
Accessing and Recovering Copy Data with the Application Manager

Copyright, Trademarks, and other Legal Matter

Copyright © 2009 - 2019 Actifio, Inc. All rights reserved.

Actifio®, AnyIT®, Dedup Async®, OnVault®, Enterprise Data-as-a-Service®, FlashScan®, AppFlash DEVOPS Platform®, Copy Data Cloud®, and VDP® are registered trademarks of Actifio, Inc.

Actifio Sky™, Actifio One™, and Virtual Data Pipeline™ are trademarks of Actifio, Inc.

All other brands, product names, goods and/or services mentioned herein are trademarks or property of their respective owners.

Actifio, Inc., is a provider of data protection and availability products. Actifio's technology is used in products sold by the company and products and services sold and offered by its commercial partners. The current list of Actifio patents is available online at: <http://www.actifio.com/patents/>

Actifio believes the information in this publication is accurate as of its publication date. Actifio reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

THE INFORMATION IN THIS PUBLICATION IS PROVIDED "AS IS." ACTIFIO, INC. MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WITH RESPECT TO THE INFORMATION IN THIS PUBLICATION, AND SPECIFICALLY DISCLAIMS IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This software and the associated documentation are proprietary and confidential to Actifio. Use, copying, and distribution of any Actifio software described in this publication requires an applicable software license. Any unauthorized use or reproduction of this software and the documentation may be subject to civil and/or criminal liability.

Actifio strives to produce quality documentation and welcomes your feedback. Please send comments and suggestions to docs@actifio.com.

Contents

Preface	v
Actifio Appliances.....	vi
The ActifioNOW Customer Portal.....	vi
Actifio Support Centers	vi
Chapter 1 - Application Manager Restore Tab	1
The Application Manager Service Menu	2
Using The Application Manager Restore Tab.....	3
Chapter 2 - General Procedures Associated With Accessing Data	5
Accessing Data in an Actifio OnVault.....	5
Manually Expiring Images.....	6
Marking an Image as Sensitive	7
Chapter 3 - Creating Clones	9
Cloning an Image of an Application	10
Cloning an Image of a VMware Virtual Machine	12
Cloning an Image of a Hyper-V Virtual Machine	14
Chapter 4 - Creating LiveClones	17
Creating a LiveClone	18
Chapter 5 - Mounting Images	19
Performing a Standard Mount	20
Application Aware Mounts	22
Unmount or Unmount and Delete Active images	24
Mounting Applications to Windows Mount Points without Using a Drive Letter	25
Chapter 6 - Mounting an Oracle Database for Data Access or Recovery	27
Mounting an Oracle Database Image from an ASM Disk Group for Data Access	28
Mounting an Oracle Database Image from a File System for Data Access	30
Mounting an Oracle Database as a Virtual Application	32
Chapter 7 - Mounting a Hyper-V VM Image	35
Mounting a Hyper-V VM Image to an Existing Host	35
Mounting a Hyper-V VM Image to a New VM.....	37

Chapter 8 - Mounting File Systems 39

 Mounting a Local File System.....39

 Mounting a Mapped CIFS File System41

 Mounting a Mapped NFS File System.....43

 Copying Selected Files and Directories to Your Desktop45

Chapter 9 - Mounting Microsoft Exchange Databases 47

Chapter 10 - Mounting Consistency Groups 49

Chapter 11 - Mounting Generic Applications 51

Index 53

Preface

This guide provides step-by-step instructions on how to access protected application and VM data:

- Use the Application Manager's Restore tab, see [Application Manager Restore Tab](#) on page 1.
- Use general procedures to access protected data, see [General Procedures Associated With Accessing Data](#) on page 5.
- Create Clones, see [Creating Clones](#) on page 9.
- Create LiveClones, see [Creating LiveClones](#) on page 17.
- Use Standard Mounts to mount an application's data, or an Application Aware Mounts to mount an entire application, see [Mounting Images](#) on page 19.

This guide also provides application specific methods of data access for:

- Hyper-V VMs, see [Mounting a Hyper-V VM Image](#) on page 35
- File Systems, see [Mounting File Systems](#) on page 39
- Exchange, see [Mounting Microsoft Exchange Databases](#) on page 47
- Generic Applications, see [Mounting Generic Applications](#) on page 51
- Consistency Groups, see [Mounting Consistency Groups](#) on page 49

It assumes you have read **Introducing Actifio Copy Data Management**, are familiar with the components of the Actifio Desktop, and have a grasp of the basic concepts associated with an Actifio appliance.

Application specific processes and procedures for Microsoft SQL Server, Oracle, and VMware VMs can be found in their respective guides:

- ***An Oracle DBA's Guide to Actifio Copy Data Management***
- ***An SQL Server DBA's Guide to Actifio Copy Data Management***
- ***A VMware Manager's Guide to Actifio Copy Data Management***

Actifio Appliances

Unless otherwise specified, all features and functions described in this document apply to all Actifio appliances.

The ActifioNOW Customer Portal

During the configuration and initialization of your Actifio appliance your Actifio representative provided you with a user name and password for the ActifioNOW customer portal.

From the ActifioNOW customer portal you can obtain detailed reports about your Actifio appliance, access the Actifio product documentation, including release notes, and search the knowledge base for answers to specific questions.

To log into the ActifioNOW customer portal:

1. Go to: <https://now.actifio.com>.
2. When prompted, enter the user name and password provided by your Actifio representative.

Actifio Support Centers

To contact an Actifio support representative, you can:

- Send email to: support@actifio.com
- Call:
 - From anywhere:** +1.315.261.7501
 - US Toll-Free:** +1.855.392.6810
 - Australia:** 0011 800-16165656
 - Germany:** 00 800-16165656
 - New Zealand:** 00 800-16165656
 - UK:** 0 800-0155019

1 Application Manager Restore Tab

This chapter provides an overview of the components and options of the Application Manager that pertain to accessing application and VM data from the Restore tab:

[The Application Manager Service Menu](#) on page 2

[Using The Application Manager Restore Tab](#) on page 3

It assumes that you have read the **Getting Started with Actifio Copy Data Management** guide and are familiar with the basic concepts and options associated with the Application Manager service.

Note: Do not confuse the Restore operation with the other operations that can be performed in the Restore tab.

The Restore operation overwrites data and should be used with caution. The Restore operation is described in detail in **Restoring Copy Data with the Application Manager** in the Actifio Documentation Library.

The Restore tab is one of several tabs that appears at the top of the Application Manager. Tabs are context sensitive and only appear when they provide a valid action or information for the selected application. For example:



The Application Manager Tabs

For detailed information on the:

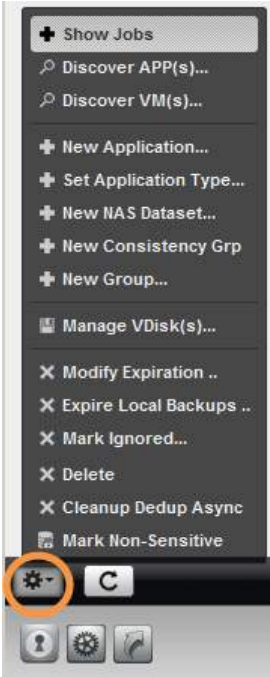
- **Protect** tab, see **Virtualizing and Protecting Copy Data with the Application Manager**
- **Policies** tab, see **Virtualizing and Protecting Copy Data with the Application Manager**
- **Replication** tab, see **Replicating Data Using Actifio Appliances**.
- **Workflow** tab, see **Creating Automated Workflows for SQL Server Databases** and **Creating Automated Workflows for Oracle Databases**.

Note: The **Orgs** tab is used to identify which organizations include an application as a member. Organization membership is described in **Getting Started with Actifio Copy Data Management**.

The Application Manager Service Menu

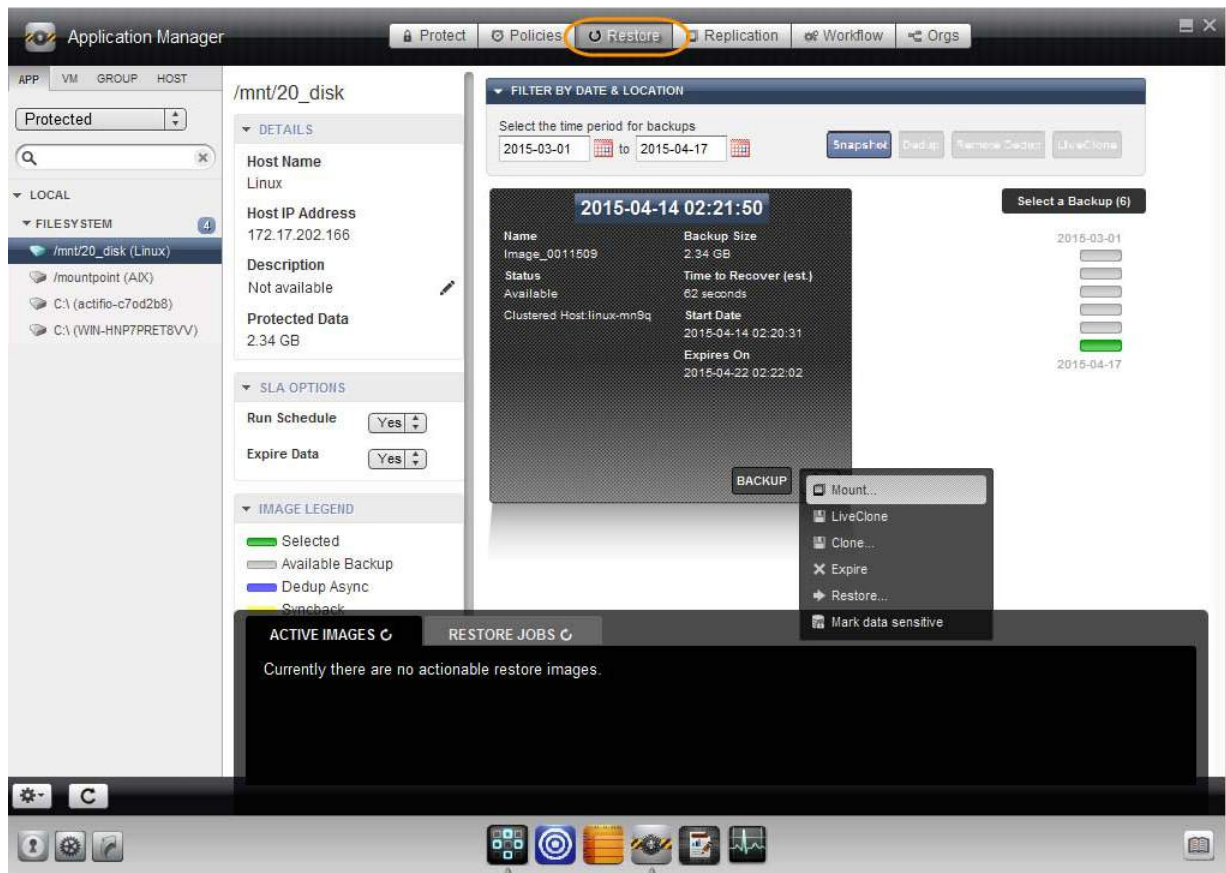
The gear icon in the lower left corner of the Actifio Desktop displays the Application Manager Service Menu.

Application Manager Service Menu Items

Location of Menu	Menu Item	Task
	Show Jobs	Display jobs associated with the application in context, Switches your view to System Monitor, and applies appropriate filters.
	Discover APP(s)	Find file systems, Oracle databases, and Microsoft Exchange and Microsoft SQL Server applications on a selected host. The host must have an Actifio Connector installed.
	Discover VM(s)	Find virtual machines on an ESX or Hyper-V server.
	New Application	Add an application from a host where the Actifio Connector is not installed and to name a mounted image as a new application.
	Set Application Type	Assign a database type within a consistency group. This is not used for any other application type.
	New NAS Dataset	Create a NAS dataset from a NAS server. See <i>Configuring and Using the Actifio NAS Director</i> .
	New Consistency Grp	Create a group of applications to protect the consistency of data among member applications on the same host.
	New Group	Use an application group if you want to use a single policy to protect several applications. Applications on different hosts can be grouped.
	Manage VDisk(s)	Manage virtual disks.
	Modify Expiration	Change the expiration date for backups for a selected application.
	Expire All Backups	Expire all the backups for the selected application, group, or for a consistency group.
	Mark Ignored	Ignore an application at discovery and for dashboard statistics.
	Unmark Ignored	Reverse the choice you made using the Mark Ignored option.
	Delete	Delete an application, a group, or a consistency group.
	Cleanup Dedup Async	Cleans up artifacts from Dedup-Async operations. This only appears when there are Dedup-Async replication images to be cleaned up.
	Cleanup StreamSnap	Cleans up artifacts from StreamSnap operations. This only appears when there are StreamSnap replication images to be cleaned up.
	Mark Sensitive	Mark data as sensitive according to your data-sensitivity policies.

Using The Application Manager Restore Tab

The Restore tab is used to initiate all the copy data access options for protected data including: Mount, Application Aware Mount, Clone, LiveClone, and Restore.



The Restore Options on the Restore Tab

To access application or VM data:

1. Select an application or VM from the left-hand menu.
2. Select an backup image from the images listed on the right-hand side. The image selection will turn green.
3. Click the gear icon next to BACKUP.
4. From the drop down menu, select the access method.

Unlike Mount, Application Aware Mount, Clone, and LiveClone, the Restore option in the Restore tab can overwrite captured data. The Restore option in the Restore tab is described in detail in ***Restoring Copy Data with the Application Manager***.

2 General Procedures Associated With Accessing Data

This chapter provides some general procedures common to all applications and VMs. Including:

- [Accessing Data in an Actifio OnVault](#) on page 5
- [Manually Expiring Images](#) on page 6
- [Marking an Image as Sensitive](#) on page 7

Accessing Data in an Actifio OnVault

The Snapshot to OnVault policy allows you to replicate data to the cloud for object storage. Replication is scheduled within the policy and the most recent snapshot taken by the Policy Template's Production to Snapshot Policy will be replicated. An HTTPS connection is used to ensure data security and to minimize network traffic.

An Actifio OnVault is typically used for long-term retention and consists of file system and application data.

When accessing data in an Actifio OnVault, keep in mind that:

- Actifio CDS and Sky appliances can create a clone from data in an Actifio OnVault.
- Actifio Sky appliances can mount data in an Actifio OnVault.
- Actifio CDS appliances **cannot** mount data in an Actifio OnVault.
- LiveClones cannot be created from Actifio OnVault data.
- Actifio Application Aware mounts are not supported for data in an Actifio OnVault.

Manually Expiring Images

You can manually expire an image earlier than its scheduled time in order to regain storage space. Expiring deduped images may not free any storage if data blocks are shared with other images of the same or different applications. In any case, no storage will actually become available until a full Dedup Garbage Collection sweep is performed. Garbage Collection is managed under the Domain Manager Dedup tab. It is detailed in **Configuring Resources and Settings with the Domain Manager** in the Actifio Documentation Library.

To manually expire an image:

1. Open the Application Manager to the **Restore** tab.
2. Select the image type by clicking on the corresponding Snapshot, Dedup, Syncback, Remote Dedup, LiveClone, Dedup Async, Remote Snap, or OnVault button. You can use the Shift key to select multiple items.
3. Select the image to clone from the list on the right. The selected image icon turns green and detailed information about it is displayed in the image box at the center of the display.
4. Click the image information action pull-down menu at the bottom right.
5. Select **Expire**. The image is deleted. Its space will be reclaimed after the next GC sweep.



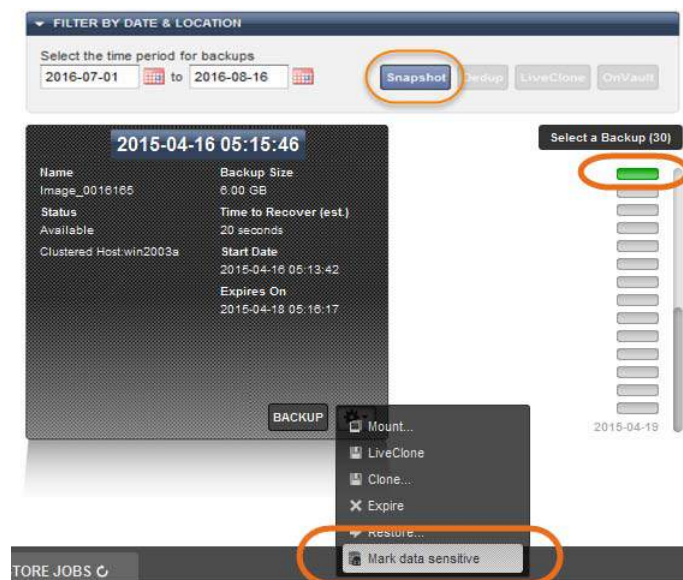
Expiring an Image

Marking an Image as Sensitive

You can mark images as sensitive. Sensitive data can be accessed only by users with **Access to sensitive data** turned on in their Actifio user accounts as detailed in **Setting Up Users and Roles With the Domain Manager** in the Actifio Documentation Library.

To mark an image as sensitive:

1. Open the Application Manager to the **Restore** tab.
2. Select the image type by clicking on the corresponding Snapshot, Dedup, Syncback, Remote, LiveClone, or OnVault button. You can use the Shift key to select multiple image types.
3. Select the image to clone from the list on the right. The selected image icon turns green and detailed information about it is displayed in the image box at the center of the display.
4. Click the image information action pull-down menu at the bottom right.
5. Select **Mark data sensitive**. The image is tagged as containing sensitive data. It can now be accessed only by users with access to sensitive data turned on in their Actifio user accounts.



Marking Data as Sensitive

You can also mark applications and VMs as sensitive. When an application or a VM is marked as sensitive, then all subsequent images of it are also marked sensitive. Marking applications as sensitive is detailed in **Virtualizing and Protecting Copy Data with the Application Manager** in the Actifio Documentation Library.

3 Creating Clones

A **clone** is a full, static copy of a protected application. Because they are static, Clones cannot be refreshed and they do not permit prep-mounting. Unlike a mounted image that does not consume additional storage space, a clone consumes as much storage as the original application.

For details on cloning SQL Server databases, see ***An SQL Server DBA's Guide to Actifio Copy Data Management***.

Clones differ from LiveClones in that Clones are static copies of an application and cannot be updated according to a schedule. For details on LiveClones, see [Chapter 4, Creating LiveClones](#).

Cloned applications can be protected like any other application.

Note: *Actifio CDS and Actifio Sky appliances can create Clones from data in an Actifio OnVault. LiveClones cannot be created from data in an Actifio OnVault.*

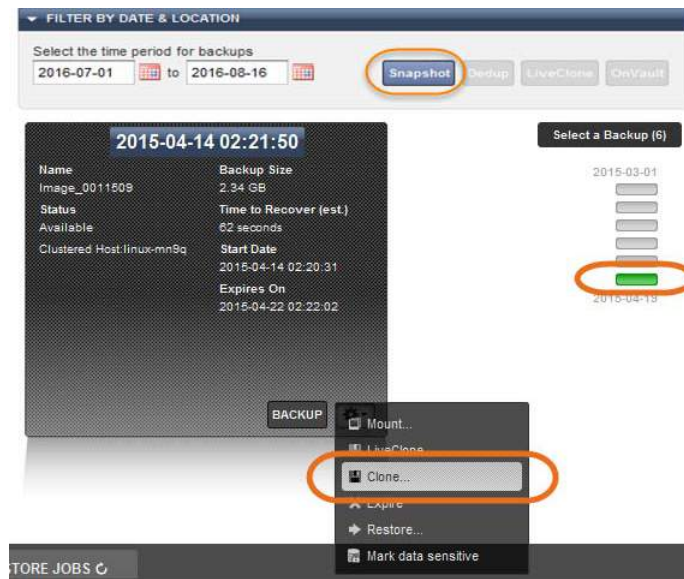
This chapter describes:

- [Cloning an Image of an Application](#) on page 10
- [Cloning an Image of a VMware Virtual Machine](#) on page 12
- [Cloning an Image of a Hyper-V Virtual Machine](#) on page 14

Cloning an Image of an Application

To clone an image of a file system, database, or group:

1. Open the Application Manager to the **Restore** tab.
2. From the APP tab, select the application with the image to be cloned.
3. Select the time period for images using the calendar icons to filter the list of images as needed.
4. Select the image type by clicking on the corresponding Snapshot, Dedup, Remote, LiveClone, or OnVault buttons. You can use the "Shift" key to select multiple types.



Cloning a Snapshot Image of a VM

5. Select the image to clone from the list on the right. The selected image icon turns green and detailed information about it is displayed in the image box at the center of the display.
6. From the pull-down menu at the bottom of the backup details, select **Clone**. The Clone window appears.

Clone Job Window for an Application

7. Image Name, Backup Date, and Host Name are provided at the top of the screen. A **Label** is optional.
8. If necessary, change the default storage pool from the **Select default storage pool** drop-down list.
9. Select a host from **Select Host(s)** to mount the image to. You can select any known host from the dropdown list, grouped into Physical Machines and Virtual Machines. If you need a host that has not yet been added, add it from the Domain Manager service menu.
10. Select All volumes or select a single volume or multiple volumes from **Select volumes to promote**. If you select specific volumes, then you can select a different target diskpool for each one. The default diskpool is **act_per_pool** (the Actifio performance pool).
11. Click **Submit**. You can see the cloned image under the Restore tab of this application. The disk corresponding to this image is shown as a mapped VDisk under **Domain Manager > System > Hosts**.

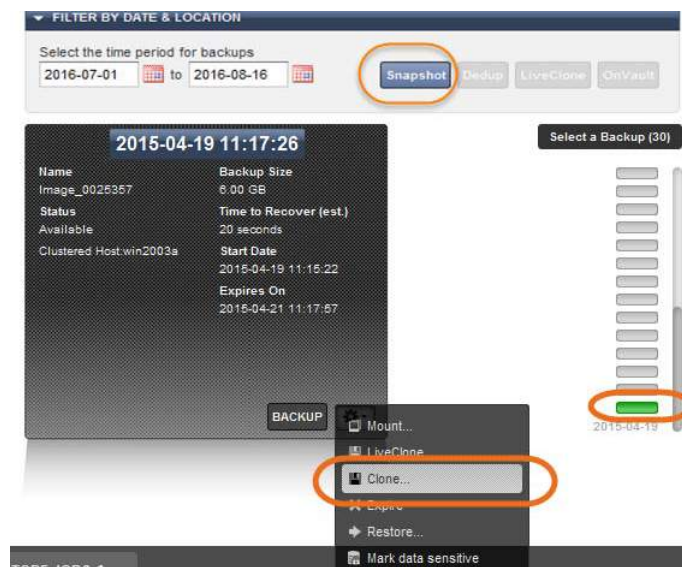
Cloning an Image of a VMware Virtual Machine

You can clone images of both VMware VMs and Hyper-V VMs. Hyper-V image clones are detailed in [Cloning an Image of a Hyper-V Virtual Machine](#) on page 14.

When Cloning as a new VM, the VM version, Guest Id, Number of CPUs, Memory, Hardware details, and VMDK volume details are preserved.

To clone an image of a VMware VM:

1. Open the Application Manager to the **Restore** tab.
2. From the VM tab, select the VM with the image to be cloned.
3. Select the time period for images using the calendar icons to filter the list of images as needed.
4. Select the image type by clicking on the corresponding Snapshot, Dedup, Remote, LiveClone, or OnVault buttons. You can use the Shift key to select multiple image types.



Cloning a Snapshot Image of a VM

5. Select the image to clone from the list on the right. The selected image icon turns green and detailed information about it is displayed in the image box at the center of the display.
6. From the pull-down menu at the bottom of the backup details, select **Clone**. The Clone window appears.

Clone Job Window for a VMware VM

7. Enter a name for the new VM that you want to clone in **VM Name** field.
8. Select a vCenter from **Select vCenter Server** drop-down list where you want to create a VM.
9. Select an ESX host from **ESX Host** box where you want to create a VM.
10. Select a datastore from **Datastore** box that has the required storage available.
11. Select all volumes or select a single volume or multiple volumes from **Select volumes to promote**. If you select specific volumes, then you can select a different target diskpool for each one. The default diskpool is **act_per_pool** (the Actifio performance pool). The first volume cannot be deselected.

Note: The Actifio appliance assumes that the first volume of the VM is the boot volume. If the first volume is not the boot volume, contact Actifio Customer Support for assistance.

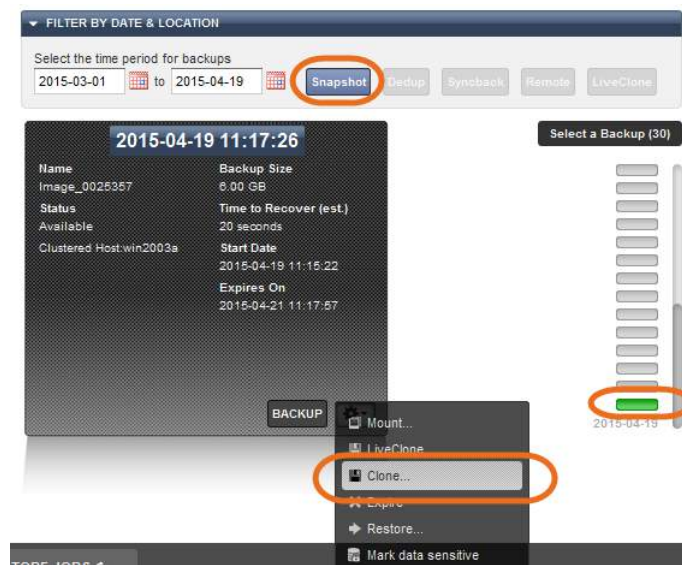
12. Click **Submit**. You can see the cloned image under the Restore tab of this application. The disk corresponding to this image is shown as a mapped VDisk under **Domain Manager > System > Hosts**.

Cloning an Image of a Hyper-V Virtual Machine

You can clone images of both VMware VMs and Hyper-V VMs. VMware image clones are detailed in [Cloning an Image of a VMware Virtual Machine](#) on page 12.

To clone an image of a Hyper-V VM:

1. Open the Application Manager to the **Restore** tab.
2. From the VM tab, select the VM with the image to be cloned.
3. Select the time period for images using the calendar tool to filter the list of images as needed.
4. Select the image type by clicking on the corresponding Snapshot, Dedup, Remote, LiveClone, or OnVault buttons. You can use the Shift key to select multiple image types.



Cloning a Snapshot Image of a VM

5. Select the image to clone from the list on the right. The selected image icon turns green and detailed information about it is displayed in the image box at the center of the display.
6. From the pull-down menu at the bottom of the backup details, select **Clone**. The Clone window appears.

Clone Job Window for a Hyper-V VM

7. In **Mount to VM** select either SCVMM or Hyper-V.
8. Enter a name for the new clone VM in the **VM Name** field.
9. If you will mount to a Hyper-V server, then select one from the Hyper-V Server list.
10. Select a datastore from the **Path** text field.
11. Select all volumes or select a single volume or multiple volumes from **Select volumes to promote**. If you select specific volumes, then you can select a different target diskpool for each one. The default diskpool is **act_per_pool** (the Actifio performance pool). The first volume cannot be deselected.

Note: The Actifio appliance assumes that the first volume of the VM is the boot volume. If the first volume is not the boot volume, Contact Actifio Customer Support for assistance.

12. Click **Submit**. You can see the cloned image under the Restore tab of this application. The disk corresponding to this image is shown as a mapped VDisk under **Domain Manager > System > Hosts**.

4 Creating LiveClones

LiveClones are dynamic copies of protected applications that can be updated according to a schedule. Unlike a mounted image that does not consume additional storage space, a LiveClone consumes as much storage as the original application.

LiveClones differ from Clones in that LiveClones are dynamic and can be updated according to a schedule. For details on Clones, see [Chapter 3, Creating Clones](#).

Note: *Actifio CDS and Actifio Sky appliances can create Clones from data in an Actifio OnVault. LiveClones cannot be created from data in an Actifio OnVault.*

LiveClones provide a crucial building block in managing the copy data lifecycle as described in ***Creating Automated Workflows for Oracle Databases*** and ***Creating Automated Workflows for SQL Server Databases***.

LiveClones can be:

- Refreshed with the most recent application data. Refreshes can be done manually or automatically by a schedule.
- Mounted to a specific host for a pre-processing operation. Known as prep-mount, this operation allows you to do such things as data masking, even if some copies of this same LiveClone are already mounted (not prep-mounted). Prep-Mounting is described in detail in ***Creating Automated Workflows for Oracle Databases*** and ***Creating Automated Workflows for SQL Server Databases***.

Note: *While the LiveClone image is prep-mounted, it is busy. It cannot be deleted, refreshed, or mounted. If you mount application images before prep-mounting another image of the same application, the mounted images continue to be usable.*

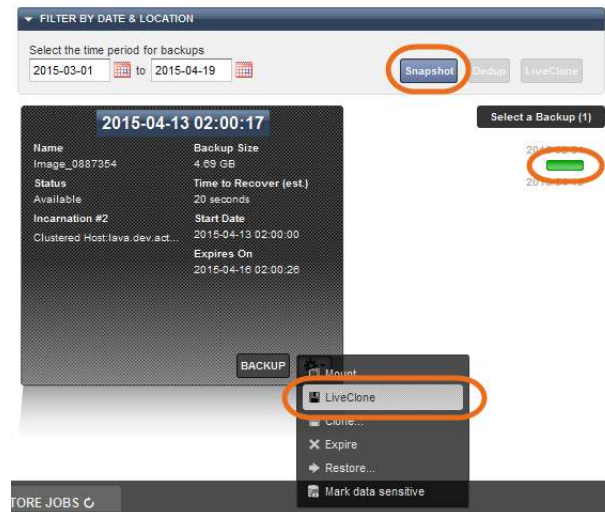
This chapter contains general instructions for [Creating a LiveClone](#) on page 18.

Creating a LiveClone

Note: LiveClone is not supported for remote images, including images in an Actifio OnVault.

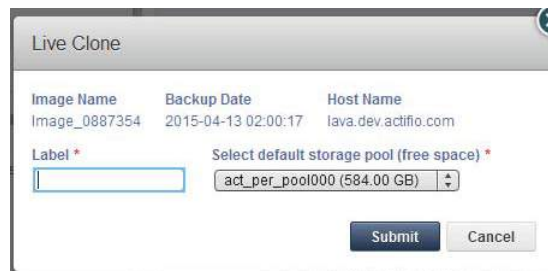
To create a LiveClone of an image:

1. Open the Application Manager to the **Restore** tab. Select the application with the image to be LiveCloned.
2. Select the time period for images using the calendar icons to filter the list of images as needed.
3. Select an image type by clicking the **Snapshot** or **Dedup** button. You can use the Shift key to select both.
4. Select the image to LiveClone from the list on the right. The selected image icon turns green and detailed information about it is displayed in the image box at the center of the display.



Creating a LiveClone of an Image

5. From the pull-down menu in the backup details, select **LiveClone**. The LiveClone Job window appears.



Clone Job Window for a LiveClone

6. Enter a unique name for the new LiveClone in the **Label** field.
7. Select a diskpool where you want to create the LiveClone from the **Select default storage pool** drop-down list. The default diskpool is **act_per_pool** (the performance pool).
8. Click **Submit**. Creation of a LiveClone can take some time depending on the size of the image. The disk corresponding to this image appears under **Domain Manager > System > Hosts**.

Note: Thin/thick provisioning of the original VMs is maintained while cloning/restoring a VM snapshot.

5 Mounting Images

Captured application data can be made available instantly via a mount operation to a physical or virtual machine (VM) host. When mounting data to a host, the host does not require additional configuration or a start/restart operation. Multiple images can be mounted to the same host.

You can mount images from:

- An application or a group to the same host, to another host, or to an existing VM.
- A VM to the same VM, to another VM, to a new VM, or to any other host. The mounted image is displayed as a new drive on the mounted VM or host.
- Actifio Sky appliances can mount data in an Actifio OnVault.

Note: *Actifio CDS appliances cannot mount data in an Actifio OnVault.*

Actifio appliances provide two types of mounts:

- Standard Mounts allow you to mount just the data captured from an application. The mounted data can then be used by its associated application type. See [Performing a Standard Mount](#) on page 20 for details.
- Application Aware Mounts allow you to mount captured Microsoft® SQL and Oracle Databases as virtual applications. This allows you to quickly access an application without having to import mounted data to the application. See [Application Aware Mounts](#) on page 23 for details.

In addition, mounted images can be unmounted or unmounted and deleted. See [Unmount or Unmount and Delete Active images](#) on page 25 for details.

This chapter provides general instructions on how to mount data.

For application specific mounts see:

- ***An SQL Server DBA's Guide to Actifio Copy Data Management.***
- ***A VMware vCenter Administrator's Guide to Actifio Copy Data Management***
- [Chapter 6, Mounting an Oracle Database for Data Access or Recovery](#)
- [Chapter 7, Mounting a Hyper-V VM Image](#)
- [Chapter 8, Mounting File Systems](#)
- [Chapter 9, Mounting Microsoft Exchange Databases](#)
- [Chapter 10, Mounting Consistency Groups](#)
- [Chapter 11, Mounting Generic Applications](#) (Only on in-band Actifio CDS appliances.)

Performing a Standard Mount

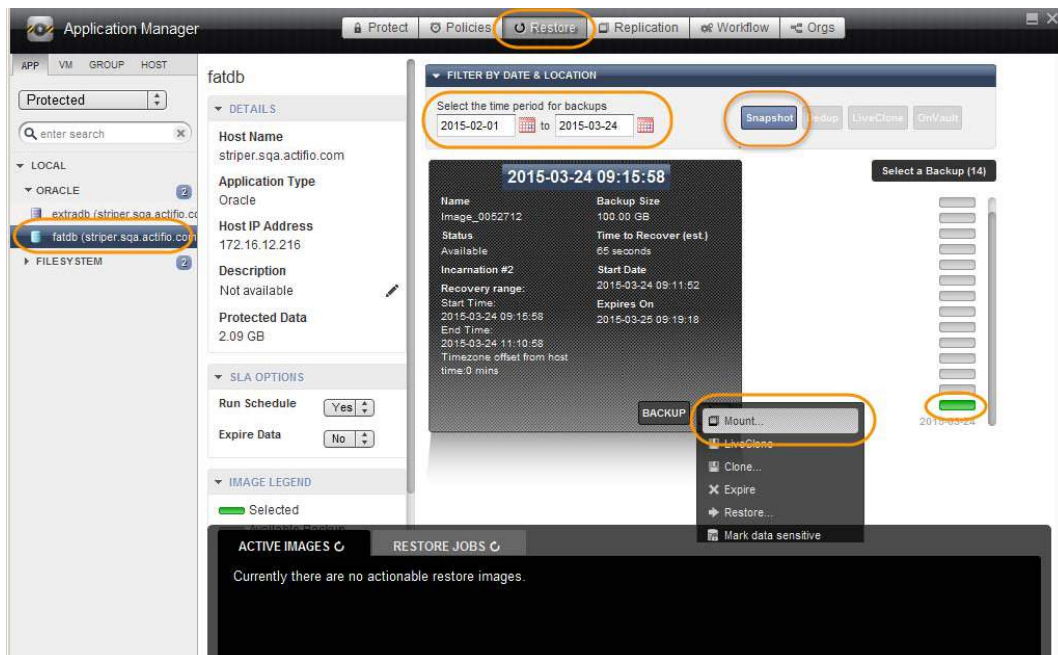
A mounted image can be used directly from the mounted host or you can restore selected files or directories from it. The original image is never modified, even if the mounted image is modified or deleted.

Note: Before mounting an image, ensure that the WWPN/iSCSI port of the host where the images will be mounted is accessible to the Actifio appliance.

Note: If you are mounting to a Windows host and if you are concerned about running out of drive letters, see [Mounting Applications to Windows Mount Points without Using a Drive Letter](#) on page 26.

To mount an image to a host:

1. Open the **Application Manager** and click the **Restore** tab.
2. Select the application or VM from the navigation pane. The application can be a local image or a remote image (from remote Actifio appliances 1 or 2 in a multi-hop appliance configuration).
3. If the image that you want to mount is older than those shown in the graphical list on the right, then select the **time period** that includes the desired image using the calendar tool.
4. Select the **image type** by clicking on the corresponding Snapshot, Dedup, Remote, LiveClone, or OnVault buttons. You can use the Shift key to select multiple types.
5. Select the image to mount from the **graphical list** on the right. The selected image icon turns green and detailed information about it is displayed in the image box at the center of the display. The most recent image is selected by default.
6. Click the pull-down menu from the bottom right of the image information display and select **Mount**. The Mount Job window appears.



Mounting an Image

Details for a Standard Mount to a Physical Host

7. Image Name, Backup Date, and Host Name are provided at the top of the screen. A **Label** is optional.
8. If necessary, change the default storage pool from the **Select default storage pool** drop-down list.
9. Select a host from **Select Host(s)** to mount the image to. You can select any known host from the dropdown list, grouped into Physical Machines and Virtual Machines. If you need a host that has not yet been added, add it from the Domain Manager service menu.
10. Select whether to **Map to all Cluster servers** or to **Map to all ESX hosts**, depending on if you are mounting an application or a VMware VM.
11. If you are mounting to a VMware virtual host, select a raw device mapping **Mount Mode**: pRDM or vRDM. If you do not know what to select, then select pRDM.

Note: VMware snapshots treat mounted vRDMs as Independent and are not included in snapshots. Because of this, by default, Actifio does not include vRDMs when protecting a mounted VM. Actifio does provide an option where you can mark vRDMs as Dependent. Although rarely used, when this option is enabled, vRDMs will be included in VMware snapshots. Actifio SLA templates will capture vRDMs marked as Dependent and the captured data will be counted in MDL usage.

Selecting Mount Points or Mount Drives

The next step is to select a mount drive (Windows) or a mount point for the image. You can choose:

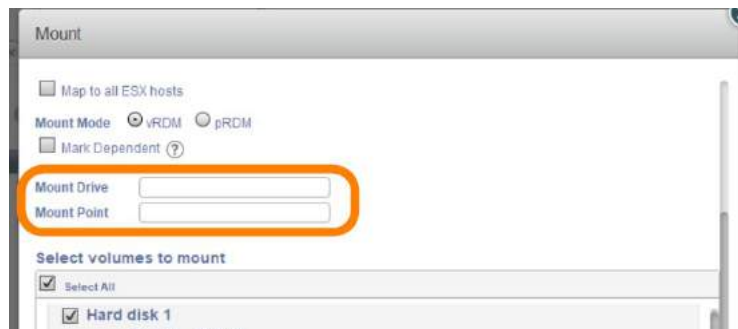
- o [To mount the entire image](#)
- o [To mount some volumes within the image](#)

To mount the entire image

To mount the entire image, select either Mount Drive or Mount Point immediately below Mark Dependent.

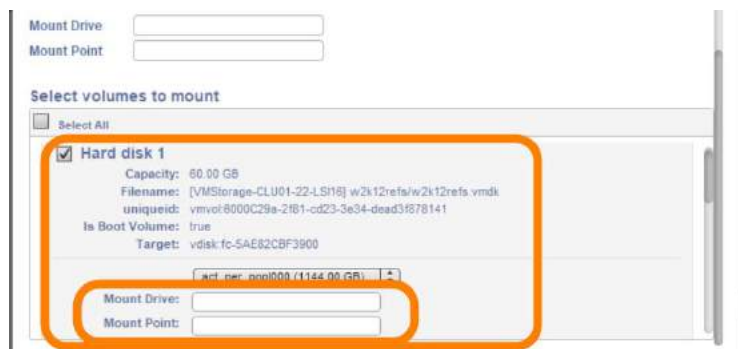
Mount Drive: Specifies a drive letter to be assigned to the volume. If the drive letter is not available, the job fails. If multiple volumes are found, then it assigns subsequent available drive letters. If no Mount Drive is specified, the Connector chooses an available drive letter. If you are concerned about running out of drive letters, see [Mounting Applications to Windows Mount Points without Using a Drive Letter](#) on page 26.

Mount Point: the full path at which you want to mount the volume. If the path exists as an empty folder, the Connector will use it. If it does not exist, the Connector will create it. *If it exists as a file or as a folder that is not empty, then the job will fail.* If there are multiple volumes to be mounted, the Connector chooses the user-specified mount point for one of the volumes and for the remaining it appends an underscore (_) followed by a number, i.e., <user_specified>_#.



To mount some volumes within the image

To mount some volumes in the image, use **Select volumes to mount**. Uncheck Select All, then select the volumes with their checkboxes. If you do not specify the mount points/drives, then the behavior for entire images is followed.



If you specify a mount drive or a mount point, then:

- o Each volume must have a mountable file system.
- o Do not select volumes if you are accessing images of VMs, Generic Applications, or in-band applications.
- o Do not select volumes if the image contains logical volumes that span two or more disks.
- o You may see unexpected results if you specify Mount Drive or Mount Point for a volume that has multiple partitions or contains logical volumes that span across other volumes.

12. Click **Mount**. A job is submitted to mount the image to the selected host. After the image has been mounted, the Active Images pane lists it among the images mounted on the host. Select the mounted image from the list.

Application Aware Mounts

Application Aware mounts allow you to mount captured Microsoft® SQL and Oracle databases as virtual applications. This allows you to quickly bring a database online without having to actually move the data and without having to manually configure a new instance of the database.

Application Aware mounts are particularly useful in test and development environments where multiple copies of a database must be quickly brought on line.

Virtual applications can be captured like any other application. If a virtual application is mounted to a host that has been added to an Actifio appliance, then the virtual application will appear in the list of available applications in the Actifio Application Manager.

The capture, application mount, capture sequence can be repeated as needed. Any one of the virtual application generations can be modified or deleted without affecting its parent or descendants. Each generation is independent and can be accessed and its data can change as it is used.

By default, the number of generations is restricted to five. If necessary, Actifio Support can help you to modify the database descendant level limit (children and the grandchildren).

Note: When performing an Application Aware mount of a SQL Server database to a SQL Server Failover Instance, if you are specifying a custom mount point for the mount, make sure the custom mount point resides on a volume that is a cluster resource. This is required to allow the SQL Server Instance to move to other cluster nodes in case of failover.

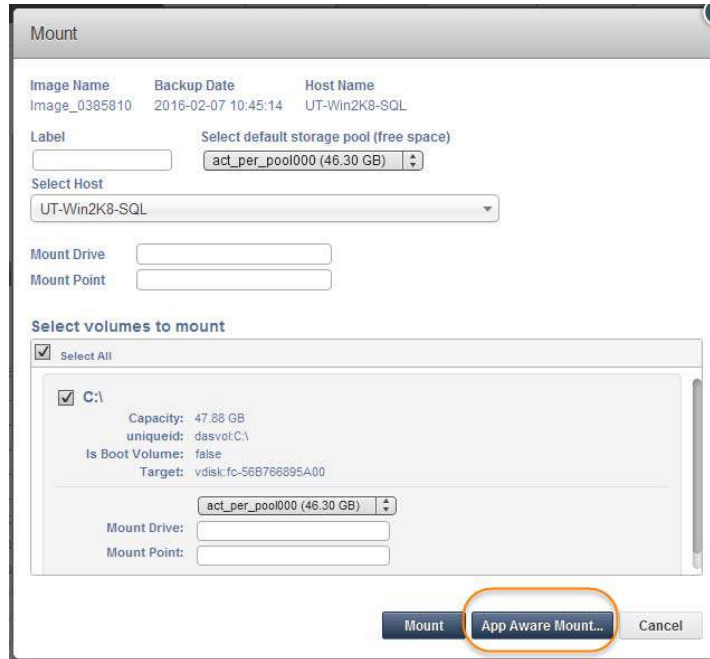
Application Aware mounts are initiated exactly like Standard Mounts:

1. Click the pull-down menu from the bottom right of the image information display and select **Mount**. The Mount Job window appears.



Mounting an Image

2. If you have selected a Microsoft SQL or Oracle database, then you have the App Aware Mount option:



Making it an Application Aware Mount

The details for creating an Application Aware mount varies by the database selected. For database specific details on application aware mounts, see:

- ***An SQL Server DBA's Guide to Actifio Copy Data Management*** and ***Creating Automated Workflows for SQL Server Databases*** in your Actifio Documentation Library
- ***An Oracle DBA's Guide to Actifio Copy Data Management*** and ***Creating Automated Workflows for Oracle Databases*** in your Actifio Documentation Library

Unmount or Unmount and Delete Active images

Mounted images are virtual copies of the selected images that have been made available to a host. Mounted images can be Unmounted or Unmounted and Deleted:

Unmount images when there still may be work do be done with the image.

Unmount and Delete images when all work on an image is done. The mounted copy of the snapshot is deleted; the snapshot itself is never touched.

To unmount or unmount and delete an active image:

1. Open the **Application Manager** to the **Restore** tab.
2. From the Navigation pane, select the application.
3. Select the mounted image from the Active Images (bottom pane).
4. From the gear icon, select either **Mount** or **Unmount & Delete**.

STDB

DETAILS

Host Name: rhel137-14
Host IP Address: 172.17.137.14
Description: Not available
Protected Data: 1.27 GB

SLA OPTIONS

Run Schedule: No
Expire Data: No

IMAGE LEGEND

- Selected
- Available Backup
- Dedup Async
- Syncback

FILTER BY DATE & LOCATION

Select the time period for backups: 2014-12-01 to 2015-01-07

2015-01-07 08:39:30

Label: clstbdbg
Source Image: Image_0689644
Name: Image_0690132
Backup Size: 30.00 GB
Status: Available
Start Date: 2015-01-07 08:32:41
Recovery range:
Start Time: 2015-01-07 08:39:30
End Time: 2015-01-07 08:55:13
Timezone offset from host time: 0 mins
Expires On: never
Incarnation #: 5

Select a Backup (5)

- 2014-12-01
- 2015-01-07

MOUNTED

- Restore File(s)...
- Unmount
- Unmount & Delete

ACTIVE IMAGES

Original Backup Name	Image Name	Backup Date/Time	Mounted Host	Image State	Label
Image_0689644	Image_0690132	2015-01-07 08:39:30	rhel137-14	MOUNTED	clstbdbg

Unmount and Delete the Mounted Images

Note: To unmount and/or unmount and delete multiple images, go to the Actifio Domain Manager and in the left-hand navigation menu, expand the **System** options. Click **Images** and you will be able to select multiple mounted images.

Mounting Applications to Windows Mount Points without Using a Drive Letter

When mounting to a Windows host, you can specify a mount point without specifying a drive letter. For example:

```
D:\hostname\dbrestore
D:\hostname\dbrestore_1
D:\hostname\dbrestore_2
D:\hostname\dbrestore_3
```

The Actifio Connector automatically assigns a drive letter to each mount point.

Windows allows up to 26 drive letters. If you are concerned about running out of drive letters, you can use only mount points, and prohibit the use of drive letters.

To prohibit the use of drive letters, use the Actifio command line interface (CLI) to set the config parameter **truepathdefaultdriveletter** parameter to **0**. When this parameter is set to zero, if you have only specified a mount point then the Actifio Connector will not assign drive letters to those mounted volumes.

If you do not provide either a mount point or a drive letter, then the Actifio Connector will still assign any available drive letter, even if the **truepathdefaultdriveletter** config parameter is set to 0.

The default value for this parameter is **1**, which means the Actifio Connector assigns a drive letter AND a mount point.

To learn the value of the parameter, use the CLI command:

```
udsinfo getparameter | grep truepathdefaultdriveletter
```

The response will be either:

```
truepathdefaultdriveletter 0
or
truepathdefaultdriveletter 1
```

To set the parameter off (prohibiting the use of Windows drive letters) use:

```
udstask setparameter -param truepathdefaultdriveletter -value 0
```

To turn the parameter back on, use: `udstask setparameter -param truepathdefaultdriveletter -value 1`

6 Mounting an Oracle Database for Data Access or Recovery

This chapter describes how to mount an Oracle database image for immediate access and if necessary, to recover the database. Specifically this chapter details:

The **standard mount** provides instant access to data without moving data. Captured copies of databases can be rolled forward via the Actifio user interface and mounted on any database server. Standard mount methods include:

- o [Mounting an Oracle Database Image from an ASM Disk Group for Data Access](#) on page 28
- o [Mounting an Oracle Database Image from a File System for Data Access](#) on page 30

The **Application Aware mount** presents and makes the captured Oracle data available to a target server as a virtual Oracle database. This allows you to address the unique challenges associated with creating and managing copies of production databases for non-production use. Application Aware mounts are performed from the Actifio appliance and do not require manual intervention by database, server, or storage administrators. Application Aware mounts can be used for such things as database reporting, analytics, integrity testing, and test and development. Application Aware mounts are described in [Mounting an Oracle Database as a Virtual Application](#) on page 32.

The **restore** function reverts the production data to a specified point in time. Restore operations actually move data. Typically restore operations are performed to restore a database to a valid state after a massive data corruption or storage array failure. The amount of time required to complete a restore operation depends on the amount of data involved. To restore a database, see **Restoring Copy Data with the Application Manager**.

Note: You Oracle DBA should be familiar with the content in the **An Oracle DBA's Guide to Actifio Copy Data Management**, and all database preparation steps detailed in that book should be completed.

Mounting an Oracle Database Image from an ASM Disk Group for Data Access

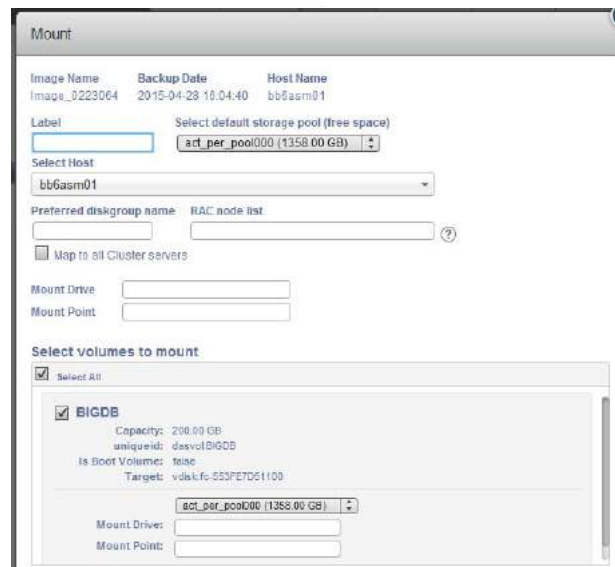
To mount an Oracle database image for data access:

1. Open the Actifio Desktop to the **Application Manager** and select the **Restore** tab.
2. In the Navigation pane, select the protected Oracle application.



Mounting an Oracle Database

3. Under **Select a backup** on the right, select a snapshot image.
4. From the gear icon dropdown menu, select **Mount**. The Mount window opens.



Mount Details for an Oracle Database with ASM Data

5. Provide a label as needed. This is optional.
6. If necessary, change the default storage pool from the **Select default storage pool** drop-down list. The available free space in the pool is indicated in parentheses.
7. In the **Select Host** drop down list, select target Node1 of the RAC node.
8. Enter a diskgroup name for the mounted image copy under **Preferred diskgroup name**.
9. RAC Node list:
 - o To provision a RAC database on the target RAC cluster, specify the IP address of all nodes for the target RAC cluster separated by a colon (:) in the order of RAC nodes 1....n.
 - o To provision a single node RAC database on a target RAC cluster or a standalone database under ASM on a non-RAC ASM target, provide the IP address of the target node.
10. If you are mounting to a VMware virtual host, select raw device mapping **Mount Mode**: pRDM or vRDM. If you do not know what to select, then select pRDM. If this will be an application-aware virtual database, and if the ASM Disk Group is in use, then you must select pRDM or the mount will fail.

Note: *VMware snapshots treat mounted vRDMs as Independent and are not included in snapshots. Because of this, by default, Actifio does not include vRDMs when protecting a mounted VM. Actifio does provide an option where you can mark vRDMs as Dependent. Although rarely used, when this option is enabled, vRDMs will be included in VMware snapshots. Actifio SLA templates will capture vRDMs marked as Dependent and the captured data will be counted in MDL usage.*

11. **Map to all Cluster Servers** and **Mount Drive**: Ignore these settings.
12. **Mount Point**: Enter the full path at which you want to mount the volume.
 - o If the path exists as an empty folder, the Actifio Connector will use it.
 - o If it does not exist, the Connector will create it.
 - o If it exists as a file or as a folder that is not empty, then the job will fail.

If there are multiple volumes to be mounted, the Connector uses the mount point that you specify for one of the volumes, and for the remaining it appends an underscore followed by a number, i.e., <specified>_#

 - o If you enter no value here, then the Oracle **database image** will be mounted to ASM with a disk group name specified under the preferred disk group (see [Step 8](#)).
 - o If logs are Actifio-protected, then the **logs image** will be mounted to /act/mnt/<jobid>_Log, and subsequent logs images to /act/mnt/<jobid>_Log_1, /act/mnt/<jobid>_Log_2, and so on.
13. Check **Select All** to mount all volumes.

Mounting an Oracle Database Image from a File System for Data Access

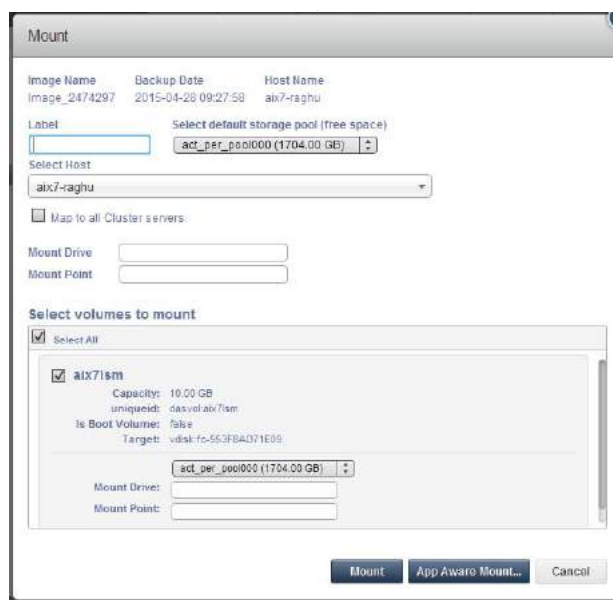
To mount an Oracle database image from a file system for data access:

1. Open the Actifio Desktop to the **Application Manager** and select the **Restore** tab.
2. In the Navigation pane, select the protected Oracle application.



Mounting an Oracle Database

3. Under **Select a backup** on the right, select a snapshot image.
4. From the gear icon dropdown menu, select **Mount**. The Mount window opens.



Mount Details for an Oracle Database from a File System

5. Provide a label as needed. This is optional.
6. If necessary, change the default storage pool from the **Select default storage pool** drop-down list. The available free space in the pool is indicated in parentheses.
7. **Select Host** drop down list: Select the primary node.
8. **Map to all Cluster Servers** and **Mount Drive**: Ignore these settings.
9. **Mount Point**: Enter the full path at which you want to mount the volume.
 - o If the path exists as an empty folder, the Actifio Connector will use it.
 - o If it does not exist, the Connector will create it.
 - o If it exists as a file or as a folder that is not empty, then the job will fail.

If there are multiple volumes to be mounted, the Connector uses the mount point that you specify for one of the volumes, and for the remaining it appends an underscore followed by a number, i.e., <specified>_#

- o If you enter a mount point, then the Oracle **database image** will be mounted to /<mountpoint>.
 - o If logs are Actifio-protected, then the **logs image** will be mounted to /act/mnt/<jobid>_Log, and subsequent logs images to /act/mnt/<jobid>_Log_1, /act/mnt/<jobid>_Log_2, and so on.
10. Check **Select All** to mount all volumes.

Mounting an Oracle Database as a Virtual Application

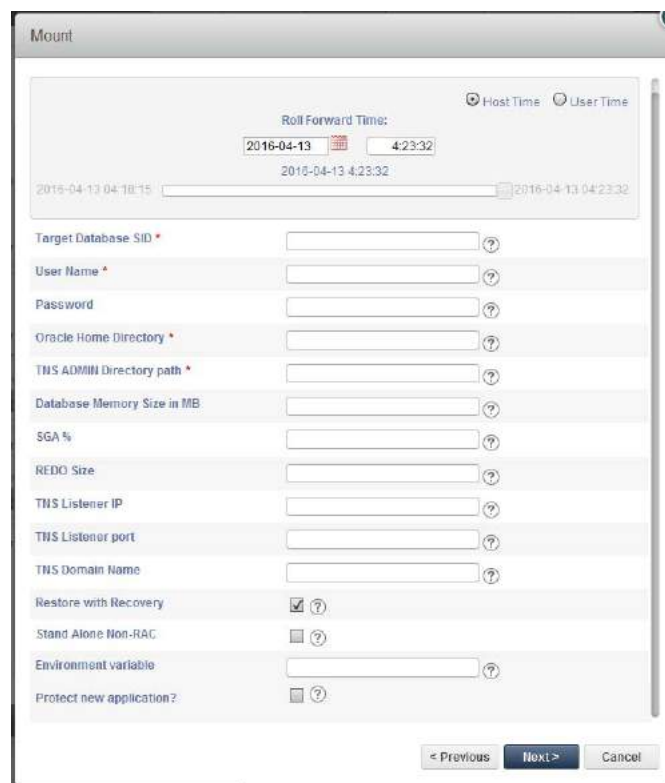
An Actifio Application Aware mount mounts a captured Oracle database as a virtual application. It allows you to quickly bring a database online without having to actually move the data and without having to manually configure a new instance of the database. An Application Aware mount addresses the challenges of creating and managing copies of production databases without manual intervention by database, server, and storage administrators.

Note: Oracle virtual applications consume a minimum 300 MB to account for redo logs and the control file.

Note: Oracle databases captured in Actifio OnVault storage cannot be mounted as virtual applications.

To mount an Oracle database as a virtual application:

1. Start mounting the image as detailed in [Mounting an Oracle Database Image from a File System for Data Access](#) on page 30. At the bottom of the Mount page, select **App Aware Mount**.



The screenshot shows a 'Mount' dialog box with a 'Roll Forward Time' section at the top, including 'Host Time' and 'User Time' tabs, and a date/time picker set to 2016-04-13 4:23:32. Below this is a list of configuration fields, each with a question mark icon for help. The fields are: Target Database SID *, User Name *, Password, Oracle Home Directory *, TNS ADMIN Directory path *, Database Memory Size in MB, SGA %, REDO Size, TNS Listener IP, TNS Listener port, TNS Domain Name, Restore with Recovery (checked), Stand Alone Non-RAC (unchecked), Environment variable, and Protect new application? (unchecked). At the bottom are buttons for '< Previous', 'Next >', and 'Cancel'.

Mounting and Confirming an Application Aware Oracle Database Mount

2. Fill in the form as needed for this virtual application. Fields marked with an asterisk (*) are required. The ? icons beside each field provide helpful information.
 - o **Target Database SID:** Specify SID for the new Oracle database to be provisioned on the target.
 - o **User Name/Password:** Specify Oracle Operating System user credentials on the target.
 - o **Oracle Home Directory:** Specify the Oracle Home Directory (\$ORACLE_HOME) on the target database server.
 - o **TNS Admin Directory Path:** Specify TNS_ADMIN Directory path (path of tnsnames.ora file) on the target database server.

- o **Database Memory Size in MB:** Database total memory size, in MB, for the database being provisioned on target. See the table below for the expected behavior depending on how this and SGA% (next) are set.
- o **SGA%:** Parameter to configure SGA/PGA memory, as a percentage of total memory, for the database being provisioned. See the table below for the expected behavior depending on how this and Database Memory Size in MB (above) are set.

Database Memory Size in MB	SGA%	Behavior
not specified	N/A	Total database memory size and memory parameter on target will be the same as source database.
specified	not specified	MEMORY_TARGET parameter will be set for the database being provisioned on the target.
specified	specified	Set SGA and PGA for the database provisioned on the target to: <ul style="list-style-type: none"> • $SGA_TARGET = \text{Database Memory Size in MB} \times (SGA\%/100)$ • $PGA_TARGET = \text{Database Memory Size in MB} \times (100-SGA\%/100)$

- o **REDO Size:** Parameter to configure REDO size, in MB, for the database being provisioned. If not specified, REDO size is be set to 500 MB.
 - o **TNS Listener IP:** Specify IP address for the TNS Listener. It can be one of SCAN IP, VIP, or Host IP. If not specified, Host IP will be used.
 - o **TNS Listener Port:** TNS Listener port to be used to create service name under tnsnames.ora for provisioned database on target. If not specified, port 1521 is used.
 - o **TNS Domain Name:** Specify domain name to be used with service name under tnsnames.ora for provisioned database on target. This is needed when database service is using Domain Name.
 - o **Restore with Recovery:** If selected, brings the newly created database online: the provisioned database on target will be open for read and write. This is the default selection.
 - o **Stand Alone Non-RAC:** This is only applicable for databases where the source database is in a RAC configuration and Actifio stores the copy in ASM format. If selected, this performs an application aware mount to a stand alone ASM non-RAC instance. Do not select this option if a RAC node list has been provided.
 - o **Environment Variable:** List of user-defined environment variables, separated by any special-character delimiter. These environment variables are passed to pre / post scripts.
3. The application aware mount will be a new database. If you want to protect the new database, then check **Protect New Applications?** to apply an SLA to the new database. New Template and Profile fields will appear where you can select any of your existing SLA templates and resource profiles.
 4. Click **Next** to view a confirmation window. If everything is satisfactory, click **Done**.

7 Mounting a Hyper-V VM Image

This chapter describes:

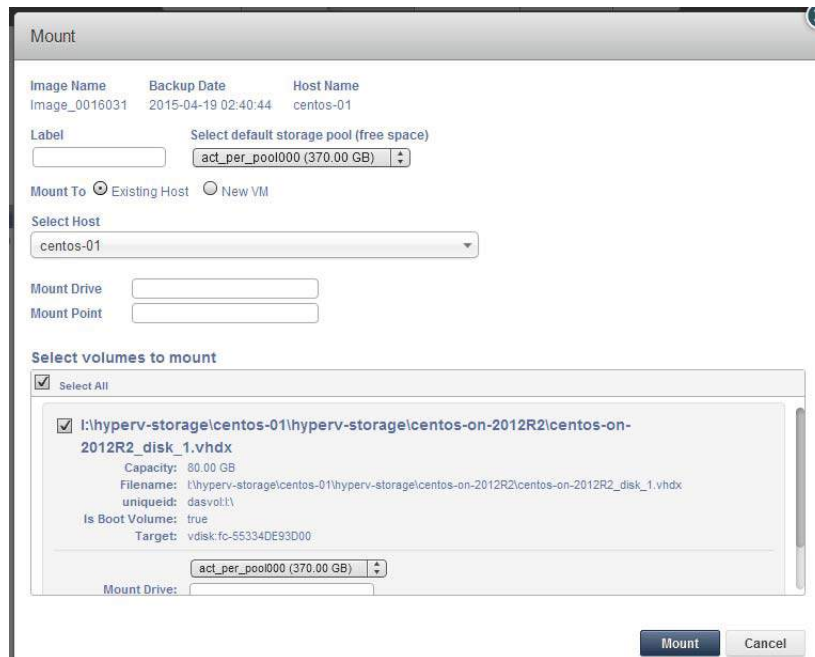
- [Mounting a Hyper-V VM Image to an Existing Host](#) on page 35
- [Mounting a Hyper-V VM Image to a New VM](#) on page 37

Note: Before mounting an image, ensure that the WWPN/iSCSI port of the host where the images will be mounted is accessible to the Actifio appliance.

Mounting a Hyper-V VM Image to an Existing Host

To mount a Hyper-V VM image to an existing host:

1. Open the **Application Manager** to the **Restore** tab.
2. Select the application or VM from the navigation pane. The backup can be a local image or a remote image.
3. Select the time period for images using the calendar icons to filter the list of images as needed.
4. Select the image type by clicking on the corresponding Snapshot, Dedup, Remote, LiveClone, or OnVault buttons. You can use the Shift key to select multiple types.
5. Select the image to mount from the list on the right. The selected image icon turns green and detailed information about it is displayed in the image box at the center of the display. The most recent image is selected by default.
6. Click the pull-down menu from the bottom right of the image information display and select **Mount**. The Mount Job window appears.



Mounting a Hyper-V VM to an Existing Hypervisor

7. Image Name, Backup Date, and Host Name are provided at the top of the screen. A **Label** is optional.
8. If necessary, change the default storage pool from the **Select default storage pool** drop-down list.
9. At Mount To select **Existing Host**.
10. Select a host from **Select Host(s)** to mount the image to. You can select any known host from the dropdown list, grouped into Physical Machines and Virtual Machines. If you need a host that has not yet been added, add it from the Domain Manager service menu.
11. **Mount Drive:** (Windows only). Specifies a drive letter to be assigned to the volume. If the drive letter is not available, the job fails. If multiple volumes are found, then it assigns subsequent drive letters. If no Mount Drive is specified, the Connector chooses a drive letter itself, if available. If you are concerned about running out of drive letters, see [Mounting Applications to Windows Mount Points without Using a Drive Letter](#) on page 26.
12. **Mount Point:** the full path at which you want to mount the volume. If the path exists as an empty folder, the Connector will use it. If it does not exist, the Connector will create it. *If it exists as a file or as a folder that is not empty, then the job will fail.* If there are multiple volumes to be mounted, the Connector chooses the user specified for one of the volumes and for the remaining it appends an underscore (_) followed by a number, i.e., <user_specified>_#.
13. Select all volumes, a single volume, or multiple volumes from **Select volumes to mount**. By default, all volumes are selected. If you select individual volumes, you can override the default storage pool selected above for specific volumes.
14. Click **Mount**. A job is submitted to mount the image to the selected host. After the image has been mounted, the Active Images pane lists it among the images mounted on the host.

Mounting a Hyper-V VM Image to a New VM

To mount a Hyper-V VM image to an existing host:

1. Open the **Application Manager** to the **Restore** tab.
2. Select the application or VM from the navigation pane. The backup can be a local image or a remote image.
3. Select the time period for images using the calendar icons to filter the list of images as needed.
4. Select the image type by clicking on the corresponding Snapshot, Dedup, Remote, LiveClone, or OnVault buttons. You can use the Shift key to select multiple types.
5. Select the image to mount from the list on the right. The selected image icon turns green and detailed information about it is displayed in the image box at the center of the display. The most recent image is selected by default.
6. Click the pull-down menu from the bottom right of the image information display and select **Mount**. The Mount Job window appears.

Clone

Image Name: Image_0016031 Backup Date: 2015-04-19 02:40:44 Host Name: centos-01

Label:

Mount To VM: ☒ SCVMM ☐ Hyper-V ?

VM Name: Hyper-V Server: Path:

Select SCVMM Server:

Select volumes to promote

☒ Select All

☒ I:\hyperv-storage\centos-01\hyperv-storage\centos-on-2012R2\centos-on-2012R2_disk_1.vhdx

Capacity: 80.00 GB
Filename: I:\hyperv-storage\centos-01\hyperv-storage\centos-on-2012R2\centos-on-2012R2_disk_1.vhdx
uniqueid: dasvot\1
Is Boot Volume: true
Target: vdisk:fc-55334DE93D00

Mounting a Hyper-V VM to a New Hypervisor

7. Image Name, Backup Date, and Host Name are provided at the top of the screen. A **Label** is optional.
8. If necessary, change the default storage pool from the **Select default storage pool** drop-down list.
9. At Mount To select **New VM**.
10. Select whether to mount to an SCVMM or a Hyper-V VM.
 - o If you select SCVMM, then select an SCVMM server from the **Select SCVMM Server** dropdown.
 - o If you select Hyper-V, then select a Hyper-V server from the **Hyper-V Server** dropdown.
11. Select all volumes, a single volume, or multiple volumes from **Select volumes to mount**. By default, all volumes are selected. If you select individual volumes, you can override the default storage pool selected above for specific volumes. If you are concerned about running out of drive letters, see [Mounting Applications to Windows Mount Points without Using a Drive Letter](#) on page 26.
12. Click **Mount**. A job is submitted to mount the image to the selected host. After the image has been mounted, the Active Images pane lists it among the images mounted on the host.

8 Mounting File Systems

A mounted file system image can be used directly from the mounted host or you can restore selected files or directories from it. Before mounting an image, ensure that the WWPN/iSCSI port of the host where the images will be mounted is accessible to the Actifio appliance.

This chapter describes:

[Mounting a Local File System](#) on page 39

[Mounting a Mapped CIFS File System](#) on page 41

[Mounting a Mapped NFS File System](#) on page 43

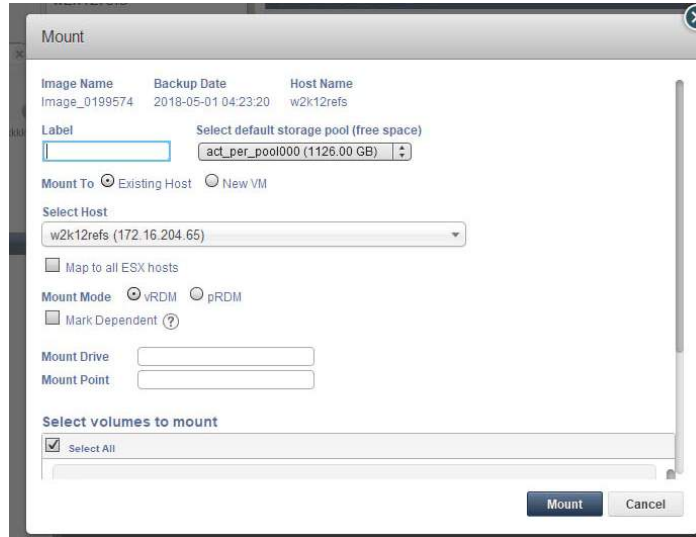
[Copying Selected Files and Directories to Your Desktop](#) on page 45 (also called File-Level Restore).

Mounting a Local File System

This procedure is for mounting local file systems. To mount mapped CIFS file systems, see [Mounting a Mapped CIFS File System](#) on page 41, and to mount mapped NFS file systems see [Mounting a Mapped NFS File System](#) on page 43.

To mount a local file system image to a host:

1. Open the **Application Manager** to the **Restore** tab.
2. Select the file system from the navigation pane. The backup can be a local image or a remote image (from remote Actifio appliances 1 or 2 in a multi-hop appliance configuration).
3. Select the time period for images using the calendar icons to filter the list of images as needed.
4. Select the image type by clicking on the corresponding Snapshot, Dedup, Remote, LiveClone, or OnVault buttons. You can use the Shift key to select multiple types.
5. Select the image to mount from the list on the right. The selected image icon turns green and information about it appears in the image box at the center of the display. The most recent image is selected by default.
6. Click the gear menu from the bottom of the image box and select **Mount**. The Mount Job window appears.



Mounting a File System Image

7. Image Name, Backup Date, and Host Name are provided at the top of the screen. A **Label** is optional.
8. If necessary, change the default storage pool from the **Select default storage pool** drop-down list.
9. Select a host from **Select Host(s)** to mount the image to. You can select any known host from the dropdown list, grouped into Physical Machines and Virtual Machines. If you need a host that has not yet been added, add it from the Domain Manager service menu.
10. Select whether to **Map to all Cluster servers**.
11. If you are mounting to a VMware virtual host, select a raw device mapping **Mount Mode**: pRDM or vRDM. If you do not know what to select, then select pRDM.

Note: VMware snapshots treat mounted vRDMs as Independent and are not included in snapshots. Because of this, by default, Actifio does not include vRDMs when protecting a mounted VM. Actifio does provide an option where you can mark vRDMs as Dependent. Although rarely used, when this option is enabled, vRDMs will be included in VMware snapshots. Actifio SLA templates will capture vRDMs marked as Dependent and the captured data will be counted in MDL usage.

12. **Mount Point:** the full path at which you want to mount the volume. If the path exists as an empty folder, the Connector will use it. If it does not exist, the Connector will create it. *If it exists as a file or as a folder that is not empty, then the job will fail.* If there are multiple volumes to be mounted, the Connector chooses the user specified for one of the volumes and for the remaining it appends an underscore (_) followed by a number, i.e., <user_specified>_#.
13. Decide if you will mount all volumes or if you want to select specific volumes to mount. To mount all volumes, enter values in the upper Mount Point text fields in [Step 14](#). To mount to specific volume(s), leave the upper Mount Point blank and enter the values for the selected volume as described in [Step 15](#).
14. To mount all volumes:
 - o Enter a Mount Drive (Windows only). Specifies a drive letter to be assigned to the volume. If the drive letter is not available, the job fails. If multiple volumes are found, then it assigns subsequent drive letters. If no Mount Drive is specified, the Connector chooses a drive letter itself, if available.
 - o Enter a Mount Point (Unix OS).
15. To mount to specific volume(s), leave the upper Mount Point blank. Enter values for the selected volume:
 - o Enter a Mount Drive (Windows only).

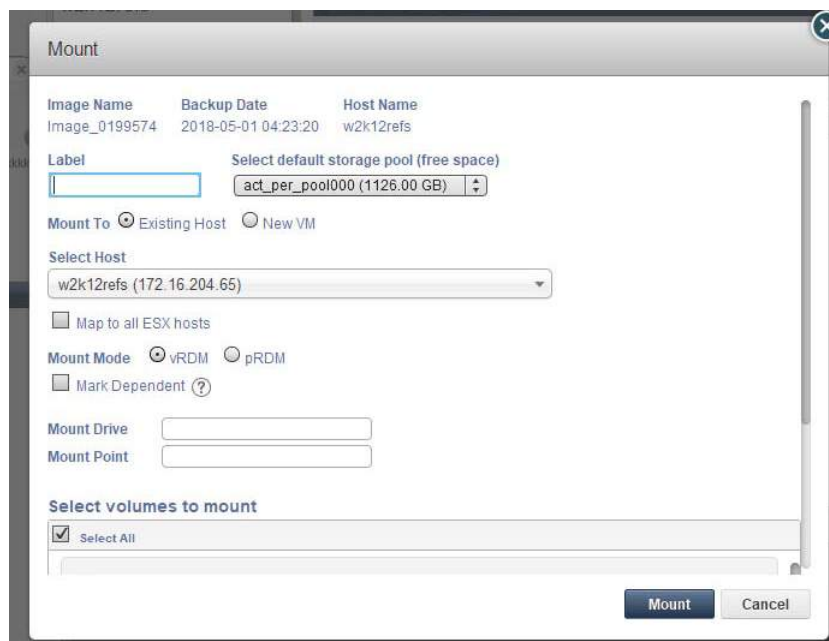
- o Enter a Mount Point (Unix OS).
- 16. Select a single or multiple volumes from **Select volumes to mount**. By default, all volumes are selected.
- 17. Click **Mount**. A job is submitted to mount the image to the selected host. After the image has been mounted, the Active Images pane lists it among the images mounted on the host.

Mounting a Mapped CIFS File System

This procedure is for mounting mapped CIFS file systems. To mount mapped NFS file systems, see [Mounting a Mapped NFS File System](#) on page 43, and to mount local file systems see [Mounting a Local File System](#) on page 39.

To mount a CIFS file system image to a host:

1. Open the **Application Manager** to the **Restore** tab.
2. Select the file system from the navigation pane. The backup can be a local image or a remote image (from remote Actifio appliances 1 or 2 in a multi-hop appliance configuration).
3. Select the time period for images using the calendar icons to filter the list of images as needed.
4. Select the image type by clicking on the corresponding Snapshot, Dedup, Remote, LiveClone, or OnVault buttons. You can use the Shift key to select multiple types.
5. Select the image to mount from the list on the right. The selected image icon turns green and information about it appears in the image box at the center of the display. The most recent image is selected by default.
6. From the gear-wheel menu at the bottom of the image box select **Mount**. The Mount window appears.



Mounting a File System Image

7. Image Name, Backup Date, and Host Name are provided at the top of the screen. A **Label** is optional.
8. If necessary, change the default storage pool from the **Select default storage pool** drop-down list.
9. Select a host from **Select Host(s)** to mount the image to. You can select any known host from the dropdown list, grouped into Physical Machines and Virtual Machines. If you need a host that has not yet been added, add it from the Domain Manager service menu.
10. Select whether to **Map to all Cluster servers**.

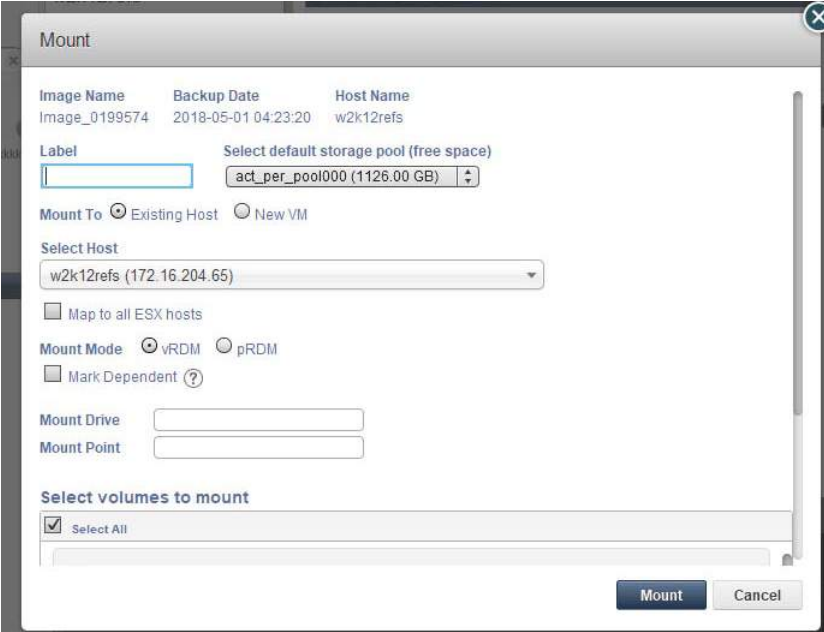
11. Decide if you will mount all volumes or if you want to select specific volumes to mount. To mount all volumes, enter values in the upper Mount Point text fields in [Step 14](#). To mount to specific volume(s), leave the upper Mount Point blank and enter the values for the selected volume as described in [Step 15](#).
12. **Mount Point:** the full path at which you want to mount the volume. If the path exists as an empty folder, the Connector will use it. If it does not exist, the Connector will create it. *If it exists as a file or as a folder that is not empty, then the job will fail.* If there are multiple volumes to be mounted, the Connector chooses the user-specified mount point for one of the volumes and for the remaining it appends an underscore (_) followed by a number, i.e., <user_specified>_#.
13. To mount all volumes, use the upper fields:
 - o Enter a Mount Drive (Windows only). Specifies a drive letter to be assigned to the volume. If the drive letter is not available, the job fails. If multiple volumes are found, then it assigns subsequent drive letters. If no Mount Drive is specified, the Connector chooses a drive letter itself, if available.
 - o Enter a Mount Point (Unix OS).
14. To mount to specific volume(s), leave the upper Mount Point blank and enter the values for the selected volume:
 - o Enter a Mount Drive (Windows only).
 - o Enter a Mount Point (Unix OS).
15. Select a single or multiple volumes from **Select volumes to mount**. By default, all volumes are selected.
16. Click **Mount**. A job is submitted to mount the image to the selected host. After the image has been mounted, the Active Images pane lists it among the images mounted on the host.

Mounting a Mapped NFS File System

This procedure is for mounting mapped NFS file systems. To mount mapped CIFS file systems, see [Mounting a Mapped CIFS File System](#) on page 41, and to mount local file systems see [Mounting a Local File System](#) on page 39.

To mount a mapped NFS file system image to a host:

1. Open the **Application Manager** to the **Restore** tab.
2. Select the file system from the navigation pane. The image can be a local image or a remote image (from remote Actifio appliances 1 or 2 in a multi-hop appliance configuration).
3. Select the time period for images using the calendar icons to filter the list of images as needed.
4. Select the image type by clicking on the corresponding Snapshot, Dedup, Remote, LiveClone, or OnVault buttons. You can use the Shift key to select multiple types.
5. Select the image to mount from the list on the right. The selected image icon turns green and information about it appears in the image box at the center of the display. The most recent image is selected by default.
6. Click the gear menu from the bottom of the image box and select **Mount**. The Mount Job window appears.



Mounting a File System Image

7. Image Name, Backup Date, and Host Name are provided at the top of the screen. A **Label** is optional.
8. If necessary, change the default storage pool from the **Select default storage pool** drop-down list.
9. Select a host from **Select Host(s)** to mount the image to. You can select any known host from the dropdown list, grouped into Physical Machines and Virtual Machines. If you need a host that has not yet been added, add it from the Domain Manager service menu.
10. Select whether to **Map to all Cluster servers**.
11. Decide if you will mount all volumes or if you want to select specific volumes to mount. To mount all volumes, enter values in the upper Mount Point text fields in [Step 14](#). To mount to specific volume(s), leave the upper Mount Point blank and enter the values for the selected volume as described in [Step 15](#).

12. **Mount Point:** the full path at which you want to mount the volume. If the path exists as an empty folder, the Connector will use it. If it does not exist, the Connector will create it. *If it exists as a file or as a folder that is not empty, then the job will fail.* If there are multiple volumes to be mounted, the Connector chooses the user specified for one of the volumes and for the remaining it appends an underscore (_) followed by a number, i.e., <user_specified>_#.
13. To mount all volumes:
 - o Enter a Mount Drive (Windows only). Specifies a drive letter to be assigned to the volume. If the drive letter is not available, the job fails. If multiple volumes are found, then it assigns subsequent drive letters. If no Mount Drive is specified, the Connector chooses a drive letter itself, if available. If you are concerned about running out of drive letters, see [Mounting Applications to Windows Mount Points without Using a Drive Letter](#) on page 26.
 - o Enter a Mount Point (Unix OS).
14. To mount to specific volume(s), leave the upper Mount Point blank and enter the values for the selected volume:
 - o Enter a Mount Drive (Windows only).
 - o Enter a Mount Point (Unix OS).
15. Select a single or multiple volumes from **Select volumes to mount**. By default, all volumes are selected.
16. Click **Mount**. A job is submitted to mount the image to the selected host. After the image has been mounted, the Active Images pane lists it among the images mounted on the host. Select the mounted image from the list.

Copying Selected Files and Directories to Your Desktop

You can download a subset of files or directories from an image mounted to the host. This feature is supported on Windows-based file systems and Unix platforms (Linux, AIX, HP, and Solaris). The restoration includes zipping the files.

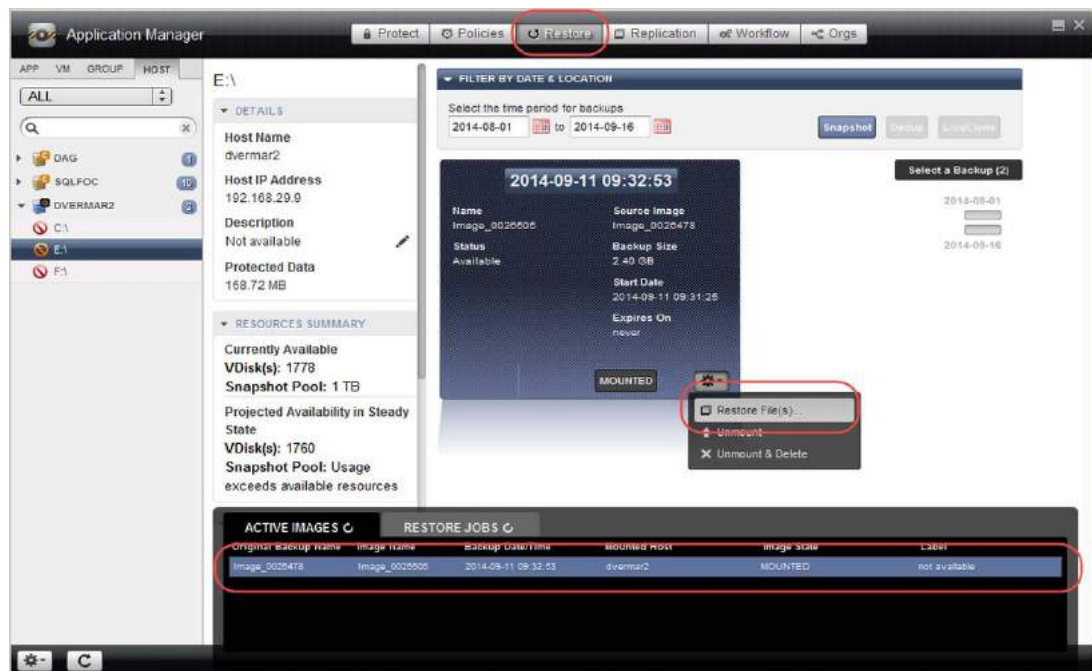
Note: AIX recovery is not applicable to Sky appliances.

Prerequisites to perform this function:

- The Actifio Connector must be installed and running on the mounted host (Windows or Unix).
- The Application Discovery function is executed at least once on the mounted host.

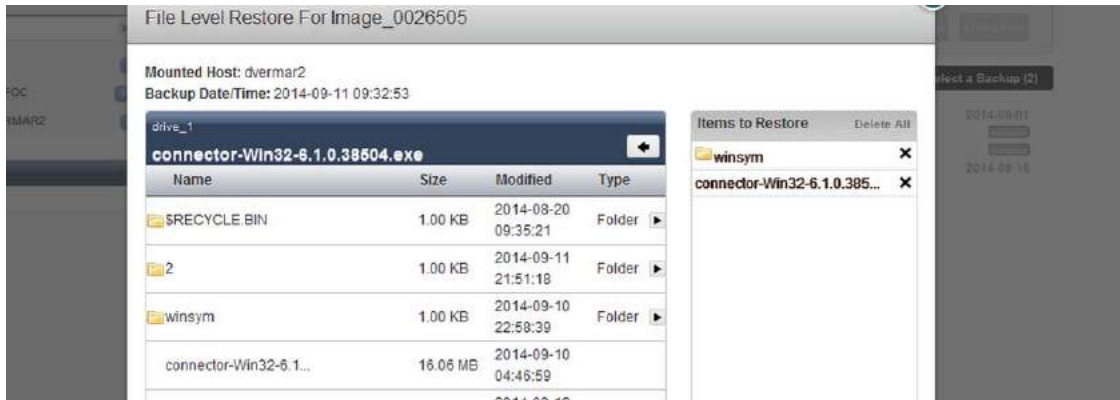
To restore selected files or directories:

1. Open the Application Manager to the **Restore** tab.
2. Select the desired application or VM from the navigation pane. If you are selecting a VM, ensure that the Actifio Connector is installed on the Virtual Machine and applications on the VM are discovered.
3. Mount the image as detailed in [Mounting File Systems](#) on page 39. The Restore image is populated.
4. After the image has been mounted, the Active Images pane lists it among the images mounted on the host. Select the mounted image from the list.
5. Click the pull-down menu at the bottom right.



Restoring Selected Files and Directories

6. Click **Restore File(s)**. A tree view of the directories and files of the image is displayed.
7. Select the files and/or directories to restore by double-clicking the folder or file. You can select the files in a directory by opening the directory by clicking the arrow mark displayed against the folder. You can see the selected files or folders under **Items to Restore**.



File-Level Restore from a File System

8. Click **Submit**. The Save As window appears.
9. Select a destination folder on the client running Actifio Desktop.
10. Enter a name for the zip file. Be sure to include the proper extension of your supported zip program.
11. Click **Save**. The Actifio Connector zips the selected files and directories and starts the download.

Note: To prevent unauthorized access to sensitive information, download the required files to a secure local disk or a NAS mount then share the files with the required operators.

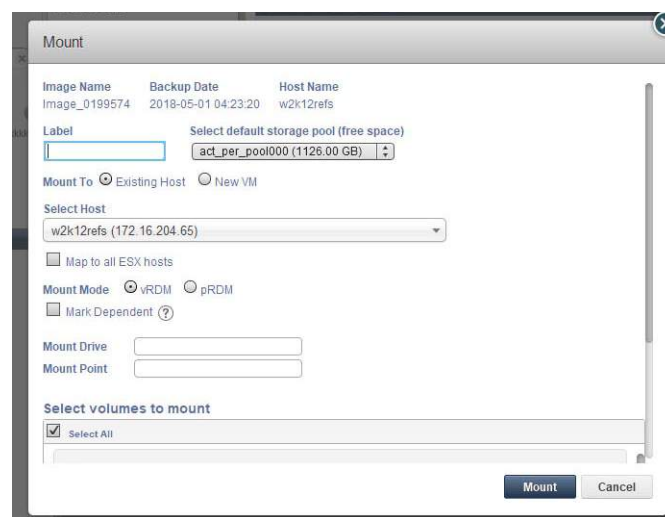
9 Mounting Microsoft Exchange Databases

This chapter describes how to mount a Microsoft® Exchange database for instant access. A mounted Exchange database image can be used directly from the mounted host or you can restore selected files or directories from it.

Note: Before mounting an image, ensure that the WWPN/iSCSI port of the host where the images will be mounted is accessible to the Actifio appliance.

To mount an Exchange database to a host:

1. Open the **Application Manager** to the **Restore** tab.
2. Select the application or VM from the navigation pane. The backup can be a local image or a remote image (from remote Actifio appliances 1 or 2 in a multi-hop appliance configuration).
3. Select the time period for images using the calendar icons to filter the list of images as needed.
4. Select the image type by clicking on the corresponding Snapshot, Dedup, Remote, LiveClone, or OnVault buttons. You can use the Shift key to select multiple types.
5. Select the image to mount from the list on the right. The selected image icon turns green and detailed information about it is displayed in the image box at the center of the display. The most recent image is selected by default.
6. Click the pull-down menu from the bottom right of the image information display and select **Mount** and the Mount Job window appears.



Mounting an Exchange Database Image

7. Image Name, Backup Date, and Host Name are provided at the top of the screen. A **Label** is optional.
8. If necessary, change the default storage pool from the **Select default storage pool** drop-down list.

9. Select a host from **Select Host(s)** to mount the image to. You can select any known host from the dropdown list, grouped into Physical Machines and Virtual Machines. If you need a host that has not yet been added, add it from the Domain Manager service menu.
10. Select whether to **Map to all Cluster nodes**.
11. If you are mounting to a VMware virtual host, select a raw device mapping **Mount Mode**: pRDM or vRDM. If you do not know what to select, then select pRDM.

Note: *VMware snapshots treat mounted vRDMs as Independent and are not included in snapshots. Because of this, by default, Actifio does not include vRDMs when protecting a mounted VM. Actifio does provide an option where you can mark vRDMs as Dependent. Although rarely used, when this option is enabled, vRDMs will be included in VMware snapshots. Actifio SLA templates will capture vRDMs marked as Dependent and the captured data will be counted in MDL usage.*

12. **Mount Drive:** (Windows only). Specifies a drive letter to be assigned to the volume. If the drive letter is not available, the job fails. If multiple volumes are found, then it assigns subsequent drive letters. If no Mount Drive is specified, the Connector chooses a drive letter itself, if available. If you are concerned about running out of drive letters, see [Mounting Applications to Windows Mount Points without Using a Drive Letter](#) on page 26.
13. **Mount Point:** the full path at which you want to mount the volume. If the path exists as an empty folder, the Connector will use it. If it does not exist, the Connector will create it. *If it exists as a file or as a folder that is not empty, then the job will fail.* If there are multiple volumes to be mounted, the Connector chooses the user specified for one of the volumes and for the remaining it appends an underscore (_) followed by a number, i.e., <user_specified>_#.
14. Select a single or multiple volumes from **Select volumes to mount**. By default, all volumes are selected.
15. Click **Mount**. A job is submitted to mount the image to the selected host. After the image has been mounted, the Active Images pane lists it among the images mounted on the host. Select the mounted image from the list.

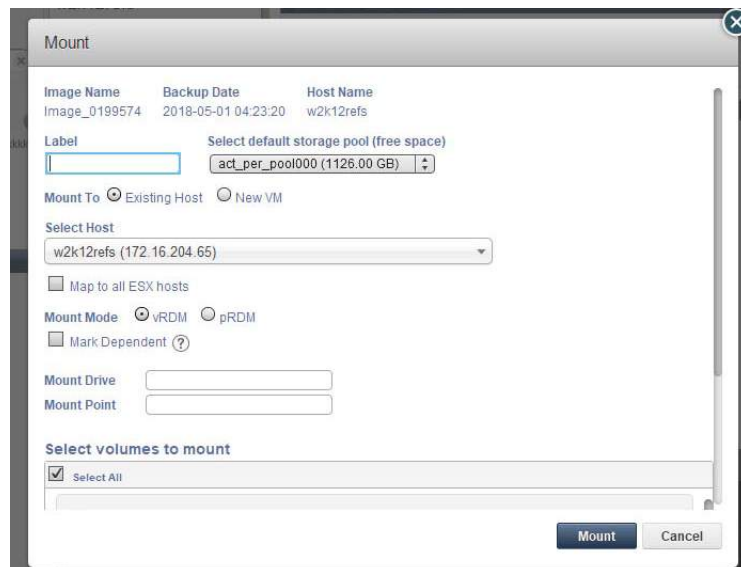
10 Mounting Consistency Groups

Before mounting a consistency group image, ensure that the WWPN/iSCSI port of the host where the images will be mounted is accessible to the Actifio appliance.

Consistency groups that contain SQL Server databases or Oracle databases can be mounted together in an application aware mount. An individual SQL Server database and Oracle database in a consistency group cannot be mounted as a virtual application as part of an application aware mount.

To mount a Consistency Group image to a host:

1. Open the **Application Manager** to the **Restore** tab.
2. Under the Groups tab, select the consistency group from the navigation pane. The image can be a local image or a remote image (from remote Actifio appliances 1 or 2 in a multi-hop appliance configuration).
3. Select the time period for images using the calendar tool to filter the list of images as needed.
4. Select the image type by clicking on the corresponding Snapshot, Dedup, Remote, LiveClone, or OnVault buttons. You can use the Shift key to select multiple types.
5. Select the image to mount from the graphical list on the right. The selected image icon turns green and detailed information about it is displayed in the image box at the center of the display. The most recent image is selected by default.
6. Click the menu from the bottom right of the image information display and select **Mount**. The Mount Job window appears. Image Name, Backup Date, and Host Name are provided at the top of the screen.



Mounting a Consistency Group Image

7. Provide a **Label** (optional).

8. If necessary, change the default storage pool from the **Select default storage pool** drop-down list. The available free space in the pool is indicated in parentheses.
9. Select a host from **Select Host(s)** to mount the image to. You can select any known host from the dropdown list, grouped into Physical Machines and Virtual Machines. If you need a host that has not yet been added, add it from the Domain Manager service menu.
10. If you are mounting to a VMware virtual host, select a raw device mapping **Mount Mode**: pRDM or vRDM. If you do not know what to select, then select pRDM.

Note: VMware snapshots treat mounted vRDMs as Independent and are not included in snapshots. Because of this, by default, Actifio does not include vRDMs when protecting a mounted VM. Actifio does provide an option where you can mark vRDMs as Dependent. Although rarely used, when this option is enabled, vRDMs will be included in VMware snapshots. Actifio SLA templates will capture vRDMs marked as Dependent and the captured data will be counted in MDL usage.

11. **Mount Drive:** (Windows only). Specifies a drive letter to be assigned to the volume. If the drive letter is not available, the job fails. If multiple volumes are found, then it assigns subsequent drive letters. If no Mount Drive is specified, the Connector chooses a drive letter itself, if available. If you are concerned about running out of drive letters, see [Mounting Applications to Windows Mount Points without Using a Drive Letter](#) on page 26.
12. **Mount Point:** the full path at which you want to mount the volume. If the path exists as an empty folder, the Connector will use it. If it does not exist, the Connector will create it. *If it exists as a file or as a folder that is not empty, then the job will fail.* If there are multiple volumes to be mounted, the Connector chooses the user specified for one of the volumes and for the remaining it appends an underscore (_) followed by a number, i.e., <user_specified>_#.
13. Select a single or multiple volumes from **Select volumes to mount**. By default, all volumes are selected.
14. Click **Mount**. A job is submitted to mount the image to the selected host. After the image has been mounted, the Active Images pane lists it among the images mounted on the host. Select the mounted image from the list.

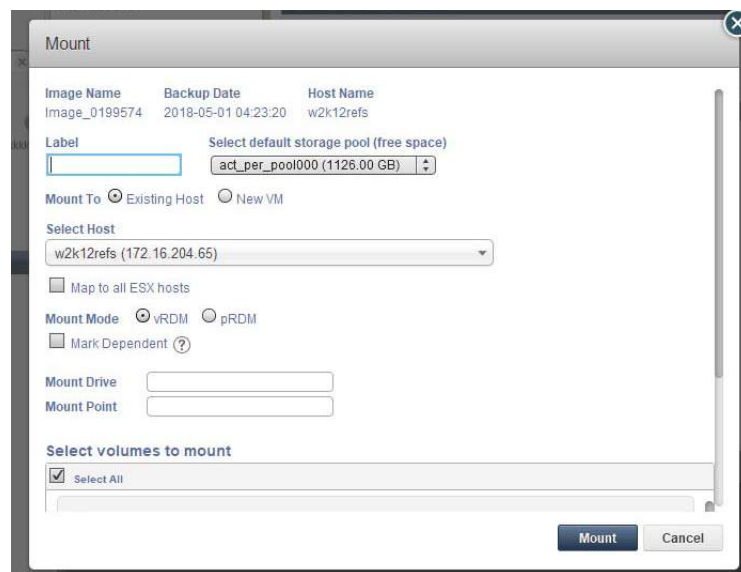
Note: You can also mount a single SQL database from a consistency group. See **An SQL Server DBA's Guide to Actifio Copy Data Management** in your Actifio Documentation Library.

11 Mounting Generic Applications

Before mounting a generic image, ensure that the WWPN port of the host where the images will be mounted is accessible to the Actifio CDS appliance. Generic applications are available only on in-band Actifio CDS storage.

To mount a generic application image to a host:

1. Open the **Application Manager** to the **Restore** tab.
2. Select the generic application from the navigation pane.
3. Select the time period for images using the calendar tool to filter the list of images as needed.
4. Select the image type by clicking on the corresponding Snapshot, Dedup, Remote or LiveClone buttons. You can use the Shift key to select multiple types.
5. Select the image to mount from graphical the list on the right. The selected image icon turns green and detailed information about it is displayed in the image box at the center of the display. The most recent image is selected by default.
6. Click the pull-down menu from the bottom right of the image information display and select **Mount**. The Mount Job window appears. Image Name, Backup Date, and Host Name are at the top of the screen.



Mounting a Generic Application Image

7. Provide a **Label** (optional).
8. If necessary, change the default storage pool from the **Select default storage pool** drop-down list. The available free space in the pool is indicated in parentheses.

9. Select a host from **Select Host(s)** to mount the image to. You can select any known host from the dropdown list, grouped into Physical Machines and Virtual Machines. If you need a host that has not yet been added, add it from the Domain Manager service menu.
10. Select whether to **Map to all Cluster servers** (physical hosts) or **Map to all ESX hosts** (VMs).
11. If you are mounting to a VMware virtual host, select a raw device mapping **Mount Mode**: pRDM or vRDM. If you do not know what to select, then select pRDM.

Note: *VMware snapshots treat mounted vRDMs as Independent and are not included in snapshots. Because of this, by default, Actifio does not include vRDMs when protecting a mounted VM. Actifio does provide an option where you can mark vRDMs as Dependent. Although rarely used, when this option is enabled, vRDMs will be included in VMware snapshots. Actifio SLA templates will capture vRDMs marked as Dependent and the captured data will be counted in MDL usage.*

12. **Mount Drive:** (Windows only). Specifies a drive letter to be assigned to the volume. If the drive letter is not available, the job fails. If multiple volumes are found, then it assigns subsequent drive letters. If no Mount Drive is specified, the Connector chooses a drive letter itself, if available. If you are concerned about running out of drive letters, see [Mounting Applications to Windows Mount Points without Using a Drive Letter](#) on page 26.
13. **Mount Point:** the full path at which you want to mount the volume. If the path exists as an empty folder, the Connector will use it. If it does not exist, the Connector will create it. *If it exists as a file or as a folder that is not empty, then the job will fail.* If there are multiple volumes to be mounted, the Connector chooses the user specified for one of the volumes and for the remaining it appends an underscore (_) followed by a number, i.e., <user_specified>_#.
14. Select a single or multiple volumes from **Select volumes to mount**. By default, all volumes are selected.
15. Click **Mount**. A job is submitted to mount the image to the selected host. After the image has been mounted, the Active Images pane lists it among the images mounted on the host.

Index

A

- Actifio Connector is not installed 2
- application aware mount
 - Oracle 32
 - SQL Server database 22
- Application Manager
 - Service Menu 2

B

- backup image
 - expiring 6
 - mounting to physical host 20, 35, 39, 47, 49, 51

C

- CIFS file system, mounting 41
- clone
 - about 9
 - expiring 6, 7
 - image of an application to a host 10
 - VM image 12, 14
- consistency group, mounting 49
- contact information, Actifio Support ii
- copyright ii

D

- data sensitivity 2
- Delete service menu item 2
- Discover App(s) service menu item 2
- Discover VM(s) service menu item 2

E

- Expire All Backups service menu item 2

F

- file system
 - mounting to a physical host 39
- file-level restore 45

G

- generic applications, mounting 51

H

- Hyper-V VM, mounting 35

L

- legal matter ii
- LiveClone
 - creating 18
 - expiring 6, 7
- local file system, mounting 39

M

- Manage VDisk(s) service menu item 2
- Mark Ignored service menu item 2
- Microsoft Exchange database, mounting 47
- Modify Expiration service menu item 2
- Modify Sensitivity service menu item 2
- mount images
 - consistency groups 49
 - Exchange database 47
 - generic applications 51
 - Hyper-V VM 35
 - local file systems 39
 - mapped CIFS file systems 41
 - mapped file systems 43
 - mounting to a physical host 20
 - Oracle databases 28, 30
 - standard procedure 20

N

- New Application service menu item 2
- New Consistency Grp service menu item 2
- New Group service menu item 2
- NFS file system, mounting 43

O

- object-based storage 5
- Oracle database
 - accessing data v
 - mounting 27
- Oracle database, mounting 27

P

- physical host
 - mapping a Generic Application to all when mounting 52
 - mounting backup image 20, 35, 39, 47, 49, 51

pRDM or vRDM 21
protecting several applications with a single policy 2

R

restoring selected files and directories 45

S

selected files or directories, restoring 45
Set Application Type service menu item 2
Show Jobs service menu item 2
snapshot
 expiring 6, 7
 mounting 20, 35, 37, 39, 41, 43, 47, 49, 51
SQL Server, accessing data v
syncback image, expiring 6

T

thin/thick provisioning of VMs 18
trademarks ii

V

vault image, expiring 6
virtual application, see application aware mount
VMware VMs, accessing images v

W

warranty ii
WWPN/iSCSI port 20, 35, 39, 47, 49, 51