

# vRealize Infrastructure Navigator User's Guide

vRealize Infrastructure Navigator 5.8.5

This document supports the version of each product listed and supports all subsequent versions until the document is replaced by a new edition. To check for more recent editions of this document, see <http://www.vmware.com/support/pubs>.

EN-001707-01

**vmware**<sup>®</sup>

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

<http://www.vmware.com/support/>

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 © 2012–2016 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

vRealize Infrastructure Navigator User's Guide	5
<b>1 vRealize Infrastructure Navigator Overview</b>	<b>7</b>
vRealize Infrastructure Navigator Functionality	7
vRealize Infrastructure Navigator Target Users and Benefits	8
Essential Concepts of vRealize Infrastructure Navigator	8
vRealize Infrastructure Navigator Architecture	9
vRealize Infrastructure Navigator Components	10
<b>2 Mapping Overview</b>	<b>11</b>
Mapping Services	11
Active Discovery	12
Remapping Services	12
Services Supported by vRealize Infrastructure Navigator	13
<b>3 Getting Started with vRealize Infrastructure Navigator</b>	<b>15</b>
Log in to the vRealize Infrastructure Navigator Portal	15
Enable or Disable the vRealize Infrastructure Navigator Plug-in	16
vRealize Infrastructure Navigator Notification Messages	16
<b>4 Application Visibility at Virtual Machine Level</b>	<b>19</b>
Understanding the Navigator Portlet	19
Viewing Application Dependencies of a Virtual Machine	20
Dependency Map and Table Messages	20
Viewing the Dependency Map	21
Viewing the Dependency Table	23
Viewing Details of a Virtual Machine	24
Defining an Unknown Service	26
Discovery of External Entities	27
Aging Process of Dependencies	27
Understanding the Manual Application Feature	28
Understanding Application Definition	30
<b>5 Application Visibility at the vCenter Entity Level</b>	<b>33</b>
Understanding the Navigator Portlet	33
Viewing Application Dependencies of a vCenter Entity	34
Viewing the Inventory Table	34
Filter Text in the Inventory Table	36
Export Inventory Table	36
Viewing Details of a vCenter Entity	36

<b>6</b>	<b>Managing vRealize Hyperic Agents</b>	<b>37</b>
	Configure vRealize Hyperic Action Profiles	38
	Edit vRealize Hyperic Action Profiles	38
	Delete vRealize Hyperic Action Profiles	38
	Install a vRealize Hyperic Agent on a Virtual Machine	39
	Refresh the Agent Status Summary	40
	Cancel Pending Tasks	40
	Index	41

# vRealize Infrastructure Navigator User's Guide

Draft comment filepath: GUID-D6909FE5-1E27-44A6-A775-3FF1940E830B.xml

---

The VMware<sup>®</sup> vRealize<sup>™</sup> Infrastructure Navigator<sup>™</sup> User's Guide describes the tasks that you can perform using vRealize Infrastructure Navigator.

## Intended Audience

Draft comment filepath: GUID-D6909FE5-1E27-44A6-A775-3FF1940E830B.xml

This information is intended for virtual infrastructure administrators who are familiar with virtual machine technology and datacenter operations.



# vRealize Infrastructure Navigator Overview

# 1

Draft comment filepath: GUID-33859849-FA4B-4557-8206-2C7537B1D76A.xml

---

vRealize Infrastructure Navigator is an application awareness plug-in to the vCenter Server that provides continuous dependency mapping of applications.

vRealize Infrastructure Navigator offers application context to virtual infrastructure administrators for monitoring and managing virtual infrastructure inventory objects and actions. Administrators can use vRealize Infrastructure Navigator to understand the impact of the change on the virtual environment in their application infrastructure.

---

**NOTE** Plug-ins (also referred to as extensions) expand the capabilities of vCenter Server by adding features and functionality to the base product.

---

This chapter includes the following topics:

- [“vRealize Infrastructure Navigator Functionality,”](#) on page 7
- [“vRealize Infrastructure Navigator Target Users and Benefits,”](#) on page 8
- [“Essential Concepts of vRealize Infrastructure Navigator,”](#) on page 8
- [“vRealize Infrastructure Navigator Architecture,”](#) on page 9
- [“vRealize Infrastructure Navigator Components,”](#) on page 10

## vRealize Infrastructure Navigator Functionality

Draft comment filepath: GUID-D1D1DE62-3402-413D-B214-02C503F54C5F.xml

vRealize Infrastructure Navigator provides a centralized view of your application environment.

vRealize Infrastructure Navigator performs the following high-level functions:

- Maps virtual infrastructure resources such as virtual machines, Web servers, mail servers, database servers, application servers, cache servers, messaging servers, application management servers, and virtualization management servers.
- Displays relationships between virtual machines and external machines through services.
- Allows you to detect inconsistencies from the norm.
- Allows you to take advantage of integration with other VMware products such as vCenter Server, vCenter Site Recovery Manager, and vRealize Operations Manager.
- Allows you to define multi-tier application pattern and then discovers all of this pattern instances in the vCenter Server. You can then view these application instance maps.
- Allows you to create or define manual applications that in turn allow you to track a group of virtual machines.

- Allows you to create or define roles that you can use to find instances of the applications in your environment.
- Allows you to customize vRealize Hyperic agent profiles that you can then select when deploying the agent on multiple virtual machines, so that the selected profile is applied to all those machines.

## vRealize Infrastructure Navigator Target Users and Benefits

Draft comment filepath: GUID-97D873B2-34AF-4A25-B15F-C5E62A758DE6.xml

vRealize Infrastructure Navigator creates a detailed model of the application environment and offers application context to its users.

vRealize Infrastructure Navigator helps virtual infrastructure administrators to accurately answer the following questions:

- Which application services are running on my virtual machines?
- What are the dependencies among application services running on different virtual machines?
- Where are the hidden optimization opportunities and how can I capitalize on them?
- How do certain application changes impact my environment?
- What are the risks involved in making changes in the virtual environment?
- How do the issues related to specific virtual machines impact application operation and how can I prevent or solve these issues?
- How does the integration with Site Recovery Manager and vRealize Operations Manager benefit users?

## Essential Concepts of vRealize Infrastructure Navigator

Draft comment filepath: GUID-563F325F-5C9A-484E-8F65-45FADD661085.xml

Before working with vRealize Infrastructure Navigator, you must understand certain concepts related to vRealize Infrastructure Navigator.

<b>Mapping</b>	Mapping is a continuous process that creates and maintains a detailed model of your application environment.
<b>Services</b>	vRealize Infrastructure Navigator maps services that are installed and running in your virtual environment. Services include Web servers, mail servers, database servers, application servers, cache servers, messaging servers, application management servers, and virtualization management servers. To view the list of services supported by vRealize Infrastructure Navigator, see <a href="#">“Services Supported,”</a> on page 13
<b>vCenter Entity</b>	A vCenter entity is any entity that is part of the Hosts and Clusters inventory pane except a virtual machine. For example, a vCenter Server, an ESX host, a cluster, a datastore are all vCenter entities.
<b>Change</b>	A change is any modification in the virtual environment. For example, installing a new service is a change.
<b>Incoming Dependency</b>	When a virtual machine or a service running on it requires information from a service running on the selected virtual machine, a dependency exists between the two virtual machines. This dependency is known as an incoming dependency.  For example, if the selected virtual machine serves another virtual machine it is an incoming dependency.

**Outgoing Dependency** When the selected virtual machine or a service running on it requires information from a service running on another virtual machine, a dependency exists between the two virtual machines. This dependency is known as an outgoing dependency.

For example, if the selected virtual machine is served by another virtual machine it is an outgoing dependency.

**Manual Application** Allows you to mark a collection of virtual machines with an application name. For example, vRealize Configuration Manager can show the health of an application group rather than that of individual virtual machines.

**Application Definition** An application definition is a rule or pattern by which a collection of connected virtual machines are identified as a deployed application instance. An application instance is a set of connected virtual machines that matches an application definition.

## vRealize Infrastructure Navigator Architecture

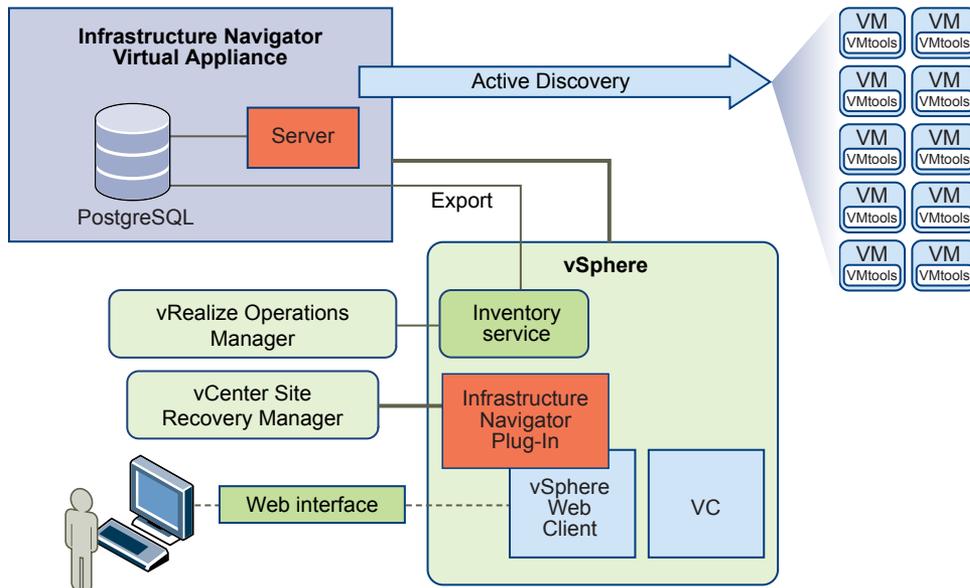
Draft comment filepath: GUID-3CDAED81-FA3A-46DA-BC4D-5F137F42D2E1.xml

vRealize Infrastructure Navigator is a virtual appliance that you can deploy on the vCenter Server. A virtual appliance is a virtual machine image that contains software designed to run in a virtual machine.

With the components of vRealize Infrastructure Navigator, you can map services running in your virtual environment, examine the application discovery status, view and analyze the dependency map, and have a centralized view of the entire application environment.

The architecture illustrates various components of vRealize Infrastructure Navigator and their dependencies.

**Figure 1-1.** vRealize Infrastructure Navigator Architecture Diagram



## vRealize Infrastructure Navigator Components

Draft comment filepath: GUID-C4E44E67-F3B4-44E5-85DB-2CEB568FB0AB.xml

A component is a software or software design with a well-defined interface. A component represents specific behavior of the system.

The following table lists and describes principal components of vRealize Infrastructure Navigator.

**Table 1-1.** vRealize Infrastructure Navigator Components

Component	Description
Server in the vRealize Infrastructure Navigator virtual machine	The Server component reconciles the data from active discovery and transfers the data to the Database component.
Database in the vRealize Infrastructure Navigator virtual machine	The Database component stores the data received from the Server component. The Database component also stores vRealize Infrastructure Navigator configurations. <b>NOTE</b> vRealize Infrastructure Navigator does not support data storage in an external database.
vRealize Infrastructure Navigator Plug-in in the vSphere Web Client	The vRealize Infrastructure Navigator Plug-in in the vSphere Web Client provides a graphical user interface that you use to view and analyze dependencies.
Inventory Service	Inventory service is a vSphere component to which vRealize Infrastructure Navigator exports its data.

# Mapping Overview

Draft comment filepath: GUID-EAB869D3-2B48-4301-A6D0-270A1DE56B7F.xml

---

Mapping is a continuous process that creates and maintains a detailed model of your application environment. The mapping process populates the vRealize Infrastructure Navigator database with the mapped items and identifies the relationships between them.

This chapter includes the following topics:

- [“Mapping Services,”](#) on page 11
- [“Active Discovery,”](#) on page 12
- [“Remapping Services,”](#) on page 12
- [“Services Supported by vRealize Infrastructure Navigator,”](#) on page 13

## Mapping Services

Draft comment filepath: GUID-BE10B7D3-6E14-4E82-AC6E-DCA875BB81CF.xml

vRealize Infrastructure Navigator maps services that are installed and running in your virtual environment. Services include Web servers, mail servers, database servers, application servers, cache servers, messaging servers, application management servers, and virtualization management servers. With the mapped data, you can visualize dependencies between services and virtual machines through application dependency mapping.

vRealize Infrastructure Navigator maps services running on virtual machines only if all the following conditions are satisfied:

- The virtual machine is powered on.
- The virtual machine can be accessed on the network.
- The vCenter Server credentials are of administrator level. For more information on credentials, see [“Log in to the vRealize Infrastructure Navigator Portal,”](#) on page 15.
- The virtual machine is running on a supported ESX version. For the supported ESX/ESXi versions list, see *vRealize Infrastructure Navigator Installation and Configuration Guide*.
- VMware Tools is installed and running on the virtual machine.
- The VMware Tools version is supported by vRealize Infrastructure Navigator.

- The virtual machine has a supported guest operating system on it.

---

**NOTE** Microsoft Windows NT, Microsoft Windows 2000, Apple Macintosh, FreeBSD, SCO UnixWare 7, Sun Solaris 9, and Sun Solaris 10 (64-bit) are not supported by vRealize Infrastructure Navigator. Also, vRealize Infrastructure Navigator does not support virtual machines with guest operating system that were defined as Other (64-bit) and Other (32-bit) during creation.

---

If any one of these conditions fails, an Access failed error message appears in the Discovery Status field.

## Active Discovery

Draft comment filepath: GUID-A77113AB-3643-4B38-81B0-780686FB9BBF.xml

In vRealize Infrastructure Navigator, active discovery is the method used to access the virtual machines. Active discovery is a multithreaded process that uses VMware Tools to access virtual machines.

vRealize Infrastructure Navigator starts the mapping process shortly after installation and if you provide valid administrator-level vCenter Server credentials. vRealize Infrastructure Navigator also supports some minimally privileged users who can start the discovery process. For more information on administrator-level credentials and minimally privileged user, see *vRealize Infrastructure Navigator Installation and Configuration Guide*. Mapping is continuous, unless you stop or disable vRealize Infrastructure Navigator.

Depending on the size of your environment, vRealize Infrastructure Navigator begins to populate the inventory table within an hour after you install the virtual appliance and start the discovery process. To view the complete information in the inventory table, dependency map, and dependency table, wait until you have collected at least one hour of data.

---

**NOTE** If the initial mapping process is incomplete, a This VM is pending application mapping message is displayed in place of the dependency map.

---

## Remapping Services

Draft comment filepath: GUID-BF00E1AD-A09E-4D6A-AB27-ED585C0E06AC.xml

After initial deployment, vRealize Infrastructure Navigator remaps services at a predefined time interval. Remapping ensures that the vRealize Infrastructure Navigator database is current and that it is synchronized with any changes in the virtual environment. The default frequency for remapping is one hour, and is displayed in the Successful Discovery field.

A change is any change in the virtual environment. For example, installing a service is a change. A change in the virtual environment takes effect only after remapping.

When the specified time interval has elapsed, vRealize Infrastructure Navigator discovers any changes. For example, if you install a service on a powered-on virtual machine, vRealize Infrastructure Navigator discovers this service within one hour, the default frequency for remapping.

Every five minutes, the vRealize Infrastructure Navigator server is synchronized with vCenter Server and the Discovery Status field is updated with the relevant change information. For example, consider a virtual machine with services installed and running on that it is powered off. Within five minutes of the power-off, vRealize Infrastructure Navigator discovers the change as the vCenter Server is refreshed and updates this in the Discovery Status field. Services that have been discovered on the virtual machine before the virtual machine was powered off remain on the virtual machine. The Successful Discovery field displays the time elapsed since vRealize Infrastructure Navigator last discovered the virtual machine when it was up and running.

## Services Supported by vRealize Infrastructure Navigator

Draft comment filepath: GUID-5851F12F-CEE2-4922-95AA-318F0A2085CC.xml

vRealize Infrastructure Navigator maps services that are installed and running in your virtual environment.

### Services Supported

Draft comment filepath: GUID-5851F12F-CEE2-4922-95AA-318F0A2085CC.xml

The following table lists and describes the services supported by vRealize Infrastructure Navigator along with the supported versions and service name as displayed in the UI.

**Table 2-1.** Services Supported

Category	Service Name	Version	Description
Web Server	Apache HTTP	2.0.X, 2.2.X	The Apache HTTP Server, also known as Apache, is an open-source Web server that provides HTTP services in sync with the current HTTP standards.
	IIS	6.0.X	The Internet Information Services (IIS) is a flexible, secure, and easy-to-manage Web server developed by Microsoft for use with Microsoft Windows.
	Nginx	0.7, 0.8	The nginx is a lightweight, HTTP, and reverse proxy server, as well as a mail proxy server that runs on UNIX, Linux, BSD variants, Mac OS X, Solaris, and Microsoft Windows.
	SharePoint	2007, 2010	Microsoft SharePoint is a centralized web application platform and a replacement for multiple web applications. In the user interface, the single server installation of SharePoint appears as SharePoint Server, Web-server Front End appears as SharePoint Web Server, and Application appears as SharePoint Application Server.
Cache Server	GemFire	6.0, 6.5	VMware vFabric GemFire is a distributed data management platform that provides dynamic scalability, high performance, and data management capabilities of a database.
Mail Server	Exchange	2003, 2007, 2010	Microsoft Exchange Server is the server side of the messaging application used by enterprises.
Database Server	Oracle DB	11g	The Oracle Database is an Object-Relational Database Management System (ORDBMS).
	MS-SQL DB	9.0, 10.0, 10.5	Microsoft SQL Server is a relational model database server.
	DB2	9.5, 9.7	IBM DB2 Enterprise Server Edition is a relational model database server that runs on Unix, Linux, IBM i, z/OS and Windows servers.
	MySQL DB	5.1, 5.5	MySQL is an open source Relational Database Management System (RDBMS) that runs as a server, providing multi-user access to a number of databases.
	Sybase DB	15.0, 15.5	Adaptive Server Enterprise (ASE) is a Relational Database Management System (RDBMS) developed by Sybase Corporation.
Application Server	Apache Tomcat	6.0.X, 7.0	Apache Tomcat is an open-source software implementation of the Java Servlet and JavaServer Pages (JSP) technologies that provides an environment for Java code to run.
	tc Server	2.0, 2.1.1	tc Server is a lightweight application server that provides an enterprise version of the Apache Tomcat application server optimized for cloud and virtual environments.
	WebSphere	6.1, 7.0	WebSphere Application Server (WAS) is a software application server developed by IBM that builds, deploys, and manages SOA business applications and services.

**Table 2-1.** Services Supported (Continued)

Category	Service Name	Version	Description
	WebLogic	10.3	Oracle WebLogic Server is an application server for building and deploying enterprise Java EE applications.
	JBoss	5.1, 6.0	JBoss Application Server is an open-source Java EE-based application server that provides Java EE 5 features along with extended enterprise services including clustering, caching, and persistence.
Virtualization Management	VMware vCenter	4.1, 5.0	VMware vCenter Server centrally manages VMware vSphere environments and improves IT administrators control over the virtual environment.
	VMware vCloud Director	1.1, 1.5	VMware vCloud Director delivers cloud infrastructure on-demand so that the end users can consume virtual resources with maximum agility. Consolidate datacenters and deploy workloads on shared infrastructure with built-in security and role-based access control. Migrate workloads between different clouds and integrate existing management systems using customer extensions, APIs, and open cross-cloud standards.
	VMware vShield Manager	4.1, 5.0	VMware vShield Manager provides a central point of control for managing, deploying, reporting, logging and integrating vShield as well as third-party security services. Working in conjunction with vCenter Server, vShield Manager enables role based access control and separation of duties as part of a unified framework for managing virtualization security.
	VMware vCenter Operations Standard	1.0.0, 1.0.1	vCenter Operations Standard is a tool for monitoring and managing the performance of your virtual environment. vCenter Operations Standard collects performance data from each object at every level of your virtual infrastructure, from individual virtual machines and disk drives to entire clusters and data centers. It stores and analyzes the data, and uses that analysis to provide real-time information about problems, or potential problems, anywhere in your enterprise.
Application Management	VMware View Server	4.6, 5.0	VMware View simplifies desktop and application management while increasing security and control. Delivers a personalized high fidelity experience for end-users across sessions and devices.
Messaging Server	RabbitMQ	1.8.1, 2.3.1	RabbitMQ is an open-source, enterprise messaging system that uses Advanced Message Queuing Protocol (AMQP). RabbitMQ provides robust messaging for applications.
Disaster Recovery Server	Site Recovery Manager	4.1, 5.0	Site Recovery Manager is used for disaster protection and site migration for all virtualized applications migration.
	Replication Server	1.0	Replication Server is a part of the host based replication solution for Site Recovery Manager.
	Replication Management Server	1.0	Replication Management Server is a part of the host based replication solution for Site Recovery Manager.
Authentication Server	Active Directory	Windows 2003 and Windows 2008	Active Directory provides a central location for network administration and security.

# Getting Started with vRealize Infrastructure Navigator

# 3

Draft comment filepath: GUID-F6DE08EA-EC30-4A08-A8CE-38C31F135388.xml

---

You can use the vRealize Infrastructure Navigator portal to view and analyze the information collected during discovery.

This chapter includes the following topics:

- [“Log in to the vRealize Infrastructure Navigator Portal,”](#) on page 15
- [“Enable or Disable the vRealize Infrastructure Navigator Plug-in,”](#) on page 16
- [“vRealize Infrastructure Navigator Notification Messages,”](#) on page 16

## Log in to the vRealize Infrastructure Navigator Portal

Draft comment filepath: GUID-82B2CAB4-E06E-45CC-9955-8A086E95AA6C.xml

You can access the vRealize Infrastructure Navigator portal through the vSphere Web Client. vRealize Infrastructure Navigator is compatible only with the vSphere Web Client and does not support the .NET client.

### Prerequisites

- Install and deploy the vRealize Infrastructure Navigator plug-in on a vCenter Server from which you want to administer vRealize Infrastructure Navigator. For more information, see *vRealize Infrastructure Navigator Installation and Configuration Guide*.
- You must have administrator privileges to use vRealize Infrastructure Navigator services. An administrator is a user who is assigned the administrator role on the vCenter Server or a user in a group that is assigned the administrators role on the vCenter Server. A user or group must be assigned with the administrator role on the root folder and all the child folders that are propagating from root folder. For more information on assigning privileges, see *vRealize Infrastructure Navigator Installation and Configuration Guide*.

### Procedure

- 1 Open a Web browser and enter the URL for the vSphere Web Client, **https://client-hostname:port/vsphere-client**.

By default the port is 9443, but this can be changed during vSphere Web Client installation.

- 2 Enter administrator credentials in the **Username** and **Password** fields.
- 3 Click **Login** to connect to the vCenter Server.

If the vRealize Infrastructure Navigator plug-in is deployed correctly, you can see the **Application Services** tab under **Manage** tab at the vCenter entity level and the **Application Dependencies** tab under **Manage** tab at the virtual machine level.

If you have all the required privileges, services running in your virtual environment are displayed. Otherwise, the message Infrastructure Navigator can only be used by vCenter Server administrators is displayed.

---

**NOTE** vRealize Infrastructure Navigator displays the services running in your virtual environment within approximately one hour of you installing the virtual appliance. To view the complete information, wait until you have collected at least one hour of data. You can manually start or stop the discovery process, start or stop Site Recovery Manager integration, and uninstall the vRealize Infrastructure Navigator virtual appliance. For more information, see *vRealize Infrastructure Navigator Installation and Configuration Guide*.

---

## Enable or Disable the vRealize Infrastructure Navigator Plug-in

Draft comment filepath: GUID-08039706-3682-40EA-9D27-21F16A82D35C.xml

You can enable or disable the vRealize Infrastructure Navigator plug-in through the Plug-in Manager. After you install the vRealize Infrastructure Navigator plug-in, it is enabled by default.

### Prerequisites

Install and deploy the vRealize Infrastructure Navigator plug-in on the vCenter Server from which you want to administer vRealize Infrastructure Navigator. For more information, see *vRealize Infrastructure Navigator Installation and Configuration Guide*.

### Procedure

- 1 Log in to vSphere Web Client.
- 2 From the inventory menu, click **Administration**.
- 3 Click **Plug-in Management**. Enable or disable the plug-in, as required.

**Table 3-1.** Enable or Disable the vRealize Infrastructure Navigator Plug-in

Option	Procedure
Disable Plug-in	<p>Right-click <b>vRealize Infrastructure Navigator</b> and click <b>Yes</b> in the Disable Plug-in dialog box to disable the vRealize Infrastructure Navigator plug-in.</p> <p><b>NOTE</b> Disabling the plug-in does not remove it from the client. You must uninstall the plug-in to remove it.</p> <p>When you disable the plug-in, the <b>Application Services</b> tab and the Navigator portlet in the <b>Summary</b> tab is not visible in the vSphere Web Client, but vRealize Infrastructure Navigator continues the mapping process in the background.</p>
Enable Plug-in	<p>Right-click <b>vRealize Infrastructure Navigator</b> and click <b>Yes</b> in the Enable Plug-in dialog box to enable the vRealize Infrastructure Navigator plug-in.</p>

## vRealize Infrastructure Navigator Notification Messages

Draft comment filepath: GUID-21022BD0-9720-4945-9FD6-02F09522C424.xml

vRealize Infrastructure Navigator displays notification messages when any general system error or any credentials error. The notification messages appear in the **Application Dependencies** tab at the virtual machine level and at the **Application Services** tab at the vCenter Entity level. Notification messages related to Site Recovery Manager appears only when Site Recovery Manager Server is configured to work with vRealize Infrastructure Navigator.

In the event that there is more than one notification message, vRealize Infrastructure Navigator displays the most important notification according to the priorities described below.

**Table 3-2.** Notification Messages

Priority	Icon	Icon Description	Error Summary	Error Description	Resolution
1		Critical	Navigator server is not responding.	Unable to retrieve data from the Navigator server as it is not responding.	Refresh or restart the Navigator server.
2		Info	VM access is off.	Data might not be accurate because Navigator access to virtual machines is off.	Click the <b>Turn on VM access</b> link to start the discovery process.
3		Critical	Invalid or insufficient vCenter credentials.	Data might not be accurate as the vCenter credentials are invalid.	Click <b>Set the vCenter credentials</b> link to enter the vCenter Server credentials.
4		Warning	Site Recovery Manager Server integration is stopped.	Site Recovery Manager Server integration is stopped due to invalid credentials.	Click <b>Set the Site Recovery Manager credentials</b> to enter the Site Recovery Manager Server credentials.

If there is an error in retrieving data from Site Recovery Manager Server, the Error in retrieving data from the SRM server message appears.

If there is an error in retrieving data from the vRealize Infrastructure Navigator server, the Error in retrieving data from the Infrastructure Navigator server message appears.

At vCenter Entity level, if there is an error in retrieving data from the vRealize Infrastructure Navigator server there is no popup message, but Error in retrieving data from the Infrastructure Navigator server message appears in the **Application Services** tab and the portlet is empty.



# Application Visibility at Virtual Machine Level

# 4

Draft comment filepath: GUID-283FBB44-5D57-45D4-8C78-19624F291F01.xml

---

You can view the application dependency of a virtual machine to help you to manage your vSphere inventory. The inventory appears in the left pane and displays all the virtual machines managed by the vCenter Server.

You view the services that vRealize Infrastructure Navigator provides on a virtual machine by selecting the virtual machine from the inventory. The selected virtual machine name is highlighted in the inventory and its details appear in the Navigator portlet on the **Summary** tab.

This chapter includes the following topics:

- [“Understanding the Navigator Portlet,”](#) on page 19
- [“Viewing Application Dependencies of a Virtual Machine,”](#) on page 20
- [“Dependency Map and Table Messages,”](#) on page 20
- [“Viewing the Dependency Map,”](#) on page 21
- [“Viewing the Dependency Table,”](#) on page 23
- [“Viewing Details of a Virtual Machine,”](#) on page 24
- [“Defining an Unknown Service,”](#) on page 26
- [“Discovery of External Entities,”](#) on page 27
- [“Aging Process of Dependencies,”](#) on page 27
- [“Understanding the Manual Application Feature,”](#) on page 28
- [“Understanding Application Definition,”](#) on page 30

## Understanding the Navigator Portlet

Draft comment filepath: GUID-EAB2E2E5-86A4-4125-AB8F-B2D47B26ACDB.xml

The Navigator portlet on the **Summary** tab gives you a summarized result of the mapping process that has been performed on the selected virtual machine.

The following table lists and describes the fields in the Navigator portlet.

**Table 4-1.** Navigator Portlet

Field	Value
Discovery Status	<p>Displays the discovery status of the virtual machine.</p> <ul style="list-style-type: none"> <li>■ Normal: Indicates absence of any error. For more information, see <a href="#">“Mapping Services,”</a> on page 11.</li> <li>■ Access failed: Indicates that the mapping process failed on the selected virtual machine and displays an error message describing the reason for failure.</li> </ul> <p>The field displays a green icon for a Normal status and a gray icon for a Access failed status.</p>
Successful Discovery	Displays the time elapsed since the last successful discovery of the virtual machine.
Application services	Displays a comma-separated list of services installed and running on the selected virtual machine. In case of multiple services with the same version or multiple services without any version, the service name is displayed once with number of instances in parentheses.
Dependencies	Displays the total number of dependencies including incoming and outgoing dependencies. Click <b>Dependencies</b> to view the number of incoming and outgoing dependencies.
Incoming	<p>When a virtual machine, or a service running on it, requires information from a service running on the selected virtual machine, a dependency exists between the two virtual machines. This dependency is known as an incoming dependency.</p> <p>For example, if the selected virtual machine serves another virtual machine it is an incoming dependency.</p>
Outgoing	<p>When the selected virtual machine, or a service running on it, requires information from a service running on another virtual machine, a dependency exists between the two virtual machines. This dependency is known as an outgoing dependency.</p> <p>For example, if the selected virtual machine is served by another virtual machine it is an outgoing dependency.</p>

To view the dependency map of the selected virtual machine, click **Show dependencies** at the bottom of the Navigator portlet or click the **Application Dependencies** tab under **Manage** tab from the toolbar.

## Viewing Application Dependencies of a Virtual Machine

Draft comment filepath: GUID-0193E890-849F-48CD-B98C-ACCFAC499F84.xml

By default the **Application Dependencies** tab displays the first level application dependencies of s selected virtual machine in map and tabular formats. The information panel displays additional information about the machine. You can select the way that you see the application dependencies in a map or table by using the **Application Dependencies** drop-down menu.

The **Application Dependencies** tab also shows second-level application dependencies of all the virtual machines except the selected virtual machine in a map. For more information, see [“Viewing Second-Level Application Dependencies,”](#) on page 22.

## Dependency Map and Table Messages

Draft comment filepath: GUID-BF86C175-C776-4F4B-A9B3-72AC8C030096.xml

vRealize Infrastructure Navigator displays messages in the dependency map and dependency table depending on the discovery status of a virtual machine and the information-retrieval action that is performed on the virtual machine.

You might see the following messages while using vRealize Infrastructure Navigator.

**Table 4-2.** Dependency Map and Table Messages

Message	Description
Loading	The dependency map or table is being loaded with relevant data.
Access failed. VMware Tools is not installed	Discovery failed because VMware tools is not installed on the selected virtual machine.
Access failed. VM is powered off or suspended	The selected virtual machine is powered off or suspended.
Retrieving data from SRM	Infrastructure Navigator is retrieving data from Site Recovery Manager
SRM integration is stopped	The integration of the Site Recovery Manager has stopped.
This VM is pending application mapping	The initial mapping process is incomplete.
Access failed. The disk is full	vRealize Infrastructure Navigator cannot perform discovery on the targeted virtual machine because the disk of targeted virtual disk is full.

## Viewing the Dependency Map

Draft comment filepath: GUID-F0834EC9-9FCC-4866-A12A-AB9C695A527B.xml

The dependency map is a map of relationships that displays the services installed and running on a virtual machine. The dependency map displays all virtual machines connected to the selected virtual machine by incoming or outgoing dependencies. The name of the selected virtual machine appears at the top of the dependency map. The dependency map also displays the total number of unknown services running on that particular virtual machine that have connections. If you have integrated Site Recovery Manager with vRealize Infrastructure Navigator, the Site Recovery Manager Protection Groups and Site Recovery Manager Recovery Plans of the selected virtual machine are also displayed in the dependency map. If a virtual machine is part of a vApp, the vApp name is also displayed in the dependency map.

The following table lists and describes the icons that are used in the vRealize Infrastructure Navigator dependency map.

**Table 4-3.** Dependency Map Icons

Icon	Description
	Represents a virtual machine. The name of the virtual machine appears next to the icon. If you select a virtual machine it is highlighted in dark blue.
	Represents services running on the selected virtual machine. The names of the services appear below the virtual machine that you have selected.
	Indicates that the specific virtual machine is protected by Site Recovery Manager. The information related to Site Recovery Manager also appears, assuming that Site Recovery Manager integration is enabled.
	Represents a vApp. If a virtual machine is part of a vApp, the vApp name also appears.
	Indicates a critical alarm for a virtual machine. The icon appears next to the virtual machine name. The total number of critical alarms is listed in the tool tip. If you click the icon, the <b>Issues</b> tab on the <b>Monitor</b> tab for the specific virtual machine opens.
	Indicates a warning alarm for a virtual machine. The icon appears next to the virtual machine name. The total number of warning alarms is listed in the tool tip. If you click the icon, the <b>Issues</b> tab on the <b>Monitor</b> tab for the specific virtual machine opens.
	Click the icon to view the second level incoming and outgoing dependencies. This button is present in all the virtual machines except the selected virtual machine and external entities. The total number of incoming or outgoing dependencies is displayed on the button. For example, if there are 4 incoming dependencies for a specific virtual machine other than the selected VM, the number 4 appears on the button. For more information, see <a href="#">“Viewing Second-Level Application Dependencies,”</a> on page 22.

In the case of an outgoing connection from a selected virtual machine (VM1) to a second virtual machine (VM2) that is part of the virtual environment monitored by vRealize Infrastructure Navigator, VM2 appears in the dependency map as an outgoing dependency. In the case of an incoming connection from a virtual machine (VM1) to a selected virtual machine (VM2) that is part of the virtual environment monitored by vRealize Infrastructure Navigator, VM1 appears in the dependency map as an incoming dependency.

The arrows in a dependency map indicates whether a dependency is outgoing or incoming. An outgoing arrow from a selected virtual machine denotes an outgoing dependency and an incoming arrow to the selected virtual machine denotes incoming dependency.

In the dependency map, you can double-click another virtual machine (VM3) to navigate to that virtual machine and view its dependency map. The navigation is successful when the following changes occur:

- The other virtual machine (VM3) is highlighted in dark blue.
- The other virtual machine (VM3) is highlighted in the left inventory pane.
- The information panel displays details of the other virtual machine (VM3).

---

**NOTE** If you try to open a dependency map that has more than 70 direct connections, the dependency map does not load. The `Too many connections. Redirecting to table view` message is displayed. After three seconds, you are redirected to the table view.

vRealize Infrastructure Navigator discovers and displays machines, services, and dependencies that are external to the current vCenter Server. For more information, see [“Discovery of External Entities,”](#) on page 27.

---

## Viewing Second-Level Application Dependencies

Draft comment filepath: GUID-F3BA1999-5431-4379-ABDD-8EEB6235C886.xml

You can view a second level of application dependencies that are dependent on or serve a specific virtual machine.

Beneath each virtual machine in a map, other than the selected virtual machine, are two buttons, represented by , that you can use to view second-level application dependencies. Clicking the button on the left shows incoming application dependencies. Clicking the button on the right shows outgoing application dependencies. The total number of dependencies is displayed on the button. If there are no dependencies to display, the button is disabled and a tool tip shows a `No more dependencies to display` message. If you click one of these buttons, it displays the next level of application dependencies that is dependent or serves the virtual machine and the button is grayed out.

The first level application dependency is shown in dark blue color and the second-level application dependencies are shown in dark green color.

You can remove the newly discovered virtual machines and its connections that have been discovered by this functionality by clicking the  icon on the upper right corner of the virtual machine.

If you remove a second-level dependent virtual machine, the count on the button of the original virtual machine is increased by one. You can retrieve all the second-level dependent virtual machines by clicking on the button of the original virtual machine again.

---

**NOTE** If a virtual machine has more than 70 incoming or outgoing dependencies, the  is disabled and at the tool tip

`Too many connections. Double-click the virtual machine to see its first level dependencies in table view`

message is displayed.

---

## Understanding the Dependency Map Toolbar

Draft comment filepath: GUID-CE742D08-DDFB-4AF3-8594-C6D05184DE6B.xml

You can use the control buttons on the Dependency Map toolbar to manage the dependency map.

The toolbar appears above the dependency map.

**Table 4-4.** Dependency Map Control Buttons

Control Button	Description
	Click to create manual application. For more information, see <a href="#">“Create an Application Manually,”</a> on page 28.
	Click to rename an application. Fore more information, see <a href="#">“Rename an Application Manually,”</a> on page 28.
	Click to add application members, see <a href="#">“Add Virtual Machines to an Application,”</a> on page 29.
	Click to remove the virtual machines from a selected application. For more information, see <a href="#">“Remove Virtual Machines from the Dependency Map of an Application,”</a> on page 29.
	Click to magnify areas of the dependency map. Click the icon again to close the magnifier.
	Click to open an overview image to the left of the dependency map. You can click the overview image to navigate within the dependency map. Click the icon again to close the overview image.
	Click the <b>Fit content</b> icon to adjust the magnification of the dependency map so that it fits exactly in the rectangular map pane.
	Click the <b>Zoom in</b> icon to magnify the dependency map by preset levels. You can use your mouse wheel to change the size of the dependency map. Place the cursor on the dependency map and roll the mouse wheel forward to zoom in on the map.
	Click the <b>Zoom out</b> icon to shrink the dependency map by preset levels. You can use your mouse wheel to change the size of the dependency map. Place the cursor on the dependency map and roll the mouse wheel backward to zoom out.
	Click to export the displayed dependency map as an image.

You can move the dependency map in any direction by left-clicking the map and dragging your mouse in the required direction without releasing the mouse button.

The toolbar also has two drop-down menus. You can select to view the application dependencies in either Map View or Table View by using the **Application Dependencies** drop-down menu. By default, the **Display map of** drop-down menu displays the first level application dependencies dependency map.

## Viewing the Dependency Table

Draft comment filepath: GUID-6FEE98F6-4233-4DA6-986C-CD1547D5FA3F.xml

The dependency table is the tabular form of the dependency map. In addition to specifying the virtual machine name and services installed, it provides the virtual machine state, virtual machine status, discovery status, and the time elapsed since last successful discovery of the selected virtual machine.

You view a dependency table by selecting **Application Dependencies > Table View** on the **Application Dependencies** tab. The tables in the view give you details about the first level of application dependency for the selected virtual machine, together with an incoming dependency table and an outgoing dependency table.

The three tables are sub-tables of the inventory table.

- The incoming dependencies table displays details of all virtual machines that depend on the selected virtual machine.
- The *virtual machine name* table displays the details of the selected virtual machine.
- The outgoing dependencies table displays the details of all virtual machines on which the selected virtual machine depends.

If a virtual machine has no incoming dependencies, a `No incoming dependencies` message is displayed in place of the incoming dependencies table. If the virtual machine has no outgoing dependencies, a `No outgoing dependencies` message is displayed in place of the outgoing dependencies table.

**Table 4-5.** Dependency Table

Field	Value
Name	Displays the virtual machine name as displayed in the vCenter inventory panel.
Services	Displays a comma-separated list of mapped services along with their versions that are running on the selected virtual machine. In case of multiple services with the same version or multiple services without any version, the service name is displayed once with the number of instances in parenthesis.
Discovery Status	Displays the discovery status of the virtual machine. <ul style="list-style-type: none"> <li>■ Normal. Indicates absence of any error. For more information, see <a href="#">“Mapping Services,”</a> on page 11.</li> <li>■ Access failed. Indicates that the mapping process failed on the selected virtual machine, and displays an error message stating the reason for failure.</li> </ul> The field also displays a green icon for a Normal status and a gray icon for Access failed status.
Successful Discovery	Displays the time elapsed since the last successful discovery of the virtual machine.
Protection Group	Displays the Site Recovery Manager protection group of the virtual machine. A blank field indicates that the virtual machine does not belong to any Site Recovery Manager protection group.
Recovery Plans	Displays a comma-separated list of Site Recovery Manager recovery plans for the virtual machine. A blank field indicates that the virtual machine does not belong to any Site Recovery Manager recovery plan.

The Protection Group and Recovery Plans column appears only if you have integrated vRealize Infrastructure Navigator with Site Recovery Manager. For information about Site Recovery Manager integration, see *vRealize Infrastructure Navigator Installation and Configuration Guide*.

## Viewing Details of a Virtual Machine

Draft comment filepath: GUID-B34E82AB-EE3F-40B6-8EFB-4A026B5089B7.xml

The information panel at the bottom of the dependency table or dependency map displays details of a selected virtual machine that are not displayed in the dependency map or the dependency table.

The information panel appears very small. You can drag the link above the information panel to view the complete information.

The following table lists and describes the fields in the **General** tab of the information panel.

**Table 4-6.** General Tab

Field	Description
Guest OS	The name of the guest operating system installed on the selected virtual machine.
DNS name	The Domain Name System (DNS) name of the selected virtual machine.
IP Addresses	A comma-separated list of IP addresses of the selected virtual machine.

**Table 4-6.** General Tab (Continued)

Field	Description
Host	The name of the ESX host on which the selected virtual machine resides.
Cluster	The name of the cluster assigned to the selected virtual machine.
Storage	The name of the storage assigned to the selected virtual machine.
Networks	The name of the network assigned to the selected virtual machine.
VMware Tools	The status of the VMware Tools installed on the selected virtual machine.
vApp Name	The name of the vApp to which the selected virtual machine belongs.

By default, the **Services** tab shows all the known services, and unknown services with at least one incoming dependency. To view unknown services that do not have any incoming dependency, select the checkbox above the table.

**Table 4-7.** Services Tab

Field	Description
Type	Displays the icons of supported service and unsupported service.
Action	<ul style="list-style-type: none"> <li>■ Use the  icon to create user-defined services from unknown services. For more information, see <a href="#">“Create User-Defined Service,”</a> on page 26.</li> <li>■ Use the  icon to edit the details of a user-defined service. For more information, see <a href="#">“Edit User-Defined Service,”</a> on page 26.</li> <li>■ Use the  icon to remove a user-defined service. For more information, see <a href="#">“Delete User-Defined Service,”</a> on page 27.</li> </ul>
Name	Displays the name of the service, if it is a supported service. If the service is an unknown service, the name displayed is Unknown Service.
Listening Ports	Displays a comma-separated list of listening port numbers for the selected virtual machine.
Category	Displays the name of the category to which the supported service belongs. If the service is an unknown service, the category name displayed is Unknown.
Process Using Port	Displays the name of the process that runs on the listening port of the selected virtual machine.
# Incoming Dependencies	Displays the number of incoming dependencies to the selected virtual machine.

## Defining an Unknown Service

Draft comment filepath: GUID-0E51C9D5-3C82-4366-BD24-7B5BA6D2DE3B.xml

Services that are not part of the vRealize Infrastructure Navigator knowledge base are categorized as unknown services. You can define an unknown service as a user-defined service and enlarge the knowledge base.

### Create User-Defined Service

Draft comment filepath: GUID-BC0ECD14-EBC4-4B2A-B4FC-1E71703736E0.xml

You can create user-defined services from unknown services. If you create a user-defined service, all the virtual machines that run the service on the defined port number and process name display the service.

#### Procedure

- 1 In the **Services** tab of the information panel, click the **Add a service definition** icon .
 

The Create User Defined Service Definition window appears. If multiple ports or multiple processes are related to the unknown service, you can select them from the drop-down menu.
- 2 Select either the **Port** or **Process** check boxes, or both.
 

If you select both port and process name to define a service, the selection takes precedence over a service that you have defined using only the port or process name.
- 3 Specify a name for the unknown service.
- 4 Select the category from the **Category** menu.
- 5 Click **OK**.

The user-defined service replaces the unknown service in the information panel and on the **Summary** tab at the vCenter Entity level.

---

**NOTE** On external entities, the definition of unknown services includes port number, name, and category. If you create a user-defined service for an internal virtual machine and include the process name, this definition does not apply to the external virtual machines.

---

### Edit User-Defined Service

Draft comment filepath: GUID-C479121C-B119-41ED-B92C-1E7F47569D09.xml

You can edit user defined services. The edit definition results in changes to all services that match this definition.

You can only edit a single definition at a time. To edit additional definitions, repeat the procedure.

#### Procedure

- 1 In the **Services** tab of the information panel, click the **Edit the service definition** icon .
- 2 Select the definition that you are editing from the drop-down menu.
 

The **Port** and **Process** information related to the selected definition is populated by default and the current definition name is displayed.
- 3 Type a new name for the definition.
- 4 (Optional) To change the category, select a new category from the **Category** menu.
- 5 Click **OK**.

The new definition name is applied to the user-defined service.

## Delete User-Defined Service

Draft comment filepath: GUID-E83FC5BD-F4D5-41F9-B3F1-41184CFFB7E2.xml

You can delete a user-defined service definition that you have created. Deleting the definition affects all services that match the definition.

### Procedure

- 1 In the **Services** tab of the information panel, click the **Delete the service definition** icon .
 

The Delete User Defined Service Definition window appears.
- 2 From the drop-down menu, select the definition to delete.
- 3 Click **OK**.

The definition is removed from the vRealize Infrastructure Navigator database.

## Discovery of External Entities

Draft comment filepath: GUID-9C0A14FD-B8B3-41DD-8B5D-4F6B4EEBB13C.xml

vRealize Infrastructure Navigator discovers and displays machines, services, and dependencies that are external to the current vCenter Server. If an external machine has more than one IP address, each address is discovered as a separate external machine. If multiple external machines have the same IP address, they are discovered as a single external machine.

An external virtual machine appears in a gray color in the dependency map and is represented by its DNS name. If a DNS name does not exist, the dependency map displays the IP address of the external virtual machine.

If you select a machine that is external to your current vCenter Server environment, the information panel displays the details of the selected machine below the dependency table and dependency map.

The **Service** tab displays the services running on the external virtual machine. The **General** tab displays the message

This is an external IP address. It can be either a physical machine or a virtual machine, which is not managed by the vCenter Server that Navigator is deployed on.

## Aging Process of Dependencies

Draft comment filepath: GUID-C0346961-7A66-4017-9170-BA0BEEE6D524.xml

To keep the database, portlets, and the map accurate and updated with relevant connections, vRealize Infrastructure Navigator removes infrequently used dependencies.

To ensure that only the relevant dependencies between virtual machines and between services are visible, vRealize Infrastructure Navigator removes infrequently used dependencies after three days of inactivity. The inactivity period is non-configurable.

For example, a dependency between a source and a target where the source is a virtual machine and the target is a service, a virtual machine, or an external entity is removed if the dependency has not been discovered in the past inactivity period. vRealize Infrastructure Navigator tracks the last time the dependency was discovered. If discovery is turned off and later turned back on, vRealize Infrastructure Navigator resets the countdown of the inactivity period.

## Understanding the Manual Application Feature

Draft comment filepath: GUID-2C283DA5-542C-48A9-8740-D7D21F6DA8F7.xml

You can use the manual application feature to mark a collection of virtual machines with an application name. For example, vRealize Operations Manager can show the health of an application group rather than that of individual virtual machines.

The manual application feature's requirements are as follows.

- A manual application must be unique, meaning that two manual applications cannot have the same name.
- The name of the manual application is limited to 128 characters.

The manual application feature's functionalities are as follows.

- You can use the dependency map to create a manual application.
- You can create manual applications with virtual machines that are not connected.
- Manual applications are listed in the **Display map of** drop-down menu.
- If a selected virtual machine does not belong to any application, the **Display map of** drop-down menu shows only the first level dependencies of that virtual machine.
- If you create a manual application using only external entities, you cannot view the created manual application.

### Create an Application Manually

Draft comment filepath: GUID-8D98105C-70BC-48D3-A24A-E04103086241.xml

You can create an application manually to mark a collection of virtual machines with an application name.

You can filter and show virtual machines that belong to a specific application.

#### Procedure

- 1 At virtual machine level, expand the dependency map to view all available dependencies.
- 2 Select the virtual machines for which you are creating an application.
- 3 Click the **Create application** icon .
- 4 Specify a name for the application.

The name must be unique to the vCenter Server you are currently working on.

- 5 Click **OK**.

The application is created. You can view the application by selecting one of its virtual machines and opening its dependency map. The application appears in the **Display map of** drop-down menu.

### Rename an Application Manually

Draft comment filepath: GUID-C265AE34-1813-4B7F-947E-8D84DEFD7E42.xml

You can rename an application that you have created.

#### Procedure

- 1 At virtual machine level, from the **Display map of** drop-down menu, select the manually created application that you are renaming.
- 2 Click the **Rename application** icon .

- 3 Specify a new name in the **Name** text box.  
The name must be unique to the vCenter Server that you are currently working on.
- 4 Click **OK**.

The new name is applied to the application.

## Add Virtual Machines to an Application

Draft comment filepath: GUID-0A2910CF-CBE1-40BC-9503-FB58163042F6.xml

You can add virtual machines to an application that you have created.

### Procedure

- 1 Open the application map to which you are adding the virtual machines.
- 2 Expand all the incoming or outgoing dependencies of the application map.
- 3 Select the virtual machines to add.
- 4 Click the **Add selected application members** icon .

The updated application map appears.

## Remove Virtual Machines from the Dependency Map of an Application

Draft comment filepath: GUID-3A17A56C-5044-4FE8-9B1E-EF48DC646F17.xml

You can remove the virtual machines from the dependency map of a selected application. When you remove the virtual machines from an application, the changes appear in the application map.

### Procedure

- 1 Open the application map from which you are removing a virtual machine.
- 2 Select the machines that you are removing.
- 3 Click the  icon.

Depending on the virtual machines that you select for removal, three different types of messages are displayed.

- If you try to remove a virtual machine other than the spotlighted virtual machine, then this message is displayed.  
Removing the virtual machine from the application will change the displayed application map. Do you want to continue?
- If you try to remove the spotlighted virtual machine or if spotlighted virtual machine is present among the virtual machines that you select for removal, then this message is displayed.  
By removing the spotlighted virtual machine from the application, you will lose the focus on this application. The first-level dependencies will be displayed. Do you want to continue?
- If you try to remove all the virtual machines from the application, then this message is displayed.  
Removing all the virtual machines from manual application will make this application undiscoverable by the Infrastructure Navigator. The first-level dependencies map will be displayed. Do you want to continue?

## Understanding Application Definition

Draft comment filepath: GUID-4E3E4552-0600-4C00-9FEF-56B838C01021.xml

An application definition is a rule or pattern by which a collection of connected virtual machines are identified as a deployed application instance. An application instance is a set of connected virtual machines that matches an application definition.

During the discovery process, the virtual machines, the services running on the virtual machines, and the components deployed on the virtual machines are compared to application definitions. Each set of connected virtual machines that matches an application definition is considered an application instance.

If you have Microsoft Exchange installed, each Exchange role is a service for which you can create application definitions. When you are creating a rule and you select **Mail Server** as the server category, each of the Exchange roles are listed under Service Name,

The **Manage** tab of the vRealize Infrastructure Navigator virtual appliance displays the application definitions management table. The application definitions management table shows all the application definitions that exist under a vCenter Server, and all the Exchange roles.

On the **Services** tab in the information panel at the bottom of the screen, you can view the Microsoft Exchange name and version number of a role, and a list of the ports on which listening occurs. You can also view this information in the vRealize Infrastructure Navigator portlet on the **Summary** tab.

## Create Application Definitions

Draft comment filepath: GUID-F52273D2-A1B3-43C3-8F64-BF16332729D0.xml

You can create application definitions by which a collection of connected virtual machines are identified as a deployed application instance. The application definitions management table shows all the application definitions that exist under a vCenter Server.

### Procedure

- 1 Log in to the vSphere Web Client.
- 2 From the inventory menu, select **Infrastructure Navigator**.  
The vRealize Infrastructure Navigator home page appears.
- 3 Click the **Manage** tab.
- 4 From the **vCenter Server** drop-down menu, select the vCenter Server where you want to create the application definition.

- 5 Click the **Create Automatic Application Definition** icon .

- 6 Type a name and description for the application definition, and click **Next**.

The name must be unique to the vCenter Server that you are currently working on. The length of the name is limited to 128 alphanumeric characters including spaces. The description is not mandatory, but is helpful as it can increase the efficiency in future tasks. The length of the description must be less than or equal to 2048 alphanumeric characters including spaces.

- 7 To set the rule, select the service category from the **Service Category** drop-down menu and service name from the **Service Name** drop-down menu.

You must select a service category, a service name, or both before proceeding. You can set more than one rule by clicking the **Add** icon . The **Clustered** check box, which groups all the occurrences of this service into a single application instance is selected by default.

- 8 Click **Next**.

The Ready to complete screen displays a summary of your settings.

- 9 Click **Finish**.

The created application definition is listed in the application definitions management table. Any valid application definition generates application instances.

## Edit Application Definition

Draft comment filepath: GUID-467C54E2-6FE6-4FFC-BD9B-DCFF262E5A9D.xml

You can edit an existing application definition that you have created. An existing and valid application definition might become invalid if one of the user-defined services used originally in the application definition does not exist anymore or has been renamed.

### Procedure

- 1 Log in to the vSphere Web Client.
- 2 From the inventory menu, select **Infrastructure Navigator**.  
The vRealize Infrastructure Navigator home page appears.
- 3 Click the **Manage** tab.
- 4 From the **vCenter Server** drop-down menu, select the vCenter Server from which you want to edit an application definition.
- 5 Select the application definition that you want to edit and click the **Edit Automatic Application**

**Definition** icon .

- 6 To edit the name and description, type a new name and description in the **Name** and **Description** text box and click **Next**.

The name must be unique to the vCenter Server that you are currently working on. The length of the name is limited to 128 alphanumeric characters including spaces. The description is not mandatory, but is helpful as it can increase the efficiency in future tasks. The length of the description must be less than or equal to 2048 alphanumeric characters including spaces.

- 7 To add, delete, or change the rules, edit or select the new service category or service name from the **Service Category** or **Service Name** drop-down menu.
- 8 Click **Next**.

The Ready to complete screen displays a summary of your new settings.

- 9 Click **Finish**.

The new definition is applied to the application definition.

## Delete Application Definition

Draft comment filepath: GUID-80DB2D24-F66A-4243-B737-F876C042020B.xml

You can delete an application definition. If you delete an application definition you lose all the discovered application instances.

### Procedure

- 1 Log in to the vSphere Web Client.
- 2 From the inventory menu, select **Infrastructure Navigator**.

The vRealize Infrastructure Navigator home page appears.

- 3 Click the **Manage** tab.
- 4 From the **vCenter Server** drop-down menu, select the vCenter Server from which you want to delete an application definition.
- 5 Select the application definition that you want to delete and click the **Delete Automatic Application Definition** icon .
- 6 Click **Yes**.

The application definition is deleted from the application definitions management table.

---

**NOTE** Deleting multiple application definitions together is not supported.

---

## Export Application Definition List

Draft comment filepath: GUID-60DF7C89-2A23-4167-B103-FF93B4EC990E.xml

You can export the application definitions that are listed in the application definitions management table as a CSV file. You can select the rows and columns that you want to export or can export the entire table.

### Prerequisites

You must define at least one application definition before you export an application definition list.

### Procedure

- 1 Log in to the vSphere Web Client.
- 2 From the inventory menu, select **Infrastructure Navigator**.  
The vRealize Infrastructure Navigator home page appears.
- 3 Click the **Manage** tab.
- 4 From the **vCenter Server** drop-down menu, select the vCenter Server for which you want to generate the CSV file.
- 5 Click the **Export** icon  at the bottom right-hand corner of the screen.  
If no application definition is defined, this icon is disabled.
- 6 (Optional) In the Rows pane, select the rows that you want to export.
  - Select the **All rows** check box if you want to export all the rows.
  - Select the **Selected rows only** check box if you want to export the selected rows. You can use Ctrl +click to select multiple rows.
- 7 (Optional) Select the columns that you want to export from the Columns pane.
- 8 Click **Generate CSV Report**.
- 9 Click **Save** and select the location where you want to save the CSV file.

# Application Visibility at the vCenter Entity Level

# 5

Draft comment filepath: GUID-284DD368-C600-4FCE-AAB4-C0905F709724.xml

---

You can view the services installed and running on a vCenter entity to manage your vSphere inventory. The inventory appears in the left pane and displays all the vCenter entities managed by the vCenter Server.

You can view the services installed and running on a vCenter entity, by selecting a vCenter entity from the inventory. The selected vCenter entity name is highlighted in the inventory and its details appear in the Navigator portlet in the **Summary** tab.

This chapter includes the following topics:

- [“Understanding the Navigator Portlet,”](#) on page 33
- [“Viewing Application Dependencies of a vCenter Entity,”](#) on page 34
- [“Viewing the Inventory Table,”](#) on page 34
- [“Filter Text in the Inventory Table,”](#) on page 36
- [“Export Inventory Table,”](#) on page 36
- [“Viewing Details of a vCenter Entity,”](#) on page 36

## Understanding the Navigator Portlet

Draft comment filepath: GUID-F464011F-7D7E-4AC7-BD76-02340746238C.xml

The Navigator portlet on the **Summary** tab provides a summarized result of the mapping process carried out on a selected vCenter entity.

The following table describes the fields in the Navigator portlet.

**Table 5-1.** Navigator Portlet

Field	Value
Known Application Services	Displays the total number of services running on the selected vCenter entity. Services include Web servers, mail servers, database servers, application servers, cache servers, messaging servers, application management servers, and virtualization management servers. You can click <b>Known Application Services</b> to view the number of Web servers, mail servers, database servers, application servers, cache servers, messaging servers, application management servers, and virtualization management servers discovered by vRealize Infrastructure Navigator.
Application Server	Displays the number of application servers running on the selected vCenter entity. Supported application servers include Apache Tomcat, tc Server, WebSphere, WebLogic, and JBoss.
Web Server	Displays the number of Web servers running on the selected vCenter entity. Supported Web servers include Apache HTTP, IIS, SharePoint, and Nginx.
Messaging Server	Displays the number of messaging servers running on the selected vCenter entity. RabbitMQ is the only supported messaging server.

**Table 5-1.** Navigator Portlet (Continued)

Field	Value
Mail Server	Displays the number of mail servers running on the selected vCenter entity. Microsoft Exchange is the only supported mail server.
Database Server	Displays the number of database servers running on the selected vCenter entity. Supported database servers include Oracle DB, MS-SQL DB, DB2, MySQL DB, and Sybase DB.
Cache Server	Displays the number of cache servers running on the selected vCenter entity. GemFire is the only supported cache server.
Application Management	Displays the number of application management servers running on the selected vCenter entity. VMware View Server is the only supported application management server.
Virtualization Management	Displays the number of virtualization management servers running on the selected vCenter entity. Supported virtualization management servers include VMware vCenter, VMware vCloud Director, and VMware vShield Manager.
Disaster Recovery Server	Displays the number of disaster recovery servers running on the selected vCenter entity. Supported disaster recovery servers include Site Recovery Manager, Replication Server, and Replication Management Server.
Authentication Server	Active Directory provides a central location for network administration and security. Server computers that run Active Directory are called domain controllers. An Active Directory domain controller authenticates and authorizes all users and computers in a Windows domain type network. For example, when a user logs into a computer that is part of a Windows domain, Active Directory checks the submitted password and determines whether the user is an administrator or a normal user.

To view the inventory table of a selected vCenter entity, click **Show all in inventory** at the bottom of the Navigator portlet.

## Viewing Application Dependencies of a vCenter Entity

Draft comment filepath: GUID-6EB321AF-5DD5-47CB-B68F-50A3C2900D65.xml

The **Application Services** tab on the **Manage** tab displays the inventory table of a selected vCenter entity. The **Application Services** tab also displays additional information about the selected vCenter entity in the information panel at the bottom of the screen.

## Viewing the Inventory Table

Draft comment filepath: GUID-563CAE22-1F39-4966-B748-30BB6A9ABCE1.xml

Each row in the inventory table displays information about a virtual machine that belongs to the selected vCenter entity.

For example, if you select an ESX host, all the virtual machines on that ESX host are listed in the inventory table. The virtual machine data displayed in each row of the inventory table is identical to the dependency table of that virtual machine.

**Table 5-2.** Inventory Table

Field	Value
Name	Displays the virtual machine name as displayed in the VC inventory panel.
VM State	Displays the current state of the virtual machine. <ul style="list-style-type: none"> <li>■ Powered Off</li> <li>■ Powered On</li> </ul>
VM Status	Displays the current status of the virtual machine. <ul style="list-style-type: none"> <li>■ Normal</li> <li>■ Alert</li> </ul> The field also displays a green icon for a Normal status and a red icon for an Alert status.

**Table 5-2.** Inventory Table (Continued)

Field	Value
Services	Displays a comma-separated list of mapped services along with their versions that are running on the selected virtual machine. In case of multiple services with the same version or multiple services without any version, the service name is displayed once with number of instances in parenthesis.
Applications	Displays a comma separated list of the manual applications and the automatic application instances that the selected virtual machine takes part in. Automatic instances are named after the respective application definition name followed by instance number in the brackets. All applications are displayed in an ascending order.
Discovery Status	Displays the discovery status of the virtual machine. <ul style="list-style-type: none"> <li>■ Normal. Indicates absence of any error. For more information, see <a href="#">“Mapping Services,”</a> on page 11.</li> <li>■ Access failed. Indicates that the mapping process failed on the selected virtual machine and displays an error message stating the reason for failure.</li> </ul> The field also displays a green icon for a Normal status and a gray icon for Access failed status.
Successful Discovery	Displays the time elapsed since the last successful discovery of the virtual machine.
Protection Group	Displays the Site Recovery Manager protection group of the virtual machine. A blank field indicates that the virtual machine does not belong to any Site Recovery Manager protection group.
Recovery Plans	Displays a comma-separated list of Site Recovery Manager recovery plans for the virtual machine. A blank field indicates that the virtual machine does not belong to any Site Recovery Manager recovery plan.

The Protection Group and Recovery Plans column appears only if you decide to integrate vRealize Infrastructure Navigator with Site Recovery Manager. For information about Site Recovery Manager integration, see *vRealize Infrastructure Navigator Installation and Configuration Guide*.

## Customize the Inventory Table

Draft comment filepath: GUID-E897A729-49A1-4D17-93CA-B31488FC45DF.xml

You can customize the inventory table by adding or removing columns. By default, vRealize Infrastructure Navigator does not display information about the state and the status of virtual machines in the inventory table.

### Procedure

- 1 Select a vCenter entity from the inventory pane.
- 2 To view the inventory table for the selected vCenter entity, click the **Application Services** tab under **Manage** tab.
- 3 Right-click any column heading.
- 4 In the pop-up menu, click **Show/Hide Columns**.  
All columns of the inventory table appear in a list.
- 5 (Optional) To add a column, select an item from the list and click **OK**.
- 6 (Optional) To hide a column, deselect an item from the list and click **OK**.

## Filter Text in the Inventory Table

Draft comment filepath: GUID-49350921-8CD1-42BB-AF6D-1CA1C0219FAF.xml

vRealize Infrastructure Navigator enables you to search through a vCenter entity inventory table by filtering the information about a specific object.

You can specify the search criteria to search for a specific object. For example, you can enter partial host name as the search criteria.

### Procedure

- 1 Select a vCenter entity from the inventory.
- 2 Click the **Application Services** tab on **Manage** tab.  
The **Filter** text box appears.
- 3 In the **Filter** text box, enter your search criteria for the object.  
Only the rows matching the search criteria appear in the table.
- 4 (Optional) Click **Clear**, to remove the filter and redisplay all the data that was initially displayed in the inventory table.

## Export Inventory Table

Draft comment filepath: GUID-A9C392CE-1C40-4497-BC5F-7B78690BB545.xml

You can export the inventory table related to a selected vCenter Server entity as a CSV file. All the information present in the inventory table is exported to the CSV file.

### Procedure

- 1 Select the vCenter entity from the inventory pane.
- 2 Click the  icon.
- 3 Select the folder where you want to save the CSV file.
- 4 Click **Save**.

All the data in the inventory table is exported to the CSV file.

## Viewing Details of a vCenter Entity

Draft comment filepath: GUID-EDC8D9C0-5258-47F4-ABC7-C2D3CB9468AE.xml

By default, the information panel displays the details of the virtual machine that appears in the first row of the inventory table of the selected vCenter entity. As you select different rows in the inventory table, the information displayed in the information panel changes accordingly.

The information panel that appears below the inventory table is identical to the information panel that appears below the dependency map and the dependency table of the selected virtual machine.

To view the list and description of the fields in the information panel, see [Table 4-6](#).

# Managing vRealize Hyperic Agents

Draft comment filepath: GUID-378568A8-DB97-4EC0-A311-54234E37B907.xml

---

You can install vRealize Hyperic agents on virtual machines that are managed by vCenter Server, using vRealize Infrastructure Navigator.

In the **Manage > Hyperic Agents** tab, you can see all the virtual machines for which you have vRealize Infrastructure Navigator access privileges. Depending on the level of access you have been assigned, you can install a vRealize Hyperic agent on those virtual machines, refresh the status of the agents, or cancel pending agent installations.

## Preparing to Install a vRealize Hyperic Agent on a Virtual Machine

Draft comment filepath: GUID-378568A8-DB97-4EC0-A311-54234E37B907.xml

Before you can install a vRealize Hyperic agent on a virtual machine, you must have sufficient privileges to perform the action. Privileges are assigned at the level of vCenter Server or one of its objects, and propagated.

You must configure certain agent management parameters for the vRealize Hyperic agent. During installation, the target virtual machine retrieves the agent installation files from the vRealize Infrastructure Navigator appliance, so you must verify that the virtual machine can retrieve the files from the vRealize Infrastructure Navigator appliance.

If you are using an external repository for the vRealize Hyperic agent installation files, you must ensure that the virtual machines can access that repository.

## Procedures for Preparing to Install and Installing a vRealize Hyperic Agent on a Virtual Machine

Draft comment filepath: GUID-378568A8-DB97-4EC0-A311-54234E37B907.xml

There are a number of procedures to set up the environment and install a vRealize Hyperic agent on a virtual machine using vRealize Infrastructure Navigator.

This chapter includes the following topics:

- [“Configure vRealize Hyperic Action Profiles,”](#) on page 38
- [“Edit vRealize Hyperic Action Profiles,”](#) on page 38
- [“Delete vRealize Hyperic Action Profiles,”](#) on page 38
- [“Install a vRealize Hyperic Agent on a Virtual Machine,”](#) on page 39
- [“Refresh the Agent Status Summary,”](#) on page 40
- [“Cancel Pending Tasks,”](#) on page 40

## Configure vRealize Hyperic Action Profiles

Draft comment filepath: GUID-615C80E2-1087-4B9A-A9E1-47FE5629CF33.xml

You configure vRealize Hyperic settings so that vRealize Infrastructure Navigator can communicate with the vRealize Hyperic agent. You can configure multiple profiles according to your requirements.

### Procedure

- 1 Under **Administration** in the navigator panel, select **Agent Management**.
- 2 On the **Hyperic Action Profiles** tab, select the vCenter Server for which you are configuring vRealize Hyperic parameters.
- 3 Click the **Add** icon to create a new profile.
- 4 Type values for **Name**, **Hyperic IP Address** and **Hyperic Password**.  
You can edit all of the profile values. If you edit the `Windows installation directory` parameter, you must only use ASCII characters.
- 5 Verify that all the mandatory parameters have values.
- 6 Click **Save**.

## Edit vRealize Hyperic Action Profiles

Draft comment filepath: GUID-E6BBDB70-A682-42F1-B844-79E1A91618B3.xml

You can edit vRealize Hyperic action profiles and apply them to your deployed vRealize Hyperic agents.

### Procedure

- 1 Under **Administration** in the navigator panel, select **Agent Management**.
- 2 On the **Hyperic Action Profiles** tab, select the vCenter Server for which you are editing vRealize Hyperic profile parameters.
- 3 Select the profile to edit from the list and click the **Edit** icon to display the current profile settings.
- 4 Edit the profile values as required.  
If you edit the `Windows installation directory` parameter, you must only use ASCII characters.
- 5 Verify that all the mandatory parameters have values.
- 6 Click **Save**.

The new values are applied to the profile. Any pending or running actions are not affected.

## Delete vRealize Hyperic Action Profiles

Draft comment filepath: GUID-B8FA090C-B6EA-4DC7-BE15-52F9195E8228.xml

You can delete a profile that is no longer required.

### Procedure

- 1 Under **Administration** in the navigator panel, select **Agent Management**.
- 2 On the **Hyperic Action Profiles** tab, select the vCenter Server for which you are deleting a vRealize Hyperic action profile.
- 3 Select the profile to edit from the list and click the **Delete**.
- 4 Click **Save**.

The action profile is deleted. Pending and running actions are not affected when you delete a profile.

## Install a vRealize Hyperic Agent on a Virtual Machine

Draft comment filepath: GUID-FE83C032-17DC-4104-B150-9B1F26BE6A7C.xml

You can install vRealize Hyperic agents on one or more virtual machines.

If you do not have the required administration privileges, but you have View and Perform Action privileges for the affected virtual machines, you can still view the list of machines and the status of the agents running on them.

You can select virtual machines for which you do not have administration privileges, but a vRealize Hyperic agent is only installed on the machines for which you do have the required privileges.

Should it be necessary, you can cancel pending agent installations. See [“Cancel Pending Tasks,”](#) on page 40.

### Prerequisites

- You must have configured and applied vRealize Hyperic profile settings for the agent that you are installing on the virtual machines. You can click the **Hyperic Profile Settings** link to access the necessary Web page if necessary. See [“Configure vRealize Hyperic Action Profiles,”](#) on page 38 .
- To install vRealize Hyperic agents on a virtual machines, you must have a user role with **Agent Management.Hyperic.Administrator** privileges for the target machines.

### Procedure

- 1 Select the aggregated item in the vSphere Web Client navigator that includes the virtual machines on which to install a vRealize Hyperic agent.
- 2 On the **Manage > Hyperic Agents** tab, select one or more virtual machines on which to install a vRealize Hyperic agent.

You can only install one vRealize Hyperic agent on a virtual machine.

- 3 Select the agent profile that applies for this agent installation.  
If you are deploying the agent on multiple virtual machines, the profile applies to each agent installation.
- 4 Click the Install Hyperic Agent on selected VMs icon at the top of the table.

A vRealize Hyperic agent is installed on the virtual machines. An error message appears in the Issues column of the table if installation of the agent fails on any of the virtual machines.

### What to do next

Refresh the page to update the status information of the agents. See [“Refresh the Agent Status Summary,”](#) on page 40

[“Refresh the Agent Status Summary,”](#) on page 40.

## Refresh the Agent Status Summary

Draft comment filepath: GUID-8E9B41EE-36F1-4A82-A166-7ADBA005BA8F.xml

If the status of an agent changes during the period between automated refresh cycles, you do not immediately see the change. You can initiate a refresh to immediately display the current status of the agents and to view any installation-related error messages.

### Procedure

- 1 Select the aggregated item in the vSphere Web Client navigator that contains the virtual machines whose status you want to refresh, and click the **Manage > Hyperic Agents** tab.
- 2 Click the **Refresh Hyperic Agent's status** icon to update the agent status for the virtual machines. The Issues status is also updated.

The current agent status of the virtual machines appears.

## Cancel Pending Tasks

Draft comment filepath: GUID-3A1DC8B7-0A13-40CA-8364-71F1A6616DC4.xml

Installing vRealize Hyperic agents on many virtual machines in a single process can take some time. Until it is the turn of a virtual machine to have an agent installed, the installation task is in pending mode. You can cancel all pending tasks that you initiated.

When you cancel vRealize Hyperic agent installation pending tasks, all tasks that were initiated under your user name that have not begun to process are cancelled, regardless of whether the virtual machines are listed in the currently displayed table. Agents that have already been installed on virtual machines are not affected.

### Procedure

- ◆ Click the **Cancel Pending Tasks** icon above the table and, at the prompt, click **OK**.

All pending tasks that were initiated with your user name are cancelled.

# Index

## A

- access virtual machines **28**
- action profiles
  - configure **38**
  - delete **38**
  - edit **38**
- active discovery **10, 12**
- Active Discovery **9**
- Adaptive Server Enterprise **13**
- agents
  - cancel installation **40**
  - install **39**
  - managing **37**
  - refresh status **40**
- aging **27**
- Apache **13**
- application
  - add vms **29**
  - create manually **28**
  - rename manually created **28**
- application definition **30**
- application group **28**
- application instance **30**
- application management **13, 33**
- application name **28**
- application server **13, 33**
- application services **8, 19, 33**
- application visibility **19**
- application definition creation **30**
- application definition deletion **31**
- application definitions management table **30**
- application dependencies tab **15, 19, 20**
- application instances **30, 31**
- architecture **9**
- audience **5**

## B

- benefits **8**

## C

- cache server **13, 33**
- change **8**
- cluster **24**
- compatible **15**

- configurations **10**
- create user defined service **26**
- CSV file **32, 36**
- customize inventory table **35**

## D

- database component **10**
- database server **13, 33**
- DB2 **13**
- dependencies
  - aging **27**
  - second level **22**
- dependency map, remove virtual machines **29**
- dependency table **23**
- dependency map toolbar **23**
- disable plug-in **16**
- discovery **30**
- discovery status **19, 23, 34**
- DNS name **24**

## E

- edit application definition **31**
- enable plug-in **16**
- entities, external **27**
- Exchange **13**
- export application definition **32**
- export inventory table **36**

## F

- feedback **5**
- filter text **36**
- fit content **23**
- frequency **12**
- functionality **7**

## G

- GemFire **13**
- graphical user interface **10**
- guest operating system **11, 24**

## H

- host **24**

## I

- IIS **13**

incoming dependency **19, 21**  
 information panel **20, 24, 34, 36**  
 integration **7**  
 invalid user-defined service **31**  
 inventory **19, 33**  
 inventory table **33, 34, 36**  
 IP address **15, 24**

**J**

JBoss **13**

**K**

knowledge base **26**

**L**

login **15**

**M**

magnifier **23**  
 mail server **13, 33**  
 manual application **28**  
 map and table messages **20**  
 mapping **8, 11, 12**  
 messages, map and table **20**  
 messaging server **13, 33**  
 MS-SQL DB **13**  
 MySQL DB **13**

**N**

navigate **21**  
 Navigator tab **33, 36**  
 network **24**  
 NGINX **13**  
 notification messages **16**

**O**

Oracle DB **13**  
 outgoing dependency **19, 21**  
 overview, vRealize Infrastructure Navigator **7**

**P**

password **15**  
 plug-in **10**  
 port based service **26**  
 portal **15**  
 portlet **19, 33**  
 protection group **23, 34**

**R**

RabbitMQ **13**  
 recovery plan **23, 34**  
 remapping **12**

**S**

search **36**  
 server component **10**  
 service category **30, 31**  
 service name **30, 31**  
 services, create user-defined **26**  
 SharePoint **13**  
 Site Recovery Manager **7, 23, 34**  
 storage **24**  
 successful discovery **19**  
 support **5**  
 Sybase DB **13**  
 synchronize **12**

**T**

tc Server **13**  
 Tomcat **13**

**U**

user name **15**  
 user-defined service  
   create **26**  
   delete **27**  
   edit **26**

**V**

vApp **24**  
 vCenter entity **8, 33, 34, 36**  
 vCenter Server **7, 9, 15, 16, 19, 33**  
 virtual environment **8**  
 virtual infrastructure **7, 8**  
 virtual appliance **9, 12**  
 virtual machines, remove from dependency  
   map **29**  
 virtualization management **13, 33**  
 VM name **23**  
 VM Name **34**  
 VM state **23**  
 VM State **34**  
 VM status **23**  
 VM Status **34**  
 VMware Tools **11, 24**  
 vRealize Hyperic  
   configure action profiles **38**  
   install agents **39**  
   manage agents **37, 40**  
   refresh agent status **40**  
 vSphere Web Client **10, 15, 16**

**W**

Web server **13, 33**  
 WebLogic **13**

WebSphere 13

**Z**

zoom in 23

zoom out 23

