

# CA Server Automation

## Rapid Server Imaging Server for AppLogic Installation and User Guide

12.7



This Documentation, which includes embedded help systems and electronically distributed materials, (hereinafter referred to as the "Documentation") is for your informational purposes only and is subject to change or withdrawal by CA at any time.

This Documentation may not be copied, transferred, reproduced, disclosed, modified or duplicated, in whole or in part, without the prior written consent of CA. This Documentation is confidential and proprietary information of CA and may not be disclosed by you or used for any purpose other than as may be permitted in (i) a separate agreement between you and CA governing your use of the CA software to which the Documentation relates; or (ii) a separate confidentiality agreement between you and CA.

Notwithstanding the foregoing, if you are a licensed user of the software product(s) addressed in the Documentation, you may print or otherwise make available a reasonable number of copies of the Documentation for internal use by you and your employees in connection with that software, provided that all CA copyright notices and legends are affixed to each reproduced copy.

The right to print or otherwise make available copies of the Documentation is limited to the period during which the applicable license for such software remains in full force and effect. Should the license terminate for any reason, it is your responsibility to certify in writing to CA that all copies and partial copies of the Documentation have been returned to CA or destroyed.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, CA PROVIDES THIS DOCUMENTATION "AS IS" WITHOUT WARRANTY OF ANY KIND, INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NONINFRINGEMENT. IN NO EVENT WILL CA BE LIABLE TO YOU OR ANY THIRD PARTY FOR ANY LOSS OR DAMAGE, DIRECT OR INDIRECT, FROM THE USE OF THIS DOCUMENTATION, INCLUDING WITHOUT LIMITATION, LOST PROFITS, LOST INVESTMENT, BUSINESS INTERRUPTION, GOODWILL, OR LOST DATA, EVEN IF CA IS EXPRESSLY ADVISED IN ADVANCE OF THE POSSIBILITY OF SUCH LOSS OR DAMAGE.

The use of any software product referenced in the Documentation is governed by the applicable license agreement and such license agreement is not modified in any way by the terms of this notice.

The manufacturer of this Documentation is CA.

Provided with "Restricted Rights." Use, duplication or disclosure by the United States Government is subject to the restrictions set forth in FAR Sections 12.212, 52.227-14, and 52.227-19(c)(1) - (2) and DFARS Section 252.227-7014(b)(3), as applicable, or their successors.

Copyright © 2012 CA. All rights reserved. All trademarks, trade names, service marks, and logos referenced herein belong to their respective companies.

# Contact CA Technologies

## Contact CA Support

For your convenience, CA Technologies provides one site where you can access the information that you need for your Home Office, Small Business, and Enterprise CA Technologies products. At <http://ca.com/support>, you can access the following resources:

- Online and telephone contact information for technical assistance and customer services
- Information about user communities and forums
- Product and documentation downloads
- CA Support policies and guidelines
- Other helpful resources appropriate for your product

## Providing Feedback About Product Documentation

If you have comments or questions about CA Technologies product documentation, you can send a message to [techpubs@ca.com](mailto:techpubs@ca.com).

To provide feedback about CA Technologies product documentation, complete our short customer survey which is available on the CA Support website at <http://ca.com/docs>.

## CA Technologies Product References

The following terms are used interchangeably and refer to the same things in the documentation:

- *Rapid Server Imaging (RSI) server and DynaCenter server*
- *RSI agent and DynaCenter Provisioning Agent (DPAD)*
- *RSI and Management Workstation (MWS)*

DynaCenter versions correspond to the following CA Server Automation releases:

- CA Server Automation 12.7 supports DynaCenter 4.2
- CA Server Automation 12.6 supports DynaCenter 4.1
- CA Server Automation 12.5 supports DynaCenter 4.0

<b>Preface</b> .....	<b>9</b>
About This Guide.....	9
Audience .....	9
What's New in this Guide.....	9
DynaCenter for AppLogic Version 1.1 .....	9
Supplemental documentation.....	10
Need Help?.....	10
Working with the Command Line.....	10
CLI Authentication .....	10
CLI Help.....	11
<b>Chapter 1: Introduction</b>	
Overview .....	13
Image-Based Provisioning .....	13
Architecture .....	13
Image Depot Storage.....	13
Architecture Diagram .....	14
<b>Part I: Installation</b>	
<b>Chapter 2: Before You Install DynaCenter for AppLogic</b>	
Overview .....	17
Installation Checklist .....	17
Storage Options .....	17
Storage Sizing Guidelines.....	18
Create a DynaCenter Appliance on the CA AppLogic Grid.....	18
Task 1: Create the DynaCenter Appliance.....	18
Task 2: Install required packages.....	20
Task 3: Update the operating system and installed packages.....	20
Task 4: Edit the /etc/hosts.template file .....	21
<b>Chapter 3: Installing the DynaCenter Software</b>	
DynaCenter Installation Options.....	23
Basic installation .....	23
Advanced installation .....	23
Section A: Basic Installation.....	25
Install DynaCenter .....	25
Section B: Advanced Installation with External Storage for Depot (Recommended) .....	29
Task 1: Install DynaCenter.....	29
Task 2: Set up the Storage Server.....	29
Storage Server with Apache and DAV support .....	29
Task 3: Register the Depot .....	31
Task 4: Edit the oem.ini file .....	32
<b>Chapter 4: Installing the DynaCenter Cloud API</b>	
Install the Cloud API.....	33

## Chapter 5: Installing the DynaCenter AppLogic Module

Prerequisite .....	34
Install the DynaCenter AppLogic Module .....	35

## Chapter 6: Configuring DynaCenter

OEM Configuration File .....	37
OEM Configuration File Sections and Options .....	37
Sample OEM Configuration File .....	41
Retaining customizations .....	42
Configure Logging .....	42
Log levels .....	42
Log files .....	44
Log file backups .....	45
Retaining customizations .....	45

## Part II: Working with the DynaCenter Appliance

### Chapter 7: Capturing Server Images

Operating System Support for Capture Operations .....	49
Prerequisites to Capture Operations .....	49
RAM requirements for source servers .....	50
Create firewall tunnels .....	50
Register the server network .....	50
Register the depot .....	51
Determine the MAC address of the server to be captured .....	53
Configure the source server (Windows 2008 only) .....	53
Capture a Server .....	54
Task 1: Disable anti-virus software .....	55
Task 2: Install a DynaCenter Agent (DPAD) on the server .....	55
Task 3: Register the server .....	57
Task 4: Capture the server .....	57
Task 5: Remove the DPAD from the server (optional) .....	59
Task 6: Enable anti-virus software .....	59

### Chapter 8: Deploying Images

Operating System Support for Deploy Operations .....	60
Prerequisites .....	60
RAM Requirements for target servers .....	60
Build CA AppLogic templates .....	61
Build CA AppLogic Windows filer applications (Windows only) .....	61
Capture source images .....	61
Deploy an Image to an Appliance where no Image is Deployed .....	62
Process Overview .....	62
Task 1: Create a CA AppLogic appliance to receive the image .....	62
Task 2: Deploy an image to the CA AppLogic appliance .....	64
Task 3: (Optional) Enable SSH root access (Linux only) .....	65
Task 4: Install TurboGate paravirtualized drivers (Windows only) .....	65
Task 5: Configure the Windows operating system (Windows 2008 only) .....	66

Deploy an Image to an Appliance where an Image is Already Deployed.....	67
Process Overview.....	67
Task 1: Delete the existing appliance .....	67
Task 2: Remove the appliance from the DynaCenter database.....	67
Task 3: Create a new appliance and deploy the new image .....	68
<b>Chapter 9: Customizing Images</b>	
Overview .....	69
Section A: Understand Profiles.....	71
Types of profiles .....	71
Capture profiles .....	71
Deploy profiles.....	71
Storage Layers.....	71
Linux storage layers.....	71
Windows storage layers .....	72
Windows File systems.....	73
Section B: Create a Profile .....	75
Create a Profile .....	75
Sample Storage Capture Profile Statements .....	76
Sample Storage Deploy Profile Statements.....	77
Miscellaneous deploy profile statements.....	83
Sample Complex Deploy Profile .....	84
Test a profile .....	85
Procedure.....	85
Section C: Create a Software Component .....	86
Set Permissions for Linux/Unix Components.....	86
Create a Component .....	86
Windows Component Example .....	87
Linux Component Example.....	88
<b>Chapter 10: General Maintenance</b>	
Manage the DynaCenter License .....	91
Examine your existing license .....	91
Request a new license.....	92
Install a new license .....	92
Backup and Restore the DynaCenter Database and Repositories .....	93
Back up the database.....	93
Restore the database .....	93
Back up the repositories.....	93
Restore the repositories .....	95
<b>Chapter 11: Troubleshooting</b>	
DynaCenter Reinstallation Fails after an Aborted Installation.....	96
DynaCenter Cloud API Reinstallation Fails after an Aborted Installation .....	96
Image Redeploy Fails after an Aborted Deploy .....	97
<b>Glossary.....</b>	<b>98</b>
<b>Index .....</b>	<b>101</b>



# Preface

---

## About This Guide

This guide provides the information and procedures needed to install DynaCenter in your CA AppLogic environment. It also provides the procedures for maintaining and operating DynaCenter and its components after the installation.

While Racemi provides a robust programming interface for integrating applications with DynaCenter's image and server management capabilities, this document describes performing operations from the Command Line Interface that is available immediately after DynaCenter is installed.

For the latest version of this Guide, contact CA Support.

## Audience

This document is intended for system and network administrators who perform installation, administrative, and operational tasks related to capturing images for provision to appliances in CA AppLogic environments using DynaCenter.

## What's New in this Guide

### DynaCenter for AppLogic Version 1.1

This Guide was updated for the 1.1 release and includes the following new or revised information:

- DynaCenter for AppLogic now supports CA AppLogic version 3.0 and 3.1.
- DynaCenter for AppLogic currently only supports CA AppLogic Xen-based grids. See the Overview section in Chapter 2: Before You Install DynaCenter for AppLogic on page 17.
- Updated the template to use when creating the DynaCenter Appliance. See Task 1: Create the DynaCenter Appliance on page 18.
- Updated the instructions for installing the TurboGate drivers after you deploy an image to a Windows appliance. See Task 4: Install TurboGate paravirtualized drivers (Windows only) on page 65.
- Added information about the CA AppLogic grid user and user group to the prerequisite for installing the DynaCenter AppLogic Module. See Prerequisite on page 34.
- Added information about setting the SSH Administrator password when creating a CA AppLogic template. See Build CA AppLogic templates on page 61.

## Supplemental documentation

- *Rapid Server Imaging Server Administration Guide*
- *Rapid Server Imaging Server Release Notes*
- *Rapid Server Imaging Server Installation Guide*

## Need Help?

Contact CA Support with questions or comments.

## Working with the Command Line

This guide provides procedures for customizing your DynaCenter environment using the Command Line Interface (CLI). This section provides information that can help you as you work with the CLI.

**Note:** The CA Server Automation user interface provides equivalent operations to the CLI. See the CA Server Automation Reference Guide, RSI CLI section, for command and parameter details.

### CLI Authentication

Certain commands issued from the CLI require authentication. If authentication is required, the command will prompt for a username and password. You can avoid passing the username and password as clear text on the command line by creating an authenticated session.

#### Set up an authenticated session

At any point when you are using the CLI, you can begin an authenticated session to eliminate the need to authenticate each command as you issue it.

1. On the DynaCenter Appliance, type the following command:

```
racelogin --use-auth-cache
```

The system will prompt you for the username and password to use for this session.

2. On the DynaCenter Appliance, run the DynaCenter CLI commands you need.

DynaCenter will execute the commands without requesting your username and password.

3. On the DynaCenter Appliance, type the following command:

```
racelogout
```

DynaCenter ends the authenticated session and log in security is restored to the system.

**Important:** Logging out of the DynaCenter Appliance does not end the authenticated DynaCenter session.

## CLI Help

The dccmd program drives DynaCenter from the command line.

- To see a list of supported dccmd commands, on the DynaCenter Appliance type:

```
dccmd -help
```

- To see help for a specific command, on the DynaCenter Appliance type:

```
dccmd <command_name> --help
```



# Chapter 1: Introduction

---

## Overview

DynaCenter provides next-generation server imaging and rapid provisioning technology to capture server images from physical or virtual systems and deploy them across any compatible resource without the requirement to use identical hardware.

DynaCenter for AppLogic extends DynaCenter capabilities to support image-based provisioning to CA AppLogic 3.0 and 3.1 environments.

## Image-Based Provisioning

Server provisioning is the act of preparing a server for use by installing an operating system (OS), all required applications, and any necessary data.

Image-based provisioning is faster, more flexible, and significantly less error-prone than manual or script-based provisioning. The content of the disks on a server (the “image”) is copied and stored in an image library (Depot) and from there the image can be written to the disks of the same server or to a different server. The image includes the operating system, applications (optional), and data. The provisioned server boots the same OS and has the same applications installed as the original server had when the image was captured.

## Architecture

DynaCenter automates the migration of existing applications from physical, virtual, or cloud servers into a CA AppLogic grid. Images are captured from the source server and stored in the image depot. Those images can then be deployed from the image depot on to Singleton appliances in the CA AppLogic grid as needed.

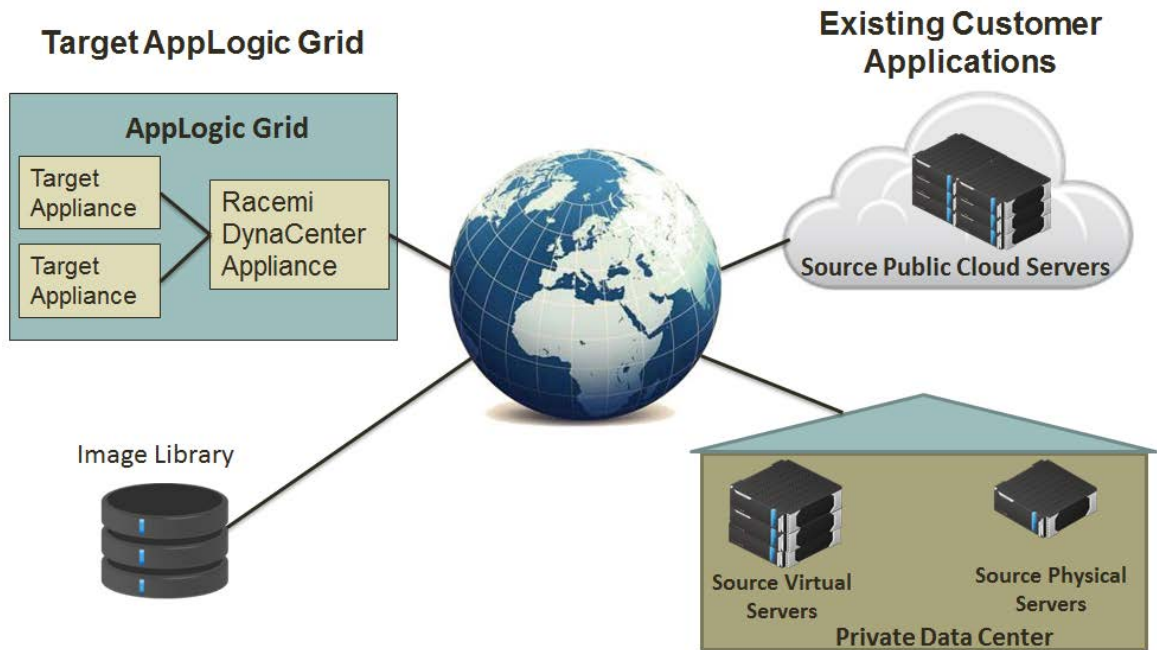
## Image Depot Storage

DynaCenter supports a flexible storage architecture that allows you to do any of the following:

- Use a storage server in the CA AppLogic grid
- Use existing NAS or SAN within your datacenter
- Use public cloud storage
- Use portable storage in a remote site

This option can resolve issues with network bandwidth when migrating large numbers of servers from a remote site to a CA AppLogic grid.

## Architecture Diagram



# Part I: Installation



## Chapter 2: Before You Install DynaCenter for AppLogic

### Overview

This chapter describes the decisions and preparations you should make before you begin to set up your DynaCenter environment on your CA AppLogic grid.

**Important:** DynaCenter must be installed on an already installed and configured CA AppLogic Xen-based grid. If your CA AppLogic Xen-based grid is not installed and properly configured, you must complete that task before you attempt to install DynaCenter.

### Installation Checklist

Use the following checklist to ensure that your environment is installed and set up correctly.

✓	Description	Reference
<input type="checkbox"/>	Determine where you will store captured images	Storage Options on page 17
<input type="checkbox"/>	Determine the space you will need to store captured images	Storage Sizing Guidelines on page 18
<input type="checkbox"/>	Create a CentOS server on the CA AppLogic grid	Create a DynaCenter Appliance on the CA AppLogic Grid, on page 18
<input type="checkbox"/>	Determine which DynaCenter installation option is best for your environment	DynaCenter Installation Options on page 23
<input type="checkbox"/>	Install DynaCenter (choose one installation option)	Basic installation, which starts on page 25
		Advanced Installation with External Storage for Depot (Recommended), which starts on page 29
<input type="checkbox"/>	Install the DynaCenter Cloud API	Installing the DynaCenter Cloud API, which starts on page 33
<input type="checkbox"/>	Install the DynaCenter for AppLogic Module	Installing the DynaCenter AppLogic Module, which starts on page 34

### Storage Options

DynaCenter needs a storage location for the server images you will capture. By default the captured image depot is located on the root file system of the server

where DynaCenter is installed (DynaCenter Basic Installation); however, you should consider using an alternate storage location to ensure that there is enough storage space to accommodate all of your data (DynaCenter Advanced Installation). The advanced installation option is the recommended installation method.

Before you install DynaCenter, understand which installation option is best suited to your environment.

**Reference:** DynaCenter Installation Options on page 23 explains the various installation options.

## Storage Sizing Guidelines

The amount of space you need to allocate for storage depends entirely on how many images you will need to store and how large those images will be. DynaCenter automatically compresses system images before it stores them, so you do not need a one-to-one data to storage ratio; however, increasing disk space upfront is inexpensive relative to running out of storage later. You can prepare a storage environment that is guaranteed to accommodate all your data with plenty of space by calculating the total disk usage of all the systems you will protect with DynaCenter. Or, if it makes sense for your environment, you might calculate your average data usage per system, and then use a storage device with  $N \times A$  available space - where "N" is the number of systems you will need to capture and "A" is the average data requirement. Of course storage space can be added later if you need to capture additional systems.

## Create a DynaCenter Appliance on the CA AppLogic Grid

Before you can install your DynaCenter environment, you must create a DynaCenter Appliance. The DynaCenter Appliance is a [simple appliance](#) (server) in the CA AppLogic grid.

Task	Description	Reference
1	Create the DynaCenter Appliance	Task 1: Create the DynaCenter Appliance on page 18
2	Install the required packages on the operating system	Task 2: Install required packages on page 20
3	Update the operating system	Task 3: Update the operating system on page 20
4	Edit the /etc/hosts.template file	Task 4: Edit the /etc/hosts.template file on page 21

### Task 1: Create the DynaCenter Appliance

Use the following specifications to create the DynaCenter Appliance:

**Note:** For specific instructions on how to create an appliance, see your CA AppLogic documentation.

Element	Sub-Item	Description	Value
Template		Partially configured application used as a template to provision application instances	VDS64_CentOS55_r4
Instance name		Name for the appliance	User-specified value
Properties	hostname	Hostname to assign	User-specified value
	primary_ip	Primary IP address of the external interface of the appliance	User-specified value
	netmask	Network mask of the external interface	User-specified value
	gateway	Default IP network gateway for the external interface	User-specified value
	dns1	Primary nameserver	User-specified value
	dns2	Secondary nameserver	User-specified value
	user	User account to be created on provision of the application	User-specified value
	user_pw	Password of the user account to be created	User-specified value
	root_pw	Password of the root account	User-specified value
Resources	CPU	CPU defined as a fraction of a CPU	2
	Memory	Memory defined in gigabytes	4G (minimum)
	Bandwidth	Bandwidth defined in megabits per second	1000M <b>Note:</b> This is a suggestion; throttle this setting to best suit your environment
	Storage	Size of the disk volume; specify the volume name and the desired size	One of the following: <ul style="list-style-type: none"> <li>▪ <b>Local image depot:</b> VDS64_CENTOS55.boot.size =80G</li> <li>▪ <b>External image depot:</b> VDS64_CENTOS55.boot.size =15G</li> </ul>

## Example

To provision from the CA AppLogic command line:

```
app provision VDS64_CentOS55_r4\  
dynacenterapp hostname=dynacenterapp \  
primary_ip=172.16.120.15 \  
netmask=255.255.255.0 gateway=172.16.120.1 \  
dns1=172.16.240.1 dns2=172.16.250.1 \  
user=admin user_pw=dynacenter \  
root_pw=dynacenter \  
cpu.dflt=2 mem.dflt=4G bw.dflt=1000M \  
VDS64_CENTOS55.boot.size=15G
```

## Task 2: Install required packages

When you provision the DynaCenter Appliance the template does not contain all of the packages that DynaCenter requires. You must install those additional packages before you install the DynaCenter software on the appliance.

1. As the root user, access the appliance over SSH using any suitable SSH client package.
2. Run `yum -y install <package>` for the following packages:
  - dhcp
  - expect
  - gmp
  - mod\_ssl
  - perl-Crypt-SSLeay
  - popo.i386
  - postgresql-server
  - samba
  - tftp-server
  - webserver

## Task 3: Update the operating system and installed packages

The operating system and any installed packages need to be updated with the latest patches and security fixes.

1. If not already connected to the appliance, access the appliance as the root user over SSH using any suitable SSH client package.
2. Run `yum update` to update the appliance.

#### Task 4: Edit the `/etc/hosts.template` file

1. If not already connected to the appliance, access the appliance as the root user over SSH using any suitable SSH client package.
2. Open the `/etc/hosts.template` file in a text editor such as vi.
3. Add the appliance hostname to the 127.0.0.1 line in the file.

**Example:**

```
127.0.0.1 dynacenterapp
```

4. Save your changes to the file.
5. Reboot the appliance.



## Chapter 3: Installing the DynaCenter Software

---

DynaCenter is a server imaging and rapid provisioning technology that captures server images from physical or virtual systems and deploys those images to any compatible resource without the limitation of requiring identical hardware. This chapter describes how to install the DynaCenter software on the DynaCenter Appliance.

### DynaCenter Installation Options

You can install DynaCenter using either of the following methods:

- Basic installation
- Advanced installation with external storage for the depot (recommended)

Use the information in this section to help you decide which installation method is best for your environment.

#### Basic installation

The basic installation places all DynaCenter components on the root file system on the DynaCenter Appliance.

##### When to use

Use this installation method for non-production environments or for environments where only a small number of servers will be managed.

**Reference:** See Section A: Basic Installation, which starts on page 25.

#### Advanced installation

The advanced installation places all components except the captured image depot on the DynaCenter Appliance. The captured image depot must be set up on a separate storage server (recommended).

##### When to use

Use this installation method for production environments when an external storage server is available. This is the recommended installation method.

**Reference:** See Section B: Advanced Installation with External Storage for Depot (Recommended), which starts on page 29.



---

## Section A: Basic Installation

---

DynaCenter needs a storage location for the server images you will capture. The basic installation places the captured image depot on the root file system of the DynaCenter Appliance.

**Note:** This is not the recommended installation configuration for production environments.

### Install DynaCenter

1. Access the DynaCenter Appliance as the root user over SSH using any suitable SSH client package.
2. Mount or copy the DynaCenter installation media to a directory on the DynaCenter Appliance.
3. Change to the directory on the DynaCenter Appliance where you copied the installation media.
4. Type the following command:

```
./dc-install
```

The installation program displays the following screen:

```
DynaCenter Package Installation
```

```
-----  
Welcome to the DynaCenter Package Manager. This program  
will guide you through the installation/upgrade process.
```

5. Choose and confirm the operating systems that you want DynaCenter to support. Each operating system that will be captured or provisioned needs a corresponding agent image. Agent images for Red Hat Linux, SUSE Linux, and Windows are provided by default; agent images for other operating systems are optional.

**Note:** Select N (no) for the optional operating systems as DynaCenter for AppLogic does not currently support Solaris.

```
Client Operating System Support
```

```
-----  
DynaCenter supports capture and deploy of a variety of  
operating systems. Support for Windows, RHEL, and SLES are  
included by default. Select the additional operating  
systems that should be supported by this installation.
```

```
Install support for Solaris-sun4u? (N) [Y, N]
```

```
Install support for Solaris-i86pc? (N) [Y, N]
```

```
No additional operating systems have been selected
```

```
Continue with installation? (Y) [Y, N]
```

6. Review and confirm the list of RPM packages that will be installed or upgraded. These packages include DynaCenter binaries as well as other files that DynaCenter needs to operate.

```
Searching for installed packages.
The following packages will be upgraded/installed:
vmware-viper1-4.1.0-254719.x86_64.rpm
racemi-dynacenter-4.2.0-0.rpm
racemi-mws-4.2.0-0.rpm
racemi-help-4.2.0-0.rpm
racemi-comp-solaris-i86pc-3.2.0-0.rpm
racemi-python-2.7.2-1.rpm
ntfsprogs-2.0.0-1.i386.rpm
racemi-comp-solaris-sun4u-4.1.0-0.rpm
.
.
Continue with installation? (Y) [Y, N]
```

7. Choose and confirm the network interface for the management network.

The management network is used for communication between the DynaCenter daemons. The interface for the Management Address should always be on localhost (loopback).

Management Address

-----

The MWS requires an address for accessing its management services as well as remote access on the network. For security, it is recommended, however not required, that this address be on a network that is not exposed to managed clients. The following list of addresses are configured on this system and available for use.

```
0. 127.0.0.1 on loopback
1. 172.16.120.15 on eth0
Select management address (0) [0, 1, 2] 0
Selected: 127.0.0.1 on loopback
Accept and continue? (Y) [Y, N]
```

**Note:** Do not set the management network to an IP that is in the range of the CA AppLogic public IP addresses.

8. Choose and confirm the client networks that contain servers that will be managed by the DynaCenter Appliance.

A Client Network is a network interface card (NIC) or VLAN configured on the DynaCenter Appliance that is connected to the same network(s) as the managed servers. Managed servers are the systems that DynaCenter will be capturing and provisioning. The DynaCenter installer will scan the operating system for its network configuration and present each detected NIC or VLAN as an option in the "Client Networks" section. Note that more than one network can be specified during installation.

## Client Networks

-----  
The MWS must be configured to manage servers on each of the networks configured on its interfaces. For security, it is recommended, however not required, that the interface used for management is not included in the set of client networks. The following list of networks are configured on this system and available for use.

```
0. 172.16.120.0/24 on eth0
Select client network(s) (0) [0] 0
Selected: 172.16.120.0/24 on eth0
Accept and continue? (Y) [Y, N]
```

9. Specify and confirm the Agent Image Addresses on the client network that will be used by agent images during capture, provision, and driver capture operations.

Agent Image Addresses are dedicated IP addresses on the Client Network that DynaCenter assigns to agent images during capture, provision, and driver capture operations. The number of IP addresses specified should be equal to or greater than the number of concurrent operations that will be performed.

**Example:** If the user needs to run five captures and three provisions simultaneously, there should be at least eight IP addresses available in the Agent Image Address space.

## Agent Image Addresses

-----  
The MWS uses diskless agent images for offline capture and deploy of managed servers. These agent images need an address pool on each client network. By default, agent images will use the first unused address available on a given client network, however specifying a limited set of addresses minimizes the potential for collision with other servers which might become active while an agent image is in use. Addresses may be specified as a comma or space separated list of addresses or address ranges, such as:

```
10.10.20.2, 10.10.20.50-10.10.20.100, 10.10.20.200
Enter addresses for network 172.16.120.0/24
Current [172.16.120.0-172.16.120.255] 172.16.120.100-
172.16.120.105
Using addresses: 172.16.120.100-172.16.120.150
Accept and continue? (Y) [Y, N]
```

10. The installation begins.  
An 'Installation complete' message is displayed when the installation completes.
11. Log out of the MWS server and then log back in.  
During the installation DynaCenter configures certain environmental variables; you must log out and then log back in for the changes to take effect.



---

## Section B: Advanced Installation with External Storage for Depot (Recommended)

---

DynaCenter needs a storage location for the server images you will capture. This section describes how to install DynaCenter when you want to use an external storage server for the image depot. This is the recommended DynaCenter installation option.

The following table outlines the process for installing DynaCenter when using an external storage server for the captured image depot:

Task	Description	Reference
1	Install DynaCenter	Task 1: Install DynaCenter on page 29
2	Set up the storage server	Task 2: Set up the Storage Server using the following option: <ul style="list-style-type: none"><li>Storage Server with Apache and DAV support on page 29</li></ul>
3	Register the depot	Task 3: Register the Depot on page 31
4	Edit the oem.ini file	Task 4: Edit the oem.ini file on page 32

### Task 1: Install DynaCenter

Install DynaCenter using the instructions provided in Section A: Basic Installation, which starts on page 25.

### Task 2: Set up the Storage Server

When you use external storage for the captured image depot (recommended), use the following option:

- Use a storage server that runs the Apache web server and is capable of supporting DAV (Distributed Authoring and Versioning)—Recommended

#### Storage Server with Apache and DAV support

Storage on an external device must meet the following criteria:

- Be a properly configured device that is IP routable to and from the DynaCenter Appliance and the managed server(s) that will use it
- Have the correct time set to match the DynaCenter Appliance or have NTP configured.

#### Configure the storage server

- Log into the storage server as the root user.
- Locate or create the directory that is to be used as depot storage.
- Set the directory and file ownership to the httpd user (normally apache:apache).

**Example:** On a Red Hat system type, `chown apache:apache /path/to/depot`

4. Set the directory permissions to read/write for any user or group that will use the httpd process.

**Example:** Type, `chmod 755 /path/to/depot`

5. On the storage server, create a new file in the conf.d directory of the webserver with the following settings:

**Tip:** You can name the file anything, but a name such as `depot.conf` will be descriptive of the file function.

```
Alias </my_depot_alias/> </path/to/depot/>
<Directory </path/to/depot>>
    DAV On
    AuthType Basic
    AuthName "DAV Restricted"
    AuthUserFile /path/to/password/file/<password_file>
    <LimitExcept GET HEAD OPTIONS>
        Require user <username>
    </LimitExcept>
</Directory>
```

Where:

Value	Description
my_depot_alias	A user-friendly alias for the depot <b>Note:</b> This can be the path to the depot if a user-friendly name is not important to you.
path/to/depot	The location of the depot on the storage server
path/to/password/file	The location of the apache password file where the user's password can be verified
password_file	The apache password file where the user's password can be verified
username	The username of the user authorized to access the depot directory

### Example

On a Red Hat system, create a new file called `depot.conf` in `/etc/httpd/conf.d` with the following settings:

```
Alias /my_depot/ /repo/images/
<Directory /repo/images>
    DAV On
    AuthType Basic
    AuthName "DAV Restricted"
    AuthUserFile /etc/httpd/repo.pwd
```

```

    <LimitExcept GET HEAD OPTIONS>
        Require user someuser
    </LimitExcept>
</Directory>

```

6. Type the following command to create or update the file used to store the authentication information for users authorized to access the depot:

```
htpasswd -bc /path/to/password/file/<password_file>
<username> <password>
```

**Example:** `htpasswd -bc /etc/httpd/repo.pwd someuser somepassword`

7. As a root user, type the following command to restart the apache server:

```
service httpd restart
```

### Task 3: Register the Depot

To ensure that the external depot is visible to the DynaCenter Appliance and any servers that the DynaCenter Appliance will manage, you must register the depot.

1. On the DynaCenter Appliance, type the following command to register the depot with the credentials you previously specified or your S3 credentials:

```

dccmd register depot \
[--access-identity=<id_or_user_name>] \
[--access-secret=<secret_key>] \
<depotId> <depotURL> \
<networkId>=<depotURL> [<networkId>=<depotURL>...]

```

Where:

Options	--access-identity	An authorized identity to access this storage server (for example, the username, the account, etc.). <b>Note:</b> If you use this option, you must also define --access-secret. <b>WebDAV storage:</b> This is a username of a user authorized to access the server.
	--access-secret	The password, key, or certificate associated with the authorized identity. <b>WebDAV storage:</b> This is the password associated with the username specified for --access-identity.
Arguments	depotId	The name of the depot.
	depotURL	The URL of the network storage. It can be one of the following: <ul style="list-style-type: none"> <li>▪ <b>WebDAV storage:</b> dav://server-</li> </ul>

		address/path
	networkId= depotURL	Network that contains managed servers and the URL of the depot when accessed from that network

**Example:**

```

dccmd register depot mystorage \
--access-identity=someuser --access-secret=somepassword \
dav://my_storage_server_hostname_or_IP/my_depot \
172.16.120.0/24=dav://172.16.120.3/repo/images

```

2. Confirm that the depot registered successfully:

```

dccmd show depot <depotId> --format=full>

```

**Example:**

```

dccmd show depot mystorage --format=full

```

**Note:** The CA Server Automation user interface provides equivalent operations to the CLI. See the *CA Server Automation Reference Guide*, RSI CLI section, for command and parameter details.

## Task 4: Edit the oem.ini file

The oem.ini file specifies the location of the depot. If you do not want to have to specify the depot location each time you perform an operation, you must edit the oem.ini file to point to the depot location on the storage server.

1. On the DynaCenter Appliance, open the following file:

```

/opt/race/share/conf/oem.ini

```

2. Edit the depot section of the oem.ini file as follows:

```

[depot]
uri = depot://<depot_name_on_storage_server>

```

## Chapter 4: Installing the DynaCenter Cloud API

---

The DynaCenter Cloud API integrates a driving application with the cloud management capabilities of DynaCenter, which allows you to deploy images to appliances in a CA AppLogic grid.

### Install the Cloud API

**Note:** The Cloud API is delivered on a separate DVD.

1. Access the DynaCenter Appliance as the root user over SSH using any suitable SSH client package.

2. Type the following command to create an authenticated DynaCenter session:

```
racelogin --use-auth-cache
```

The system will prompt you for the username and password to use for this session.

3. Mount or copy the DynaCenter Cloud installation media to a directory on the DynaCenter Appliance.

4. Change to the directory on the DynaCenter Appliance where you copied the installation media.

5. Type the following command:

```
./cloud-install
```

An "Installation successful." message indicates that the installation has completed.

6. If you do not plan to install the DynaCenter AppLogic module at this time, type the following command to end the authenticated session:

```
racelogout
```

## Chapter 5: Installing the DynaCenter AppLogic Module

---

The DynaCenter AppLogic Module integrates the cloud management capabilities of DynaCenter with CA AppLogic 3.0 and 3.1, which allows you to deploy images to appliances in a CA AppLogic grid.

### Prerequisite

The DynaCenter Appliance uses a public and private key pair to authenticate communication with the CA AppLogic Grid Controller. You must create a public/private key pair and then copy the public key to the CA AppLogic Grid Controller so that it can communicate with the DynaCenter Appliance.

**Note:** To perform this procedure you must be a grid user in the Admin group on the CA AppLogic grid. From the CA AppLogic grid Shell type the following commands to add yourself as a grid user in the Admin group:

```
user create <username> pwd=<password>
user set <username> group=admin
```

1. On the DynaCenter Appliance, navigate to the `/root/.ssh` directory.
2. Type the following command to create the key pair:

```
ssh-keygen -v -f <key_name>
```

**Example:** `ssh-keygen -v -f applogic_key`

**Note:** Do not provide a passphrase for the key. If you provide a passphrase here, you will be prompted for the passphrase before each DynaCenter operation is executed.

**Tip:** Store the key pair in a safe location in case you need it in the future. For example, `/home/your_user/.ssh`.

3. Open the public key file in a text editor and copy the content of the file.
4. From the shell prompt, log in to the CA AppLogic Grid Controller.
5. Type the following command to put the public key on the CA AppLogic Grid Controller:

```
user set <username> sshkey="<content_of_public_key>"
```

Where `<username>` is a registered CA AppLogic grid user or an CA AppLogic grid user account created for use with DynaCenter and `<content_of_public_key>` is the pasted content of your public key file.

**Example:** `user set jsmith@mycompany.com sshkey="ssh-rsa AAAAB3NzaC1yc2EAAAABJQAAAIEAjImKG3fwQT1VLOQcEGz1K3h/KnYEtofL4SPCKyNG6EFGxNzWMyktapijMEyQ5wovGkTcsDt9C555J4dN9Dv65M7T2h`

```
ePOEEItBbY5uygvD7LPx8c8GQhytpR7oywQ30GI4xdIVNQg3QgolW3nnzVl  
pz3YsrGRYInWus4+W4PTEc== jsmith@mycompany.com"
```

Placing the public key on the CA AppLogic Grid Controller authorizes the DynaCenter Appliance to pass commands to the Grid Controller.

## Install the DynaCenter AppLogic Module

The DynaCenter AppLogic Module provides the capability to manage CA AppLogic resources and it is delivered on a separate DVD.

1. Access the DynaCenter Appliance as the root user over SSH using any suitable SSH client package.

2. If you do not already have an authenticated DynaCenter session running, type the following command to create an authenticated session:

```
racelogin --use-auth-cache
```

The system will prompt you for the username and password to use for this session.

3. Mount or copy the DynaCenter AppLogic Module installation media to a directory on the DynaCenter Appliance.
4. Change to the directory on the DynaCenter Appliance where you copied the installation media.
5. Type the following command:

```
./cloud-applogic-install \  
file:///root/.ssh/<name_of_private_key_file>
```

Where `name_of_private_key_file` is the name of the private key file that is paired with the public key specified in Step 5 on page 34.

**Example:** `./cloud-applogic-install \  
file:///root/.ssh/applogic_key`

**Note:** The three forward slash characters are necessary for this command to work.

An "Installation successful." message indicates that the installation has completed.

6. Type the following command to end the authenticated session:  

```
racelogout
```



## Chapter 6: Configuring DynaCenter

---

You can customize certain default DynaCenter settings that control the behavior for specific API commands, task options, and logging levels. This chapter describes DynaCenter files that you might want to customize for your environment.

### OEM Configuration File

The OEM configuration file defines the default behavior for specific API command and task options. This section describes how to edit the file to set the values that are appropriate for your DynaCenter environment.

### OEM Configuration File Sections and Options

The sections in the OEM configuration file relate to a specific OEM API command or task:

- chassis
- server\_group
- depot
- repository
- image
- error\_handling
- deploy
- agent
- capture

Each section specifies the values that define the default behavior for the OEM API command or task. Certain values should not be edited, but they are listed here for completeness. If any of the editable values listed below are not appropriate for your environment, edit the file. The file is located on the DynaCenter Appliance in `/opt/race/share/conf/oem.ini`.

#### chassis

A chassis is a representation of a physical collection of servers. The chassis option affects the defaults used when target servers are registered through the OEM API commands.

Value	Description	Default
id	The name of the chassis to use for newly created servers. Target servers can belong to any chassis, but servers that are manually registered are added to this chassis.	OEM

### server\_group

A server group is used to organize servers and is used to control which combinations of software and hardware resources can communicate.

Value	Description	Default
name	The name of the server group for managed servers. All servers are added to this group during provisioning. <b>Note:</b> Do not edit this option.	OEM

### depot

The depot options describe where and how captured images are stored on network attached storage devices.

Value	Description	Default
uri	The URI for the captured images depot, for example, depot://images. The value is used as a default if no value is given on the command line. <b>Important:</b> If your depot is not in the default location (the root directory on the DynaCenter Appliance), you must edit this setting.	

### repository

The repository options control where meta-data data is written in the DynaCenter repositories.

Value	Description	Default
drivers	The name of the repository where Driversets should be saved. <b>Note:</b> Do not edit this option.	default
image	The name of the repository where captured and deployed images should be saved by default. <b>Note:</b> Do not edit this option.	instance
template	The name of the repository where templates for captured and deployed images should be saved. <b>Note:</b> Do not edit this option.	default

### image

The image options provide defaults for image handling operations.

Value	Description	Default
remove_empty_template	A Boolean value that controls whether an empty template is removed after the last deployed image that is using it is removed.	True

## error\_handling

The error handling section of the configuration file controls how some classes of errors are handled by default.

Value	Description	Default
ignore_missing	Delete/remove operations will not produce an error message if the specified item has already been deleted or does not exist.	True
overwrite_existing	Overwrite existing captured image if one with the same name exists.	False
remove_failed_captures	When true, partial images are removed from the depot if the full capture fails for any reason. When false, images are only removed if the capture is canceled.	True

CA Server Automation prechecks for an existing image and does not allow any existing image to be overwritten.

## deploy

The deploy options set the defaults for the deploy operation.

Value	Description	Default
scale_images	A Boolean value that globally controls image scaling. When true, captured images are resized as needed to fit onto servers and consume all available space.	True
remove_agent	A Boolean value that controls whether the DPAD is removed after the image has been deployed. When true, the DPAD agent is removed from the target server.	False

## agent

The agent options control the management of agent images.

Value	Description	Default
retain_images	The number of agent images to cache in the depot so that they are available for deploy and capture operations. If all of the cached images are in use at the same time, DynaCenter will create new agent images as needed, but that increases the amount of time needed to complete the operation.	5
heartbeat_interval	The frequency (in seconds) with which the DPAD communicates with DynaCenter. <b>Tip:</b> When working with slower networks or cloud	30

	<p>networks, consider increasing the heartbeat interval to avoid missed heartbeats during capture and deploy operations.</p> <p><b>Note:</b> A longer heartbeat interval means that commands from DynaCenter will take longer to reach the DPAD.</p>	
pm_heartbeat_interval	<p>The frequency (in seconds) with which the agent image communicates with DynaCenter.</p> <p><b>Tip:</b> When working with slower networks or cloud networks, consider increasing the heartbeat interval to avoid missed heartbeats during capture and deploy operations.</p> <p><b>Note:</b> A longer heartbeat interval means that commands from DynaCenter will take longer to reach the DPAD.</p>	10
mws_url	<p>The url base used to access the DynaCenter Appliance.</p> <p><b>Note:</b> Do not edit this option.</p>	
register_url	<p>The communication path used by the DPAD to communicate with DynaCenter when the DPAD first starts.</p> <p><b>Note:</b> Do not edit this option.</p>	
heartbeat_url	<p>The communication path used by the DPAD to let DynaCenter know that it is running and to check if there are any pending tasks.</p> <p><b>Note:</b> Do not edit this option.</p>	
time_url	<p>The communication path used by the DPAD to get the current time from DynaCenter.</p> <p><b>Note:</b> Do not edit this option.</p>	
taskstatus_url	<p>The communication path used by the DPAD to send information to DynaCenter about the status of any tasks the DPAD is performing.</p> <p><b>Note:</b> Do not edit this option.</p>	
log_url	<p>The communication path used by the DPAD to send log messages to DynaCenter.</p> <p><b>Note:</b> Do not edit this option.</p>	
event_url	<p>The communication path used by the DPAD to send information to DynaCenter about any actions or tasks the DPAD is performing.</p> <p><b>Note:</b> Do not edit this option.</p>	
request_url	<p>The communication path used by the DPAD to request the next provisioning task.</p>	

	<b>Note:</b> Do not edit this option.	
command_url	The communication path used by the DPAD to send information about the status of the provisioning task that is currently running. <b>Note:</b> Do not edit this option.	
set_clock	A Boolean value that determines whether the DPAD asks DynaCenter for the current time. When set to True, the DPAD changes the system time on the server when the daemon starts.	False

### capture

The capture option sets the defaults for the deploy operation.

Value	Description	Default
compress_image	A Boolean value that globally controls image compression. When true, captured images are compressed.	True

### Sample OEM Configuration File

This sample configuration file represents the default configuration of DynaCenter.

```
[chassis]
id = OEM

[server_group]
name = OEM

[depot]
uri = depot://image

[repository]
drivers = default
image = instance
template = default

[image]
remove_empty_template = True

[error_handling]
ignore_missing = True
overwrite_existing = False
remove_failed_captures = True

[deploy]
scale_images = True
remove_agent = False
```

```

[agent]
retain_images = 5
heartbeat_interval = 30
pm_heartbeat_interval = 10
mws_url = https://localhost
register_url = %(mws_url)s/agent/register/
heartbeat_url = %(mws_url)s/agent/heartbeat
time_url = %(mws_url)s/agent/get_current_time
taskstatus_url = %(mws_url)s/agent/taskstatus
log_url = %(mws_url)s/agent/log
event_url = %(mws_url)s/agent/event
command_url = %(mws_url)s/agent/mark_command
request_url = %(mws_url)s/agent/next_request
set_clock = False

[capture]
compress_image = True

```

### Retaining customizations


When you upgrade DynaCenter, you do not lose the customizations you have made to the oem.ini file. During an upgrade, DynaCenter rewrites the oem.ini file with your custom settings and any new configuration settings introduced as part of the upgrade.

### Configure Logging

DynaCenter logs all of its operations to files on the DynaCenter Appliance. The default logging configuration should meet your needs; however, if you need to change the logging behavior, use the information in this section to reconfigure the settings.

### Log levels

The log level specifies the severity and threshold of a log message. The log levels listed below are in order from the most severe to the least severe; lower log levels include the higher ones, for example, the level INFO includes all levels up to SYSMSG.

Log Level	Description	Log Volume
SYSMSG	System messages, usually with information about server startup and shutdown	Lowest 
CRITICAL	Messages that show critical or fatal errors	
ERROR	Error messages about failed operations, for example, the cause of a failed capture or provision	
WARNING	Messages about errors other than those that caused an operation to fail or abort	
USER	High-level messages that show the progress of a	

	current operation	Highest
INFO	Specific messages that show the progress of a current operation	
DEBUG	Verbose messages used by Support to troubleshoot issues	

### Configure log levels

There are various loggers that send their log messages to the DynaCenter Logging Daemon (DLAD). The loggers determine which messages are sent to the DLAD based on the threshold specified in the logclient.ini file. By default, the loggers log all messages at level DEBUG and higher so that all messages are sent to the DLAD. The DLAD determines which messages are written to the log files based on the threshold specified in the logserver.ini file.

Configure logging in the following ways:


- To specify which log messages the loggers send to the DLAD, edit the log level in the logclient.ini configuration file.
 

**Important:** Racemi does not recommend changing the default setting unless the default DEBUG log level is so verbose that it is causing performance issues.

**Reference:** See Configure the logging level for a logger on page 43.
- To specify which log messages the DLAD writes to the log files, edit the log level in the logserver.ini configuration file.
 

**Reference:** See Configure the logging level for the DLAD on page 44.

### Configure the logging level for a logger

 **Caution:** Changing the logger logging level from the default DEBUG setting can result in the loss of important information.

1. On the DynaCenter Appliance, open the logclient.ini file from the following location with an editor such as vi:

```
/opt/race/share/conf/logclient.ini
```

2. Locate the section for the logger that you want to change the log level for.

**Example:** To change the log level for the task logger, locate the [logger\_task] section.

3. Change the level= line to reflect the new log level.

**Example:** To change the task logger level from DEBUG to USER, edit the line level=DEBUG to level=USER.

4. Save and close the file.
5. Type the following command to restart DynaCenter services:
 

```
dcctl restart
```

## Configure the logging level for the DLAD

1. On the DynaCenter Appliance, open the logserver.ini file from the following location with an editor such as vi:  

```
/opt/race/share/conf/logserver.ini
```
2. Locate the section for the logger that you want to change the log level for.  
**Example:** To change the log level for the task logger, locate the [logger\_task] section.
3. Change the level= line to reflect the new log level.  
**Example:** To change the task logger level from INFO to USER, edit the line level=INFO to level=USER.
4. Save and close the file.
5. Type the following command to restart DynaCenter services:  

```
dcctl restart
```

## Log files

DynaCenter generates several log files that you might need to reference. The log files are written in /var/log/dynacenter.

### Task log

DynaCenter writes logs that are related to tasks (such as capture and provision tasks) to /var/log/dynacenter/task.log. Each task-related log message contains the task ID of the operation.

Command line programs that start tasks print the task ID to stdout when run with the --no-wait or -v options.

### Other log files

DynaCenter creates several other log files in /var/log/dynacenter that you might need to reference for troubleshooting purposes:

Log File	Description
configure.log	Contains information related to the DynaCenter installation process
daemon.log	Contains messages from the various daemons about non-task-related processes
dc-install.log	Contains information related to the DynaCenter installation process
install.log	Contains information related to the DynaCenter installation process
handler.log	Failsafe log if there is a problem with the log system
Pyro_log	Contains debugging information related to the internal communication mechanism

userlogs	Directory that contains logs from user-run command line programs such as dccmd
----------	--

## Log file backups

DynaCenter automatically backs up log files in one of the following ways:

- `install.log`—this log file is backed up every time you install DynaCenter. A timestamp is appended to the file name of the older log file to prevent older files from being overwritten.
- All other log files (except `Pyro_log`)—these log files are rotated when they reach 100MB. When the file reaches 100MB, it is renamed to `<name>.log.1` and any existing log files of the same type are incremented by one. DynaCenter stores a maximum of ten backups, so, when the log files are rotated, `<name>.log.10` is deleted and `<name>.log.9` becomes `<name>.log.10`.

## Retaining customizations

When you upgrade DynaCenter, you do not lose the customizations you have made to the `logserver.ini` or `logclient.ini` files as these files are not overwritten during the upgrade process. Instead of overwriting the files and erasing your custom settings, DynaCenter creates new versions of the files by appending `.rpmnew` to the original file name. You can then compare your file with the new file created as part of the upgrade and copy any new options in the new file to your original file.



# Part II: Working with the DynaCenter Appliance



## Chapter 7: Capturing Server Images

---

The capture operation uses the content of a disk to create a server image and then places that image in the image depot so that it can be deployed to a CA AppLogic appliance. During the capture operation, you can use a capture profile to define which storage on the server should be captured as part of the image.

**Note:** DynaCenter does not currently support capturing images of appliances that are running in a CA AppLogic grid.

### Operating System Support for Capture Operations

DynaCenter supports the capture of servers for the following operating systems that can be deployed to a CA AppLogic grid:

- RedHat 5.5 and later 32-bit
- RedHat 5.5 and later 64-bit
- CentOS 5.5 and later 32-bit
- CentOS 5.5 and later 64-bit
- Windows 2008 Release 2

### Prerequisites to Capture Operations

Before you can capture a server image there are prerequisite tasks that must be completed. This section identifies those tasks.

**Note:** Some of these tasks might already have been completed as part of other operations.

✓	Description	Reference
<input type="checkbox"/>	Ensure that the server meets the recommended RAM requirement	RAM requirements for source servers on page 50.
<input type="checkbox"/>	Create the necessary firewall tunnels on your site	Create firewall tunnels on page 50. <b>Tip:</b> If the firewall tunnels have already been created, you can skip this task.
<input type="checkbox"/>	Register the network used by the server you want to capture	Register the server network on page 50. <b>Tip:</b> If this network is already registered with DynaCenter, you can skip this task. Check the list of networks in the output from the <code>dccmd list networks</code> command to confirm whether the network has already been registered.

<input type="checkbox"/>	Register the depot where the server image will be stored	Register the depot on page 51.
<input type="checkbox"/>	Determine the MAC address of the source server	Determine the MAC address of the server to be captured on page 53. <b>Tip:</b> If this server is already registered with DynaCenter, you can skip this task. Check the output from the <code>dccmd list servers</code> command to confirm whether the server has already been registered.
<input type="checkbox"/>	Configure the source server to meet CA AppLogic requirements	Configure the source server (Windows 2008 only) on page 53.

### RAM requirements for source servers

Source servers must have at least 768MB of RAM for capture operations to complete successfully. For offline capture operations it is recommended that the source servers have at least 1GB of RAM.

### Create firewall tunnels

Before DynaCenter can communicate with servers outside of the CA AppLogic grid, you must create the appropriate firewall tunnels to allow communication between the resource and the DynaCenter Appliance.

You will need to open firewall tunnels in the following situations:

- If you have managed servers located on external networks, open a port from your firewall and direct traffic on that port to port 443 on the DynaCenter Appliance.

**Example:** Open port 4102 on the firewall and point it to port 443 on the DynaCenter Appliance.

To confirm that the DynaCenter Appliance can be accessed by servers on external networks, connect to `https://<firewall_ip>:4102/` from outside of the firewall.

- If your depot is being served from a location other than the DynaCenter Appliance, open a port from your firewall and direct traffic on that port to port 443 on the server where the depot is located.

**Example:** Open port 4103 on the firewall and point it to port 443 on the server where the depot is located.

To confirm that the depot can be accessed by servers on external networks, connect to `https://<firewall_ip>:4103/path/to/depot/` from outside of the firewall.

**Note:** If the firewall tunnels already exist, confirm that they are operational.

### Register the server network

Before DynaCenter can communicate with a server, you must associate the network where the server resides with DynaCenter.

**Note:** If the network is already registered, you do not need to perform this task. To see if the network is already registered, run the `dccmd list networks` command on the DynaCenter Appliance and check the output for the network where the server resides. If the `dccmd list networks` command does not provide enough detail, use the `dccmd show network <network name>` command.

### Procedure

1. On the DynaCenter Appliance, type the following command:

```
dccmd register external network <network name> \
<MWS URL base>
```

Where:

Arguments	network name	Unique name for the network you are registering <b>Example:</b> server_network
	MWS URL base	URL used to access the DynaCenter Appliance from outside the local area network <b>Example:</b> https://www.my_company.com:4102 where my_company.com is the externally addressable name or IP address of the DynaCenter Appliance.

**Example:**

```
dccmd register external network server_network \
https://192.168.10.20:4102
```

2. Confirm that the network registered successfully:

```
dccmd show network <network name> --format=full
```

**Example:**

```
dccmd show network server_network --format=full
```

**Note:** The CA Server Automation user interface provides equivalent operations to the CLI. See the *CA Server Automation Reference Guide*, RSI CLI section, for command and parameter details.

### Register the depot

Before a server can connect to the depot where captured images are stored, you must associate the network where the server resides with the depot.

**Note:** You do not have to complete this task if either of the following is true:

- The depot is located on the DynaCenter Appliance (physically or by means of an NFS mount – because local depots are automatically registered) **and** the network where the server is located is shown in the “locations” field in the output from the `dccmd show depot <depot_name> --format=full` command.

- The depot is already registered (to see if the depot is already registered, run the `dccmd list depots --format=full` command on the DynaCenter Appliance and check the output for the depot information) **and** the network where the server is located is shown in the "locations" field in the output from the `dccmd show depot <depot_name> --format=full` command.

### Procedure

1. On the DynaCenter Appliance, type the following command to register the depot:

```

dccmd register depot \
[--access-identity=<id_or_user_name>] \
[--access-secret=<secret_key>] \
<depotId> <depotURL> \
<networkId>=<depotURL> [<networkId>=<depotURL>...]

```

Where:

Options	--access-identity	Authorized identity to access this storage server (for example, the username, the account, etc.) <b>Note:</b> If you use this option, you must also define --access-secret. <b>WebDAV storage:</b> This is a username of a user authorized to access the server.
	--access-secret	Password, key, or certificate associated with the authorized identity <b>WebDAV storage:</b> This is the password associated with the username specified for --access-identity.
Arguments	depotId	Name of the depot
	depotURL	URL of the network storage; it can be one of the following: ▪ <b>WebDAV storage:</b> dav://server-address/path
	networkId=depotURL	Network that contains servers you want to capture and the URL of the depot when accessed from that network

### Example:

```

dccmd register depot mystorage \
dav://mystorage/repo/images \
--access-identity=someuser \
--access-secret=somepassword \
server_network=dav://192.168.127.253:4102/repo/images

```

2. Confirm that the depot registered successfully:

```
dccmd show depot <depotId> --format=full
```

**Note:** The CA Server Automation user interface provides equivalent operations to the CLI. See the *CA Server Automation Reference Guide*, RSI CLI section, for command and parameter details.

## Determine the MAC address of the server to be captured

Before you can capture a server, the server must be registered with DynaCenter. Before you can register a server you must know the MAC address of the server.

**Note:** If the server is already registered, you do not need to perform this task. To see if the server is already registered, run the `dccmd list servers` command on the DynaCenter Appliance and check the output for the server name.

### Procedure

1. Open the command line interface on the server.
  2. In the command line interface, do one of the following to determine the MAC address of the interface used to connect to DynaCenter:
    - On Unix systems, type `ifconfig`
    - On Windows systems, type `ipconfig /all`
  3. Locate the MAC address as follows:
    - On Unix systems, in the HWaddr field  
**Example:** 00:1d:c2:00:d7:e0
    - On Windows systems, in the Physical Address field  
**Example:** 00-1d-c2-00-d7-e0
- Note:** If there is more than one interface listed in the output, use the MAC address for the interface that is the external IP address.
4. Record the MAC address.

## Configure the source server (Windows 2008 only)

CA AppLogic requires that the Windows Server 2008 operating system be configured in a specific way when part of a CA AppLogic grid. If you are capturing a Windows Server 2008 image to deploy into your grid, you should review the CA AppLogic requirements before you capture the image and deploy that image to the grid.

**Reference:** The CA AppLogic documentation for Windows Server 2008 located at describes how to create a Windows Server 2008 Base Server Class.

- For CA AppLogic 3.0, see [http://doc.3tera.com/AppLogic31/Developer\\_Guide/index.htm](http://doc.3tera.com/AppLogic31/Developer_Guide/index.htm)
- For CA AppLogic 3.1, see [http://doc.3tera.com/AppLogic30/en/Developer\\_Guide/index.htm](http://doc.3tera.com/AppLogic30/en/Developer_Guide/index.htm)

From the Table of Contents, drill down to OS Installation -> Distribution Installations -> Windows Appliance Installation -> Windows Installation Reference -> Windows Server 2008 Base Server Class Installation Reference; within these instructions you will find the configuration requirements for Windows 2008 as outlined in the following table:

<b>Requirement</b>	<b>Noted in</b>
Set the screen resolution	Step 4
Set the screen saver timeout	Step 4
Disable the page file	Step 4
Disable power management hibernation support	Step 4
Disable IE enhanced security	Step 4
Clean up any leftover pagefile	Step 5
Install high priority and optional Windows updates	Step 7
Disable the Windows Firewall	Step 10
Disable automatic updates	Step 11
Disable password complexity requirements	Step 12
Set the Administrator password to never expire	Step 13
Disable the shutdown event tracker	Step 14
Set the disk device timeout	Step 15
Disable TCP checksum offload	Step 16

## Capture a Server

The capture operation gathers hardware information, configuration information, and the content of the disk from a source server to create a server image and then saves that image in the image depot so that it can be deployed at a later time. As part of the capture operation, you can use a capture profile to define which storage on the server should be captured as part of the image.

DynaCenter supports two capture modes in CA AppLogic environments:

- **Live capture:** The DynaCenter agent (DPAD) is installed and running on the server. DynaCenter uses the agent to read the contents of the disk and to create the image; the source server continues to run and no rebooting of the server is required.
- **Offline capture:** The server is rebooted into a customized operating system, the Agent Image, provided by DynaCenter. The customized operating system contains the DynaCenter agent (DPAD). DynaCenter performs the capture and then reboots the server to its normal state.

This section lists and describes the tasks that you must complete to capture an image of a server outside of the CA AppLogic grid to deploy into a CA AppLogic appliance.

**Important:** See Prerequisites to Capture Operations on page 49 before you perform these procedures.

Task	Description	Reference
1	Disable anti-virus software	Task 1: Disable anti-virus software on page 55
2	Install a DPAD on the server	Task 2: Install a DynaCenter Agent (DPAD) on the server on page 55.
3	Register the server	Task 3: Register the server on page 57. <b>Tip:</b> Check the output from the <code>dccmd list servers</code> command to confirm whether the server has already been registered.
4	Capture the server image	Task 4: Capture the server on page 57.
5	Remove the DPAD from the server (optional)	Task 5: Remove the DPAD from the server (optional) on page 59.
6	Enable anti-virus software	Task 6: Enable anti-virus software on page 59

### Task 1: Disable anti-virus software

Anti-virus software can interfere with the DynaCenter capture operation; temporarily disable any anti-virus software that is running on the server before you begin to capture the server image.

### Task 2: Install a DynaCenter Agent (DPAD) on the server

The DynaCenter Provisioning Agent (DPAD) is a management service that communicates with DynaCenter. The DPAD serves the following functions:

- As part of a live capture operation, the agent captures server hardware information, configuration information, and the content of the server's disk to create the server image.
- As part of an offline capture operation, the server you are capturing must be rebooted. The DynaCenter agent is the recommended mechanism for rebooting the server.

**Note:** If your environment does not support installing a DynaCenter agent on the server for offline capture operations, you have the following options:

- Use a remote command from, for example, SSH (Linux) or rexec (Windows)
- Use a third party agent
- Use a smart power source (such as KVM)
- Manually reboot the system

**Note:** If the DPAD is already installed, you do not need to perform this task. To see if the DPAD is already installed and communicating with DynaCenter, run the `dccmd ping server <server_name>` command from the DynaCenter Appliance. If the DPAD is installed, the ping response will be:

```
DynaCenter agent in server <server_name> is alive and well.
```

## DPAD packages and location

The available DPAD packages are:

- **Windows:** dpsetup.exe
- **Linux:** racemi-blademgmt-linux-\*.rpm

The DPAD installation packages are located in the following directory on the DynaCenter Appliance:

```
/opt/race/mws/software/packages/agent
```

## Procedure

5. Copy the appropriate package from the DynaCenter Appliance to the source server located outside of the CA AppLogic Grid.

### Example:

On the target server, type the following command:

```
scp user@hostname_of_DynaCenter_Appliance:\
/opt/race/mws/software/packages/agent\
/racemi-blademgmt-linux-*.rpm
/tmp
```

**Note:** You can use the DynaCenter Appliance hostname or the DynaCenter Appliance IP address; however, if you use the hostname of the DynaCenter Appliance, it must be DNS resolvable.

6. From the directory on the source server where you placed the package, install the package using the appropriate command:

- **Windows non-interactive:** Open the command prompt as an administrator and then type the following command:

```
dpsetup.exe /S /mwsurl=<your_DynaCenter_Appliance_URL>
```

**Example:** dpsetup.exe /S /mwsurl=https://10.54.1.1

The DPAD is installed on the server; go to Step 6.

- **Windows interactive:** Double-click the dpsetup.exe executable file and respond to the installer wizard.

The DPAD is installed on the server; go to Step 6.

- **Linux:** Type `rpm -Uvh racemi-blademgmt-linux-*.rpm`

7. On non-Windows systems, open the dpad.ini file with an editor such as vi from the following location on the source server:

```
/opt/race/etc/dpad.ini
```

8. Edit the mws\_url line to point to the DynaCenter Appliance that manages the server where you installed the DPAD.

**Example 1:** mws\_url = https://10.4.1.1

**Example 2:** mws\_url = https://<your\_company>.com:4433

**Note:** Do not edit any other settings in the dpad.ini file.

9. Type the following command to restart the DPAD:

```
service dpad.rc restart
```

10. On the DynaCenter Appliance, confirm that the DPAD installed correctly by checking that the server registered with DynaCenter:

```
dccmd show server <server_name>
```

The substatus should be Running.

### Task 3: Register the server

You can only capture a server that is registered with DynaCenter.

**Note:** If the server is already registered, you do not need to perform this task. To see if the server is already registered, run the `dccmd list servers` command on the DynaCenter Appliance and check the output for the server name.

#### Procedure

1. From the command line of the DynaCenter Appliance, run the following command:

```
dccmd register server [--networks=<network>] \  
[--name=<server_name>] <MAC>
```

Where:

Options	--networks	network name specified when you registered the network where the server is located <b>Tip:</b> To view a list of registered networks, run <code>dccmd list networks</code> .
	--name	Name for this server in the list of registered servers
Arguments	MAC	MAC address of the server being registered <b>Example:</b> 00:1d:c2:00:d8:b0 <b>Reference:</b> Determine the MAC address of the server to be captured on page 53.

#### Example:

```
dccmd register server \  
--networks=server_network --name=my_server \  
00:1d:c2:00:d8:b0
```

2. Confirm that the server registered successfully:

```
dccmd show server <server_name>
```

The substatus should be Running.

### Task 4: Capture the server

1. From the command line of the DynaCenter Appliance, run the following command:

```

dccmd capture server [--depot=<depot_url>] \
[--description=<image_description>] \
[--name=<image_name>] \
[--offline|--live] \
[--overwrite-existing|--no-overwrite-existing] \
[--profile=<profile_url>] \
<server_id> <ostype>\

```

Where:

Options	--depot	Location of the depot where the image will be stored
	--description	Helpful comment about the image
	--name	Alternate image name for the captured image. The default is to generate a name that uses information found in the image.
	--offline --live	Capture mode <b>Note:</b> The server will be rebooted during an offline capture.
	--overwrite-existing no-overwrite-existing	Image overwrite mode if an image with the same name already exists
	--profile	Profile to use when capturing an image. The value is either a URL that points to a document accessible from the DynaCenter Appliance or a string that contains all of the profile data. <b>Example:</b> --profile=file:///profiles/my_capture_profile <b>Tip:</b> On the DynaCenter Appliance, type <code>curl -k &lt;profile_url&gt;</code> to test your profile url. For example, <code>curl -k file:///profiles/my_capture_profile</code> <b>Reference:</b> See Chapter 9: Customizing Images, which starts on page 69.
Arguments	server_id	Name of the registered server to be captured
	ostype	String that describes the operating system that is to be captured <b>Tip:</b> To view a list of valid os types, run <code>dccmd list ostypes</code> . <b>Note:</b> If you are performing a live

		capture, this argument is optional.
--	--	-------------------------------------

**Example:**

```
dccmd capture server \  
--depot=dav://mystorage/repo/images \  
--description='my_server' \  
--live \  
Dell-r200 \  
'RedHat_Linux-EL_5_*-x86_64'
```

The captured image is saved in the image depot.

2. Confirm that the image was captured:

```
dccmd list images --captured
```

Your image should appear in the list results.

**Note:** The CA Server Automation user interface provides equivalent operations to the CLI. See the *CA Server Automation Reference Guide*, RSI CLI section, for command and parameter details.

### Task 5: Remove the DPAD from the server (optional)

When you no longer want DynaCenter to communicate with the server you are capturing, you can remove the DPAD from the server.

#### Windows

1. Log in to the server you want to uninstall the agent from.
2. Open **Control Panel**→**Programs and Features**.
3. Right-click **Racemi DynaCenter x.x.x-x**, and then click **Uninstall/Change**.
4. When prompted, click **Uninstall** to remove the agent.
5. After the agent is uninstalled, click **Close**.
6. Open **Windows Explorer**→**Program Files (x86)**.
7. Right-click the **DynaCenter** directory and then click **Delete**.

#### Linux

- Type `rpm -e racemi-blademgmt-linux-*`

### Task 6: Enable anti-virus software

After the capture operation is complete, enable your anti-virus software to ensure that your server is protected.

## Chapter 8: Deploying Images

---

The deploy operation takes a captured image from the image depot and provisions it to a CA AppLogic appliance. You can use a profile to modify the storage configuration of the image during the deploy operation.

### Operating System Support for Deploy Operations

DynaCenter supports the deployment of the following operating systems to a CA AppLogic grid:

- RedHat 5.5 and later 32-bit
- RedHat 5.5 and later 64-bit
- CentOS 5.5 and later 32-bit
- CentOS 5.5 and later 64-bit
- Windows 2008 Release 2

### Prerequisites

Before you can deploy an image to an appliance there are prerequisite tasks that must be completed. This section identifies those tasks.

**Note:** Some of these tasks might already have been completed as part of other operations.

✓	Description	Reference
<input type="checkbox"/>	Ensure that the server meets the recommended RAM requirement	RAM Requirements for target servers on page 60.
<input type="checkbox"/>	Create a CA AppLogic template for the appliance you are deploying an image to	Build CA AppLogic templates on page 61.
<input type="checkbox"/>	Create a Windows filer application	Build CA AppLogic Windows filer applications (Windows only) on page 61.
<input type="checkbox"/>	Capture source images to deploy into the grid	Capture source images on page 61.

### RAM Requirements for target servers

Target servers must have at least 768MB of RAM for deploy operations to complete successfully; it is recommended that the target server have at least 1GB of RAM.

## Build CA AppLogic templates

Before you can deploy an image to a CA AppLogic appliance, you must have a template that has the same operating system and the same bitness as the image you want to deploy. CA AppLogic provides templates for CentOS 5.5 32- and 64-bit; if you are deploying to any other operating system, you must create an appropriate template.

**Important:** When you install the APK to build your CA AppLogic template, you must set a password for the SSH Administrator:

```
net user Administrator <password>
```

When you provision an appliance from the template (as the first step in deploying an image into the CA 3Tera AppLogic grid) you will provide this password in the `admin_pw=<password>` (Windows) or the `root_pw=<password>` (Linux) argument of the `app provision` command.

**Reference:** See the CA AppLogic documentation for information about how to create a template.

## Build CA AppLogic Windows filer applications (Windows only)

If you plan to deploy an image to an appliance that is running Windows 2008, you must have a Windows filer template application for that version of the operating system.

The Windows filer template application allows CA AppLogic to resize volumes on the appliance that you are deploying an image to.

**Reference:** See the CA AppLogic documentation for information about how to create a Windows filer application.

## Capture source images

Before you can deploy an image to a CA AppLogic appliance, you must have images in the depot.

**Reference:** See Chapter 7: Capturing Server Images, which starts on page 49 for information about capturing source images.

The source image contains the networking and storage information from the server that it was captured from. Some of this information must be modified when you deploy the image to another system. During the deploy operation, an image is modified in the following ways:

- DynaCenter removes the networking information because CA AppLogic manages the network information for an appliance.

**Note:** Any network information contained in your source image or specified in a deploy profile is ignored when the image is deployed. The deployed image uses the network information that was assigned to the target appliance when you created the appliance.

- DynaCenter disables the “Passwords must meet complexity requirements” setting on the target server. CA AppLogic requires certain configuration settings on Windows Server 2008 systems and, because the password complexity check prevents a newly deployed image from registering with the CA AppLogic grid, DynaCenter makes this configuration change.

**Note:** While disabling password complexity requirements might be seen as a security risk, this is a CA AppLogic requirement.

**Reference:** See Task 5: Configure the Windows operating system (Windows 2008 only) on page 66.

- You can modify the storage configuration using a profile.

**Reference:** See Sample Storage Deploy Profile Statements on page 77.

## Deploy an Image to an Appliance where no Image is Deployed

This section describes how to deploy an image to an appliance that does not already have an image deployed to it.

### Process Overview

Task	Description	Reference
1	Create an appliance on the CA AppLogic grid	Task 1: Create a CA AppLogic appliance to receive the image on page 62
2	Deploy an image to the appliance	Task 2: Deploy an image to the CA AppLogic appliance on page 64
3	Re-enable ssh root access on Linux appliances (optional)	Task 3: (Optional) Enable SSH root access (Linux only) on page 65
4	Install the TurboGate drivers (Windows only)	Task 4: Install TurboGate paravirtualized drivers (Windows only) on page 65
5	Configure the Windows operating system (Windows only)	Task 5: Configure the Windows operating system (Windows 2008 only) on page 66

### Task 1: Create a CA AppLogic appliance to receive the image

In a CA AppLogic environment, you must create an appliance before DynaCenter can deploy an image. When you provision the appliance, choose a template that has the same operating system and the same bitness as the image you want to deploy to the appliance and allocate sufficient resources for the image.

**Note:** For specific instructions on how to create an appliance, see your CA AppLogic documentation.

#### Procedure

1. To provision an appliance from the CA AppLogic command line, type the following command:

```
app provision <template-name> <appliance-name> \  
user=<some-user-name> user_pw=<some-user-password> \  

```

```
root_pw=<ssh-administrator-user-password> \  
primary_ip=<external-interface-ip> \  
netmask=<external-interface-mask> \  
gateway=<external-interface-default-gateway> \  
hostname=<new-hostname> \  
dns1=<primary-nameserver> dns2=<secondary-nameserver> \  
cpu.dflt=<default-cpu> mem.dflt=<default-memory> \  
<volume-name>.boot.size=<volume-size>
```

**Note:** To provision Windows appliances, use `admin_pw=<some-admin-password>` instead of `root_pw=<root-user-password>`.

### Linux Example

To provision an appliance for a 64-bit CentOS 5.5 image from the CA AppLogic command line:

```
app provision VDS64_CentOS55_r4\  
my_centos_system \  
user=admin user_pw=some_password \  
root_pw=ssh_admin_password \  
primary_ip=172.16.120.15 \  
netmask=255.255.255.0 gateway=172.16.120.1 \  
hostname=centos_55_64 \  
dns1=172.16.240.1 dns2=172.16.250.1 \  
cpu.dflt=1 mem.dflt=2G\  
VDS64_CENTOS55.boot.size=50G
```

Where `root_pw=ssh_admin_password` is the SSH Administrator password set when the template was created. See Build CA AppLogic templates on page 61.

### Windows Example

To provision an appliance for a Windows 2008 image from the CA AppLogic command line:

```
app provision VDS_Win08E\  
my_windows_system \  
user=admin user_pw=some_password \  
admin_pw=ssh_admin_password \  
primary_ip=172.16.120.25 \  
netmask=255.255.255.0 gateway=172.16.120.1 \  
hostname=win_8 \  
dns1=172.16.240.1 dns2=172.16.250.1 \  
cpu.dflt=1 mem.dflt=4G \  
VDS_Win08E.boot.size=100G
```

Where `admin_pw=ssh_admin_password` is the SSH Administrator password set when the template was created. See Build CA AppLogic templates on page 61.

2. Type `app list` to verify that the appliance was provisioned.

**Note:** The CA Server Automation user interface provides equivalent operations to the CLI. See the *CA Server Automation Reference Guide*, RSI CLI section, for command and parameter details.

## Task 2: Deploy an image to the CA AppLogic appliance

After you have created an appliance on the CA AppLogic grid, you can deploy any image to the appliance if the image has the same operating system and the same bitness as the appliance.

### Procedure

1. From the command line of the DynaCenter Appliance, run the following command:

```
dccmd cloud deploy image \
[--depot=<depot_url>] \
[--profile=<profile_url>] \
<image_id> <domain_id> <server_id> <network_id>
```

Where:

Options	--depot	Location of the depot that contains the captured image to be deployed
	--profile	Profile to use when deploying this image. The value is either a URL that points to a document accessible from the DynaCenter Appliance or a string that contains all of the profile data. <b>Example:</b> --profile=file:///profiles/my_deploy_profile <b>Tip:</b> On the DynaCenter Appliance, type <code>curl -k &lt;profile_url&gt;</code> to test your profile url. For example, <code>curl -k file:///profiles/my_deploy_profile</code> <b>Reference:</b> See Chapter 9: Customizing Images, which starts on page 69.
Arguments	image_id	Name of the captured image to deploy to the appliance
	domain_id	DynaCenter domain that should be assigned to the new server <b>Note:</b> In CA AppLogic environments, this is always <code>applogic-domain</code> .
	server_id	Name of the appliance <b>Note:</b> This is the <code>&lt;appliance-name&gt;</code> argument you specified when you created the appliance.

	network_id	network name specified when you registered the external network <b>Note:</b> In CA AppLogic environments, this is always applogic-network.
--	------------	---

#### Linux Example:

```

dccmd cloud deploy image \
--depot=dav://mystorage/repo/images \
--profile=file:///profiles/email_cluster \
dell_r200_centos55_64 \
applogic-domain \
my_centos_system \
applogic-network

```

#### Windows Example:

```

dccmd cloud deploy image \
--depot=dav://mystorage/repo/images \
--profile=file:///profiles/email_cluster \
dell_r200_w2k8\
applogic-domain \
my_windows_system \
applogic-network

```

**Note:** The CA Server Automation user interface provides equivalent operations to the CLI. See the *CA Server Automation Reference Guide*, RSI CLI section, for command and parameter details.

### Task 3: (Optional) Enable SSH root access (Linux only)

When DynaCenter deploys an image to your Linux appliance, it injects the CA AppLogic Appliance Kit, which disables SSH access for the root user. If you require SSH root access to the appliance, you must enable it after the deploy operation completes.

1. From the CA AppLogic grid Shell, login to the deployed appliance.
2. Open the `sshd_conf` file with an editor such as `vi` from the following location on the appliance:  
`/etc/ssh/sshd_conf`
3. Change the `PermitRootLogin` setting to "yes".
4. Save your changes to the file.
5. Type the following command to restart the secure shell daemon:  
`/etc/init.d/sshd restart`

### Task 4: Install TurboGate paravirtualized drivers (Windows only)

The TurboGate paravirtualized drivers provide improved performance for fully virtualized Windows systems.

1. Log in to the appliance as an Administrator.
2. On the appliance, open the TurboGate folder that DynaCenter placed on the Desktop.
3. Double-click the `install_turbogate.bat` file.  
The TurboGate paravirtualized drivers are installed.
4. When prompted to restart the appliance, click **OK**.
5. On the Grid Controller, locate the appliance.
6. Right-click the appliance and click **Restart**.  
After the appliance restarts, the status of the appliance should be Running.
7. To confirm that the drivers were installed, log in to the appliance, open the Device Manager, and confirm that the two Halsign GK drivers are listed in the **Network adapters** section.

### Task 5: Configure the Windows operating system (Windows 2008 only)

CA AppLogic requires that the Windows Server 2008 operating system be configured in a specific way when part of a CA 3Tera AppLogic grid. If you are deploying a Windows Server 2008 image into your CA AppLogic grid, you should review the CA AppLogic requirements.

**Note:** If the server that the image was captured from was configured as required by CA AppLogic, you do not have to perform this task.

**Reference:** The CA AppLogic documentation for Windows Server 2008 located at describes how to create a Windows Server 2008 Base Server Class.

- For CA AppLogic 3.0, see [http://doc.3tera.com/AppLogic31/Developer\\_Guide/index.htm](http://doc.3tera.com/AppLogic31/Developer_Guide/index.htm)
- For CA AppLogic 3.1, see [http://doc.3tera.com/AppLogic30/en/Developer\\_Guide/index.htm](http://doc.3tera.com/AppLogic30/en/Developer_Guide/index.htm)

From the Table of Contents, drill down to OS Installation -> Distribution Installations -> Windows Appliance Installation -> Windows Installation Reference -> Windows Server 2008 Base Server Class Installation Reference; within these instructions you will find the configuration requirements for Windows 2008 as outlined in the following table:

Requirement	Noted in
Set the screen resolution	Step 4
Set the screen saver timeout	Step 4
Disable the page file	Step 4
Disable power management hibernation support	Step 4
Disable IE enhanced security	Step 4

Clean up any leftover pagefile	Step 5
Install high priority and optional Windows updates	Step 7
Disable the Windows Firewall	Step 10
Disable automatic updates	Step 11
Disable password complexity requirements <b>Note:</b> DynaCenter automatically disables this setting when it deploys an image.	Step 12
Set the Administrator password to never expire	Step 13
Disable the shutdown event tracker	Step 14
Set the disk device timeout	Step 15
Disable TCP checksum offload	Step 16


## Deploy an Image to an Appliance where an Image is Already Deployed

This section describes how to deploy an image to an appliance that has an image from a previous deploy operation still deployed.

### Process Overview

Task	Description	Reference
1	Delete the existing appliance from the CA AppLogic grid	Task 1: Delete the existing appliance on page 67
2	Remove the appliance from the DynaCenter database	Task 2: Remove the appliance from the DynaCenter database on page 67
3	Create a new appliance and deploy the new image	Deploy an Image to an Appliance where no Image is Deployed on page 62

### Task 1: Delete the existing appliance

 **Caution:** When you delete an appliance, all information such as configuration settings and any user data is lost. Before you delete the appliance, backup or record any information or data that you do not want to lose.

- Type the following command from the CA AppLogic command line to delete the appliance:

```
app destroy <appliance_name>
```

### Task 2: Remove the appliance from the DynaCenter database

- From the command line of the DynaCenter Appliance, run the following command:

```
dccmd remove server <server_id>
```

Where:

Arguments	<code>server_id</code>	Name of the appliance <b>Note:</b> This is the <appliance-name> argument you specified when you created the appliance.
-----------	------------------------	---

**Example:**

```
dccmd remove server my_centos_system
```

**Task 3: Create a new appliance and deploy the new image**

**Reference:** See Deploy an Image to an Appliance where no Image is Deployed on page 62.

## Chapter 9: Customizing Images

---

### Overview

An image is a collection of files that holds the information gathered from the disk(s) on the system that was captured, the information gathered about the system that was captured, and the characteristics of the image (file system type, original partition size, etc.).

Sometimes, capturing or deploying an exact replica of a system is not appropriate. In these situations, you can use a profile to customize how an image is captured or deployed. Using a profile to customize a capture or deploy operation you can:

- Specify which storage on the server should be captured.
- Specify how the storage on the target server should be configured.
- Add supplemental files, scripts, and patches to an image to satisfy a unique deployment scenario by creating a component.

This chapter contains the following sections, which provide information about using profiles to customize how an image is captured or deployed:

- The different types of profiles and how DynaCenter refers to storage and file systems on a server so that you can create profiles that achieve the results you expect.

**Reference:** See Section A: Understand Profiles, which starts on page 71.

- How to create a profile and sample profile statements.

**Reference:** See Section B: Create a Profile, which starts on page 75.

- How to create a software component with examples.

**Reference:** See Section C: Create a Software Component, which starts on page 86.



---

## Section A: Understand Profiles

---

A profile contains a list of statements that specify how the capture or deploy of an image should be customized. When you use a profile, the profile settings override the metadata associated with the image. You can create and store as many profiles as you need and then reference a specific profile when you deploy or capture an image.

This section provides some basic concepts about profiles so that you can build profiles that achieve your desired goals.

### Types of profiles

There are two types of profiles—profiles that control the behavior of the image capture operation and profiles that control the behavior of the image deploy operation.

#### Capture profiles

By default, DynaCenter captures the entire image for the operating system installed on the server; however, capture profiles allow you to specify exactly which data on a server should be part of the image captured from that server. By controlling which storage is captured, you can save space (smaller images) and capture images that can be used in more deployment operations. For example, if Disk 1 contains the operating system and Disk 2 contains a database, you might want the captured image to only contain the operating system disk. A capture profile allows you to specify that only Disk 1 should be captured.

#### Deploy profiles

Deploy profiles minimize the number of images you need to store in the depot by allowing you to customize a golden image for each unique deployment. For example, you can store a generic file server image and then, using a deploy profile, customize the storage layout on the target appliance based on the requirements of each appliance instance.

### Storage Layers

Before you can effectively use profiles to configure storage when you deploy an image to a server, you must understand how DynaCenter interprets server storage.

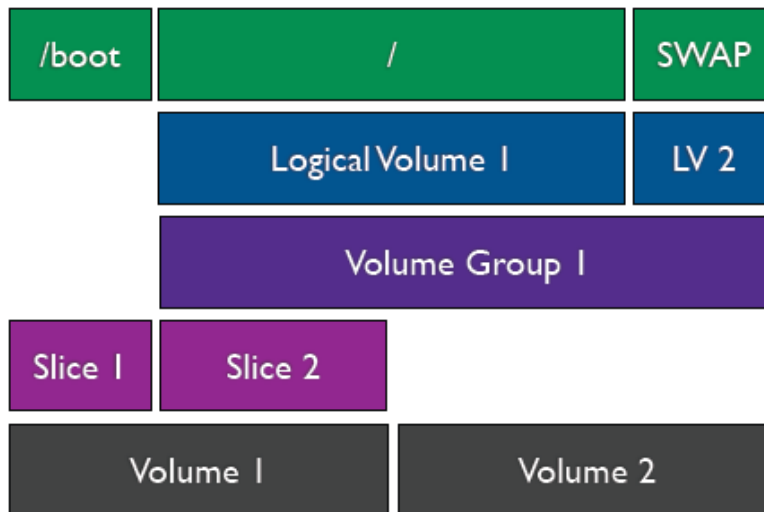
#### Linux storage layers

In Linux-like environments, DynaCenter uses five layers of storage to define how a file system is laid down on a server; the following table describes these layers:

Storage Layer	Description
Volumes	Disks or LUNS on the server
Slices	Partitions on the disk. A slice can be part of a disk or it

	can consume the whole disk. Slices are constrained by the characteristics of the physical disk.
Volume Groups	Collections of Logical Volumes, physical volumes (disks), and slices (partitions)
Logical Volumes	Partitions within the Volume Group
File systems	Collections of data that sit on a slice or a Logical Volume

The following diagram illustrates how these layers might be laid out on a Linux-based server:



When you deploy an image, you can specify how you want the storage laid out on the target server by defining, in a profile, the storage layers from the bottom up.

### Windows storage layers

In Windows environments, DynaCenter uses three layers of storage to define how a file system is laid down on a server; the following table describes these layers:

Storage Layer	Description
Volumes	Disks or LUNS on the server
Slices	Partitions on the disk. A slice can be part of a disk or it can consume the whole disk. Slices are constrained by the characteristics of the physical disk.
File systems	Collections of data <b>Note:</b> All file systems must reside on their own slice.

The following diagram illustrates how these layers might be laid out on a Windows server:



When you deploy an image, you can specify how you want the storage laid out on the target server by defining, in a profile, the storage layers from the bottom up.

## Windows File systems

Before you can effectively use profiles to define which storage to capture from a Windows server you must understand how DynaCenter interprets the Windows file system layout.

The following table provides examples of how to identify a specific Windows file system given a particular disk layout:

Disk Layout	Mountpoint	Refers to
Disk 1 partition 1 partition 2 Disk 2 partition 1	E	Disk 2, partition 1
Disk 1 partition 1 Disk 2 partition 1 partition 2	E	Disk 2, partition 2
Disk 1 partition 1 Disk 2 partition 1 partition 2	D	Disk 2, partition 1



---

## Section B: Create a Profile

---

Profiles are represented differently depending on whether you are using the command line or web services. This section describes how to create profiles that are used by the command line tools. These profiles are defined in a text file using a simple descriptive language.

**Reference:** The *DynaCenter OEM Integration Guide* explains how to create profiles for use with web services and explains how to convert a profile text file for use with web services.

**Tip:** If your environment has a set of standard capture and deploy scenarios, you can create a profile for each scenario and make those profiles available to your end-users through the driving application.

### Create a Profile

You create a profile by listing, in a text file, all of the statements that will customize the image. After you create a profile, you apply the profile to a capture or deploy operation using the `--profile` option in either the `dpmrsi capture` command or the `dpmrsi deploy` command. The statements defined in the profile override the information in the image to create a custom image. Any user defined profile options will supercede the profile statements.

You can combine any number of statements in a profile to create a simple or a very complex customization. The statements in a profile might include any or all of the following:

- Any custom storage settings.

**References:** Sample Storage Capture Profile Statements, which start on page 76 and Sample Storage Deploy Profile Statements, which start on page 77.

- Any supplemental components, such as additional applications, patches, or scripts to deploy with an image.

**Reference:** Miscellaneous deploy profile statements, which starts on page 83.

## Sample Storage Capture Profile Statements

This section provides samples of profile statements commonly used to define which storage should be captured in an image.

**Note:** You can add descriptive comments, preceded with #, to explain the purpose of the statement.

### Capture all file systems except a specific file system (Linux/UNIX)

By default, DynaCenter captures all of the file systems on a server. If you do not want to capture a particular file system, you can exclude that file system from the capture operation.

```
# Capture all file systems on the server except /home  
  
fs /home --exclude
```

**Note:** If your system has only the /, /boot, /home, and /opt file systems, this capture profile would have the same result as Capture a subset of file systems (Linux/UNIX) on page 76.

### Capture all file systems/disks/drives except a specific file system/disk/drive (Windows)

By default, DynaCenter captures all of the file systems on a server. If you do not want to capture a particular file system, you can exclude that file system from the capture operation.

```
# Capture all file systems on the server except E:\  
  
fs E --exclude
```

**Important:** You must capture the drive where the operating system is installed. The profile statement `fs /` uses the %SYSTEMROOT% environment variable to capture the drive where the operating system files are located.

**Note:** If your system has only the C:\, D:\, E:\, and F:\ file systems, this capture profile would have the same result as Capture a subset of file systems/disks/drives (Windows) on page 77.

### Capture a subset of file systems (Linux/UNIX)

By default, DynaCenter captures all of the file systems on a server. If you want to capture only a subset of file systems, you must name the specific file systems you want to capture. When you name a specific file system to capture, DynaCenter only captures the file system that is specifically named; DynaCenter does not capture any file systems mounted under the named file system.

```
# Capture the operating system, the kernel, and "applications"  
  
fs /  
  
fs /boot
```

```
fs /opt
```

**Note:** Many UNIX variants put applications in the /opt hierarchy. This sample assumes that /opt is a separate file system.

**Note:** If your system has only the /, /boot, /home, and /opt file systems, this capture profile would have the same result as Capture all file systems except a specific file system on page 76.

### Capture a subset of file systems/disks/drives (Windows)

By default, DynaCenter captures all of the file systems on a server. If you want to capture only a subset of file systems, you must name the specific file systems you want to capture.

```
# Capture the operating system, D:\, and F:\ (but not E:\)
```

```
fs /
```

```
fs D
```

```
fs F
```

**Important:** You must capture the drive where the operating system is installed. The profile statement `fs /` uses the %SYSTEMROOT% environment variable to capture the drive where the operating system files are located.

**Note:** If your system has only the C:\, D:\, E:\, and F:\ file systems, this capture profile would have the same result as Capture all file systems/disks/drives except a specific file system/disk/drive (Windows) on page 76.

## Sample Storage Deploy Profile Statements

This section provides samples of profile statements commonly used to define the storage configuration for an appliance when you deploy an image to that appliance.

**Note:** You can add descriptive comments, preceded with #, to explain the purpose of the statement.

### Deploy a two disk capture to a two disk target server (Linux/UNIX)

**Note:** This sample illustrates how to place two file systems on the same partition. If you wanted to deploy each file system to a dedicated slice, you could eliminate the use of volume groups and logical volumes shown in this sample.

```
# Deploy a two disk capture to a two disk Linux target server
```

```
# Create two disks on the target server
```

```
volume 1
```

```
volume 2
```

```

# Create two slices to fill the first disk; allow each slice
# to expand in size to consume available space on the volume;
# specify the minimum size of each slice in mebibyte (MiB)

slice 1 --volume 1 --expand --size=300

slice 2 --volume 1 --expand --size=30000

# Create a volume group to contain one logical volume for root
and one logical volume for swap

vg MyVolGroup1 --slice 2

lv RootLV --vg MyVolGroup1 --size 5000

lv SwapLV --vg MyVolGroup1 --size 1300

# Create three file systems—a boot file system on the first
# slice, a root file system in the root logical volume and a
# swap file system in the swap logical volume; specify the
# type of file system; specify which slice/logical volume will
# hold the file systems

fs / --type ext3 --lv RootLV

fs /boot --type ext3 --slice 1

fs /swap --type swap --lv SwapLV

```

**Important:** The order of the slice statements determines the position of the slice in the partition table; the integers 1 and 2 do not determine the position of the slice, and each slice statement must have a unique integer. The order of the fs statements determines the order of the file system entries in the fstab file.

**Reference:** See Deploy an image to five partitions (Linux) on page 81 for information about how DynaCenter handles deploy operations when your profile specifies that you want more than four slices in one volume.

### Deploy a two disk capture to a two disk target server (Windows)

**Note:** In Windows environments all file systems **must** reside on their own slice.

```

# Deploy a two disk capture to a two disk Windows target
# server

# Create two disks on the target server

volume 1
volume 2

# Create one slice to fill each disk; allow each slice to
# expand in size to consume available space on the volume;
# specify the minimum size of each slice in mebibyte (MiB)

```

```

slice 1 --volume 1 --expand --size=30000

slice 2 --volume 2 --expand --size=30000

# Create a file system on each slice; specify the type of
# file system; specify which slice will hold the file system

fs / --type ntfs --slice 1

fs E --type ntfs --slice 2

```

**Important:** The order of the slice statements determines the position of the slice in the partition table; the integers 1 and 2 do not determine the position of the slice, and each slice statement must have a unique integer. The order of the fs statements determines the order of the file system entries in the fstab file.

**Reference:** See Deploy an image to five partitions (Windows) on page 82 for information about how DynaCenter handles deploy operations when your profile specifies that you want more than four slices in one volume.

### Deploy a two disk capture to a one disk target server (Linux/UNIX)

```

# Deploy a two disk capture to a one disk Linux target
# server

# Create one disk on the target server

volume 1

# Create two slices; allow one slice to expand in size to
# consume available space on the volume; specify the minimum
# size of the slices in MiB

slice 1 --volume 1 --size=300

slice 2 --volume 1 --expand --size=5000

# Create a file system on each slice; specify the type of
# file system; specify the slice that will hold the file
# system

fs / --type ext3 --slice 2

fs /boot --type ext3 --slice 1

```

**Important:** The order of the slice statements determines the position of the slice in the partition table; the integers 1 and 2 do not determine the position of the slice, and each slice statement must have a unique integer. The order of the fs statements determines the order of the file system entries in the fstab file.

## Deploy a two disk capture to a one disk target server (Windows)

**Note:** In Windows environments all file systems **must** reside on their own slice.

```
# Deploy a two disk capture to a one disk Windows target
# server

# Create one disk on the target server

volume 1

# Create two slices; allow one slice to expand in size to
# consume available space on the volume; specify the minimum
# size of each slice in MiB

slice 1 --volume 1 --size=5000

slice 2 --volume 1 --expand --size=30000

# Create a file system on each slice; specify the type of
# file system; specify the slice that will hold the file
# system

fs / --type ntfs --slice 1

fs E --type ntfs --slice 2
```

## Deploy a two partition capture to a three partition target server (Linux/UNIX)

# Deploy a two partition capture to the first and third  
# partitions of a three partition target server

# Create one disk on the target server

```
volume 1

# Create three slices on the disk; specify the minimum size of
# each slice in MiB

slice 1 --volume 1 --size=25000

slice 2 --volume 1 --size=5000

slice 3 --volume 1 --size=10000

# Create a file system on two slices; specify the type of
# file system; specify which slice will hold the file system

fs / --type ext3 --slice 1

fs /boot --type ext3 --slice 3
```

**Important:** The order of the slice statements determines the position of the slice in the partition table; the integers 1, 2, and 3 do not determine the position of the slice,

and each slice statement must have a unique integer. The order of the fs statements determines the order of the file system entries in the fstab file.

### Deploy a two partition capture to a three partition target server (Windows)

```
# Deploy a two partition capture to the first and third
# partitions of a three partition target server

# Create one disk on the target server

volume 1

# Create three slices on the disk; specify the minimum size of
# each slice in MiB

slice 1 --volume 1 --size=25000

slice 2 --volume 1 --size=5000

slice 3 --volume 1 --size=10000

# Create a file system on two slices; specify the type of
# file system; specify which slice will hold the file system

fs / --type ntfs --slice 1

fs E --type ntfs --slice 3
```

**Important:** The order of the slice statements determines the position of the slice in the partition table; the integers 1, 2, and 3 do not determine the position of the slice, and each slice statement must have a unique integer.

**Reference:** See Deploy an image to five partitions (Windows) on page 82 for information about how DynaCenter handles deploy operations when your profile specifies that you want more than four slices in one volume.

### Deploy an image to five partitions (Linux)

```
# Deploy an image to five partitions

# Create a disk on the target server

volume 1

# Create one slice for each partition; allow each slice to
# expand in size to consume available space on the volume;
# specify the minimum size of each slice in mebibyte (MiB)

slice 1 --volume 1 --expand --size=300

slice 2 --volume 1 --expand --size=30000

slice 3 --volume 1 --expand --size=30000
```

```

slice 4 --volume 1 --expand --size=30000

slice 5 --volume 1 --expand --size=30000

# Create a file system on each slice; specify the type of
# file system; specify which slice will hold the file system

fs / --type ext3 --slice 2

fs /boot --type ext3 --slice 1

fs swap --type swap --slice 3

fs /usr --type ext3 --slice 4

fs /home --type ext3 --slice 5

```

**Important:** The order of the slice statements determines the position of the slice in the partition table; the integers 1, 2, and 3 do not determine the position of the slice, and each slice statement must have a unique integer. The order of the fs statements determines the order of the file system entries in the fstab file.

**Note:** Linux systems only support four partitions per disk so, when you deploy this image, DynaCenter will place slice four and above on an extended partition that is divided into logical partitions. The deployed image will be laid out as follows:

Disk Layout	Mountpoint
Primary Partition 1	/boot
Primary Partition 2	/
Primary Partition 3	swap
Extended Partition 4	
Logical Partition 5	/usr
Logical Partition 6	/home

### Deploy an image to five partitions (Windows)

```

# Deploy an image to five partitions

# Create a disk on the target server

volume 1

# Create one slice for each partition; allow each slice to
# expand in size to consume available space on the volume;
# specify the minimum size of each slice in mebibyte (MiB)

slice 1 --volume 1 --expand --size=30000

slice 2 --volume 1 --expand --size=30000

slice 3 --volume 1 --expand --size=30000

```

```

slice 4 --volume 1 --expand --size=30000

slice 5 --volume 1 --expand --size=30000

# Create a file system on each slice; specify the type of
# file system; specify which slice will hold the file system

fs / --type ntfs --slice 1

fs E --type ntfs --slice 2

fs F --type ntfs --slice 3

fs G --type ntfs --slice 4

fs H --type ntfs --slice 5

```

**Note:** Microsoft Windows systems only support four partitions per disk so, when you deploy this image, DynaCenter will place slice four and above on an extended partition that is divided into logical partitions. The deployed image will be laid out as follows:

Disk Layout	Mountpoint
Primary Partition 1	/
Primary Partition 2	E
Primary Partition 3	F
Extended Partition 4	
Logical Partition 5	G
Logical Partition 6	H

### Miscellaneous deploy profile statements

This section provides samples of other profile statements commonly used for deploy operations.

#### Deploy a component with an image

```
#Deploy a software component with an image
```

```
component <name>
```

Where <name> is the name of the component to be deployed with an image. More than one component can be specified in the profile; however, a profile can only contain components with the same OSType as the image.

**Reference:** Section C: Create a Software Component, which starts on page 86.

## Sample Complex Deploy Profile

This section provides a sample deploy profile to illustrate how multiple profile statements are joined to create a complex customization of an image.

```
# Sample Complex Deploy Profile
# Define networking information:
# Specify the hostname

hostname DELL-r200

# Create two interfaces:
# - first interface should use the DHCP server to obtain
#   IP address
# - second interface should use a specific IP address
#   and netmask
# - control the default routing of network traffic into
#   and out of the server

interface 1
ip --interface 1 --dhcp
interface 2
ip --interface 2 --address 192.168.10.171 --netmask
255.255.128.0
route --gateway 192.168.1.1 --default

# Define storage:
# - one disk
# - two slices/partitions
# - one volume group on second slice/partition
# - two logical volumes called root and swap in volume
#   group
# - three file systems -- boot file system on first
#   slice/partition, root file system in root logical
#   volume and swap file system in swap logical volume

volume 1
slice 1 --volume 1 --size 300
slice 2 --volume 1 --size 7000
vg VG1 --slice 2
lv RootLV --vg VG1 --size 5000
lv SwapLV --vg VG1 --size 1300
fs / --type ext3 --lv RootLV
fs /boot --type ext3 --slice 1
fs /swap --type swap --lv SwapLV

# Include SSH certificate component

component RootSSHCertificate
```

## Test a profile

Profiles contain complex, related data but have only a loose structure. This means that it is possible to create profiles that do not make sense. You can test a profile to ensure the following:

- That the profile is not empty.
- That there is only one Driverset referenced in the profile.
- That a Driverset or any components referenced in the profile exist.
- That each profile statement is syntactically and semantically valid.

**Note:** Testing a profile does not ensure that the profile is correct; it only tests that the syntax is valid.

### Procedure

- On the DynaCenter Appliance, type one of the following:
  - To test a capture profile:  
`dccmd test captureprofile <profile_url>`
  - To test a deploy profile:  
`dccmd test deployprofile <profile_url>`

Where:

Arguments	profile_url	Profile to validate
-----------	-------------	---------------------

DynaCenter uses standard output to list any errors with the profile.

---

## Section C: Create a Software Component

---

A software component is used to manipulate the content and behavior of an image by applying supplemental files, scripts, patches, etc. to the image during a deploy operation. A component can contain one or more files or binaries. All the necessary files and binaries can be contained in one component or they can be divided between several smaller components to provide flexibility.

### Set Permissions for Linux/Unix Components

When you install a component as part of a deployment it is important that the ownership and permissions for the files that make up the component are set appropriately. If you set the ownership and permissions appropriately when you create the component, you will not have to customize them on each target server where the component is installed. Use the `chmod` and `chown` commands to set directory and file permissions.

### Create a Component

When you create a component you create a source tree that contains all the directories and files for the component. All directories and files must have the appropriate permissions and ownership.

The following instructions are for creating one component with one file; examples later in this section show how to create more components with different files.

1. Download the file for the component.
2. Create a directory for the file.
3. Upload the file to the directory.
4. Install the file as a component:

```
rinstallsnapshot --description=<component_description> \  
--no-bootable --os-type=<ostype> --prefix=<directory> \  
--vendor=<vendor> <name> <source> <repository>
```

Where:

Options	--description	Helpful comment about the component.
	--no-bootable	Makes the component not bootable by itself.
	--os-type	Operating system of the component and the image it will be applied to. <b>Note:</b> Each component must have the same os-type as the image that will use it or the provision will fail. The <code>dcemd list ostypes</code> command lists valid operating system types. The format supports wildcards;

		however, it is always best to select the most specific value possible.
	--prefix	Directory where all the files for the component will be installed. Whatever is given as the source is assumed to be the top of the desired hierarchy. If no --prefix is given, only a root directory exists.
	--vendor	Vendor of the component <b>Note:</b> You can specify any custom value here. Any non-default value ensures that your component will be migrated if you ever upgrade DynaCenter.
Arguments	name	Descriptive name for the software component
	source	Source of the files for the component
	repository	Repository that will hold the component

5. Verify the component was installed and review its configuration:

```
rshowsnapshot <component_name>
```

6. Verify the executable file was created for the component:

```
rcommandprompt --component=<component_name>
ls <prefix>
exit
```

7. Add the component to the image profile using the component statement.

**Reference:** See Deploy a component with an image on page 83.

## Windows Component Example

This example creates two Windows components for Windows 2008 images.

1. Download the files for the components WinSCP and TightVNC for Windows 2008.
2. Create /root/install on the DynaCenter Appliance with the following subdirectories: "W2k8\_WinSCP" and "W2k8\_VNC".
3. Upload the files to their respective subdirectories in /root/install.
4. Install the WinSCP component:

```
rinstallsnapshot --description="WinSCP for Windows 2008" \
--no-bootable --os-type=Microsoft_Windows-2008_*_*_* \
--prefix=/install/W2k8_WinSCP --vendor=WinSCP \
Win2K8_WinSCP /root/install/W2k8_WinSCP default
```

5. Verify the WinSCP component was installed and review its configuration:

```
rshowsnapshot Win2k8_WinSCP
```

6. Verify the executable file was created for the component:

```
rcommandprompt --component=Win2K8_WinSCP
ls root/install/W2k8_WinSCP
exit
```

7. Install the TightVNC component:

```
rinstallsnapshot --description="TightVNC Windows 2008" \
--no-bootable --os-type=Microsoft_Windows-2008_*_*_* \
-- prefix=/install/W2k8_VNC --vendor=TightVNC \
Win2K8_VNC /root/install/W2k8_VNC default
```

8. Verify the TightVNC component was installed and review its configuration:

```
rshowsnapshot Win2K8_VNC
```

9. Verify the executable file was created for the component:

```
rcommandprompt --component=Win2K8_VNC
ls root/install/W2k8_VNC
exit
```

10. Add the components to the image profile and include the profile when you deploy the image.

After the image is deployed, C:\install\W2k8\_WinSCP and C:\install\W2k8\_VNC will have been created.

## Linux Component Example

This example creates an RHEL5 component for RHEL 5 32-bit images.

1. Download htop for RHEL 5 32-bit.
2. On the DynaCenter Appliance, create /tmp/rpm\_install/RHEL5\_32bit\_htop.
3. Upload the file to the /tmp/rpm\_install/RHEL5\_32bit\_htop directory.
4. Set the permissions and ownership of the directories using the chmod and chown commands.
5. Create the RHEL5 component:

```
rinstallsnapshot --description="htop for RHEL5 32-bit" \
--no-bootable --os-type=RedHat_Linux-EL_5_*-i686 \
--prefix=/tmp/install/RHEL5_32bit_htop --vendor=htop \
RHEL5_32bit_htop /tmp/rpm_install/RHEL5_32bit_htop \
default
```

The component file list will include entries for /tmp/, tmp/rpm\_install, and tmp/rpm\_install/RHEL5\_htop, each of which will have its permissions and ownership tailored for provisioning depending on what is given as the source.

**Note:** If no --prefix is specified, only a root directory exists.

6. Verify the component was installed and review the configuration:

```
rshowsnapshot RHEL5_32bit_htop
```

7. Add component statements to the profile and include the profile when you deploy the image.



## Chapter 10: General Maintenance

---

Periodically complete general maintenance procedures to ensure that the DynaCenter license remains up to date and the database is securely backed up or restored.

### Manage the DynaCenter License

DynaCenter is licensed via a cryptographically signed license with an expiration date. If your license expires, you must request a new license if you want to continue performing DynaCenter operations. This section describes how to examine your existing license, then request and install a new one.

#### Examine your existing license

Check your existing license to see when it expires so that you can request a new license before DynaCenter operations are interrupted.

**Note:** All license operations are managed from the Linux shell via command-line tools.

1. Log in to the DynaCenter Appliance.
2. At the shell prompt, type `rshowlicense`, and then provide the DynaCenter administrative username and password when prompted.

You should see output like:

```
DynaCenter License Information
Issuer: Racemi
Issued To: Data Center
License Type: demo
Hostname: mws.yourcompany.com
Database Instance: demouser:mws.yourcompany.com:127.0.0.1
Issue Date: 2011-03-23 12:00:00.00
Expiration Date: 2011-04-22 00:00:00.00
Grace Period: 0 days
Component(s):DynaCenter
```

Your license might include different components and it might have a different license type; it will include a different expiration date.

Notice that this license has an expiration date with no grace period. This means that after the expiration date has passed, DynaCenter will refuse any operational instructions until a new license is provided. Your license might have a grace period, during which DynaCenter will still support normal operation, but will warn you that the license is expiring. After the license has expired, DynaCenter will not perform licensed operations.

## Request a new license

Before the license expires, request a new license from CA Technical Support.

## Install a new license

After the license renewal is approved, you will receive an email with your new license. Review the content of the email to ensure that the information is correct before you install the license.

**Note:** The license update process should take less than five minutes.

1. Save the license file, `dynacenterLicense.xml`, that is attached to the email and place it on the DynaCenter Appliance in the `/opt/race/share/conf` directory.
2. Log into the DynaCenter Appliance as the root user.
3. Type the following command to stop all DynaCenter services:

```
dcctl stop
```

This will not disrupt any of your managed servers, but the system will not respond to new server boot requests while the license upgrade is in process.

4. Type the following command to load the new license:

```
/opt/race/bin/rimportlicensefile \  
/opt/race/share/conf/dynacenterLicense.xml
```

5. Type the following command to start all DynaCenter services:

```
dcctl start
```

You should be back on line with the new license installed.

## Backup and Restore the DynaCenter Database and Repositories

Periodically back up the DynaCenter database and image repositories. The best practice is to back up your database and your image repositories at the same time.

### Back up the database

DynaCenter includes a command line tool that simplifies the database backup process. Running the tool will temporarily shut down DynaCenter services on the DynaCenter Appliance, so do not run it while systems are trying to boot or while the DynaCenter Appliance is committing changes to the database.

1. Open a command terminal on the DynaCenter Appliance.
2. Use the following command to shut down the DynaCenter daemons and back up the database non-interactively:

```
/opt/race/share/conf/dbbacker.sh -y
```

The backup location is:

```
/opt/race/share/conf/dynacenter_database.${datestamp}.sql
```

**Note:** Run `dbbacker.sh -h` to obtain a full list of arguments and options for the script.

### Restore the database

**Note:** If the DynaCenter database does not already exist, create one using the `make_db` script:

```
/opt/race/share/conf/make_db
```

1. Open a command terminal on the DynaCenter Appliance.
2. To restore the database, run:

```
psql dynacenter < backupfile.sql
```

The `backupfile.sql` file is the file created by `dbbacker.sh`.

### Back up the repositories

Your image repositories are the core of your DynaCenter installation, and they should be backed up in conjunction with the database. DynaCenter does not ship with a tool to backup repositories because storage configurations typically differ widely across deployments.

The default locations for DynaCenter repositories are:

- `/repo/I` , which stores metadata for DynaCenter agents and images
- `/repo/R` , which stores DynaCenter components and templates
- `/repo/images` , which stores captured images (the depot)

**Note:** While the default location for the depot is on the DynaCenter Appliance, Racemi recommends using external storage for your depot. See DynaCenter Installation Options on page 23 for more information.

Whenever you perform a database backup, you should create an archive of at least the /repo/I and /repo/R repositories using tar, cpio, or some similar tool and then secure the archives on durable media along with the database backup file that they correspond to. You should perform a repository backup when DynaCenter processes are under minimal load to avoid file contention.

**Note:** Do not use the Secure Copy Protocol (SCP) for copying files on a network as it does not retain any symbolic links in the files. You can use SCP to copy tar archives as tarring preserves the symbolic links.

### Back up metadata, component, and template repositories

To archive metadata for agents and images and components and templates stored on the DynaCenter Appliance:

1. Log in to the DynaCenter Appliance as root.
2. From the DynaCenter Appliance command line, type:

```
/opt/race/bin/dcctl stop
```

3. Execute your preferred archive command.

**Example:**

```
cd /  
tar cvzf 20100711metadata_arch.tgz repo/I  
tar cvzf 20100711component_arch.tgz repo/R
```

4. From the DynaCenter Appliance command line, type:

```
/opt/race/bin/dcctl start
```

### Back up the captured image repository (Depot)

**Note:** If you are not using external storage for your captured image depot, use the procedure in Back up metadata, component, and template on page 94 to archive your depot.

To archive the captured image repository (the depot) stored on external storage:

1. Log in to the external storage as root.
2. Execute your preferred archive command.

**Example:**

```
cd /  
tar cvzf 20100711captured_images_arch.tgz repo/images
```

## Restore the repositories

Use the procedures in this section to restore the DynaCenter repositories.

### Restoring the metadata, component, and template repositories

1. Log in to the DynaCenter Appliance as root.
2. From the DynaCenter Appliance command line, type:  
`/opt/race/bin/dcctl stop`
3. Untar the archived file.

**Example:**

```
cd /  
tar xvzf 20100711metadata_arch.tgz  
tar xvzf 20100711component_arch.tgz
```

4. From the DynaCenter Appliance command line, type:  
`/opt/race/bin/dcctl start`

### Restoring the captured image repository (depot)

**Note:** If you are not using external storage for your captured image depot, use the procedure in Restoring the metadata, component, and template repositories on page 95 to restore your depot.

To restore the captured image repository to external storage:

1. Log in to the external storage as root.
2. Untar the archived file.

**Example:**

```
cd /  
tar xvzf 20100711captured_images_arch.tgz
```

# Chapter 11: Troubleshooting

---

This chapter lists issues you might encounter as you install DynaCenter for AppLogic.

## DynaCenter Reinstallation Fails after an Aborted Installation

### Problem

When you try to install DynaCenter after aborting a previous installation attempt, the reinstallation fails.

### Background

After a previous installation attempt fails or is aborted, certain DynaCenter files might remain on the DynaCenter Appliance; these files can cause subsequent installation attempts to fail.

### Solution

After a failed installation attempt, ensure that all DynaCenter files are removed from the DynaCenter Appliance before you try to run the installation again.

1. Type the following command:

```
rpm -e racemi-mws racemi-dynacenter
```

2. Rerun `python ./dc-install`.

## DynaCenter Cloud API Reinstallation Fails after an Aborted Installation

### Problem

When you try to reinstall the DynaCenter Cloud API after a previous installation attempt fails or is aborted, the reinstallation fails.

### Background

After a previous installation attempt fails or is aborted, certain DynaCenter Cloud API files might remain on the DynaCenter Appliance; these files can cause subsequent installation attempts to fail.

### Solution

After a failed installation attempt, ensure that all DynaCenter Cloud API files are removed from the DynaCenter Appliance before you try to run the installation again.

1. Type the following command:

```
./cloud-uninstall
```

2. Type the following command to reinstall the DynaCenter Cloud API:

```
./cloud-install
```

An "Installation successful." message indicates that the installation has completed.

## Image Redeploy Fails after an Aborted Deploy

### Problem

When you try to redeploy an image to an appliance after a previous deploy attempt fails or is aborted, the redeploy fails.

### Background

Because the deploy operation overwrites the appliance operating system as it lays an entire server image on the appliance, a deploy that fails or is aborted leaves the appliance in an unknown state.

### Solution

After a deploy fails or is aborted, delete the appliance, and begin the deploy process again.

**Reference:** See Deploy an Image to an Appliance where no Image is Deployed on page 62.

### Agent Image

While DynaCenter is capturing or deploying images, it may boot the server into an image that contains special support software. This image is called an “agent image”. Agent images are created in the repository and managed automatically by DynaCenter. They use network addresses allocated from the boot network for the boot group of the server.

### Appliance

In a CA AppLogic environment, a self-contained virtual environment that provides a particular function inside an application. The DynaCenter environment requires a simple appliance. See also [simple appliance](#).

### Capture

The process of scanning an image already installed on a server and saving the data into an archive format.

### Captured Image

An archived form of a standard image. A captured image is identified with a name assigned by DynaCenter.

### Deploy

The process of moving a captured image from the depot to a target server for provisioning.

### Deployed Image

An image that has already been provisioned onto a server.

### Depot

Storage container for captured images. The depot must be routable to the DynaCenter Appliance and to servers being managed by DynaCenter. There can be more than one depot.

### Directly Attached Network

Any local subnet attached to DynaCenter.

### Driving Application

The third-party vendor software that controls DynaCenter.

**Reference:** Managing Windows Drivers in the *DynaCenter OEM Integration Guide*.

### DynaCenter Appliance

A simple appliance where the DynaCenter software is installed and from which DynaCenter operations are executed.

## External Network

Any network behind one or more routers or firewalls.

## Image

A complete software image (OS, applications, data) that can be booted and run on a server.

## Image Scaling

During image capture, the process whereby DynaCenter examines each file system to determine how much space is allocated to and used by the files and then computes the file system size to hold original contents while increasing the size based on consumption and availability.

## Managed Server

A server that is managed by DynaCenter for the purposes of capturing and deploying images.

**Note:** The terms managed server, source server, and target server are used interchangeably.

## Master Image

Part of an image template, the master image includes the files which will eventually be copied into the captured image. The master image is used by configure scripts in software components to apply global changes so those changes can propagate efficiently without having to be recomputed each time.

## MWS

The Management Work Station (MWS) runs DynaCenter and in some configurations serves as a storage location for the depot. See also [DynaCenter Appliance](#).

## OSType

DynaCenter uses an ostype string to identify the operating system name, version, and platform. These strings follow a specific syntax with well-known values in certain positions to make parsing easier. The syntax is rigid and the full specifier includes many details. Partner-specific scripts might be needed to convert another notion of operating system and hardware platform to an ostype before it is passed to DynaCenter.

**Reference:** `rinstallsnapshot --help` for more specific details on the ostype string.

## Profile

Settings that can be used to specify the storage to be captured for a server or that can replace the default configuration already in the image for deployment.

## Repository

Storage location known to DynaCenter that holds metadata for images, files that are part of software components, and other data necessary for provisioning and manipulating images.

## Server

A real or virtual server capable of running software images.

## Server Group

A server group is a container for servers used to control access through permissions and compatibility checks. When using DynaCenter in most OEM configurations, only one server group is needed, however more can be created.

## Simple appliance

In a CA AppLogic environment, a single virtual environment. It is comprised of a virtual machine, virtual volumes, and virtual network interfaces. It runs its own copy of an operating system (e.g., CentOS) and appliance-specific software. See also [appliance](#).

## Software Component

A software component is used to manipulate the content and behavior of an image by applying supplemental files, scripts, patches, etc. to the image during deployment. A component can contain one or more files or binaries. One component can be created with all the needed files and binaries or several smaller components can be created to manipulate the image(s).

## Source Server

A server that is managed by DynaCenter for the purposes of capturing images.

**Note:** The terms source server and managed server are used interchangeably.

## Storage Server

Any device that contains storage. Storage servers will typically be devices that are large enough to store many captured images. The DynaCenter Appliance functions as a storage server that contains at least a repository of software components.

## Target Server

A server that is managed by DynaCenter for the purposes of deploying images.

**Note:** The terms target server and managed server are used interchangeably.

## Template

A DynaCenter template controls how images are created using software components and default profile information.

- anti-virus
    - disabling for capture, 55
    - enabling after capture, 59
  - AppLogic module
    - install, 35
    - installation prerequisite, 34
  - architecture, 13
  - authentication
    - CLI, 10
    - depot, 31, 52
- A**
- back up
    - database, 93
    - depot, 94
    - repositories, 93, 94
  - backupfile.sql, 93
- B**
- capture
    - disabling anti-virus, 55
    - enabling anti-virus, 59
    - prerequisites, 49
    - profile, 71
  - capture operation
    - supported OSs, 49, 60
  - capture prerequisite
    - RAM requirements, 50
    - register depot, 51
    - register server, 50
    - server MAC address, 53
  - capture prerequisite
    - firewall, 50
  - capture server, 54
  - checklist
    - installation, 17
  - CLI
    - authentication, 10
    - help, 11
    - working with, 10
  - cloud API
    - install, 33
  - command
    - dbbacker.sh, 93
    - dccmd capture server, 58
    - dccmd cloud deploy image, 64, 67
    - dccmd --help, 11
    - dccmd list images, 59
    - dccmd list networks, 49, 51, 52, 65
    - dccmd list otypes, 58, 86
    - dccmd list servers, 50, 53, 55
    - dccmd ping server, 55
    - dccmd register depot, 31, 52
    - dccmd register external network, 51
    - dccmd register server, 57
    - dccmd show depot, 32, 53
    - dccmd show network, 51
    - dccmd show server, 57
    - dccmd test captureprofile, 85
    - dccmd test deployprofile, 85
    - dcctl restart, 43, 44
    - dcctl start, 92, 94, 95
    - dcctl stop, 92, 94, 95
    - ifconfig, 53
    - ipconfig, 53
    - psql dynacenter, 93
    - racelogin --use-auth-cache, 10, 33, 35
    - racelogout, 10, 35
    - rcommandprompt, 87
    - rimportlicensefile, 92
    - rinstallsnapshot, 86
    - rshowlicense, 91
    - rshowsnapshot, 87
  - command line interface. *See* CLI
  - component
    - create, 86
    - example, Linux, 88
    - example, Windows, 87
- C**
- D**
- database

- backing up, 93
- backup location, 93
- restoring, 93
- DAV
  - for storage server, 29
- dbbacker.sh, 93
- dccmd capture server, 58
- dccmd cloud deploy image, 64, 67
- dccmd commands
  - help for, 11
  - list of, 11
- dccmd --help, 11
- dccmd list images, 59
- dccmd list networks, 49, 51, 52, 65
- dccmd list otypes, 58, 86
- dccmd list servers, 50, 53, 55
- dccmd ping server, 55
- dccmd register depot, 31, 52
- dccmd register external network, 51
- dccmd register server, 57
- dccmd show depot, 32, 53
- dccmd show network, 51
- dccmd show server, 57
- dccmd test captureprofile, 85
- dccmd test deployprofile, 85
- dcctl restart, 43, 44
- dcctl start, 92, 94, 95
- dcctl stop, 92, 94, 95
- deploy
  - appliance with image, 67
  - appliance with no image, 62
- deploy
  - prerequisites, 60
- deploy
  - profile, 71
- deploy prerequisite
  - build template, 61
  - RAM requirements, 60
  - source images, 61
  - Windows filer application, 61
- depot
  - authentication, 31, 52
  - register, external storage, 31
  - restore, 95
- DPAD
  - package location, 56

- Windows non-interactive install, 56
- Windows silent install, 56
- dpad.ini, 56
- DynaCenter
  - advanced install with external storage, 29
  - basic installation, 25
  - choosing installation method, 23
  - installation options, 23
- DynaCenter Appliance
  - create, 18
  - required packages, 20
  - specifications, 18
- dynacenterLicense.xml, 92

## F

- file location
  - DPAD packages, 56
  - dpad.ini, 56
  - dynacenterLicense.xml, 92
  - logclient.ini, 43
  - logserver.ini, 44
  - make\_db, 93
  - oem.ini, 32, 37

## H

- help
  - CLI, 11
  - dccmd command, 11
- hosts.template, 18, 21

## I

- ifconfig, 53
- installation
  - DynaCenter options, 23
- installation
  - checklist, 17
  - prerequisites, 17
- ipconfig, 53

## L

- license, 91
  - examine existing, 91
  - install new, 92
  - renew, 92

- list
  - dccmd commands, 11
- log
  - file location, 44
- log files
  - backup, 45
  - other, 44
  - task log, 44
- log levels, 42
  - configure, 43
- logclient.ini, 43
- logging
  - configure, 42
- logserver.ini, 44

## M

- make\_db, 93

## O

- OEM configuration file, 37
  - sample, 41
- oem.ini, 32, 37
  - agent section, 39
  - capture section, 41
  - chassis section, 37
  - deploy section, 39
  - depot section, 38
  - error\_handling section, 39
  - image section, 38
  - repository section, 38
  - sample file, 41
  - server\_group section, 38

## P

- password complexity
  - disabling, 62
- prerequisites
  - capture, 49
  - deploy, 60
  - installation, 17
- profile
  - capture
    - exclude file system Linux, 76
    - exclude file system Windows, 76
    - subset of file systems Linux, 76

- subset of file systems Windows, 77
- capture type, 71
- complex example, 84
- create, 75
- deploy
  - disk (more to fewer) Linux, 79
  - disk (more to fewer) Windows, 80
  - five partitions Linux, 81
  - five partitions Windows, 82
  - partition (fewer to more) Linux, 80
  - partition (fewer to more) Windows, 81
  - software component, 83
  - two disk to two disk Linux, 77
  - two disk to two disk Windows, 78
- deploy type, 71
- parts of, 75
- purpose of, 69
- sample
  - capture statements, 76
  - deploy statements, 77
- storage location, 75
- test, 85
- types of, 71
- understand Linux storage layers, 71
- understand storage layers, 71
- understand Windows file systems, 73
- understand Windows storage layers, 72

psql dynacenter, 93

## R

- racelogin --use-auth-cache, 10, 33, 35
- racelogout, 10, 35
- RAM requirement, 50, 60
- RAM requirements
  - capture, 50
  - deploy, 60
- rcommandprompt, 87
- register
  - depot, external storage, 31
- repositories
  - /repo/I, 93
  - /repo/images, 93
  - /repo/R, 93
  - backing up, 93, 94
  - backing up depot, 94
  - restoring, 95

- restoring depot, 95
- restore
  - database, 93
  - depot, 95
  - repositories, 95
- rimportlicensefile, 92
- rinstallsnapshot, 86
- rpmnew, 45
- rshowlicense, 91
- rshowsnapshot, 87

## S

- server capture, 54
- software component
  - example, Linux, 88
  - example, Windows, 87

- storage
  - considerations, 17, 25
  - default location, 17, 25
  - size, 18
  - supported types, 13
- storage server
  - setting up, 29
  - with Apache/DAV support, 29
- supported OSs
  - for capture operations, 49, 60
- supported storage, 13

## T

- task log, 44
  - location, 44