

# IaaS Configuration for Physical Machines

vRealize Automation 6.2

**vmware**<sup>®</sup>

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

<https://docs.vmware.com/>

The VMware Web site also provides the latest product updates.

If you have comments about this documentation, submit your feedback to:

[docfeedback@vmware.com](mailto:docfeedback@vmware.com)

Copyright © 2008–2015 VMware, Inc. All rights reserved. [Copyright and trademark information.](#)

**VMware, Inc.**  
3401 Hillview Ave.  
Palo Alto, CA 94304  
[www.vmware.com](http://www.vmware.com)

# Contents

IaaS Configuration for Physical Platforms	7
Updated Information	7
Using the Goal Navigator	8
<b>1 Configuring IaaS</b>	<b>9</b>
Custom Properties in Machine Provisioning, Blueprints, and Build Profiles	9
Order of Precedence for Custom Properties	10
Configuring IaaS Checklist	11
Bringing Resources Under vCloud Automation Center Management	12
Store User Credentials for Endpoints	12
Create an Endpoint for Physical Machines	12
Preparing an Endpoint CSV File for Import	13
Import a List of Endpoints	14
Configure Machine Prefixes	15
Create a Business Group	16
Physical Reservations	17
Physical Reservation Selection	17
Create a Physical Reservation	18
<b>2 Optional Configurations</b>	<b>21</b>
Build Profiles and Property Sets	21
Create a Property Set	22
Create a Build Profile	23
Configuring Reservation Policies	24
Configure a Reservation Policy	25
Cost Profiles	26
Cost Calculation for Physical Machines	26
How Cost Is Displayed	27
Configure a Cost Profile	28
Enabling Remote Desktop Connections	29
Enabling Connections to Machines Using SSH	29
<b>3 Preparing for Provisioning</b>	<b>31</b>
Enabling Visual Basic Scripts in Provisioning	31
Choosing a Provisioning Scenario	32
Preparing for PXE Provisioning	33
Installing vRealize Automation Designer	34
Import Custom PowerShell Scripts	35
Preparing for Linux Kickstart Provisioning	36
Prepare the Linux Kickstart Configuration Sample File	37
Specify Custom Scripts in a kickstart/autoYaST Configuration File	37

- Preparing for SCCM Provisioning 38
  - Create a Software Package for SCCM Provisioning 39
- Preparing for WIM Provisioning 39
  - Reference Machine Requirements for WIM Provisioning 40
  - SysPrep Requirements for the Reference Machine 41
  - Install PEBuilder 41
  - Specify Custom Scripts in a PEBuilder WinPE 42
  - Create a WinPE Image by Using PEBuilder 42
  - Manually Insert the Guest Agent into a WinPE Image 43

## 4 Creating Blueprints 47

- Choosing a Blueprint Scenario 47
- Create a Blueprint for Linux Kickstart Provisioning 48
  - Specify Linux Kickstart Blueprint Information 48
  - Specify Linux Kickstart Blueprint Build Information 49
  - Configure Linux Kickstart Blueprint Machine Resources 50
  - Add Required Properties to a Linux Kickstart Blueprint 50
  - Configure Blueprint Actions 53
- Create a Blueprint for WIM Provisioning 53
  - Specify WIM Blueprint Information 54
  - Specify WIM Blueprint Build Information 55
  - Configure WIM Blueprint Machine Resources 55
  - Add Required Properties to a WIM Blueprint 56
  - Configure Blueprint Actions 60
- Create a Blueprint for SCCM Provisioning 60
  - Specify SCCM Blueprint Information 61
  - Specify SCCM Build Information 62
  - Configure SCCM Machine Resources 62
  - Add Required Properties to an SCCM Blueprint 63
  - Configure Blueprint Actions 66
- Create a Blueprint for PXE Provisioning 66
  - Specify PXE Blueprint Information 67
  - Specify PXE Build Information 68
  - Configure PXE Machine Resources 69
  - Add Custom Properties to a PXE Blueprint 69
  - Configure Blueprint Actions 73
- Publish a Blueprint 73

## 5 Configuring Advanced Blueprint

- Settings 75
  - Applying Reservation Policies 75
    - Add a Reservation Policy to a Blueprint 76
  - Enabling Visual Basic Scripts in Provisioning 76
    - Call a Visual Basic Script from a Blueprint 77
  - RDP Connections 78
    - Configure Connections Using RDP 78
    - Enable Connections Using RDP 79
  - Enable Connections Using SSH 80

Allow Requesters to Specify Machine Host Name	81
<b>6 Managing Infrastructure</b>	<b>83</b>
Managing Resource Usage	83
Resource Usage Terminology	83
Choosing a Resource Monitoring Scenario	84
Endpoint Data Collection	85
Start Endpoint Data Collection Manually	85
<b>7 Monitoring Workflows and Viewing Logs</b>	<b>87</b>
Index	89



# IaaS Configuration for Physical Platforms

---

The Infrastructure as a service (IaaS) feature of VMware vRealize Automation enables the rapid modeling and provisioning of servers and desktops across virtual and physical, private and public, or hybrid cloud infrastructure. This documentation is specifically designed for physical platform integrations with vRealize Automation.

This documentation guides you through the following processes:

- Configuring IaaS features and policies
- Preparing for provisioning
- Bringing resources under vRealize Automation management
- Creating machine blueprints

All of the IaaS configuration steps that you must complete before machine provisioning are included in this document. For information about how to manage provisioned machines, see *Tenant Administration*.

---

**NOTE** Not all features and capabilities of vRealize Automation are available in all editions. For a comparison of feature sets in each edition, see <https://www.vmware.com/products/vrealize-automation/>.

---

## Intended Audience

This information is intended for IaaS administrators, fabric administrators, and business group managers of vRealize Automation. This content is written for experienced Windows or Linux system administrators who are familiar with virtualization technology and the basic concepts described in *Foundations and Concepts*.

## VMware Technical Publications Glossary

VMware Technical Publications provides a glossary of terms that might be unfamiliar to you. For definitions of terms as they are used in VMware technical documentation, go to <http://www.vmware.com/support/pubs>.

## Updated Information

This *IaaS Configuration for Physical Machines* is updated with each release of the product or when necessary.

This table provides the update history of the *IaaS Configuration for Physical Machines*.

Revision	Description
001643-02	Updated <a href="#">“Add Required Properties to a WIM Blueprint,”</a> on page 56 and <a href="#">“Custom Properties for WIM Blueprints,”</a> on page 57.
001643-01	Minor updates made to topics, including <a href="#">“Enabling Connections to Machines Using SSH,”</a> on page 29.
001643	Initial release.

## Using the Goal Navigator

The goal navigator guides you through high-level goals that you might want to accomplish in vRealize Automation.

The goals you can achieve depend on your role. To complete each goal, you must complete a sequence of steps that are presented on separate pages in the vRealize Automation console.

The goal navigator can answer the following questions:

- Where do I start?
- What are all the steps I need to complete to achieve a goal?
- What are the prerequisites for completing a particular task?
- Why do I need to do this step and how does this step help me achieve my goal?

The goal navigator is hidden by default. You can expand the goal navigator by clicking the icon on the left side of the screen.

After you select a goal, you navigate between the pages needed to accomplish the goal by clicking each step. The goal navigator does not validate that you completed a step, or force you to complete steps in a particular order. The steps are listed in the recommended sequence. You can return to each goal as many times as needed.

For each step, the goal navigator provides a description of the task you need to perform on the corresponding page. The goal navigator does not provide detailed information such as how to complete the forms on a page. You can hide the page information or move it to a more convenient position on the page. If you hide the page information, you can display it again by clicking the information icon on the goal navigator panel.



# Configuring IaaS

---

Preparation is required by IaaS administrators, tenant administrators, and fabric administrators to bring resources under vRealize Automation management, allocate resources to users, prepare for provisioning machines, and create machine blueprints.

This chapter includes the following topics:

- [“Custom Properties in Machine Provisioning, Blueprints, and Build Profiles,”](#) on page 9
- [“Configuring IaaS Checklist,”](#) on page 11
- [“Bringing Resources Under vCloud Automation Center Management,”](#) on page 12
- [“Configure Machine Prefixes,”](#) on page 15
- [“Create a Business Group,”](#) on page 16
- [“Physical Reservations,”](#) on page 17

## Custom Properties in Machine Provisioning, Blueprints, and Build Profiles

Custom properties are name-value pairs used to specify attributes of a machine or to override default specifications.

Different custom properties are used for different provisioning methods, types of machines, and machine options. Custom properties can be used as described in the following examples:

- Specify a particular type of guest OS
- Enable WIM-based provisioning, in which a Windows Imaging File Format (WIM) image of a reference machine is used to provision new machines
- Customize the behavior of Remote Desktop Protocol when connecting to a machine
- Register a virtual machine with a XenDesktop Desktop Delivery Controller (DDC) server
- Customize a virtual machine’s system specifications, such as adding multiple hard disk drives
- Customize the guest OS for a machine, for instance, by including specified users in selected local groups
- Enable cleanup of a the Active Directory account of a machine after it is destroyed

Specifying the characteristics of the machines to be provisioned is generally done by adding properties to blueprints and build profiles. You can make custom properties available to multiple blueprints and all business groups by placing them in build profiles.

Any property specified in a blueprint overrides the same property specified in the incorporated build profile. This enables a blueprint to use most of the properties in a profile while differing from the profile in some limited way. For more information, see *Order of Precedence for Custom Properties*.

For example, a blueprint that incorporates a standard developer workstation profile might override the US English settings in the profile with UK English settings. On the other hand, if no appropriate profile is available all the needed properties can be specified in the blueprint itself. This arrangement ensures that the number and complexity of blueprints remain manageable.

At new machine request time, vRealize Automation has not yet allocated a reservation and the compute resource and endpoint are unknown as well. Therefore, only custom properties from a build profile, blueprint and business group are reconciled and presented when the machine is requested.

## Order of Precedence for Custom Properties

When the same property exists in more than one source, a specific order is followed when applying properties to the machine.

You can add custom properties that apply to provisioned machines to the following elements:

- A reservation, to apply the custom properties to all machines provisioned from that reservation
- A business group, to apply the custom properties to all machines provisioned by business group members
- A global or local blueprint, to apply the custom properties to all machines provisioned from the blueprint
- Build profiles, which can be incorporated into any global or local blueprint, to apply the custom properties to all machines provisioned from the blueprint
- A machine request, if you are a business group manager, to apply the custom properties to the machine being provisioned
- The applicable approval policy, if any exist and if advanced approval support is enabled, to require approvers to provide the values to be applied to the machine being approved

The full order of precedence for custom properties is that any property value specified in a source later in the list overrides values for the same property specified in sources earlier in the list. The order is shown in the following list:

- 1 Build profile
- 2 Blueprint
- 3 Business group
- 4 Compute resource
- 5 Reservations
- 6 Endpoint
- 7 Runtime

For vApps, the order is similar, as shown in the following list:

- 1 Build profile, specified on a vApp component blueprint
- 2 vApp component blueprint
- 3 Build profile, specified on a vApp blueprint
- 4 vApp blueprint
- 5 Business group

- 6 Compute resources
- 7 Reservations
- 8 Endpoint
- 9 Runtime specified on a vApp
- 10 Runtime specified on a component machine

Any runtime property takes higher precedence and overrides a property from any source. A custom property is marked as runtime if the following conditions exist:

- The property is marked as Prompt User, which specifies that the user must supply a value for it when requesting a machine. This requires that the machine requestor customize individual characteristics of each machine, or gives them the option of doing so when a default value is provided for the required property.
- A business group manager is requesting a machine and the property appears in the custom properties list on the Properties tab of the Confirm Machine Request page.

Custom properties in reservations and business groups may be applied to many machines so they should be used carefully. Their use is typically limited to purposes related to their sources, such as resource management, line of business accounting, and so on. Specifying the characteristics of the machine to be provisioned is generally done by adding properties to blueprints and build profiles.

Each blueprint of any type can optionally incorporate one or more build profiles and thereby inherit the custom properties in those profiles. Build profiles are especially useful for applying common sets of properties for specific purposes to a wide range of blueprints. For example, your site might want to add a second disk to, customize Microsoft Remote Desktop Protocol behavior for, and enable Active Directory cleanup for a wide variety of machines. If a build profile with the necessary properties is created, it can be incorporated into all of your blueprints, local or global.

When creating and managing build profiles, a fabric administrator can load a number of predefined property sets to add several related properties all at once, instead of one by one.

## Configuring IaaS Checklist

There are required and optional configurations that are performed by IaaS administrators, tenant administrators, and fabric administrators in order to fully implement and customize the IaaS feature of vRealize Automation.

The Configuring IaaS Checklist provides a high-level overview of the sequence of steps required to have a fully functioning IaaS instance.

**Table 1-1.** Configuring IaaS checklist

Task	Required Role
<input type="checkbox"/> Store credentials and create endpoints to bring resources under vRealize Automation management. See <a href="#">"Bringing Resources Under vCloud Automation Center Management,"</a> on page 12.	IaaS administrator
<input type="checkbox"/> Configure the machine prefixes used to create names for machines provisioned through vRealize Automation. See <a href="#">"Configure Machine Prefixes,"</a> on page 15.	Fabric administrator
<input type="checkbox"/> Create at least one business group of users who need to request machines. See <a href="#">"Create a Business Group,"</a> on page 16.	Tenant administrator
<input type="checkbox"/> Create at least one reservation to allocate resources to a business group. See <a href="#">"Create a Physical Reservation,"</a> on page 18.	Fabric administrator
<input type="checkbox"/> Configure optional policies and settings. See <a href="#">Chapter 2, "Optional Configurations,"</a> on page 21.	Fabric administrator

**Table 1-1.** Configuring IaaS checklist (Continued)

Task	Required Role
<input type="checkbox"/> Depending on your intended method of provisioning, preparation outside of vRealize Automation might be required before you can start creating machine blueprints. For example, if you intend to use WIM provisioning, you need to include the vRealize Automation guest agent in your WinPE. See <a href="#">“Choosing a Provisioning Scenario,”</a> on page 32.	Outside of vRealize Automation
<input type="checkbox"/> Create and publish machine blueprints. See <a href="#">“Choosing a Blueprint Scenario,”</a> on page 47.	<ul style="list-style-type: none"> <li>■ Tenant administrator</li> <li>■ Business group manager</li> </ul>

Before users can request machines, a tenant administrator must configure the service catalog. See *Tenant Administration*.

## Bringing Resources Under vCloud Automation Center Management

For vRealize Automation to manage your infrastructure, you must create endpoints and store administrator-level user credentials for those endpoints.

### Store User Credentials for Endpoints

You must store administrator-level credentials for your environment so that vRealize Automation can communicate with your endpoints. Because the same credentials can be used for multiple endpoints, credentials are managed separately from endpoints and associated when endpoints are created or edited.

Credentials used to manage endpoints must have administrator privileges.

#### Prerequisites

Log in to the vRealize Automation console as an **IaaS administrator**.

#### Procedure

- 1 Select **Infrastructure > Endpoints > Credentials**.
- 2 Click **New Credentials**.
- 3 Enter a name in the **Name** text box.
- 4 (Optional) Enter a description in the **Description** text box.
- 5 Type the user name in the **User name** text box.  
For example, `my_admin_credentials`.
- 6 Type the password in the **Password** text boxes.
- 7 Click the **Save** icon (✔).

#### What to do next

Now that your credentials are stored, you are ready to create an endpoint. See [“Create an Endpoint for Physical Machines,”](#) on page 12.

## Create an Endpoint for Physical Machines

Endpoints allow vRealize Automation to communicate with your environment to collect data and provision machines.

**NOTE** You do not have to create endpoints one at a time. You can also create endpoints by importing them from a CSV file.

### Prerequisites

- Log in to the vRealize Automation console as an **IaaS administrator**.
- [“Store User Credentials for Endpoints,”](#) on page 12.

### Procedure

- 1 Select **Infrastructure > Endpoints > Endpoints**.
- 2 **New Endpoint > Physical** and select the type of machine for which you are creating the endpoint.
- 3 Enter a name in the **Name** text box.
- 4 (Optional) Enter a description in the **Description** text box.
- 5 Type the address used to interact with the management interface of the hardware in the **Address** text box.

Machine	Address Format
<b>Cisco UCS Manager</b>	IP address in URL format, for example <b>https://111.222.333.444</b>
<b>Dell iDRAC</b>	Host name and optional port, Web URL, or IP address, for example <b>11.222.333.444</b>
<b>HP iLO</b>	Host name and optional port, Web URL, or IP address, for example <b>mymachine-mycompany.com:8281</b>

- 6 Select the **Credentials** for the endpoint.  
If you did not already store the credentials, you can do so now.
- 7 (Optional) Add any custom properties.
- 8 (Optional) Click the **Details** tab to provide information about the physical location of your hardware.
- 9 Click **OK**.

vRealize Automation can now discover your compute resources.

---

**IMPORTANT** Renaming vSphere assets after discovery can cause provisioning to fail.

---

## Preparing an Endpoint CSV File for Import

Instead of adding endpoints one at a time by using the vRealize Automation console, you can import a list of endpoints of various types by uploading a CSV file.

The CSV file must contain a header row with the expected fields. Fields are case sensitive and must be in a specific order. You can upload multiple endpoints of varying types with the same CSV file. For vCloud Director, system administrator accounts are imported, rather than organization administrator endpoints.

**Table 1-2.** CSV File Fields and Their Order for Importing Endpoints

Field	Description
InterfaceType	(Required) You can upload multiple types of endpoints in a single file. <ul style="list-style-type: none"> <li>■ AmazonEC2</li> <li>■ Openstack</li> <li>■ vCloud</li> <li>■ vCO</li> <li>■ CiscoUCS</li> <li>■ DellIldrac</li> <li>■ HPilo</li> <li>■ NetAppOnTap</li> <li>■ SCVMM</li> <li>■ KVM</li> <li>■ vSphere</li> </ul>
Address	(Required for all interface types except Amazon AWS) URL for the endpoint. For information about the required format for your platform type, see the appropriate procedure to create an endpoint for your platform.
Credentials	(Required) Name you gave the user credentials when you stored them in vRealize Automation.
Name	(Required) Provide a name for the endpoint. For RedHat Openstack, the address is used as the default name.
Description	(Optional) Provide a description for the endpoint.
DataCenter	(Optional) For physical machines, you can provide the datacenter where the machine is located.
Row	(Optional) For physical machines, you can provide the row where the machine is located.
Rack	(Optional) For physical machines, you can provide the rack where the machine is located.
OpenstackProject	(Required for RedHat Openstack only) Provide the tenant name for the endpoint.

## Import a List of Endpoints

Importing a CSV file of endpoints can be more efficient than adding endpoints one at a time by using the vRealize Automation console.

### Prerequisites

- Log in to the vRealize Automation console as an **IaaS administrator**.
- Store the credentials for your endpoints.
- Prepare an Endpoint CSV file for import.

### Procedure

- 1 Select **Infrastructure > Endpoints > Endpoints**.
- 2 Click **Import Endpoints**.
- 3 Click **Browse**.
- 4 Locate the CSV file that contains your endpoints.

5 Click **Open**.

A CSV file opens that contains a list of endpoints in the following format:

```
InterfaceType,Address,Credentials,Name,Description
vCloud,https://abxpoint2vco,svc-admin,abxpoint2vco,abxpoint
```

6 Click **Import**.

You can edit and manage your endpoints through the vRealize Automation console.

## Configure Machine Prefixes

Fabric administrators create machine prefixes that are used to create names for machines provisioned through vRealize Automation. Tenant administrators and business group managers select these machine prefixes and assign them to provisioned machines through blueprints and business group defaults.

A prefix is a base name to be followed by a counter of a specified number of digits. When the digits are all used, vRealize Automation rolls back to the first number.

Machine prefixes must conform to the following limitations:

- Contain only the case-insensitive ASCII letters a through z, the digits 0 through 9, and the hyphen (-).
- Not begin with a hyphen.
- No other symbols, punctuation characters, or blank spaces can be used.
- No longer than 15 characters, including the digits, to conform to the Windows limit of 15 characters in host names.



Longer host names are truncated when a machine is provisioned, and updated the next time data collection is run. However, for WIM provisioning names are not truncated and provisioning fails when the specified name is longer than 15 characters.

- vRealize Automation does not support multiple virtual machines of the same name in a single instance. If you choose a naming convention that causes an overlap in machine names, vRealize Automation does not provision a machine with the redundant name. If possible, vRealize Automation skips the name that is already in use and generates a new machine name using the specified machine prefix. If a unique name cannot be generated, provisioning fails.

### Prerequisites

Log in to the vRealize Automation console as a **fabric administrator**.

### Procedure

- 1 Select **Infrastructure > Blueprints > Machine Prefixes**.
- 2 Click the **Add** icon ()
- 3 Enter the machine prefix in the **Machine Prefix** text box.
- 4 Enter the number of counter digits in the **Number of Digits** text box.
- 5 Enter the counter start number in the **Next Number** text box.
- 6 Click the **Save** icon ()

Tenant administrators can create business groups so that users can access vRealize Automation to request machines.

## Create a Business Group


Tenant administrators create business groups to associate a set of services and resources to a set of users, often corresponding to a line of business, department, or other organizational unit. Users must belong to a business group to request machines.

To add multiple users to a business group role, you can add multiple individual users, or you can add multiple users at the same time by adding an identity store group or a custom group to a role. For example, you can create a custom group Sales Support Team and add that group to the support role. For information about creating custom groups, see *Tenant Administration*. You can also use existing identity store user groups. The users and groups you choose must be valid in the identity store.

### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator**.
- Request a machine prefix from a fabric administrator. See [“Configure Machine Prefixes,”](#) on page 15.

### Procedure

- 1 Select **Infrastructure > Groups > Business Groups**.
- 2 Click the **Add** icon ()
- 3 (Optional) Select an existing business group from the **Copy from existing group** drop-down box.  
Data from the group you chose appears.
- 4 Enter a name in the **Name** text box.
- 5 (Optional) Enter a description in the **Description** text box.
- 6 Select a **Default machine prefix**.
- 7 (Optional) Type a default **Active directory container** for machines provisioned in this group and press Enter.  
The Active Directory container is used only for WIM provisioning. Other provisioning methods require additional configuration to join provisioned machines to an AD container.
- 8 Type a user name or group name in the **Group manager role** search box and press Enter.  
Repeat this step to add more than one user or group to the role. You do not have to specify users at this time. You can create empty business groups to populate later.
- 9 Type one or more user names or group names in the **Send manager emails to** text box and press Enter.  
Multiple entries must be separated with commas. For example,  
**JoeAdmin@mycompany.com,WeiMgr@mycompany.com**.
- 10 Add users to your business group.  
Multiple entries must be separated by line breaks. You do not have to specify users at this time. You can create empty business groups to populate later.
  - a Type a user name or group name in the **Support role** search box and press Enter.  
Repeat this step to add more than one user or group to the role.
  - b Type a user name or group name in the **User role** search box and press Enter.  
Repeat this step to add more than one user or group to the role.
- 11 (Optional) Add any custom properties.
- 12 Click **OK**.



Fabric administrators can now allocate resources to your business group by creating a reservation.

## Physical Reservations

A physical reservation is a set of physical machines reserved for and available to a particular business group for provisioning.

Any physical machine or blade represented by a physical endpoint is available to any fabric administrator to include in a physical reservation, but each machine or blade can belong to only one reservation.

Unprovisioned physical machines or blades must be added to a physical reservation before they can be provisioned or imported, and cannot be removed from a reservation until they are decommissioned and become unprovisioned. Each physical reservation is for one business group only but a business group can have any number of physical reservations containing any number of physical machines or blades.

A reservation can also define policies, priorities, and quotas that determine machine placement.

## Physical Reservation Selection

When a member of a business group requests a physical machine, vRealize Automation must select a machine from one of the group's physical reservations.

The reservation from which a machine is provisioned must satisfy the following criteria:

- The reservation must be a physical reservation.
- The reservation must be enabled.
- The reservation must have capacity remaining in its machine quota or have an unlimited quota.
- The reservation must contain an unprovisioned machine matching the blueprint specifications.
- If the blueprint or request specifies a location, the compute resource must be associated with that location.
- If the blueprint specifies a reservation policy, the reservation must belong to that reservation policy.

Reservation policies are a way to guarantee that the selected reservation satisfies any additional requirements for provisioning machines from a specific blueprint.

For example, although a physical reservation is not restricted to a particular hardware type, the best practice is to create reservations with only one type of physical machine and use reservation policies to restrict provisioning from blueprints of a specific type to reservations containing only machines of that type. This allows you to ensure that your HP iLO blueprints are correct for HP iLO provisioning, and so on. For example, when you use a custom property in a blueprint to specify the location of a boot disk, the value is a web URL for HP iLO machines but an NFS or CIFS path for Dell iDRAC machines.

If no reservation is available that meets all of the selection criteria, provisioning fails.

If multiple reservations meet all of the criteria, the reservation from which to provision a requested machine is determined by the following logic:

- Reservations with higher priority are selected over reservations with lower priority.
- If multiple reservations have the same priority, the reservation with the lowest percentage of its machine quota allocated is selected.
- If multiple reservations have the same priority and quota usage, machines are distributed among reservations in round-robin fashion.

If there are multiple unprovisioned machines in the selected reservation, machine is selected for provisioning by the following process:

- 1 The first machine is evaluated against the resource specifications in the blueprint, including the resource matching settings. For example, at least 2 CPUs and exactly 2 GB of memory, or exactly 4 CPUs and 4 GB.

- 2 If the machine matches the specifications, it is selected for provisioning. If it does not, the next machine in sequence is evaluated, and so on.

## Create a Physical Reservation

Before members of a business group can request machines, fabric administrators must allocate resources to them by creating reservations.

Each business group must have at least one physical reservation for its members to provision physical machines. Each physical machine can belong to only one reservation, but each reservation can contain multiple physical machines.

### Prerequisites

- Log in to the vRealize Automation console as a **fabric administrator**.
- A tenant administrator must create at least one business group. See [“Create a Business Group,”](#) on page 16.

### Procedure

- 1 [Specify Reservation Information](#) on page 18  
Each reservation is configured for a specific business group to grant them access to request specific physical machines.
- 2 [Specify Resources](#) on page 19  
Add physical machines to the reservation.
- 3 [Configure Alerts](#) on page 19  
Optionally, you can configure alerts to send notifications whenever reserved resources run low.

## Specify Reservation Information

Each reservation is configured for a specific business group to grant them access to request specific physical machines.

---

**NOTE** Once you create a reservation, you cannot change the business group and you can only remove physical machines from the reservation if they are currently unprovisioned.

---

### Prerequisites

- Log in to the vRealize Automation console as a **fabric administrator**.
- A tenant administrator must create at least one business group. See [“Create a Business Group,”](#) on page 16.

### Procedure

- 1 Select **Infrastructure > Reservations > Reservations**.
- 2 Click **New Reservation > Physical**.
- 3 Enter a name in the **Name** text box.
- 4 Select a tenant from the **Tenant** drop-down menu.
- 5 Select a business group from the **Business group** drop-down menu.  
Only users in this business group can provision machines by using this reservation.
- 6 (Optional) Select a reservation policy from the **Reservation policy** drop-down menu.  
This option requires additional configuration. You must create a reservation policy.

- 7 (Optional) Type a number in the **Machine quota** text box to set the maximum number of machines that can be provisioned on this reservation.

Only machines that are powered on are counted towards the quota. Leave blank to make the reservation unlimited.

- 8 Type a number in the **Priority** text box to set the priority for the reservation.  
The priority is used when a business group has more than one reservation. A reservation with priority 1 is used for provisioning over a reservation with priority 2.
- 9 (Optional) Deselect the **Enable this reservation** check box if you do not want this reservation active.
- 10 (Optional) Add any custom properties.

Do not navigate away from this page. Your reservation is not complete.

## Specify Resources

Add physical machines to the reservation.

### Prerequisites

[“Specify Reservation Information,”](#) on page 18.

### Procedure

- 1 Click the **Resources** tab.
- 2 Click **Add Machine**.
- 3 Select the physical machines you want to add to your reservation.  
Each physical machine can belong to only one reservation.
- 4 Click **OK**.

At this point, you can save the reservation by clicking **OK**. Optionally, you can configure notifications to send alerts out when resources allocated to this reservation become low.

## Configure Alerts

Optionally, you can configure alerts to send notifications whenever reserved resources run low.

Alerts are an optional step in the reservation configuration. If you do not want to set alerts, click **OK** to save your reservation.

If configured, alerts are generated daily, rather than when the specified thresholds are reached.

---

**IMPORTANT** Notifications are only sent if emails are configured and notifications are enabled. See *Tenant Administration*.

---

### Prerequisites

[“Specify Resources,”](#) on page 19.

### Procedure

- 1 Click the **Alerts** tab.
- 2 Set capacity alerts to On.
- 3 Use the sliders to set thresholds for resource allocation.

- 4 Type one or more user email addresses or group names to receive alert notifications in the **Recipients** text box.

Press Enter to separate multiple entries.

- 5 Select **Send alerts to group manager** to include group managers in the email alerts.

- 6 Choose a reminder frequency (days).

- 7 Click **OK**.

You can configure optional policies such as build profiles and reservation policies or begin preparing for provisioning.

# Optional Configurations

---

You can configure optional policies and settings to give you more control over the resource usage of provisioned machines.

This chapter includes the following topics:

- [“Build Profiles and Property Sets,”](#) on page 21
- [“Configuring Reservation Policies,”](#) on page 24
- [“Cost Profiles,”](#) on page 26
- [“Enabling Remote Desktop Connections,”](#) on page 29
- [“Enabling Connections to Machines Using SSH,”](#) on page 29

## Build Profiles and Property Sets

vRealize Automation contains property sets that fabric administrators can use when they create build profiles.

Property sets are groups of related properties that are commonly used together in build profiles and machine blueprints. Instead of adding custom properties to a build profile or a machine blueprint individually, you can add an entire set to a build profile and provide the values.

Many commonly used property sets are included in vRealize Automation.

For example, the `WimImagingProperties` property set contains custom properties commonly used for WIM-based provisioning:

- `Image.ISO.Location`
- `Image.ISO.Name`
- `Image.Network.Password`
- `Image.Network.User`
- `Image.WIM.Index`
- `Image.WIM.Name`
- `Image.WIM.Path`

As another example, the `vApp` property set contains the following custom properties that can be used for vApp provisioning:

- `VirtualMachine.NetworkN.Name`
- `VCloud.Template.MakeIdenticalCopy`

- VMware.SCSI.Type
- Sysprep.Identification.DomainAdmin
- Sysprep.Identification.DomainAdminPassword
- Sysprep.Identification.JoinDomain

Fabric administrators can create their own property sets and add them to vRealize Automation.

## Create a Property Set

Fabric administrators can create their own groupings of related custom properties and add them to vRealize Automation for use in build profiles.

Property sets are available to fabric administrators of all tenants.

### Procedure

- 1 [Create a Property Set XML File](#) on page 22  
A fabric administrator defines property sets in an XML file and uploads them to vRealize Automation.
- 2 [Add a Property Set to vRealize Automation](#) on page 23  
After you create a property set XML file, a fabric administrator can upload the property set to vRealize Automation.

## Create a Property Set XML File

A fabric administrator defines property sets in an XML file and uploads them to vRealize Automation.

If you edit a property set that is already in use in a build profile, vRealize Automation does not automatically update the build profile. A fabric administrator must reload the property set to the build profile.

### Procedure

- 1 Create an XML file.
- 2 Insert the following version and encoding values into the schema declaration.  
**version="1.0" encoding="UTF-16".**
- 3 Insert a <Doc> element.

```
<Doc>
</Doc>
```

- 4 Insert a <CustomProperties> element in the <Doc> element.

```
<Doc>
  <CustomProperties>
  </CustomProperties>
</Doc>
```

- 5 Define the attributes of the custom property to include in the property set.

```
<Doc>
  <CustomProperties>
    <Property Name="property_name" DefaultValue="property_value" Encrypted="true_or_false"
    PromptUser="true_or_false"/>
  </CustomProperties>
</Doc>
```

If you do not include the DefaultValue attribute, no default value is stored. If you do not include the Encrypted or PromptUser attributes, they default to false.

- 6 Repeat [Step 5](#) step for each property to include in the property set.
- 7 Save and close the file.

A fabric administrator can now upload your property set XML file to vRealize Automation.

## Add a Property Set to vRealize Automation

After you create a property set XML file, a fabric administrator can upload the property set to vRealize Automation.

### Prerequisites

- Log in to the vRealize Automation console as a **fabric administrator**.
- Create a property set XML file.

### Procedure

- 1 Select **Infrastructure > Blueprints > Build Profiles**.
- 2 Click **Manage Property Sets**.
- 3 Click **Browse** to select the **Property set XML file name**.
- 4 Enter a name and, optionally, a description.
- 5 Click **OK**.

You can now include your property set in build profiles.

## Create a Build Profile


Fabric administrators can organize commonly used custom properties into build profiles so that tenant administrators and business group managers can include these custom property sets in blueprints.




Build profiles are available to tenant administrators and business group managers of all tenants. You can create your build profile by adding custom properties individually, by loading property sets that contain multiple custom properties, or by using a combination of the two methods.

### Prerequisites

Log in to the vRealize Automation console as a **fabric administrator**.

### Procedure

- 1 Select **Infrastructure > Blueprints > Build Profiles**.
- 2 Click the **Add** icon (.
- 3 Enter a name and, optionally, a description.
- 4 (Optional) Add custom properties individually to your build profile.
  - a Click **New Property**.
  - b Enter the custom property in the **Name** text box.
  - c Enter the value of the custom property in the **Value** text box.
  - d (Optional) Select the **Encrypted** check box to encrypt the custom property in the database.

- e (Optional) Select the **Prompt user** check box to require the user to provide a value when they request a machine.  
If you choose to prompt users for a value, any value you provide for the custom property is presented to them as the default. If you do not provide a default, users cannot continue with the machine request until they provide a value for the custom property.
- f Click the **Save** icon ()
- 5 (Optional) Select a property set to load into your build profile.
  - a Select a property set from the **Add from property set** drop-down menu.
  - b Click **Load**.
- 6 (Optional) Click the **Edit** icon () to configure a custom property loaded from a property set.
  - a Enter the value of the custom property in the **Value** text box.
  - b Select the **Encrypted** check box to encrypt the custom property in the database.
  - c Select the **Prompt user** check box to require the user to provide a value when they request a machine.  
If you choose to prompt users for a value, any value you provide for the custom property is presented to them as the default. If you do not provide a default, users cannot continue with the machine request until they provide a value for the custom property.
  - d Click the **Save** icon ()
- 7 Click **OK**.

Tenant administrators and business group managers can now select your build profile and include it in their blueprints.

## Configuring Reservation Policies

When a user requests a machine, it can be provisioned on any reservation of the appropriate type that has sufficient capacity for the machine. You can apply a reservation policy to a blueprint to restrict the machines provisioned from that blueprint to a subset of available reservations.

Reservation policies provide an optional and helpful means of controlling how reservation requests are processed. A reservation policy is often used to collect resources into groups for different service levels, or to make a specific type of resource easily available for a particular purpose. The following scenarios provide a few examples of possible uses for reservation policies:

- To ensure that machines provisioned from a virtual blueprint are placed on reservations with storage devices that support NetApp FlexClone
- To restrict provisioning of cloud machines to a specific region containing a machine image that is required for a specific blueprint
- To restrict provisioning of Cisco UCS physical machines to reservations on endpoints on which the selected service profile template and boot policy are available
- As an additional means of using a Pay As You Go allocation model for vApps

You can add multiple reservations to a reservation policy, but a reservation can belong to only one policy. You can assign a single reservation policy to more than one blueprint. A blueprint can have only one reservation policy.



A reservation policy can include reservations of different types, but only reservations that match the blueprint type are considered when selecting a reservation for a particular request. For more information about how reservations are selected for provisioning a machine, see *IaaS Configuration for Cloud Platforms*, *IaaS Configuration for Physical Machines*, or *IaaS Configuration for Virtual Platforms*.

## Configure a Reservation Policy

Fabric administrators create reservation policies to collect resources into groups for different service levels, or to make a specific type of resource easily available for a particular purpose. After you create the reservation policy, you then must populate it with reservations before tenant administrators and business group managers can use the policy effectively in a blueprint.

### Prerequisites

- Log in to the vRealize Automation console as a **fabric administrator**.
- Create at least one reservation.

### Procedure

- 1 [Create a Reservation Policy](#) on page 25  
Fabric administrators use reservation policies to group similar reservations together. Create the reservation policy tag first, then add the policy to reservations to allow a tenant administrator or business group manager to use the reservation policy in a blueprint.
- 2 [Assign a Reservation Policy to a Reservation](#) on page 25  
When fabric administrators create a reservation, the option to assign that reservation to a reservation policy appears. To assign an existing reservation to a reservation policy, you edit the reservation.


## Create a Reservation Policy

Fabric administrators use reservation policies to group similar reservations together. Create the reservation policy tag first, then add the policy to reservations to allow a tenant administrator or business group manager to use the reservation policy in a blueprint.

### Prerequisites

- Log in to the vRealize Automation console as a **fabric administrator**.
- Create at least one reservation.

### Procedure

- 1 Select **Infrastructure > Reservations > Reservation Policies**.
- 2 Click **New Reservation Policy**.
- 3 Enter a name and, optionally, a description.
- 4 Click the **Save** icon (.

## Assign a Reservation Policy to a Reservation

When fabric administrators create a reservation, the option to assign that reservation to a reservation policy appears. To assign an existing reservation to a reservation policy, you edit the reservation.

### Prerequisites

[“Create a Reservation Policy,”](#) on page 25.

### Procedure

- 1 Select **Infrastructure > Reservations > Reservations**.

- 2 Point to a reservation and click **Edit**.
- 3 Select your reservation policy from the **Reservation Policy** drop-down menu.
- 4 Click **OK**.

Tenant administrators and business group managers can now use your reservation policy in blueprints. See [“Add a Reservation Policy to a Blueprint,”](#) on page 76.

## Cost Profiles

Fabric administrators can associate compute resources and physical machines with cost profiles to enable calculation of a machine’s cost. The cost is displayed to machine owners, requesters, approvers, and administrators at various points in the request and provisioning life cycle.

A cost profile includes the following values for daily cost:

- Cost per GB of memory capacity specified in the virtual blueprint or installed in the physical machine
- Cost per CPU specified in the virtual blueprint or installed in the physical machine
- Cost per GB of storage capacity as specified in the virtual blueprint (not used for physical machines, because storage attached to physical machines is not discovered or tracked)

For finer definition of storage cost for virtual machines, you can also associate each known datastore on a compute resource with a storage cost profile. A storage cost profile contains only a daily cost per GB of storage. If you assign a storage cost profile to a datastore, this storage cost overrides the storage cost in the cost profile assigned to the compute resource.

For virtual machines, the machine cost is calculated from the cost profile and storage cost profile on the compute resource, the resources it consumes, and the daily blueprint cost. You can use the blueprint cost to represent a markup for using the machine in addition to the resources that the machine consumes, for example to account for the cost of specific software deployed with that blueprint.

For physical machines, the machine cost is calculated from the cost profile on the machine, the CPU and memory on the machine, and the daily blueprint cost. You can use the blueprint cost to represent such factors as storage cost or additional costs for using the machine.

You cannot apply cost profiles to machines provisioned on Amazon Web Services or Red Hat OpenStack. For machines provisioned on these cloud platforms, the only cost factor is the daily cost in the blueprint from which it was provisioned. The cost for vCloud Director vApps includes any cost profile and storage cost profile on the virtual datacenter and the blueprint cost.

## Cost Calculation for Physical Machines

Several factors can contribute to the calculation of cost for physical machines.

The daily cost of a machine is based on the cost of the memory and CPU resources that it consumes, and the blueprint cost.

**Table 2-1.** Daily Cost Drivers

Cost Driver	Calculated Cost
Memory	Memory (GB) on the physical machine multiplied by the daily memory cost per gigabyte specified in the cost profile associated with the machine
CPUs	Number of CPUs on the physical machine multiplied by the daily CPU cost specified in the cost profile associated with the machine
Blueprint cost	The value for daily cost specified in the machine blueprint is added to the total cost of the machine. This value can represent a markup for using the machine in addition to the resources consumed by the machine.

Storage cost specified in a cost profile is not taken into account for physical machines. If you assign a cost profile that includes a value for storage cost to a physical machine, it is ignored. You can account for the cost of using storage in the daily cost specified in the blueprint for the physical machine.

Lease cost is calculated as daily cost multiplied by the total number of days in the lease period, if applicable.

Cost-to-date is calculated as daily cost multiplied by the number of days a machine is provisioned.

## How Cost Is Displayed

The machine cost is displayed at various stages of the request and provisioning life cycle and is updated according to the current information in the request or on the provisioned item.

Daily cost and lease cost appear at all stages of the lifecycle. After the machine is provisioned, the cost-to-date also appears.

**Table 2-2.** Cost Displayed During the Request and Provisioning Life Cycle

Life Cycle Stage	Value Displayed for Cost
Viewing the catalog item details before a request	<p>Projected costs based on the cost profile, the lease duration specified in the blueprint, the daily blueprint cost, and the machine resources on the physical machine.</p> <p>More than one physical machine that matches the blueprint specifications can exist. If these machines have different costs, the cost displays as a range.</p> <p>If the blueprint has the at least option selected for resource matching, then the candidate physical machines can have different specifications from what is selected in the blueprint, resulting in higher costs than expected.</p> <p>If the blueprint specifies a range for the lease duration or the daily cost is a range, the lease cost appears as a range with the lower bound being the minimum lease duration multiplied by the minimum cost, and the upper bound being the maximum lease duration multiplied by the maximum cost.</p>
Completing the request form	<p>Projected costs based on the cost profile, the lease duration specified in the request form, the daily blueprint cost, and the machine resources on the physical machine.</p> <p>More than one physical machine that matches the specifications in the request form can exist. If these machines have different costs, the cost displays as a range.</p> <p>If the blueprint has the at least option selected for resource matching, then the candidate physical machines can have different specifications from what is specified in the request form, resulting in higher costs than expected.</p> <p>By default, the request form is populated with the minimum values for machine resources and lease duration, and the values for daily and lease costs are calculated accordingly. The costs are updated as the user edits the relevant values in the request form.</p>

**Table 2-2.** Cost Displayed During the Request and Provisioning Life Cycle (Continued)

Life Cycle Stage	Value Displayed for Cost
Viewing details of a submitted request or approving a request	Projected costs based on the requested lease duration, blueprint cost, and the machine resources on the physical machine. More than one physical machine that matches the specifications in the request can exist. If these machines have different costs, the cost appears as a range. If the blueprint has the at least option selected for resource matching, then the candidate physical machines can have different specifications from what is specified in the request, resulting in higher costs than expected.
Viewing the details of a provisioned machine	Actual daily cost, lease cost, and cost-to-date based on the resource use of the provisioned machine, lease duration, blueprint cost, and number of days since the machine was provisioned.

## Configure a Cost Profile

Fabric administrators can create cost profiles and associate them with physical machines to enable calculation of a machine's cost.

### Prerequisites

Log in to the vRealize Automation console as a **fabric administrator**.

### Procedure

- 1 [Create a Cost Profile](#) on page 28  
Fabric administrators create cost profiles to define daily costs for memory and CPU for physical machines.
- 2 [Assign a Cost Profile to a Physical Machine](#) on page 29  
Fabric administrators can assign a cost profile to a physical machine to add memory and CPU costs to the calculated cost for provisioning the machine.

## Create a Cost Profile

Fabric administrators create cost profiles to define daily costs for memory and CPU for physical machines.

The values for daily cost specified in a cost profile can be up to four decimal places, although the values are rounded to two decimal places when displayed to end users in the catalog.

Storage cost specified in a cost profile is not taken into account for physical machines. If you assign a cost profile that includes a value for storage cost to a physical machine, it is ignored. You can account for the cost of using storage in the daily cost specified in the blueprint for the physical machine.

### Prerequisites

Log in to the vRealize Automation console as a **fabric administrator**.

### Procedure

- 1 Select **Infrastructure > Compute Resources > Cost Profiles**.
- 2 Click **New Cost Profile**.
- 3 Enter a name and, optionally, a description.
- 4 Type a value for the daily cost per gigabyte of memory in the **Memory Cost (per GB)** text box.
- 5 Type a value for the daily cost per CPU in the **CPU Cost** text box.
- 6 Click the **Save** icon (✓).

## Assign a Cost Profile to a Physical Machine

Fabric administrators can assign a cost profile to a physical machine to add memory and CPU costs to the calculated cost for provisioning the machine.

### Prerequisites

- Create a physical machine reservation.
- Log in to the vRealize Automation console as a **fabric administrator**.

### Procedure

- 1 Select **Infrastructure > Machines > Reserved Machines**.
- 2 Point to a machine and click **Edit**.
- 3 Click the **Hardware** tab.
- 4 Select a cost profile from the **Cost Profile** drop-down menu.  
The daily values for memory cost and CPU cost from the selected cost profile appear.
- 5 Click **OK**.

## Enabling Remote Desktop Connections

A system administrator can create a custom remote desktop protocol file that tenant administrators and business group managers use in blueprints to configure RDP settings.

The following high-level overview is the sequence of tasks required to enable machine users to connect using RDP.

- 1 A system administrator creates a custom RDP file and places it in the `Website\Rdp` subdirectory of the vRealize Automation installation directory. Provide fabric administrators, tenant administrators, and business group managers with the full pathname for the custom RDP file so that it can be included in blueprints.
- 2 (Optional) A fabric administrator creates a build profile using the property set `RemoteDesktopProtocolProperties` to compile RDP custom properties and values for tenant administrators and business group managers to include in their blueprints.
- 3 A tenant administrator or business group manager adds the RDP custom properties to a blueprint to configure the RDP settings of machines provisioned from the blueprint.
- 4 A tenant administrator or business group manager enables the **Connect using RDP or SSH** option in a blueprint.
- 5 A tenant administrator or business group manager entitles users or groups to use the **Connect using RDP or SSH** option. See *Tenant Administration*.

## Enabling Connections to Machines Using SSH

With a combination of custom properties and blueprint settings, you can enable the **Connect Using SSH** option for Linux machines provisioned through vRealize Automation.

To enable machine users to connect using SSH:

- 1 A blueprint creator adds the custom property `Machine.SSH` to add the ability to connect using SSH to a blueprint. Optionally, a fabric administrator can include this custom property in a property group.
- 2 A blueprint creator enables the **Connect using RDP or SSH** machine operation for machines provisioned from the blueprint.

- 3 A tenant administrator or business group manager entitles users or groups to use the **Connect using RDP** or **Connect Using SSH** options.

If the custom property `Machine.SSH` is set to **true**, and the **Connect using RDP or SSH** machine operation is enabled in the blueprint, all Linux machines provisioned from the blueprint display the **Connect Using SSH** option to entitled users.

# Preparing for Provisioning

---

There is some configuration required outside of vRealize Automation to prepare for machine provisioning.

This chapter includes the following topics:

- [“Enabling Visual Basic Scripts in Provisioning,”](#) on page 31
- [“Choosing a Provisioning Scenario,”](#) on page 32
- [“Preparing for PXE Provisioning,”](#) on page 33
- [“Preparing for Linux Kickstart Provisioning,”](#) on page 36
- [“Preparing for SCCM Provisioning,”](#) on page 38
- [“Preparing for WIM Provisioning,”](#) on page 39

## Enabling Visual Basic Scripts in Provisioning

Visual Basic scripts are run outside of vRealize Automation as additional steps in the machine life cycle and can be used to update the custom property values of machines. Visual Basic scripts can be used with any provisioning method.

For example, you could use a script to generate certificates or security tokens before provisioning and then use those certificates and tokens in provisioning a machine.

---

**NOTE** This information does not apply to Amazon Web Services.

---

When executing a Visual Basic script, the EPI agent passes all machine custom properties as arguments to the script. To return updated property values to vRealize Automation, you must place these properties in a dictionary and call a function provided by vRealize Automation.

The sample Visual Basic script `PrePostProvisioningExample.vbs` is included in the `Scripts` subdirectory of the EPI agent installation directory. This script contains a header to load all arguments into a dictionary, a body in which you can include your functions, and a footer to return updated custom properties to vRealize Automation.

The following is a high-level overview of the steps required to use Visual Basic scripts in provisioning:

- 1 A system administrator installs and configures an EPI agent for Visual Basic scripts. See *Installation and Configuration*.
- 2 A system administrator creates Visual Basic scripts and places them on the system where the EPI agent is installed.

- 3 Gather the following information for tenant administrators and business group managers for each Visual Basic script:
  - The complete path to the Visual Basic script, including the filename and extension. For example, `%System Drive%Program Files (x86)\VMware\VCAC Agents\EPI_Agents\Scripts\SendEmail.vbs`.

---

**NOTE** A fabric administrator can create a build profile by using the property sets `ExternalPreProvisioningVbScript` and `ExternalPostProvisioningVbScript` to provide this required information. Doing so makes it easier for tenant administrators and business group managers to include this information correctly in their blueprints.

---
- 4 Tenant administrators and business group managers use custom properties in their blueprints to call the Visual Basic scripts.

## Choosing a Provisioning Scenario

There are several methods you can use with vRealize Automation to provision physical machines.

Some additional configuration outside of vRealize Automation is required to prepare for physical machine provisioning.

**Table 3-1.** Choosing a Provisioning Method

Scenario	Supported Platforms	Provisioning Method	Pre-provisioning Preparations
Provision a machine by querying a PXE boot server for a network boot strap program (NBP), then download and execute any boot image-based provisioning method to deploy the desired operating system. This is the only supported provisioning method for Cisco USC machines.	<ul style="list-style-type: none"> <li>■ Cisco USC</li> <li>■ HP iLO</li> <li>■ Dell iDRAC</li> </ul>	Physical PXE and Physical SCCM PXE	<a href="#">“Preparing for PXE Provisioning,”</a> on page 33
Provision a machine by booting from an ISO image, using a kickstart or autoYaSt configuration file and a Linux distribution image to install the operating system on the machine.	<ul style="list-style-type: none"> <li>■ HP iLO</li> <li>■ Dell iDRAC</li> </ul>	Physical Provisioning	<a href="#">“Preparing for Linux Kickstart Provisioning,”</a> on page 36
Provision a machine and pass control to an SCCM task sequence to boot from an ISO image, deploy a Windows operating system, and install the vRealize Automation guest agent.	<ul style="list-style-type: none"> <li>■ HP iLO</li> <li>■ Dell iDRAC</li> </ul>	Physical SCCM	<a href="#">“Preparing for SCCM Provisioning,”</a> on page 38
Provision a machine by booting into a WinPE environment and installing an operating system using a Windows Imaging File Format (WIM) image of an existing Windows reference machine.	<ul style="list-style-type: none"> <li>■ HP iLO</li> <li>■ Dell iDRAC</li> </ul>	Physical Provisioning	<a href="#">“Preparing for WIM Provisioning,”</a> on page 39



## Preparing for PXE Provisioning

Prepare to provision a machine by querying a PXE boot server for a network boot strap program (NBP). You can configure the NBP to then download and execute any boot image-based provisioning method to deploy an operating system.

The Preboot eXecution Environment (PXE) allows computers to be booted using a network interface. A system that uses PXE can boot a machine from a network bootstrap program (NBP) independently of its data storage devices or any installed operating system. You can configure the NBP to then boot the machine by using one of the boot image-based provisioning methods that vRealize Automation supports (WIM, kickstart/autoYaST, or SCCM).

The following is a list of requirements for PXE provisioning:

- Ensure that the PXE server is available on a VLAN that is accessible to the physical machines being provisioned.
- Create a network boot program (NBP) that boots the physical machine from the desired image.
- Configure the PXE server to deliver the desired NBP in response to a query from the physical machines that you intend to provision. Optionally, this can be accomplished by using PowerShell scripts during machine provisioning.

Depending on how your PXE server is configured, there are a number of different approaches you can take to provision machines by using PXE. The following is a high-level overview of a common approach you can take to provision a machine by using PXE:

- 1 Configure an NBP to boot machines by using one of the boot image-based provisioning methods that vRealize Automation supports:
  - To provision by using Linux Kickstart or autoYaST, see [“Preparing for Linux Kickstart Provisioning,”](#) on page 36.
  - To provision by using WIM, see [“Preparing for WIM Provisioning,”](#) on page 39.
  - To provision by using SCCM, see [“Preparing for SCCM Provisioning,”](#) on page 38.
- 2 If you are provisioning Cisco UCS Manager machines, gather the following information for your tenant administrators and business group managers to include in blueprints:
  - The name of the service profile template
  - (Optional) The name of the boot policy to apply on reboot
- 3 Configure vRealize Automation to run custom PowerShell scripts either before the machine is booted with the NBP or during machine provisioning.
  - Install vRealize Automation Designer, see [“Installing vRealize Automation Designer,”](#) on page 34.
  - Create your custom PowerShell scripts.
  - Ensure that the PowerShell execution policy on your DEM machines is properly configured to execute your custom PowerShell scripts.
  - Import your custom PowerShell scripts into vRealize Automation, see [“Import Custom PowerShell Scripts,”](#) on page 35.
  - Gather the names of the custom PowerShell scripts so that tenant administrators and business group managers can include them in their blueprint. These must be the names you assigned the scripts in the vRealize Automation Model Manager.

---

**NOTE** You can create a build profile using the property set PXEProvisioningProperties to call the PowerShell scripts during provisioning. This makes it easier for tenant administrators and business group managers to include this information correctly in their blueprints.

---

## Installing vRealize Automation Designer

You can install vRealize Automation Designer on a Windows machine and configure it to communicate with a remote Model Manager instance.

### vRealize Automation Designer Prerequisites

vRealize Automation Designer is typically installed on a development machine rather than a server.

#### Supported Operating Systems

Supported operating systems for vRealize Automation Designer are listed in the *vRealize Automation Support Matrix* on the VMware vRealize Automation Documentation page.

#### System Configuration Requirements

See the *vRealize Automation Support Matrix* for your vRealize Automation version for potential updates to this information.

- .NET Framework 4.5 must be installed.
- The vRealize Automation Designer host must have network access to the IaaS Website components (specifically, the Model Manager Web component).
- If the Model Manager is installed remotely, the certificate used for the Model Manager Web component must be trusted on the vRealize Automation Designer host.

### Download the vRealize Automation Designer Installer

You can download the vRealize Automation Designer installer from the vRealize Appliance.

#### Prerequisites

- Log in to the Windows machine as a local administrator.
- If you are using Internet Explorer, verify that Enhanced Security Configuration is not enabled. See <res://iesetup.dll/SoftAdmin.htm>.

#### Procedure

- 1 Open a browser.
- 2 Navigate to the Windows installer download page by using the host name of the (<https://vra-va-hostname.domain.name:5480/installer/>).
- 3 Click **vRealize Automation Designer**.
- 4 When prompted, save the installer.

#### What to do next

[“Install vRealize Automation Designer,”](#) on page 34.

### Install vRealize Automation Designer

The vRealize Automation Designer installer is packaged as Windows installation wizard.

#### Prerequisites

[“Download the vRealize Automation Designer Installer,”](#) on page 34.

#### Procedure

- 1 Navigate to the directory where you downloaded the installer.

- 2 Right-click DesignCenter-Setup.exe and select **Run as administrator**.
- 3 On the Welcome page, click **Next**.
- 4 Read the License Agreement, select **I accept the terms in the License Agreement**, and click **Next**.
- 5 On the Custom Setup page, click **Next**.
- 6 Specify the fully qualified domain name and port of the Model Manager Web instance in *hostname:port* format.  
  
The default port is 443.
- 7 Specify the Model Manager service user credentials.
- 8 Click **Next**.  
  
The installer validates the combination of Model Manager host and credentials by attempting to access to the Model Manager. If an error is returned, you must provide the correct combination of Model Manager host and credentials before proceeding.
- 9 Click **Install**.
- 10 Click **Finish**.

### What to do next

You can launch the vRealize Automation Designer from the Windows Start menu by navigating to the installation directory.

## Import Custom PowerShell Scripts

You make PowerShell scripts available to be invoked by importing them into Model Manager.

Files in the Model Manager have both a version and a revision. When you import a file or update a stored file, you can optionally provide a version number (the default is 0.0). Revisions are automatically created each time a file of a specific version is imported or updated. For example, you can separately import a MyPowerShellScript1.ps1 version 1.0 and MyPowerShellScript1.ps1 version 2.0. If you later update version 2.0, Model Manager maintains the following files:

- MyPowerShellScript1.ps1 1.0 1
- MyPowerShellScript1.ps1 2.0 1
- MyPowerShellScript1.ps1 2.0 2

### Prerequisites

[“Install vRealize Automation Designer,”](#) on page 34.

### Procedure

- 1 Open a command prompt.
- 2 Run the CloudUtil.exe command with the following arguments to import your custom PowerShell scripts:

```
CloudUtil.exe File-Import -n|--name <Friendly name to assign> -f|--filename <Path and file name>
```

Optionally, you can add a description and version to the custom script, specify a Model Manager host, and request a stack trace in case of error.

```
CloudUtil.exe File-Import -n|--name <Friendly name to assign> -f|--filename <Path and file name> -d|--description <Description> -i|--iteration <Version number> --repository <Model Manager Root URI> -v|--verbose
```

- 3 Repeat this procedure for each of your custom PowerShell scripts.
- 4 Record the names you assigned to your scripts with the command `-n|--name <Name>`.  
Tenant administrators and business group managers require these names to call your scripts.

### Example: Importing a Custom PowerShell Script

For example:

```
CloudUtil.exe File-Import -n|--name MyPowerShellScript -f|--filename MyPowerShellScript101.ps1 -
d|--description
use this script with Pxe.Setup.ScriptName -i|--iteration 3.0 --repository
https://myMachine.myCompany.com:5480/repository
-v|--verbose
```

## Preparing for Linux Kickstart Provisioning

Linux Kickstart provisioning uses a configuration file to automate a Linux installation on a newly provisioned machine. To prepare for provisioning you must create a bootable ISO image and a kickstart or autoYaST configuration file.

The following is a high-level overview of the steps required to prepare for Linux Kickstart provisioning:

- 1 Ensure that a DHCP server is available on the network. vRealize Automation cannot provision machines by using Linux Kickstart provisioning unless DHCP is available.
- 2 Prepare the configuration file. In the configuration file, you must specify the locations of the vRealize Automation server and the Linux agent installation package. See [“Prepare the Linux Kickstart Configuration Sample File,”](#) on page 37.
- 3 Edit the `isolinux/isolinux.cfg` or `loader/isolinux.cfg` to specify the name and location of the configuration file and the appropriate Linux distribution source.
- 4 Create the boot ISO image and place it in the required location. Record the address.

**Table 3-2.** Required Location

Scenario	Location
HP iLO	Place the image in a web-accessible location.
Dell iDRAC	Place the image in a location available to NFS or CIFS.
PXE provisioning	The appropriate location is determined by your PXE server configuration.

- 5 (Optional) Add customization scripts.
  - a To specify post-installation customization scripts in the configuration file, see [“Specify Custom Scripts in a kickstart/autoYaST Configuration File,”](#) on page 37.
  - b To call Visual Basic scripts in blueprint, see [“Enabling Visual Basic Scripts in Provisioning,”](#) on page 31.
- 6 Gather the name and location of the ISO image so that tenant administrators and business group managers can include it in their blueprints. For Dell iDRAC integrations where the image is located on a CIFS share that requires authentication, you need to provide tenant administrators and business group managers with the username and password to access the share.

---

**NOTE** You can create a build profile with the property set `BootIsoProperties` to include the required ISO information. This makes it easier for tenant administrators and business group managers to include this information correctly in their blueprints.

---

## Prepare the Linux Kickstart Configuration Sample File

vRealize Automation provides sample configuration files that you can modify and edit to suit your needs. There are several changes required to make the files usable.

### Procedure

- 1 Navigate to the vCloud Automation Center Appliance management console installation page.  
For example: `https://vcac-hostname.domain.name:5480/installer/`.
- 2 Download and save the Linux Guest Agent Packages.
- 3 Unpack the `LinuxGuestAgentPkgs` file.
- 4 Navigate to the `LinuxGuestAgentPkgs` file and locate the subdirectory that corresponds to the guest operating system that you are deploying during provisioning.
- 5 Open the `sample-https.cfg` file.
- 6 Replace all instances of the string `host=dcac.example.net` with the IP address or fully qualified domain name and port number for the vRealize Automation server host.

Platform	Required Format
vSphere ESXi	IP Address, for example: <code>--host=172.20.9.59</code>
vSphere ESX	IP Address, for example: <code>--host=172.20.9.58</code>
SUSE 10	IP Address, for example: <code>--host=172.20.9.57</code>
All others	FQDN, for example: <code>--host=mycompany-host1.mycompany.local:443</code>

- 7 Locate each instance of `gugent.rpm` or `gugent.tar.gz` and replace the URL `rpm.example.net` with the location of the guest agent package.

For example:

```
rpm -i nfs:172.20.9.59/suseagent/gugent.rpm
```

- 8 Save the file to a location accessible to newly provisioned machines.

## Specify Custom Scripts in a kickstart/autoYaST Configuration File

You can modify the configuration file to copy or install custom scripts onto newly provisioned machines. The Linux agent runs the scripts at the specified point in the workflow.

Your script can reference any of the `./properties.xml` files in the `/usr/share/gugent/site/workitem` directories to modify the custom properties of provisioned machines.

### Prerequisites

- Prepare a kickstart or autoYaST configuration file. See [“Prepare the Linux Kickstart Configuration Sample File,”](#) on page 37.
- Your script must return a non-zero value on failure to prevent machine provisioning failure.

### Procedure

- 1 Create or identify the script you want to use.
- 2 Save the script as `NN_scriptname`.

`NN` is a two digit number. Scripts are executed in order from lowest to highest. If two scripts have the same number, the order is alphabetical based on `scriptname`.

- 3 Make your script executable.
- 4 Locate the post-installation section of your kickstart or autoYaST configuration file.  
In kickstart, this is indicated by %post. In autoYaST, this is indicated by post-scripts.
- 5 Modify the post-installation section of the configuration file to copy or install your script into the `/usr/share/gugent/site/workitem` directory or your choice.

Custom scripts are most commonly run for virtual kickstart/autoYaST with the work items SetupOS (for create provisioning) and CustomizeOS (for clone provisioning), but you can run scripts at any point in the workflow.

For example, you can modify the configuration file to copy the script `11_addusers.sh` to the `/usr/share/gugent/site/SetupOS` directory on a newly provisioned machine by using the following command:

```
cp nfs:172.20.9.59/linuxscripts/11_addusers.sh /usr/share/gugent/site/SetupOS
```

The Linux agent runs the script in the order specified by the work item directory and the script file name.

## Preparing for SCCM Provisioning

vRealize Automation boots a newly provisioned machine from an ISO image, and then passes control to the specified SCCM task sequence.

SCCM provisioning is supported for the deployment of Windows operating systems. Linux is not supported. Software distribution and updates are not supported.

The following is a high-level overview of the steps required to prepare for SCCM provisioning:

- 1 Consult with your network administrator to ensure that the following network requirements are met:
  - Communication with SCCM requires the NetBios name of the SCCM server. At least one Distributed Execution Manager must be able to resolve the fully qualified name of the SCCM server to its NetBios name.
  - The SCCM server and the vRealize Automation server must be on the same network and available to each other.
- 2 Create a software package that includes the vRealize Automation guest agent. See [“Create a Software Package for SCCM Provisioning,”](#) on page 39.
- 3 In SCCM, create the desired task sequence for provisioning the machine. The final step must be to install the software package you created that contains the vRealize Automation guest agent. For information about creating task sequences and installing software packages, please see the SCCM documentation.
- 4 Create the boot ISO image for the task sequence and place it in the required location. Record the address.

**Table 3-3.** Required Location

Scenario	Location
HP iLO	Place the image in a web-accessible location.
Dell iDRAC	Place the image in a location available to NFS or CIFS.
PXE provisioning	The appropriate location is determined by your PXE server configuration.

- 5 Gather the following information so that tenant administrators and business group managers can include it in their blueprints:
  - The name of the collection containing the task sequence.
  - The fully qualified domain name of the SCCM server on which the collection containing the sequence resides.
  - The site code of the SCCM server.
  - Administrator-level credentials for the SCCM server.

---

**NOTE** You can create a build profile with the property set `SCCMProvisioningProperties` to include all of this required information. This makes it easier for tenant administrators and business group managers to include this information correctly in their blueprints.

---

## Create a Software Package for SCCM Provisioning

The final step in your SCCM task sequence must be to install a software package that includes the vRealize Automation guest agent.

### Procedure

- 1 Navigate to the vCloud Automation Center Appliance management console installation page.  
For example: `https://vcac-hostname.domain.name:5480/installer/`.
- 2 Download and save the Windows guest agent files.
  - Windows guest agent files (32-bit.)
  - Windows guest agent files (64-bit.)
- 3 Extract the Windows guest agent files to a location available to SCCM.
- 4 Create a software package from the definition file `SCCMPackageDefinitionFile.sms`.
- 5 Make the software package available to your distribution point.
- 6 Select the contents of the extracted Windows guest agent files as your source files.

## Preparing for WIM Provisioning

Provision a machine by booting into a WinPE environment and then install an operating system using a Windows Imaging File Format (WIM) image of an existing Windows reference machine.

The following is a high-level overview of the steps required to prepare for WIM provisioning:

- 1 Identify or create the staging area. This should be a network directory that can be specified as a UNC path or mounted as a network drive by the reference machine, the system on which you build the WinPE image, and the physical endpoints of the physical machines that are being provisioned.
- 2 Ensure that a DHCP server is available on the network. vRealize Automation cannot provision machines by using a WIM image unless DHCP is available.
- 3 Identify an existing virtual or physical machine to use as your reference machine or create a reference machine. For vRealize Automation requirements, see [“Reference Machine Requirements for WIM Provisioning,”](#) on page 40.
- 4 Using the System Preparation Utility for Windows, prepare the reference machine's operating system for deployment. See [“SysPrep Requirements for the Reference Machine,”](#) on page 41.
- 5 Create the WIM image of the reference machine. Do not include any spaces in the WIM image file name or provisioning fails.

- 6 (Optional) Create any custom scripts you want to use to customize provisioned machines and place them in the appropriate work item directory of your PEBuilder installation. See [“Specify Custom Scripts in a PEBuilder WinPE,”](#) on page 42.
- 7 Create a WinPE image that contains the vRealize Automation guest agent. You can use the vRealize Automation PEBuilder to create the WinPE image. See [“Create a WinPE Image by Using PEBuilder,”](#) on page 42. You can create the WinPE image by using another method, but you must manually insert the vRealize Automation guest agent. See [“Manually Insert the Guest Agent into a WinPE Image,”](#) on page 43.
- 8 Place the WinPE image in a location accessible to the physical machines you intend to provision and record the address.

**Table 3-4.** Required Location

Scenario	Location
HP iLO	Place the image in a web-accessible location.
Dell iDRAC	Place the image in a location available to NFS or CIFS.
PXE provisioning	The appropriate location is determined by your PXE server configuration.

- 9 Gather the following information so that tenant administrators and business group managers can include it in their blueprints:
  - The name and location of the WinPE ISO image.
  - The name of the WIM file, the UNC path to the WIM file, and the index used to extract the desired image from the WIM file.
  - The user name and password under which to map the WIM image path to a network drive on the provisioned machine.
  - (Optional) If you do not want to accept the default, K, the drive letter to which the WIM image path is mapped on the provisioned machine.

---

**NOTE** You can create a build profile with the property set `WimImagingProperties` to include all of this required information. This makes it easier for tenant administrators and business group managers to include this information correctly in their blueprints. Optionally, you can also add the property set `SysprepProperties` and prompt tenant administrators and business group managers to specify or overwrite settings in the SysPrep answer file.

---

## Reference Machine Requirements for WIM Provisioning

WIM provisioning involves creating a WIM image from a reference machine. The reference machine must meet basic requirements for the WIM image to work for provisioning in vRealize Automation.

The following is a high-level overview of the steps to prepare a reference machine:

- 1 If the operating system on your reference machine is Windows Server 2008 R2, Windows Server 2012, Windows 7, or Windows 8, the default installation creates a small partition on the system's hard disk in addition to the main partition. vRealize Automation does not support the use of WIM images created on such multi-partitioned reference machines. You must delete this partition during the installation process.
- 2 Install NET 4.5 and Windows Automated Installation Kit (AIK) for Windows 7 (including WinPE 3.0) on the reference machine.
- 3 If the reference machine operating system is Windows Server 2003 or Windows XP, reset the administrator password to be blank. (There is no password.)



- 4 (Optional) A Windows Management Instrumentation (WMI) agent is required to collect certain data from a Windows machine managed by vRealize Automation, for example the Active Directory status of a machine's owner. To ensure successful management of Windows machines, you must install a WMI agent (typically on the Manager Service host) and enable the agent to collect data from Windows machines.

## SysPrep Requirements for the Reference Machine

A SysPrep answer file is required for WIM provisioning and there are a number of required settings.

**Table 3-5.** Windows Server 2003 or Windows XP reference machine SysPrep required settings:

GuiUnattended Settings	Value
AutoLogon	<b>Yes</b>
AutoLogonCount	<b>1</b>
AutoLogonUsername	<i>username</i> ( <i>username</i> and <i>password</i> are the credentials used for auto logon when the newly provisioned machine boots into the guest operating system. Administrator is typically used.)
AutoLogonPassword	<i>password</i> corresponding to the AutoLogonUsername.

**Table 3-6.** Required SysPrep Settings for reference machine that are not using Windows Server 2003 or Windows XP:

AutoLogon Settings	Value
Enabled	<b>Yes</b>
LogonCount	<b>1</b>
Username	<i>username</i> ( <i>username</i> and <i>password</i> are the credentials used for auto logon when the newly provisioned machine boots into the guest operating system. Administrator is typically used.)
Password	<i>password</i> ( <i>username</i> and <i>password</i> are the credentials used for auto logon when the newly provisioned machine boots into the guest operating system. Administrator is typically used.) <b>NOTE</b> For reference machines that use a Windows platform newer than Windows Server 2003/Windows XP, you must set the autologon password by using the custom property <code>Sysprep.GuiUnattended.AdminPassword</code> . A convenient way to ensure this is done is to create a build profile that includes this custom property so that tenant administrators and business group managers can include this information correctly in their blueprints.

## Install PEBuilder

The PEBuilder tool provided by vRealize Automation provides a simple way to include the vRealize Automation guest agent in your WinPE images.

PEBuilder has a 32 bit guest agent. If you need to run commands specific to 64 bit, install PEBuilder and then get the 64 bit files from the `GugentZipx64.zip` file.

Install PEBuilder in a location where you can access your staging environment.

### Prerequisites

- Install NET Framework 4.5.

- Windows Automated Installation Kit (AIK) for Windows 7 (including WinPE 3.0) is installed.

### Procedure

- 1 Navigate to the vCloud Automation Center Appliance management console installation page.  
For example: `https://vcac-hostname.domain.name:5480/installer/`.
- 2 Download the PEBuilder.
- 3 (Optional) Download the Windows 64-bit guest agent package if you want to include the Windows 64-bit guest agent in your WinPE instead of the Windows 32-bit guest agent.
- 4 Run `VCAC-WinPEBuilder-Setup.exe`.
- 5 Follow the prompts to install PEBuilder.
- 6 (Optional) Replace the Windows 32-bit guest agent files located in `\PE Builder\Plugins\VRM Agent\VRMGuestAgent` with the 64-bit files to include the 64-bit agent in your WinPE.

You can use PEBuilder to create a WinPE for use in WIM provisioning.

## Specify Custom Scripts in a PEBuilder WinPE

Using PEBuilder, you can include custom scripts in your WinPE. The agent runs the scripts at the specified point in the provisioning workflow to customize machines.

### Prerequisites

“Install PEBuilder,” on page 41.

### Procedure

- 1 Create or identify the script you want to use.  
Your script must return a non-zero value on failure to prevent machine provisioning failure.
- 2 Save the script as `NN_scriptname`.  
`NN` is a two digit number. Scripts are executed in order from lowest to highest. If two scripts have the same number, the order is alphabetical based on `scriptname`.
- 3 Make your script executable.
- 4 Place your scripts in the appropriate `Plugins\VRM Agent\VRMGuestAgent\site\work item` subdirectory of the PEBuilder installation directory.

For example, `C:\Program Files (x86)\VMware\VCAC\PE Builder\Plugins\VRM Agent\VRMGuestAgent\site\SetupOS`.

Custom scripts are most commonly run with the work items `SetupOS` (for create provisioning) and `CustomizeOS` (for clone provisioning), but you can run scripts at any point in the workflow.

The agent runs the script in the order specified by the work item directory and the script file name.

## Create a WinPE Image by Using PEBuilder

Use the PEBuilder tool provided by vRealize Automation to create a WinPE ISO file that includes the vRealize Automation guest agent.

### Prerequisites

- “Install PEBuilder,” on page 41.
- (Optional) Add any third party plugins you want to add to the WinPE image to the `Plugins` subdirectory of the PEBuilder installation directory.

- (Optional) [“Specify Custom Scripts in a PEBuilder WinPE,”](#) on page 42.

### Procedure

- 1 Run PEBuilder.
- 2 Enter the vRealize Automation server host name in the **vCAC Hostname** text box.
  - In a high availability environment, specify the vRealize Automation server load balancer for the system that the manager service is running on.
  - In non-high availability environment, specify the host name for the system that the manager service is running on.

- 3 Enter the vRealize Automation server port in the **vCAC Port** text box.

- 4 Enter the path to the PEBuilder plugins directory.

This depends on the installation directory specified during installation. The default is C:\Program Files (x86)\VMware\vCAC\PE Builder\PlugIns.

- 5 Enter the output path for the ISO file you are creating in the **ISO Output Path** text box.

This location should be on the staging area you prepared.

- 6 Click **File > Advanced**.

---

**NOTE** Do not change the **WinPE Architecture** or **Protocol** settings.

---

- 7 Select the **Include vCAC Guest Agent in WinPE ISO** check box.

This inserts the Windows 32-bit guest agent into your WinPE ISO.

- 8 Click **OK**.

- 9 Click **Build**.

### What to do next

If you are provisioning HP iLO machines, place the WinPE image in a web-accessible location. For Dell iDRAC machines, place the image in a location available to NFS or CIFS. Record the address.

## Manually Insert the Guest Agent into a WinPE Image

You do not have to use the vRealize Automation PEBuilder to create your WinPE. However, if you do not use the PEBuilder you must manually insert the vRealize Automation guest agent into your WinPE image.

### Prerequisites

- Select a Windows system from which the staging area you prepared is accessible and on which .NET 4.5 and Windows Automated Installation Kit (AIK) for Windows 7 (including WinPE 3.0) are installed.
- Create a WinPE.

### Procedure

- 1 [Install the Guest Agent in a WinPE](#) on page 44

If you choose not to use the vRealize Automation PEBuilder to create you WinPE, you must install PEBuilder to manually copy the guest agent files to your WinPE image.

- 2 [Configure the doagent.bat File](#) on page 44

If you choose not to use the vRealize Automation PEBuilder, you must manually configure the `doagent.bat` file.

3 [Configure the doagentc.bat File](#) on page 45

If you choose not to use the vRealize Automation PEBuilder, you must manually configure the `doagentc.bat` file.

4 [Configure the Guest Agent Properties Files](#) on page 46

If you choose not to use the vRealize Automation PEBuilder, you must manually configure the guest agent properties files.

## Install the Guest Agent in a WinPE

If you choose not to use the vRealize Automation PEBuilder to create your WinPE, you must install PEBuilder to manually copy the guest agent files to your WinPE image.

PEBuilder has a 32 bit guest agent. If you need to run commands specific to 64 bit, install PEBuilder and then get the 64 bit files from the `GugentZipx64.zip` file.

### Prerequisites

- Select a Windows system from which the staging area you prepared is accessible and on which .NET 4.5 and Windows Automated Installation Kit (AIK) for Windows 7 (including WinPE 3.0) are installed.
- Create a WinPE.

### Procedure

- 1 Navigate to the vCloud Automation Center Appliance management console installation page.  
For example: `https://vcac-hostname.domain.name:5480/installer/`.
- 2 Download the PEBuilder.
- 3 (Optional) Download the Windows 64-bit guest agent package if you want to include the Windows 64-bit guest agent in your WinPE instead of the Windows 32-bit guest agent.
- 4 Execute `vcac-WinPEBuilder-Setup.exe`.
- 5 Deselect both **Plugins** and **PEBuilder**.
- 6 Expand **Plugins** and select **VRMAgent**.
- 7 Follow the prompts to complete the installation.
- 8 (Optional) After installation is complete, replace the Windows 32-bit guest agent files located in `\PE Builder\Plugins\VRM Agent\VRMGuestAgent` with the 64-bit files to include the 64-bit agent in your WinPE.
- 9 Copy the contents of `%SystemDrive%\Program Files (x86)\VMware\PE Builder\Plugins\VRM Agent\VRMGuestAgent` to a new location within your WinPE Image.  
For example: `C:\Program Files (x86)\VMware\PE Builder\Plugins\VRM Agent\VRMGuestAgent`.

## Configure the doagent.bat File

If you choose not to use the vRealize Automation PEBuilder, you must manually configure the `doagent.bat` file.

### Prerequisites

[“Install the Guest Agent in a WinPE,”](#) on page 44.

### Procedure

- 1 Navigate to the `VRMGuestAgent` directory within your WinPE Image.  
For example: `C:\Program Files (x86)\VMware\PE Builder\Plugins\VRM Agent\VRMGuestAgent`.

- 2 Make a copy of the file `doagent-template.bat` and name it `doagent.bat`.
- 3 Open `doagent.bat` in a text editor.
- 4 Replace all instances of the string `#Dcac Hostname#` with the fully qualified domain name and port number of the IaaS Manager Service host.

Option	Description
<b>If you are using a load balancer</b>	Enter the fully qualified domain name and port of the load balancer for the IaaS Manager Service. For example, <code>manager_service_LB.mycompany.com:443</code>
<b>With no load balancer</b>	Enter the fully qualified domain name and port of the machine on which the IaaS Manager Service is installed. For example, <code>manager_service.mycompany.com:443</code>

- 5 Replace all instances of the string `#Protocol#` with the string `/ssl`.
- 6 Replace all instances of the string `#Comment#` with `REM` (`REM` must be followed by a trailing space).
- 7 (Optional) If you are using self-signed certificates, uncomment the `openssl` command.  

```
echo QUIT | c:\VRMGuestAgent\bin\openssl s_client -connect
```
- 8 Save and close the file.
- 9 Edit the `Startnet.cmd` script for your WinPE to include the `doagent.bat` as a custom script.

## Configure the `doagentc.bat` File

If you choose not to use the vRealize Automation PEBuilder, you must manually configure the `doagentc.bat` file.

### Prerequisites

[“Configure the `doagent.bat` File,”](#) on page 44.

### Procedure

- 1 Navigate to the `VRMGuestAgent` directory within your WinPE Image.  
 For example: `C:\Program Files (x86)\VMware\PE Builder\Plugins\VRM Agent\VRMGuestAgent`.
- 2 Make a copy of the file `doagentsvc-template.bat` and name it `doagentc.bat`.
- 3 Open `doagentc.bat` in a text editor.
- 4 Replace all instances of the string `#Dcac Hostname#` with the fully qualified domain name and port number of the IaaS Manager Service host.

Option	Description
<b>If you are using a load balancer</b>	Enter the fully qualified domain name and port of the load balancer for the IaaS Manager Service. For example, <code>manager_service_LB.mycompany.com:443</code>
<b>With no load balancer</b>	Enter the fully qualified domain name and port of the IaaS Website Server. For example, <code>manager_service.mycompany.com:443</code>

- 5 Replace all instances of the string `#errorlevel#` with the character `1`.
- 6 Replace all instances of the string `#Protocol#` with the string `/ssl`.
- 7 Replace all instances of the string `#Comment#` with the string `REM` followed by a trailing space.
- 8 Save and close the file.

## Configure the Guest Agent Properties Files

If you choose not to use the vRealize Automation PEBuilder, you must manually configure the guest agent properties files.

### Prerequisites

[“Configure the doagentc.bat File,”](#) on page 45.

### Procedure

- 1 Navigate to the VRMGuestAgent directory within your WinPE Image.  
For example: C:\Program Files (x86)\VMware\PE Builder\Plugins\VRM Agent\VRMGuestAgent.
- 2 Make a copy of the file `gugent.properties` and name it `gugent.properties.template`.
- 3 Make a copy of the file `gugent.properties.template` and name it `gugentc.properties`.
- 4 Open `gugent.properties` in a text editor.
- 5 Replace all instances of the string `GuestAgent.log` the string `X:/VRMGuestAgent/GuestAgent.log`.
- 6 Save and close the file.
- 7 Open `gugentc.properties` in a text editor.
- 8 Replace all instances of the string `GuestAgent.log` the string `C:/VRMGuestAgent/GuestAgent.log`.
- 9 Save and close the file.

# Creating Blueprints

Machine blueprints are the complete specification for a virtual, cloud, or physical machine. Blueprints determine a machine's attributes, the manner in which it is provisioned, and its policy and management settings.

This chapter includes the following topics:

- [“Choosing a Blueprint Scenario,”](#) on page 47
- [“Create a Blueprint for Linux Kickstart Provisioning,”](#) on page 48
- [“Create a Blueprint for WIM Provisioning,”](#) on page 53
- [“Create a Blueprint for SCCM Provisioning,”](#) on page 60
- [“Create a Blueprint for PXE Provisioning,”](#) on page 66
- [“Publish a Blueprint,”](#) on page 73

## Choosing a Blueprint Scenario

Depending on your environment and the methods of provisioning your fabric administrators have prepared, there are several procedures available to create the blueprint for your needs.

All of these provisioning methods require preparation by your fabric administrators before you can create a blueprint and provision machines. Please contact your fabric administrators to determine which provisioning methods they have prepared for you.

**Table 4-1.** Choosing a Blueprint Scenario

Scenario	Supported Platforms	Procedure	Custom Properties
Provision a machine by querying a PXE boot server for a network boot strap program (NBP). You can configure the NBP to then download and execute any boot image-based provisioning method to deploy an operating system. This is the only supported provisioning method for Cisco UCS Manager machines.	All	<a href="#">“Create a Blueprint for PXE Provisioning,”</a> on page 66	<a href="#">“Custom Properties for PXE Provisioning,”</a> on page 70
Provision a machine by booting from an ISO image, using a kickstart or autoYaSt configuration file and a Linux distribution image to install the operating system on the machine.	<ul style="list-style-type: none"> <li>■ Dell iDRAC</li> <li>■ HP iLO</li> </ul>	<a href="#">“Create a Blueprint for Linux Kickstart Provisioning,”</a> on page 48	<a href="#">“Custom Properties for Linux Kickstart Blueprints,”</a> on page 51

**Table 4-1.** Choosing a Blueprint Scenario (Continued)

Scenario	Supported Platforms	Procedure	Custom Properties
Provision a machine and pass control to an SCCM task sequence to boot from an ISO image, deploy a Windows operating system, and install the vRealize Automation guest agent.	<ul style="list-style-type: none"> <li>■ Dell iDRAC</li> <li>■ HP iLO</li> </ul>	<a href="#">“Create a Blueprint for SCCM Provisioning,”</a> on page 60	<a href="#">“Custom Properties for SCCM Blueprints,”</a> on page 64
Provision a machine by booting into a WinPE environment and installing an operating system using a Windows Imaging File Format (WIM) image of an existing Windows reference machine.	<ul style="list-style-type: none"> <li>■ Dell iDRAC</li> <li>■ HP iLO</li> </ul>	<a href="#">“Create a Blueprint for WIM Provisioning,”</a> on page 53	<a href="#">“Custom Properties for WIM Blueprints,”</a> on page 57

## Create a Blueprint for Linux Kickstart Provisioning

You can provision a Dell iDRAC or HP iLO machine by booting from an ISO image and using a kickstart or autoYaSt configuration file and a Linux distribution image to install the operating system on the machine.

### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Gather the name and location of the ISO image from your fabric administrator. For Dell iDRAC integrations where the image is located on a CIFS share that requires authentication, you also need the user name and password to access the share.

---

**NOTE** Your fabric administrator might have provided this information in a build profile.

---

### Procedure

- 1 [Specify Linux Kickstart Blueprint Information](#) on page 48  
Blueprint information settings control who can access a blueprint and how many machines they can provision with it.
- 2 [Specify Linux Kickstart Blueprint Build Information](#) on page 49  
The build information settings determine how a machine is provisioned.
- 3 [Configure Linux Kickstart Blueprint Machine Resources](#) on page 50  
Machine resource settings control the resources consumed by a machine provisioned with your blueprint.
- 4 [Add Required Properties to a Linux Kickstart Blueprint](#) on page 50  
Linux Kickstart provisioning requires custom properties to locate the boot ISO image.
- 5 [Configure Blueprint Actions](#) on page 53  
Use blueprint actions and entitlements together to maintain detailed control over provisioned machines.

## Specify Linux Kickstart Blueprint Information

Blueprint information settings control who can access a blueprint and how many machines they can provision with it.

### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.



- Gather the name and location of the ISO image from your fabric administrator. For Dell iDRAC integrations where the image is located on a CIFS share that requires authentication, you also need the user name and password to access the share.

---

**NOTE** Your fabric administrator might have provided this information in a build profile.

---

### Procedure

- 1 Select **Infrastructure > Blueprints > Blueprints**.
- 2 Select **New Blueprint > Physical** and select the type of blueprint you are creating.
- 3 Enter a name in the **Name** text box.
- 4 (Optional) Enter a description in the **Description** text box.
- 5 (Optional) Select the **Master** check box to allow users to copy your blueprint.
- 6 Select who can provision machines with this blueprint.

Roles	Who Can Provision
<b>If you are both a business group manager and a tenant administrator</b>	<ul style="list-style-type: none"> <li>■ Select the <b>Shared blueprint</b> check box to allow the blueprint to be entitled to users in any business group.</li> <li>■ Deselect the <b>Shared blueprint</b> check box to create a local blueprint, and select a business group from the <b>Business group</b> drop-down menu.</li> </ul>
<b>Business group manager</b>	Select a business group from the <b>Business group</b> drop-down menu.
<b>Tenant administrator</b>	Your blueprints are always shared. You cannot choose who can use them to provision machines.

- 7 (Optional) Select a reservation policy from the **Reservation policy** drop-down menu.  
This option requires additional configuration by a fabric administrator to create a reservation policy.
- 8 Select a machine prefix from the **Machine prefix** drop-down menu.  
You can select **Use group default** to accept the default machine prefix business group for the user.
- 9 (Optional) Enter a number in the **Maximum per user** text box to limit the number of machines that a single user can provision with this blueprint.
- 10 (Optional) Set the daily cost of the machine by typing the amount in the **Cost (daily)** text box.  
This cost is added to any cost profiles that your fabric administrator sets up.

Your blueprint is not finished. Do not navigate away from this page.

## Specify Linux Kickstart Blueprint Build Information

The build information settings determine how a machine is provisioned.

### Prerequisites

[“Specify Linux Kickstart Blueprint Information,”](#) on page 48.

### Procedure

- 1 Click the **Build Information** tab.
- 2 Select how machines provisioned from this blueprint are classified from the **Blueprint type** drop-down menu.

Hypervisor indicates that the machine is being provisioned as a hypervisor running VMware ESXi or ESX. For record-keeping and licensing purposes, Hypervisor is considered a server.

- 3 Select **PhysicalProvisioningWorkflow** from the **Provisioning workflow** drop-down menu.

Your blueprint is not finished. Do not navigate away from this page.

## Configure Linux Kickstart Blueprint Machine Resources

Machine resource settings control the resources consumed by a machine provisioned with your blueprint.

### Prerequisites

[“Specify Linux Kickstart Blueprint Build Information,”](#) on page 49.

### Procedure

- 1 Specify CPU settings for provisioned machines.
  - a Enter the minimum number of CPUs in the **Minimum** text box.
  - b (Optional) Enter the maximum number of CPUs in the **Maximum** text box.
  - c Select an option from the **Resource Matching** drop-down menu to restrict provisioning to machines with **At Least** as many CPUs as your blueprint minimum or **Exactly** as many CPUs as your blueprint minimum.
- 2 Specify memory settings for provisioned machines.
  - a Enter the minimum amount of memory in the **Minimum** text box.
  - b (Optional) Enter the maximum amount of memory in the **Maximum** text box.
  - c Select an option from the **Resource Matching** drop-down menu to restrict provisioning to machines with **At Least** as much memory as your blueprint minimum or **Exactly** as much memory as your blueprint minimum.
- 3 (Optional) Specify the lease settings for provisioned machines, or leave blank for no expiration date.
  - a Enter the minimum number of lease days in the **Minimum** text box.
 

If you only provide a minimum, this number becomes the value for all machines provisioned from this blueprint.
  - b (Optional) Enter the maximum number of lease days in the **Maximum** text box to allow users to select their own settings within the range that you provide.

Your blueprint is not finished. Do not navigate away from this page.

## Add Required Properties to a Linux Kickstart Blueprint

Linux Kickstart provisioning requires custom properties to locate the boot ISO image.

---

**NOTE** If your fabric administrator creates a build profile that contains the required custom properties and you include it in your blueprint, you do not need to individually add the required custom properties to the blueprint.

---

For a list of commonly used custom properties for Linux Kickstart provisioning, see [“Custom Properties for Linux Kickstart Blueprints,”](#) on page 51.

### Prerequisites


[“Configure Linux Kickstart Blueprint Machine Resources,”](#) on page 50.

### Procedure


- 1 Click the **Properties** tab.

- 2 (Optional) Select one or more build profiles from the **Build profiles** menu.  
Build profiles contain groups of custom properties. Fabric administrators can create build profiles.
- 3 Add the ISO name custom property.
  - a Click **New Property**.
  - b Enter `Image.ISO.Name` in the **Name** text box.
  - c Enter the ISO name in the **Value** text box.
  - d (Optional) Select the **Encrypted** check box to encrypt the custom property in the database.
  - e (Optional) Select the **Prompt user** check box to require the user to provide a value when they request a machine.

If you choose to prompt users for a value, any value you provide for the custom property is presented to them as the default. If you do not provide a default, users cannot continue with the machine request until they provide a value for the custom property.

- f Click the **Save** icon ().
- 4 Add the ISO location custom property.
  - a Click **New Property**.
  - b Type `Image.ISO.Location` in the **Name** text box.
  - c Enter the location of the ISO image that your fabric administrator provided for you in the **Value** text box.

Option	Example
<b>HP iLO</b>	<code>http://11.222.333.444/iso/</code>
<b>Dell iDRAC</b>	<code>11.222.333.444:/vol_name/directory</code>
<b>Cisco UCS Manager</b>	Does not require an ISO

- d Click the **Save** icon ().
- 5 For Dell iDRAC integrations, if the ISO is located on a CIFS share that requires authentication, add the credentials to access the CIFS share.

Option	Description
<b>Image.ISO.UserName</b>	Type the username in the <b>Value</b> text box. This must be in the format <code>username@domain</code> .
<b>Image.ISO.Password</b>	Type the password for <code>Image.ISO.UserName</code> in the <b>Value</b> text box.

Your blueprint is not finished. Do not navigate away from this page.

## Custom Properties for Linux Kickstart Blueprints

vRealize Automation includes custom properties that you can use to provide additional controls for Linux Kickstart blueprints.

Certain vRealize Automation custom properties are required to use with Linux Kickstart blueprints.

**Table 4-2.** Required Custom Properties for Linux Kickstart Blueprints

Custom Property	Description
<code>VMware.VirtualCenter.OperatingSystem</code>	Specifies the vCenter Server guest operating system version ( <code>VirtualMachineGuestOsIdentifier</code> ) with which vCenter Server creates the machine. This operating system version must match the operating system version to be installed on the provisioned machine. Administrators can create property groups using one of several property sets, for example, <code>VMware[OS_Version]Properties</code> , that are predefined to include the correct <code>VMware.VirtualCenter.OperatingSystem</code> values. This property is for virtual provisioning. For related information, see the enumeration type <code>VirtualMachineGuestOsIdentifier</code> in vSphere API/SDK Documentation. For a list of currently accepted values, see the VMware vCenter Server documentation.
<code>Image.ISO.Location</code>	Values for this property are case sensitive. Specifies the location of the ISO image from which to boot, for example <code>http://192.168.2.100/site2/winpe.iso</code> . The format of this value depends on your platform. For details, see documentation provided for your platform. This property is required for WIM-based provisioning, Linux Kickstart and autoYaST provisioning, and SCCM-based provisioning.
<code>Image.ISO.Name</code>	Values for this property are case sensitive. Specifies the name of the ISO image from which to boot, for example <code>/ISO/Microsoft/WinPE.iso</code> . The format of this value depends on your platform. For details, see documentation provided for your platform. This property is required for WIM-based provisioning, Linux Kickstart and autoYaST provisioning, and SCCM-based provisioning.
<code>Image.ISO.UserName</code>	Specifies the user name to access the CIFS share in the format <code>username@domain</code> . For Dell iDRAC integrations where the image is located on a CIFS share that requires authentication to access.
<code>Image.ISO.Password</code>	Specifies the password associated with the <code>Image.ISO.UserName</code> property. For Dell iDRAC integrations where the image is located on a CIFS share that requires authentication to access.

Optional custom properties are available.

**Table 4-3.** Optional Custom Properties for Linux Kickstart Blueprints

Custom Property	Description
<code>VirtualMachine.Admin.ThinProvision</code>	Determines whether thin provisioning is used on ESX compute resources using local or iSCSI storage. Set to True to use thin provisioning. Set to False to use standard provisioning. This property is for virtual provisioning.
<code>Machine.SSH</code>	Set to True to enable the <b>Connect Using SSH</b> option, on the vRealize Automation Items page, for Linux machines provisioned from this blueprint. If set to True and the <b>Connect using RDP or SSH</b> machine operation is enabled in the blueprint, all Linux machines that are provisioned from the blueprint display the <b>Connect Using SSH</b> option to entitled users.

## Configure Blueprint Actions

Use blueprint actions and entitlements together to maintain detailed control over provisioned machines.

Entitlements control which machine operations specific users can access. Blueprint actions control which machine operations can be performed on machines provisioned from a blueprint. For example, if you disable the option to reprovision machines created from a blueprint, then the option to reprovision a machine created from the blueprint does not appear for any users. If you enable the reprovision machine operation, then users who are entitled to reprovision machines can reprovision machines created from this blueprint.

---

**NOTE** The options that appear on the **Actions** tab depend on your platform and any customizations made to your vRealize Automation instance.

---

### Prerequisites

[“Add Required Properties to a Linux Kickstart Blueprint,”](#) on page 50.

### Procedure

- 1 Click the **Actions** tab.
- 2 (Optional) Select the check boxes for each machine option to enable for machines provisioned from this blueprint.
- 3 Click **OK**.

Your blueprint is saved in draft state.

### What to do next

Publish your blueprint to make it available as a catalog item. See [“Publish a Blueprint,”](#) on page 73.

## Create a Blueprint for WIM Provisioning

You can provision a Dell iDRAC or HP iLO machine by booting into a WinPE environment and then installing an operating system using a Windows Imaging File Format (WIM) image of an existing Windows reference machine.

### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Gather the following information from your fabric administrator:
  - a The name and location of the WinPE ISO image.
  - b The name of the WIM file, the UNC path to the WIM file, and the index used to extract the desired image from the WIM file.
  - c The user name and password under which to map the WIM image path to a network drive on the provisioned machine.
  - d For Dell iDRAC integrations where the image is located on a CIFS share that requires authentication, the user name, and password to access the share.
  - e (Optional) If you do not want to accept the default, K, the drive letter to which the WIM image path is mapped on the provisioned machine.

---

**NOTE** Your fabric administrator might have provided this information in a build profile.

---

**Procedure**

- 1 [Specify WIM Blueprint Information](#) on page 54  
Blueprint information settings control who can access a blueprint and how many machines they can provision with it.
- 2 [Specify WIM Blueprint Build Information](#) on page 55  
The build information settings determine how a machine is provisioned.
- 3 [Configure WIM Blueprint Machine Resources](#) on page 55  
Machine resource settings control the resources consumed by a machine provisioned with your blueprint.
- 4 [Add Required Properties to a WIM Blueprint](#) on page 56  
WIM provisioning requires a number of custom properties to locate the WIM image and WinPE.
- 5 [Configure Blueprint Actions](#) on page 60  
Use blueprint actions and entitlements together to maintain detailed control over provisioned machines.

**Specify WIM Blueprint Information**

Blueprint information settings control who can access a blueprint and how many machines they can provision with it.

**Prerequisites**

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Gather the following information from your fabric administrator:
  - a The name and location of the WinPE ISO image.
  - b The name of the WIM file, the UNC path to the WIM file, and the index used to extract the desired image from the WIM file.
  - c The user name and password under which to map the WIM image path to a network drive on the provisioned machine.
  - d For Dell iDRAC integrations where the image is located on a CIFS share that requires authentication, the user name, and password to access the share.
  - e (Optional) If you do not want to accept the default, K, the drive letter to which the WIM image path is mapped on the provisioned machine.

---

**NOTE** Your fabric administrator might have provided this information in a build profile.

---

**Procedure**

- 1 Select **Infrastructure > Blueprints > Blueprints**.
- 2 Select **New Blueprint > Physical** and select the type of blueprint you are creating.
- 3 Enter a name in the **Name** text box.
- 4 (Optional) Enter a description in the **Description** text box.
- 5 (Optional) Select the **Master** check box to allow users to copy your blueprint.

- 6 Select who can provision machines with this blueprint.

Roles	Who Can Provision
<b>If you are both a business group manager and a tenant administrator</b>	<ul style="list-style-type: none"> <li>■ Select the <b>Shared blueprint</b> check box to allow the blueprint to be entitled to users in any business group.</li> <li>■ Deselect the <b>Shared blueprint</b> check box to create a local blueprint, and select a business group from the <b>Business group</b> drop-down menu.</li> </ul>
<b>Business group manager</b>	Select a business group from the <b>Business group</b> drop-down menu.
<b>Tenant administrator</b>	Your blueprints are always shared. You cannot choose who can use them to provision machines.

- 7 (Optional) Select a reservation policy from the **Reservation policy** drop-down menu.  
This option requires additional configuration by a fabric administrator to create a reservation policy.
- 8 Select a machine prefix from the **Machine prefix** drop-down menu.  
You can select **Use group default** to accept the default machine prefix business group for the user.
- 9 (Optional) Enter a number in the **Maximum per user** text box to limit the number of machines that a single user can provision with this blueprint.
- 10 (Optional) Set the daily cost of the machine by typing the amount in the **Cost (daily)** text box.  
This cost is added to any cost profiles that your fabric administrator sets up.

Your blueprint is not finished. Do not navigate away from this page.

## Specify WIM Blueprint Build Information

The build information settings determine how a machine is provisioned.

### Prerequisites

[“Specify WIM Blueprint Information,”](#) on page 54.

### Procedure

- 1 Click the **Build Information** tab.
- 2 Select how machines provisioned from this blueprint are classified from the **Blueprint type** drop-down menu.  
  
Hypervisor indicates that the machine is being provisioned as a hypervisor running VMware ESXi or ESX. For record-keeping and licensing purposes, Hypervisor is considered a server.
- 3 Select **PhysicalProvisioningWorkflow** from the **Provisioning workflow** drop-down menu.

Your blueprint is not finished. Do not navigate away from this page.

## Configure WIM Blueprint Machine Resources

Machine resource settings control the resources consumed by a machine provisioned with your blueprint.

### Prerequisites

[“Specify WIM Blueprint Build Information,”](#) on page 55.

**Procedure**

- 1 Specify CPU settings for provisioned machines.
  - a Enter the minimum number of CPUs in the **Minimum** text box.
  - b (Optional) Enter the maximum number of CPUs in the **Maximum** text box.
  - c Select an option from the **Resource Matching** drop-down menu to restrict provisioning to machines with **At Least** as many CPUs as your blueprint minimum or **Exactly** as many CPUs as your blueprint minimum.
- 2 Specify memory settings for provisioned machines.
  - a Enter the minimum amount of memory in the **Minimum** text box.
  - b (Optional) Enter the maximum amount of memory in the **Maximum** text box.
  - c Select an option from the **Resource Matching** drop-down menu to restrict provisioning to machines with **At Least** as much memory as your blueprint minimum or **Exactly** as much memory as your blueprint minimum.
- 3 (Optional) Specify the lease settings for provisioned machines, or leave blank for no expiration date.
  - a Enter the minimum number of lease days in the **Minimum** text box.  
  
If you only provide a minimum, this number becomes the value for all machines provisioned from this blueprint.
  - b (Optional) Enter the maximum number of lease days in the **Maximum** text box to allow users to select their own settings within the range that you provide.

Your blueprint is not finished. Do not navigate away from this page.

**Add Required Properties to a WIM Blueprint**

WIM provisioning requires a number of custom properties to locate the WIM image and WinPE.

---

**NOTE** If your fabric administrator creates a build profile that contains the required custom properties and you include it in your blueprint, you do not need to individually add the required custom properties to the blueprint.

---

For a list of custom properties related to WIM provisioning, see [“Custom Properties for WIM Blueprints,”](#) on page 57.

**Prerequisites**

[“Configure WIM Blueprint Machine Resources,”](#) on page 55.

**Procedure**

- 1 Click the **Properties** tab.
- 2 (Optional) Select one or more build profiles from the **Build profiles** menu.  
  
Build profiles contain groups of custom properties. Fabric administrators can create build profiles.
- 3 Add the ISO location custom property.
  - a Click **New Property**.
  - b Type `Image.ISO.Location` in the **Name** text box.



- c Enter the location of the ISO image that your fabric administrator provided for you in the **Value** text box.

The value of `Image.ISO.Location` is case sensitive.

Option	Example
<b>HP iLO</b>	<code>http://11.222.333.444/iso/</code>
<b>Dell iDRAC</b>	<code>11.222.333.444:/vol_name/directory</code>
<b>Cisco UCS Manager</b>	Does not require an ISO

- d (Optional) Select the **Encrypted** check box to encrypt the custom property in the database.
- e (Optional) Select the **Prompt user** check box to require the user to provide a value when they request a machine.

If you choose to prompt users for a value, any value you provide for the custom property is presented to them as the default. If you do not provide a default, users cannot continue with the machine request until they provide a value for the custom property.

- f Click the **Save** icon ()

- 4 Add the remaining required custom properties for WIM provisioning.

Option	Description
<b>Image.ISO.Name</b>	Type the name of the ISO image that your fabric administrator provided for you in the <b>Value</b> text box. This custom property value is case sensitive.
<b>Image.WIM.Path</b>	Type the UNC path to the WIM file that your fabric administrator provided for you in the <b>Value</b> text box.
<b>Image.WIM.Name</b>	Type the name of the WIM file that your fabric administrator provided for you in the <b>Value</b> text box.
<b>Image.WIM.Index</b>	Type the index to be used to extract the desired image from the WIM file that your fabric administrator provided for you in the <b>Value</b> text box.
<b>Image.Network.User</b>	Type the user name under which to map the WIM image path ( <code>Image.WIM.Path</code> ) to a network drive on the machine in the <b>Value</b> text box.
<b>Image.Network.Password</b>	Type the associated password for the network user ( <code>Image.Network.User</code> ) in the <b>Value</b> text box.
<b>Image.ISO.UserName</b>	For Dell iDRAC integrations, if the ISO is located on a CIFS share that requires authentication, type the username in the <b>Value</b> text box. This must be in the format <code>username@domain</code> .
<b>Image.ISO.Password</b>	For Dell iDRAC integrations, if the ISO is located on a CIFS share that requires authentication, type the password for <code>Image.ISO.UserName</code> in the <b>Value</b> text box.

Your blueprint is not finished. Do not navigate away from this page.

## Custom Properties for WIM Blueprints

vRealize Automation includes custom properties that provide additional controls for WIM blueprints.

Certain vRealize Automation custom properties are required for WIM blueprints.

**Table 4-4.** Required Custom Properties for WIM Blueprints

Custom Property	Description
<code>Image.ISO.Location</code>	Values for this property are case sensitive. Specifies the location of the ISO image from which to boot, for example <code>http://192.168.2.100/site2/winpe.iso</code> . The format of this value depends on your platform. For details, see documentation provided for your platform. This property is required for WIM-based provisioning, Linux Kickstart and autoYaST provisioning, and SCCM-based provisioning.
<code>Image.ISO.Name</code>	Values for this property are case sensitive. Specifies the name of the ISO image from which to boot, for example <code>/ISO/Microsoft/WinPE.iso</code> . The format of this value depends on your platform. For details, see documentation provided for your platform. This property is required for WIM-based provisioning, Linux Kickstart and autoYaST provisioning, and SCCM-based provisioning.
<code>Image.ISO.UserName</code>	Specifies the user name to access the CIFS share in the format <code>username@domain</code> . For Dell iDRAC integrations where the image is located on a CIFS share that requires authentication to access.
<code>Image.ISO.Password</code>	Specifies the password associated with the <code>Image.ISO.UserName</code> property. For Dell iDRAC integrations where the image is located on a CIFS share that requires authentication to access.
<code>Image.Network.Letter</code>	Specifies the drive letter to which the WIM image path is mapped on the provisioned machine. The default value is K.
<code>Image.WIM.Path</code>	Specifies the UNC path to the WIM file from which an image is extracted during WIM-based provisioning. The path format is <code>\\server\share\$</code> format, for example <code>\\lab-ad\dfs\$</code> .
<code>Image.WIM.Name</code>	Specifies the name of the WIM file, for example <code>win2k8.wim</code> , as located by the <code>Image.WIM.Path</code> property.
<code>Image.WIM.Index</code>	Specifies the index used to extract the correct image from the WIM file.
<code>Image.Network.User</code>	Specifies the user name with which to map the WIM image path ( <code>Image.WIM.Path</code> ) to a network drive on the provisioned machine. This is typically a domain account with access to the network share.
<code>Image.Network.Password</code>	Specifies the password associated with the <code>Image.Network.User</code> property.
<code>VMware.VirtualCenter.OperatingSystem</code>	Specifies the vCenter Server guest operating system version ( <code>VirtualMachineGuestOsIdentifier</code> ) with which vCenter Server creates the machine. This operating system version must match the operating system version to be installed on the provisioned machine. Administrators can create property groups using one of several property sets, for example, <code>VMware[OS_Version]Properties</code> , that are predefined to include the correct <code>VMware.VirtualCenter.OperatingSystem</code> values. This property is for virtual provisioning. For related information, see the enumeration type <code>VirtualMachineGuestOsIdentifier</code> in vSphere API/SDK Documentation. For a list of currently accepted values, see the VMware vCenter Server documentation.

Optional custom properties are also available for WIM blueprints.

**Table 4-5.** Common Custom Properties for WIM Blueprints

Custom Property	Description
SysPrep. <i>Section.Key</i> ■ SysPrep.GuiUnattended.AdminPassword ■ SysPrep.GuiUnattended.EncryptedAdminPassword ■ SysPrep.GuiUnattended.TimeZone	<p>Specifies information to be added to the SysPrep answer file on machines during the WinPE stage of provisioning. Information that already exists in the SysPrep answer file is overwritten by these custom properties. <i>Section</i> represents the name of the section of the SysPrep answer file, for example GuiUnattended or UserData. <i>Key</i> represents a key name in the section. For example, to set the time zone of a provisioned machine to West Pacific Standard Time, define the custom property GuiUnattended.UserData.TimeZone and set the value to 275.</p> <p>For a full list of sections, keys, and accepted values, see the System Preparation Utility for Windows documentation.</p> <p>The following <i>Section.Key</i> combinations can be specified for WIM-based provisioning:</p> <ul style="list-style-type: none"> <li>■ GuiUnattended               <ul style="list-style-type: none"> <li>■ AdminPassword</li> <li>■ EncryptedAdminPassword</li> <li>■ TimeZone</li> </ul> </li> <li>■ UserData               <ul style="list-style-type: none"> <li>■ ProductKey</li> <li>■ FullName</li> <li>■ ComputerName</li> <li>■ OrgName</li> </ul> </li> <li>■ Identification               <ul style="list-style-type: none"> <li>■ DomainAdmin</li> <li>■ DomainAdminPassword</li> <li>■ JoinDomain</li> <li>■ JoinWorkgroup</li> </ul> </li> </ul>
Sysprep.Identification.DomainAdmin	Specifies a user name with administrator-level access to the target domain in Active Directory. Do not include the user domain in the credentials that you send to vCloud Director.
Sysprep.Identification.DomainAdminPassword	Specifies the password to associate with the Sysprep.Identification.DomainAdmin property.
Sysprep.Identification.JoinDomain	Specifies the name of the domain to join in Active Directory.
Sysprep.Identification.JoinWorkgroup	Specifies the name of the workgroup to join if not using a domain.
SysPrep.UserData.ComputerName	Specifies a machine name, for example lab-client005.
SysPrep.UserData.FullName	Specifies the full name of a user.
SysPrep.UserData.OrgName	Specifies the organization name of the user.
SysPrep.UserData.ProductKey	Specifies the Windows product key.
VirtualMachine.Admin.ThinProvision	Determines whether thin provisioning is used on ESX compute resources using local or iSCSI storage. Set to True to use thin provisioning. Set to False to use standard provisioning. This property is for virtual provisioning.

## Configure Blueprint Actions

Use blueprint actions and entitlements together to maintain detailed control over provisioned machines.

Entitlements control which machine operations specific users can access. Blueprint actions control which machine operations can be performed on machines provisioned from a blueprint. For example, if you disable the option to reprovision machines created from a blueprint, then the option to reprovision a machine created from the blueprint does not appear for any users. If you enable the reprovision machine operation, then users who are entitled to reprovision machines can reprovision machines created from this blueprint.

---

**NOTE** The options that appear on the **Actions** tab depend on your platform and any customizations made to your vRealize Automation instance.

---

### Prerequisites

[“Add Required Properties to a WIM Blueprint,”](#) on page 56.

### Procedure

- 1 Click the **Actions** tab.
- 2 (Optional) Select the check boxes for each machine option to enable for machines provisioned from this blueprint.
- 3 Click **OK**.

Your blueprint is saved in draft state.

### What to do next

Publish your blueprint to make it available as a catalog item. See [“Publish a Blueprint,”](#) on page 73.

## Create a Blueprint for SCCM Provisioning

You can provision a machine and then pass control to an SCCM task sequence to boot from an ISO image, deploy a Windows operating system, and install the vRealize Automation guest agent.

### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Gather the following information from your fabric administrator:
  - a The name of the collection containing the task sequence.
  - b The fully qualified domain name of the SCCM server on which the collection containing the sequence resides.
  - c The site code of the SCCM server.
  - d Administrator-level credentials for the SCCM server.
  - e For Dell iDRAC integrations where the image is located on a CIFS share that requires authentication, the user name and password to access the share.

---

**NOTE** Your fabric administrator might have provided this information in a build profile.

---

**Procedure**

- 1 [Specify SCCM Blueprint Information](#) on page 61  
Blueprint information settings control who can access a blueprint and how many machines they can provision with it.
- 2 [Specify SCCM Build Information](#) on page 62  
The build information settings determine how a machine is provisioned.
- 3 [Configure SCCM Machine Resources](#) on page 62  
Machine resource settings control the resources consumed by a machine provisioned with your blueprint.
- 4 [Add Required Properties to an SCCM Blueprint](#) on page 63  
SCCM provisioning requires custom properties to successfully provision machines with the desired ISO and task sequence.
- 5 [Configure Blueprint Actions](#) on page 66  
Use blueprint actions and entitlements together to maintain detailed control over provisioned machines.

**Specify SCCM Blueprint Information**

Blueprint information settings control who can access a blueprint and how many machines they can provision with it.

**Prerequisites**

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Gather the following information from your fabric administrator:
  - a The name of the collection containing the task sequence.
  - b The fully qualified domain name of the SCCM server on which the collection containing the sequence resides.
  - c The site code of the SCCM server.
  - d Administrator-level credentials for the SCCM server.
  - e For Dell iDRAC integrations where the image is located on a CIFS share that requires authentication, the user name and password to access the share.

---

**NOTE** Your fabric administrator might have provided this information in a build profile.

---

**Procedure**

- 1 Select **Infrastructure > Blueprints > Blueprints**.
- 2 Select **New Blueprint > Physical** and select the type of blueprint you are creating.
- 3 Enter a name in the **Name** text box.
- 4 (Optional) Enter a description in the **Description** text box.
- 5 (Optional) Select the **Master** check box to allow users to copy your blueprint.

- 6 Select who can provision machines with this blueprint.

Roles	Who Can Provision
<b>If you are both a business group manager and a tenant administrator</b>	<ul style="list-style-type: none"> <li>■ Select the <b>Shared blueprint</b> check box to allow the blueprint to be entitled to users in any business group.</li> <li>■ Deselect the <b>Shared blueprint</b> check box to create a local blueprint, and select a business group from the <b>Business group</b> drop-down menu.</li> </ul>
<b>Business group manager</b>	Select a business group from the <b>Business group</b> drop-down menu.
<b>Tenant administrator</b>	Your blueprints are always shared. You cannot choose who can use them to provision machines.

- 7 (Optional) Select a reservation policy from the **Reservation policy** drop-down menu.  
This option requires additional configuration by a fabric administrator to create a reservation policy.
- 8 Select a machine prefix from the **Machine prefix** drop-down menu.  
You can select **Use group default** to accept the default machine prefix business group for the user.
- 9 (Optional) Enter a number in the **Maximum per user** text box to limit the number of machines that a single user can provision with this blueprint.
- 10 (Optional) Set the daily cost of the machine by typing the amount in the **Cost (daily)** text box.  
This cost is added to any cost profiles that your fabric administrator sets up.

Your blueprint is not finished. Do not navigate away from this page.

## Specify SCCM Build Information

The build information settings determine how a machine is provisioned.

### Prerequisites

[“Specify SCCM Blueprint Information,”](#) on page 61.

### Procedure

- 1 Click the **Build Information** tab.
- 2 Select Desktop or Server from the **Blueprint type** drop-down menu.  
This information is for record-keeping and licensing purposes. Do not select Hypervisor for SCCM blueprints.
- 3 Select **PhysicalSccmProvisioningWorkflow** from the **Provisioning workflow** drop-down menu.

Your blueprint is not finished. Do not navigate away from this page.

## Configure SCCM Machine Resources

Machine resource settings control the resources consumed by a machine provisioned with your blueprint.

### Prerequisites

[“Specify SCCM Build Information,”](#) on page 62.

**Procedure**

- 1 Specify CPU settings for provisioned machines.
  - a Enter the minimum number of CPUs in the **Minimum** text box.
  - b (Optional) Enter the maximum number of CPUs in the **Maximum** text box.
  - c Select an option from the **Resource Matching** drop-down menu to restrict provisioning to machines with **At Least** as many CPUs as your blueprint minimum or **Exactly** as many CPUs as your blueprint minimum.
- 2 Specify memory settings for provisioned machines.
  - a Enter the minimum amount of memory in the **Minimum** text box.
  - b (Optional) Enter the maximum amount of memory in the **Maximum** text box.
  - c Select an option from the **Resource Matching** drop-down menu to restrict provisioning to machines with **At Least** as much memory as your blueprint minimum or **Exactly** as much memory as your blueprint minimum.
- 3 (Optional) Specify the lease settings for provisioned machines, or leave blank for no expiration date.
  - a Enter the minimum number of lease days in the **Minimum** text box.  
 If you only provide a minimum, this number becomes the value for all machines provisioned from this blueprint.
  - b (Optional) Enter the maximum number of lease days in the **Maximum** text box to allow users to select their own settings within the range that you provide.

Your blueprint is not finished. Do not navigate away from this page.

**Add Required Properties to an SCCM Blueprint**

SCCM provisioning requires custom properties to successfully provision machines with the desired ISO and task sequence.

---

**NOTE** If your fabric administrator creates a build profile that contains the required custom properties and you include it in your blueprint, you do not need to individually add the required custom properties to the blueprint.

---

For a list of custom properties commonly used for SCCM provisioning, see [“Custom Properties for SCCM Blueprints,”](#) on page 64.

**Prerequisites**

[“Configure SCCM Machine Resources,”](#) on page 62.

**Procedure**

- 1 Click the **Properties** tab.
- 2 (Optional) Select one or more build profiles from the **Build profiles** menu.  
 Build profiles contain groups of custom properties. Fabric administrators can create build profiles.
- 3 Add the ISO location custom property.
  - a Click **New Property**.
  - b Type `Image.ISO.Location` in the **Name** text box.

- c Enter the location of the ISO image that your fabric administrator provided for you in the **Value** text box.

Option	Example
<b>HP iLO</b>	http://11.222.333.444/iso/
<b>Dell iDRAC</b>	11.222.333.444:/vol_name/directory
<b>Cisco UCS Manager</b>	Does not require an ISO

- d (Optional) Select the **Encrypted** check box to encrypt the custom property in the database.
- e (Optional) Select the **Prompt user** check box to require the user to provide a value when they request a machine.

If you choose to prompt users for a value, any value you provide for the custom property is presented to them as the default. If you do not provide a default, users cannot continue with the machine request until they provide a value for the custom property.

- f Click the **Save** icon ()

- 4 Add the remaining required SCCM custom properties.

Option	Description
<b>Image.ISO.Name</b>	Type the name of the ISO image that your fabric administrator provided for you in the <b>Value</b> text box.
<b>SCCM.Collection.Name</b>	Type the SCCM collection name that your fabric administrator provided for you in the <b>Value</b> text box.
<b>SCCM.Server.Name</b>	Type the name of the SCCM file that your fabric administrator provided for you in the <b>Value</b> text box.
<b>SCCM.Server.SiteCode</b>	Type the SCCM site code that your fabric administrator provided for you in the <b>Value</b> text box.
<b>SCCM.Server.UserName</b>	Type the administrator-level user name that your fabric administrator provided for you in the <b>Value</b> text box.
<b>SCCM.Server.Password</b>	Type the associated password for the SCCM user in the <b>Value</b> text box.
<b>Image.ISO.UserName</b>	For Dell iDRAC integrations, if the ISO is located on a CIFS share that requires authentication, type the username in the <b>Value</b> text box. This must be in the format username@domain.
<b>Image.ISO.Password</b>	For Dell iDRAC integrations, if the ISO is located on a CIFS share that requires authentication, type the password for <b>Image.ISO.UserName</b> in the <b>Value</b> text box.

Your blueprint is not finished. Do not navigate away from this page.

## Custom Properties for SCCM Blueprints

vRealize Automation includes custom properties that you can use to provide additional controls for SCCM blueprints.

Certain custom properties are required to use with SCCM blueprints.



**Table 4-6.** Required Custom Properties for SCCM Blueprints

Custom Property	Description
Image.ISO.Location	Values for this property are case sensitive. Specifies the location of the ISO image from which to boot, for example <code>http://192.168.2.100/site2/winpe.iso</code> . The format of this value depends on your platform. For details, see documentation provided for your platform. This property is required for WIM-based provisioning, Linux Kickstart and autoYaST provisioning, and SCCM-based provisioning.
Image.ISO.Name	Values for this property are case sensitive. Specifies the name of the ISO image from which to boot, for example <code>/ISO/Microsoft/WinPE.iso</code> . The format of this value depends on your platform. For details, see documentation provided for your platform. This property is required for WIM-based provisioning, Linux Kickstart and autoYaST provisioning, and SCCM-based provisioning.
Image.ISO.UserName	Specifies the user name to access the CIFS share in the format <code>username@domain</code> . For Dell iDRAC integrations where the image is located on a CIFS share that requires authentication to access.
Image.ISO.Password	Specifies the password associated with the <code>Image.ISO.UserName</code> property. For Dell iDRAC integrations where the image is located on a CIFS share that requires authentication to access.
SCCM.Collection.Name	Specifies the name of the SCCM collection that contains the operating system deployment task sequence.
SCCM.Server.Name	Specifies the fully qualified domain name of the SCCM server on which the collection resides, for example <code>lab-sccm.lab.local</code> .
SCCM.Server.SiteCode	Specifies the site code of the SCCM server.
SCCM.Server.UserName	Specifies a user name with administrator-level access to the SCCM server.
SCCM.Server.Password	Specifies the password associated with the <code>SCCM.Server.UserName</code> property.

Certain custom properties are used most often with SCCM blueprints.

**Table 4-7.** Common Custom Properties for SCCM Blueprints

Custom Property	Description
SCCM.CustomVariable.Name	Specifies the value of a custom variable, where <i>Name</i> is the name of any custom variable to be made available to the SCCM task sequence after the provisioned machine is registered with the SCCM collection. The value is determined by your choice of custom variable. If your integration requires it, you can use <code>SCCM.RemoveCustomVariablePrefix</code> to remove the <code>SCCM.CustomVariable.</code> prefix from your custom variable.
SCCM.RemoveCustomVariablePrefix	Set to <i>true</i> to remove the prefix <code>SCCM.CustomVariable.</code> from SCCM custom variables you created by using the custom property <code>SCCM.CustomVariable.Name</code> .

## Configure Blueprint Actions

Use blueprint actions and entitlements together to maintain detailed control over provisioned machines.

Entitlements control which machine operations specific users can access. Blueprint actions control which machine operations can be performed on machines provisioned from a blueprint. For example, if you disable the option to reprovision machines created from a blueprint, then the option to reprovision a machine created from the blueprint does not appear for any users. If you enable the reprovision machine operation, then users who are entitled to reprovision machines can reprovision machines created from this blueprint.

---

**NOTE** The options that appear on the **Actions** tab depend on your platform and any customizations made to your vRealize Automation instance.

---

### Prerequisites

[“Add Required Properties to an SCCM Blueprint,”](#) on page 63.

### Procedure

- 1 Click the **Actions** tab.
- 2 (Optional) Select the check boxes for each machine option to enable for machines provisioned from this blueprint.
- 3 Click **OK**.

Your blueprint is saved in draft state.

### What to do next

Publish your blueprint to make it available as a catalog item. See [“Publish a Blueprint,”](#) on page 73.

## Create a Blueprint for PXE Provisioning

You can provision a machine by querying a PXE boot server for a network boot strap program (NBP). You can configure the NBP to then download and execute any boot image-based provisioning method to deploy an operating system.

### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Gather the following information from your fabric administrator:
  - For Cisco UCS Manager machines, record the service profile template name to apply to provisioned machines.
  - (Optional) For Cisco UCS Manager machines, record the name of the boot policy to apply on reboot.
  - Depending on how your administrators prepare for provisioning, gather any other required information. For example, you might require the assigned names of custom PowerShell scripts to run during provisioning.

---

**NOTE** Your fabric administrator might have provided this information in a build profile.

---

### Procedure

- 1 [Specify PXE Blueprint Information](#) on page 67  
Blueprint information settings control who can access a blueprint and how many machines they can provision with it.
- 2 [Specify PXE Build Information](#) on page 68  
The build information settings determine how a machine is provisioned.
- 3 [Configure PXE Machine Resources](#) on page 69  
Machine resource settings control the resources consumed by a machine provisioned with your blueprint.
- 4 [Add Custom Properties to a PXE Blueprint](#) on page 69  
Depending on how your administrators configure your PXE server and prepare for provisioning, you may be required to add custom properties to successfully provision machines.
- 5 [Configure Blueprint Actions](#) on page 73  
Use blueprint actions and entitlements together to maintain detailed control over provisioned machines.

## Specify PXE Blueprint Information

Blueprint information settings control who can access a blueprint and how many machines they can provision with it.

### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Gather the following information from your fabric administrator:
  - For Cisco UCS Manager machines, record the service profile template name to apply to provisioned machines.
  - (Optional) For Cisco UCS Manager machines, record the name of the boot policy to apply on reboot.
  - Depending on how your administrators prepare for provisioning, gather any other required information. For example, you might require the assigned names of custom PowerShell scripts to run during provisioning.

---

**NOTE** Your fabric administrator might have provided this information in a build profile.

---

### Procedure

- 1 Select **Infrastructure > Blueprints > Blueprints**.
- 2 Select **New Blueprint > Physical** and select the type of blueprint you are creating.
- 3 Enter a name in the **Name** text box.
- 4 (Optional) Enter a description in the **Description** text box.
- 5 (Optional) Select the **Master** check box to allow users to copy your blueprint.

- 6 Select who can provision machines with this blueprint.

Roles	Who Can Provision
<b>If you are both a business group manager and a tenant administrator</b>	<ul style="list-style-type: none"> <li>■ Select the <b>Shared blueprint</b> check box to allow the blueprint to be entitled to users in any business group.</li> <li>■ Deselect the <b>Shared blueprint</b> check box to create a local blueprint, and select a business group from the <b>Business group</b> drop-down menu.</li> </ul>
<b>Business group manager</b>	Select a business group from the <b>Business group</b> drop-down menu.
<b>Tenant administrator</b>	Your blueprints are always shared. You cannot choose who can use them to provision machines.

- 7 (Optional) Select a reservation policy from the **Reservation policy** drop-down menu.  
This option requires additional configuration by a fabric administrator to create a reservation policy.
- 8 Select a machine prefix from the **Machine prefix** drop-down menu.  
You can select **Use group default** to accept the default machine prefix business group for the user.
- 9 (Optional) Enter a number in the **Maximum per user** text box to limit the number of machines that a single user can provision with this blueprint.
- 10 (Optional) Set the daily cost of the machine by typing the amount in the **Cost (daily)** text box.  
This cost is added to any cost profiles that your fabric administrator sets up.

Your blueprint is not finished. Do not navigate away from this page.

## Specify PXE Build Information

The build information settings determine how a machine is provisioned.

### Prerequisites

[“Specify PXE Blueprint Information,”](#) on page 67.

### Procedure

- 1 Click the **Build Information** tab.
- 2 Select how machines provisioned from this blueprint are classified from the **Blueprint type** drop-down menu.  
  
Hypervisor indicates that the machine is being provisioned as a hypervisor running VMware ESXi or ESX. For record-keeping and licensing purposes, Hypervisor is considered a server.
- 3 Select a PXE workflow from the **Provisioning Workflow** drop-down menu.
  - Select **PhysicalSccmPxeProvisioningWorkflow** to boot from an NBP then pass the machine to an SCCM task sequence. SCCM provisioning with PXE requires custom properties to successfully provision.
  - Select **PhysicalPxeProvisioningWorkflow** to boot from an NBP and then provision by any other method.
- 4 If you are provisioning Cisco UCS Manager machines, select a template from the **Service profile template** drop-down menu.
- 5 (Optional) If you are provisioning Cisco UCS Manager machines, select a boot policy to apply on reboot from the **Boot policy on reboot** drop-down menu.

Your blueprint is not finished. Do not navigate away from this page.

## Configure PXE Machine Resources

Machine resource settings control the resources consumed by a machine provisioned with your blueprint.

### Prerequisites

[“Specify PXE Build Information,”](#) on page 68.

### Procedure

- 1 Specify CPU settings for provisioned machines.
  - a Enter the minimum number of CPUs in the **Minimum** text box.
  - b (Optional) Enter the maximum number of CPUs in the **Maximum** text box.
  - c Select an option from the **Resource Matching** drop-down menu to restrict provisioning to machines with **At Least** as many CPUs as your blueprint minimum or **Exactly** as many CPUs as your blueprint minimum.
- 2 Specify memory settings for provisioned machines.
  - a Enter the minimum amount of memory in the **Minimum** text box.
  - b (Optional) Enter the maximum amount of memory in the **Maximum** text box.
  - c Select an option from the **Resource Matching** drop-down menu to restrict provisioning to machines with **At Least** as much memory as your blueprint minimum or **Exactly** as much memory as your blueprint minimum.
- 3 (Optional) Specify the lease settings for provisioned machines, or leave blank for no expiration date.
  - a Enter the minimum number of lease days in the **Minimum** text box.  
  
If you only provide a minimum, this number becomes the value for all machines provisioned from this blueprint.
  - b (Optional) Enter the maximum number of lease days in the **Maximum** text box to allow users to select their own settings within the range that you provide.

Your blueprint is not finished. Do not navigate away from this page.

## Add Custom Properties to a PXE Blueprint

Depending on how your administrators configure your PXE server and prepare for provisioning, you may be required to add custom properties to successfully provision machines.

---

**NOTE** If your fabric administrator creates a build profile that contains the required custom properties and you include it in your blueprint, you do not need to individually add the required custom properties to the blueprint.

---


For a list of custom properties commonly used for PXE provisioning, see [“Custom Properties for PXE Provisioning,”](#) on page 70.

### Prerequisites

[“Configure PXE Machine Resources,”](#) on page 69.

### Procedure

- 1 Click the **Properties** tab.

- 2 (Optional) Select one or more build profiles from the **Build profiles** menu.  
Build profiles contain groups of custom properties. Fabric administrators can create build profiles.
- 3 (Optional) Add any custom properties to your blueprint.
  - a Click **New Property**.
  - b Enter the custom property in the **Name** text box.
  - c Enter the value of the custom property in the **Value** text box.
  - d (Optional) Select the **Encrypted** check box to encrypt the custom property in the database.
  - e (Optional) Select the **Prompt user** check box to require the user to provide a value when they request a machine.  
  
If you choose to prompt users for a value, any value you provide for the custom property is presented to them as the default. If you do not provide a default, users cannot continue with the machine request until they provide a value for the custom property.
  - f Click the **Save** icon ()

Your blueprint is not finished. Do not navigate away from this page.

## Custom Properties for PXE Provisioning

PXE is the only provisioning method supported for Cisco UCS Manager. You can use the network bootstrap program with vRealize Automation custom properties to initiate WIM, SCCM, or Linux Kickstart provisioning. You can also use custom properties to call your own PowerShell scripts. Linux Kickstart provisioning does not require custom properties.

### Custom Properties for Provisioning With PowerShell Scripts

You can use these properties for calling PowerShell scripts.

**Table 4-8.** Custom Properties for Calling PowerShell Scripts

Custom Property	Description
Pxe.Setup.ScriptName	Specifies a custom EPI PowerShell script to run on the machine before it is started by using the PXE network boot program. The value is the name assigned to the script when it is uploaded to the model manager, for example <code>setup.ps1</code> .
Pxe.Clean.ScriptName	Specifies the name of an EPI PowerShell script installed in the vRealize Automation Model Manager, to run on the machine after it is provisioned. The value is the name assigned to the script when it is uploaded to the Model Manager, for example <code>clean.ps1</code> .

### Custom Properties For PXE and SCCM Provisioning

You can use these properties for PXE and SCCM provisioning.

**Table 4-9.** Custom Properties for PXE and SCCM Provisioning

Custom Property	Description
SCCM.Collection.Name	Specifies the name of the SCCM collection that contains the operating system deployment task sequence.
SCCM.Server.Name	Specifies the fully qualified domain name of the SCCM server on which the collection resides, for example <code>lab-sccm.lab.local</code> .

**Table 4-9.** Custom Properties for PXE and SCCM Provisioning (Continued)

Custom Property	Description
SCCM.Server.SiteCode	Specifies the site code of the SCCM server.
SCCM.Server.UserName	Specifies a user name with administrator-level access to the SCCM server.
SCCM.Server.Password	Specifies the password associated with the SCCM.Server.UserName property.
SCCM.CustomVariable.	Specifies the value of a custom variable, where <i>Name</i> is the name of any custom variable to be made available to the SCCM task sequence after the provisioned machine is registered with the SCCM collection. The value is determined by your choice of custom variable. If your integration requires it, you can use SCCM.RemoveCustomVariablePrefix to remove the SCCM.CustomVariable. prefix from your custom variable.

### Custom Properties For PXE and WIM Provisioning

You can use these properties for PXE and WIM provisioning.

**Table 4-10.** Custom Properties for PXE and WIM Provisioning

Custom Property	Description
Image.Network.Letter	Specifies the drive letter to which the WIM image path is mapped on the provisioned machine. The default value is K.
Image.WIM.Path	Specifies the UNC path to the WIM file from which an image is extracted during WIM-based provisioning. The path format is \\server\share\$ format, for example \\lab-ad\dfs\$.
Image.WIM.Name	Specifies the name of the WIM file, for example win2k8.wim, as located by the Image.WIM.Path property.
Image.WIM.Index	Specifies the index used to extract the correct image from the WIM file.
Image.Network.User	Specifies the user name with which to map the WIM image path (Image.WIM.Path) to a network drive on the provisioned machine. This is typically a domain account with access to the network share.
Image.Network.Password	Specifies the password associated with the Image.Network.User property.

**Table 4-10.** Custom Properties for PXE and WIM Provisioning (Continued)

Custom Property	Description
<p><i>SysPrep.Section.Key</i></p> <ul style="list-style-type: none"> <li>■ <i>SysPrep.GuiUnattended.AdminPassword</i></li> <li>■ <i>SysPrep.GuiUnattended.EncryptedAdminPassword</i></li> <li>■ <i>SysPrep.GuiUnattended.TimeZone</i></li> </ul>	<p>Specifies information to be added to the SysPrep answer file on machines during the WinPE stage of provisioning. Information that already exists in the SysPrep answer file is overwritten by these custom properties. <i>Section</i> represents the name of the section of the SysPrep answer file, for example <i>GuiUnattended</i> or <i>UserData</i>. <i>Key</i> represents a key name in the section. For example, to set the time zone of a provisioned machine to West Pacific Standard Time, define the custom property <i>GuiUnattended.UserData.TimeZone</i> and set the value to 275.</p> <p>For a full list of sections, keys, and accepted values, see the System Preparation Utility for Windows documentation.</p> <p>The following <i>Section.Key</i> combinations can be specified for WIM-based provisioning:</p> <ul style="list-style-type: none"> <li>■ <i>GuiUnattended</i> <ul style="list-style-type: none"> <li>■ <i>AdminPassword</i></li> <li>■ <i>EncryptedAdminPassword</i></li> <li>■ <i>TimeZone</i></li> </ul> </li> <li>■ <i>UserData</i> <ul style="list-style-type: none"> <li>■ <i>ProductKey</i></li> <li>■ <i>FullName</i></li> <li>■ <i>ComputerName</i></li> <li>■ <i>OrgName</i></li> </ul> </li> <li>■ <i>Identification</i> <ul style="list-style-type: none"> <li>■ <i>DomainAdmin</i></li> <li>■ <i>DomainAdminPassword</i></li> <li>■ <i>JoinDomain</i></li> <li>■ <i>JoinWorkgroup</i></li> </ul> </li> </ul>
<i>Sysprep.Identification.DomainAdmin</i>	Specifies a user name with administrator-level access to the target domain in Active Directory. Do not include the user domain in the credentials that you send to vCloud Director.
<i>Sysprep.Identification.DomainAdminPassword</i>	Specifies the password to associate with the <i>Sysprep.Identification.DomainAdmin</i> property.
<i>Sysprep.Identification.JoinDomain</i>	Specifies the name of the domain to join in Active Directory.
<i>Sysprep.Identification.JoinWorkgroup</i>	Specifies the name of the workgroup to join if not using a domain.
<i>SysPrep.UserData.ComputerName</i>	Specifies a machine name, for example <i>lab-client005</i> .
<i>SysPrep.UserData.FullName</i>	Specifies the full name of a user.
<i>SysPrep.UserData.OrgName</i>	Specifies the organization name of the user.
<i>SysPrep.UserData.ProductKey</i>	Specifies the Windows product key.



## Configure Blueprint Actions

Use blueprint actions and entitlements together to maintain detailed control over provisioned machines.

Entitlements control which machine operations specific users can access. Blueprint actions control which machine operations can be performed on machines provisioned from a blueprint. For example, if you disable the option to reprovision machines created from a blueprint, then the option to reprovision a machine created from the blueprint does not appear for any users. If you enable the reprovision machine operation, then users who are entitled to reprovision machines can reprovision machines created from this blueprint.

---

**NOTE** The options that appear on the **Actions** tab depend on your platform and any customizations made to your vRealize Automation instance.

---

### Prerequisites

[“Add Custom Properties to a PXE Blueprint,”](#) on page 69.

### Procedure

- 1 Click the **Actions** tab.
- 2 (Optional) Select the check boxes for each machine option to enable for machines provisioned from this blueprint.
- 3 Click **OK**.

Your blueprint is saved in draft state.

### What to do next

Publish your blueprint to make it available as a catalog item. See [“Publish a Blueprint,”](#) on page 73.

## Publish a Blueprint

Blueprints are saved in the draft state and must be manually published before you can configure them as catalog items.

You need to publish a blueprint only once. Any changes you make to a published blueprint are automatically reflected in the catalog.

### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Create a blueprint.

### Procedure

- 1 Select **Infrastructure > Blueprints > Blueprints**.
- 2 Point to the blueprint to publish and click **Publish** from the drop-down menu.
- 3 Click **OK**.

Your blueprint is now ready for tenant administrators, business group managers, and service architects to associate it with a catalog service and entitle users to request it from the catalog.

### What to do next

For information about how to configure and manage the catalog, see *Tenant Administration*.



# Configuring Advanced Blueprint Settings

# 5

Tenant administrators and business group managers can use custom properties and optional policies to configure advanced blueprint settings such as reservation policies, Visual Basic scripts, and Active Directory cleanup.

This chapter includes the following topics:

- [“Applying Reservation Policies,”](#) on page 75
- [“Enabling Visual Basic Scripts in Provisioning,”](#) on page 76
- [“RDP Connections,”](#) on page 78
- [“Enable Connections Using SSH,”](#) on page 80
- [“Allow Requesters to Specify Machine Host Name,”](#) on page 81

## Applying Reservation Policies

When a user requests a machine, it can be provisioned on any reservation of the appropriate type that has sufficient capacity for the machine. You can apply a reservation policy to a blueprint to restrict the machines provisioned from that blueprint to a subset of available reservations.

Reservation policies provide an optional and helpful means of controlling how reservation requests are processed. A reservation policy is often used to collect resources into groups for different service levels, or to make a specific type of resource easily available for a particular purpose. The following scenarios provide a few examples of possible uses for reservation policies:

- To ensure that machines provisioned from a virtual blueprint are placed on reservations with storage devices that support NetApp FlexClone
- To restrict provisioning of cloud machines to a specific region containing a machine image that is required for a specific blueprint
- To restrict provisioning of Cisco UCS physical machines to reservations on endpoints on which the selected service profile template and boot policy are available
- As an additional means of using a Pay As You Go allocation model for vApps

You can add multiple reservations to a reservation policy, but a reservation can belong to only one policy. You can assign a single reservation policy to more than one blueprint. A blueprint can have only one reservation policy.

A reservation policy can include reservations of different types, but only reservations that match the blueprint type are considered when selecting a reservation for a particular request. For more information about how reservations are selected for provisioning a machine, see *IaaS Configuration for Cloud Platforms*, *IaaS Configuration for Physical Machines*, or *IaaS Configuration for Virtual Platforms*.


## Add a Reservation Policy to a Blueprint

When tenant administrators and business group managers create a new blueprint, the option to add a reservation policy appears. To add a reservation policy to an existing blueprint, you edit the blueprint.

### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Verify that a fabric administrator configured a reservation policy. See [“Configure a Reservation Policy,”](#) on page 25.

### Procedure

- 1 Select **Infrastructure > Blueprints > Blueprints**.
- 2 Point to the blueprint to edit.
- 3 Click the **Edit** icon (  ).
- 4 Select a **Reservation policy** from the **Reservation policy** drop-down menu.
- 5 Click **OK**.

The machines provisioned from your blueprint are now restricted to the resources specified in your reservation policy.

## Enabling Visual Basic Scripts in Provisioning

Visual Basic scripts are run outside of vRealize Automation as additional steps in the machine life cycle and can be used to update the custom property values of machines. Visual Basic scripts can be used with any provisioning method.

For example, you could use a script to generate certificates or security tokens before provisioning and then use those certificates and tokens in provisioning a machine.

---

**NOTE** This information does not apply to Amazon Web Services.

---

When executing a Visual Basic script, the EPI agent passes all machine custom properties as arguments to the script. To return updated property values to vRealize Automation, you must place these properties in a dictionary and call a function provided by vRealize Automation.

The sample Visual Basic script `PrePostProvisioningExample.vbs` is included in the `Scripts` subdirectory of the EPI agent installation directory. This script contains a header to load all arguments into a dictionary, a body in which you can include your functions, and a footer to return updated custom properties to vRealize Automation.

The following is a high-level overview of the steps required to use Visual Basic scripts in provisioning:

- 1 A system administrator installs and configures an EPI agent for Visual Basic scripts. See *Installation and Configuration*.
- 2 A system administrator creates Visual Basic scripts and places them on the system where the EPI agent is installed.

- 3 Gather the following information for tenant administrators and business group managers for each Visual Basic script:
  - The complete path to the Visual Basic script, including the filename and extension. For example, `%System Drive%Program Files (x86)\VMware\VCAC Agents\EPI_Agents\Scripts\SendEmail.vbs`.

---

**NOTE** A fabric administrator can create a build profile by using the property sets `ExternalPreProvisioningVbScript` and `ExternalPostProvisioningVbScript` to provide this required information. Doing so makes it easier for tenant administrators and business group managers to include this information correctly in their blueprints.

---
- 4 Tenant administrators and business group managers use custom properties in their blueprints to call the Visual Basic scripts.

## Call a Visual Basic Script from a Blueprint

Tenant administrators and business group managers can call Visual Basic scripts to run outside of vRealize Automation as additional steps in the machine life cycle and to update custom property values of machines.

---

**NOTE** If your fabric administrator creates a build profile that contains the required custom properties and you include it in your blueprint, you do not need to individually add the required custom properties to the blueprint.

---

### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Gather the following information from your fabric administrator for each Visual Basic script:
  - The complete path to the Visual Basic script, including the filename and extension. For example, `%System Drive%Program Files (x86)\VMware\VCAC Agents\EPI_Agents\Scripts\SendEmail.vbs`.

---

**NOTE** Your fabric administrator might have provided this information in a build profile.

---

- Create at least one blueprint.

### Procedure

- 1 Select **Infrastructure > Blueprints > Blueprints**.
- 2 Point to the blueprint to which you want to add Visual Basic scripts and click **Edit**.
- 3 Click the **Properties** tab.
- 4 (Optional) Select one or more build profiles from the **Build profiles** menu.  
Build profiles contain groups of custom properties. Fabric administrators can create build profiles.
- 5 Add the Visual Basic script custom properties.
  - a Click **New Property**.
  - b Type the Visual Basic script custom property name in the **Name** text box.

Option	Description
<code>VbScript.PreProvisioning.Name</code>	Runs the Visual Basic script before a machine is provisioned.
<code>VbScript.PostProvisioning.Name</code>	Runs the Visual Basic script after a machine is provisioned.
<code>VbScript.UnProvisioning.Name</code>	Runs the Visual Basic script when a provisioned machine is destroyed.

- c Type the complete pathname, including filename and extension, to the Visual Basic script in the **Value** text box.

For example, %SystemDrive%\Program Files (x86)\VMware\vCAC Agents\EPI\_Agent\Scripts\SendEmail.vbs.

- d (Optional) Select the **Encrypted** check box to encrypt the custom property in the database.
- e (Optional) Select the **Prompt user** check box to require the user to provide a value when they request a machine.

If you choose to prompt users for a value, any value you provide for the custom property is presented to them as the default. If you do not provide a default, users cannot continue with the machine request until they provide a value for the custom property.

- f Click the **Save** icon ()

- 6 Repeat to add multiple Visual Basic scripts to your blueprint.
- 7 Click **OK**.

## RDP Connections

Tenant administrators and business group managers can configure RDP settings and enable connect by using RDP for machines provisioned with their blueprints.

### Configure Connections Using RDP

Tenant administrators and business group managers can use custom properties to configure RDP settings.

---

**NOTE** If your fabric administrator creates a build profile that contains the required custom properties and you include it in your blueprint, you do not need to individually add the required custom properties to the blueprint.

---

#### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Create at least one blueprint.

#### Procedure

- 1 Select **Infrastructure > Blueprints > Blueprints**.
- 2 Point to the blueprint to change and click **Edit**.
- 3 Click the **Properties** tab.
- 4 (Optional) Select one or more build profiles from the **Build profiles** menu.


Build profiles contain groups of custom properties. Fabric administrators can create build profiles.

- 5 Configure RDP settings.
  - a Click **New Property**.
  - b Enter the RDP custom property names in the **Name** text box and the corresponding values in the **Value** text box.

Option	Description and Value
<b>(Required for RDP customization)RDP.File.Name</b>	Specifies an RDP file from which to obtain settings, for example <code>My_RDP_Settings.rdp</code> . The file must reside in the <code>Website\Rdp</code> subdirectory of the vRealize Automation installation directory.
<b>(Required for RDP customization)VirtualMachine.Rdp.SettingN</b>	Configures specific RDP settings. <i>N</i> is a unique number used to distinguish one RDP setting from another. For example, to specify the Authentication Level so that no authentication requirement is specified, define the custom property <code>VirtualMachine.Rdp.Setting1</code> and set the value to authentication level:i:3. Use to open an RDP link to specify settings.  For a list of available settings and correct syntax, see the Microsoft Windows RDP documentation.
<b>VirtualMachine.Admin.NameCompletion</b>	Specifies the domain name to include in the fully qualified domain name of the machine that the RDP or SSH files generate for the user interface options <b>Connect Using RDP</b> or <b>Connect Using SSH</b> option. For example, set the value to <code>myCompany.com</code> to generate the fully qualified domain name <code>my-machine-name.myCompany.com</code> in the RDP or SSH file.

- c (Optional) Select the **Encrypted** check box to encrypt the custom property in the database.
- d (Optional) Select the **Prompt user** check box to require the user to provide a value when they request a machine.

If you choose to prompt users for a value, any value you provide for the custom property is presented to them as the default. If you do not provide a default, users cannot continue with the machine request until they provide a value for the custom property.

- e Click the **Save** icon ()
- 6 Click **OK**.

#### What to do next

[“Enable Connections Using RDP,”](#) on page 79.

## Enable Connections Using RDP

Tenant administrators and business group managers can enable RDP connections on a blueprint so that entitled users can remotely access machines provisioned from that blueprint.

#### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Create at least one blueprint.
- (Optional) [“Configure Connections Using RDP,”](#) on page 78.

---

**IMPORTANT** If you are using Amazon Web Services, RDP, or SSH must be enabled on the Amazon machine instance and the machines must be in a security group in which the correct ports are open.

---

#### Procedure

- 1 Select **Infrastructure > Blueprints > Blueprints**.

- 2 Point to the blueprint to change and click **Edit**.
- 3 Click the **Actions** tab.
- 4 Select the **Connect using RDP or SSH** check box to allow users to connect to their machine by using an RDP or SSH connection.
- 5 Click **OK**.

All users who are entitled to connect using RDP now see the **Connect Using RDP** option for all machines they request from your blueprint. For information about entitlements, see *Tenant Administration*.

## Enable Connections Using SSH

Tenant administrators and business group managers can use a custom property to enable users to connect remotely to their Linux machines using SSH.

---

**NOTE** If your fabric administrator creates a build profile that contains the required custom properties and you include it in your blueprint, you do not need to individually add the required custom properties to the blueprint.

---

### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Create at least one blueprint.

---

**IMPORTANT** If you are using Amazon Web Services, RDP, or SSH must be enabled on the Amazon machine instance and the machines must be in a security group in which the correct ports are open.

---


The SSH daemon must also be running on the target machine.

### Procedure

- 1 Select **Infrastructure > Blueprints > Blueprints**.
- 2 Point to the blueprint to change and click **Edit**.
- 3 Click the **Properties** tab.
- 4 (Optional) Select one or more build profiles from the **Build profiles** menu.  
Build profiles contain groups of custom properties. Fabric administrators can create build profiles.
- 5 Click **New Property**.
- 6 Type **Machine.SSH** in the **Name** text box.  
You may also need to add the **VirtualMachine.Admin.NameCompletion** custom property.
- 7 Type **true** in the **Value** text box.
- 8 (Optional) Select the **Encrypted** check box to encrypt the custom property in the database.
- 9 (Optional) Select the **Prompt user** check box to require the user to provide a value when they request a machine.

If you choose to prompt users for a value, any value you provide for the custom property is presented to them as the default. If you do not provide a default, users cannot continue with the machine request until they provide a value for the custom property.



- 10 (Optional) Add the `VirtualMachine.Admin.NameCompletion` custom property.  
Specifies the domain name to include in the fully qualified domain name of the machine that the RDP or SSH files generate for the user interface options **Connect Using RDP** or **Connect Using SSH** option. For example, set the value to `myCompany.com` to generate the fully qualified domain name `my-machine-name.myCompany.com` in the RDP or SSH file.
- 11 Click the **Save** icon ()
- 12 Click the **Actions** tab.
- 13 Select the **Connect using RDP or SSH** check box to allow users to connect to their machine by using an RDP or SSH connection.
- 14 Click **OK**.

All users who are entitled to connect using SSH see the **Connect Using SSH** option for all machines they request from your blueprint. For information about entitlements, see *Tenant Administration*.

## Allow Requesters to Specify Machine Host Name

Tenant administrators and business group managers can use a custom property to prompt users to specify a host name for their machines.

---


**NOTE** If your fabric administrator creates a build profile that contains the required custom properties and you include it in your blueprint, you do not need to individually add the required custom properties to the blueprint.

---

### Prerequisites

- Log in to the vRealize Automation console as a **tenant administrator** or **business group manager**.
- Create at least one blueprint.

### Procedure

- 1 Select **Infrastructure > Blueprints > Blueprints**.
- 2 Point to the blueprint to change and click **Edit**.
- 3 Click the **Properties** tab.
- 4 Click **New Property**.
- 5 Type **Hostname** in the **Name** text box.
- 6 Leave the **Value** text box blank.
- 7 Select the **Prompt user** check box to require the user to provide a value when they request a machine.  
Because host names must be unique, users can only request one machine at a time from this blueprint.
- 8 Click the **Save** icon ()
- 9 Click **OK**.

Users who request a machine from your blueprint are required to specify a hostname for their machine. vRealize Automation validates that the specified host name is unique.



# Managing Infrastructure

---

Different vRealize Automation roles monitor resource usage and manage infrastructure in different ways.

This chapter includes the following topics:

- [“Managing Resource Usage,”](#) on page 83
- [“Endpoint Data Collection,”](#) on page 85

## Managing Resource Usage

Fabric administrators manage the resource usage of the compute resources and reservations they own, and tenant administrators and business group managers manage the resource usage of the business groups they own.

### Resource Usage Terminology

vRealize Automation uses explicit terminology to distinguish between resources that are available, resources that have been set aside for specific usages, and resources that are actively being consumed by provisioned machines.

The Resource Usage Terminology table explains the terminology vRealize Automation uses to display resource usage.

**Table 6-1.** Resource Usage Terminology

Term	Description
Physical	Indicates the actual memory or storage capacity of a compute resource.
Reserved	Indicates the machine quota, memory, and storage capacity set aside for a reservation. For example, if a compute resource has a physical capacity of 600 GB and there are three reservations on it for 100 GB each, then the reserved storage of the compute resource is 300 GB and the storage reserved is 50 percent. For physical machines, this term indicates machines that are reserved for a reservation but not yet provisioned.
Managed	For physical machines, this indicates that the machine is provisioned and currently under vRealize Automation management.
Allocated	Indicates the machine quota, memory, or storage resources actively being consumed by provisioned machines. For example, consider a reservation with a machine quota of 10. If there are 15 provisioned machines on it, but only 6 of them are currently powered on, the machine quota is 60 percent allocated.

**Table 6-1.** Resource Usage Terminology (Continued)

Term	Description
Used	For virtual provisioning this indicates the amount of storage in use by provisioned machines. When standard storage is employed, storage used and storage allocated are the same. However, when space-efficient storage technology is employed (for example, FlexClone or thin provisioning) storage used is typically less than storage allocated because machines only consume exactly the amount of storage they require.
Free	For virtual provisioning, this is the unused physical capacity on a storage path.

## Choosing a Resource Monitoring Scenario

Fabric administrators, tenant administrators, and business group managers have different concerns when it comes to resource monitoring. Because of this, vRealize Automation allows you to monitor different facets of resource usage.

For example, a fabric administrator is concerned with monitoring the resource consumption of reservations and compute resources, whereas a tenant administrator is concerned with the resource usage of the provisioning groups within a tenant. Depending on your role and the specific resource usage you want to monitor, vRealize Automation allows you different ways to track resource consumption.

**Table 6-2.** Choose a Resource Monitoring Scenario

Resource Monitoring Scenario	Privileges Required	Location
Monitor the amount of physical storage and memory on your compute resources that is currently being consumed and determine what amount remains free. You can also monitor the number of reserved and allocated machines provisioned on each compute resource.	<b>Fabric Administrator</b> (monitor resource usage on compute resources in your fabric group)	<b>Infrastructure &gt; Compute Resources &gt; Compute Resources</b>
Monitor physical machines that are reserved for use but not yet provisioned.	<b>Fabric Administrator</b>	<b>Infrastructure &gt; Machines &gt; Reserved Machines</b>
Monitor machines that are currently provisioned and under vRealize Automation management.	<b>Fabric Administrator</b>	<b>Infrastructure &gt; Machines &gt; Managed Machines</b>
Monitor the amount of storage, memory, and machine quota of your reservation that is currently allocated and determine the capacity that remains available to the reservation.	<b>Fabric Administrator</b> (monitor resource usage for reservations on your compute resources and physical machines)	<b>Infrastructure &gt; Reservations &gt; Reservations</b>
Monitor the amount of storage, memory, and the machine quota that your business groups are currently consuming and determine the capacity that remains on reserve for them.	<ul style="list-style-type: none"> <li>■ <b>Tenant Administrator</b> (monitor resource usage for all groups in your tenant)</li> <li>■ <b>Business Group Manager</b> (monitor resource usage for groups that you manage)</li> </ul>	<b>Infrastructure &gt; Groups &gt; Business Groups</b>

You can also add resource monitoring portlets to your vRealize Automation homepage to monitor different resource usage statistics. See *Tenant Administration*.

## Endpoint Data Collection

Infrastructure source endpoint data collection updates the CPU and installed memory count for physical management interfaces.

### Start Endpoint Data Collection Manually

Endpoint data collection runs automatically every 4 hours, but IaaS administrators can manually start endpoint data collection at any time for endpoints that do not require proxy agents.

The Data Collection page provides information on the status and age of data collections and allows you to manually start a new endpoint data collection.

#### Prerequisites

Log in to the vRealize Automation console as an **IaaS administrator**.

#### Procedure

- 1 Select **Infrastructure > Endpoints > Endpoints**.
- 2 Point to the endpoint for which you want to run data collection and click **Data Collection**.
- 3 Click **Start**.
- 4 (Optional) Click **Refresh** to receive an updated message about the status of the data collection you initiated.
- 5 Click **Cancel** to return to the Endpoints page.



# Monitoring Workflows and Viewing Logs

# 7

Depending on your role, you can monitor workflows and view activity logs.

**Table 7-1.** Monitoring and Log Display Options

Objective	Role	Menu Sequence and Description
Display information about actions that have occurred, such as the action type, date and time of the action, and so on.	IaaS administrator	Display default log information or control display content using column and filter options. Select <b>Infrastructure &gt; Monitoring &gt; Audit Logs</b> . The audit log provides details about the status of managed virtual machines and activities performed on these machines during reconfiguration. It also displays information about Amazon machine provisioning. The log includes Amazon machine provisioning, multi-machine, vCloud Networking and Security, reclamation, and reconfigure actions.
View the status of scheduled and available Distributed Execution Manager and other workflows.	IaaS administrator	Display workflow status and optionally open a specific workflow to display its details. Select <b>Infrastructure &gt; Monitoring &gt; Distributed Execution Status</b> .
View and optionally export log data.	IaaS administrator	Display default log information or control display content using column and filter options. Select <b>Infrastructure &gt; Monitoring &gt; Log</b> .
View the status and history of executed Distributed Execution Manager and other workflows.	IaaS administrator	Display workflow history and optionally open a specific workflow to display its execution details. Select <b>Infrastructure &gt; Monitoring &gt; Workflow History</b> .
Display a list of events, including event type, time, user ID, and so on, and optionally display an event details page.	System administrator	View a list of events and their associated attributes, such as run time, event description, tenant name, target type and ID, and other characteristics. Select <b>Administration &gt; Event Logs</b> .
Monitor the status of your requests and view request details.	Tenant administrator or business group manager	Display the status of requests that you are responsible for or own. Click <b>Requests</b> .





# Index

## A

- autoYaST
  - configuration file **37**
  - preparing for provisioning **36**
  - specifying custom scripts **37**

## B

- blueprint **56**
- blueprints
  - actions **53, 60, 66, 73**
  - adding reservation policies **76**
  - choosing scenario **47**
  - create for WIM **55**
  - creating **47**
  - creating for WIM **53, 54**
  - creating advanced blueprints **75**
  - creating for Linux Kickstart **48–50**
  - creating for SCCM **60–63**
  - creating for PXE **66–69**
  - publishing **73**
- build profiles
  - creating **23**
  - creating property sets **22, 23**
  - using property sets **21**
- business groups
  - create **16**
  - monitoring resource usage **83**

## C

- catalog items, publishing **73**
- compute resources, monitoring resource usage **83**
- cost
  - calculation **26**
  - during request and provisioning life cycle **27**
- cost profiles
  - assigning to a physical machine **29**
  - creating **28**
  - overview **26**
  - See *also* storage cost profiles
- credentials, storing **12**
- custom **9**
- custom properties
  - creating build profiles **23**
  - creating property sets **22, 23**
  - Linux Kickstart provisioning **51**

- machine provisioning **9**
- machine.ssh **80**
- order of precedence **10**
- PXE provisioning **70**
- SCCM provisioning **64**
- WIM provisioning **57**

custom properties for WIM **56**

custom

- properties, VirtualMachine.Admin.Name Completion **80**

custom scripts, specifying for Linux Kickstart/autoYaST **37**

## D

data collection, starting endpoint data collection manually **85**

## E

endpoints

- creating **12**
- import **14**
- importing a CSV file **13**
- starting data collection manually **85**

ESX, See VMware ESX

ESXi, See VMware ESXi

## F

fabric groups, creating **12**

## G

goal navigator, using **8**

guest agent

- inserting in a WinPE **43–46**
- installing for SCCM **39**

## I

laaS

- configuring **9**
- configuring overview **11**

infrastructure, managing **83**

installation

- downloading the vRealize Automation Designer installer **34**
- prerequisites **34**
- vRealize Automation Designer **34**

**K**

- kickstart, specifying custom scripts **37**
- Kickstart
  - configuration file **37**
  - preparing for provisioning **36**

**L**

- Linux
  - configuration file **37**
  - preparing for provisioning **36**
- Linux kickstart, specifying custom scripts **37**
- Linux Kickstart provisioning
  - creating blueprints **48–50**
  - custom properties **51**
- logs, viewing activity logs **87**

**M**

- machine cost, *See* cost
- machine prefixes, configuring **15**
- machine provisioning, custom properties **9**
- machines, provisioning with optional configurations **21**
- Microsoft System Center Configuration Manager **60–63**

**O**

- optional policies **21**

**P**

- PEBuilder
  - using custom scripts **42**
  - See also* VMware PEBuilder
- physical machines, reservations **17**
- physical reservations **17**
- policies, creating reservation policies **25**
- PrePostProvisioningExample.vbs, sample script **31, 76**
- property sets
  - creating **22, 23**
  - creating the XML file **22**
  - using with build profiles **21**
- provisioning
  - preparations **31**
  - WIM provisioning preparations **39**
- provisioning methods, choosing **32**
- PXE, preparing for provisioning **33**
- PXE provisioning
  - creating blueprints **66–69**
  - custom properties **70**

**R**

- RDP, *See* Remote Desktop Connection
- remote connections
  - configuring connect using RDP **29, 78**
  - configuring connect using SSH **29**

- enabling connect using SSH **80, 81**

- enabling connect using RDP **79**

- Remote Desktop Connection
  - configuring connect using RDP **29, 78**

- enabling connect using RDP **79**

- requests, monitoring status **87**

- reservation, alerts **19**

- reservation policies

- applying a reservation policy to a blueprint **75**

- assigning to a reservation **25**

- configuring **24**

- create **25**

- reservations

- assigning reservation policies **25**

- creating **18, 19**

- creating reservation policies **25**

- monitoring resource usage **83**

- physical **17**

- physical selection logic **17**

- resource monitoring

- choosing scenario **84**

- terminology **83**

- resource usage, monitoring **83**

**S**

- SCCM, preparing for provisioning **38, 39**

- SCCM provisioning

- creating blueprints **60–63**

- custom properties **64**

- selection logic, physical reservations **17**

- SSH

- configuring connect using SSH **29**

- enabling connect using SSH **80, 81**

- storage cost profiles, overview **26**

- Sysprep, for WIM provisioning **41**

**U**

- updated information **7**

- user credentials

- creating **12**

- storing **12**

**V**

- VB scripts, *See* Visual Basic scripts

- Visual Basic scripts

- enabling in provisioning **31, 76**

- in blueprints **77**

- VMware PEBuilder

- creating a WinPE **42**

- installing **41**

- vRealize Automation Designer, installing **34**

**W**

- WIM provisioning

- adding custom properties **56**

- creating blueprints **53–55**

- creating a PEBuilder WinPE **42**
- custom properties **57**
- inserting the guest agent **43–46**
- installing PEBuilder **41**
- preparing **39**
- reference machine requirements **40**
- Sysprep the reference machine **41**
- workflows, monitoring **87**

