set up this scenario.

Create and schedule command workflows

Most command workflows are meant to be run on a specific type of service (like a VM). However, you can now create command workflows without an inventory target. You can also schedule these targetless command workflows to run on a recurring basis. This scheduling capability allows you to consistently perform system maintenance tasks or synchronization tasks. With schedulable workflows, you no longer have to rely Windows Task scheduler or another external scheduler to drive these tasks.

You can use a command workflow with no inventory target to update vCommander custom attributes with values from an external server. For example, the command workflow could synchronize vCenter attributes with vCommander, or get user accounts from an Active Directory server, then add them to custom attributes that can be displayed on a request form.

Schedulable workflows can also be used with vCommander's new workflow extension capabilities (such as plug-in steps and workflow modules) to fully automate all aspects of your environment.

To learn more, see [Running a Command Workflow](#).

Submit change requests and run command workflows against managed systems

You can now submit a change request and run a command workflow on a managed system. These two features are supported for all managed system types, but are especially helpful for Kubernetes clusters. One use case involves allowing users to submit a change request that uploads a deployment manifest to a Kubernetes cluster, thereby automating [cluster provisioning](#).

To learn more, see [Customizing Service Request Forms](#) and [Creating Command Workflows](#).

Multi-Cloud Catalog and Intelligent Placement

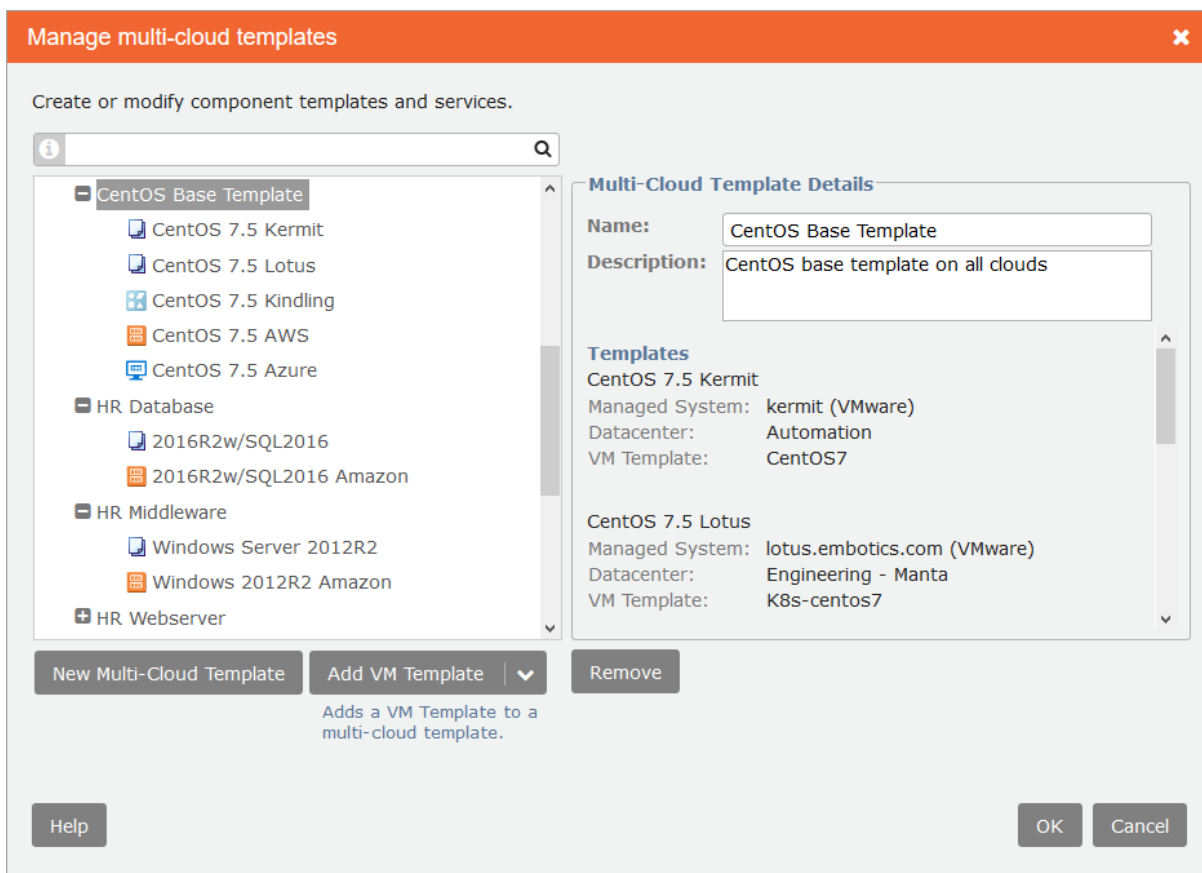
vCommander's Intelligent Placement ensures that workloads are automatically deployed to the best location, based on criteria you define. This release introduces several Intelligent Placement features: the multi-cloud service catalog, placement priorities, placement attributes and per-destination quota. You can also add OVA and OVF templates to the service catalog. Together, these features mean a smaller service catalog with more flexible automated provisioning.

In this section:

- Create services that can be deployed on multiple clouds or managed systems
- Prioritize the placement factors that are most important to you
- Use placement attributes to guide Intelligent Placement
- Configure organization quota limits for each destination
- Get a better understanding of how vCommander makes placement decisions
- Destination ratings on the service request form
- Add Amazon Marketplace AMIs to the service catalog
- Add OVA and OVF templates to the Service Catalog

Create services that can be deployed on multiple clouds or managed systems

With multi-cloud templates, you can create a single service that can be deployed on multiple private and public clouds.



Once you've created a multi-cloud template, you add it to a service catalog entry and configure the blueprint for each cloud where the template can be deployed. In the image below, you can see that the Infrastructure tab contains both global and cloud-specific settings to support deployment on multiple clouds.

Add Service: CentOS Base Template

Service Description
Component Blueprints
CentOS Base Template
Deployment
Intelligent Placement
Visibility
Summary

Infrastructure Resources Attributes Form

Set infrastructure options for this component.

Name: CentOS Base Template

Description: CentOS base template on all clouds

Deployed Name: ☒ Use default naming format ☐ Use: VM#{uniqueNumber[3]}

Completion Workflow: Default (No Workflow Defined)

Customization Spec:

Deployed VMs will be: Standalone VMs

Here are a few examples of services that you can publish using multi-cloud templates:

- a service that can be deployed on vCenter, AWS, Azure or SCVMM
- a service that can be deployed on multiple vCenters

You can also use multi-cloud templates to make it easier to keep the service catalog up to date. Create a multi-cloud template that contains a single base OS template, such as CentOS 7.5, and then create multiple published services that point to this multi-cloud template. Use completion workflows or configuration management tools (such as Chef or Puppet) to install custom software on the deployed VMs. When it's time to update the template, you only have to edit the multi-cloud template; all published services pointing to this template will automatically be updated.

To help you add multi-cloud functionality to your existing service catalog, we've provided two wizards: one to create a new multi-cloud service from existing services, and one to copy single-cloud services into an existing multi-cloud service.

Help Configure

Multi-Cloud | Add Service Edit Copy

Manage multi-cloud templates

Copy services to new multi-cloud service

Copy services to existing multi-cloud service

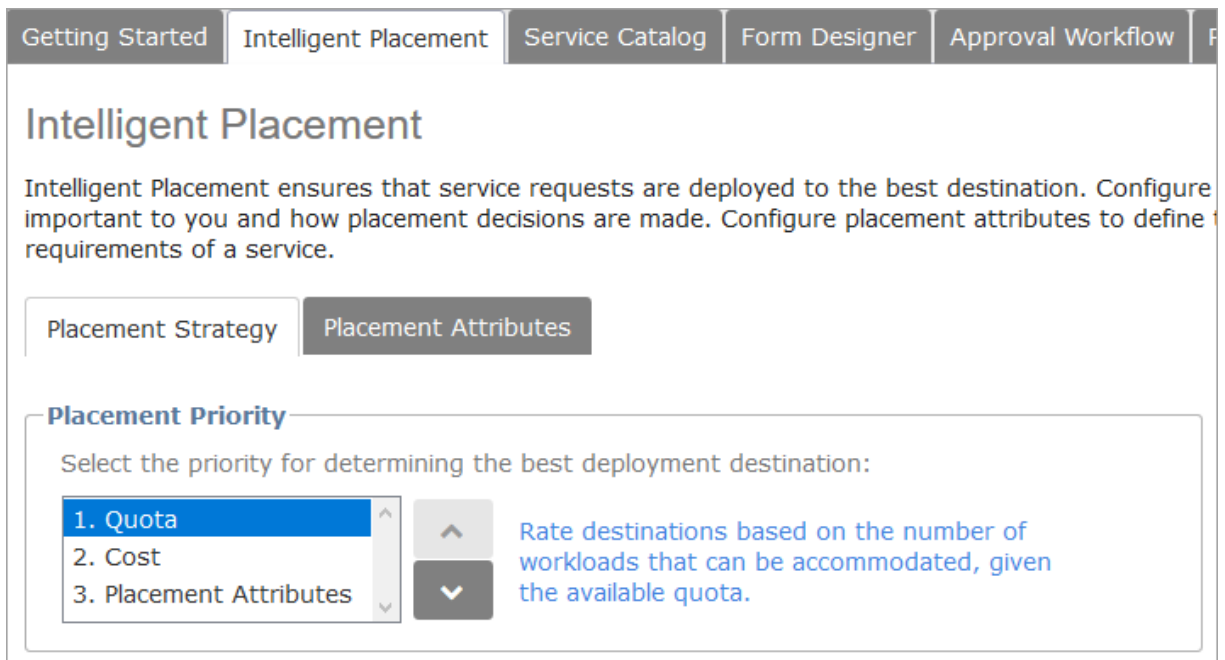
To learn more, see [Adding Multi-Cloud Services to the Catalog](#) and [Creating a Multi-Cloud Service Catalog from Existing Services](#).

Prioritize the placement factors that are most important to you

With Intelligent Placement, vCommander predicts and selects the best deployment destination for a new service request. vCommander first filters out all invalid destinations. Each valid destination is then rated, based on the following criteria:

- Quota: How much quota is available on this destination for the requester and the requester's organization?
- Cost: How much will this service cost on this destination?
- Placement attributes: Does this destination provide the capabilities required by this service?

By default, these three factors are prioritized in the order they appear above, but if cost is more important to you than quota, for example, you can customize the priority.



Advanced system properties permit further tuning of Intelligent Placement. For example, you can customize the relative weighting of placement priorities and how destinations are rated for placement attributes and cost.

To learn more, see [Customizing Priorities for Intelligent Placement](#).

Use placement attributes to guide Intelligent Placement

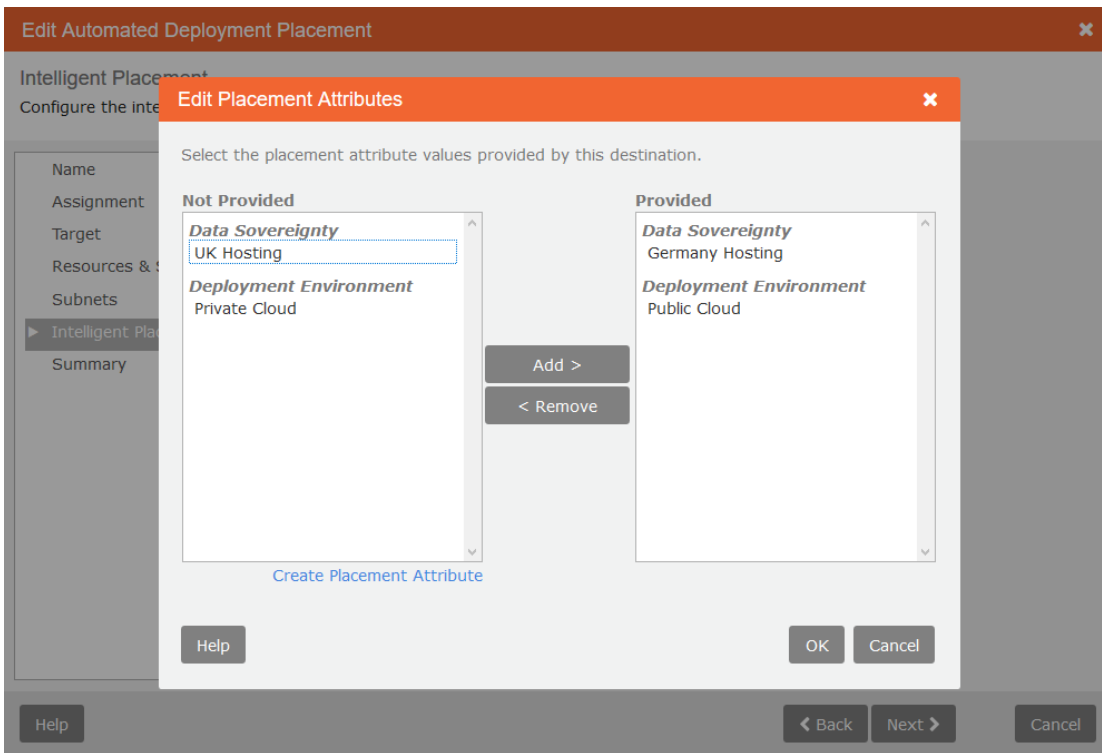
By identifying the capabilities of each deployment destination and the requirements of each service, placement attributes help ensure that service requests are automatically deployed to the best destination. For example, placement attributes can help vCommander decide whether to deploy a service to public or private cloud, or which datacenter or geographic region is best suited to a service.

You can also use placement attributes to enforce and automate governance, such as:

- the needs of Development versus Production workloads
- application performance needs, such as enhanced compute resources and IOPS
- service needs, such as the requirement for a DR-enabled location

vCommander provides complete flexibility to choose the placement requirements specific to your environments.

Once you've created a placement attribute, you assign placement attribute values to published services and to destinations. This information tells vCommander which services require certain capabilities and which destinations provide these capabilities. To provide self-service Intelligent Placement automation at request time, you can include placement attributes on service request forms. vCommander then uses this information when selecting the best destination for each service request.



To make it easier to start using placement attributes, our REST API enables you to create placement attributes and apply them to deployment destinations and published services, so that you don't have to apply them individually through the UI. For examples, see the built-in help for the vCommander REST API v2 PowerShell client or the [REST API v2 page](#) in our documentation.

To learn more, see [Configuring Attributes for Intelligent Placement](#).

Configure organization quota limits for each destination

You can now configure distinct quota limits for each destination available to a user or organization. Previously, if a group of users could deploy to four separate destinations – such as Lab, Development, Staging and Production – you had to create four organizations for this group in vCommander, so that you could configure four separate quota limits. Now you can configure this functionality within a single organization. Use the new **Destination Quota** option in the Configure Organization wizard to set distinct quota limits for each destination available to an organization.

Configure Organization

Quotas
Select how quotas will be configured.

Left Sidebar (Tree View):

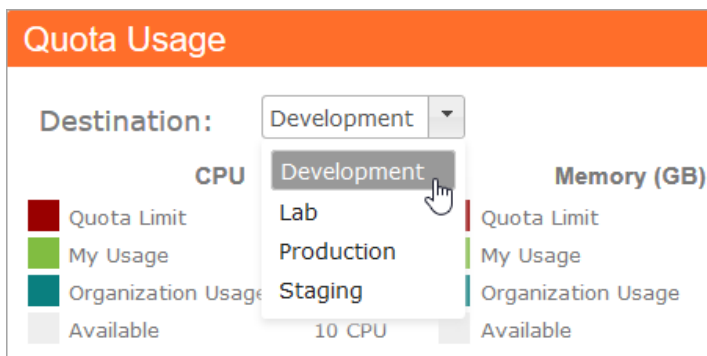
- Name and Members
- Quotas** (selected)
 - Development
 - Organization Quotas
 - Member Quotas
 - Lab
 - Organization Quotas
 - Member Quotas
 - Staging
 - Organization Quotas
 - Member Quotas
 - Production
 - Organization Quotas
 - Member Quotas

Main Content Area:

☐ No Quota ?
☐ Global Quota ?
☒ Destination Quota ? [New Destination](#)
 Create an additional destination for this organization.

For example, for a single organization, you can now set distinct resource quota limits for each destination. Or, you can set a cost quota for the Production destination, a resource quota for Staging and Development, and no quota limit for Lab.

Once you've configured a per-destination quota, Service Portal users can view their quota usage for each destination where they, or their organization, own VMs.



Per-destination quotas can be useful for such scenarios as cloud-bursting: if an organization exceeds its quota on its private cloud destinations, then vCommander can deploy to a public cloud destination instead.

To learn more, see [Configuring Per-Destination Quotas for an Organization](#).

Get a better understanding of how vCommander makes placement decisions

A new Placement tab in the Request Details dialog provides an explanation of why vCommander chose a particular destination.

Request Details

Select an item in the request tree for more details.

- ✓ Request 26
 - ✓ Approval Workflow
 - ✓ **Service: Amazon Marketplace Test Se**
 - ✓ Marketplace
 - ✓ Completion Workflow

Details | Form | Placement | Comments (12)

Placement Report

Out of 10 destinations, 3 were applicable for the selected service and requester.
Destination: "AWS US East 1" was selected.

Filtered-out Destinations

Destination "172.30.0.0/16" does not provide required placement capabilities.
Attribute "Cloud Type" no allowed value provided by destination (Private).

Rated Destinations

Destination: "AWS US East 1", rated 100
 Cost: Least expensive, rated 100
 Requested service would cost \$57.61.
 Quota: Most quota available, rated 100
 There is room for 6.5 of the requested workloads.
 Placement Attribute: Excellent compatibility, rated 100
 Attribute "SLA" matched value "Gold", which is worth 100.
 Attribute "Cloud Type" matched value "Private", which is worth 100.

First, you see a list of any destinations that were filtered out because they were invalid for this service, or because of issues such as lack of disk space. For example, if a destination doesn't provide a required placement attribute, it's filtered out. Next, you see a list of all valid destinations, with an overall rating from 1 to 100. Ratings from 1 to 100 are also provided for cost, quota, preferred placement attributes and capacity. If no destinations were valid for this service, the placement report also explains why. The placement report is available even before deployment occurs.

To learn more, see [Understanding Placement Decisions](#).

Destination ratings on the service request form

vCommander now provides more information to help requesters make a more informed decision. When the Destination element is present on the request form, a star rating is displayed for each valid destination for the requested service. Users can click an Information icon to understand how each destination is rated for quota, cost and preferred placement attribute values. If you customize the placement priorities, the ratings change; in the image below, we've prioritized placement attributes over cost and quota.

Basic Service Form

Destination:

Destination	Cost	Rating
AWS US East 1	\$51	★★★★★
Kermit Placement 2	\$1032	★★★★☆
Kermit Placement 1	\$1032	★★★★☆

Let the system decide

Information icon tooltip:

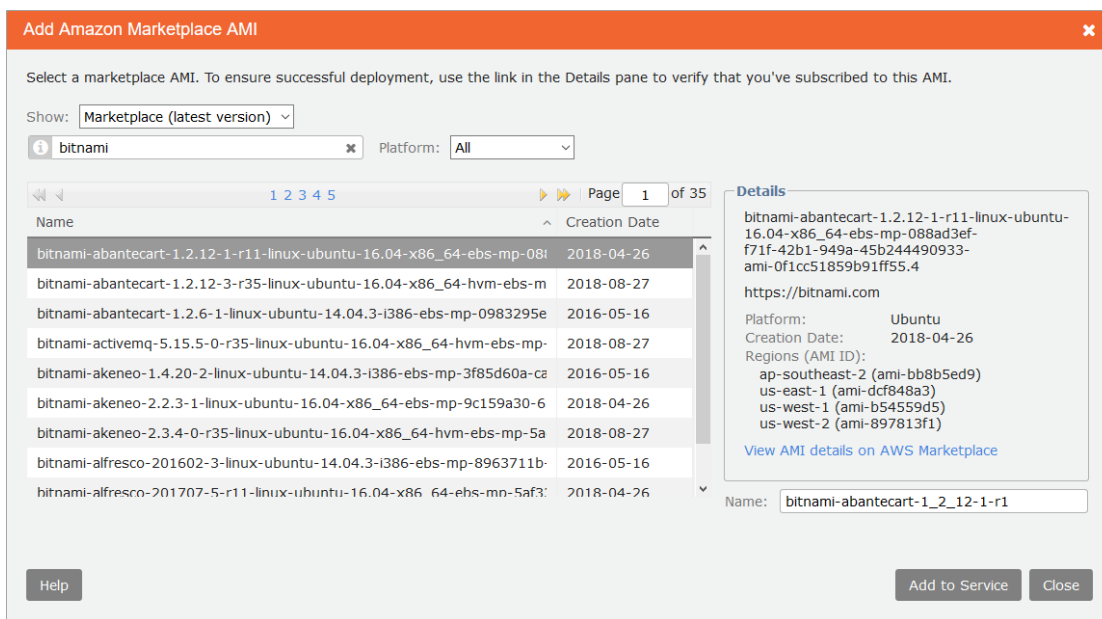
- Placement Attributes: Compatible
- Cost: Least expensive
- Quota: Most quota available

To learn more, see [Understanding Placement Decisions](#).

Add Amazon Marketplace AMLs to the service catalog

Previous releases of vCommander supported only private AMLs in the service catalog. Because private

AMIs are tied to AWS accounts, you needed to replicate identical private AMIs in each of your AWS accounts and then publish a separate service for each AMI. Now you can add any Amazon Marketplace AMI to your service catalog. When you want to update the AMI, you simply update a single published service, rather than one per account. Amazon Marketplace AMIs are also supported in [multi-cloud services](#). Administrators can customize the list of favorite AMIs too.



To learn more, see [Adding AWS Services to the Catalog](#), [Adding a Multi-Cloud Service to the Catalog](#) and [Customizing the List of Favorite Amazon Marketplace AMIs](#).

Add OVA and OVF templates to the Service Catalog

Open Virtual Format (OVF) and Open Virtual Appliance (OVA) templates are open-standard file formats for packaging and distributing VMs and applications. OVF and OVA templates provide quick and reliable provisioning of third-party services or applications.

In vCommander, you can create vCenter service catalog entries that allow users to request a VM or vApp that's described by an OVF or OVA template. You can also enable users to customize the OVA or OVF template on the request form.

To learn more, see [Adding vCenter Services to the Catalog](#).

Cloud Expense Management

vCommander now provides significant additional depth in both private and public cloud cost visibility, providing the data you require to make informed cloud cost decisions.

In this section:

- [Cost Analytics Dashboard](#)
- [Budget visibility for Service Portal users](#)
- [Cloud Billing Report](#)
- [Automatically update public cloud pricing](#)
- [Azure billing data](#)
- [Billing data for all cloud services](#)

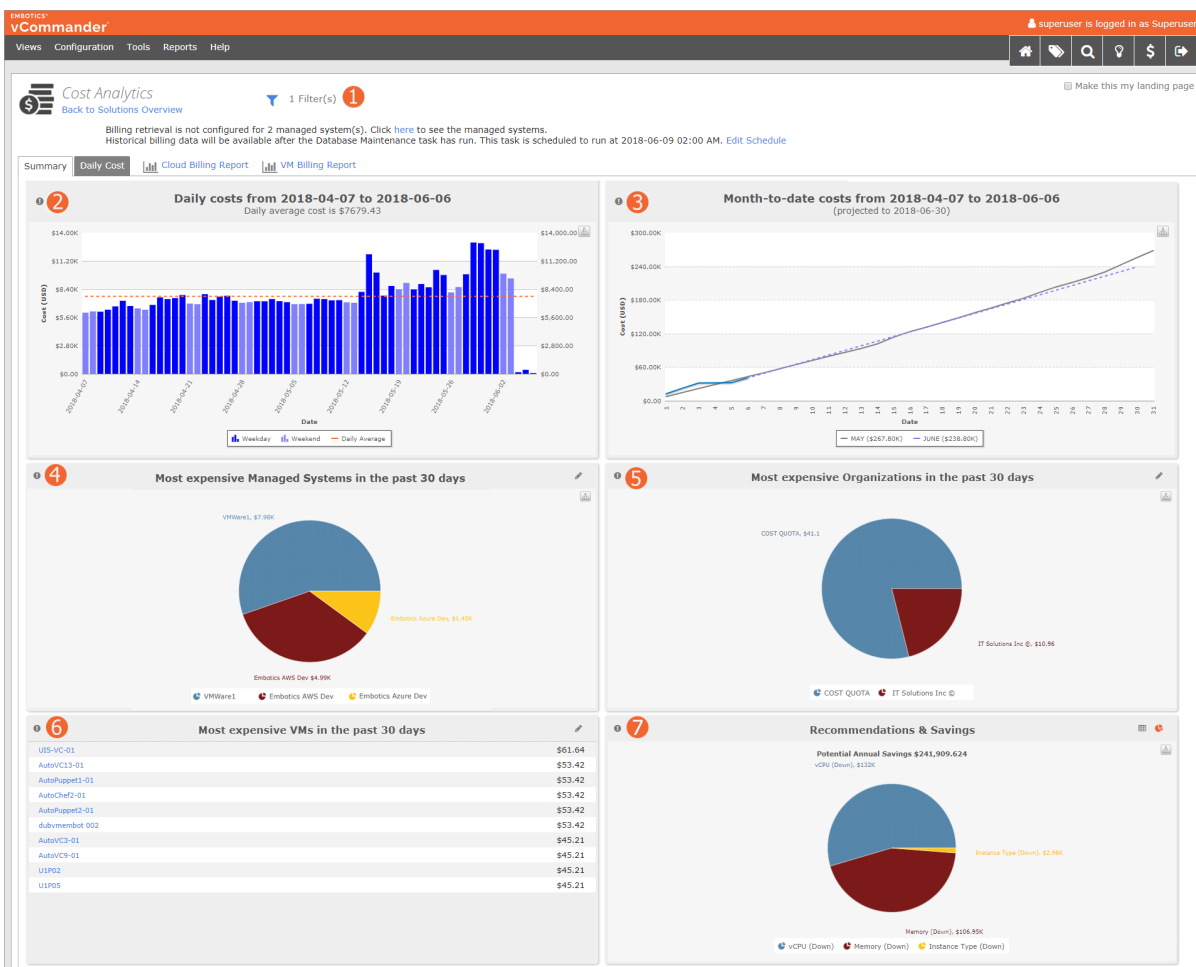
- Actual VM cost
- Cost shopping cart in the Service Portal

Cost Analytics Dashboard

A new vCommander Cost Analytics dashboard replaces the previous Chargeback and IT Costing static dashboard and provides much richer costing analysis. There's a version of this dashboard in both the vCommander admin console and the Service Portal. The ability to view Cost Analytics in the Service Portal is controlled by a new permission.

vCommander allows you to see the cost of all services across all managed systems (clouds). Sortable tables, bar charts and pie charts show a wide range of views – from daily costs to your most expensive services – and provide recommendations on how you can save money on your setup. Filters enable you to perform costing analysis on particular clouds, organizations, or other criteria important for your business. The dashboards also provide drill-through capability so that you can fully explore areas of interest.

To see the Cost Analytics dashboard in vCommander, go to **Views > Solutions > Cost Analytics**.



Quickly spot anomalies or spikes in day-to-day spending and identify their root cause with the **Daily Costs chart (2)**, which shows your costs per day as well as the average cost for the previous 60 days. To drill down to the actual spending on any given day, click any bar on the Daily Costs chart and see details of expenses broken down by service types. You can also see details of spending all the way down to the individual VM level.

Using the **Month-to-Date chart (3)**, you can see your cumulative costs for the current month and compare them to last month. This chart also shows your predicted costs for the rest of the month.

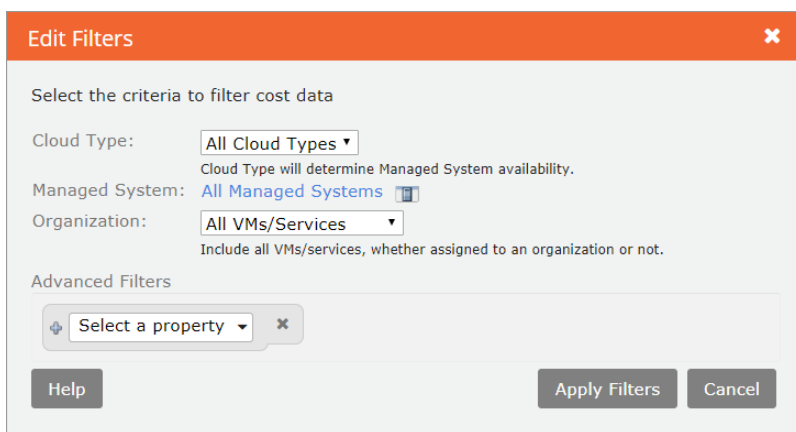
The **Most Expensive Managed Systems table (4)** shows you which of your managed systems cost the most, so you can make informed decisions about migrating services between clouds.

See at-a-glance which of your internal organizations are the top spenders using the **Most Expensive Organizations table (5)**. This table shows the cost of all VMs and other services aggregated over the past 30 days under specific organizations. Service providers that have structured their customers into tenant organizations can see which of their customers have spent the most.

Make informed decisions about cost-saving strategies with data from the **Most Expensive Services tables (6)**, which show the most expensive VMs, service types, instance types, or regions along with rightsizing recommendations. Clicking an item in this table takes you to the summary page for that item.

vCommander shows you where you can potentially save money in the **Recommendations and Savings table (7)**, which links to the Recommendations details page.

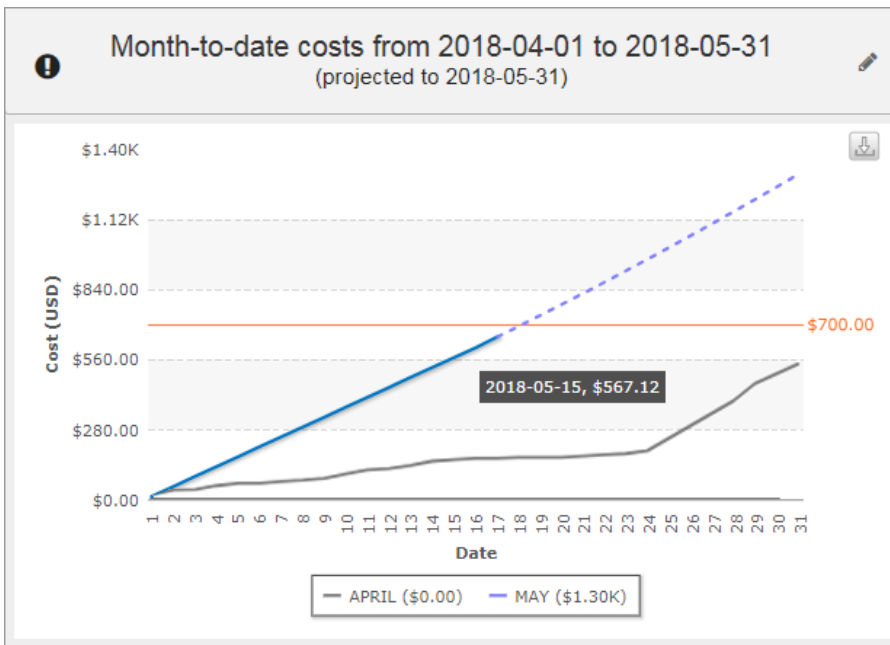
Customize your charts using the filter **(1)** on this dashboard. To focus on only the Cloud Type, Managed System, Organization, Custom Attributes, Guest OS, or Ownership that you're interested in, refine your view using the **Edit Filters** dialog.



To learn more, see [Cost Analytics](#).

This new dashboard is optionally available for Service Portal users when you want to delegate costing analysis. A new permission is available to make this visible for Service Portal users. To learn more, see [Service Portal Cost Dashboard Permissions](#).

Budget visibility for Service Portal users



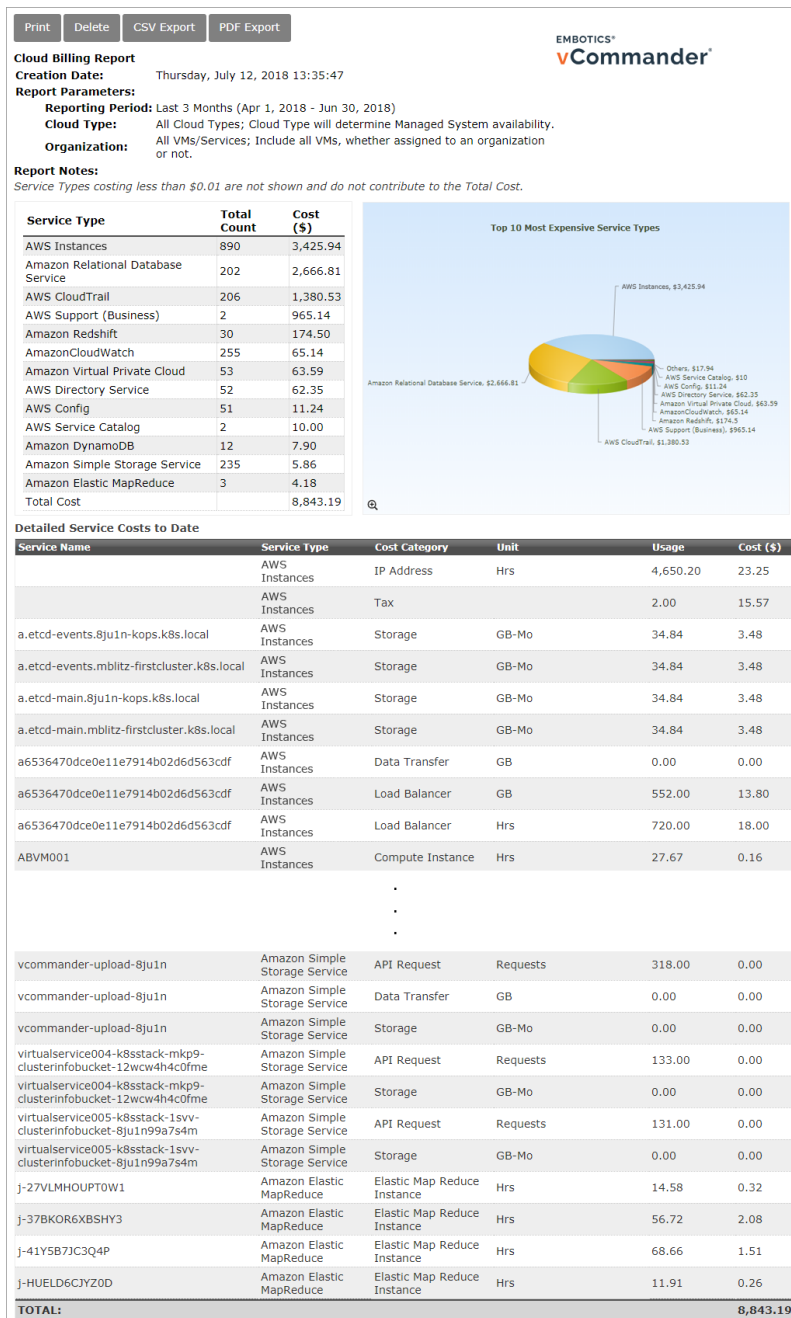
Service Portal users can now set a monthly budget and receive email alerts when daily usage costs are trending towards the budgeted amount.

To learn more, see [Displaying a Monthly Budget Amount](#).

Cloud Billing Report

The Cloud Billing report gives you full cost visibility. It shows historical data for all services, including services that vCommander doesn't manage, so all your cloud costs are visible in one report. Service providers can use this report to generate accurate billing for end users.

In the Cloud Billing report, you can filter your expenses to focus on a single cloud type, organization or timeframe, or you can narrow down your search using advanced filters. To organize your cost report further, you can group costs by categories of interest.



To learn more, see [Cloud Billing Report](#).

Automatically update public cloud pricing

To make sure vCommander has up-to-date pricing for AWS and Azure, you can download a command workflow to update vCommander with the latest AWS and Azure list prices. The workflow checks whether your list prices are current, then updates the list prices if necessary. You can configure this workflow to run on a recurring schedule, so that your price list is always current.

You can download the workflow from our [GitHub Workflows repository](#). To learn how to configure the workflow, see [Updating Public Cloud List Prices](#).

Azure billing data

You can now configure vCommander to retrieve Azure billing data. Billing data is retrieved immediately after you configure the Azure billing report location. During a nightly scheduled task, the billing data is merged with the existing data in the VM billing records.

To learn more, see [Retrieving Billing Data for Azure Managed Systems](#).

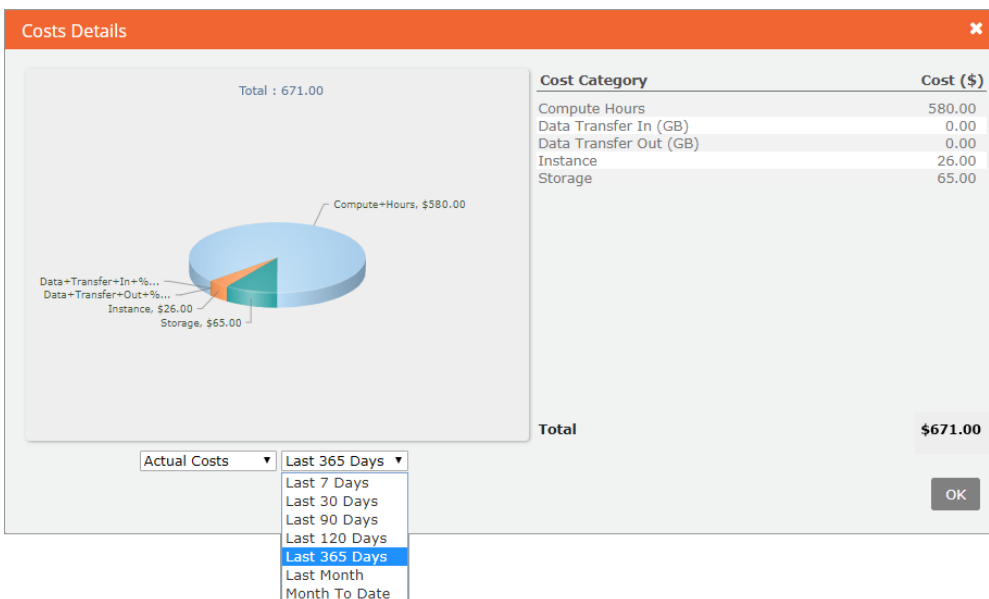
Billing data for all cloud services

When billing data retrieval is configured for AWS or Azure, the Cost Analytics now include costs for all services in the entire cloud account, even those that aren't visible elsewhere in vCommander. This allows you to report and perform analyses on all aspects of your public cloud spending. To learn more, see [Billing Data for all AWS Services](#) and [Billing Data for all Azure Services](#).

Actual VM cost

To show business users their real VM costs, vCommander offers accurate historical costs for the timespan that you choose, for up to one year. The new Actual Costs option in the Costs Details dialog of the vCommander admin console allows you to check your monthly costs against the previous month's costs.

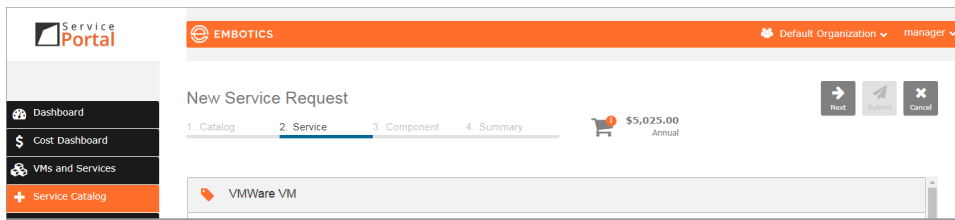
Details	
Estimated Annual Cost:	\$331 Details
Actual Costs:	Details
Created By:	
Date Created:	2018/04/17 14:20:08
Uptime:	84 days, 22 hours
Powered Off Since:	
Snapshot Count:	0
Oldest Snapshot Date:	
Virtual Disk Size (GB):	30.0
File Location:	



To learn more, see [How Much Does a Service Cost?](#)

Cost shopping cart in the Service Portal

As Service Portal users make service requests, the cost for the service is displayed at the top of the page and is automatically updated as configuration changes are made or additional service catalog items are added to the request.



To learn more, see [Requesting Services](#).

Cost Optimization and Cloud Governance

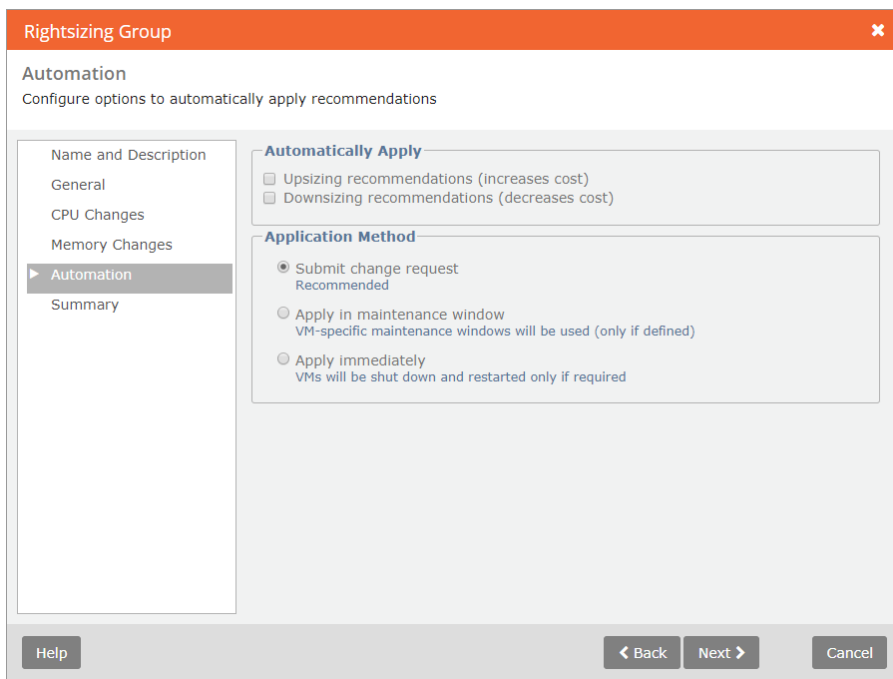
vCommander's policy automation and analytics have been enhanced to leverage the cost visibility and provide immediate and ongoing cost savings in a controlled fashion.

In this section:

- [Automated rightsizing](#)
- [Memory usage monitoring and memory rightsizing for Azure instances](#)
- [Azure tag synchronization and power schedule recommendations](#)
- [Friendly display name for all managed systems](#)

Automated rightsizing

vCommander's VM and instance rightsizing recommendations can now be fully automated in order to optimize your infrastructure and cloud spending in real time. We've enhanced rightsizing groups, which allow you to specify different rules for various workload categories (such as dev, production, web server and database). For each rightsizing group, you can enable automation for upsizing recommendations and/or downsizing recommendations. You can specify that recommendations are applied through a change request, in the maintenance window, or immediately.



To learn more, see [Configuring Rules for VM Rightsizing](#).

Memory usage monitoring and memory rightsizing for Azure instances

vCommander now provides the ability to monitor memory usage for Azure instances. Memory usage monitoring for new instances also means that vCommander can now base Azure rightsizing recommendations on memory usage as well as CPU usage data.

Edit Service: VM

Service Description
Component Blueprints
CentOS 7.2
Deployment
Intelligent Placement
Visibility
Summary

Infrastructure Resources Attributes Form

Set infrastructure options for this component.

Name: CentOS 7.2
Description: Linux
Deployed Name: ☐ Use default naming format ☒ Use: VM#{uniqueNumber[3]} [Configure global text replacement rules](#)
Completion Workflow: Default (No Workflow Defined) [Add Workflow](#) [Edit Workflow](#)
Availability Set: [?](#)

Monitor Memory Usage: ☒ Send guest OS memory usage statistics to a storage account [?](#)

To learn how to enable this feature, see [Monitoring Memory Metrics for Azure Instances](#).

Azure tag synchronization and power schedule recommendations

We've extended our support for tag synchronization and power schedule recommendations to include Azure as well as AWS, providing enhanced cloud governance in multi-cloud environments. You can synchronize tags, such as Cost Center, Business Unit, Product, Tier or Version, with vCommander custom attributes, to further enable vCommander's rich reporting capabilities.

Power schedule groups help to ensure that VMs are powered on when needed and powered off when not needed, to minimize cost without hindering productivity. vCommander can make power schedule recommendations based on Azure tag values, or enforce tags with its Compliance policy.

To learn more, see [Synchronizing Azure Tags and vCommander Metadata](#) and [Configuring VM Power Schedules](#).

Friendly display name for all managed systems

In addition to an address, all managed systems now have a friendly display name that is used throughout vCommander. For example, instead of "eastdev.xyz.com", the managed system name might be "East Coast Development MS". This means that the managed system address can be reserved for administration purposes only and isn't exposed to Service Portal users.

Edit Managed System

Managed System Type:

VMware Virtual Center

Name:

manta.embotics.com

Host:

Corporate vCommander : 443

Username:

builder@embotics.co

Password:

••••••••

In a typical 1000 VM environment, this task will take approximately 10 minutes to complete and will run as a background activity.

Help

OK

Cancel

Service Portal users can now group their workloads by the managed system's friendly name.

VMs and Services

Amazon

AutomationAWS

DBk8s-003

i-034f51279bdf65a6d

JL-Linux VM002

k8s-003

Azure

bc-asdfasdf

UbuntuVM

Private Cloud

AD 2003 R2 32 - delta.pv Primary

ALWIN10

To learn more, see [Adding a Managed System](#).

Additional Enhancements

In this section:

- [Create parent organizations for aggregate reporting and analysis](#)
- [Assign vCommander users a Reporter role](#)
- [Use multiple authentication methods when adding AWS managed systems](#)
- [Use a proxy server to connect to Azure](#)
- [Updated documentation website](#)

Create parent organizations for aggregate reporting and analysis

You can set up your multi-tenant environment with an organizational hierarchy with parent organizations at the top level and regular organizations grouped under those parent organizations.

Parent organizations allow vCommander administrators and Service Portal users to perform analysis and reporting tasks on the aggregated data of all of the VMs and services owned by the child organizations that belong to the parent organizations.

Service Portal users that belong to a parent organization can also view reports, view cost analytics and perform searches on the aggregated data of the VMs and services owned by all child organizations that belong to the parent.

To learn more, see [Using Parent Organizations](#).

Assign vCommander users a Reporter role

A new Reporter role allows vCommander admin console users to view Solutions pages and generate reports, but prevents them from making any configuration changes or viewing sensitive configuration information. Because this role is intended for high-level reporting, users with the Reporter role are prevented from seeing admin-level details and performing any tasks that target infrastructure.

Users with the Reporter role can only be assigned Auditor access rights on infrastructure. To further constrain the scope of this role, only new users can be assigned a Reporter role, and a user with a Reporter role can't be assigned any other role.

To enable the Reporter role, you must change the value of the advanced system property `embotics.role.reporter.visible` to `true`. To learn how, see [Advanced Configuration through System Properties](#). To learn how to assign the Reporter role to vCommander users, see [Overview of vCommander Administrative Roles](#).

Use multiple authentication methods when adding AWS managed systems

When you add an AWS managed system to vCommander, you can now choose to authenticate with an AWS account using one of the following:

- static AWS credentials
- an IAM and instance profile when vCommander is installed on an Amazon EC2 instance

For both authentication methods, you can now assume a different IAM role after authenticating.

To learn more, see [Adding an AWS Managed System](#).

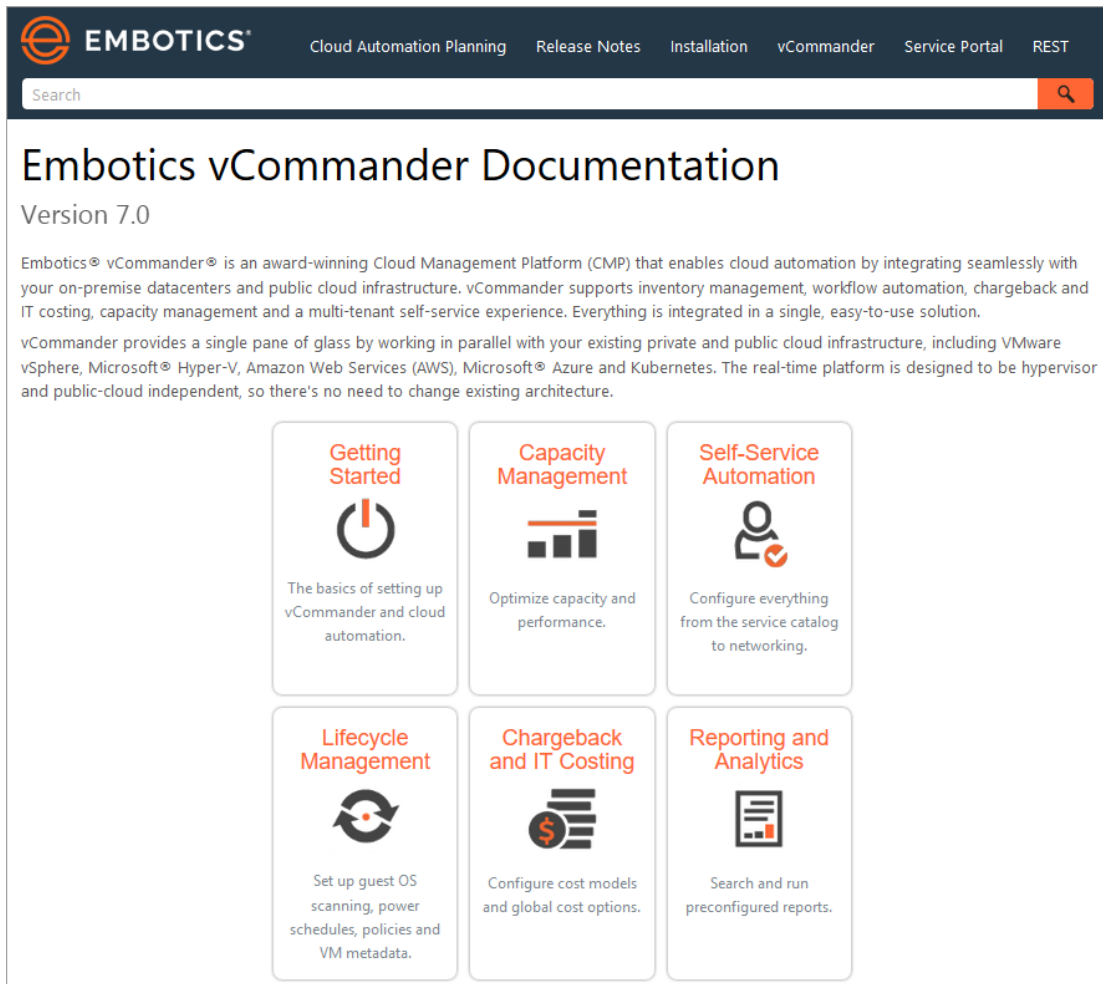
Use a proxy server to connect to Azure

You can now connect to Azure through a proxy server using basic authentication. Once you've integrated a proxy server with vCommander, you can configure an existing Azure managed system to use the proxy. You can also use a proxy when you add a new Azure subscription as a managed system.

To learn more, see [Connecting a Public Cloud to vCommander through a Proxy Server](#).

Updated documentation website

Our [documentation website](#) has a brand-new look! We've modernized the design and improved the search capabilities. The new site works well on mobile devices too. And it's now easier to access the REST API reference documentation using the REST link in the documentation site header.



New Supported Platforms

- Kubernetes is now supported as a cloud platform.
- vSphere 6.7 is now supported as a cloud platform.
- VMware Cloud on AWS, a service that allows you to provision and run your vSphere environment on AWS hardware, is now supported. vCommander can manage VMware vCenter servers, VMs and virtual service components on VMware Cloud on AWS.

For the full list of supported platforms, see [System Requirements](#).

REST API Enhancements

For this release, functionality has been added to the vCommander REST API in a number of areas.

REST API v3 enhancements include member management, provisioning automation, workflow definitions, AWS key-pair credentials, a multi-tenant API and more. For more details, see the REST API v3 documentation included in the online help for vCommander.

REST API v2 enhancements include the ability to manage placement attributes and add Azure managed systems. The REST API PowerShell client version 2.9 is compatible with vCommander 7.0 and higher.

[Download the v2 REST API PowerShell client and documentation.](#)

System Requirements

This section provides information on software, hardware and port requirements, as well as supported third-party integrations. See also [Changes to system requirements](#).

In this section:

- [Software requirements](#)
- [Hardware requirements](#)
- [Network requirements](#)
- [Account on each managed system](#)
- [Third-party integrations](#)

Software requirements

Virtualization and Cloud Platforms Supported	<ul style="list-style-type: none"> • VMware vSphere 6.7, 6.5, 6.0 (see Notes) • Amazon Web Services • Microsoft Azure • Kubernetes • Microsoft® Hyper-V System Center Virtual Machine Manager (SCVMM) 2016 (see Notes) • VMware Cloud on AWS (see Notes)
Operating Systems Supported for vCommander Installation	<ul style="list-style-type: none"> • Microsoft Windows Server 2016 • Microsoft Windows Server 2012 R2 • Microsoft Windows Server 2012 • Microsoft Windows Server 2008 R2 or higher
Languages Supported	<ul style="list-style-type: none"> • English
Recommended Databases	<ul style="list-style-type: none"> • Microsoft SQL Server 2016 • Microsoft SQL Server 2014 • Microsoft SQL Server 2012 • Microsoft SQL Server 2008 R2
Default Database	<ul style="list-style-type: none"> • PostgreSQL is included with vCommander for evaluation environments
Browser Recommended	<ul style="list-style-type: none"> • Mozilla Firefox latest version
Browsers Supported	<ul style="list-style-type: none"> • Mozilla Firefox latest version • Google Chrome latest version • Microsoft Internet Explorer 11, 10 • Microsoft Edge (experimental)
Network	<ul style="list-style-type: none"> • Gigabit Ethernet Minimum
Licensing	<ul style="list-style-type: none"> • For more information about licensing, please refer to the terms in your license agreement or contact your Embotics representative.

Notes:

- VMware vSphere 6.7 does not support linked clone deployment.
- To manage SCVMM 2016, vCommander must be running on Windows 2016.

- VMware Cloud on AWS is service that allows you to migrate, provision and run your vSphere environment on AWS hardware. vCommander can manage vCenter running on VMware Cloud on AWS.
- When vCommander is installed, an application called Erlang OTP is also installed, and it will appear in the list of installed programs on the vCommander host. Erlang OTP should not be uninstalled.
- To use Internet Explorer 10, you must edit the security configuration in new installations of vCommander. To learn how to enable the use of Internet Explorer 10 with vCommander, see the Knowledge Base article [Modifying vCommander SSL Ciphers](#).

Hardware requirements


The following table provides vCommander deployment tiers based on typical use. See [Scaling Embotics vCommander Hardware Requirements](#) for more details. You can also contact Embotics Support (support@embotics.com) to discuss requirements, should you have any questions or unique configurations.

Profile	Description	Base Requirements
Evaluation	A deployment used to evaluate vCommander's feature set with fewer than 100 VMs, supporting fewer than five concurrent users, with infrequent reporting. It won't grow significantly beyond original occupancy, and it's not expected to be upgraded to production.	<ul style="list-style-type: none"> • 2 vCPU / 2.0 GHz dual core • 12.0 GB memory (for default Postgres database) or 8.0 GB memory (for Microsoft SQL Database server) • Approximately 1.0 GB disk space (application installation) • Minimum 4.0 GB disk space for database • Default Postgres database (Microsoft SQL Database server recommended)
Small	A production deployment for static environments of fewer than 500 VMs, supporting fewer than 10 concurrent users, with infrequent reporting.	<ul style="list-style-type: none"> • 2 vCPU / 2.0 GHz quad core • 8.0 GB Memory • Approximately 1.0 GB disk space (application installation) • Dedicated application server • Microsoft SQL Database (remote database server recommended) • Minimum 6.0 GB disk space (data partition) for database
Medium	A production deployment for dynamic environments with fewer than 1500 VMs, supporting fewer than 30 concurrent users, with frequent reporting.	<ul style="list-style-type: none"> • 2 vCPU / 2.0 GHz quad core • 10.0 GB Memory • JVM memory increased to 6 GB • Approximately 1.0 GB disk space (application installation) • Dedicated application server • Remote Microsoft SQL Database server • Minimum 12.0 GB disk space (data partition) for database • DB data file (mdf) and log file (ldf) stored on separate disks

Profile	Description	Base Requirements
Enterprise	A production deployment for dynamic environments with more than 1500 VMs, supporting more than 30 concurrent users, with frequent reporting.	<ul style="list-style-type: none"> • 2 to 4 vCPU / 2.0 GHz quad core • 12.0 GB Memory (or greater) • JVM memory increased to 8 GB • Approximately 1.0 GB disk space (application installation) • Dedicated application server • Remote Microsoft SQL Database server • Minimum 20.0 GB disk space (data partition) for database • SAN backing for database files

vCommander VM Access Proxy hardware requirements

Minimum requirements:

- 2 CPUs
 -  The higher the number of CPUs available, the more concurrent connections the VM Access Proxy can handle.
- 4 GB Memory
- 10 GB disk space

The template archive size is approximately 2.5 GB.

Network requirements

The following ports are used by the various vCommander components. You configure some of these ports during installation, and you can also configure ports after installation using the vCommander Control Panel. Certain ports can be configured only through a system property. For more information, contact support@embotics.com.

IMPORTANT: To protect the security of the vCommander system, all ports must be firewalled, with the exception of ports that are required to be inbound.

-  Where the Direction is outbound, this implies a corresponding inbound connection to the target.

Network Requirements - Basic Operations

Connection	Ports	Protocol	Direction	Description
vCommander Webserver	443	TCP	Inbound	Access to vCommander admin console, Service Portal and REST API.
vCommander Microsoft SQL Server	1433	TCP	Outbound	Access to the vCommander database. Additional ports may be required depending on the configuration of your SQL server.
vCenter	443	TCP	Outbound	Communications with individual vCenters or their external Platform Services Controllers.
vCenter Hosts	443	TCP	Outbound	Access to the vCenter hosts for VM Guest OS file copy operations.
Amazon Web Services	443	TCP	Outbound	Communications with Amazon Web Services API.

Connection	Ports	Protocol	Direction	Description
Microsoft Azure	443	TCP	Outbound	Communications with Microsoft Azure API.
Kubernetes	443	TCP	Outbound	Communications with Kubernetes API.
Windows Guest OS Features	135 139 445	TCP	Outbound	Access to Windows VMs for issuing WMI commands and file copy operations.
Linux Guest OS Features	22	TCP	Outbound	Access to Linux VMs for issuing SSH commands.
Datastore Scanning	443	TCP	Outbound	Access to VMware hosts through HTTPS to collect file layout.
Legacy Datastore Scanning	22	TCP	Outbound	Access to VMware hosts through SSH to collect file layout. Only used when HTTPS access is not available.

Network Requirements - Authentication

Connection	Ports	Protocol	Direction	Description
Kerberos Key Distribution Center	88	TCP	Outbound	Access to authenticate against an Active Directory or LDAP server.
Active Directory Domain Controller for Remote LDAP Traffic	389	TCP UDP	Outbound	Access to authenticate against an Active Directory or LDAP server.
Active Directory Domain Controller for Remote Global Catalog Traffic	3268	TCP	Outbound	Access to query the global catalog of an Active Directory or LDAP server.
Active Directory Domain Controller for Remote Secure LDAP Traffic	636	TCP	Outbound	Access to authenticate against a secure Active Directory or a secure LDAP server.
Active Directory Domain Controller for Remote Secure Global Catalog Traffic	3269	TCP	Outbound	Access to query the global catalog of a secure Active Directory or secure LDAP server.

Network Requirements - Optional

Connection	Ports	Protocol	Direction	Description
Splunk Server	8089	TCP	Outbound	Communications with Splunk server for retrieval of guest OS performance metrics.
BlueCat™ Server	80	TCP	Outbound	Communications with BlueCat™ IP address management server for addressing assignments.

Network Requirements - Client Connections

All of these connections go from the client browser to the respective servers.

Network Requirements - Advanced Configuration

Connection	Ports	Protocol	Direction	Description
VM Access Proxy Appliances - Web Server	443	TCP	Inbound	Publishing listener for WebMKS open console sessions.
VM Access Proxy Appliances - Web Server	8443	TCP	Inbound	Publishing listener for RDP, VNC, SSH and plug-in-based open console sessions.
VM Access (Hyper-V Console)	2179	TCP	Outbound	Access to remote control VMs using the Hyper-V console.

Guest OS scanning port requirements

Guest OS scanning of Windows VMs requires firewall rules to handle a dynamic range of ports that are opened for the response when vCommander queries the VMs on TCP port 135. To avoid opening a large

range of high ports, refer to the following Knowledge Base articles for instructions on how to configure the Windows Firewall to enable these ports:

- [Configuring Windows for Guest OS Scans Using Group Policy](#)
- [Configuring Windows for Guest OS Scans](#)

Account on each managed system

vCommander requires an administrative account on each managed system. The account must have full administrative access on the entire managed system. Administrator privileges are required for a number of functions that vCommander performs, including retrieving VM and infrastructure information, managing VM identity, powering VMs on and off, and other policy actions.

Embotics recommends that you create a uniquely identifiable administrative account on each managed system (for example, "Embot"). Creating a unique account name allows you easily to track vCommander commands sent to the managed system by vCommander or by vCommander users.

-  vCommander doesn't make use of VMware's Linked Mode feature. vCommander communicates with each vCenter directly.

Third-party integrations

The following table provides a list of third-party software that can be integrated with vCommander, including supported versions where applicable.

Integration Category	Supported Systems and Protocols	Integration Type
Authentication	Active Directory®	Bundled
	LDAP	Bundled
	SAML2 WebSSO	Bundled
	Windows SSO	Bundled

Integration Category	Supported Systems and Protocols	Integration Type
Configuration Management and Application Deployment/Automation	Chef™ 12.17	Bundled
	Puppet™ Enterprise 2018.1.3	Bundled
	SCCM 2012 R2	Scripted
	Jenkins CI: Inbound integration	Additional download required
	Jenkins CI: Outbound integration	Additional download required
	ServiceNow or ServiceNow Express, with REST API access	Scripted
	Zerto Virtual Manager (ZVM) Replication 4.5u1 (vCenter only)	Scripted
	Docker 1.2	Scripted
	vCommander REST API plus scheduled workflows	Additional download required
	vCenter metadata synchronization, for all vCenter versions supported by vCommander	Scripted
	Ansible 2.4	Additional download required
	Terraform 0.11.x	Additional download required
IPAM	BlueCat™ IPAM 4.1	Bundled
	phpIPAM 1.3.1	Scripted
	Infoblox 8.1.2	Scripted
Application Monitoring	Splunk® 7.1, 7.0, 6.2, 6.1 (with HTTPS protocol)	Bundled
Notification	SNMP 2	Bundled
	SMTP	Bundled
Backup	Veeam Backup & Replication 9.0, 8.0	Additional download required
Workflow Automation	vCommander REST API v3	Bundled
	vCommander REST API v2 client for PowerShell 4, 3 with .NET Framework 4.5 or higher	Additional download required

Upgrade Notes

Supported upgrade paths

Consult the following table to see whether a direct upgrade from your currently installed version is supported.

Current installed version	Direct upgrade supported to Release 7.0.2
7.0.1	Yes
7.0 Beta	No
6.1.x	Yes
6.0.2	Yes
6.0.1	No
5.7.x	No
5.6.x and earlier versions	No See the Knowledge Base article What Upgrade Paths are Supported? for instructions on how to upgrade from earlier versions.

Changes to system requirements

The base memory requirements for the default Postgres database in an Evaluation deployment has changed from 8 GB to 12 GB. See also [Deprecated and Removed Features and Platforms](#).

Changes affecting upgrading users

Datastore Placement configuration in new location

As part of the Intelligent Placement feature, the Datastore Placement configuration has been moved from the Provisioning Configuration tab to the new Intelligent Placement tab.

Getting Started | **Intelligent Placement** | Service Catalog | Form Designer | Approval Workflow | Provisioning Configuration

Intelligent Placement

Intelligent Placement ensures that service requests are deployed to the best destination. Configure a placement strategy by deciding what factors are most important to you and how placement decisions are made. Configure placement attributes to define the capabilities of a deployment destination and the requirements of a service.

Placement Strategy | Placement Attributes

Placement Priority

Select the priority for determining the best deployment destination:

- 1. Placement Attributes
- 2. Quota
- 3. Cost

Use placement attributes to select a destination based on service requirements and destination capabilities.

Datastore Placement

Prevent deployment when datastore is more than % full.

Datastore Filling Strategy:

Calculate disk size for placement using:

[Help](#) [Save](#)

To learn more, see [Configuring a Global Placement Strategy](#).

New Service Request form has an additional page

As part of the Multi-Cloud Catalog feature, the new service request form now has two pages in both vCommander and the Service Portal. The service-level form and the component-level forms now appear on separate pages. This change was made to ensure that the destination can be determined before component-level form elements are displayed. When a multi-cloud service (or any other service) is requested, the component-level request form displays only those form elements applicable to the target destination. For example, if the target destination is on AWS, the component form displays the Instance Type form element, but if the target destination is on VMware, the component form displays the CPU and Memory form elements. If the component form is empty, the component form page is not displayed. Legacy (non-blueprint) forms also consist of two pages.

To learn more, see [Adding a Multi-Cloud Service to the Catalog](#).

Credentials now have a unique Name property

All credentials now have a unique Name property, so that credentials with the same username can be distinguished more easily in the user interface. During upgrade, unique names are automatically generated for any existing credentials. For Username/Password and RSA Key credentials, if the credential has a description, the auto-generated name is created by appending a unique number to the value for the Description field. If the credential doesn't have a description, the auto-generated name is created by appending a unique number to the value for the Username field. For Key Pair credentials, the auto-generated name is created by appending a unique number to the value for the Remote Key Pair Name field. You can edit these auto-generated names after upgrade.

To learn more, see [Managing Credentials](#).

Managed System Name property is now distinct from Managed System Address

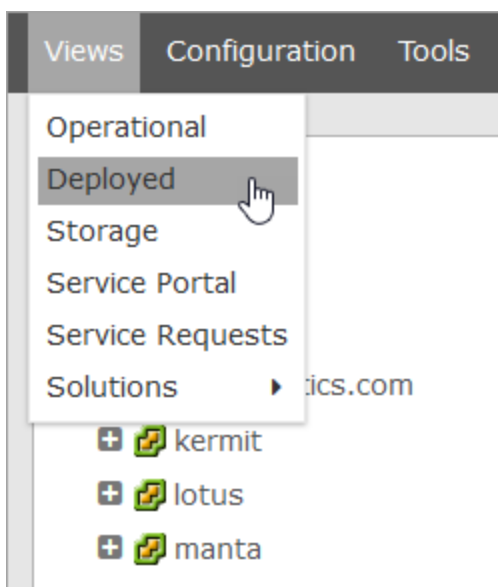
In previous releases, only public cloud managed systems had a Name property. Now all supported managed system types have a friendly name as well as an address. During upgrade, the Name field for all vCenter and SCVMM managed systems is automatically populated with the value for the Host field, but you can edit this value as appropriate after upgrade.

Scripting note: The vCommander variable `#{target.managedSystem.name}` now returns the friendly name for all managed system types. If you do edit the value for the Name field for vCenter and SCVMM managed systems, and you have scripts using the variable `#{target.managedSystem.name}`, you should edit your scripts to use the variable `#{target.managedSystem.address}` instead.

To learn more, see [Adding a Managed System](#).

Change to the VMs and Templates view

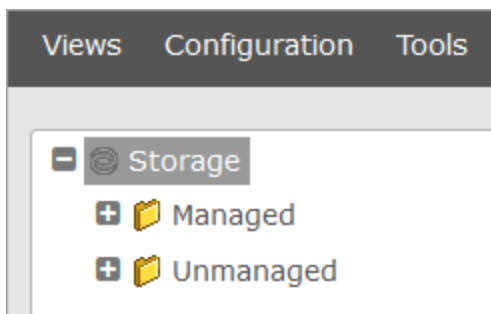
The **VMs and Templates** view, accessible from the vCommander Views menu, is now the **Deployed** view.



To learn more, see [vCommander Views](#).

Changes to the Datastore view

The Datastore view, accessible from the vCommander Views menu, is now the **Storage** view. The **In Inventory** folder is now the **Managed** folder, and the **Out of Inventory** folder is now the **Unmanaged** folder.



To learn more, see [vCommander Views](#).

Additional Stack Costs renamed to Additional Costs

The **Additional Stack Costs** custom attribute has been renamed **Additional Costs**, because it's now also used for Amazon Marketplace AMIs.

To learn more, see [Using Custom Attributes to Add Infrastructure Metadata](#).

Change request forms now target either inventory or managed systems

As part of the new ability to submit a change request on a managed system, when you create a change request form, you now need to specify whether the form targets managed systems or inventory.

This change ensures that when a vCommander user tries to submit a change request on a managed system, they do not see the default Decommissioning form. After upgrading to this release, all existing change request forms are automatically given the type Inventory.

To learn more, see [Customizing Service Request Forms](#).

Storage-ARM form element renamed to Storage - Azure

The **Storage-ARM** form element available in the service catalog blueprint Form tab has been renamed **Storage - Azure**, for clarity.

To learn more, see [Adding Azure Services to the Catalog](#).

Deprecated and Removed Features and Platforms

This section lists features and platforms that have been removed or are deprecated. Support for deprecated features and platforms will be removed in a future release. If you need more information about any of the deprecated or removed features, contact support@embotics.com.

- **Microsoft Azure Classic:** Support for Azure Classic (ASM) as a cloud platform is removed in Release 7.0.
- **Microsoft Hyper-V SCVMM 2012:** Support for SCVMM 2012 as a cloud platform is removed in Release 7.0.
- **VMware vCenter 5.5, 5.1 and 5.0:** Support for VMware vCenter 5.5, 5.1 and 5.0 as cloud platforms is removed in Release 7.0.
- **vCommander Dashboard:** The vCommander Dashboard option in the vCommander Views menu has been removed in Release 7.0.
- **Projected cost model option in Reports:** The Projected option for the Cost Model setting in the VM Billing Report and the VM Comparative Economics Report is deprecated in Release 7.0.
- **User-specific component forms for new service requests:** With the introduction in 5.7 of the blueprint service catalog model, user-specific component forms for new service requests (that is, component forms created in the Form Designer) are deprecated and will be removed in a future release.
- **End of Life Policy, Suspect Policy and Approval Policy:** The End of Life policy, Suspect policy and Approval policy and the relevant VM states are deprecated and will be removed in a future release.

Issues Resolved in This Release

Issue	Description and Resolution
25773	Invalid tag value may be passed to AWS, causing issues with RDS security groups <i>Because AWS RDS Security Groups don't support commas in tag values, synchronizing vCommander custom attributes with AWS tags could cause an issue where a stack containing an RDS security group would roll back. Before pushing tags to AWS, vCommander now replaces commas with spaces in the values of tags prefixed with "vcmdr". We've added an advanced system property, <code>embotics.mediator.aws.tagger.charactercleanup</code>, to configure which characters are replaced with spaces in "vcmdr" tags before pushing tags to AWS. See Advanced Configuration through System Properties to learn how to configure system properties.</i>
25753	User without access rights may be unable to view service request that contains only custom components <i>A user without access rights on any managed system can now retrieve a service request that contains only custom components.</i>
25740	REST API v2: Updating blueprint for CloudFormation template that modifies IAM roles may cause deployment failures <i>Using REST API v2 to update a service catalog blueprint for a CloudFormation template which modifies IAM resources now preserves configured properties as expected.</i>
25670	SCVMM VM may not have valid NIC or IP address <i>Deployed VMs on SCVMM would sometimes not have valid NICs and IP addresses. This issue has been addressed.</i>
25657	Account Details dialog may close when Name column is expanded <i>The Account Details dialog now permits users to expand the Name column.</i>
25628	General pane may display incorrect number of services for Deployed View folder <i>The General pane for a folder in vCommander's Deployed View now displays accurate numbers.</i>
25529	REST API v2: Unable to retrieve published service when Instance Type form element appears on blueprint form <i>The REST API v2 now allows retrieval of a published service when the Instance Type - AWS or Instance Type - Azure form element appears on the blueprint form.</i>
25489	Completion workflow may not be assigned to correct change request form <i>Reassigning the completion workflow for a change request form now works as expected.</i>
25487	Customization spec may not run for multi-cloud services <i>Customization specs now run as expected for multi-cloud services.</i>
25479	Network zones for invalid destinations may still be available for selection on request form <i>When a destination is marked invalid because it does not provide placement attributes required by the requested service, network zones assigned to the invalid destination can no longer be selected on the request form.</i>
25435	May be unable to use time-based filters for search or displayed lists <i>Time-based filters can now be used to restrict search results and displayed lists as expected.</i>
25434	Member of AD group may be unable to add or modify policies <i>When an Active Directory group has been added as a vCommander user, members of that group can now add and modify policies as expected.</i>
25423	Error when creating or editing policies for user without access rights on all managed systems <i>A vCommander user who has the Superuser or Enterprise Admin role but doesn't have access rights on all managed systems can now create and edit policies as expected.</i>

Issue	Description and Resolution
25299	Service Portal link in vCommander Views menu may not work if service access is restricted to specific host name or IP <i>When you restrict Service Portal access to a specific host name or IP address on the Service Access tab in vCommander, you can use the Views > Service Portal menu option as expected.</i>
25239	Quantity form element value may not be respected for Service Portal user <i>A Service Portal user can now use the Quantity form element to request multiple services as expected.</i>
25223	Conditional step in workflow module may not run <i>Workflow modules containing conditional steps now run as expected.</i>
25085	Switching the quota type may result in blank Organization Quota page <i>In the Configure Organization wizard, when you choose either Global Quota or Destination Quota on the Quotas page, and then select Cost Quota or Resource Quota for the Quota Type on the Organization Quotas page, the page is displayed as expected.</i>
25009	LDAP user DN containing escape character may cause inability to log in <i>When vCommander is integrated with LDAP, if a user's distinguishedName includes an escape character (for example, distinguishedName=CN=level \, two,OU=level1,DC=omega,DC=pv), the user is able to log in as expected.</i>
24634	Conditional workflow step may treat numeric custom attribute value as null <i>A workflow step set to run only if a custom attribute has a value now runs as expected when the custom attribute has a numeric value.</i>
24581	Permissions error may be displayed in vCommander <i>When a user with no access rights on parts of the virtual infrastructure logs into vCommander, permissions errors are no longer displayed in the UI.</i>
24476	REST API v2: Get-VMChangeRequestParams requires permission to modify ownership <i>Connecting to the REST API v2 using Connect-Client2 with a user that does not have the Modify Ownership Role and calling Get-VMChangeRequestParams now returns parameters as expected.</i>
24463	Service Portal user may see recommendations for removed managed system <i>When a managed system is removed from vCommander, related recommendations are no longer displayed in the Service Portal.</i>
24459	Cost columns may be sorted incorrectly when configuring member cost quota <i>Columns displaying costs are now sorted correctly when configuring quota for organization members.</i>
24297	Invalid SCVMM deployment destination may prevent VM deployment <i>When one SCVMM deployment destination is invalid, it's still possible to deploy to another SCVMM deployment destination as expected.</i>
24219	Unable to specify username for Open Secure SSH Session with Key Pair <i>We've added an advanced system property, <code>embotics.ssh.aws.keypair.user</code>, to allow you to specify the username for the Open Secure SSH Session with Key Pair command. By default, vCommander uses the <code>centos</code> user for CentOS instances, <code>root</code> for Debian instances, <code>ubuntu</code> for Ubuntu instances, and <code>ec2-user</code> for all other instances. See Advanced Configuration through System Properties for more information.</i>
23705	Automated deployment may fail if one datastore out of several is over threshold <i>For a deployment destination that targets multiple datastores, if only one datastore is over the configured threshold, the deployment destination now remains valid and permits deployment to it.</i>
23515	User name used to open remote connection does not appear in audit events <i>The Open Remote Session event created when a user opens a remote VM connection now includes the name of the user that opened the connection.</i>

Issue	Description and Resolution
22711	Failure to tag VMs in AWS stack may cause service request failure <i>If synchronization of AWS tags is configured in vCommander, a failure to tag VMs in a newly deployed stack no longer causes the service request to fail.</i>
22687	Change request form may attempt to validate unchanged values <i>Previously, requesting a resource change for a VM with existing resource values that exceed the values permitted by the change request form would result in a validation error. For example, if a VM has 2 GB of RAM, but the change request form allows only values up to 1 GB, when a requester attempts to change a different resource value, such as storage, the request form would display an error for the memory value. Now, the change request form does not attempt to validate values for resource settings that the requester hasn't changed.</i>
22685	VM Population Trending Report advanced filter limited to 50 managed systems <i>The advanced filter for Managed System in the VM Population Trending Report no longer limits the number of managed systems displayed for selection.</i>
22635	Fencing Configuration page in Edit Service wizard may not reflect component name change <i>When you edit the name of a component in the service catalog, the Fencing Configuration page now properly displays the updated component name.</i>
21971	Automated deployment failure may cause subsequent failures with error "The requested name is already in use" <i>If the VM naming convention is not configured to assign unique VM names, an automated deployment failure no longer causes VM naming issues for subsequent deployments.</i>
20882	Shutdown Guest OS command may fail for vRouter with third-party guest tools <i>It's now possible to shut down the guest OS for a vRouter for fenced networks if the Shutdown Guest OS command is supported by the installed third-party guest tools.</i>

Issues resolved in previous 7.0.x releases

Issue	Description and Resolution
24535	Latest Azure public cloud templates not available in vCommander Public Images folder <i>The Public Images folder in vCommander's Deployed view for Azure has been updated to include the latest Windows and Linux OS templates.</i>
24514	Unable to access Service Portal after restricting access to specific URL <i>Restricting the Service Portal access to a specific URL now works as expected.</i>
24460	Possible to run context-menu command on incorrect item in vCommander list <i>Because running a context-menu command required first selecting the item with left-click, and then using right-click to bring up a context menu, it was possible to inadvertently run a command on the wrong item. Right-clicking an entry in a vCommander list, such as the Virtual Machines tab, now also selects it.</i>
24363	Clicking a VM in Service Portal's VMs and Services list may sometimes take you to Dashboard <i>Clicking a VM in the VMs and Services list now takes you to the VM's details page as expected.</i>
24296	Expiry date may not be updated on copied service request <i>When a service request with an expiry date in the past is copied, and the requester specifies a date in the future, the new expiry date was not always used, leading to possible deployment failure. The user-specified expiry date is now used for copied service requests as expected.</i>
24260	Service Portal user may get logged out when user deletes a scheduled task <i>The Service Portal user is no longer logged out after deleting a scheduled task.</i>

Issue	Description and Resolution
24240	SAML login not available <i>SAML SSO is supported in the 7.0 release.</i>
24230	Opening an SSH Session with a Key Pair results in error with VM Access Proxy version 3.2 <i>The VM Access Proxy version 3.2 supports opening an SSH session with a key pair.</i>
24176	REST API v3: Issue with role assignment <i>A user created in REST API v3 with a Service Portal role is now assigned the appropriate permissions, and attempting to create a user without specifying a role now returns an error as expected.</i>
24162	Custom External Page not displayed in Service Portal <i>For Service Portal users, a configured Custom External Page is displayed as expected.</i>
24119	Email may not be sent for scheduled Cluster Capacity report <i>Emailed reports are now sent as expected when a Cluster Capacity report is scheduled.</i>
24109	Cost calculations may be incorrect for recurring charges and upfront instance reservations in AWS <i>AWS accounts with All Upfront costs and recurring charges are now handled as expected.</i>
24051	May be unable to update performance data and run VM Performance Trending report for Azure VMs <i>Running the Update Performance command and running the VM Performance Trending report for an Azure VM now produces a report containing performance data.</i>
23974	Service Portal user without Show Cost permission may be able to see VM recommendation costs <i>VM recommendation costs are no longer displayed for Service Portal users without permission to view costs.</i>
23943	NIC may not be displayed in Clone VM wizard when cloning a VM displayed in a list <i>Previously, when right-clicking a VM in a list and running any of the cloning commands, the clone wizard did not always display the NIC, even though the NIC was assigned properly during deployment. The correct NIC is now displayed on the Resources page of the wizard.</i>
23674	Synchronization of an AD group may fail without clear error message when timeout is exceeded <i>When synchronization of an AD group fails because the timeout was exceeded, the vCommander log now clearly indicates the reason.</i>
23558	Saved Search incorrectly labeled Report in Tools > Scheduled Tasks menu <i>The Tools > Scheduled Tasks menu incorrectly listed the Saved Search item as Report, so that the menu contained two Report items. The menu now includes both Report and Saved Search.</i>
23534	Service Fulfillment Report pie chart makes it hard to distinguish service levels <i>The pie chart in the Service Fulfillment Report now uses different colors to indicate different service levels.</i>
23438	Organization Manager may be unable to delete user from organization <i>Organization managers can now delete users in the Service Portal as expected.</i>
23393	Unable to add a domain user in the Service Portal <i>Previously, attempting to add a domain user in the Service Portal resulted in the creation of a local user. Adding a user in the Service Portal using the format joe@xyz.com or xyz.com/joe now creates a domain user as expected.</i>
23385	May be unable to delete a completion workflow <i>Certain completion workflows could not be deleted in an earlier version. Completion workflows can now be deleted successfully.</i>

Issue	Description and Resolution
23066	In the Report Generator, VM names in the VM Location list are truncated <i>A horizontal scrollbar now allows you to see the full names of all VMs as you expand folders in reports such as the VM Performance Trending report.</i>
23051	Login credentials difficult to distinguish in drop-downs and tables <i>All credentials now have a Name property to allow administrators to distinguish them in the UI.</i>
22843	Modifying the CSS to change Service Portal colors does not persist after upgrade <i>Modified .css files for Service Portal colors now persist after upgrade.</i>
22830	Task may fail when removing very large stack <i>The timeout for removing a stack has been increased to 60 minutes, and a new system property, <code>embotics.mediator.aws.deletestack.timeout</code>, allows configuration of this timeout. See Advanced Configuration through System Properties for more information.</i>
22814	Service Portal permissions assigned to Security Group aren't inherited by users in that Security Group <i>Service Portal permissions are now properly inherited by users.</i>
22776	May be unable to navigate to Tasks page from Service Portal Dashboard <i>Using the left menu to navigate to the Service Portal Tasks page from the Dashboard now works as expected.</i>
22762	Unable to set expiry group for virtual service <i>An expiry group can now be set for virtual services as expected.</i>
22757	Recommendations page may be inaccessible from Performance Summary <i>The Recommendations page is now available using links on the Performance Summary page.</i>
22730	Insufficient number of allowed characters for CPU Count form element <i>The maximum character count for the CPU Count has been increased from 30 to 50.</i>
22729	CPU Counts not sorted properly on Service Portal request form <i>CPU Count values are now listed numerically.</i>
22584	Managed systems may become disconnected in the rare situation where datastores are removed while vCommander is updating datastore usage <i>Managed systems now remain connected when datastores are removed.</i>
22461	Error message indicates incorrect file size when uploading CloudFormation template greater than 51,200 bytes <i>The size limit for the CloudFormation template has been fixed, and the error message is now correct.</i>
22176	Open SSH with Keypair may be unavailable for AWS instances <i>It's now possible to open an SSH session using a keypair for AWS instances as expected.</i>
22120	In Chrome, some widget titles aren't displayed properly on sample Service Portal theme <i>The sample theme provided for the Service Portal now displays as expected in Chrome.</i>
21846	Host/IP URL validation fails when using .corp domain for Chef server <i>Domains other than .com can now be used when integrating with a Chef server.</i>
21614	REST API v2: getRequestedServices does not work with Connect-Client2 Service Portal user authentication <i>The REST API v2 call <code>getRequestedServices</code> now works with the multi-tenant API <code>Connect-Client2</code>.</i>
21597	Log files may grow larger than configured size <i>The log file rollover now keeps file size within configured limits.</i>

Issue	Description and Resolution
21547	Failed service requests and components may not have the correct state <i>The "Failed" state for service requests and requested service components is now assigned when appropriate.</i>
21453	Unable to access variables for name and user ID of user initiating a command workflow <i>The variables <code>#{request.requester.name}</code> and <code>#{request.requester.userId}</code> can now be used to return the user name and user ID of the user initiating a command workflow.</i>
21365	Rejecting a service request may not update the state of the currently running service-level completion workflow to "Rejected" <i>Service-level completion workflows now show the "Rejected" status as appropriate.</i>
21313	REST API v2 Update-CustomAttribute: Unable to add custom attribute child value to a sublist with existing children <i>The REST API v2 call <code>Update-CustomAttribute</code> now functions as expected.</i>
21159	Google Chrome version 58 doesn't support Common Name in self-signed certificates <i>The self-signed certificate for the VM Access Proxy now includes the Subject Alternative Name extension.</i>
21156	Variable returning Display Name for Chef integration doesn't support values with periods <i>When the Display Name field for a Chef integration includes periods, such as <code>xyz.example.com</code>, the variable <code>#{integrations.chef['server_address'].address}</code> now validates properly.</i>
21093	VM Billing Report date handling may differ from that of REST API v2 <i>Retrieving billing records using the REST API v2 now retrieves records for the same period as the VM Billing Report when the same dates are specified.</i>
18032	Can't set Optimal and Marginal level to minutes in the Service Fulfillment Report <i>You can now choose Minutes in the Optimal Service and Marginal Service drop-down lists for the Service Fulfillment Report.</i>

Known Issues

Issue	Description and Solution
25826	<p>Clicking Deploy at component level of Request Details dialog may prevent deployment of other components in multi-service request</p> <p>If you click Deploy at the Component level of the Request Details dialog for a multi-service request, the Deploy button may not be visible for other components in the request, and the service may remain in the In Progress state.</p> <p><i>To manually deploy a multi-service request, click Deploy at the Service level, rather than at the Component level.</i></p>
25789	<p>REST API v2: Unable to request service if Instance Type element appears on blueprint form for Azure public image or Amazon Marketplace AMI</p> <p>If the Instance Type - Azure element appears on the blueprint form for an Azure public image component, using the REST API v2 to request the service may fail. Likewise, if the Instance Type - AWS element appears on the blueprint form for an Amazon Marketplace AMI component, using the REST API v2 to request the service may fail.</p> <p><i>Remove the Instance Type - Azure or Instance Type - AWS element from the blueprint form.</i></p>
25771	<p>Deleting a parent organization may remove deployment destination assignments for child organizations</p> <p>When you delete a parent organization, any deployment destinations assigned to its child organizations may become unassigned.</p> <p><i>Edit the deployment destinations to reassign them to the proper organizations.</i></p>
25386	<p>Remove Kubernetes clusters from vCommander before upgrade from version 7.0.1</p> <p>To support Rancher-provisioned Kubernetes clusters, vCommander has changed how Kubernetes clusters are handled in version 7.0.2. As a result, Kubernetes clusters added in version 7.0.2 or higher may collide with clusters added in version 7.0.1.</p> <p><i>If you added one or more Kubernetes clusters to vCommander 7.0.1, to prevent collisions and possible data corruption, remove these clusters prior to upgrade. You can re-add them after upgrade.</i></p>
25106	<p>Unable to create RSA Key credentials from within certain workflow steps</p> <p>Certain workflow steps that target the guest OS, such as the Execute SSH Command workflow step, allow you create Username/Password credentials, but not RSA Key or Key Pair credentials.</p> <p><i>If your workflow step requires RSA Key or Key Pair credentials, for example to access an Amazon EC2 Linux instance, create the required credentials from the Configuration > Credentials page first. Then, when you add the workflow step to a command workflow or completion workflow, you can select the required credentials from the Credentials list.</i></p>
24773	<p>Upgrade may remove customized list of public Azure images</p> <p>During upgrade to this release, changes to the file <code>arm-images.xml</code> are not preserved.</p> <p><i>As is recommended with all customized configuration files, back up your customized file before upgrading. After upgrading, merge your customizations into the new <code>arm-images.xml</code> file in the vCommander installation directory, and restart the vCommander service.</i></p>
24428	<p>Linked clone deployments not supported for vCenter 6.7</p> <p>Due to changes in VMware vSphere 6.7, linked clone deployments are not supported for vCenter 6.7 managed systems.</p> <p><i>Linked clone deployments for vCenter 6.7 will be supported in a future vCommander release.</i></p>
23056	<p>WebMKS not supported for direct console connections to vCenter 6.0 VMs on ESXi 5.5</p> <p>The WebMKS method isn't supported for direct (non-proxied) console connections to vCenter 6.0 VMs on ESXi 5.5.</p> <p><i>Use the VMRC method instead of the WebMKS method to open console connections in this environment. Contact support@embotics.com to learn how to edit an advanced system property that controls the preferred connection method.</i></p>

Issue	Description and Solution
21870	<p>Deploying the VM Access Proxy disables the "Synchronize guest time with host" option</p> <p>When you deploy the VM Access Proxy, the "Synchronize guest time with host" option is disabled.</p> <p><i>In vCenter, right-click the VM Access Proxy deployment and select Edit Settings. On the VM Options tab (the Option tab in the Thick Client), enable the Synchronize guest time with host option in the VMware Tools panel.</i></p>
21147	<p>Google Chrome version 58 doesn't support Common Name in self-signed certificates</p> <p>Chrome Version 58 now requires a Subject Alternative Name instead of the Common Name used in the self-signed certificate delivered with vCommander.</p> <p><i>If you're using Chrome version 58, generate a self-signed certificate for vCommander using the Subject Alternative Name. See the Knowledge Base article Trusting a Self-Signed Certificate for more information.</i></p>
21088	<p>Unable to view performance charts for VMs on managed systems running vSphere 6.7 and 6.5</p> <p>Performance charts are not available for vSphere 6.7 or 6.5, as the managed system does not support it.</p> <p><i>Performance Summary information for vSphere 6.7 and 6.5 is still available for vCommander and Service Portal users. Administrators can also view the VM Performance Trending report.</i></p>
19275	<p>Open SSH Session not supported in Chrome and Firefox</p> <p>The commands Open SSH Session and Open SSH Session with Key Pair are no longer supported in Chrome and Firefox due to the discontinuation of support for the Java plug-in (applets) by these browsers.</p> <p><i>Use the VM Access Proxy to open an SSH session.</i></p>
17455	<p>Performance metrics may not be available immediately after upgrade to vSphere 6</p> <p>Attempting to run the Update Performance and Capacity command for a cluster immediately after upgrading to vSphere 6 may fail, because performance metrics are not yet available to vCommander.</p> <p><i>Wait about an hour for vSphere to make performance metrics available, and run the command again.</i></p>
16002	<p>Mouse pointer may not be visible when opening VM console using IE 11 or 10</p> <p>When the WebMKS console connection method is configured, Internet Explorer 11 or 10 users may be unable to see the mouse pointer in the console session.</p> <p><i>To open a console to a Windows VM from Internet Explorer 11 or 10 when using WebMKS, try enabling mouse trails with the shortest option. Or, use the VMRC plug-in method instead of the WebMKS method. For Linux VMs, use the VMRC plug-in connection method. See About the Console Connection Methods to learn how to change the console connection method for HTML5 browsers.</i></p>
15602	<p>Multiple connections in same browser not supported</p> <p>vCommander and the Service Portal don't support multiple connections in the same browser. For example, you can connect to vCommander in both Firefox and Chrome at the same time, but you can't connect to vCommander in two instances of Firefox at the same time.</p> <p><i>Use a different browser to open another session.</i></p>

