Using VMware vFabric Application Director

vFabric Application Director 1.0

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Using VMware vFabric Application Director

vFabric Application Director automates application provisioning in the cloud including deploying and configuring the application’s components and dependent middleware platform services on infrastructure clouds. vFabric Application Director 1.0 simplifies complex deployments of custom and packaged applications on infrastructure clouds that are based on vCloud APIs.

This guide describes how to install and use vFabric Application Director to deploy and manage applications across virtual and cloud-based infrastructures.

Intended Audience

This information is intended for anyone who wants to install or use vFabric Application Director for application deployments. This audience includes application architects and application deployers who work in collaboration with application infrastructure administrators and cloud administrators.
Introducing vFabric Application Director

vFabric® vFabric™ Application Director is an application provisioning solution that simplifies creating and standardizing application deployment topologies on infrastructure clouds. Application architects can use a graphic-based canvas with a drag-and-drop interface to create application deployment topologies called application blueprints.

These application blueprints define the structure of the application, enable the use of standardized application infrastructure components, and include installation dependencies and default configurations for custom and packaged enterprise applications. Application blueprints are logical deployment topologies that are portable across VMware-based IaaS clouds.

This chapter includes the following topics:

- “vFabric Application Director Overview,” on page 9
- “Core Architectural Principles,” on page 11
- “Key Concepts,” on page 13

vFabric Application Director Overview

vFabric Application Director has a unique model-driven, open, and extensible architecture. With its catalog of standard components, or services, vFabric Application Director simplifies and automates deployments of multitier enterprise applications in hybrid cloud environments.

Enterprise users can quickly standardize, deploy, configure, and scale their complex applications in dynamic cloud environments. These applications can range from simple Web applications to complex custom applications and packaged applications.

Application architects can use the drag-and-drop canvas to create visual application blueprints. These blueprints standardize the structure of the application, including software components, dependencies, and configurations, for repeated deployments. With a prepopulated, extensible catalog of standard virtual machine templates, application infrastructure components, and scripts, architects can create a blueprint in minutes.
Application blueprints are portable across deployment environments. After a blueprint is available, application development, QA, and release teams can work within the standards set by IT. Teams can repeatedly deploy a standard blueprint, customize configurations as allowed, and deploy within IT-approved deployment environments.

From an application blueprint, you can create different deployments using deployment profiles to test prototypes or deploy mission-critical multitier applications in production environments.

From these saved blueprints, the application deployer can generate execution plans for deploying the application to a private or public cloud.
After an application is deployed, application operations teams can monitor and scale these applications by using the integrated vFabric Application Performance Manager (APM).

**Optimized integration with vFabric APM** refers to predefined monitoring agents available in the vFabric Application Director catalog.

**Core Architectural Principles**

vFabric Application Director was designed to automate deployments of complex applications across any IaaS cloud. vFabric Application Director 1.0 automates deployments on IaaS clouds that are based on vCloud 1.5.

- **Deploying Any Application and Middleware Service** on page 12
  With vFabric Application Director, application architects can construct an application deployment with any type of middleware service and application using virtual machine templates and scripts.

- **Multicloud Support** on page 12
  vFabric Application Director is designed to deploy the same application to multiple clouds.
vFabric Application Director Extensibility and Open Architecture on page 12
vFabric Application Director is optimized for vFabric components but is extensible to other components.

Standardization in vFabric Application Director on page 13
With vFabric Application Director, you can create reusable services using standardized configuration properties to meet strict requirements for IT compliance.

Policy-Based Security on page 13
vFabric Application Director grants users specific roles for their functions.

Deploying Any Application and Middleware Service
With vFabric Application Director, application architects can construct an application deployment with any type of middleware service and application using virtual machine templates and scripts.

Note vFabric Application Director 1.0 can deploy applications on Linux operating systems.

NOTE Application architects can use virtual machine templates from a standardized cloud provider library defined for their enterprise.

Architects can also add application components to the middleware services defined in the application blueprint.

Multicloud Support
vFabric Application Director is designed to deploy the same application to multiple clouds.

vFabric Application Director encapsulates deployment settings into deployment profiles, separate from application blueprints. Deployment profiles are portable across private and public clouds that implement vCloud APIs.

vFabric Application Director uses a cloud abstraction layer (vCloud APIs) to plug in cloud providers. vFabric Application Director automates deployments to vCloud Director. Built on top of VMware vSphere virtualization, VMware vCloud Director enables IT services to be deployed across private clouds, public clouds, or both. vCloud Director uses open standards like the vCloud API and the Open Virtualization Format (OVF).

vFabric Application Director integrates with vCloud Director through the publicly available vCloud 1.5-based IaaS API. This allows applications to be deployed in private and public deployments of vCloud Director clouds.

vFabric Application Director Extensibility and Open Architecture
vFabric Application Director is optimized for vFabric components but is extensible to other components.

The vFabric Application Director catalog has predefined (out-of-the-box) services or applications for middleware services. In addition, you can add pointers to virtual machine templates residing in cloud catalogs. The vFabric Application Director catalog also lets you add definitions of dynamically installable custom services on virtual machine templates using install, configure, and start scripts, and appropriate configurations.

Deployment execution plans are automatically generated by the system based on the blueprint. These plans help users to track the status and progress of tasks during deployment.

Custom task scripts can be added to these plans to run in the deployed virtual machine to enable additional tasks such as security patches, audit integrations, quality and compliance reviews using third-party internal IT systems, and running smoke tests.
To streamline the build to deployment process, organizations can further automate deployment by using the command-line interface to allow their continuous build systems or cloud provisioning portals to generate and deploy an application.

**Standardization in vFabric Application Director**

With vFabric Application Director, you can create reusable services using standardized configuration properties to meet strict requirements for IT compliance.

- vFabric Application Director provides a model-driven architecture that enables adding IT certified virtual machine templates and middleware services within the application blueprint.
- vFabric Application Director includes a delegation model for overriding configuration name value pairs between catalog administrator, application architect, and deployer to standardize configuration values for application and middleware service.

**Policy-Based Security**

vFabric Application Director grants users specific roles for their functions.

Users can be grouped together for isolation of applications, deployments, and deployment environments per group.

**Key Concepts**

To construct a blueprint for deploying an application, you can use virtual machine templates that you obtain directly from a cloud provider library, as well as an extensible catalog of ready-to-use application infrastructure components and scripts. After you compose your application deployment topology, you can create dependencies and edit configurations to finalize your execution plan.

The following definitions help you understand the details of this process.

<table>
<thead>
<tr>
<th><strong>Application</strong></th>
<th>Logical deployment unit, consisting of application components and their dependent services and operating systems that can be distributed across multiple virtual machines.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application components</strong></td>
<td>Custom code packaged as EAR files, WAR files, and so on.</td>
</tr>
<tr>
<td><strong>Node</strong></td>
<td>Virtual machine or a cluster of virtual machines defined in the blueprint.</td>
</tr>
<tr>
<td><strong>Blueprint</strong></td>
<td>Logical topology of an application for deployment. A blueprint captures the structure of an application with logical nodes, their corresponding services and operating systems, dependencies, default configurations, and network topology requirements.</td>
</tr>
<tr>
<td><strong>Deployment profile</strong></td>
<td>Collection of deployment settings for a blueprint, including cluster size, CPU, memory, cloud templates, and networks.</td>
</tr>
<tr>
<td><strong>Cloud provider type</strong></td>
<td>Type of cloud infrastructure on which deployments can be made, such as vCloud Director. vFabric Application Director only supports vCloud Director 1.5.</td>
</tr>
<tr>
<td><strong>Cloud provider</strong></td>
<td>A cloud instance for deployment. For vCloud Director, each vFabric Application Director cloud provider is mapped to a vCloud Director organization. A cloud type can have multiple cloud providers.</td>
</tr>
</tbody>
</table>
Deployment environment

An environment in a cloud provider, for example, development, test, staging, and production. A cloud provider can have multiple deployment environments. For vCloud Director, a deployment environment maps to an organization virtual datacenter (vDC) for a defined cloud provider and uses resources from that vDC.

An organization vDC provides resources to an organization and is partitioned from a provider vDC. Organization vDCs provide an environment where virtual systems can be stored, deployed, and operated. They also provide storage for virtual media, such as floppy disks and CD ROMs. A single organization can have multiple organization vDCs.

Catalog

Library that contains logical templates, which are pointers to cloud templates, as well as scripted software, called services that can be installed on a virtual machine.

Logical template

A predefined virtual machine definition in vFabric Application Director. A logical template can be mapped to an actual template in the cloud catalog. Logical templates allow an application blueprint to remain cloud agnostic.

Service

Scripted software that can be installed on a virtual machine and reused in multiple applications.

Tag

Organizes the lists of templates and services to enhance readability in the blueprint editor. A list of tags appear on the Administration tab, and you can add new tags to the list.

Operating system

Specifies an operating system supported by the IT organization for templates and services. A list of operating systems appears on the Administration tab, and you can add to the list.

Properties

Configuration name-value pairs for services and application components. These are variables used by the scripts to set parameters on a script and run various configurations. For example, you can set JVM_ROUTE as a property to set the JVM Route for session affinity in clusters.

Actions

Life cycle stages for the install, configure, and start scripts for services and application components to be installed.

Execution plan

Task plan for viewing the order in which virtual machines are created and software is installed, configured, and started.

Logical network

An entity created from multiple networks or part of a larger network. A logical network is defined by its IP addressing scheme.

Custom Tasks

From the execution plan, you can add custom tasks to perform additional customized tasks such as run security patches in an application deployment. You can create a custom task in the catalog and add it to an application deployment. vFabric Application Director also provides predefined tasks in the catalog that you can use to configure an APT repository, a YUM repository, or register a machine with a Red Hat Network.

Teardown

Remove a vApp and associated virtual machines of a deployed application from the cloud.
Complete these tasks to install vFabric Application Director, configure, and deploy a predefined (out-of-the-box) sample application directly to vCloud Director.

**Table 2-1. List of Tasks to Get Started with vFabric Application Director**

<table>
<thead>
<tr>
<th>Step</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Install and set up the vFabric Application Director virtual appliance. See Chapter 3, “Installing vFabric Application Director,” on page 17.</td>
</tr>
<tr>
<td>2</td>
<td>Configure vFabric Application Director to use a proxy. Perform this task when an application needs to download files from outside the corporate firewall. See “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25.</td>
</tr>
<tr>
<td>3</td>
<td>Log in vFabric Application Director and register a cloud provider. Registering a cloud provider links to a vCloud Director instance and organization vDC. See “Log In to vFabric Application Director,” on page 31 and “Register a Cloud Provider,” on page 37.</td>
</tr>
<tr>
<td>4</td>
<td>Create a deployment environment within the registered cloud provider. You must map the deployment environment to an organization vDC within the cloud instance before you can deploy an application. See “Create a Deployment Environment,” on page 39.</td>
</tr>
<tr>
<td>5</td>
<td>Deploy a predefined sample application. vFabric Application Director includes predefined sample applications, services, and virtual machine templates to help you understand the basic concepts and start using the product. See “Deploy Clustered Dukes Bank Application,” on page 58.</td>
</tr>
<tr>
<td>6</td>
<td>Check the status of the deployment. During deployment, components are installed and configured based on the dependencies of an application. See “Understanding the Deployment Process,” on page 82. You can use the user interface to check the status of application deployment in real time. See “Checking Deployment Status on the Execution Plan Tab,” on page 83.</td>
</tr>
<tr>
<td>7</td>
<td>Troubleshoot deployment failures. If you experience any deployment failures, you can examine the virtual machine-specific logs and deployment logs and troubleshoot the problem. See “Collect Logs to Troubleshoot Deployment Failures,” on page 88.</td>
</tr>
</tbody>
</table>
To install vFabric Application Director, you must deploy the virtual appliance in vCloud Director 1.5.

This chapter includes the following topics:

- “Preparing to Install vFabric Application Director,” on page 17
- “Deploy the vFabric Application Director Appliance,” on page 21
- “Configure Virtual Machines for vFabric Application Director,” on page 22
- “Initial Start Up of vFabric Application Director Virtual Machine,” on page 23
- “Troubleshooting Problems Connecting to the vFabric Application Director Web Interface,” on page 24
- “Unlock Your darwin_user Account,” on page 24
- “Restarting vFabric Application Director,” on page 25
- “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25

**Preparing to Install vFabric Application Director**

Before you begin installing the vFabric Application Director appliance, verify that your computing environment meets the hardware and software system requirements.

vFabric Application Director requires that vCloud Director use specific configuration settings. If you previously installed configurations of vCenter and vCloud Director servers, verify that these servers use the settings that work with vFabric Application Director.

- **vFabric Application Director System Requirements** on page 18
  The virtual appliance on which you run vFabric Application Director must meet certain hardware requirements. In addition, certain ports must be opened for vFabric Application Director.

- **Set Up vCloud Director for vFabric Application Director** on page 19
  You must configure vCloud Director to successfully host applications that you create and deploy using vFabric Application Director. If you have a previously installed version of vCloud Director, you must check the configuration settings to optimize vFabric Application Director.

- **Verify Your vCloud Director Setup** on page 20
  If you have a previously installed version of vCloud Director 1.5, verify that you can work with vApps, and communicate with the virtual machine and to external network IP addresses.

- **Verify Your vCenter Installation** on page 20
  You must optimize your existing vCenter installation so that it works with vFabric Application Director.
To optimize your storage and network to work with vFabric Application Director, you must verify that your vCenter cluster configurations meet certain requirements.

vFabric Application Director System Requirements

The virtual appliance on which you run vFabric Application Director must meet certain hardware requirements. In addition, certain ports must be opened for vFabric Application Director.

Disk Space and Memory Requirements

vFabric Application Director requires a minimum of 20GB of disk space, 2GB memory, and 1 vCPU with a speed of 2GHz.

*Note* For some organization vDCs, by default vCloud Director sometimes sets the virtual CPU to 0.24GHz, based on the vCloud Director setup. If this setting is the default in your environment, you must set the vCPU speed to 2GHz for the organization vDC in which the vFabric Application Director vApp is deployed. Otherwise, the performance of the vFabric Application Director virtual appliance is affected.

Port Requirements

Open the following ports for the vFabric Application Director virtual machine.

<table>
<thead>
<tr>
<th>Port</th>
<th>Connection Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCP Port 8443</td>
<td>(External) for the vFabric Application Director user interface connection from the external browser client.</td>
</tr>
<tr>
<td>TCP Port 22</td>
<td>(Optional) for the external SSH connection.</td>
</tr>
<tr>
<td>TCP Port 6969</td>
<td>(Internal) for Tomcat JMX.</td>
</tr>
<tr>
<td>TCP Port 6379</td>
<td>(Internal) for Redis.</td>
</tr>
<tr>
<td>TCP Ports 43623, 4369, 5672</td>
<td>(External) for vFabric RabbitMQ.</td>
</tr>
<tr>
<td>TCP Port 5432</td>
<td>(Internal) for vFabric Postgres.</td>
</tr>
<tr>
<td>TCP Port 80, 5480</td>
<td>(External) for vami-lighttpd.</td>
</tr>
<tr>
<td>TCP Port 5488, 5489</td>
<td>(External) for vami-sfcbd.</td>
</tr>
</tbody>
</table>

Web Interface Support

vFabric Application Director supports the following Web browsers:

- Mozilla Firefox 9.0. Also requires Adobe Flash Player Plug-in 10.3 or later.
  The browser is supported on Mac 10.6, Windows 7, and Windows 2003.
- Mozilla Firefox 8.0. Also requires Adobe Flash Player Plug-in 11.1 or later.
  The browser is supported on Ubuntu 11.10.
- Internet Explorer 8.0 or 9.0. Also requires Adobe Flash Player Plug-in 11.1 or later.
  The browser is supported on Windows XP, Windows 7, and Windows 2003.

VMRC Plug-In

The VMRC plug-in lets you connect to a deployed virtual machine directly from vFabric Application Director. This plug-in is supported on Mozilla Firefox running on Windows and Ubuntu operating systems and Internet Explorer running on Windows operating systems. The VMRC plug-in is not supported on the Mac operating system.
Virtualization Software Requirements

To use vFabric Application Director, you must have installed and set up the following VMware products:

- vSphere ESXi 5.0, see vSphere documentation https://www.vmware.com/support/pubs/vsphere-esxi-vcenter-server-pubs.html.
- vSphere vCenter Server 5, see vSphere documentation https://www.vmware.com/support/pubs/vsphere-esxi-vcenter-server-pubs.html.
- vCloud Director 1.5, see vCloud Director documentation https://www.vmware.com/pdf/vcd_15_install.pdf.

Supported Operating Systems for Virtual Machine Templates in the vFabric Application Director Catalog

- Red Hat Enterprise Linux 6.1, 64-bit
- Red Hat Enterprise Linux 6.1, 32-bit
- Ubuntu 10.04.2, 64-bit
- Ubuntu 10.04.3, 32-bit
- CentOS 5.6, 64-bit
- CentOS 5.6, 32-bit
- CentOS 5.7, 32-bit

Set Up vCloud Director for vFabric Application Director

You must configure vCloud Director to successfully host applications that you create and deploy using vFabric Application Director. If you have a previously installed version of vCloud Director, you must check the configuration settings to optimize vFabric Application Director.

Prerequisites

- Familiarize yourself with the procedures for creating organizations and catalogs. See the vCloud Director 1.5 documentation center.
- Configure your vCenter settings for vFabric Application Director. See “Verify Your vCenter Installation,” on page 20.
- Verify that the vCloud Director administrator uploaded templates to a catalog.

**Note** If the templates are uploaded to a catalog contained in a different vCloud Organization from the one in which vFabric Application Director performs application deployments, you must publish the catalog and the templates. Check that the catalog has the correct attributes so that users can access it.

- Verify that you have a direct connect network with an external pool of IP addresses that can be used by vFabric Application Director. Check with your vCloud Director administrator to determine the number of IP addresses in the pool.

Procedure

- In vCloud Director, allocate a separate organization for vFabric Application Director.

What to do next

**Verify Your vCloud Director Setup**

If you have a previously installed version of vCloud Director 1.5, verify that you can work with vApps, and communicate with the virtual machine and to external network IP addresses.

vFabric Application Director supports deploying virtual machines directly connected and NAT-routed networks. Use IPPOOL addressing for deployed virtual machines to communicate with the vFabric Application Director server over the network.

*Note* DHCP addressing for directly connected networks is not supported.

**Prerequisites**

Familiarize yourself with the procedures for customizing vCloud Director. See the vCloud Director 1.5 documentation center and VMware knowledge base article 2005829.

**Procedure**

1. From the vCloud Director user interface, create a vApp with one virtual machine.
2. Verify that the virtual machines in the vCloud organization have a vCloud network configuration that allows them to connect to the vFabric Application Director appliance.
   
   The vCloud organization is mapped to the vFabric Application Director cloud provider.
3. Deploy the vApp.
4. Using the VMRC plug-in, connect to the virtual machines and ensure that they can ping an external IP.
   
   The deployed virtual machines must be able to ping the vFabric Application Director appliance. Connectivity with the deployed virtual machine is optional for the vFabric Application Director.

**What to do next**

Download and deploy the vFabric Application Director appliance. See “Deploy the vFabric Application Director Appliance,” on page 21.

**Verify Your vCenter Installation**

You must optimize your existing vCenter installation so that it works with vFabric Application Director.

**Prerequisites**

Familiarize yourself with the procedures for creating vSphere 5.0 resource pools and vCenter clusters that have DRS enabled. See the vSphere 5.0 documentation center.

**Procedure**

- Verify that you have one or more hosts running ESXi 5.0.
- Verify that you have a resource pool.
  
  Use the default values to create a resource pool.

**What to do next**

Verify that your vCenter cluster configurations are optimized to work with vFabric Application Director. See “Verify vCenter Cluster Configurations,” on page 21.
Verify vCenter Cluster Configurations

To optimize your storage and network to work with vFabric Application Director, you must verify that your vCenter cluster configurations meet certain requirements.

Prerequisites

- Familiarize yourself with the procedures for creating vSphere 5.0 resource pools and vCenter clusters that have DRS enabled. See the vSphere 5.0 documentation center.
- Verify that you have a vCenter cluster with DRS enabled.
- Verify that all of the hosts used by vFabric Application Director are in the same vCenter cluster.

Procedure

1. Create a cluster with DRS enabled.
   
   You can only create a provider vDC backed by a vCenter resource pool that is part of a DRS cluster.

2. Check the configuration settings for datastore and network requirements.

<table>
<thead>
<tr>
<th>Option</th>
<th>Action</th>
</tr>
</thead>
</table>
   | Multiple hosts in a cluster | - Verify that all of the hosts have at least one shared datastore, for example, shared LUN, NFS, etc.  
                              |   - Verify that all of the hosts in the cluster have connectivity to at least one common network.  
                              |   - To support live virtual machine migration, verify that all of the hosts in the cluster are identical. |
   | Single host in a cluster | - Verify that your host has shared storage.  
                              |   Although vCloud Director and vFabric Application Director can consume local storage, shared storage ensures future scalability.  
                              |   - Verify that the host has at least one network. |

What to do next

Download and deploy the vFabric Application Director appliance. See “Deploy the vFabric Application Director Appliance,” on page 21.

Deploy the vFabric Application Director Appliance

To install vFabric Application Director, you must download the appliance.

Prerequisites

Verify that you completed all of the prerequisites listed in “Preparing to Install vFabric Application Director,” on page 17.

Procedure

1. Download the vFabric Application Director appliance.
   
   The appliance consists of the following files:
   
   - ApplicationDirector-<VersionNumber>-<buildNumber>_OVF10.ovf
   - ApplicationDirector-<VersionNumber>-<buildNumber>-system.vmdk
   
   Substitute * with the build number of the appliance.

   Save both files in a folder without changing their file names.
2 Log in to vCloud Director and select the organization vDC where you want to deploy vFabric Application Director.

3 Select the Catalog view and click the **Upload** button ( homosex). 

4 In the Upload OVF as a Template window, complete the requested information.

5 Click **OK** on any certificate warning pop-up windows to continue uploading the appliance. Depending on network speed and location of the download files, it might take between 15 minutes to an hour to complete the upload process.

6 Right-click the uploaded template and select the **Add to My Cloud** option.

7 In the Add vApp from Catalog wizard, type the following details:
   a Name and describe the vApp.
   b Under **Leases**, select **Never expires** as the **Runtime Lease** option.
   c Click **Next**.

8 Read and accept the EULA and click **Next**. The Configure Virtual Machines wizard appears.

**Configure Virtual Machines for vFabric Application Director**

Configuring virtual machines for vFabric Application Director ensures that you select the correct network settings for your vFabric Application Director setup.

As a best practice, install the vFabric Application Director appliance on a direct network with a static IP address and a unique host name to avoid any functionality problems.

**Prerequisites**

- Complete the tasks in “Preparing to Install vFabric Application Director,” on page 17.
- Complete the steps in “Deploy the vFabric Application Director Appliance,” on page 21.

**Procedure**

1 Use the Configure Virtual Machines wizard to add a vApp.
   a Accept the default Full Name. Changing the default Full Name prevents vFabric Application Director vApp from starting up. If you need to replace the Full Name of the vFabric Application Director virtual machine, edit the virtual machine properties after the instantiation process is complete.
   b Provide a valid Computer Name.
   c Select the **NIC** button in the Primary NIC column.
   d From the **Network** drop-down menu, select the network that is mapped to the Primary NIC. As a best practice, use a direct network.
   e In the IP Assignment column, select **Static IP POOL** or **DHCP** from the first drop-down menu, leave the second drop-down menu blank, and click **Next**.
   f If you deployed virtual machines, select the **IPPOOL** option. vCloud Director limits the use of NAT_Routed networks with DHCP service.
   g In the Configure Networking Properties pane, leave all of the options unchecked and click **Finish** to add the vApp.
2 Navigate to My Cloud.
3 Right-click the newly added vApp and click Start.

What to do next

Start the vFabric Application Director appliance to initialize the vFabric Application Director server. See “Initial Start Up of vFabric Application Director Virtual Machine,” on page 23.

Initial Start Up of vFabric Application Director Virtual Machine

You must start the newly added virtual machine to confirm that your vFabric Application Director installation was successful and complete the remaining set up procedures.

Prerequisites

Verify that you have the VMRC plug-in installed to work with your browser. For information about compatible Web browsers, see “vFabric Application Director System Requirements,” on page 18. For more information about setting up the correct network configuration, see “Configure Virtual Machines for vFabric Application Director,” on page 22.

Procedure

1 From the vCloud Director My Cloud view, click the image under the consoles column that corresponds to your vFabric Application Director appliance.
   
   It might take some time until the connection to the appliance is established and the vApp console view opens.

2 Click inside the VMRC console.

3 When prompted, type the vFabric Application Director serial number and select Enter.

4 Type a password for the root user account and select Enter.

5 When prompted, retype the password to confirm it and select Enter.

6 Type a password for the darwin_user account and select Enter.

   Select a password for the darwin_user account that you can remember easily. When prompted for this password again, you have only three attempts to type the correct password.

7 When prompted, retype the password to confirm it and select Enter.

   NOTE It takes some time for the boot scripts to install and start other required software processes in the background, before you are prompted to set the admin user account password. During this time, the system might appear to be unresponsive.

8 Type a password for the vFabric Application Director admin user account and select Enter.

9 When prompted, retype the password to confirm it and select Enter.

   The boot up script should finish starting the necessary services and display the Web URL and DHCP or Static IP address for accessing the vFabric Application Director server.

10 Navigate to the Web URL using a supported browser.

   The Web URL format is https://ip_address:8443/darwin/flex/darwin.html.

11 Log in as the admin user.

   Use the password you set for the admin user account.
The browser opens the vFabric Application Director user interface. See “Tips for Using the vFabric Application Director Web Interface,” on page 32.

**Note** Do not shut down the vFabric Application Director virtual machine from vSphere vCenter. Use vCloud Director to shut down the virtual machine.

**What to do next**

Register a Cloud Provider. See Chapter 6, “Registering a Cloud Provider,” on page 35.

**Troubleshooting Problems Connecting to the vFabric Application Director Web Interface**

A few situations can cause connection problems when you attempt to access the vFabric Application Director Web interface.

**Table 3-1. Common Connection Errors**

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Possible Cause</th>
<th>Possible Solution</th>
</tr>
</thead>
</table>
| The vFabric Application Director virtual appliance does not have a working IP address or network. | The following problems might cause a networking error:  
  - Organizational vDC network is not configured properly  
  - Network settings not specified in the Configure Virtual Machines wizard  
  - IP address is not specified for IP Assignment setting in the Configure Virtual Machines wizard  
  - Static IP address is not available  
  - DHCP server is not available | You must resolve the networking issue.                                        |
| The vFabric Application Director virtual appliance temporarily fails to retrieve a working IP address during start up, or the IP address changes after start up. | The following problems might cause a networking error:  
  - A problem was encountered with the network  
  - Static IP address is not available  
  - DHCP server is not available  
  - The IP address was explicitly modified | Run the following command in the virtual machine operating system with root privileges: `/home/darwin/tools/darwin_util.sh -a AUTO` |
| The vFabric tcServer service encounters an error in the vFabric Application Director virtual appliance. | The virtual appliance was not shut down properly and restarted. The tc Server service was incorrectly started or restarted. | In this case, navigate to the log file at `/home/darwin/tcserver/darwin/logs/catalina.out` for error details and contact VMware technical support if needed. |

**Unlock Your darwin_user Account**

If you do not provide the correct password after three attempts when you use the SSH client to log in with your darwin_user account, you are locked out of the darwin_user account.

**Prerequisites**

- Verify that you are logged in to the vCloud Director console.
- Verify that you have root privileges on the vFabric Application Director appliance.
  
  SSH is disabled for the root account.
Procedure

1. Check the number of failed login attempts from the UNIX shell prompt.
   
   `faillog -u <user-acct>`

2. Unlock the account from the UNIX shell prompt.
   
   `faillog -u <user-acct> -r`

**Restarting vFabric Application Director**

In some cases, you might have to restart vFabric Application Director.

---

**CAUTION** Do not restart your vFabric Application Director virtual machine using the `/home/darwin/tcserver/darwin/bin/tcruntime-ctl.sh restart` command. If you use this command, the vFabric Application Director virtual machine uses default `redis` and `agent` jar paths causing deployments to fail.

---

**Prerequisites**

**Procedure**

1. Log in to your vFabric Application Director virtual machine using the SSH client or vCloud Director console.

2. Restart vFabric Application Director.
   
   - If you are logged in with the `darwin_user` account, type `sudo service vmware-darwin-tcserver restart`.
   
   - If you are logged in with the root account, type `service vmware-darwin-tcserver restart`.

**Configure vFabric Application Director to Use a Proxy for External URLs**

Even if you use vFabric Application Director only to deploy applications in a private cloud, some deployments might require access to URLs from outside the corporate firewall. For example, an action script might involve downloading application bits from an open-source Web site. You can configure vFabric Application Director to use a proxy for these use cases.

You must complete this task before you create new services and applications or before you deploy any existing predefined sample services and applications.

**Prerequisites**

- Verify that you have access to the virtual machine where vFabric Application Director is installed and have the password for logging in to the operating system with the `darwin_user` account. This password was set during installation. See “Initial Start Up of vFabric Application Director Virtual Machine,” on page 23.

- Verify that your vFabric Application Director user account has the catalog administrator role (`ROLE_CATALOG_ADMIN`) assigned to it.

- Verify that your vFabric Application Director user account has the application architect role (`ROLE_APP_ARCHITECT`) assigned to it.

- Familiarize yourself with the procedure for creating new services. See “Add a Service to the Catalog,” on page 49.
**Procedure**

1. Configure the vFabric Application Director virtual appliance to use a proxy.
   - Log in to the vFabric Application Director virtual appliance as `darwin_user`.
   - Type `su` to switch to a root user.
   - Open the file `/home/darwin/tcserver/darwin/webapps/darwin/conf/darwin_global.conf` with a text editor.
   - Update the proxy IP and port information and save the file.

   The proxy URL format is `http://proxy:PortNumber`.

   The proxy specified in this file is used by any existing predefined applications or catalog services that must access a repository by using a `yum update` or `install` command. The predefined services and applications have the script required to access this proxy.

2. Log in to vFabric Application Director as a user with the catalog administrator role and define proxy-specific properties and scripts to create a new service or customize an existing service that you already created.
   - For a new service, add a service to the catalog.
   - Add a property with the name `global_conf` to the service, of type Content, and define the value as `https://${darwin.server.ip}:8443/darwin/conf/darwin_global.conf`.

   **Note**: If you add a value to the `http_proxy`, `https_proxy`, or `ftp_proxy` property with service scripts that use the `darwin_global.conf` as a file source, when the script runs, these properties override any existing proxy information in the deployed application.

   - Add the following lines to the beginning of each action script for the service that requires a proxy:
     ```
     # Import global conf
     . $global_conf
     ```
   - Save the service.

3. Log in to vFabric Application Director as a user with the application architect role and define proxy-specific properties and scripts in the application blueprint to configure an application to use a proxy while creating the application blueprint.
   - For the application component, add the `global_conf` property to the application component, of type Content, and define the value as `https://${darwin.server.ip}:8443/darwin/conf/darwin_global.conf`.
   - Add the following lines to the beginning of each action script for the application component that requires a proxy:
     ```
     # Import global conf
     . $global_conf
     ```

**What to do next**

Log in to vFabric Application Director and register a cloud provider. See “Log In to vFabric Application Director,” on page 31 and “Register a Cloud Provider,” on page 37.
After you install vFabric Application Director, you must create accounts for users and assign users to groups. Several preconfigured user accounts are available, but are disabled by default.

**Note** For vFabric Application Director 1.0, you must use the command-line interface to create groups and user accounts, manage users, and assign roles.

This chapter includes the following topics:

- “Overview of Users, Roles, and Groups,” on page 27
- “Predefined Users, Groups, and Roles,” on page 29
- “Use the vFabric Application Director CLI to Create Users and Groups,” on page 29

### Overview of Users, Roles, and Groups

You must determine who can use vFabric Application Director and what tasks those users are authorized to perform. You can selectively assign administrative permissions by assigning roles to specific users. You can limit access to specific deployment environments and cloud templates by associating each user with a specific group.

### Users

A user with the `ROLE_SYSTEM_ADMIN` role can use the vFabric Application Director command-line interface to create users, change passwords, enable or disable user accounts, and specify which roles a user has and which group a user belongs to. See “Available CLI Options,” on page 95.

**Note** For vFabric Application Director 1.0, user accounts are created and stored in a local user database. vFabric Application Director does not integrate with Microsoft Active Directory or any other LDAP directory service.

vFabric Application Director provides five predefined user accounts with roles that map to specific privileges in product areas. See “Predefined Users, Groups, and Roles,” on page 29.

All of the predefined user accounts except the admin user are disabled by default. You must use the command-line interface to create users and groups. See “Use the vFabric Application Director CLI to Create Users and Groups,” on page 29.
vFabric Application Director allows creating groups and a user can only belong to only one group. Applications, deployments, cloud templates, and cloud providers created by a user can be viewed by all the users of that same group. Users belonging to a group cannot view applications, deployments, cloud templates and providers of another group. vFabric Application Director provides a predefined default group. See “Predefined Users, Groups, and Roles,” on page 29.

**NOTE** For vFabric Application Director 1.0, each user can be associated with only one group. If a user needs access to applications, deployments, templates, or cloud providers belonging to multiple groups, a system administrator must provide such users with multiple accounts to use when they belong to different groups.

### Roles

By associating a user with one or more roles, you can specify which functions the user can perform. These functions include managing user accounts, managing the catalog of templates and services, managing the list of cloud providers and deployment environments, creating applications, and deploying applications. The built-in admin user has all these roles assigned to it.

### Groups

Assigning a user to a group determines which of the following vFabric Application Director items the user can access:

- **Applications**, including specific application versions and deployments
- **Logical templates**
  
  A predefined virtual machine definition in vFabric Application Director. A logical template can be mapped to an actual template in the cloud catalog. Logical templates allow an application blueprint to remain cloud agnostic.
- **Cloud providers**, including deployment environments

Each user account, template, application, cloud provider, and deployment environment is associated with only one group. You associate a user with a group when you create the user account. The vFabric Application Director items such as templates, cloud providers, and applications are associated with the same group as the user who creates them.

For example, when a user in abcGroup creates an abcApp application, all of the users in that group can access the application. A user in xyzGroup can create an application xyzApp for all of the users in that group to access. However, a user in abcGroup cannot access the xyzApp application and the same is true for a user in the xyzGroup. If a user’s group is changed, any applications created as a member of that group remain in that group. The limited group access also applies to cloud providers, deployment environments, templates, and deployments.

The predefined Default group includes all of the predefined sample applications and logical deployments. The built-in user accounts, including the admin user, belong to this Default group.
Predefined Users, Groups, and Roles

vFabric Application Director provides five predefined user accounts with roles that map to specific privileges within product areas.

<table>
<thead>
<tr>
<th>User</th>
<th>Roles Assigned</th>
<th>Product Area Managed</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>admin</td>
<td>ROLE_SYSTEM_ADMIN, ROLE_CLOUD_ADMIN, ROLE_CATALOG_ADMIN, ROLE_APP_ARCHITECT, ROLE_DEPLOYER</td>
<td>Users, groups, and roles</td>
<td>System administrator manages users and groups. Because this account includes all roles, you can also perform the actions listed for the other users in this table.</td>
</tr>
<tr>
<td>cloudAdmin</td>
<td>ROLE_CLOUD_ADMIN</td>
<td>Cloud providers and deployment environments</td>
<td>Manage cloud providers and deployment environments.</td>
</tr>
<tr>
<td>catalogAdmin</td>
<td>ROLE_CATALOG_ADMIN</td>
<td>Catalog</td>
<td>Maintain and add services, templates, and tasks to the catalog.</td>
</tr>
<tr>
<td>appArchitect</td>
<td>ROLE_APP_ARCHITECT</td>
<td>Applications</td>
<td>Design and create applications.</td>
</tr>
<tr>
<td>deployer</td>
<td>ROLE_DEPLOYER</td>
<td>Deployments</td>
<td>Initiate deployments and teardown a deployed application.</td>
</tr>
</tbody>
</table>

All of the predefined user accounts except the admin user are disabled by default. You must enable these built-in user accounts and set the passwords.

The password for the admin user is the admin password that was set the first time the appliance was started.

Use the command-line interface to create, enable, and manage the predefined users and groups. See “Use the vFabric Application Director CLI to Create Users and Groups,” on page 29 and “Managing Users and Groups,” on page 95.

Use the vFabric Application Director CLI to Create Users and Groups

You must use the command-line interface (CLI) to create users and groups.

Prerequisites

- Verify that your user account has the system administrator role (ROLE_SYSTEM_ADMIN) assigned to it.
- Familiarize yourself with the roles available for users. See “Predefined Users, Groups, and Roles,” on page 29.
- Verify that you know the password for the darwin_user. This password was set during installation. See “Initial Start Up of vFabric Application Director Virtual Machine,” on page 23.

Procedure

1. Use the SSH client to log in to the vFabric Application Director appliance as the user darwin_user.
   The password for this account was set during installation.
2. Open a command prompt.
3. Change directories to /home/darwin/tools.
4. To open the vFabric Application Director CLI, run the java -jar darwin-cli.jar command.
5 Log in to the vFabric Application Director server.

    login --serverUrl https://DarwinServerIP:8443/darwin --username admin_role --password password

In this command, admin_role is a user with the system administrator role, and password is the password for the account. Replace DarwinServerIP with the vFabric Application Director server IP address.

The system returns a message similar to this:

    You are logged in to https://${darwin.server.ip}:8443/darwin as admin.

6 In the root shell prompt, press the Tab key to display the list of available commands.

7 Type the command to perform the appropriate action.

<table>
<thead>
<tr>
<th>Option</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>List usage information</td>
<td>help</td>
</tr>
<tr>
<td>Create a group</td>
<td>create-group --nameGroupName --description Description</td>
</tr>
<tr>
<td>Create a user</td>
<td>create-user --username UserName --firstName FirstName --lastName LastName --password password --enabled true --roles ROLE_SYSTEM_ADMIN, ROLE_CATALOG_ADMIN, ROLE_CLOUD_ADMIN, ROLE_DEPLOYER, ROLE_APP_ARCHITECT --group groupName</td>
</tr>
</tbody>
</table>

If you specify all the roles shown in this example, the user is the equivalent of the admin user. Specify only the roles the specific user must have. The valid values for the enabled option are true, yes, 1, false, no, and 0.

Often after you enter a command, the system displays many details relating to the user, in addition to indicating whether the command was successful.

What to do next

Use the CLI to perform tasks such as changing passwords or enabling and disabling accounts for users and groups. See “Managing Users and Groups,” on page 95.
Using the vFabric Application Director Console

You can use the vFabric Application Director Web interface to register cloud providers, maintain the catalog of virtual machine templates and services, create applications, and deploy applications to the cloud.

**Note** For vFabric Application Director 1.0, you must use the command-line interface to create groups and user accounts, manage users, and assign roles.

You can also use the Web interface or the command-line interface to deploy applications and teardown deployed applications from the cloud. See “Deploy an Application,” on page 80, “Teardown an Application from the Cloud,” on page 86, and Chapter 13, “Using the vFabric Application Director CLI,” on page 93.

This chapter includes the following topics:

- “Log In to vFabric Application Director,” on page 31
- “Tips for Using the vFabric Application Director Web Interface,” on page 32

**Log In to vFabric Application Director**

To see the sample applications included with vFabric Application Director, you must log in using an account that belongs to the Default group.

Whether you can perform a particular task after logging in depends on the roles assigned to the user account. The objects you can see depend on the group associated with the user. For more information, see Chapter 4, “Setting Up Users and Groups,” on page 27.

**Prerequisites**

- Verify that you have the URL for the vFabric Application Director Web interface. This Web URL appears in the console of the virtual machine that hosts vFabric Application Director when installation is complete. See “Initial Start Up of vFabric Application Director Virtual Machine,” on page 23.

- Verify that you have credentials for a user account that was set up in vFabric Application Director. You can also use the admin user account and the password that was set during installation. The admin user has all roles associated with it and can perform all functions in vFabric Application Director.

- Verify that the supported versions of a Web browser and Adobe Flash Player are installed on your computer. See “vFabric Application Director System Requirements,” on page 18.

**Procedure**

1. Open a browser and type the URL for the vFabric Application Director console.

   Example of a URL for accessing the console: https://10.20.30.200:8443/darwin/flex/darwin.html

2. Type the credentials of a user account with the necessary roles assigned to it.
You can access applications, cloud providers, deployments, and deployment environments that belong to the group associated with your user account. All users can see the sample application components, services, and tasks included in the vFabric Application Director catalog.

**Tips for Using the vFabric Application Director Web Interface**

You can use vFabric Application Director user interface to access almost all of the functions available and to navigate to, find, and filter objects.

The Web user interface includes the standard features of a Web application. For example, with the search filters, you can select filtering criteria that are related to the objects you are searching for.

When you first log in to vFabric Application Director, you see a home page that organizes the tasks that you can perform. Links to the most often performed tasks are listed here.

**Figure 5-1. vFabric Application Director Welcome Page**

![vFabric Application Director Welcome Page](image)

After you click one of these links, the four main categories of tasks that appear on the home page are available as tabs. For example, if your user account has the system administrator role assigned to it you see: Applications, Deployments, Catalog, and Cloud Providers tabs. You do not need to return to the home page after you complete one type of task to begin a different type of task.
To return to the home page from one of the main tabs, click the **vFabric Application Director** name in the title bar of the window.

**Using the vFabric Application Director Buttons**

To perform many tasks in vFabric Application Director, you click the buttons.

<table>
<thead>
<tr>
<th>Icon</th>
<th>Name Used in Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Add" /></td>
<td>Add button, to create a new entry in the table displayed</td>
</tr>
<tr>
<td><img src="image" alt="New Version" /></td>
<td>New Version button, to retain the name but otherwise create a new version because only the name is copied</td>
</tr>
<tr>
<td><img src="image" alt="Copy this Application Version" /></td>
<td>Copy this Application Version button, to create a new version of an existing application or create an application by copying an existing application</td>
</tr>
<tr>
<td><img src="image" alt="Copy this Service Version" /></td>
<td>Copy this Service Version button, to create a service by copying an existing service</td>
</tr>
<tr>
<td><img src="image" alt="Edit" /></td>
<td>Edit button, to modify the version or a property or component such as the NIC</td>
</tr>
<tr>
<td><img src="image" alt="Delete" /></td>
<td>Delete button</td>
</tr>
<tr>
<td><img src="image" alt="Remove this vApp from the cloud" /></td>
<td>Remove this vApp from the cloud or Teardown button, to remove a deployed application from the cloud</td>
</tr>
<tr>
<td><img src="image" alt="Refresh" /></td>
<td>Refresh button</td>
</tr>
<tr>
<td><img src="image" alt="View Logs" /></td>
<td>View Logs button, available on a deployment details page or an execution plan after deployment</td>
</tr>
<tr>
<td><img src="image" alt="View Task Information" /></td>
<td>View Task Information button, available in execution plans, to see action script text, properties, and logs</td>
</tr>
<tr>
<td><img src="image" alt="Expand Cluster" /></td>
<td>Expand Cluster button, available in execution plans, to display all virtual machines in a cluster node</td>
</tr>
<tr>
<td><img src="image" alt="Add Script Task" /></td>
<td>Add Script Task button, available in execution plans, to add custom tasks to an application deployment</td>
</tr>
<tr>
<td><img src="image" alt="Deploy" /></td>
<td>Deploy button, to deploy an application blueprint</td>
</tr>
<tr>
<td>Icon</td>
<td>Name Used in Procedures</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------</td>
</tr>
<tr>
<td><img src="image" alt="Add Relation" /></td>
<td><strong>Add Relation</strong> button, to create relations between components in a blueprint</td>
</tr>
<tr>
<td><img src="image" alt="Convert to Node Array" /></td>
<td><strong>Convert to Node Array</strong> button, to create a clustered node</td>
</tr>
</tbody>
</table>
Registering a Cloud Provider

Registering a cloud provider involves creating vFabric Application Director cloud providers and deployment environments and mapping them to an organization vDC and other entities in vCloud Director.

In vFabric Application Director, specifying a cloud provider is how you specify which vCloud Director organization, or tenant of a multitenant cloud, to use. Specifying a deployment environment is how you define which available organization vDC to use for deploying applications.

If a cloud provider has deployment environments mapped to it, then that cloud provider cannot be deleted. When a cloud provider is deleted, all of the mappings to the cloud templates of the cloud provider from the logical templates are also removed.

Familiarize yourself with the key concepts relating to registering a cloud provider. See “Key Concepts,” on page 13.

This chapter includes the following topics:

- “Creating and Updating Custom Virtual Machine Templates for Your Applications,” on page 35
- “Register a Cloud Provider,” on page 37
- “Register a Template,” on page 38
- “Create a Deployment Environment,” on page 39

Creating and Updating Custom Virtual Machine Templates for Your Applications

To create custom template virtual machines to use in vFabric Application Director, verify that certain software and virtualization requirements are met and that certain Linux commands are available.

Virtual Machine Requirements

In vFabric Application Director, you map logical templates to cloud templates created in vCloud Director. These cloud templates must meet certain requirements to work properly in vFabric Application Director.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system</td>
<td>Use one of the following operating systems:</td>
</tr>
<tr>
<td></td>
<td>- Red Hat Enterprise Linux 6.1, 64-bit</td>
</tr>
<tr>
<td></td>
<td>- Red Hat Enterprise Linux 6.1, 32-bit</td>
</tr>
<tr>
<td></td>
<td>- Ubuntu 10.04.2, 64-bit</td>
</tr>
<tr>
<td></td>
<td>- Ubuntu 10.04.3, 32-bit</td>
</tr>
<tr>
<td></td>
<td>- CentOS 5.6, 64-bit</td>
</tr>
<tr>
<td></td>
<td>- CentOS 5.6, 32-bit</td>
</tr>
<tr>
<td></td>
<td>- CentOS 5.7, 32-bit</td>
</tr>
</tbody>
</table>
### Requirement | Description
--- | ---
VMware Tools | VMware Tools must be installed and the version must be from either vCloud Director 1.5 or vCenter Server 5.0.
CD/DVD Drive | At least one CD/DVD drive must be available on the virtual machine.
JRE | JRE 1.6.0 must be installed. The preferred and supported JRE can be installed from one of these packages, which are available in the vFabric Application Director virtual appliance:
- http://<ApplicationDirector-IP>/agent/vmware-jre-1.6.0_26-fcs.x86_64.rpm
- http://<ApplicationDirector-IP>/agent/vmware-jre-1.6.0_26-fcs.i386.rpm
- http://<ApplicationDirector-IP>/agent/vmware-jre-1.6.0_26_amd64.deb
- http://<ApplicationDirector-IP>/agent/vmware-jre-1.6.0_26_i386.deb
Agent bootstrap service | Download the vmware-appdirector-agent-service.zip file from the VMware product download site. Install the agent bootstrap script from one of the following packages:
- vmware-appdirector-agentservice_1.0.0.0-0_x86_64.rpm
- vmware-appdirector-agentservice_1.0.0.0-0_i386.rpm
- vmware-appdirector-agentservice_1.0.0.0-0_amd64.deb
- vmware-appdirector-agentservice_1.0.0.0-0_i386.deb
To install the agent bootstrap service on an RPM-based Linux virtual machine template, run the `rpm -i` command.
To install the agent bootstrap service on a Debian-based Linux virtual machine template, run the `dpkg -i` command.
Linux commands | The following Linux commands must be available on the virtual machine:
- `wget`
- `md5sum`
- `grep`
- `sed`
- `setsid`
- `awk`
- `ifconfig`
Openssh Server and Client | If you plan to use ssh logging for troubleshooting or for other reasons, the OpenSSH server and client must be installed.

**IMPORTANT** Because the boot process must not be interrupted, configure the virtual machine so that nothing causes the virtual machine's boot process to pause before reaching the final operating system login prompt. For example, verify that no processes or scripts prompt for user interaction when the virtual machine starts. This requirement applies only to virtual machine templates created for the vFabric Application Director catalog.

### Verifying Configuration of a Cloud Template from the vCloud Director Catalog

After the virtual machine template that you create is uploaded to vCloud Director and registered as a vApp template in a vCloud Director catalog, be sure to verify the configuration before using the template in vFabric Application Director.

Use the vCloud Director Web interface to manually instantiate a copy of the vApp to your cloud. For instructions, see the vCloud Director documentation.

Verify that the following items are functioning correctly in the instantiated vApp.
<table>
<thead>
<tr>
<th>Item</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guest customization</td>
<td>To verify that the customization process was successful, open the /var/log/vmware-imc/customization.log file and make sure it says that the customization completed with a status of success. Check that an active and correct IP address exists with respect to the IP assignment from vCloud Director. See the vCloud Director documentation. If your cloud template has a customization script, vFabric Application Director overwrites the script with its own guest customization script. The guest customization script is used to set up the virtual machine so that it can communicate with the vFabric Application Director server to complete the deployment process.</td>
</tr>
<tr>
<td>Agent bootstrapping</td>
<td>To verify that the vFabric Application Director agent boot service ran and attempted to download the vFabric Application Director agent JAR file from the vFabric Application Director server, open and examine the log file located at /opt/vmware-appdirector/agent/logs/agent_bootstrap.log. The attempt to download the JAR file is expected to fail at this point. The download process is successful when vFabric Application Director deploys the vApp from a vFabric Application Director execution plan.</td>
</tr>
</tbody>
</table>

**Upgrading Existing Virtual Machine Templates**

To update the content of an existing template or use it for creating a new template, you must run the `agent_reset.sh` command for resetting the vFabric Application Director agent boot service status.

You can log in to the virtual machine as root and run this command:

```
/opt/vmware-appdirector/agent-bootstrap/agent_reset.sh
```

After you run this command, you can place the vApp instance back in the catalog as a new vApp template.

**Register a Cloud Provider**

In vFabric Application Director 1.0, registering a cloud provider means linking to a vCloud Director instance and organization. Any catalog accessible to the vCloud organization provides access to virtual machine templates and applications. The vCloud organization's vDC map to deployment environments.

**Note** Only vCloud Director 1.5 is supported as a cloud type.

You cannot delete a cloud provider that is linked to a deployment environment. When you delete a cloud provider that is not linked to a deployment environment, all of the cloud template mappings from logical templates are removed.

**Prerequisites**

- Verify that your user account has the cloud administrator role (ROLE_CLOUD_ADMIN) assigned to it.
- Verify that vCloud Director 1.5 is installed and configured.
- Verify that the vCloud organization that you plan to use with vFabric Application Director is created and configured with a user account that has access to the vCloud organization. vCloud Director supports multitennancy through the use of organizations. An organization is a unit of administration for a collection of users, groups, and computing resources.
- When mapping physical templates for a cloud provider in vFabric Application Director, make sure that the vCloud Director template that you are mapping to is a single virtual machine. Multiple virtual machine vApps are not supported.

vCloud Director does not allow templates with multiple virtual machines to be registered to the vFabric Application Director cloud provider.
For information about setting up vCloud Director for use with vFabric Application Director, see “Preparing to Install vFabric Application Director,” on page 17.

Procedure

1. On the vFabric Application Director home page, in the Cloud Setup list, click Manage Cloud Providers.
2. On the Cloud Providers list that appears, click the Add button (➕) above the table to add a provider.
3. In the Details portion of the Register Cloud Provider dialog box, specify a vFabric Application Director cloud provider name and map this provider to a vCloud Director organization.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Provider Type</td>
<td>vCloud Director is the only supported type.</td>
</tr>
<tr>
<td>Name and Description</td>
<td>Best practice: To keep track of which vCloud Director organization you are using, include the vCloud Director organization name in either of these fields. The text from these fields appears in the list on the Cloud Providers tab.</td>
</tr>
<tr>
<td>Cloud IP/Hostname</td>
<td>The cloud IP or host name must match the name or IP address of the host on which vCloud Director is installed.</td>
</tr>
<tr>
<td>Organization Name</td>
<td>The organization name must match the name of an organization in vCloud Director.</td>
</tr>
<tr>
<td>Username and Password</td>
<td>Credentials for a user that has at least an organization administrator role in vCloud Director. This user must not be the vCloud Director system administrator.</td>
</tr>
</tbody>
</table>

4. To test whether the values you entered are correct, click Validate Connection.
5. (Optional) Click OK to register the cloud provider.
6. (Optional) Click the Templates button near the top of the dialog box to continue and register virtual machine templates.

The cloud provider is registered and its virtual machine templates and virtual datacenters are available for use in vFabric Application Director.

What to do next

Register templates so that logical items in the vFabric Application Director catalog are mapped to actual items in the cloud provider’s catalog. See “Register a Template,” on page 38.

Register a Template

You must register a cloud template in vFabric Application Director before you can deploy an application.

Prerequisites

- Verify that your user account has the cloud administrator role (ROLE_CLOUD_ADMIN) assigned to it.
- Verify that at least one cloud provider is registered in vFabric Application Director. See “Register a Cloud Provider,” on page 37.
- Verify that you have one or more catalogs in a vCloud Director organization.
- Create virtual machine templates that meet vFabric Application Director requirements and add the templates to the vCloud Director catalogs. For information about cloud templates, see “Creating and Updating Custom Virtual Machine Templates for Your Applications,” on page 35.

For information about setting up vCloud Director for use with vFabric Application Director, see “Preparing to Install vFabric Application Director,” on page 17.
Procedure

1. On the vFabric Application Director home page, in the Cloud Setup list, click **Manage Cloud Providers**.
2. In the **Cloud Providers** list, click the name of a provider.
3. Click the **Templates** button near the top of the Edit Cloud Provider dialog box.
4. Click the **Add** button above the table to add a template.
   - If any of the required entries on the Details portion of this dialog box were invalid or left blank, you are prompted to correct them when you click the **Add** button.
5. Select a catalog and click **Get Templates**.
   - Only vCloud Director templates with single virtual machines appear in the drop-down menu.
   - vCloud Director does not allow templates with multiple virtual machines to be registered to the vFabric Application Director cloud provider.
6. Select the check boxes next to one or more templates in the list, click **OK**, and click **OK** again.

   The templates you registered are added to the list of cloud templates that you can choose from when mapping a logical template to a cloud template.

**Create a Deployment Environment**

You must map a deployment environment to a vCloud Director organization vDC before you can deploy an application.

Cloud vDCs provide an environment where virtual systems can be stored, deployed, and operated. For example, you might have separate deployment environments for development, test, staging, and production. For vCloud Director, a deployment environment is equivalent to an organization vDC.

If a deployment environment is currently being used in a deployment profile, it cannot be deleted.

**Prerequisites**

- Verify that your user account has the cloud administrator role (**ROLE_CLOUD_ADMIN**) assigned to it.
- Verify that at least one cloud provider is registered in vFabric Application Director. See “Register a Cloud Provider,” on page 37.
- Verify that an organization vDC is created and configured in the vCloud Director organization. The vFabric Application Director deployment environment is equivalent to the organization vDC in vCloud Director.
  - For information about setting up vCloud Director for use with vFabric Application Director, see “Preparing to Install vFabric Application Director,” on page 17.

**Procedure**

1. On the vFabric Application Director home page, in the **Cloud Setup** list, click **Manage Deployment Environments**.
2. In the **Deployment Environments** list that appears, click the **Add** button above the table.
3 In the Create Deployment Environment dialog box, specify a vFabric Application Director deployment environment name and map this environment to a vCloud Director organization vDC.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deployment Environment name and Description</td>
<td>To keep track of which vCloud Director organization vDC you are using, include the vDC name in either of these fields. The text from these fields appears in the list on the Deployment Environments tab.</td>
</tr>
<tr>
<td>Cloud Provider Name</td>
<td>If the cloud provider you want to use does not appear in the list, cancel the dialog box and use the Cloud Providers tab to add the cloud provider.</td>
</tr>
<tr>
<td>Organization vDC</td>
<td>Click Select vDC to select from a list of vDCs that the cloud provider you selected provides.</td>
</tr>
</tbody>
</table>

4 Select an organization vDC and click OK in the Cloud vDC dialog box.

5 Click OK in the Create Deployment Environment dialog box.

The deployment environment you created is added to the list of deployment environments that you can select from when you create a deployment profile.
Developing vFabric Application Director Components

vFabric Application Director provides an open framework to create and develop components that can be installed in a virtual machine.

The vFabric Application Director components in the catalog include predefined sample services such as JBoss and MySQL, predefined tasks such as scripts to configure the APT repository, and blueprint application components such as WAR and SQL_SCRIPT.

In this information, components include services, application components, and custom tasks. All of these components use actions and properties as their common underlying framework.

**Note** Only use the sample components in the vFabric Application Director catalog in a test environment.

Familiarize yourself with the key concepts that appear frequently in topics about developing deployable components. See “Key Concepts,” on page 13.

This chapter includes the following topics:

- “Defining Component Actions,” on page 41
- “Configuring Component Properties,” on page 42
- “vFabric Application Director Predefined Properties,” on page 45
- “Secured Component Properties,” on page 45
- “Required Component Properties,” on page 46
- “Best Practices for Developing Components,” on page 46

**Defining Component Actions**

Each component includes the three predefined life cycle stages or actions to install, configure, and start scripts for a service or application component.

The catalog administrator must provide a bash script for at least one of the life cycle stages. These scripts are customized to use the component properties.

For example, to deploy an Apache Tomcat server in a virtual machine you might add the following scripts:

**INSTALL**
Download the Tomcat server installation bits and install the Tomcat service.

**CONFIGURE**
Set the JAVA_OPTS, CATALINA_OPTS, and any other required configuration.

**START**
Start the Tomcat service using the start command in the Tomcat server.
The application architect can parameterize the script by declaring, for example, the installer location, install path, and Tomcat start command as properties in the script. The parameters render these scripts generic and you can deploy the service on different environments without modifying them.

You can also modify parameters from within the script. These modified properties can be referred as property values for other components. See VMware vFabric Application Director Catalog Services.

The scripts defined for an action are run in the /tmp/runId/ComponentName-LifecycleStageName folder in the deployed virtual machine as the root user. The runId is the unique job identifier for each deployment, which is available on the Details tab.

If a script exits with a non-zero exit status, the vFabric Application Director agent cancels the entire deployment and marks it as Failed Deployment. Otherwise, the agent marks the script as completed. The application architect should set proper exit codes in the script to provide appropriate information to the deployer. See “Understanding the Deployment Process,” on page 82.

You can add a service or custom task in an application deployment and define the component action. See “Add a Service to the Catalog,” on page 49 and “Add a Custom Task to the Catalog,” on page 52.

**Configuring Component Properties**

Component properties are used to parameterize scripts so that vFabric Application Director can pass the defined properties as environment variables to scripts running in a virtual machine.

Before running a script from the life cycle stage, the vFabric Application Director agent in the virtual machine communicates with the vFabric Application Director server to resolve the properties. The agent then proceeds to create environment variables and passes them to the scripts.

- **Types of Properties** on page 42
  - vFabric Application Director supports String, Array, and Content properties.

- **Defining Property Values** on page 43
  - A catalog administrator can define properties in the catalog for services, custom tasks, and blueprint application components.

- **Binding to Other Properties** on page 44
  - In several deployment scenarios, a component needs the property value of another component to customize itself. In vFabric Application Director, this process is called binding to other properties.

**Types of Properties**

vFabric Application Director supports String, Array, and Content properties.

- **String Property**
  - The property value can be any string. Most properties are defined as strings.

- **Array Property**
  - A list of values defined as "["value1", "value2", "value3"]" or bound to a list of properties in a clustered node. vFabric Application Director agent converts the values to bash array properties and passes them as input to the script. Bash array variables can be accessed using ${property[0]}.
For example, consider a load balancer virtual machine that is balancing the load for a cluster of application server virtual machines. In such a case, an array property is defined for the load balancer service and set to the array of IP addresses of the application server virtual machines. The load balancer service configure script uses the array property to configure the appropriate load balancing scheme.

**Content Property**

The property value is a URL to a file to download content. vFabric Application Director agent downloads the content from the URL to the virtual machine and passes the location of the local file in the virtual machine to the script.

Content properties must be defined as a valid URL to the file with the http or https protocol. For example, the sample Hyperic HQ agent has a property value HQ_PACKAGE_32 set to http://$ (darwin.server.ip)/artifacts/services/hyperic/hyperic-hq-agent-4.6-x86-linux.tar.gz. The Hyperic artifacts are hosted in the vFabric Application Director appliance and the URL points to that location in the appliance. The vFabric Application Director agent downloads the artifacts from the specified location into the deployed virtual machine.

**Property Reference Permissions**

Property reference permissions control which property types you can refer to for configuration purposes.

<table>
<thead>
<tr>
<th>Property Type</th>
<th>Reference Permission</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>String</td>
</tr>
<tr>
<td>Content</td>
<td>Content</td>
</tr>
<tr>
<td>Array</td>
<td>String and Content</td>
</tr>
</tbody>
</table>

**Defining Property Values**

A catalog administrator can define properties in the catalog for services, custom tasks, and blueprint application components.

To allow for customization of a component script, the default value for a property in the catalog can be overridden in a blueprint to accommodate the needs of a specific application in which the service is used. The property value can be further overridden in the deployment profile to comply with the deployment environment where the service is deployed.

**NOTE** Property values are case-sensitive. A new property value does not take effect if the value is typed incorrectly.

For example, to deploy an Apache Tomcat server, the catalog administrator might have configured the value of the JVM HEAP_SIZE to 512MB. The application architect can redefine the value to 1024MB for a larger application. The deployer might override the value to 2048MB when deploying the application in a production deployment environment to handle large loads.

Property values are overridable by default, but the catalog administrator can choose to disable the overridable feature. For properties that can be overridden, the application architect might force a value for the property in some regulated environments, and disable the overridable feature for the deployer.

You can define property values when you add a service or custom task in an application deployment. See “Add a Service to the Catalog,” on page 49 and “Add a Custom Task to the Catalog,” on page 52.
Binding to Other Properties

In several deployment scenarios, a component needs the property value of another component to customize itself. In vFabric Application Director, this process is called binding to other properties.

The catalog administrator can modify property definitions within the script. For instance, a WAR component might need the installation location of the Apache Tomcat server. The WAR component can set the server_home property value to the Apache Tomcat server install_path property value.

However, the bash script for a component can only use its own properties. Therefore, in addition to setting a property to a hard-coded value, vFabric Application Director allows a property to be bound to another property in the blueprint. Binding to another property lets you customize a script based on the value of another component’s properties and virtual machine properties such as IP addresses. To bind a property to another property, select the property value from the Blueprint Value drop-down menu in the Edit Property dialog box.

For a single virtual machine node, the referenced properties in the Blueprint Value drop-down menu are, nodeName:ComponentName:PropertyName.

For clustered virtual machines node, the referenced properties in the Blueprint Value drop-down menu are, all(nodeName:ComponentName:PropertyName). When another property refers to this cluster property, it gets the PropertyName property values from all the virtual machines in the cluster. The predefined all(nodeName:node_array_index) property for clustered virtual machines gets properties for a specific virtual machine in a cluster. See “Predefined Node Array Index Property,” on page 45.

For cluster and single nodes, self:ComponentName:PropertyName value is used to indicate a component property from the virtual machine where the target component is running. For instance, if a WAR component is deployed in an Apache Tomcat server, the WAR server_home property can be set to self:tomcat:install_path to refer to the Apache Tomcat server running in the current virtual machine.

Node level properties such as IP address display as, nodeName:ip or self:ip. These properties belong exclusively to the virtual machine and not to any specific component in the virtual machine.

For IP addresses of virtual machines with multiple NICs, vFabric Application Director provides either a nodeName:NICx_ip or self:NICx_ip property. Where x reflects the NIC number. See “Predefined IP Address Property,” on page 45.

Figure 7-1. Binding to Another Property in a Clustered Node
vFabric Application Director Predefined Properties

vFabric Application Director provides some commonly used properties as predefined properties. These properties are available for clustered nodes.

Usually, most services need the IP address of the virtual machines they are running in. For clustered nodes, a service might need the IP addresses of all the virtual machines in the cluster. Therefore, the virtual machine IP address is designated as a predefined property.

Predefined IP Address Property

A node can have multiple NICs, with each NIC assigned one IP address in the deployed virtual machine. These IP addresses are available in the NodeName:NICx_ip properties, where -x- is the NIC number.

In the sample Clustered Duke’s Bank application, the Load Balancer node properties are shown as load_balancer:NIC0_ip and load_balancer:NIC1_ip because the Load Balancer node has two NICs defined. It is not guaranteed that NIC0 and NIC1 will be assigned to eth0 and eth1, respectively, in the virtual machine. The NICs are logical names in the blueprint for the network interfaces. These NICs are mapped to logical networks, which are mapped to specific cloud networks. The property NIC0_ip returns the IP address assigned to the virtual machine as defined in the blueprint, not the eth0 IP address in the virtual machine.

The load_balancer:ip property is also provided. This property refers to the IP address of the first NIC and NIC0. If a component needs IP addresses of all virtual machines in a cluster, it uses the all(NodeName:NICx_ip) property. To refer to the IP address of the current virtual machine, self:ip property is available. This property is useful for clustered nodes, as a component might need to know the virtual machine it is in, rather than the IP addresses of all the virtual machine in the cluster. To get the properties for a specific virtual machine in a cluster, you can use the all(NodeName:node_array_index) property. See “Predefined Node Array Index Property,” on page 45.

Predefined Node Array Index Property

For clustered nodes, a special property called node_array_index identifies the position of the current virtual machine in the cluster.

The node_array_index property value of the first virtual machine in the cluster is 0, the node_array_index property value of the second virtual machine in the cluster is 1, and so on.

For example, in a deployment with a clustered node, if the first virtual machine is the master virtual machine, then it manages other virtual machines in the cluster as subordinate machines. This master virtual machine must be configured differently. For example, if one of the properties for the component is myPosition, then it must be bound to the predefined <self:node_array_index> property. The component script can verify whether the value of myPosition property is 0, and if so it can perform an additional configuration.

For clustered nodes, the predefined node array property is all(NodeName:node_array_index). The property gives the indexes of all the virtual machines in the cluster and can be used to identify the size of the cluster.

Secured Component Properties

Properties are used to configure deployed components. In some cases, they are used to store sensitive data such as, passwords.

For example, a WAR component might need the database user’s password to access the database. These properties can be marked as secured. Values of secured properties are masked and shown as asterisks in vFabric Application Director.
If a property is changed from secured to unsecured, vFabric Application Director resets the property value, for security purposes. You must set a new value for the property.

**IMPORTANT** If secured properties are printed in the script using the `echo` command or other similar commands, these values appear in plain text in the log files. The values in the log files are not masked.

### Required Component Properties

You can set properties as they are required. For example, a deployment might fail if properties are not defined for scripts that rely on them during the deployment.

For example, to run an Apache Tomcat server, Java is required and the `JAVA_HOME` property value must be set.

When a property is marked as required, a value must be provided in at least one of the life cycle stages of the property, such as the catalog, blueprint, or deployment profile. For example, a catalog administrator can define a required property, mark it as overridable, and not set any value for the property in the catalog. The application architect must provide a value for this property in the blueprint or mark it as overridable in the deployment profile. If the application architect has not set a value for this property, the deployer is required to set a value for this property in the deployment profile before deploying the application.

### Best Practices for Developing Components

Familiarize yourself with the sample components in the catalog, as they include a number of examples of how to define properties and action scripts.

**NOTE** Use the sample components in the vFabric Application Director catalog only in a test environment.

Follow these best practices when developing components in vFabric Application Director.

1. Some installers might need access to the tty console. Redirect the input from `/dev/console`. For example, the predefined RabbitMQ service uses the `.rabbitmq_rhel.py --setup-rabbitmq < /dev/console` command in its install script.

2. Content property with a defined URL downloads the content without using a proxy. If your deployment environment requires a proxy, define the property as a string and use `wget` in the script to download the content.

3. Bash does not support two-dimensional array. An array property cannot be bound to a `all(NodeName:ComponentName:PropertyName)` property, as it becomes a two-dimensional array.

4. When a component uses multiple life cycle stages, the property value can be changed in the INSTALL stage. The new value is sent to the next life cycle stage. Action scripts can compute the value of a property during deployment to supply the value to other dependent scripts.

**NOTE** You cannot change the content property value for a component that uses multiple life cycle stages.

For example, in the Clustered Duke’s Bank sample application, JBossAppServer service computes the JVM_ROUTE property during the install life cycle stage. This property is used by the JBossAppServer service to configure the life cycle. Apache load balancer service then binds its JVM_ROUTE property to the `all(appserver:JBossAppServer:JVM_ROUTE)` property to get the final computed value of node0 and node1.

If a component requires a property value from another component to complete an application deployment successfully, you must state explicit dependencies in the blueprint.
Managing the vFabric Application Director Catalog

With the prepopulated, extensible catalog of standard logical templates, sample services, application components, and task scripts, application architects can quickly create a blueprint of a multitier enterprise application.

**IMPORTANT** vFabric Application Director includes many predefined logical templates and services. A catalog administrator can use or modify these predefined templates and services to avoid having to create them themselves. A best practice is to create a copy of the service to preserve the original for future reference.

The services in the catalog are available to all user groups in vFabric Application Director. Logical templates must be added for each group outside the Default group.

For example, you can use the vFabric Application Director catalog to create custom tasks, which are customized scripts that you can add to the execution plan in a deployment profile.

Familiarize yourself with the key concepts relating to managing the catalog. See "Key Concepts," on page 13.

This chapter includes the following topics:
- “Add a Template to the Catalog,” on page 47
- “Add a Service to the Catalog,” on page 49
- “Copy a Service from an Existing Service,” on page 52
- “Add a Custom Task to the Catalog,” on page 52
- “Add Operating Systems or Tags to the Lists in the Catalog,” on page 54

**Add a Template to the Catalog**

Virtual machine templates and scripts provide a means of using any type of service when constructing an application. You can create logical templates, or use the included logical templates, and link these logical templates to actual virtual machine templates from vCloud Director.

**NOTE** Save your changes frequently. The vFabric Application Director user interface session expires after 30 minutes of inactivity. If the session expires, any changes that were not saved are lost.

**Prerequisites**
- Verify that your user account has the catalog administrator role (ROLE_CATALOG_ADMIN) assigned to it.
- Create cloud templates in vCloud Director that meet the requirements for working properly in vFabric Application Director. See “Creating and Updating Custom Virtual Machine Templates for Your Applications,” on page 35.
If the application requires access to URLs from outside the corporate firewall, configure the applicable services and application components to use a proxy. See “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25.

Although vFabric Application Director includes a list of operating systems and a list of descriptive tags to identify application components, you might have to add items to these lists. See “Add Operating Systems or Tags to the Lists in the Catalog,” on page 54.

If you plan to have application or services preinstalled in a template, you must create and configure the services before you can add them to the template. See “Add a Service to the Catalog,” on page 49.

Procedure

1. On the vFabric Application Director home page, in the Catalog list, click Manage Catalog Items.

2. On the Logical Templates tab, click one of the icons above the table.

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add</td>
<td>Opens a dialog box for adding a completely new template.</td>
</tr>
<tr>
<td>New Version</td>
<td>Opens a dialog box for creating a new version of an existing template.</td>
</tr>
</tbody>
</table>
<pre><code>                                | The name stays the same, but the template contents are not copied from      |
                                | the previous template. You must create a version from the beginning.        |
</code></pre>

3. Complete the Details fields.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Best practice: To keep track of which cloud template or operating system you are using, include the name of the cloud template or operating system.</td>
</tr>
<tr>
<td>Version</td>
<td>Best practice: If you are creating a new version of an existing template, add a qualifier to the version number. For example, you might add a</td>
</tr>
</tbody>
</table>
<pre><code>                                | qualifier to denote major and minor versions such as 1.5.1 or 1.0.1-SNAPSHOT.                                                               |
</code></pre>
<p>| Description | Best practice: Add detailed information about the template. For example, describe the differences from the previous version, a special script you are |
| using, or the amount of disk size required.                                                                                               |
| Tags     | Categorize templates based on the functions that they provide. vFabric Application Director organizes the templates based on tags you see        |
| when you create a deployment blueprint for an application. You can add multiple tags.                                                      |
| To use a tag that is not in the list, click Cancel, and use the Administration tab to create a tag.                                       |
| OS       | Specifies the operating system installed in the template. This OS information is used in the application blueprint to limit which services can be added |
| to this template. Some services do not run on all operating systems. For example, if you specify an Ubuntu operating system, when you use this    |
| template in a blueprint and try to add a service that is not compatible with Ubuntu, vFabric Application Director prevents you from adding that   |
| service. To use an operating system name that is not in the list, click Cancel, and use the Administration tab to create a OS name.             |</p>
4 (Optional) Click the Services Included button above the fields to specify a preinstalled service.

As part of the logical template definition, you can describe which services are already installed in the template along with the operating system. Typically, in IT organizations, a few performance monitoring agents or virus scanners are installed in a template. Also, for example, vFabric tc Server might be preinstalled in the template to speed up deployments. If you always use a particular service when you deploy a template, you can preinstall it to avoid having to add it for every deployment.

a Click the Add button above the table to add a service.

b To use a service that is not in the list, click Cancel, and use the Services tab to create a service and the scripts it includes.

c Select the check box next to the preinstalled and other services to include.

d Click OK.

If any preinstalled services are added to a logical template after creating a blueprint, the new preinstalled services are not added to the node. In this case, you must recreate the node and add the preinstalled services.

You are returned to the Create a Logical Template dialog box.

5 Click the Cloud Templates button above the fields to map a cloud template to the logical template.

You might want to add multiple cloud templates to one logical template so that you can select different cloud templates for different clouds. Even if you are using the same cloud, you might need to select from different cloud templates at deployment time to allow for different template configurations.

For example, with multiple cloud templates, you can use the same logical template, but if you are deploying to a production environment, you can select a cloud template that has a large amount of disk space. For a test or staging environment, you can select a cloud template with a small amount of disk space.

a Click the Add button above the table to add a cloud template.

A new row appears in the table, containing the first available cloud provider in the list of cloud providers that you created.

b To change the cloud provider, select a cloud provider name in the drop-down menu.

c To change the cloud template, select a template name in the drop-down menu.

6 To add multiple cloud templates to a logical template, repeat Step 5.

7 When you finish creating the logical template, click OK.

8 To delete logical templates used in a blueprint, all of the other objects referencing the template must be first deleted.

The references include application blueprints and any deployments of the blueprint.

The logical template that you created is added to the Logical Templates tab under the Catalog tab. The template also appears in the list of logical templates that you can include when you create a deployment blueprint for an application.

### Add a Service to the Catalog

Use the vFabric Application Director catalog to create software services. A service comprises scripts for installing, configuring, and starting the software services required by your application.

The vFabric Application Director catalog contains many predefined services. In some cases, rather than creating a new service, you might prefer to edit the scripts and variables in the predefined service. As a best practice, create a copy of the predefined service before you make any changes. See “Copy a Service from an Existing Service,” on page 52.
If a service is used in a blueprint or included as a preinstalled service in a logical template, the service cannot be deleted.

**Note** Save your changes frequently. The vFabric Application Director user interface session expires after 30 minutes of inactivity. If the session expires, any changes that were not saved are lost.

**Prerequisites**

- Verify that your user account has the catalog administrator role (ROLE_CATALOG_ADMIN) assigned to it.
- Although vFabric Application Director includes a list of operating systems and a list of descriptive tags to identify application components, you might need to add items to these lists. For information, see “Add Operating Systems or Tags to the Lists in the Catalog,” on page 54.
- If you plan to use a script that downloads software from an external Web site, the virtual machine you use for deploying the application must have access to an external network.
- If you plan to add an operating system with SELinux enabled, verify that the permissive mode is enabled or specific exceptions are in place for the applications being installed to avoid any installation failures.
- Familiarize yourself with the basic concepts of defining and configuring component properties and actions. See Chapter 7, “Developing vFabric Application Director Components,” on page 41.

**Procedure**

1. On the vFabric Application Director home page, in the Catalog list, click *Manage Catalog Items*.
2. Click the *Services* tab, and click one of the icons above the table.

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add (+)</td>
<td>Opens a dialog box for adding a completely new service.</td>
</tr>
<tr>
<td>New Version (++)</td>
<td>Opens a dialog box for creating a new version of an existing service. The name stays the same, but the service contents are not copied from the previous service. You must create a version from the beginning.</td>
</tr>
</tbody>
</table>

3. Complete the Details information.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Best practice: Use a name that corresponds to the software component to which the scripts relate.</td>
</tr>
<tr>
<td>Service Version</td>
<td>You can specify major, minor, or micro releases, with or without qualifiers. For example, you might use version numbers such as 1.0, 1.5, or 1.0.1–SNAPSHOT.</td>
</tr>
<tr>
<td>Description</td>
<td>Best practice: If you are creating a new version of an existing service, describe the differences from the previous version.</td>
</tr>
<tr>
<td>Tags</td>
<td>Tags are used for organizing the list of services you see when you create a deployment blueprint for an application. You can add multiple tags. To use a tag that is not in the list, click Cancel, and use the Administration tab to create a tag.</td>
</tr>
<tr>
<td>Supported OSes</td>
<td>If the scripts used in this service can run only on particular operating systems, select those operating systems here. In the blueprint editor, vFabric Application Director prevents the service from being added to a template unless the template contains one of these operating systems. Leave this field blank if the service can be used in any operating system. To use an operating system name that is not in the list, click Cancel, and use the Administration tab to create a operating system name.</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Supported Components</td>
<td>If only certain types of application component can run in this service, specify those components here. For example, only WAR and JAR components can run in a vFabric tc Server instance. Only SQL scripts can run in a database server. The components you select restrict what application components can be added to this service in an application blueprint. Leave this field blank if any component can be added to the service.</td>
</tr>
<tr>
<td>Pre-installed in a Template</td>
<td>Indicates that the service is already installed in a template. Only those services that have this check box selected appear in the list when you click Services Included while creating or editing a logical template. Preinstalled services are not available in the blueprint.</td>
</tr>
</tbody>
</table>

4 Click Properties above the text boxes to define variables used in the scripts for the service.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Click the first row of the Name column to define a variable. For example, you might create a property for a port number or a URL that is used in the script.</td>
</tr>
<tr>
<td>Type</td>
<td>To change the type, click the type name and select a type from the drop-down menu. You cannot add types to the menu.</td>
</tr>
<tr>
<td>Value</td>
<td>Type the value to substitute for this property when the script runs. For example, for a property called http_port, you might type 80 in this field. Note: If you add a value to the http_proxy, https_proxy, or ftp_proxy property with service scripts that use the darwin_global.conf file as a file source, when the script runs, these properties override any existing proxy information in the deployed application.</td>
</tr>
<tr>
<td>Secured</td>
<td>Select the check box for passwords you define or other properties whose values you want to obscure. For example, the db_password property in the sample MySQL service is secured. If a property is changed from Secured to Unsecured, vFabric Application Director resets the property value, for security purposes. You must set a new value for the property.</td>
</tr>
<tr>
<td>Overridable in Blueprint</td>
<td>Enabled by default. Allows users such as an application architect to override the value for the property in an application blueprint. For example, the catalog administrator might configure the vFabric tc Server service to have a JVM heap size of 512MB. But for large deployments, the application architect might change the setting to 1024MB.</td>
</tr>
<tr>
<td>Save and Add Another button</td>
<td>Click to save the property definition and add a new row to the table.</td>
</tr>
</tbody>
</table>

After a variable is created, you can insert the property variable in the INSTALL, CONFIGURE, or START script for this service.

5 Click Actions above the text boxes to create install, configure, and start scripts.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifecycle Stage</td>
<td>You are not required to add scripts for all the life cycle stages. If you do not need a particular stage, ignore it.</td>
</tr>
<tr>
<td>Script</td>
<td>Click in the Script column to open the Edit Script dialog box. You can then write the script or copy a script into the dialog box. A catalog administrator can parameterize the installation and configuration of services. The properties that are defined for a service can be used inside the script. To insert the properties you defined, click the down arrow in the Select a property list. Click Save when you are finished.</td>
</tr>
<tr>
<td>Delete button</td>
<td>Clears the script but does not remove the row for the life cycle stage.</td>
</tr>
</tbody>
</table>

6 When you are finished creating the service, click OK.
The service you created is added to the Services tab under the Catalog tab. If you selected the Pre-install in a Template check box, the service appears in the list of services that you can include when you create or edit a template. If you did not select this check box, the service appears in the list of services that you can include when you create a deployment blueprint for an application.

Copy a Service from an Existing Service

When you copy a service, all of the properties, action scripts, operating systems, and a list of descriptive tags to identify application components are retained.

You cannot change the name of the existing service. You can change the version number to differentiate the new service from the parent version and include a description. A best practice is to create a copy of the service to preserve the original for future reference.

Prerequisites

- Verify that your user account has the catalog administrator role (ROLE_CATALOG_ADMIN) assigned to it.
- If you plan to edit the properties and scripts contained in services that you add to the application blueprint, familiarize yourself with the tasks described in “Add a Service to the Catalog,” on page 49.
- If you plan to use a script that downloads software from an external Web site, the virtual machine you use for deploying the application must have access to an external network.
- Familiarize yourself with the basic concepts of defining and configuring component properties and actions. See Chapter 7, “Developing vFabric Application Director Components,” on page 41.

Procedure

1. On the vFabric Application Director home page, in the Catalog list, click Manage Catalog Items.
2. Click the Services tab.
3. In the Services list that appears, in the row for the service that you want to copy, click the Copy this Service Version button ( ) in the Actions column.
4. Complete the information in the dialog box that appears, and click OK.
5. (Optional) Select the Pre-install in a Template check box.
   The new service appears in the list of services that you can include when you create or edit a template. If you did not select this check box, the new service appears in the list of services that you can include when you create a deployment blueprint for an application.

A new service version appears under the Services tab.

Add a Custom Task to the Catalog

With vFabric Application Director, you can create a custom task to perform additional customized tasks in the application deployment.

The vFabric Application Director catalog contains predefined tasks to configure APT or YUM repositories and a script to register a machine to the Red Hat network. You can add these customized tasks to the execution plan in a deployment profile. In some cases, rather than creating a custom task, you might prefer to edit a predefined task.

If a custom task is used in a deployment profile to customize an application deployment, the task cannot be deleted.

Note  Save your changes frequently. The vFabric Application Director user interface session expires after 30 minutes of inactivity. If the session expires, any changes that were not saved are lost.
Prerequisites

- Verify that your user account has the catalog administrator role (ROLE_CATALOG_ADMIN) assigned to it.
- Although vFabric Application Director includes a list of operating systems and a list of descriptive tags to identify application components, you might have to add items to these lists. For information, see “Add Operating Systems or Tags to the Lists in the Catalog,” on page 54.
- If the application requires access to URLs from outside the corporate firewall, configure the applicable services and application components to use a proxy. See “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25.
- Familiarize yourself with the basic concepts of defining and configuring component properties and actions. See Chapter 7, “Developing vFabric Application Director Components,” on page 41.

Procedure

1. On the vFabric Application Director home page, in the Catalog list, click Manage Catalog Items.
2. Click the Tasks tab, and click one of the icons above the table.

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add (.addButton)</td>
<td>Opens a dialog box for adding a new custom task from scratch.</td>
</tr>
<tr>
<td>New Version (editVersion)</td>
<td>Opens a dialog box for creating a version of an existing task. The name stays the same, but the custom task contents are not copied from the previous custom task. You must create a version from the beginning.</td>
</tr>
</tbody>
</table>

3. In the dialog box that appears, complete the Task Details text boxes.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Best practice: Use a name that corresponds to the task the script performs.</td>
</tr>
<tr>
<td>Version</td>
<td>You can specify major, minor, or micro releases, with or without qualifiers. For example, you might use version numbers such as 1.0 or 1.5.</td>
</tr>
<tr>
<td>Supported OSes</td>
<td>If the scripts used in this task can run only on particular operating systems, select those operating systems here. In the execution plan, vFabric Application Director prevents the custom task from appearing in the Catalog Task Name list unless it contains one of these OSes. Leave this text box blank if the task can be used in any operating system. To use an operating system name that is not in the list, click Cancel in this dialog box, and use the Administration tab to create an operating system name.</td>
</tr>
<tr>
<td>Description</td>
<td>Best practice: If you are creating a new version of an existing task, describe the differences from the previous version.</td>
</tr>
</tbody>
</table>

4. In the Script section, you can write a script or copy a script into the dialog box and click the down arrow in the Select a property list to add custom task properties.

A catalog administrator can parameterize the installation and configuration of services. The properties that are defined for a service can be used inside the script.

5. In the Properties section, click the Add button to define variables used in the custom task properties.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Click the first row of the Name column to define a variable. For example, you might create a custom task to configure a repository or create a custom email task to send a notification email when the deployment task for a service or application component successfully completes.</td>
</tr>
<tr>
<td>Description</td>
<td>Best practice: Include details about the custom task.</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Type</td>
<td>To change the type, click the type name and select a type from the drop-down menu. You cannot add types to the menu.</td>
</tr>
<tr>
<td>Value</td>
<td>Type the value to substitute for this property when the custom task runs. For example, for a property called remove_all, you might type either true or false in this text box.</td>
</tr>
<tr>
<td>Secured (check box)</td>
<td>Select the check box for passwords you define or other properties whose values you want to obscure. For example, the JBOSS_JMX_PWD property in the JBoss service is secured.</td>
</tr>
<tr>
<td></td>
<td>If a property is changed from Secured to Unsecured, vFabric Application Director resets the property value, for security purposes. You must set a new value for the property.</td>
</tr>
<tr>
<td>Overridable in Execution Plan</td>
<td>Enabled by default. Allows users such as an application deployer to override the value for the property in an application blueprint. For example, the catalog administrator might set a URL to download global configuration for each node. However, a change in the URL might cause the custom task to fail. Therefore, the application deployer must update the URL in the execution plan of the deployment profile for the task to run successfully.</td>
</tr>
<tr>
<td>Save and Add Another button</td>
<td>Click to save the property definition and add a new row to the table.</td>
</tr>
</tbody>
</table>

6 When you finish creating the custom task, click OK.

The custom task you created is added to the Tasks tab on the Catalog tab. You can add a custom task in the execution plan and deploy it to a deployment environment. See “Add Custom Tasks,” on page 78.

Add Operating Systems or Tags to the Lists in the Catalog

Although vFabric Application Director includes a list of operating systems and a list of descriptive tags to identify application components, you might have to add items to these lists.

When you create a logical template or a software or service, you can associate one or more tags with the item. For example, you might add a Database Server tag to a service that installs and configures a database component of an application.

You can add an operating system from the list to specify which operating system a logical template uses or which operating systems are supported for a particular service. For this release, Windows operating systems are not supported.

Prerequisites

- Verify that your user account has the catalog administrator role (ROLE_CATALOG_ADMIN) assigned to it.
- Familiarize yourself with the preinstalled tags and operating systems listed on the Administration tab. You cannot delete a tag after it is created.

Procedure

1 On the vFabric Application Director home page, in the Catalog list, click Manage Catalog Items.
2 Click the Administration tab.
To add an operating system, click the **Operating Systems** button above the table, and click one of the icons above the table.

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add (.addButton)</td>
<td>Opens a dialog box for adding a new operating system from the beginning.</td>
</tr>
<tr>
<td>New Version (editButton)</td>
<td>Opens a dialog box for creating a new version of an existing operating system. The name stays the same, but you can change any of the other attributes of the operating system.</td>
</tr>
</tbody>
</table>

4. Complete the dialog box that appears and click **OK**.

5. To add a tag, click the **Tags** button above the table, and click the **Add** button.

6. Complete the dialog box that appears and click **OK**.

The newly added operating systems or tags are added to the lists, and you can select them when you create other components to add to the catalog or to an application blueprint.
Using Predefined Sample Templates, Applications, and Tasks

vFabric Application Director catalog includes sample applications, services, logical templates, and tasks to help you start using vFabric Application Director.

**Note** The predefined sample templates, applications, services, and tasks should only be used in a test environment.

All user accounts that are assigned to the Default group can access and deploy the sample applications in vCloud Director.

All of the icons rendered for the sample templates and services in the catalog are based on the name of the template or service. For example, the official MySQL icon appears next to the MySQL service in the catalog. If the name of the service or template is unique then a generic icon appears.

Familiarize yourself with the key concepts that appear frequently in topics about using sample templates and applications. See “Key Concepts,” on page 13.

This chapter includes the following topics:

- “Using the Sample CentOS Template,” on page 58
- “Deploy Clustered Dukes Bank Application,” on page 58
- “Deploy jPetStore Application,” on page 59
- “Deploy Spring Travel Application,” on page 59
- “Deploy Zimbra Application,” on page 60
- “Deploy the Zimbra Clustered Application,” on page 61
- “Deploy Radiant CMS Application,” on page 62
- “Add APT Repository Config Predefined Task,” on page 63
- “Add a YUM Repository Config Predefined Task,” on page 64
- “Add a RHN Registration Predefined Task,” on page 65
- “Sample vFabric Application Director Catalog Services,” on page 66
Using the Sample CentOS Template

vFabric Application Director provides the CentOS 5.6 32-bit OVF file with the operating system installed and all of the necessary libraries to deploy an application.

Download the vFabric Application Director 1.0.0 Download - CentOS32 Bit OVF file and vFabric Application Director 1.0.0 Download - CentOS 32 Bit VMDK file from the VMware product download site. Upload the CentOS 5.6 32-bit OVF package and vApp template to the vCloud Director catalog. For more information on the vCloud Director catalog, see the vCloud Director documentation.

For the sample Ubuntu template to work properly, you must add the libpython XML package.

**NOTE** For CentOS 32-bit sample templates, Physical Address Extension (PAE) is not enabled, so you can allocate up to 3.25GB of RAM for a virtual machine. PAE is enabled for Ubuntu 32-bit sample templates, so you can allocate more than 4GB of RAM for a virtual machine.

Deploy Clustered Dukes Bank Application

The Clustered Dukes Bank application is a sample three-tier vFabric Application Director application with a MySQL database, a JBoss Application server, and Apache as a load balancer that you can deploy to your test environment.

An application component packaged as an EAR (Dukes_Bank_App) is deployed in the JBoss server. The MySQL database is initialized with the required schema using the initialize_db_script script. The appserver node is defined as a cluster. Multiple virtual machines of this type can be deployed with traffic load balanced by the Apache load balancer.

**NOTE** Use the predefined sample application only in a test environment.

**Prerequisites**

- Register the uploaded CentOS 5.6 32-bit template to a cloud provider. See “Using the Sample CentOS Template,” on page 58 and “Register a Cloud Provider,” on page 37.
- Map the cloud template to the CentOS56 32bit logical template. See “Add a Template to the Catalog,” on page 47.
- Log in to vFabric Application Director with a user account that belongs to the Default group.
- Verify that your user account has the deployer role (ROLE_DEPLOYER) assigned to it.
- If your system requires a proxy to access the Internet, verify that your proxy connections are properly configured. See “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25.
- Understand the basic concepts of creating a deployment profile and deploying an application. See Chapter 11, “Deploying Applications,” on page 75.

**Procedure**

1. On the vFabric Application Director home page, in the Applications list, click Manage Applications.
2. Click Clustered Dukes Bank App.
   The blueprint appears.
3. Create a deployment profile and deploy the application.
4. If the cloud template is in a private network without a proxy, when you deploy the application, add a YUM configuration task to each virtual machine in the deployment profile, and set the repository_url property to use a CentOS 5.6 32-bit repository hosted in the private network.
5. To access the application, add the IP address of the deployed load balancer in a supported Web browser at http://Load_Balancer_IP:8081/bank/main.faces.

6. Use the password 200/foobar to log in to the application.

**Deploy jPetStore Application**

jPetStore is a single-tier sample Web store application that deploys the jPetStore App WAR file on tc Server using SQLFire as a database that you can deploy to your test environment.

**NOTE** Use the predefined sample application only in a test environment.

**Prerequisites**

- Register the uploaded CentOS 5.6 32-bit template to a cloud provider. See “Using the Sample CentOS Template,” on page 58 and “Register a Cloud Provider,” on page 37.
- Map the cloud template to the CentOS 56 32-bit 6GB disk logical template. See “Add a Template to the Catalog,” on page 47.
- Log in to vFabric Application Director with a user account that belongs to the Default group.
- Verify that your user account has the deployer role (ROLE_DEPLOYER) assigned to it.
- If your system requires a proxy to access the Internet, verify that your proxy connections are properly configured. See “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25.
- Understand the basic concepts of creating a deployment profile and deploying an application. See Chapter 11, “Deploying Applications,” on page 75.

**Procedure**

1. On the vFabric Application Director home page, in the Applications list, click Manage Applications.
2. Click jPetStore.
   
   The blueprint appears.
   
   All the services and application components for this application are predefined and do not need additional configuration.
3. Create a deployment profile and deploy the application.
4. To access the application, add the jPetStore virtual machine IP address in a supported Web browser at http://jPetStore_VM_IP:8080/jpetstore-1.0.0.

**Deploy Spring Travel Application**

Spring Travel is a single-tier sample vFabric Application Director Web application that deploys the Spring Travel App WAR file on tc Server.

**NOTE** Use the predefined sample application only in a test environment.

**Prerequisites**

- Register the uploaded CentOS 5.6 32-bit template to a cloud provider. See “Using the Sample CentOS Template,” on page 58 and “Register a Cloud Provider,” on page 37.
- Map the cloud template to the CentOS56 32bit 6GB Disk logical template. See “Add a Template to the Catalog,” on page 47.
- Log in to vFabric Application Director with a user account that belongs to the Default group.
- Verify that your user account has the deployer role (ROLE_DEPLOYER) assigned to it.
If your system requires a proxy to access the Internet, verify that your proxy connections are properly configured. See “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25.

Understand the basic concepts of creating a deployment profile and deploying an application. See Chapter 11, “Deploying Applications,” on page 75.

**Procedure**

1. On the vFabric Application Director home page, in the Applications list, click **Manage Applications**.
2. Click Spring Travel.
   
   The blueprint appears.
   
   All the services and application components for this application are predefined and do not need additional configuration.
3. Create a deployment profile and deploy the application.
4. To access the application, add the Spring Travel virtual machine IP address in a supported Web browser:
   
   http://SpringTravel_VM_IP:8080/swf-booking-mvc-2.0.3.RELEASE.

---

**Deploy Zimbra Application**

Zimbra is an email and collaboration suite. The Zimbra App is divided into the LDAP server node, the Mailbox (mbox) node, and the Mail Transport Agent (MTA) node.

**NOTE**  Use the predefined sample application only in a test environment.

**Prerequisites**

- Register the uploaded CentOS 5.6 32-bit template to a cloud provider. See “Using the Sample CentOS Template,” on page 58 and “Register a Cloud Provider,” on page 37.
- Map the cloud template to the CentOS56 32-bit 6GB Disk logical template. See “Add a Template to the Catalog,” on page 47.
- Log in to vFabric Application Director with a user account that belongs to the Default group.
- Verify that your user account has the deployer role (**ROLE_DEPLOYER**) assigned to it.
- Verify that you have a software and license key available.
- Verify that vFabric Application Director is configured to use proxy. See “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25.
- Verify that the Zimbra virtual machine IP addresses has an associated DNS record that supports forward and reverse IP address lookup.
- Understand the basic concepts of creating a deployment profile and deploying an application. See Chapter 11, “Deploying Applications,” on page 75.

**Procedure**

1. On the vFabric Application Director home page, in the Applications list, click **Manage Applications**.
2. Click **Zimbra App**.
   
   The blueprint appears.
3. Set up an NFS server.
   
   You can download the file from the VMware Zimbra Web site **Downloads** tab.
5. Untar the installation files in the NFS server you created.
6 Obtain the license file from the VMware Zimbra Web site and host the file on an HTTP server.

7 Select each Zimbra service in the blueprint and configure the property value.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>zimbra_nfs_path</td>
<td>Add the NFS server path. For example, nfsserver.com:/path/to/export.</td>
</tr>
<tr>
<td>zimbra_installer_root_relpath</td>
<td>Set to the directory that contains the untared installation files.</td>
</tr>
<tr>
<td>zimbra_licencefile_url</td>
<td>Add the URL of the hosted licence file.</td>
</tr>
<tr>
<td>ldap_ip</td>
<td>From the drop-down menu, set the property to bind to ldap:ip.</td>
</tr>
<tr>
<td>mbox_ip</td>
<td>From the drop-down menu, set the property to bind to mbox:ip.</td>
</tr>
<tr>
<td>mta_ip</td>
<td>From the drop-down menu, set the property to bind to mta:ip.</td>
</tr>
<tr>
<td>self_ip</td>
<td>From the drop-down menu, set the property to bind to self:ip.</td>
</tr>
</tbody>
</table>

For example, when you configure Zimbra MTA service, the property value for mta_ip is self:ip.

8 Create a deployment profile and deploy the application.

9 To access the application, add the IP address of the deployed mbox virtual machine in a supported Web browser and log in using the username **admin** and default password **vmware**.

   You can change the default password value in the ADMIN_PWD property for all virtual machines in a blueprint.

**Deploy the Zimbra Clustered Application**

Zimbra is an email and collaboration suite. The Zimbra Clustered App is divided into five nodes, the LDAP server node, the primary mailbox (mbox) node, the clustered subordinate mailbox (mbox) nodes, the Mail Transport Agent (MTA) node, and the proxy node.

**Note**: Use the predefined sample application only in a test environment.

**Prerequisites**

- Register the uploaded CentOS 5.6 32-bit template to a cloud provider. See “Using the Sample CentOS Template,” on page 58 and “Register a Cloud Provider,” on page 37.
- Map the cloud template to the CentOS56 32-bit 6GB Disk logical template. See “Add a Template to the Catalog,” on page 47.
- Log in to vFabric Application Director with a user account that belongs to the Default group.
- Verify that your user account has the deployer role (ROLE_DEPLOYER) assigned to it.
- Verify that you have a software and license key available.
- Verify that vFabric Application Director is configured to use a proxy. See “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25.
- Verify that the Zimbra virtual machine IP addresses have an associated DNS record that supports forward and reverse IP address lookup.
- Understand the basic concepts of creating a deployment profile and deploying an application. See Chapter 11, “Deploying Applications,” on page 75.

**Procedure**

1. On the vFabric Application Director home page, in the Applications list, click **Manage Applications**.
2. Click **Clustered Zimbra App**.

   The blueprint appears.
3 Set up an NFS server.
   You can download the file from the VMware Zimbra Web site Downloads tab.
5 Untar the installation files in the NFS server you created.
6 Obtain the license file from the VMware Zimbra Web site and host the file on an HTTP server.
7 Select each Zimbra service in the blueprint and configure the property value.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>zimbra_nfs_path</td>
<td>Add the NFS server path. For example, nfsserver.com:/path/to/export.</td>
</tr>
<tr>
<td>zimbra_installer_root_relpath</td>
<td>Set to the directory that contains the untared installation files.</td>
</tr>
<tr>
<td>zimbra_licencefile_url</td>
<td>Add the URL of the hosted license file.</td>
</tr>
<tr>
<td>ldap_ip</td>
<td>From the drop-down menu, set the property to bind to ldap:ip.</td>
</tr>
<tr>
<td>mbox_ip</td>
<td>From the drop-down menu, set the property to bind to mbox:ip.</td>
</tr>
<tr>
<td>mta_ip</td>
<td>From the drop-down menu, set the property to bind to mta:ip.</td>
</tr>
<tr>
<td>self_ip</td>
<td>From the drop-down menu, set the property to bind to self:ip.</td>
</tr>
<tr>
<td>proxy_ip</td>
<td>From the drop-down menu, set the property to bind to proxy:ip.</td>
</tr>
</tbody>
</table>

For example, when configuring Zimbra MTA service, the property value for mta_ip is self:ip.
8 Create a deployment profile and deploy the application.
9 To access the application, add the IP address of the deployed proxy virtual machine in a supported Web browser and log in using username admin and default password vmware.
   You can change the default password value in the ADMIN_PWD property for all virtual machines in a blueprint.

### Deploy Radiant CMS Application

Radiant CMS is a single-node application that deploys a Ruby On Rails service and a MySQL database, and installs the Radiant Application configured to use the MySQL database.

**NOTE** Use the predefined sample application only in a test environment.

### Prerequisites
- Register the uploaded CentOS 5.6 32-bit template to a cloud provider. See “Using the Sample CentOS Template,” on page 58 and “Register a Cloud Provider,” on page 37.
- Map the cloud template to the CentOS56 32-bit logical template. See “Add a Template to the Catalog,” on page 47.
- Log in to vFabric Application Director with a user account that belongs to the Default group.
- Verify that your user account has the deployer role (ROLE_DEPLOYER) assigned to it.
- Verify that vFabric Application Director is configured to use a proxy. See “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25.
- Understand the basic concepts of creating a deployment profile and deploying an application. See Chapter 11, “Deploying Applications,” on page 75.

### Procedure
1 On the vFabric Application Director home page, in the Applications list, click Manage Applications.
2 Click Radiant CMS.
The blueprint appears.

All the services and application components for this application are predefined and do not need additional configuration.

3 Create a deployment profile and deploy the application.

4 To access the application, add the Radiant CMS virtual machine IP address (http://VM_IP/) in a supported Web browser and log in using the Radiant default admin username and Radiant password.

Add APT Repository Config Predefined Task

The APT Repository Config predefined task is a script used for updating the APT repositories to install or update software on Ubuntu or other Debian-based operating systems.

You can configure the APT Repository Config properties to add a new repository or remove all of the existing repositories. If you need more than one repository, you can create multiple tasks and link them in the execution plan by adding one task next to the other.

NOTE Use the predefined sample task only in a test environment.

Prerequisites

- Log in to vFabric Application Director with a user account that belongs to the Default group.
- Verify that your user account has the deployer role (ROLE_DEPLOYER) assigned to it.
- Verify that the predefined task is added to the execution deployment plan before you add any services or application components that require APT for installing or updating software packages.
- Verify that vFabric Application Director is configured to use a proxy. See “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25.

Procedure

1 On the vFabric Application Director home page, in the Applications list, click Manage Applications.

2 Click the name of the application to deploy.

The blueprint for the application appears.

3 In the deployment profile wizard navigator at the top of the screen, click though the wizard pages until you get to Execution Plan.

4 Click the Expand Cluster button ( ) in the execution plan, if the node is clustered.

If the clustered node is not expanded, the predefined task is added to the first virtual machine in the cluster.

5 Drag the Add Script Task button ( ) and add a predefined task in the blueprint.

When you drag Add Script Task, you see anchors (‡) that indicate where you can insert the predefined task.

After you drag a predefined task to a node, the Add Custom Task dialog box opens. The supported operating systems, predefined task details, script, and property details appear in the dialog box.

6 On the Properties tab, click the repository_name property and type a new unique value identifying the repository in the Edit Property dialog box.
7. On the Properties tab, click the source_str property and type
   http://site.example.com/debian distribution component1 component2 ... in the URL value text box
   of the Edit Property dialog box.

   A sample Ubuntu URL is deb http://us.archive.ubuntu.com/ubuntu/ lucid main.

8. On the Properties tab, click the remove_all_repos property and define an appropriate value in the Edit
   Property dialog box.

   - Set the value to true to remove all other repositories before adding the new configuration.
   - Accept the default false value to add a new repository.

9. Click OK.

   The APT Repository Config predefined task is added to the execution plan.

What to do next

Determine whether you want to add a customized task to the vFabric Application Director catalog. See “Add
a Custom Task to the Catalog,” on page 52.

Add a YUM Repository Config Predefined Task

The YUM Repository Config predefined task is a script used for updating the YUM repositories to install or
update software on CentOS or other RPM-based operating systems.

You can configure the YUM Repository Config properties to add a new repository or remove all of the existing
repositories. If you need more than one repository, you can create multiple tasks and link them in the execution
plan by adding one task next to the other.

NOTE Use the predefined sample task only in a test environment.

Prerequisites

- Log in to vFabric Application Director with a user account that belongs to the Default group.
- Verify that your user account has the deployer role (ROLE_DEPLOYER) assigned to it.
- Verify that the predefined task is added to the execution deployment plan before you add any services or
  application components that require YUM for installing or updating software packages.
- Verify that vFabric Application Director is configured to use a proxy. See “Configure vFabric Application
  Director to Use a Proxy for External URLs,” on page 25.

Procedure

1. On the vFabric Application Director home page, in the Applications list, click Manage Applications.

2. Click the name of the application to deploy.

   The blueprint for the application appears.

3. In the deployment profile wizard navigator at the top of the screen, click though the wizard pages until
   you get to Execution Plan.

4. Click the Expand Cluster button ( ) in the execution plan, if the node is clustered.

   If the clustered node is not expanded, the predefined task is added to the first virtual machine in the cluster.
5 Drag the **Add Script Task** button ([image]) and add a predefined task in the blueprint.

When you drag **Add Script Task**, you see anchors ([image]) that indicate where you can insert the predefined task.

After you drag a predefined task to a node, the Add Custom Task dialog box opens. The supported operating systems, predefined task details, script, and property details appear in the dialog box.

6 On the **Properties** tab, click the repository_name property and type a new unique value identifying the repository in the Edit Property dialog box.

7 On the **Properties** tab, click the repository_url property and type a URL value in the Edit Property dialog box.

A sample CentOS 5.6 32-bit URL is http://vault.centos.org/5.6/os/i386/.

8 On the **Properties** tab, click the remove_all_repos property and define an appropriate value in the Edit Property dialog box.

   - Set the value to **true** to remove all other repositories before adding the new configuration.
   - Accept the default **false** value to add a new repository.

9 Click **OK**.

The YUM Repository Config predefined task is added to the execution plan.

**What to do next**

Consider adding a customized task to the vFabric Application Director catalog. See “Add a Custom Task to the Catalog,” on page 52.

---

**Add a RHN Registration Predefined Task**

The RHN Registration predefined task is a script used for updating the YUM repositories to install Red Hat Enterprise Linux or other Red Hat operating systems that have the Red Hat Network with YUM.

The predefined task registers the virtual machine with the Red Hat Network using the credentials provided with a machine name VMware_AppDirector_$RANDOM, where $RANDOM is a short string that makes the virtual machine registration unique.

---

**Prerequisites**

- Log in to vFabric Application Director with a user account that belongs to the Default group.
- Verify that your user account has the deployer role (**ROLE_DEPLOYER**) assigned to it.
- Verify that the predefined task is added to the execution deployment plan before you add any services or application components that require YUM for installing or updating software packages.
- Verify that vFabric Application Director is configured to use a proxy. See “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25.

**Procedure**

1 On the vFabric Application Director home page, in the Applications list, click **Manage Applications**.

2 Click the name of the application to deploy.

   The blueprint for the application appears.

3 In the deployment profile wizard navigator at the top of the screen, click though the wizard pages until you get to **Execution Plan**.
4 Click the **Expand Cluster** button ( ) in the execution plan, if the node is clustered.
If the clustered node is not expanded, the predefined task is added to the first virtual machine in the cluster.

5 Drag the **Add Script Task** button ( ) and add a predefined task in the blueprint.
When you drag **Add Script Task**, you see anchors ( ) that indicate where you can insert the predefined task.
After you drag a predefined task to a node, the Add Custom Task dialog box opens. The supported operating systems, predefined task details, script, and property details appear in the dialog box.

6 Click the **Properties** tab, then click the rhn_username property and type the username value used to register the virtual machine with the Red Hat Network.

7 Click the rhn_password property and type the password value used to register the virtual machine with the Red Hat Network.

8 Click **OK**.
The RHN Registration predefined task is added to the execution plan.

**What to do next**
If you have a customized task, you can add it to the vFabric Application Director catalog. See “Add a Custom Task to the Catalog,” on page 52.

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**Sample vFabric Application Director Catalog Services**

vFabric Application Director includes predefined components such as services in its catalog that are reusable components in several applications. These services are available to all user groups in vFabric Application Director. Logical templates must be added for each group outside the Default group.

**Catalog Services**

On the vFabric Application Director home page, in the Catalog list, click **Manage Catalog Items**. The **Catalog** tab includes standard logical templates, sample services, application components, and task scripts.

An application architect can create an application blueprint and add the sample services to the applicable nodes and configure them. The sample services can also be configured when deploying a predefined application.

In the application blueprint, these sample services are grouped into Application Servers, Database Servers, Web Servers, Zimbra Services, Monitoring, and Other.

See the VMware vFabric Application Director Catalog Services guide for recommended property configurations, supported operation systems, and application components information.

---

**Note** The predefined sample catalog services should only be used in a test environment.
Creating Applications

With vFabric Application Director, users are not required to install and configure individual application components on each virtual machine used in an application architecture.

vFabric Application Director provides a drag-and-drop canvas that application architects can use to construct an application blueprint. With this blueprint, you can model applications for deployment on any cloud. You can drag the following items onto the blueprint.

- Logical templates from the catalog
  vFabric Application Director logical templates are mapped to cloud templates that contain operating system images and might have services preinstalled and configured.
  vFabric Application Director includes some open source operating system images. You can also add your own operating system images to the vFabric Application Director catalog.

- Application infrastructure components and scripts from the catalog
  The included sample services are reusable software components. vFabric Application Director includes installation and configuration scripts that follow best practices for services.

- Application components
  These applications operate on top of the services. The framework is modular, so that you can deploy any application component on any service, and deploy these on any operating system image.

**NOTE** For information about deleting an application deployment from vFabric Application Director, see "Delete an Application Deployment from vFabric Application Director," on page 87.

Familiarize yourself with the key concepts that appear frequently in topics about creating applications. See "Key Concepts," on page 13.

This chapter includes the following topics:

- "Create an Application," on page 68
- "Creating an Advanced Blueprint," on page 70
- "Create an Application Version," on page 72
- "Copy an Application Version," on page 73
Create an Application

With vFabric Application Director, you can compose your application deployment topology, create dependencies, and edit configurations.

The application blueprint provides fine-grained control over installation dependencies, configuration changes, and editable scripts. From the blueprint, vFabric Application Director can generate execution plans that you can revise and based on compatibility you can deploy any applications on any services.

When you delete an application, the blueprints and deployment profiles are removed. Deployment profiles cannot be deleted.

**NOTE** For information about how to create a new version of an existing application or create an application by copying an existing application, see “Create an Application Version,” on page 72.

The Application Navigator tree on the left shows the name of the application you created, with **Blueprint** selected. Also on the left side of the canvas are the logical templates from the vFabric Application Director catalog. On the right is a list of the services available from the catalog and application components.

**Figure 10-1. Blueprint of a Three-Tiered Java Application**

**NOTE** Save your changes frequently. The vFabric Application Director user interface session expires after 30 minutes of inactivity. If the session expires, any changes that were not saved are lost.

**Prerequisites**

- Verify that your user account has the application architect role (**ROLE_APP_ARCHITECT**) assigned to it.
- To examine the sample applications and their components, log in to vFabric Application Director with a user account that belongs to the Default group.
- If the application requires access to URLs from outside the corporate firewall, configure the applicable services and application components to use a proxy. See “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25.
- If you plan to create clustered nodes, you must create action scripts that contain clustering logic so that you can add these scripts to the blueprint. See “Defining Component Actions,” on page 41.
- Familiarize yourself with the basic concepts of binding to another property if you plan to customize your application. See “Binding to Other Properties,” on page 44.
Procedure

1. On the vFabric Application Director home page, in the Applications list, click **Manage Applications**.

2. On the Applications list, click the **Add** button (▲) above the table to add an application.

3. Complete the Create an Application dialog box and click **OK**.

   For ideas about how to name the application and what text to put in the description text boxes, see the predefined applications already included on the **Applications** tab. To see these applications, you must log in as a user that is a member of the Default group.

   A major and minor version of the application is required. For example, you might also add a qualifier to the major and minor versions such as 1.0.0 or 1.0.0-SNAPSHOT.

   The canvas for modeling the application blueprint appears.

4. Select and drag one or more logical templates onto the canvas to create nodes.

   For example, to create a three-tiered application, you might drag three items from the OS Templates list onto the canvas, or drag one template from the OS Templates list, one item from the Database Servers list, and one from the Application Servers list. The names of the lists correspond to the tags associated with a template.

5. (Optional) Select one of the nodes on the canvas and change the name of the node on the **Details** and **NICs** tabs below the blueprint.

   The host name is derived from the blueprint node names based on the following naming conventions:

   - The name text box is limited to 15 characters.
   - The name text box is set based on the RFC-1912 standard.
   - If the node names contain a character other than a letter, digit, or hyphen, that character is replaced with a hyphen.
   - If the node names starts with a non-ASCII letter, the letter C is added to the name.
   - If the name ends with a hyphen, the hyphen is replaced with the letter C.

   For example, for a three-tiered application, you might rename each of the three nodes as Application Server, Database Server, and Load Balancer.

6. (Optional) To change the default number of CPUs or amount of memory for a deployed virtual machine, select the relevant node on the canvas and edit the values on the **Details** tab below the blueprint.

   The tabs that appear below the blueprint correspond to the node selected.

7. Select and drag one or more services or application components onto the nodes.

   For example, you might drag the MySQL service onto a database server node, drag the JBoss service onto an application server node, and drag an Apache service onto the Load Balancer node.

   If a service or application component is not compatible with a particular node, you cannot drop it on the node. For example, you can drag the application component called SQL_SCRIPT onto a MySQL service, but you cannot drag the SQL_SCRIPT component onto a JBoss service.

   Compatibility restrictions are created when the catalog administrator sets the supported operating systems and components for a catalog service. The catalog administrator can also add to the list of operating systems and tags that are already available in the catalog. For example, the MySQL service in the catalog has the supported components listed as SQL_SCRIPT, therefore only the SQL_SCRIPT application component type can be added to it.
In addition, MySQL service has the supported operating systems set to CentOS32 5.6.0, CentOS64 5.6.0, and Ubuntu32 10.4.3. Therefore, the MySQL service can be added into logical templates that include one of the operating systems.

You can add the SCRIPT and Other application components to a node or any service.

8 (Optional) Select a service or application component and edit the information on the Details and Actions tabs below the blueprint.

Only those properties that the catalog administrator designated as overridable can be changed on the application blueprint.

On the Actions tab, scripts are accessible for all stages of the component's life cycle, including install, configure, and start. A catalog administrator can edit a service script from the Services tab.

9 (Optional) To edit a property, click in a cell of the table.

The Edit Property dialog box appears.

10 (Optional) To bind a property to another property, select the property value from the Blueprint Value drop-down menu in the Edit Property dialog box.

Binding to another property lets you customize a script based on the value of other node’s run time property values such as IP addresses.

11 When you are finished creating the blueprint for the application, click the Save icon in the toolbar above the canvas.

vFabric Application Director checks the application topology you created and displays a message box listing any errors. For example, you see a message if a property type that you selected is not compatible with a script type, or if a service or component is missing a required script. Some errors require correction before you can save the application.

The application is saved, and the application name appears on the Applications tab.

**Note** If any preinstalled services are added to a logical template after you create a blueprint, the new preinstalled services are not added to the node. In this case, you must recreate the node and add the preinstalled services.

**What to do next**

Deploy the application. See Chapter 11, “Deploying Applications,” on page 75.

**Creating an Advanced Blueprint**

With vFabric Application Director, you can create an advanced application blueprint with dependencies between components, clustered nodes, and multiple networks.

- **Create a Dependency Between Components** on page 71
  
  Dependencies are added in the blueprint to define a specific order in which the deployment tasks must be performed.

- **Specify a Node as a Cluster** on page 71
  
  For scaling deployments, you might need to deploy multiple virtual machines or a cluster for a particular node and then manage them using a load balancer.

- **Define Multiple NICs for a Node** on page 72
  
  In most deployments, some servers are deployed into a DMZ zone and some servers are deployed to a network protected by firewall.
Create a Dependency Between Components

Dependencies are added in the blueprint to define a specific order in which the deployment tasks must be performed.

Procedure

1. To create dependencies between nodes or components, click the **Add Relation** button ( grenades) in the toolbar above the canvas.

2. Select the first component and then the component it is dependent on.
   
   A blue dotted line appears and points to the dependent component. For example, because a load balancer usually cannot be configured until the application is up and running, you might add a dependency from an Apache service to a WAR component.

3. When you are finished, click the **Save** icon in the toolbar above the canvas.

Example: Create Dependency from JBoss to MySQL

For example, you might draw a dependency line from the JBoss service to the MySQL service.

This line indicates that the application server is dependent on having the database created and configured.

What to do next

Deploy the application. See Chapter 11, “Deploying Applications,” on page 75.

Specify a Node as a Cluster

For scaling deployments, you might need to deploy multiple virtual machines or a cluster for a particular node and then manage them using a load balancer.

Prerequisites

Familiarize yourself with the basic concepts of binding to another property, node array index property, and defining component actions. See Chapter 7, “Developing vFabric Application Director Components,” on page 41.

Procedure

1. To specify a cluster of virtual machines, click the cluster icon ( clusters) in the node.

2. Click the **Cluster** tab below the blueprint.

3. Set the cluster size.

4. Bind to a property like node_array_index to identify which virtual machine the current script is running in.
   
   If there are other properties that refer to a cluster property, define the component properties to access the array of property values from the clustered nodes.
   
   You can find the IP addresses of all the virtual machines in a cluster by binding a property to all(node:ip).

5. When you are finished, click the **Save** icon in the toolbar above the canvas.

Example: Specifying the Load Balancer

See the Clustered Duke’s Bank sample application to understand how a cluster is used. In the Load Balancer node, click **Apache_LB** and the http_node_ips property refers to all(appserver:ip).
What to do next

Deploy the application. See Chapter 11, “Deploying Applications,” on page 75.

Define Multiple NICs for a Node

In most deployments, some servers are deployed into a DMZ zone and some servers are deployed to a network protected by firewall.

For instance, in the Clustered Duke’s Bank sample application, the Load Balancer node is the only node that you can access from a public network. The Database and Appserver nodes are deployed in a private network. The Load Balancer node can access the Database and Appserver nodes.

In vFabric Application Director, to resolve this situation, you can define two NICs on the Load Balancer. Each NIC must specify a logical network name. At deployment time, the logical network is mapped to an actual cloud network. When a virtual machine is created, the number of NICs for the virtual machine are derived from the node.

In the Duke’s Bank sample application, the Load Balancer node has two NICs, NIC0 pointing to ServiceNetwork and NIC1 pointing to MgmtNetwork. Database and Appserver nodes have one NIC pointing to the ServiceNetwork. At deployment time, ServiceNetwork can be mapped to a cloud network protected by firewall and MgmtNetwork can be mapped to a public cloud network.

Prerequisites

Familiarize yourself with the predefined IP address property concept when you have multiple NICs in a virtual machine. See “Predefined IP Address Property,” on page 45.

Procedure

1. To add multiple NICs, select a node and click on the NICs tab below the node. You can add up to 10 NICs to a node.
2. To add a NIC, click the Add icon (➕) and specify a logical network name.
3. To be part of the same network as another node, pick the network name from the drop-down menu or type a new network.
4. When you are finished, click the Save icon in the toolbar above the canvas.

What to do next

Deploy the application. See Chapter 11, “Deploying Applications,” on page 75.

Create an Application Version

You can create either a version of an existing application or create an application by copying an existing application.

When you create an application by creating a new version, the application name remains the same, but the blueprint contents are not copied from the previous application. When the blueprint appears, the canvas is blank, and you create a new version.

Prerequisites

- Verify that your user account has the application architect role (ROLE_APP_ARCHITECT) assigned to it.
- Verify that at least one application is created and visible to the group that your user account belongs to. For instructions, see “Create an Application,” on page 68.
If you plan to edit the properties and scripts contained in services that you add to the application blueprint, familiarize yourself with the tasks described in “Add a Service to the Catalog,” on page 49.

Familiarize yourself with the process of adding components to an application blueprint, creating dependencies between components, or modifying services and scripts. See “Create an Application,” on page 68.

If the application requires access to URLs from outside the corporate firewall, configure the applicable services and application components to use a proxy. See “Configure vFabric Application Director to Use a Proxy for External URLs,” on page 25.

**Procedure**

1. On the vFabric Application Director home page, in the Applications list, click **Manage Applications**.
2. In the Applications list that appears, click the **Create a new Application version for an existing Application** button ( ) in the Actions column.
3. Complete the dialog box that appears, and click **OK**.
   
   A new application version is created and the blueprint for the application appears.
4. Create new nodes, select components of the application, and modify dependencies, as required.
5. When you finish creating the blueprint for the application, click the **Save** icon in the toolbar above the canvas.

The application is saved, and the application name appears on the **Applications** tab.

**What to do next**

Deploy the application. See Chapter 11, “Deploying Applications,” on page 75.

**Copy an Application Version**

When you copy an existing application, all of the blueprint contents are copied except deployment profiles.

When you copy as a new application version, you cannot edit the application name and the application description does not appear in the Copy application version dialog box. You can only edit the application version and version description. Any changes made to the application version and description fields are reflected on the original application and all the applications are created as a new version from the original application.

When you copy as a new application, you can change all aspects including the application name. Changes made to the new application do not affect the original application used to create the application.

**Prerequisites**

- Verify that your user account has the application architect role (**ROLE_APP_ARCHITECT**) assigned to it.
- If you are not familiar with the process of adding components to an application blueprint, creating dependencies between components, or modifying services and scripts, see “Create an Application,” on page 68.

**Procedure**

1. On the vFabric Application Director home page, in the Applications list, click **Manage Applications**.
2. In the Applications list that appears, in the row for the application that you want to copy, click the **Copy this Application Version** button ( ) in the Actions column.
3 Complete the Copy application version dialog box that appears.
   - To create an application, select **Save as new application**.
   - To create an application version, select **Save as new version**.

4 Click **OK**.
   - A new application is created and the blueprint for the application appears.

5 Create new nodes, select components of the application, and modify dependencies, as required.

6 When you are finished creating the blueprint for the application, click the **Save** icon in the toolbar above the canvas.

The application is saved, and the application name appears on the **Applications** tab.

**What to do next**

Deploy the application. See Chapter 11, “Deploying Applications,” on page 75.
Deploying Applications

The main goal of vFabric Application Director is to simplify and automate deployments of multitier enterprise applications in hybrid cloud environments.

**NOTE** For information about deleting deployments, see “Delete an Application Deployment from vFabric Application Director,” on page 87.

Familiarize yourself with the key concepts relating to deploying applications. See “Key Concepts,” on page 13.

This chapter includes the following topics:

- “Create a Deployment Profile,” on page 75
- “Use an Existing Deployment Profile,” on page 78
- “Add Custom Tasks,” on page 78
- “Deploy an Application,” on page 80
- “Understanding the Deployment Process,” on page 82
- “Checking Deployment Status on the Details Tab,” on page 82
- “Checking Deployment Status on the Execution Plan Tab,” on page 83

**Create a Deployment Profile**

Deployment profiles govern settings such as cloud templates, networks, and application configuration values allowed for use in specific deployment environments.

You should create a different deployment profile for each deployment environment. In a deployment profile, you can enter or override any application properties for a specific deployment if the **Override at Deployment** option is enabled for the property. For example, for a particular deployment environment, you might change the database port to 3307.

Deployment execution plans are automatically generated by the system based on the blueprint. These plans help application release teams by communicating with third-party software for approvals and sending notifications. You can review the execution plan before deploying the application.

The network list contains vCloud Director networks. vFabric Application Director supports external networks and vCloud routed networks with or without DHCP. If the network list is empty, contact your vCloud Director administrator.
Prerequisites

- Verify that your user account has the deployer role (ROLE_DEPLOYER) assigned to it.
- Verify that at least one deployment environment is created in vFabric Application Director. See “Create a Deployment Environment,” on page 39.
- Verify that at least one cloud template is mapped to each logical template used in the blueprint. See “Add a Template to the Catalog,” on page 47.
- Verify that at least one application is created in vFabric Application Director. See Chapter 10, “Creating Applications,” on page 67.

Procedure

1. On the vFabric Application Director home page, in the Applications list, click Manage Applications.

   The blueprint for the application appears.

2. Click the name of the application to open the blueprint canvas.

3. Click the Deploy button ( ) in the toolbar above the canvas.

   Selecting the Deploy button does not deploy the application, it only initiates the process of creating a deployment profile that you can save or deploy immediately.

4. Select the option for creating a deployment profile, provide a name for the deployment profile, and click OK.

   Best Practice: You might name the profile so that the name indicates which type of environment is used, specific override property, or clustered node configuration. For example, for an application called MyTimecard, you might name the profile myTimecard-QA to indicate that this profile is for the QA environment rather than the production environment.

   The Deployment Profile wizard appears, with Choose the cloud environment to deploy highlighted.

5. Select a deployment environment from the list and click Map Details.

   Map details retrieve the list of cloud templates and networks available in the deployment environment. The nodes listed in the VM Templates section correspond to the components of the application, as shown in the application blueprint. The Networking section lists the logical networks defined in the blueprint.
The list in the **Deployment Environment** section corresponds to the list shown on the **Deployment Environments** tab of the **Cloud Providers** tab.

Click the ellipses button (…) at the end of the row to display more information about the item in the list.

6 In the VM Templates section, designate a cloud template for the logical template in the cloud environment. If the list of cloud templates is empty, you must map at least one cloud template to the logical template or ask your catalog administrator to perform this task.

7 In the Networking section, select a supported cloud network for each logical network in the catalog. The network you select depends on the deployment environment.

For example, for a load balancer, if you are deploying the application to a test environment, you might select an internal network for both load balancer networks (NICs). When you create a deployment profile for the production environment, you might select an internal network for one load balancer NIC and an external network for the other load balancer NIC.

Click the ellipses button (…) at the end of the row to display more information about the item in the list.

8 When you finish making your selections, click **Next**.

9 (Optional) Type a new value to override a property from the catalog or blueprint.

For example, the vFabric tc Server service might have a JVM heap size of 512MB. But for a large deployment, you can override that setting and change the size to 1024MB.

You can define new values only for node properties and for application and service properties that have the **Overridable at Deployment** check box selected in the application blueprint.

a Select **Service**, **Application Component**, or **Node** from the Properties drop-down menu.

b Select the specific service, component, or node from the Properties drop-down menu.

c In the table of properties, click the New Value column of a specific row and enter the value to use in the deployment profile.

10 When you finish making your changes, click **Next**.

11 Review the components and dependencies in the execution plan.

The blue dotted lines in the execution plan define a specific order in which the deployment tasks will run. For example, because a load balancer usually cannot be configured until the application is running, you might add a dependency in the blueprint.

For services and components that have scripts associated with them, click the down arrow next to the component or service name to view the script or the variable definitions used in the script.

12 When you finish reviewing the execution plan, click **Next** and review the settings for the deployment profile.

13 Click **Save** or **Deploy**.

If you click **Deploy** the deployment profile is saved.

The deployment profile is complete and ready to run. The saved profile is listed in the Application Navigator tree on the left, under the **Deployment Profiles** folder.

**What to do next**

Add a custom task to an application deployment. See “Add Custom Tasks,” on page 78.
Use an Existing Deployment Profile

Instead of creating a deployment profile for deployment you can use an existing deployment profile.

Prerequisites

- Verify that your user account has the deployer role (ROLE_DEPLOYER) assigned to it.
- Verify that at least one deployment environment is created in vFabric Application Director. See “Create a Deployment Environment,” on page 39.
- Verify that at least one cloud template is mapped to each logical template used in the blueprint. See “Add a Template to the Catalog,” on page 47.
- Verify that at least one application is created in vFabric Application Director. See Chapter 10, “Creating Applications,” on page 67.

Procedure

1. On the vFabric Application Director home page, in the Applications list, click Manage Applications.
2. Click the name of the application to deploy. The blueprint for the application appears.
3. Click the Deploy button (_deploy_ ) in the toolbar above the canvas and select the existing deployment profile option.
   Selecting Deploy saves all of the changes to the blueprint.
4. If you created new nodes or changed the clustered node size, map the new or modified nodes to a cloud template.
   Any property overrides saved in an existing deployment profile remain overridden in the new value column even if the blueprint value is updated. Deleted properties no longer appear in the deployment profile.

What to do next

Complete the Deployment Profile wizard and deploy the application. See “Create a Deployment Profile,” on page 75 and “Deploy an Application,” on page 80.

Add Custom Tasks

In the execution deployment plan, you can add custom tasks to perform additional customized tasks in the application deployment.

A blueprint helps generate a common execution plan for an application on all of the deployment environments. In some cases, the execution plan needs to be customized for each deployment environment. For example, when an application is deployed to the production deployment environment, you might need to send an email after deploying, whereas in the test deployment environment, such checks might not be required. To accomplish this, you can create an email custom task to send a notification email when the deployment task for a service or application component successfully completes and add this task to the execution plan in the deployment profile, which deploys to the production deployment environment. If the custom task fails, the entire deployment is marked as Failed Deployment in the Details tab and no future tasks are run.
Figure 11-2. Example of Custom Tasks in the Execution Plan Tab

Prerequisites

- Verify that your user account has the deployer role (ROLE_DEPLOYER) assigned to it.
- Verify that at least one deployment environment is created in vFabric Application Director. See “Create a Deployment Environment,” on page 39.
- Verify that at least one cloud template is mapped to each logical template used in the blueprint. See “Add a Template to the Catalog,” on page 47.
- Verify that at least one application is created in vFabric Application Director. See Chapter 10, “Creating Applications,” on page 67.
- Verify that at least one custom task is created in the vFabric Application Director catalog. See “Add a Custom Task to the Catalog,” on page 52.
- Familiarize yourself with the basic concepts of defining and configuring component properties and actions. See Chapter 7, “Developing vFabric Application Director Components,” on page 41.

Procedure

1. On the vFabric Application Director home page, in the Applications list, click **Manage Applications**.
2. Click the name of the application to deploy.
   
   The blueprint for the application appears.
3. Click the **Deploy** button ( ) in the toolbar above the canvas.
4. Select an existing deployment profile and click **OK**.
5. In the deployment profile wizard navigator at the top of the screen, click though the wizard pages until you get to **Execution Plan**.
6. Click the **Expand Cluster** button ( ) in the execution plan, if the node is clustered.

If the clustered node is not expanded, the custom task is added to the first virtual machine in the cluster.
If an application architect changes a node to a clustered node, the custom task is added to the first virtual machine in the cluster.
Select and drag the **Add Script Task** button (🔗) and add a custom task in the blueprint.

When you drag the **Add Script Task** button you see anchors (⁎) that indicate where you can insert the custom task. For example, you can drag one or more custom tasks onto the Application Server, Database Server, or Load Balancer node.

After you drop a custom task onto a node, the Add Custom Task dialog box opens.

In the Add Custom Task dialog box, select a task from the **Catalog Task Name** drop-down menu.

The supported operating systems of the custom task appear. For example, if a task is supported on the CentOS 5.6 operating system, and the operating system of the node is Ubuntu 10.04, the task is not listed.

When you select a custom task, the task details, script, and property details appear in the dialog box.

(Optional) To override a property value in the **Properties** tab, click the property.

For example, in a send email custom task, one of the properties is the recipient's email address. You can set the property email address value to the recipient email address.

  - In the Edit Property dialog box, type the new value for the property or select an existing property from the drop-down menu to bind the property to one of the properties in the application blueprint.
  
  - Click **Save**.

In the Add Custom Task dialog box, review the script and property details of the custom task and click **OK**.

Click **Next** to review the application deployment settings and click **Deploy**.

The deployment summary page has several tabs that display the progress of the deployment in various ways.

**What to do next**

Explore the various ways to check the status of the in-progress deployment. See “Checking Deployment Status on the Details Tab,” on page 82 and “Checking Deployment Status on the Execution Plan Tab,” on page 83.

**Deploy an Application**

After you save a deployment profile, you can deploy the application from the vFabric Application Director user interface.

You can also deploy an application from the command-line interface. See “Deploying an Application Using CLI,” on page 96.

An application deployment summary lets you review all the settings and make any necessary changes to the deployment profile before deploying the application.
Figure 11-3. Example of an Application Deployment Settings Review Page

Prerequisites

- Verify that your user account has the deployer role (ROLE_DEPLOYER) assigned to it.
- Verify that at least one deployment profile is in vFabric Application Director. See “Create a Deployment Profile,” on page 75.

Procedure

1. On the vFabric Application Director home page, in the Applications list, click Manage Applications.
2. Click the name of the application to deploy.
   The blueprint for the application appears.
3. In the Application Navigator tree, select a deployment profile.
4. In the wizard navigator at the top of the page, click through the wizard pages and make any applicable changes.
5. Review the application deployment settings and click Deploy.
   A deployment summary page appears and refreshes every 15 seconds to display the deployment status.
6. (Optional) Click the Refresh button in the upper-right corner to update the real-time status of the deployment.

What to do next

Learn about the processes that take place when an application is deployed to the cloud. See “Understanding the Deployment Process,” on page 82.

You can also check the status of a current deployment. See “Checking Deployment Status on the Details Tab,” on page 82 and “Checking Deployment Status on the Execution Plan Tab,” on page 83.
Understanding the Deployment Process

When you deploy an application to the cloud, several processes take place. Virtual machines are created and software is provisioned in the virtual machines. It is important to understand the deployment process so that you can easily identify and troubleshoot any deployment failures.

The process of deploying an application to the cloud includes the following steps:

1. vFabric Application Director provisions the virtual machines by instantiating the templates from the vCloud Director catalog.

2. vFabric Application Director requests vCloud Director to establish network connections and receive IP addresses for all of the virtual machines in the deployment. After the IP addresses are assigned, the virtual machines restart to make sure the setup process is completed properly. The host names are derived from the application blueprint and assigned as the node names.

3. Bootstrap scripts included in the virtual machine download the agent from the vFabric Application Director server to the virtual machine. Bootstrap scripts must be installed on the physical templates. See “Creating and Updating Custom Virtual Machine Templates for Your Applications,” on page 35.

4. The agent bootstrap authenticates with the vFabric Application Director server.

5. The agent bootstrap in each virtual machine downloads the execution plan from vFabric Application Director to the virtual machine.

6. The agent bootstrap performs the installation and setup tasks for each component in the order specified in the deployment execution plan.

7. For each script, the agent waits for the dependent tasks to complete successfully, downloads all the content to the virtual machine /tmp/runid/taskname directory, and runs the tasks according to the parameter values sent by the server. When a task is complete, the agent informs the server about the status of the task.

   If a script exits with a non-zero exit status, the agent marks that task as failed. Otherwise, the agent marks the script as completed and proceeds to the next task. When a task fails, the entire deployment is cancelled, marked as Failed Deployment, and no future tasks are executed. The reason for failure is available in the Details tab. When all of the tasks pass, the deployment is marked as Deployed Successfully.

For troubleshooting purposes, you can access the deployment details included in the execution plan. The task information is captured in log files for the install, configure, and start scripts used on each component of the deployment. These logs capture all of the information that is sent to the stdout and stderr log files.

Checking Deployment Status on the Details Tab

vFabric Application Director provides a graphical user interface for checking the status of an application deployment on the Details tab. You can also use vCloud Director to check the status of the deployed virtual machines.

After you click the Deploy button on a deployment profile, on the deployment summary page, you can click the Details tab to check the status of the deployment.

To access the virtual machine console for a node after the IP address is acquired, use the VM Console tab. You can click to open a console and log in to the virtual machine. The blueprint on the Blueprint tab is a snapshot that reflects the settings and definitions the blueprint contained at the time of the deployment. If you make changes to the actual application blueprint, those changes do not affect the blueprint shown in a specific deployment. These deployments can be deleted without affecting any components or services in the application deployment.
Property overrides in the deployment profile do not appear in the values of the blueprint snapshot. The override appears in the **Execution Plan** tab property because the change was made to the deployment profile.

On the **Details** tab, when the deployment summary page refreshes every 15 seconds, you can see the virtual machine status updates in the VM Details section.

**Figure 11-4. Example of the VM Details Section on the Details Tab**

The VM Details section shows status updates when virtual machines are created. IP addresses for each virtual machine appear when they are assigned. Virtual machine-related information, such as instance name, logical template, cloud template details from vCloud Director, memory allocation, number of CPUs, and network connection are available. The check mark under the Console column indicates that the virtual machine is powered on. Agent bootstrap logs for each virtual machine is updated in the VM Logs column. If the bootstrap process fails, the deployment is labeled Failed Deployment and the reason appears in the Deployment state section. Click the ellipses button (...) in the columns to retrieve additional virtual machine specific information.

The Deployment Summary section lists details about the deployment profile, user role, start and end time of the deployment, run ID number of the subfolder containing logs, and the vApp name that is assigned to the application. You can also check the progress of a deployment in vCloud Director. Locate the vApp name and in vCloud Director, click the **My Cloud** tab and select **vApps** in the **My Cloud** tree on the left side of the screen. Search for the vApp name of the application you deployed in vFabric Application Director.

The Application Details section includes name and version information about the application blueprint.

The Deployment Location section incorporates deployment environment, cloud provider name, organization vDC, host IP address, Org name, and User name details. The information shown in this section is a snapshot of the application blueprint and deployment profile at the time of the deployment. If you make changes to the actual application blueprint, those changes do not affect the blueprint shown in a specific deployment.

**Checking Deployment Status on the Execution Plan Tab**

vFabric Application Director provides a graphical user interface for checking the status of an application deployment in real time on the Execution Plan tab.

After you click the **Deploy** button on a deployment profile, on the deployment summary page, you can click the **Execution Plan** tab to check the status of the deployment.

After the IP addresses are acquired and agents are bootstrapped, the components are deployed, installed, and configured according to the dependencies of the application shown by the arrows between the tasks. On the **Execution Plan** tab, you can view the status of each task when the screen refreshes every 15 seconds.
You can also check the status and details of a deployment from the **Deployments** tab. Click the **Refresh** button in the upper-right corner of the page to update the status. See “View Deployment Details for an Application,” on page 85.

**Figure 11-5. Example of the Execution Plan Tab on the Deployment Summary Page**

The following icons indicate the deployment status for each component.

- Task has not yet begun (활동).
- Task is in progress (활동).
- Task is finished successfully (완료).
- Task has failed (실패).
- Task waiting for one of the dependencies to finish running (대기).

You can examine the log files for an action script after a deployment either finishes successfully or fails. To access the log files, click the gear icon in the upper-right corner of the task and select **View Logs**. To view the property values for the script, click the gear icon in the upper-right corner of the task and select **View Properties**.
When you deploy an application, an item is added to the Deployments tab in vFabric Application Director. You can use this tab to view a list of all the deployments, examine the deployment details of an individual deployment, teardown a deployed application from the cloud, or remove an application deployment record from vFabric Application Director.

This chapter includes the following topics:

- “View Deployment Details for an Application,” on page 85
- “Teardown an Application from the Cloud,” on page 86
- “Delete an Application Deployment from vFabric Application Director,” on page 87
- “Collect Logs to Troubleshoot Deployment Failures,” on page 88
- “Troubleshooting Common Errors During Deployment,” on page 89

### View Deployment Details for an Application

You can use the Deployments tab to navigate to details about the success or failure of a particular application deployment. You can find such details as the IP addresses that were assigned, the cloud networks chosen, and the logs for each installation, configuration, and startup scripts that were run.

All of the users roles can view deployments that are associated with their user’s group.

Each deployment listed on the Deployments tab has a snapshot of the application blueprint and deployment profile at a particular time. If you make changes to the actual application blueprint or deployment profile, those changes do not affect the blueprint or deployment shown in a specific deployment.

The Details tab shows the overall status of the deployment. See “Checking Deployment Status on the Details Tab,” on page 82 and “Checking Deployment Status on the Execution Plan Tab,” on page 83.

**Procedure**

1. On the vFabric Application Director home page, in the Deployments list, click Manage Deployments.
2. Click the name of the deployment.
   
   The deployment details page appears with four tabs at the top of the page. The VM Console tab provides quick access to each virtual machine, and lets you log in to the virtual machine.
Use the tabs to find application deployment information.

<table>
<thead>
<tr>
<th>Type of Information</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reason for deployment failure</td>
<td>Look at the top of the Details tab. For action script failure, review the individual tasks on the Execution Plan tab.</td>
</tr>
<tr>
<td>Start time and end time</td>
<td>For the overall deployment status, look on the Details tab. For specific tasks, look on the Execution Plan tab.</td>
</tr>
<tr>
<td>Order in which components were created</td>
<td>Look on the Execution Plan tab.</td>
</tr>
<tr>
<td>vApp Name of the application</td>
<td>Look on the Details tab. You need the vApp name to find information about the deployment in vCloud Director.</td>
</tr>
<tr>
<td>IP Addresses of the virtual machines</td>
<td>Look on the Details tab or the VM Console tab.</td>
</tr>
<tr>
<td>Logs</td>
<td>Virtual machine provisioning logs are on the Details tab. Virtual machine-specific agent bootstrap logs are in the table of virtual machines at the bottom of the Details tab. Logs for action scripts are on the Execution Plan tab.</td>
</tr>
<tr>
<td>Details about a component or action script and its properties</td>
<td>Click the component on the Blueprint tab. The details listed there are the settings and definitions that the blueprint contained at the time of deployment.</td>
</tr>
<tr>
<td>Details about a deployed virtual machine</td>
<td>Look in the table of virtual machines at the bottom of the Details tab. This information includes disk size. Click the ellipses (...) in the Cloud Template column to retrieve this information from vCloud Director.</td>
</tr>
<tr>
<td>Details about the networks used for a virtual machine</td>
<td>Look in the table of virtual machines at the bottom of the Details tab. This information includes the IP range, whether the virtual machine uses a static IP or DHCP, and so on. Click the ellipses (...) in the Network Information column to retrieve this information from vCloud Director.</td>
</tr>
<tr>
<td>Console to access a virtual machine</td>
<td>Look on the VM Console tab or in the table of virtual machines at the bottom of the Details tab. You can view the status when the screen refreshes every 15 seconds. The green check mark under the Console column indicates that the virtual machine is powered on.</td>
</tr>
</tbody>
</table>

What to do next

To teardown a deployed application from the cloud, see “Teardown an Application from the Cloud,” on page 86.

To delete the deployment record, see “Delete an Application Deployment from vFabric Application Director,” on page 87.

Teardown an Application from the Cloud

vFabric Application Director can teardown the vApp and associated virtual machines that are part of the deployed application from the cloud.

You can teardown a deployed application from the vFabric Application Director user interface or the command-line interface. See “Using CLI to Teardown a Deployment,” on page 96.

If a deployment fails after installing one or more virtual machines that are part of an application or if applications were deployed successfully, you can use vFabric Application Director to teardown the application. All virtual machines in the application are removed from their hosts in the cloud.

Deployment teardown from the cloud does not remove the deployment record from the Deployments tab in vFabric Application Director. To remove the deployment record from the Deployments tab, see “Delete an Application Deployment from vFabric Application Director,” on page 87.

Prerequisites

- Verify that your user account has the deployer role (ROLE_DEPLOYER) assigned to it.
Verify that the virtual machines that are part of the application still exist in the cloud. If, for example, your environment has a policy of deleting virtual machines after a certain number of days, the virtual machines might already be deleted.

**Procedure**

1. On the vFabric Application Director home page, in the Deployments list, click **Manage Deployments**.
2. From the list of deployed applications, select the application to tear down.
3. Click the **Remove this vApp from the cloud** button (🗑️) in the Actions column.
4. Confirm the tear down.
5. (Optional) If the tear down process fails, repeat the process.

The **Details** tab appears and displays the status of the tear down process and the application deployment details. After the virtual machines are deleted successfully from their hosts in the cloud, a confirmation message appears in the Deployment State section.

**What to do next**

To delete the record of a deployment from the **Deployments** tab, see “Delete an Application Deployment from vFabric Application Director,” on page 87.

### Delete an Application Deployment from vFabric Application Director

After you remove an application from the cloud, or if you do not need details for a particular deployment, you can delete the deployment from the **Deployments** tab in vFabric Application Director.

Deleting a deployment from the **Deployments** tab in vFabric Application Director does not actually delete the deployed application, or vApp, and its virtual machines from the cloud. To delete an application from the cloud, see “Teardown an Application from the Cloud,” on page 86.

---

**IMPORTANT** If you delete a deployment from the **Deployments** tab without first tearing down the deployed application from the cloud, you must use vCloud Director to delete the vApp and associated virtual machines that were deployed.

**Prerequisites**

Your user account must have the deployer role (**ROLE_DEPLOYER**) assigned to it.

**Procedure**

1. On the vFabric Application Director home page, in the Deployments list, click **Manage Deployments**.
2. From the list of deployed applications, select the application to delete.
3. Click the **Delete Deployment** button (🗑️) in the Actions column.
4. Confirm the deletion.

The row is removed from the table on the **Deployments** tab.
Collect Logs to Troubleshoot Deployment Failures

vFabric Application Director creates virtual machine-specific logs and an overall deployment log to aid in troubleshooting.

You can use the log pages in the vFabric Application Director user interface to find and correct some problems on your own. If a technical support representative requests more logs, you can retrieve them from the file system of the vFabric Application Director virtual appliance or the virtual machines that were created as part of an application deployment.

Prerequisites

- Verify that you have access to the virtual machine where vFabric Application Director is installed and have the password for logging in with the darwin_user user account. This password was set during installation. See “Initial Start Up of vFabric Application Director Virtual Machine,” on page 23.
- Verify that you have credentials for logging in as root.

Procedure

- For failed tasks, use the vFabric Application Director user interface to copy the action script logs.
  a. On the vFabric Application Director home page, in the Deployments list, click Manage Deployments.
  b. Click the name of the deployment and click the Execution Plan tab.
  c. (Optional) If the node is clustered, click the Expand Cluster button first.
  d. On the failed node, click the View Task Information button.
  e. From the drop-down menu, select View Logs and copy all of the text in the log window.

You can paste the log into a text file, email, or create a bug report to send it to a technical support engineer.

- To collect logs from the vFabric Application Director virtual appliance, log in to the virtual machine and send catalina.out output from the /home/darwin/tcserver/darwin/logs directory.

- To collect logs from a virtual machine that was created as part of an application deployment, perform the following tasks:
  a. Copy all log files under the /opt/vmware-appdirector/agent/log directory on the deployed virtual machine.
  b. In the vFabric Application Director user interface, on the Deployment tab, click the name of the deployment, and on the Details tab note the run ID number.
  c. On the virtual machine, navigate to the /tmp/runid subdirectory and tar the subdirectory.

This directory contains many logs relating to application components.

What to do next

Send the logs to a technical support representative.
## Troubleshooting Common Errors During Deployment

If an application deployment fails, the Deployment Details page shows a reason for the failure. For the most common errors, you can use these solutions and redeploy the application.

### Table 12-1. Common Errors During Application Deployment

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Possible Cause</th>
<th>Possible Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>An error occurred in the cloud: com.vmware.darwin.cal.api.exceptions.CALOperationException: createVapp: Unable to perform this action. Contact your cloud administrator.</td>
<td>The cloud template used for deployment is not correct. The virtual machines cannot be created in the cloud or the password in the virtual machines cannot be set.</td>
<td>Follow the instructions for creating a custom virtual machine template in “Creating and Updating Custom Virtual Machine Templates for Your Applications,” on page 35. If you are using a predefined template, contact your vCloud Director administrator to verify that the template is correctly uploaded to the cloud.</td>
</tr>
<tr>
<td>Error in vCloud: The EULA of the entity must be accepted for it to be instantiated.</td>
<td>The cloud template requires a EULA to be accepted.</td>
<td>Disable the Create EULA check box because cloud templates should not have EULAs. For more information, see “Creating and Updating Custom Virtual Machine Templates for Your Applications,” on page 35.</td>
</tr>
<tr>
<td>com.vmware.darwin.exceptions.CloudException: com.vmware.darwin.cal.api.exceptions.CALOperationException: Unable to compose vapp 'appd-xxx-1.0.0-admin-1028-0b37d0cf-1b8d-42a2-8212-a048e61bcb'</td>
<td>Typically, this error is caused by insufficient resources, such as IP addresses or storage, in the cloud. Check virtual machine logs or the tc Server log for more detailed error messages from the cloud.</td>
<td>Verify that enough IP addresses are available in the network to which you are deploying. Also, check if the organization vDC has enough storage.</td>
</tr>
<tr>
<td>Error in vCloud: The operation was aborted because you would exceed your stored virtual machine quota. 1 new virtual machine would have been created, and you are already using 100 of a limit of 100.</td>
<td>The deployment error occurred because the virtual machine has exceeded the available storage capacity.</td>
<td>Delete any unwanted deployments from vFabric Application Director to free some IP addresses and storage space.</td>
</tr>
<tr>
<td>An error occurred in the cloud: sendPowerOn: There are insufficient CPU or memory resources to complete the operation.</td>
<td>The deployment error occurred because the virtual machine has exceeded the available CPU or memory.</td>
<td>Reconfigure CPU or memory allocation in the vCloud Director.</td>
</tr>
<tr>
<td>Run failed due to failure of task (node name, agent_bootstrap).</td>
<td>The vFabric Application Director agent cannot bootstrap and contact the Darwin server within the set time limit due to several reasons.</td>
<td>Detailed agent logs are available in the deployed virtual machine in the /opt/vmware-appdirector/agent/logs folder. Run network diagnostics to verify that you can ping the Darwin server appliance from the virtual machine. See the operating system documentation for the specific hardware and system requirements.</td>
</tr>
<tr>
<td>Agent bootstrap script is not present on the virtual machine template. See “Creating and Updating Custom Virtual Machine Templates for Your Applications,” on page 35.</td>
<td>Agent does not have network connectivity with the Darwin server appliance.</td>
<td></td>
</tr>
<tr>
<td>Insufficient memory allocation disrupted the virtual machine operating system boot sequence.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 12-1. Common Errors During Application Deployment (Continued)

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Possible Cause</th>
<th>Possible Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run failed due to failure of task <em>(node name,task name)</em>.</td>
<td>One of the execution plan tasks failed. The following problems are some of the reasons that an execution plan task might fail:</td>
<td>Open the <strong>Execution Plan</strong> tab on the Deployment page and identify the task that failed. Click on the gear icon and click <strong>View Logs</strong>. If the task log does not indicate the failure, examine the agent logs in the deployed virtual machine. Agent logs are in the logs directory under the <em>/opt/vmware-appdirector/agent</em> folder.</td>
</tr>
<tr>
<td></td>
<td>- A property of type content is not set to a valid URL. The agent log displays the following message:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exception while running task <em>(node name),&lt;task name&gt;</em>, message Cannot fetch content, url http://&lt;ip address&gt;:8443/darwin/api/file/download/123 is not accessible or invalid. cause IOException: Server returned HTTP response code: 500 for URL: http://&lt;ip address&gt;:8443/darwin/api/file/download/123 Run failed due to failure of task <em>(node name),&lt;task name&gt;</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- A property name has hyphens and other characters that are not valid for shell scripts.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The repository URL is not set to the correct operating system version.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Action scripts might need Java installed on the cloud template and Java is not installed in the cloud template.</td>
<td></td>
</tr>
<tr>
<td>Error in vCloud: There are insufficient IP addresses to complete the operation.</td>
<td>Insufficient IP addresses in the network.</td>
<td>Assign additional IP addresses to the application being deployed. Delete any unwanted deployments from vFabric Application Director to free some IP addresses and storage space.</td>
</tr>
<tr>
<td>You need to add IP addresses to the network that is associated with the object being created or deployed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>An error occurred in the cloud: sendPowerOn: Unable to perform this action.</td>
<td>The vSphere Distributed Resource Scheduler (DRS) failed to move a virtual machine from one ESX host to another.</td>
<td>Contact your cloud administrator.</td>
</tr>
<tr>
<td>Contact your cloud administrator.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>An error occurred in the cloud: createVapp: The operation failed because VirtualCenter &quot;Darwin-vCenter-5.0&quot; is not connected.</td>
<td>The vCenter instance is not connected.</td>
<td>Request your cloud administrator to connect the virtual center to the vCloud Director instance.</td>
</tr>
<tr>
<td>An application deployment has failed but a task is still running in the</td>
<td>In some cases, one of the tasks in the application deployment is running. At the same time, another task fails to deploy. vFabric Application Director immediately marks the entire deployment as failed. However, the task that is in progress continues to run until it finishes.</td>
<td>If the issue manifests itself, open the <strong>Execution Plan</strong> tab on the Deployment page. Diagnose the cause of the long running task and fix any blueprint or network connectivity issues. If the problem is intermittent you can teardown the failed deployment from the cloud. See “Teardown an Application from the Cloud,” on page 86.</td>
</tr>
<tr>
<td>execution deployment summary.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This problem does not generate an error message.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 12-1. Common Errors During Application Deployment (Continued)

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Possible Cause</th>
<th>Possible Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>A deployment is in progress infinitely and does not show either a pass or fail deployments status. This problem does not generate an error message.</td>
<td>Intermittent loss of connection with the Tomcat service, the server restarts during a deployment process, or the agent bootstrap fails. <strong>Note</strong>: This problem does not surface for all connections failures. It happens based on the state of the deployment when the connection failure occurred.</td>
<td>If the issue manifests itself, open the <strong>Execution Plan</strong> tab on the Deployment page. Diagnose the cause of the long running task and fix any blueprint or network connectivity issues. If the problem is intermittent you can teardown the failed deployment from the cloud. See “Teardown an Application from the Cloud,” on page 86.</td>
</tr>
<tr>
<td>A deployment with one or more custom task is in progress infinitely and the deployment cannot be stopped from vFabric Application Director. This problem does not generate an error message.</td>
<td>One or more custom tasks in the deployment might not have been given names.</td>
<td>You can reclaim the cloud resources from the vCloud Director application, if you have the appropriate privileges and delete the vApp corresponding to the deployment. In the deployment profile wizard, verify that the custom tasks have names and redeploy the application. See “Deploy an Application,” on page 80.</td>
</tr>
<tr>
<td>Exception while running task (node name, task name), message Cannot fetch content, url <a href="https://10.12.125.18:8443/darwin/api/file/download/">https://10.12.125.18:8443/darwin/api/file/download/</a> is not a accessible or invalid. cause SunCertPathBuilderException: unable to find valid certification path to requested target</td>
<td>The deployment error occurred because the content property might not have a value assigned to it.</td>
<td>You must add a URL in the content property value for the deployment to successfully complete. See “Types of Properties,” on page 42.</td>
</tr>
<tr>
<td>Unable to automatically setup: Invalid username/password The Hyperic Agent does not start but the deployment status was successful.</td>
<td>The Hyperic Agent server username and password might be incorrect causing the hq-agent.sh script to fail.</td>
<td>Type the correct Hyperic Agent server username and password in the configure script and launch the application deployment.</td>
</tr>
<tr>
<td>Overriding the blueprint property value in the deployment profile wizard and resetting the blueprint value to the original version might cause the value to be converted into a string as opposed to expressions.</td>
<td>Blueprint properties reset to the original values in the deployment profile wizard are not evaluated as expressions.</td>
<td>Reload the deployment profile and deploy the application without resetting the blueprint value.</td>
</tr>
</tbody>
</table>
The vFabric Application Director command-line interface (CLI) is a Spring Roo-based client that communicates to the vFabric Application Director server using REST APIs.

User accounts with the system administrator role can use the vFabric Application Director CLI to create and manage users and groups. User accounts with the system administrator role or deployer roles can use the CLI to deploy or teardown applications from the cloud. See “Predefined Users, Groups, and Roles,” on page 29.

**Note** The predefined user accounts are disabled by default. If you do not enable these accounts, you can use only the admin user. The password for the admin user is the admin password that was set the first time the appliance was booted up.

This chapter includes the following topics:

- “Start the CLI in an Appliance,” on page 93
- “Start the CLI Remotely,” on page 94
- “Available CLI Options,” on page 95

## Start the CLI in an Appliance

You can start the vFabric Application Director command-line interface (CLI) from an appliance.

### Prerequisites

Verify that you know the password for the darwin_user. This password was set during installation. See “Initial Start Up of vFabric Application Director Virtual Machine,” on page 23.

### Procedure

1. Use the SSH client to log in to the vFabric Application Director appliance as the user darwin_user.
   
   The password for this account was set during installation.

2. Change directories to /home/darwin/tools.

3. To open the vFabric Application Director CLI, run the java -jar darwin-cli.jar command.

4. Log in to the vFabric Application Director server.

   ```
   login --serverUrl https://DarwinServerIP:8443/darwin --username admin_role --password password
   ```

   In this command, admin_role is a user with the system administrator role, and password is the password for the account. Replace DarwinServerIP with the vFabric Application Director server IP address.

   The system returns a message similar to this:

   ```
   You are logged in to https://$(darwin.server.ip):8443/darwin as admin.
   ```
What to do next

Familiarize yourself with users and groups to enable and assign appropriate roles to specific users. See “Overview of Users, Roles, and Groups,” on page 27 and “Use the vFabric Application Director CLI to Create Users and Groups,” on page 29.

You can also use the CLI options to deploy an application or teardown a deployed application from the cloud. See “Available CLI Options,” on page 95.

Start the CLI Remotely

You can start the vFabric Application Director CLI from a remote machine.

Prerequisites

- Verify that you know the password for the darwin_user. This password was set during installation. See “Initial Start Up of vFabric Application Director Virtual Machine,” on page 23.
- Familiarize yourself with the roles available for users. See “Predefined Users, Groups, and Roles,” on page 29.
- Verify that you installed Java (JDK 1.6) on your remote machine.
- Make sure that the remote machine can connect to the vFabric Application Director appliance using HTTP.

Procedure

1. On the vFabric Application Director appliance, open a command prompt and change directories.
   
   cd /home/darwin/tools

2. Copy the darwin-cli.jar file to the remote machine.

3. To open the vFabric Application Director CLI from a remote machine, log in to the remote machine.

4. Change directory to the folder containing the copied darwin-cli.jar file.

5. Run the java -jar darwin-cli.jar command.

6. Log in to the vFabric Application Director server.

   login --serverUrl https://DarwinServerIP:8443/darwin --username admin_role --password password

   In this command, admin_role is a user with the system administrator role, and password is the password for the account. Replace DarwinServerIP with the vFabric Application Director server IP address.

   The system returns a message similar to this:

   You are logged in to https://${darwin.server.ip}:8443/darwin as admin.

What to do next

Determine the users who can use vFabric Application Director and assign appropriate roles to specific users. See “Overview of Users, Roles, and Groups,” on page 27 and “Use the vFabric Application Director CLI to Create Users and Groups,” on page 29.

You can also use the CLI options to teardown a deployed application from the cloud. See “Available CLI Options,” on page 95.
Available CLI Options

With the vFabric Application Director command-line interface options, you can create and manage users and groups, deploy an application, or teardown an application from the cloud.

After you log in to the CLI program, in the `roo` shell prompt, press the Tab key to display the list of available commands in vFabric Application Director. If you use multiple words with spaces between the words, enclose the words in quotation marks. Often after you enter a command, the system displays many details, in addition to indicating whether the command was successful.

The general CLI options are available to all user groups in vFabric Application Director.

Table 13-1. General CLI Commands

<table>
<thead>
<tr>
<th>CLI Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>help</td>
<td>Lists usage information.</td>
</tr>
<tr>
<td>cliversion</td>
<td>Displays the CLI version information.</td>
</tr>
<tr>
<td>login</td>
<td>Logs in the current user to the <code>roo</code> shell.</td>
</tr>
<tr>
<td>logout</td>
<td>Logs out the current user without closing the <code>roo</code> shell prompt. You can log out and log in as a different user.</td>
</tr>
<tr>
<td>exit</td>
<td>Exits the CLI program.</td>
</tr>
</tbody>
</table>

- **Managing Users and Groups** on page 95
  To manage users and groups from the CLI, you must create users and groups.

- **Deploying an Application Using CLI** on page 96
  To deploy an application, your user account must have the deployer role (`ROLE_DEPLOYER`) assigned to it.

- **Using CLI to Teardown a Deployment** on page 96
  To teardown a deployment, your user account must have the deployer role (`ROLE_DEPLOYER`) assigned to it.

Managing Users and Groups

To manage users and groups from the CLI, you must create users and groups.

Verify that your user account has the system administrator role (`ROLE_SYSTEM_ADMIN`) assigned to it.

See “Use the vFabric Application Director CLI to Create Users and Groups,” on page 29.

**NOTE** Unknown CLI options are ignored by the `roo` shell.

Table 13-2. Manage Users and Groups in the CLI

<table>
<thead>
<tr>
<th>CLI Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>change-password</td>
<td>Changes the password of the current user.</td>
</tr>
<tr>
<td>change-user-password --username UserName --password Password</td>
<td>Changes a user's password.</td>
</tr>
<tr>
<td>create-group --name GroupName --description Description</td>
<td>Creates a group. For example, to create a group called Test Group, use the command <code>create-group --name &quot;Test Group&quot;</code>.</td>
</tr>
</tbody>
</table>
Table 13-2. Manage Users and Groups in the CLI (Continued)

<table>
<thead>
<tr>
<th>CLI Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>create-user --username UserName --firstName FirstName --lastName LastName --password password --enabled true --roles ROLE_SYSTEM_ADMIN, ROLE_CATALOG_ADMIN, ROLE_CLOUD_ADMIN, ROLE_DEPLOYER, ROLE_APP_ARCHITECT --group groupName</td>
<td>Creates a user. If you specify all the roles shown in this example, the user is the equivalent of the admin user. Specify only the roles the specific user must have. The valid values for the enabled option are true, yes, 1, false, no, and 0.</td>
</tr>
<tr>
<td>update-user --username UserName --roles ROLE_SYSTEM_ADMIN, ROLE_CLOUD_ADMIN</td>
<td>Changes the roles assigned to a user. In this example, the roles ROLE_SYSTEM_ADMIN, ROLE_CLOUD_ADMIN are used. Substitute a comma-separated list of the roles you want the user to have. Do not add a space between the comma-separated list.</td>
</tr>
<tr>
<td>update-user --username UserName --group groupName</td>
<td>Changes a user’s group.</td>
</tr>
<tr>
<td>enable-user --username UserName</td>
<td>Enables a user account.</td>
</tr>
<tr>
<td>disable-user --username UserName</td>
<td>Disables a user account. CAUTION The disable option also allows you to disable your user account. If you are the only user with system administrator privileges, you cannot reenable your user account.</td>
</tr>
<tr>
<td>list-user</td>
<td>Lists information about all users.</td>
</tr>
<tr>
<td>list-user --username name</td>
<td>Displays information about a specific user.</td>
</tr>
<tr>
<td>list-roles</td>
<td>Lists information about all the roles.</td>
</tr>
<tr>
<td>list-group</td>
<td>Shows information about all the groups.</td>
</tr>
</tbody>
</table>

Deploying an Application Using CLI

To deploy an application, your user account must have the deployer role (ROLE_DEPLOYER) assigned to it.

Before you deploy an application, verify that you have a deployment profile that is complete, saved, and free of any validation errors. You also need the name of the application. You can check the status of the deployment in the vFabric Application Director user interface or in vCloud Director. See “Checking Deployment Status on the Details Tab,” on page 82 and “Checking Deployment Status on the Execution Plan Tab,” on page 83.

Table 13-3. Deploy an Application in the CLI

<table>
<thead>
<tr>
<th>CLI Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>deploy --name ApplicationName-ApplicationVersion-DeploymentProfileName</td>
<td>Deploys an application blueprint. For example, to deploy the Clustered Dukes Bank application, version 2.1.0, with the prod-dep deployment profile, use the command deploy --name &quot;Clustered Dukes Bank App-2.1.0-prod-dep&quot;. Type deploy and press the Tab key to display the possible options for the command. If the list does not display quotation marks for multiple words with spaces between the words, enclose the words in quotation marks.</td>
</tr>
</tbody>
</table>

Using CLI to Teardown a Deployment

To teardown a deployment, your user account must have the deployer role (ROLE_DEPLOYER) assigned to it.

Before you teardown a deployed application from the cloud, verify that you have the deployment name of the deployed application. You can monitor the status of the teardown process from the vFabric Application Director user interface. See “Teardown an Application from the Cloud,” on page 86.
Table 13-4. Remove Deployment in the CLI

<table>
<thead>
<tr>
<th>CLI Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>teardown --name</td>
<td>Teardown a deployed application from the vCloud Director. For example, the teardown --name appd-TestApp-1.0.0-admin-3-a99309aa-05b-45c2-b6a9-bac4f178e command removes the application from the cloud. Type teardown and press the Tab key to display the possible options for the command. If the list does not display quotation marks for multiple words with spaces between the words, enclose the words in quotation marks.</td>
</tr>
</tbody>
</table>
Troubleshooting vFabric Application Director Errors

Known vFabric Application Director troubleshooting information can assist you in solving common problems.


Table 14-1. Troubleshooting Common vFabric Application Director Errors

<table>
<thead>
<tr>
<th>Error</th>
<th>Possible Cause</th>
<th>Possible Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>The execution plan takes a long time to render and in some Web browsers causes the Adobe Flash Player plug-in to fail.</td>
<td>The cluster size of a node is set to a large value, such as 256.</td>
<td>Reduce the cluster size of the node and deploy the application. See “Creating an Advanced Blueprint,” on page 70.</td>
</tr>
<tr>
<td>Agent did not respond while running task agent_bootstrap on the node CentOS_x32_5.6. Please check agent logs. For CentOS logical templates, guest customization does not successfully complete, causing a failure in the agent bootstrap script and the overall deployment fails.</td>
<td>Having more than five NICs on a node in a CentOS virtual machine might cause the problem.</td>
<td>Reduce the number of NICs for an individual node on the CentOS virtual machines. See “Define Multiple NICs for a Node,” on page 72.</td>
</tr>
<tr>
<td>An invalid URL error in the Web browser.</td>
<td>The Adobe Flash Player plug-in might not be supported.</td>
<td>Verify that you are running the supported version of the Adobe Flash Player plug-in, in your Web browser. See “vFabric Application Director System Requirements,” on page 18.</td>
</tr>
<tr>
<td>ERROR in ch.qos.logback.core.joran.spi.ConfigurationWatchList@158f9d3 - URL [jar:file:/opt/vmware-appdirector/agent/nobel-agent.jar!/logback.xml] is not of type file</td>
<td>If you deploy a vFabric tc Server on a node with a Linux operating system, an error message mistakenly appears in the log file /opt/vmware-appdirector/agent/logs/agent_bootstrap.log.</td>
<td>You can safely ignore the error message.</td>
</tr>
<tr>
<td>The Zimbra Clustered application does not load but the deployment status was successful.</td>
<td>The zimbra_nfs_path property value might point to an unavailable NFS server.</td>
<td>Add a zimbra_nfs_path to an NFS server that is working and deploy the Zimbra Clustered application. See “Deploy the Zimbra Clustered Application,” on page 61.</td>
</tr>
<tr>
<td>Blueprint does not have any nodes. Add a node by dragging one of the logical templates.</td>
<td>For a blueprint with a blank canvas, when you click the Details button under the Application Navigator section of the blueprint editor, vFabric Application Director attempts to save the blueprint and fails.</td>
<td>Make sure that the blueprint contains one or more nodes before you click the Details button.</td>
</tr>
<tr>
<td>Error</td>
<td>Possible Cause</td>
<td>Possible Solution</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>The application name includes special characters causing the deployment to fail.</td>
<td>Rename the application without using special characters. You can add spaces between the letters or numbers.</td>
<td></td>
</tr>
<tr>
<td>The horizontal and vertical scroll bars do not appear on some of the vFabric Application Director pages.</td>
<td>Refresh your Web browser or close the left navigation bar.</td>
<td></td>
</tr>
<tr>
<td>`/usr/lib/python2.4/site-packages/Cheetah/Compiler.py:1508: UserWarning: You don't have the C version of NameMapper installed! I'm disabling Cheetah's useStackFrames option as it is slow with the Python version of NameMapper. You should get a copy of Cheetah with the compiled C version of NameMapper. warnings.warn(</td>
<td>After you deploy the Clustered Dukes Bank application, in the JBoss install and configure log file an error message mistakenly appears.</td>
<td>You can safely ignore the error message.</td>
</tr>
<tr>
<td>[Warning] option <code>max_join_size': unsigned value 18446744073709551615 adjusted to 4294967295 OK Filling help tables... [Warning] option </code>max_join_size': unsigned value 18446744073709551615 adjusted to 4294967295 OK</td>
<td>If you deploy a MySQL predefined service in a CentOS5.6 64-bit logical template, in the MySQL configure log file an error message mistakenly appears.</td>
<td>You can safely ignore the error message.</td>
</tr>
<tr>
<td>Hyperic Agent fails with a java.io.EOFException error.</td>
<td>The error might appear intermittently in the Execution Plan log file.</td>
<td>Relaunch your application deployment.</td>
</tr>
<tr>
<td>Could not save Application version because another session has modified it.</td>
<td>While an application architect is deploying an application blueprint, if another application architect attempts to access the same blueprint, the error message appears in the browser of the second application architect.</td>
<td>Click the Refresh button to reload the application deployment.</td>
</tr>
</tbody>
</table>
### Table 14-1. Troubleshooting Common vFabric Application Director Errors (Continued)

<table>
<thead>
<tr>
<th>Error</th>
<th>Possible Cause</th>
<th>Possible Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exception while running task (node name, task name), message</td>
<td>The provisioned virtual machine is attempting to download content from</td>
<td>Manually export and save a certificate file from a supported Web browser. Copy the virtual machine template in vCloud Director and import the certificate.</td>
</tr>
<tr>
<td>Cannot fetch content, url <a href="https://10.30.12.18:8443/darwin/conf/darwin">https://10.30.12.18:8443/darwin/conf/darwin</a></td>
<td>self-signed servers.</td>
<td>1  From the command prompt, log in as root and add the certificate file to the virtual machine.</td>
</tr>
<tr>
<td><em>global.conf is not accessible or invalid cause</em></td>
<td></td>
<td>2keytool -import-trust cacerts -alias UniqueAlias -file CertFilePath.crt -keystore /usr/java/jre-vmware/lib/security/cacerts</td>
</tr>
<tr>
<td>SunCertPathBuilderException:</td>
<td></td>
<td>2 Reset vFabric Application Director.</td>
</tr>
<tr>
<td>unable to find valid certification path to requested target</td>
<td></td>
<td>3 Register your cloud provider templates to use this virtual machine template. See &quot;Register a Template,&quot; on page 38 and &quot;Add a Template to the Catalog,&quot; on page 47.</td>
</tr>
<tr>
<td>For some users, when connecting to a new cloud provider a peer not</td>
<td>The certificate of the cloud provider is not in the vFabric Application</td>
<td>Manually export and save a certificate file from a supported Web browser. Import the certificate to the vFabric Application Director appliance trusted list.</td>
</tr>
<tr>
<td>authenticated error appears.</td>
<td>Director server's trusted list.</td>
<td>1  From the command prompt, log in as root and add the certificate file to the vFabric Application Director appliance trusted list.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2keytool -import-trust cacerts -alias UniqueAlias -file CertFilePath.crt -storepass&quot;&quot;-keystore /home/darwin/keystore/appd.truststore</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Restart the tc Server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/etc/init.d/vmware-darwin-tcserver restart</td>
</tr>
</tbody>
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