# Creating Automated Workflows for SQL Server Databases



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## Preface

This guide provides an overview of Actifio Workflows and how to use Actifio services to create a Workflow. This guide assumes you have read **Getting Started with 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.

Your Actifio appliance's Documentation Library contains detailed, step-by-step, application-specific instructions on how to protect and access your data. Each guide is in PDF format and may be viewed, downloaded, and printed on demand. The following guides will be of particular interest:

- Setting Up Users and Roles With the Domain Manager
- Configuring Resources and Settings With the Domain Manager
- Connecting Hosts to Actifio Appliances
- Planning and Developing Service Level Agreements
- Virtualizing and Protecting Copy Data with the Application Manager
- Accessing and Recovering Copy Data with the Application Manager
- Replicating Data Using Actific Appliances

### 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 Actific appliance your Actific representative provided you with a user name and password for the Actific NOW 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 Introduction to Provisioning Environments With Workflows

While Actifio SLA Policy Templates govern the automated capture of production data, Actifio Workflows automate access to captured data. Workflows can run according to a schedule or on demand.

Workflows are built with captured production data. Workflows can present the captured data as a LiveClone, a virtual application, or as just the application data.

For those applications that contain sensitive data, a Workflow can include a step that creates a LiveClone and then automatically runs a script to mask the sensitive data.

The LiveClone with the masked data can then be mounted as a virtual application or the LiveClone's data to provision a work environment. For example, the following figure illustrates a Workflow that:

- 1. Captures production data that contains Social Security numbers
- 2. Prep-mounts the captured data as a LiveClone so a script can scrub the Social Security numbers from the data
- 3. Mounts the scrubbed LiveClone as a virtual application via an Application Aware mount.
- 4. Flags the scrubbed virtual application as non-sensitive.



Once a Workflow completes, users can access the server on which the virtual application has been mounted and use the data as needed. Access to the data is controlled by the server on which the data is mounted.

This chapter provides an overview of Actifio Workflows, including:

- Workflow Uses on page 2
- Workflow Benefits on page 3
- Capturing Data for Workflows on page 3
- Workflow Data Access Methods on page 4

## Workflow Uses

Some of the more common uses for Workflows include:

## **Provisioning Work Environments**

Teams such as test and development can take advantage of a Workflow's ability to present captured production data as a virtual application. When production data contains sensitive information, the data can be scrubbed prior to making it available to users.

The ability to limit access to specific features and functions allows users to provision and re-provision their environments without putting production data at risk and without the assistance of database administrators or system administrators.

Users who have access to a virtual application provisioned by a Workflow can also capture that virtual application. The new application can be worked on and tested separately from the regularly updated data provided by the Workflow. For example, by peeling off the data as a new application, tests such as user acceptance tests can be performed on the new application. Tested applications can be updated and retested until they are ready for release.

A test and development Workflow could consist of:

1. Defining a schedule for updating the LiveClone with the latest production data. Scheduled Workflows can also be run on demand.

**Note:** You can run a Scheduled Workflow on-demand at any time. You cannot convert an On-Demand Workflow to a Scheduled Workflow after it has been created.

- 2. Generating a new, or updating an existing LiveClone from a selected production image marked as sensitive.
- 3. Employing scripts to scrub the LiveClone of sensitive data.
- 4. Marking the scrubbed application data as non-sensitive.
- 5. Mounting the scrubbed image as a virtual application (Application Aware Mount) to a specified host.
- 6. Capturing the scrubbed virtual application as a new application.

For an example of this type of Workflow, see LiveClone Workflow: Scrubbed Virtual Application on page 12.

#### Reporting

To analyze and report on production data without interfering with the production environment, you can define a Workflow that generates a virtual application and then executes a script that analyzes and reports on the virtual application. Once the report is generated, the mounted data can be unmounted and deleted.

A reporting Workflow could consist of:

- 1. Mounting data as a virtual application
- 2. Executing a script that analyzes the virtual application and outputs the results in a format that can be read by a third party reporting tool.
- 3. When the script is complete, unmounting and deleting the mounted image.

For an example of this type of Workflow, see Direct Mount Workflow: Virtual Application on page 22.

#### Data Warehousing

Teams can automate data warehousing, especially when data must be extracted, transformed, and loaded (ETL). A data warehousing Workflow could consist of:

- 1. Mounting data as a virtual application.
- 2. Executing a script that extracts, transforms, and loads the data.
- 3. When ETL is complete, unmounting and deleting the mounted image.

For an example of this type of Workflow, see Direct Mount Workflow: Virtual Application on page 22.

#### Copying to Removable Media

Workflows can automate copying selected data to a removable media such as tape for long-term retention. A Workflow that makes application data available for copying to removable media could consist of:

- Mounting just the application data.
- Executing a script that will initiate a third party application to copy the data to removable media.
- When the copy is complete, unmounting and deleting the mounted image.

For an example of this type of Workflow, see Direct Mount Workflow: Application Data on page 26.

## Workflow Benefits

The Actific appliance allows you to capture production data via a schedule or on demand. Once the data is captured it can be used in a Workflow to provision work environments.

With Actifio Workflows:

- Work environments can be updated with production data as soon as new data is available without having to wait days or even weeks for a DBA or system administrator to do the provisioning.
- Work environments can be updated on a predefined schedule or on demand.
- User Acceptance Testing (UAT) is streamlined. Actific can provision virtual applications (virtual copies of production applications) in UAT environments using the same protocols and environments that exist in production.
- DBAs and system administrators are freed from constantly provisioning and refreshing work environments.
- Users can quickly and efficiently reproduce and address issues using the latest production data in a secure, isolated environment.
- Software updates can be applied and tested, using the latest production data before being released into a production environment.
- Multiple teams can work in parallel and instantly access their own copy or virtual copy of production data.

Actifio Workflows take provisioning one step further by providing the ability to scrub images of sensitive data. This ability allows users to self-provision their environments with virtual applications of production data while at the same time maintaining data security.

## Capturing Data for Workflows

Workflows are made up of captured application data. Data captured for other purposes can be used by an Actifio Workflow. If you are capturing data specifically for Workflow purposes, the capture operation is no different than capturing data for other purposes. From the Actifio Desktop:

- 1. Add servers that host application data.
- 2. Discover applications on the added servers.
- 3. Define Actific Policy Templates and Resource Profiles (SLAs) according to your RPOs and RTOs.
- 4. Apply Actific Policy Templates and Resource Profiles to applications.

For details on capturing application data, see *Virtualizing and Protecting Copy Data with the Application Manager*.

## Workflow Data Access Methods

Workflows present captured data as Application Aware Mounts, LiveClones, or Standard Mounts.

## **Application Aware Mount**

The Actifio Application Aware mount function provides instant access to an application as a virtual application without actually moving data. Applications can be mounted on any application server. If the application is a database, and its logs have been captured, you can use the logs to roll the database forward to a desired point in time. Application Aware mounts are performed from the Actifio appliance and do not require manual intervention by application, database, server, or storage administrators.

Once an Application Aware Mount finishes, the virtual application can be captured like any other application. This capability is particularly useful when a problem is encountered with a virtual application. Users can roll back their copy of the virtual application to a point where the issue does not exist, while other users troubleshoot the problematic version.

## LiveClone

A LiveClone is an independent copy of an application that can be refreshed on a schedule or on demand. A LiveClone can be scrubbed for sensitive data before being made available to users. This allows teams such as development and test to use production quality data without exposing sensitive data and interfering with the production environment. LiveClones are updated on demand or according to a schedule defined in the Workflow.

## Direct Mount

Direct mounts present only an application's data. Direct mounts are updated on demand or according to a schedule defined in the Workflow.

## 2 Workflow Access Control

Actifio appliances come with a predefined Actifio Admin user. The Actifio Admin is a super user who has full control of and access to all features, functions, and resources of an Actifio appliance.

The Admin User can create users with various degrees of access.

When creating Workflows the Admin User must consider which users will have access to Workflows and what access those users will have to an Actific appliance's:

- Features
- Functions
- Managed data including access to sensitive data.

This chapter consists of the following topics:

- Configuring Roles, Organizations, and Users on page 5
- Example Role for Limited Workflow Access on page 7
- Example Organization for Limited Workflow Access on page 8
- Example User for Limited Workflow Access on page 9

## Configuring Roles, Organizations, and Users

Ultimately the users created and their degree of access to an Actifio appliance and the data it captures are driven by your corporate policies and the needs of your organizations. This section describes one of the more common approaches to creating users and assigning them the roles and organizations needed to run and view Workflows.

Although any user can be granted privileges to create and run a Workflow, team leaders are often tasked with running Workflows on demand and provisioning the work environment for their team. Team leaders typically are not the users who create Workflows, but are often responsible for running Workflows.

Giving team leaders the ability to run Workflows on demand frees DBAs and system administrators from having to update work environments.

A Workflow's on-demand capabilities allow team leaders to update their environments with refreshed production data as needed. For example, if a Workflow is scheduled to run every Sunday night, a team leader can run a Workflow on demand on a Wednesday and update the work environment with the latest production data.

To create an Actifio user who has just enough access to an Actifio appliance to run Workflows and to provision their environment with the latest Actifio Workflow updates, you can create:

- A role that has the necessary privileges to log in to the Actifio appliance, access the Application Manager, manage mounts, run Workflows, and view the status of a Workflow's progress.
- An organization that limits the user to Workflow data captured from specified application servers and if necessary, specific applications.
- A user who may or may not have access to sensitive data, and is assigned to an appropriate role and organization.

New roles, organizations, and users are created in the Domain Manager service. They are created by clicking the service menu icon on the bottom left-hand side of the Domain Manager service:

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♦ New Host ③ Join Appliance	DEDUP FOOL     ACT DED FOOL989
Certificate Exchange     Upload Certificate     Download Certificate     A torvive Job History     Upload System Update	DISK USAGE THRESHOLD MONITOR Used 0 Warning 0% 100% Pree 0 88%
X Delete	

Details on creating new roles, organizations, and users can be found in the *Setting Up Users and Roles With the Domain Manager* guide.

Use the following examples as a quick reference for creating users who do not have access to sensitive data, and are assigned roles and organizations in such a way that they can only use an Actifio appliance to provision their work environment.

## Example Role for Limited Workflow Access

The following screen capture is an example of a user role that limits a user to accessing an Actifio appliance's Application Manager, Manage LiveClones, Manage Mounts, and to view and run Workflows. It also allows that user to monitor the progress of a Workflow via the Actifio System Monitor. A single role can be assigned to multiple users.

**Note:** Because a LiveClone in a LiveClone Workflow typically contains sensitive information, users assigned a role with Manage LiveClone rights must also have access to sensitive data. See Example User for Limited Workflow Access on page 9.



**Example Role for Limited Workflow Access** 

## Example Organization for Limited Workflow Access

The following screen capture is an example of an organization that limits a Workflow user to specific application servers. If necessary, the organization could limit a Workflow user to specific applications on the servers. A single organization can be assigned to multiple users.

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**Example Organization for Limited Workflow Access** 

## Example User for Limited Workflow Access

The following screen capture is an example of a new user who does not have access to sensitive data.

**Note:** Such users do not have access to sensitive data in a Workflow even if their assigned organizations contain sensitive data.

Roles and Organizations are assigned to a user by clicking the tabs at the top of the page. A single user can be assigned multiple roles and multiple organizations.

**Note:** Because a LiveClone in a LiveClone Workflow typically contains sensitive information, users assigned a role with Manage LiveClone rights must also have access to sensitive data. See Example Role for Limited Workflow Access on page 7.

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<ul> <li>Archive Job History</li> <li>Upload System Update</li> </ul>				
X Delete				

**Example User for Limited Workflow Access** 

## 3 Defining Workflows

Workflows are defined in the Actific Application Manager. Workflows use captured production data as the source data from which they generate:

**LiveClones:** LiveClones are typically used in Workflows when an application contains sensitive data which must be scrubbed before it is mounted and made available to users. The application data can be mounted with a standard mount as just the data, as a virtual application, or as both the data and as a virtual application. Updates to the LiveClone, scrubbing, and mounting can be done automatically via a schedule or on demand.

**Direct Mounts:** Direct Mounts are used when application data does not need to be scrubbed before it is mounted and made available to users. The application data can be mounted with a standard mount as just the data, as a virtual application, or as both the data and as a virtual application. Direct mounts make captured data available almost instantly without actually moving data.

**Note:** Workflows consist of a number of options. In most cases, when creating a Workflow, not specifying an option will allow a user to specify that option when running the Workflow on demand.

You can create an Actifio Workflow from captured SQL:

- Instances
- System Databases
- User databases
- Consistency Groups
- Individual members of a Consistency Group
- Primary database of an AlwaysOn Availability Group
- Databases in VMs

Options presented while creating a Workflow will vary according to the source that is selected. For example, databases on VMware VMs will have a **Map to all ESX hosts** option. If a LiveClone or virtual application is being made from a selected Consistency Group, you will have the opportunity to provide a name for the new LiveClone Consistency Group or virtual application Consistency Group.

This chapter provides step-by-step examples for defining a:

- LiveClone Workflow: Scrubbed Virtual Application on page 12
- LiveClone Workflow: Scrubbed Application Data on page 18
- Direct Mount Workflow: Virtual Application on page 22
- Direct Mount Workflow: Application Data on page 26

## LiveClone Workflow: Scrubbed Virtual Application

LiveClone Workflows are typically used when the production data to be used contains sensitive information. The LiveClone Workflow allows you to define a LiveClone from production data and scrub the data before mounting it.

In the following example, a Workflow is defined that:

- Generates a new, or updates an existing LiveClone from a selected production image marked as sensitive.
- Defines a schedule for updating the LiveClone with the latest production data. Scheduled Workflows can also be run on demand.

**Note:** You can run a Scheduled Workflow on-demand at any time. You cannot convert an On-Demand Workflow to a Scheduled Workflow after it has been created.

- Employs scripts to scrub the LiveClone of sensitive data.
- Marks the scrubbed virtual application as non-sensitive.
- Mounts the scrubbed image as a virtual application (Application Aware Mount) to a specified host.

Users with the proper access rights can run this Workflow as described in LiveClone Run Now: New Scrubbed Virtual Application on page 30 and LiveClone Run Now: Re-Provisioning a Scrubbed Virtual Application on page 33.

To define this Workflow:

- 1. Open the Actifio Application Manager.
- 2. In the Navigation pane, select the application to be scrubbed of its sensitive data.
- 3. Click the **Workflow** tab and the Workflow Settings page is displayed:

Note: If the application already has a Workflow, click the Add button.

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#### **New Workflow Settings Page**

4. Specify a name for the Workflow and click **Use LiveClone** and the LiveClone Settings page is displayed:

Application Manager	à Protect	🛛 Policies 🕔 Restore 💭 Replication 🖉 <u>Wommany</u> 🗠 Orgs
APP VM GROUP HOST ALL : Q enter search * + LOCAL + ORACLE 3	Workflow Name: SQLWorkflow	Images Clone
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LiveClone Settings Options

5. For Schedule Type, select either **Scheduled** or **On Demand**. Scheduled Workflows can also be run on demand.

**Note:** You can run a Scheduled Workflow on-demand at any time. You cannot convert an On-Demand Workflow to a Scheduled Workflow after it has been created.

- 6. If you selected **Scheduled**, define a schedule to run the Workflow. The time selector uses a 24-hour clock.
- 7. For **Source Image**, select the latest snapshot image from the policy that produces the image to scrub.

**Note:** If you selected On Demand, the user running the Workflow can select the source snapshot image at run time.

- 8. Give the LiveClone a label to make it easily identifiable.
- Select the Snapshot Pool in which the LiveClone will reside. Ensure enough storage space is allocated to accommodate the LiveClone. If changes are necessary, see *Configuring Resources and Settings with the Domain Manager* for details on configuring Snapshot Pools.

Check **Mount for pre-processing** and the following screen provides the opportunity to mount the LiveClone to a host and then scrub the mounted image for sensitive data:

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teett23		(Previous Next)	Done Cancel
SYSNEW2 (window2008r			

### LiveClone Pre-Processing Options

Note: You may have to scroll down to see all options.

- 10. The **Mark data as non-sensitive** option only appears if the selected application is marked as containing sensitive data. Check this option if the application will not contain sensitive data after scrubbing. This will allow users who do not have access to sensitive data to access the Workflow and provision their work environments. See Example User for Limited Workflow Access on page 9 for details.
- 11. Select a host on which the LiveClone will be mounted.
- 12. If the database is on a VMware VM, you will be given the option to ensure connectivity by checking **Map to all ESX hosts**.
- 13. Add a **Mount Drive** (Windows) if you want the image mounted to a location other than the default. If you do not specify a mount point, then the Actific Connector will assign a mount location.
- 14. Enter a timeout that will allow enough time for the script to run.
- 15. Specify a **Pre Script** as needed. The pre script is used to configure the environment prior to mounting or unmounting the application. This script must reside in a folder named /act/scripts on the server that will host the mounted image. See Chapter 5, Workflow Pre and Post Scriptsfor scripting details.
- 16. Enter a timeout that will allow enough time for the script to run.
- 17. Specify a **Post Script** as needed. The post script in this example will be used to scrub the application of sensitive information after it has been mounted. This script must reside in a folder named /act/scripts on the server that will host the mounted image. See Chapter 5, Workflow Pre and Post Scripts for scripting details.
- 18. Check **Perform application aware mount** and the following application specific options appear:

Protected C	Workflow Name: test_loginsql		Images	0	LiveCione	0	Mount				
+ FILESYSTEM											
* SQL IN STANCE	(Provide at least or	e script)									
ACTSQLT2012/ACTSQL (A     GLUST0123/CLUST0123 (C	Pre-Script	Environment exe									
CLUSTERPARA03510LUST	Timeout	60 sec (	2)								
<pre>chd_db1_test    ActitioD810</pre>	Post-Script	ScrubSocSecNu			Ì						
• 2 SOL16CLUSQ2\SQL18INST	Timeout	70 SAC (	2								
SQL2008PHY04 (802008p)	Perform applica										
SQL2012CLU578Q1 (5QL2     SQL2012V1/06/M55QL5ER	Name of Consiste	ncy Group*	AppAwareCO	3	17					1	
SQL2012VM07VMSSQLSER	SQL Server Insta	nce Name*	CLUSTERPA	RA035 *	CLUSTERPA	RADIS	(?)				
SQL2K12CLUS93K3QL12N     SQLAAG02VAAG01 (sqlaat	Prefix for SQL Se	rver Database Name			0						
SQL AVAILABILITY GROUP	Recover Data	base After Restore 🥐									
REMOTE	Recover User	Logins. (?)									
ORPHAN	User Name		(		1						
	Password				) 🕐						
							(Previous	Next}	Done	Cancel	
0- C			-				-	Acti	vate Win	dows	
			<b>6</b>								

#### **LiveClone Application Specific Options**

**Note:** If you have selected a consistency group, in the space provided enter a name for the LiveClone consistency group.

- 19. In the space provided enter an **SQL Server Instance Name** for the LiveClone instance.
- 20. In the space provided, enter a prefix that will be appended to the newly provisioned database name.
- 21. Check **Recover Database After Restore.** Doing so leaves the database in a state where if logs are available they can be applied to bring the database to a specific point in time.
- 22. Check **Recover User Logins**. Doing so back ups the master database which records all the system-level information for a SQL Server. This includes login information, passwords, and server configurations.
- 23. In the spaces provided, enter a user name and password. The specified user must have the SQL Server Database role(s) necessary to perform all of the operations specified in the Workflow. For details on Microsoft SQL Server roles the *An SQL Server DBA's Guide to Actifio Copy Data Management* guide.
- 24. Click **Done** and the Workflow will run as scheduled. Users with proper access can run this Workflow on demand and provision and re-provision any server to which they have access with the virtual application.
- 25. Click **Next** and the Mount Settings options are displayed. Use these options to limit what a user running this Workflow on demand can specify.

P VM GROUP HOET	Workflow Name: SQLWorkflow	Images	Elvec	lone	
FILE SYSTEM 🔞	Mount Settings	8			
SQL IN STANCE	Mount Label	(			
CLUSTERPARA03SVCLU5     SQL2K12349Q1 (MSC5CL	mount Euron	L			
Sul2KS234901 (#SUSUL Sul2KS2 UST101 (Sult	Hosts		<u>Add All</u>	(1) Selected Hosts	Remove All
DB1_mmt1	172.17.203.209(17	2.17.203.209)	00	172.16.201.198(172.16.201.198	0
ClusterD61	2gbvm		0		
Testdb2vol	6.4rc		0		
😰 Testi 33	7.0.2sp(172.17.20	5.181)	0		
🕼 Testi 31	Mount Drive				
Testi24	Mount Point				
😭 msdb					
i model	Pre-Script				
Sn_GhdCDB_Tets_65	Timeout	sec			
Sn_ChdD8_Tata_651	Post-Script			] (?)	
📑 auto-auto-ActitioD8_1	76			U	
test123	Timeout				
SYSNEW2 (window2008r	Perform application	tion aware mount			
SENERIC 🔟				(Previous Next)	Done Cancel

#### **LiveClone Mount Settings**

- 26. Specify a **Mount label** to make the mount easily identifiable.
- 27. Click the green + icon next to a server name to specify a server on which the virtual application will be automatically mounted. Once set, users running the Workflow will not be able to specify another server.
- 28. Specify a **Mount Mode**, **Mount Drive**, or **Mount Point** as needed. Once specified, users running the Workflow will not be able to specify these mount settings.
- 29. **Pre Script** is a script used to prepare the environment prior to mounting or unmounting the virtual application. Do not confuse this script with the script you specified to scrub data. This script must reside in a folder named /act/scripts on the server that will host the mounted image. See Chapter 5, Workflow Pre and Post Scripts for scripting details.
- 30. Enter a timeout that will allow enough time for the script to run.
- 31. **Post Script** is a script used to act on the virtual application after it has been mounted or after it is unmounted. Do not confuse this script with the script you specified to scrub data. This script must reside in a folder named /act/scripts on the server that will host the mounted image. See Chapter 5, Workflow Pre and Post Scripts for scripting details.
- 32. Enter a timeout that will allow enough time for the script to run.

Note: Scripts are usually used along with the Remove mounted image after processing option.

	mages Live	Clone Mou	2
	mages Live(	None Mou	m.
Pre-Script		(?)	
Timeout			
	880		
Post-Script		0	
Timeout	880		
ADDRESS OF THE OWNER	and the second		
Available App(s)	Add All	(0) Selected App(s)	Remove All
DB1_mnt1	0		
ClusterDB1	0		
Testdb2vol	0		
Test133	0		
Protect new applicatio	sn? 🍘		
Template*	Please Se	lect ·	
Drofile*		1000000	
- marketing at	Please Se	lect *	
Remove mounted image	after processing $(\hat{?})$		
I International Advisorial Advisori	1997 - T. 1997 - Sec.	(Previous Next)	Done Cancel
		Terrore Country	
	Timeout Post Script Timeout Post Script Timeout Perform application awar Available App(s) DB1_mnt1 ClusterDB1 Testdb2vol Test133 ✓ Protect new application Template* Profile*	Timeout sec Post-Script Timeout sec Post-Script Timeout sec Perform application aware mount Available App(s) Add All DB1_mm1 ClusterDB1 ClusterDB1 Test133 Protect new application? ? Template* - Please Sec	Timeout       sec         Post Script       ⑦         Timeout       00         Imeout       00         Ø Perform application aware mount       Available App(s)         Available App(s)       Add All         OUsterDB1       0         Testdb2vol       0         Testdb2vol       0         Vertect new application? ⑦         Template*       Please Select *         Profile*       Please Select *         Remove mounted image after processing ⑦

LiveClone Mount Settings (Continued)

Note: You may have to scroll down to see all options.

- 33. Specify whether to protect the virtual application defined by this Workflow as a new application.
- 34. If you are protecting as a new application, select a template and profile to protect the new application.
- 35. **Remove mounted image after processing.** This is typically checked when you employ a script to process mounted data. Once the script finishes its task this option will unmount and delete the virtual application. See Reporting on page 2, Data Warehousing on page 2, and Copying to Removable Media on page 3.
- 36. Click **Done** and the Workflow will run as scheduled. Users with proper access can run this Workflow on demand and provision and re-provision the server as specified in this section.

## LiveClone Workflow: Scrubbed Application Data

LiveClone Workflows are typically used when the production data to be used contains sensitive information. The LiveClone Workflow allows you to define a LiveClone from production data and then scrub the LiveClone's data before mounting it.

In the following example, a Workflow is defined that:

- Generates a new, or updates an existing LiveClone from a selected production image that is marked as sensitive.
- Defines a schedule for updating the LiveClone with the latest production data. Scheduled Workflows can also be run on demand.
- Employs scripts to scrub the LiveClone of sensitive data.
- Marks the mounted, scrubbed data as non-sensitive.
- Mounts the scrubbed data (standard mount) to a specified host.

Users with the proper access rights can run this Workflow as described in LiveClone Run Now: Scrubbed Application Data on page 36.

To define this Workflow:

- 1. Open the Actifio Application Manager.
- 2. In the Navigation pane, select the application to be scrubbed of its sensitive data.
- 3. Click the **Workflow** tab and the Workflow Settings page is displayed:

*Note:* If the application already has a Workflow, click the **Add** button.

Application Manager	& Protect	C Policies	U Restore	Replication	of working	C Orgs	L.	×
MPP VM GROUP HOST ALL Q enter search X LOCAL > ORACLE > RESYSTEM C LUSTERPARADSSCLUS > CLUSTERPARADSSCLUS > CLUSTERPARADSSC	Workflow Settin Name your workflow Workflow Name* :	26 <sub>0000</sub>	89		OR Direct Mount	t Mount" button bel	ow. Cancol	
8- C	_		<b>.</b>		-	-	Į	8

### New Workflow Settings Page

4. Specify a name for the Workflow and click **Use LiveClone** and the LiveClone Settings page is displayed:

	lorkflow Name: QLWorkflow	🗑 😜 😂 🔲
ORACLE		Images LiveClone Mount
FILESYSTEM	LiveClone Settin	gs
SQL INSTANCE	Schedule Type*	Scheduled On Demand
• Salakiza4901 (MSCSC)	Schedule *	Monthly = on 1 = at 13:51
<ul> <li>SalzkacLUST101 (salz DB1_mnt1</li> </ul>	Source Image	Latest from any snapshot policy *
Cluster081	LiveClone Label*	SQLLMeClone
Testido2vol	Diskpool*	act_per_pool000 (124.00GB) *
III Testi 33	Mount for pre-proc	
P Test131	E wount of he-boo	รองกญ
medo		
model		
Traster		
Sn_GhdCDB_Tets_65		
Sn_ChdD8_Tsts_651		
auto-auto-ActitioD8_1		
teat123		(Previous Next) Done Cancel
► Q SYSNEW2 (window2008		
AL C		
\$. C		

## **LiveClone Settings Options**

- 5. For Schedule Type, select **Scheduled**. Scheduled Workflows can also be run on demand.
- 6. In **Schedule**, define a schedule to run the Workflow. The time selector uses a 24-hour clock.
- 7. For **Source Image**, select the latest snapshot image from the policy that produces the image to scrub.
- 8. Give the LiveClone a label to make it easily identifiable.
- 9. Select the Snapshot Pool in which the LiveClone will reside. Ensure enough storage space is allocated to accommodate the LiveClone. If changes are needed, see *Configuring Resources and Settings with the Domain Manager* for details on configuring Snapshot Pools.
- 10. Check **Mount for pre-processing** and the following screen provides the opportunity to mount the LiveClone to a host and then scrub the mounted image for sensitive data:

VIII GROUP HOST	Workflow Name: SQLWorkflow	Images EiveClone	o II Mount	
FILESYSTEM 000 SGLINSTANCE 00	Mount for pre-p	rocessing 🛛 Mark data non-sensitive		
CLUSTERPARA03SVCLUS	Host	2gbvm		
SOL2K1234901 (WSCSCL	<u></u>	NO. 100		
- 💒 SQL2K8CLUST1Q1 (SQL2	Map to all Esx	Hosts		
DB1_mmt1	Mount Mode	🕞 vRDM 🔘 pRDM		
Cluster061	Mount Drive	6		
Testdo2vol	10.000000000000000000000000000000000000	L		
🗊 Testi 33	Mount Point			
🕼 Test131	(Provide at least or	ne script)		
🕼 Testi 24	Pre-Script	Environment.exe	(?)	
dbem 📲	17000 C 321 CC		0	
😭 model	Timeout	60 sec 🕐		
master	Post-Script	ScrubSocSecNum	0	
Sn_GhdCDB_Tets_65			1.0	
Sn_ChdD8_Tsts_651	Timeout	70 sec ?		
auto-auto-ActifioDB_1	Perform application			ADDITION 11 COMPANY
teet123		( Previ	ous Next)	Done Cancel
SYSNEW2 (window2008r				

## LiveClone Pre-Processing Options

Note: You may have to scroll down to see all options.

- 11. The **Mark data as non-sensitive** option only appears if the selected application is marked as containing sensitive data. Check this option if the application will not contain sensitive data after scrubbing. This will allow users who do not have access to sensitive data to access the Workflow and provision their work environments. See Example User for Limited Workflow Access on page 9 for details.
- 12. Select a host on which the LiveClone will be mounted.
- 13. Add a **Mount Drive** (Windows) or a **Mount Point** as needed if you want the image mounted to a location other than the default. If nothing is specified, then the Actific Connector will assign a mount location.
- 14. Specify a **Pre Script** as needed. The pre script is used to configure the environment prior to mounting the application. This script must reside in a folder named /act/scripts on the server that will host the mounted image. See Chapter 5, Workflow Pre and Post Scripts for scripting details.
- 15. Specify a **Post Script** as needed. The post script in this example is used to scrub the application of sensitive information after it has been mounted. This script must reside in a folder named /act/scripts on the server that will host the mounted image. See Chapter 5, Workflow Pre and Post Scripts for scripting details.
- 16. Specify timeouts long enough for the scripts to complete.
- 17. Click **Done** and the Workflow will run as scheduled. Users with proper access can run this Workflow on demand and provision and re-provision any server to which they have access with the application data.
- 18. Click **Next** and the Mount Settings options are displayed. Use these options to limit what a user running this Workflow on demand can specify.

	Norkflow Name: SQLWorkflow		2 😸	9	
CAL		Images	LiveClone	Mount	
RACLE 🗐	Mount Label	-			
CLUSTERPARA03SVCLUS	Hosts		Add All (1) Se	elected Hosts	Remove All
SOL2K1234901 (VSCSCL	172 17 203 209(17	2 17 203 209)		201 198(172 16 201 198	
Salakecustiai (Sala	2gbvm		0		″ <b>–</b>
DB1_mnt1	6 4rc		0		
ClusterDB1	7.0.2sp(172.17.205	5.1811	0		
Testdo2vol	Mount Drive			1	
😰 Testi 33		1			
😭 Testi 31	Mount Point	[			
🐨 Test124	Pre-Script			) 🤊	
🐨 msdb	1000 C 1000 C 1000			1.0	
ist model	Timeout	580			
🐨 master	Post Script	1		0	
Sn_GhdCDB_Tets_65 <sup>8</sup> Sn_ChdOB_Tets_651	Timeout				
auto-auto-ActifioD8 V		560			
lest123	Perform applicat	tion aware mount			
SYSNEW2 (window2008)	Remove mounte	d image after processi	ng 🕐		
ENERIC 0			( Prev	nous Nexts	Done Cancel
All and a second se					
C					

#### **LiveClone Mount Settings**

- 19. Specify a **Mount label** to make the mount easily identifiable.
- 20. Click the green + icon next to serve names to specify the servers on which the application data will be automatically mounted. Users running the Workflow will be able to specify additional servers.
- 21. Specify a **Mount Mode**, **Mount Drive** as needed. Once specified, users running the Workflow will not be able to specify these mount settings.
- 22. **Pre Script** is a script used to prepare the environment prior to mounting or unmounting the final, scrubbed virtual application. Do not confuse this script with the script you specified to scrub data. This script must reside in a folder named /act/scripts on the server that will host the mounted image. See Chapter 5, Workflow Pre and Post Scripts for scripting details.
- 23. Specify a script timeouts long enough for the script(s) to complete.
- 24. **Post Script** is a script used to act on the virtual application after it has been scrubbed and mounted or unmounted. Do not confuse this script with the script you specified to scrub data. This script must reside in a folder named /act/scripts on the server that will host the mounted image. See Chapter 5, Workflow Pre and Post Scripts for scripting details.
- 25. Specify a script timeouts long enough for the script(s) to complete.

Note: Scripts are usually used along with the Remove mounted image after processing option.

- 26. **Do not** check Perform application aware mount.
- 27. **Remove mounted image after processing.** This is typically checked when you employ a script to process mounted data. Once the script finishes its task this option will unmount and delete the virtual application. See Reporting on page 2, Data Warehousing on page 2, and Copying to Removable Media on page 3.
- 28. Click **Done** and the Workflow will run as scheduled. Users with proper access can run this Workflow on demand and provision and re-provision the servers to which they have access as specified in this section.

## Direct Mount Workflow: Virtual Application

Direct Mount Workflows are used when the application image involved does not contain sensitive data. This allows the Workflow to mount an application's data as a virtual application or as just application data without first having to define a LiveClone and then scrub the LiveClone. Direct Mounts make application data and virtual applications available almost instantly.

In the following example, a Workflow is defined that:

- Generates new, or updates a virtual application from a single selected production image.
- Defines a schedule for updating the virtual application with the latest production data. Scheduled Workflows can also be run on demand.
- Mounts the data as a virtual application. A virtual application can be used and captured like any other application.
- Captures the mounted virtual application as a new application.

Users with the proper access rights can run this Workflow as described in Direct Mount Run Now: Virtual Application on page 38.

To define this Workflow:

- 1. Open the Actifio Application Manager.
- 2. In the Navigation pane, select the application to be mounted as a virtual application.
- 3. Click the **Workflow** tab and the Workflow Settings page is displayed:

If the selected application already has a Workflow, click Add and the Workflow Settings page is displayed:

Application Ma	nager	& Protect	0 Policies 0 Re	store 🛛 🖾 Replication	n of Yourdear	•C Orgs		E ×
APP VM GROUP HOS	ST							
ALL ;	E (x)				0			
- LOGAL			Images	LiveClone	M	ount		
	-							
► ORACLE	0							
FILESYSTEM	620	Workflow Settings						
· SQL INSTANCE	0	Name your workflow an	then select workfl	w type by clicking "I	weClone" Or "Dir	ect Mount" button h	elow	
CLUSTERPARAD3	223333322	1						
► 🚫 SQL2K12349Q1 (I	and the second	Workflow Name*:	SQLWorkflow					
▼ Salakaclustia	TISULE		SQLIVORION					
DB1_mit1								
Testdb2vol								
Test133								
Testi31								
Test124								
ist medb								
model								
a master								
Sn_BhdCDB_1	Tets 65							
🐨 Sn_ChdO8_Ts	100000							
🕼 auto-auto-Acti	ifioDB_\							
test120								
SYSNEW2 (windo	w2008r							
GENERIC	0			Use LiveClone	OR Direct Mou	Done	Cancel	
\$- C								
			• •	2				

#### **New Workflow Settings Page**

4. In the Workflow Settings page, specify a name for the Workflow and click **Direct Mount** and the Mount Settings page is displayed:

ORACLE		Images	LiveClone	Mount		
FILESYSTEM	Mount Settings					1
SQL INSTANCE	No. of the second s					4
S CLUSTERPARA035VCLUS	Schedule Type*	<ul> <li>Scheduled</li> </ul>	On Demand			
SQL2K123490.1 (NSC5C)	Schedule*	Monthly * 0	n i = at 14:45	5		
Solakectustion (sola     DB1_mml1	Source Image	Latest from an	y snapshot policy 🔻	1		1
Cluster081	Mount Label	-		2		1
Testdb2vol	Mount Laber	-				
Teet133	Hosts		Add All (1)	Selected Hosts	Remove All	
🐨 Testi 31	172 17 203 209(172	17.203.209)	0 172	16 201 198(172 16 201 1	98) 🗢	
🗊 Testi24	2gbvm		0			
😭 msdb	6.4rc		0			
🐨 model	7.0.2sp(172.17.205	181)	0			
is master	Mount Drive	1				
Sn_GhdCD8_Tats_65 <sup>th</sup> Sn_ChdD8_Tats_651	Mount Point	2		_		
auto-auto-Actifio09 1		L				
test123	Pre-Script			0		
SYSNEW2 (window2008)	Timeout	[ ] sec				
GENERIC D			(P	nevious Next)	Done Cance	al .

#### **Mount Settings Options**

- 5. For Schedule Type, select **Scheduled**. Scheduled Workflows can also be run on demand.
- 6. In Schedule, define a schedule to run the Workflow. The time selector uses a 24-hour clock.
- 7. For **Source Image**, select the latest snapshot image from the policy that produces the image to scrub.
- 8. Give the mount a label to make it easily identifiable.
- 9. In the **Hosts** section, click the green + icon to select the servers on which the data will be mounted. This ensures data will be mounted to those servers when the Workflow runs. The user who runs the Workflow will be given the option of mounting the data to other servers as needed.
- 10. Add a **Mount Drive** as needed if you want the image mounted to a location other than the default. If you do not specify a mount option, then the Actific Connector will choose a mount location.

	orkflow Name: 2LWorkflow	images Liver	Clone	
RACLE 🚺	Mount Label			
SQL IN STANCE	Hosts	Add All	(1) Selected Hosts	lemove All
CLUSTERPARA035VCLU5 SDL2K1234901 (MSCSCL	172 17 203 209(17		172 16 201 198(172 16 201 198)	0
SOL2KEGLUST101 (SOL2	2gbvm	0		-
DB1_mmt1	6 Arc	0		1
Cluster061	7.0.2sp(172.17.205			
Testdb2vol	Mount Drive			
📝 Testi 33				_
😭 Testi 31	Mount Point			
Test124	Pre-Script		(?)	
🗊 msdb	a provincial and a second			_
M model	Timeout	088		
is master	Post-Script	Ĩ.	) (?)	
Sn_GhdCD8_Tats_65 Sn_ChdD8_Tats_651	Timeout		0	_
auto-auto-Actifie08	nineou.	() sec		
test123	Perform applicat	tion aware mount		
SYSNEW2 (window2008)	Remove mounte	d image after processing (?)		
JENERIC D			(Previous Next) Done	Cancel
- C				

**Mount Settings Options (Continued)** 

Note: You may have to scroll down to see all options.

- 11. Specify a **Pre Script** as needed. The pre script is used to configure the environment prior to mounting or unmounting the application. This script must reside in a folder named /act/scripts on the server that will host the mounted image. See Chapter 5, Workflow Pre and Post Scripts for scripting details.
- 12. Specify timeouts long enough for the script to complete.
- 13. Specify a **Post Script** as needed. The post script used to perform an operation on the data after it is mounted or unmounted, for example, initiating a copy to tape operation for long-term storage. This script must reside in a folder named /act/scripts on the server that will host the mounted image. See Chapter 5, Workflow Pre and Post Scripts for scripting details.
- 14. Specify timeouts long enough for the script to complete.
- 15. Check **Perform application aware mount** and the application specific options to perform an application aware mount are displayed.

**Note:** The **Remove mounted image after processing** option disappears when you select **Perform application aware mount.** The **Remove mounted image after processing** option is typically used with pre and/or post scripts. It unmounts the image from target server, and deletes it after the script(s) finish. This option is typically used when scripts perform operations on the mounted data. See Reporting on page 2, Data Warehousing on page 2, and Copying to Removable Media on page 3.

Application Manager	A Protec	l © Policies	O Restore 🛛 🗆 Re	olication of Mo	izitara 🤟 C Orgs	E
VM GROUP HOST	Workflow Name:				-	1
\$	SQLWorkflow			2 6		
nter search 🛞		E E		2 👻	11	
CAL [		Images	LiveC	lone	Mount	
ACLE 🗿						
LESYSTEM 📶	Perform applica	ion awars mount				
	discourse and a second se	333				
CLUSTERPARA03SVCLUS	Available App(s		Add All	(1) Selected A	bb(e)	Remove All
SQL2K12349Q1 (MSCSCL	ClusterDB1			Testdb2vol		0
Salaksclustiai (sala	Test133		0	1		
DB1_mnt1	Test131		0			
Cluster081	Test124		0			71
Testdo2voi	SQL Server Instan	nce Name*	NewInstance	Name	0	
Test133	SQL Server Data		17. January			
Test124	SUL Server Data	base name	NewDBName	)	0	
gr medb	Recover Data	base After Resto	re 🕐			
🕈 model	User Name		1		0	
Traster					5.0	
Sn_GhdCDB_Tets_65	Password			0		
😵 Sn_ChdD8_Tsts_851	Protect new a	pplication?				
auto-auto-ActinoD8_1						
📑 teet123	Template*		71981defaul	threshold *		
SYSNEW2 (window2008r	· · · · · · · ·		-			
Construction of the second				<pre> ? Previous</pre>	Next3	one Cancel

**Application Aware Mount Options** 

Note: You may have to scroll down to see the application aware mount options.

- 16. Click the green + next to the server name that will host the SQL Server Instance
- 17. In the space provided, enter a name for the virtual SQL Server Database.
- 18. Check **Recover Database After Restore.** Doing so leaves the database in a state where if logs are available they can be applied to bring the database to a specific point in time.
- 19. In the spaces provided, enter a user name and password. The specified user must have the SQL Server Database role(s) necessary to perform all of the operations specified in the Workflow. For details on Microsoft SQL Server roles, see An SQL Server DBA's Guide to Actifio Copy Data Management.
- 20. At this point you can:

Check the **Protect new application** option. This allows you to apply an SLA Policy Template and a Resource Profile to protect the virtual application as a new application. For details on SLA Policy Templates and Resource Profiles see **Planning and Developing Service Level Agreements**.

Click **Done** and the Workflow will run as scheduled. Users with proper access can run this Workflow on demand to provision and re-provision their environments with the virtual application.

## Direct Mount Workflow: Application Data

Direct Mount Workflows are used when the application image involved does not contain sensitive data. This allows the Workflow to mount an application's data as a virtual application or as just application data without first having to define a LiveClone and then scrub the LiveClone. Direct Mounts make application data and virtual applications available almost instantly.

In the following example, a Workflow is defined that:

- Generates new, or updates mounted application data from a single selected production image.
- Defines a schedule for updating the application data with the latest production data. Scheduled Workflows can also be run on demand.
- Mounts just the application data.

Users with the proper access rights can run this Workflow as described in Direct Mount Run Now: Application Data on page 41.

To define this Workflow:

- 1. Open the Actifio Application Manager.
- 2. In the Navigation pane, select the application.
- 3. Click the **Workflow** tab and the Workflow Settings page is displayed:

If the selected application already has a Workflow, click Add and the Workflow Settings page is displayed:



#### **New Workflow Settings Page**

4. In the Workflow Settings page, specify a name for the Workflow and click **Direct Mount** and the Mount Settings page is displayed:

Mount Settings Schedule Type* Schedule* Sourco Image Mount Label Hosis	Monthly *	ed On Dem • on i • m eny snapshot	at (14:45	3		
Schedule Type* Schedule* Source Image Mount Label Hosts	Monthly *	* on i * m any snapshot	at (14:45	9		
Schedule* Source Image Mount Label Hosts	Monthly *	* on i * m any snapshot	at (14:45	3		
Source Image Mount Label Hosts	100000000	m any snapshot		8		
Mount Label Hosts	Latest from		policy *			
Mount Label Hosts			ронсу +			
Hosts	[					
		Δdc	LAII (1) Sele	cted Hosts	Re	move All
	17.203.209)		0 172 16.20			•
2gbvm	11203203		0	an and the ros	2011130	
	191)					
			•			
Mount Drive	,					
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Pre-Script				່		
the recentry	-					
Imeout	1	ser.	/ Dresses	House Linua	Done	Cancel
	6.4rc 7 0.2sp(172.17.205.1 Mount Drive	6.4rc 7.0.2sp(172.17.205.181) Mount Drive Mount Point Pre-Script	6.4rc 7.0.2sp(172.17.205.181) Mount Drive Mount Point Pre-Script	6.4rc 7.0.2sp(172.17.205.161)  Mount Drive  Mount Point  Pre-Script  Timeout	6.4rc 0 7.0.2sp(172.17.205.181)  Mount Drive  Mount Point  Pre-Script  ?	6.4rc 7.0.2sp(172.17.205.181)  Mount Drive  Mount Point  Pre-Script  Timeout

#### **Mount Settings Options**

- 5. For Schedule Type, select **Scheduled**. Scheduled Workflows can also be run on demand.
- 6. In **Schedule**, define a schedule to run the Workflow. The time selector uses a 24-hour clock.
- 7. For **Source Image**, select the latest snapshot image from the policy that produces the image to scrub.
- 8. Give the mount a label to make it easily identifiable.
- 9. In the **Hosts** section, click the green + icon to select the servers on which the data will be mounted. This ensures data will be mounted to those servers when the Workflow runs. The user who runs the Workflow will be given the option of mounting the data to other servers as needed.

Note: For scheduled Direct Mount Workflows that just mount the data, you must select at least one host.

10. Add a **Mount Drive** as needed if you want the image mounted to a location other than the default. If you do not specify a mount, then the Actifio Connector will choose a mount location.

Note: You may have to scroll down to see all options.

- 11. Specify a **Pre Script** as needed. The pre script is used to configure the environment prior to mounting the application. This script must reside in a folder named /act/scripts on the server that will host the mounted image. See Chapter 5, Workflow Pre and Post Scripts for scripting details.
- 12. Specify a **Post Script** as needed. The post script is used to perform an operation on the data after it is mounted, for example, initiating a copy to tape operation for long-term storage. This script must reside in a folder named /act/scripts on the server that will host the mounted image. See Chapter 5, Workflow Pre and Post Scripts for scripting details.
- 13. If you specified scripts, specify timeouts long enough for the scripts to complete.

- 14. Because you are only mounting the data, you will not select **Perform application aware mount**.
- 15. **Remove mounted image after processing.** This is typically checked when you employ a script to process mounted data. Once the script finishes its task, this option will unmount and delete the virtual application. See Reporting on page 2, Data Warehousing on page 2, and Copying to Removable Media on page 3.
- 16. Click **Done** and the Workflow will run as scheduled. Users with proper access can run this Workflow on demand to provision and re-provision their environments with the application data.
## 4 Running Workflows On Demand

Workflows can be configured to run according to a schedule or run on demand only. Scheduled Workflows can be run on demand.

Running a Workflow on demand is particularly useful when the Workflow's data source has been updated but the Workflow is not scheduled to run for a while. The Workflow can be run on demand to provision/re-provision an environment without having to wait for the next scheduled run of the Workflow.

To run Workflows on demand:

- Users must be assigned a role with the necessary rights, and assigned to the proper organizations to access an Actific appliance. For details on Roles, Organizations, and Users, see Configuring Roles, Organizations, and Users on page 5.
- User's rights also determine whether they can update a LiveClone as part of running a LiveClone Workflow.
- The options that were or were not specified when the Workflow was defined determines which options a user can specify when they run a Workflow.

This chapter provides step-by-step examples for:

- LiveClone Run Now: New Scrubbed Virtual Application on page 30
- LiveClone Run Now: Re-Provisioning a Scrubbed Virtual Application on page 33
- LiveClone Run Now: Scrubbed Application Data on page 36
- Direct Mount Run Now: Virtual Application on page 38
- Direct Mount Run Now: Application Data on page 41

## LiveClone Run Now: New Scrubbed Virtual Application

This section shows how to run a LiveClone Workflow like the one created in LiveClone Workflow: Scrubbed Virtual Application on page 12.

Running this Workflow allows a user with the proper privileges to provision a selected server with a new virtual application.

- 1. Open the Application Manager to the **Workflow** tab.
- 2. In the Navigation pane, select the application that will be used to provision the virtual application. The associated Workflow schedule appears in the Workflow screen.

Desktop						
Application Manager	A Protect Ø	Policies 🙂 Restore 📮 Re	plication of young	🗤 📲 Orgs	1	= >
APP VM GROUP HOST	Workflows Add					
Q enter search (8)	Vertice Internation	DirectMountVirtualApp	LiveCloneStand	ardMount	LiveCLoneVirtualApp	$\rangle$
LOCAL     ORACLE     IDESYSTEM     SOLINISTANCE	Workflow Name: Type: LiveCLoneVirtualApp liveClor					
		Current Run				
DB02 (UT-WN2KB-SQL)	Previous Run	Not running		Next Run		
DB04 (UT-WN2K8-SQL)	There are no previous runs	in the second seco		2016-05-01 11	:40:00	
🔕 DB05 (UT-WN2K8-SQL)						
(WN2K8-SQL5/SQL58						
SHROBO1 (WIN2K8-SQL5ISQL						
WHRDB02 (WIN2K8-50L5/SQL						
WIN2K8-50L5/50L						
WHRDB04 (WIN2K8-SQLSISQL	,		d,			
WIN2K8-SQL5/SQL						
O LogSmartResizeTest (WN2K					Run Nov	100
Mount-D801 (UT-WIN2K8-SQ Mount-D803 (UT-WIN2K8-SQ Mount-D803 (UT-WIN2K8-SQ)					- Kull NO	
Mount-0803 (01-WIN2KS-SQ Mount-Win2KS-SQL-CG-080						
Mount-Win2K8-SQL-CG-mas						
Mount-Win2K8-SQL-CG-md						
Q. C						

#### **Workflow For Selected Application**

- 3. Click **Run Now** and the Run Now Settings page is displayed.
- 4. Users assigned **Manage LiveClone** rights in their assigned role will have the option of selecting a new image for the Workflow's LiveClone. Such users can check the **Refresh LiveClone** option and from the drop down menu, select an image to be scrubbed.

**Note:** Users assigned a role with **Manage LiveClone** rights must also have access to sensitive data. See Example User for Limited Workflow Access on page 9.

At this point, if you click **Done**, then only the LiveClone will be updated.

Run Now Settings		
Refresh LiveClone ?		
Source Image*	2016-02-07 10:45:14 (Image_0385810)	
Create/Refresh a mou	nted image or a virtual application	

5. Check **Create/Refresh a mounted image or virtual application** and more Run Now Settings are displayed:

au (;)	Workflow Name: AAB		
conter search		Images LiveClone Mou	
LOCAL		inages Livectone Alou	nu./
ORACLE 👩			
ILESYSTEM	Run Now Settings	1	_
ACTSQL512014 (ACTSQL51	Source Image*	2016-04-12 12:12:12 (Image_2652958) * @	
ACTEOLS2 (ACTSOLS2)			
ACTSOLS22014 (ACTSOLS2			Host Time 🔘 User Time
ACTSOLS3 (ACTSOLS3)		Roll Forward Time:	
ACTSOLS32014 (ACTSOL53		2016-04-12 🔟 09:22:57 🚼	
ACTSQLS4 (ACTSQLS4)		2016-04-12 09 22:57	
ACTSQL542014 (ACTSQL54	2015-04-12 09:11:51 (	c 🛛	015-04-12 09:22:57
AdventureWorks2008R2 (AC			
	(Sec.) (Sec.)		
CLUSTEROB (SKY)	Hosts	(1) Selected Hosts	Remove All
CLUSTEROB (SKY) DBA (SKY)	Hosts 172.16.119.90	(1) Selected Hosts O actsgls2	Remove All
CLUSTERDE (SKY) DBA (SKY) HRADE (SGL2012LISTNERA)	Contraction of the second s		
CLUSTERDB (SKY) DBA (SKY) HRADB (SOL2012USTNERA) HROB (DUKEC1)	172.16.119.90	O actsqls2	
CLUSTERDB (SKY) DBA (SKY) HRADB (SOL2012USTNERA) HRDB (DUKEC1)	172.16.119.90 172.17.177.61	O gactegis2	
CLUSTERDB (SKY) DBA (SKY) HRADB (SOL2012LISTNERA) HRDB (DUKEC1) HRDB (DUKECLUSTER4) REPDB (DUKECLUSTER4)	172.16.119.90 172.17.177.61 172.17.177.72	SRM2 C	
© CLUSTERDB (SKY) © DBA (SKY) © HRADB (SQL2012LISTHERA) © HRDB (DUKEC1) © HRDB (DUKECLUSTER4)	172.16.119.90 172.17.177.61 172.17.177.72 ACTCLIENT22012 ACT	SRM2 C	

- 6. From the drop down menu, select the source (scrubbed) image to use for the virtual application.
- 7. If the application is a database and it is captured along with its logs, then the log recovery pane appears with a slider above the target host selection pane. Select whether to use the time of the host or the time of your workstation, and then select the recovery point by using the slider, the calendar and arrows, or by simply typing a value into the field.
- 8. If the creator of the Workflow did not specify the host to be provisioned in the Workflow, click the green + icon next to a host name to add it to the list of hosts to be provisioned. When provisioning/re-provisioning a virtual application, only one host can be selected.

Application Manager	Workflow Name:	t O Policies O Restore	🗇 Replication 🛛 🔊 🙀	uiddaur 🗠 Orgs		
ALL (;)	SQLWorkflow		$\langle \rangle $	FF		
			S 💙			
A enter search ×		Images	LiveClone	Mount		
LOCAL						
ORACLE 👩						
FILESYSTEM	172 16 119 90	01	actsqls2		0	
SQL INSTANCE	172 17 177 61	0				
ACTS0L512014 (ACTS0L51	172.17.177.72	0				
ACTSOLS2 (ACTSOLS2)	ACTCLIENT22012					
ACTSOLS22014 (ACTSOLS2						
S ACTSOLS3 (ACTSOLS3)	Map to all ESX	hosts				
ACTSOLS32014 (ACTSOLS5	Perform applica	ation aware mount				
( ACTSQLS4 (ACTSQLS4)	Create New Vi	irtual Application 🔘 Refresh Ex	asting Virtual Applicatio	n		1
S ACT50L542014 (ACT50L54	SQL Server Insta	nce Name* ACTS	QLS2 + ACTSQLS2	)/	(?)	
AdventureWorks2008R2 (AC						
CLUSTERDB (SKY)	SQL Server Data	base Name* SQLSe	rverDB	0		
() DBA (SKY)	[7] n	1 10 D 1 0				
V HRADE (SQL2012LISTNERA)	W Recover Data	base After Restore 🥐				
IRDB (DUKEC1)	User Name	actsrm	administrator	(?)		
WHRDB (DUKECLUSTER4)						
PREPOB (DUKECLUSTER4)	Password		2			
S REPOB (DUKEC1)						
ReportServer (ACTSQLS3R)				Don	ne Cance	21
ReportServer (ACTSQL52)						

#### **Application Aware Mount Options**

Note: You may have to scroll down to see all options.

If the creator of the Workflow did not specify the options for the virtual application:

- 9. Check the box for **Perform application aware mount**.
- 10. Select Create New Virtual Application.
- 11. Select an SQL Server Instance on the selected host.
- 12. In the space provided, enter a name for the new virtual SQL Server Database.
- 13. The username and password is only required if the Actific Connector used does not have privileges to apply logs or detach the database during an unmount operation.
- 14. Click **Done** and the new virtual application will be mounted as defined. Access to the virtual application is controlled by the server on which it is mounted.

## LiveClone Run Now: Re-Provisioning a Scrubbed Virtual Application

This section shows how to run a LiveClone Workflow like the one created in LiveClone Workflow: Scrubbed Virtual Application on page 12.

Running this Workflow allows a user with the proper privileges to re-provision a server with an updated virtual application.

To run a Workflow to refresh a previously provisioned virtual application with a new image:

- 1. Open the Application Manager to the **Workflow** tab.
- 2. In the Navigation pane, select the application. The Workflows available for the application and their run schedules appear in the Workflow screen.

esktop Application Manager	à Protect Ø	Policies U Restore 🖾 Re	plication <b>of</b> <u>volument</u> < Orgs	
APP VM GROUP HOST	Workflows	DirectMountVirtualAop	LiveCloneStandardMount	LiveCLoneVirtualApp
Q enter search X)	Notwoning	O Not running	O Not running	O Not running
LOCAL				
ORACLE     ORACLE     FILESYSTEM     GG     SQL INSTANCE     GG	Workflow Name: Type: LiveCLoneVirtualApp liveClor			
DB01 (UT-WIN2K8-SQL)	n	Current Run		
DE02 (UT-WN2K8-SQL)	Previous Run	Not running	Next Run	
DB03 (01-WN2K8-SQL) DB04 (UT-WN2K8-SQL)	There are no previous runs	Not forming	2016-05-01 1	1:40:00
B DB05 (UT-WN2K8-SQL)				
B HRDB (WW2K8-SOLS/SOLSE				
B HRDBOI (WW2K8-SQL5/SQL				
HRDB02 (WN2K8-5QL5/SQL				
S HRDB03 (WN2K8-5QL5/SQL				
S HRDB04 (WN2K8-50L5/SQL	1			
S HRDBOS (WINZK8-SOLSISOL				
🛇 LogSmartResizeTest (WN2K				
S Mount-D801 (UT-WN2K8-SO				Run Now
Mount-DB03 (UT-WIN2K8-SQ				
🔇 Mount-Win2K8-SQL-CG-DB0				
🔇 Nount-Win2K8-SQL-CG-mas				
Mount-WinZKB-5QL-CG-mod				

#### **Workflow For Selected Application**

- 3. Select the Workflow to execute and click **Run Now**.
- Users assigned Manage LiveClone rights in their assigned role will have the option of selecting a new image for the Workflow's LiveClone. Such users can check the **Refresh LiveClone** option and from the drop down menu, select an image to be scrubbed.

**Note:** Users assigned a role with **Manage LiveClone** rights must also have access to sensitive data. See Example User for Limited Workflow Access on page 9.

At this point, if you click **Done**, then only the LiveClone will be updated.

Run Now Settings			
Refresh LiveClone 🥐			
Source Image*	2016-02-07 10:45:14 (Image_0385810)	Ŧ	0
✔ Create/Refresh a mou	nted image or a virtual application		

5. Check **Create/Refresh a mounted image or virtual application** and more Run Now Settings are displayed:

Desktop	
Application Manager	🔒 Protect 💿 Policies 🙂 Restore 🖾 Replication 🛷 VoulAcur < Orgs
APP VM GROUP HOST	
	Workflow Name:
ALL	SQLWorkflow
Q enter search (8)	
* LOCAL	Images LiveClone Mount
F ORACLE	
FILESYSTEM	
* SQLINSTANCE	Run Now Settings
ACTS0L512014 (ACTS0L51	Source Image* 2016-04-12 12:12:12 (Image_2652958) * 0
ACTSQLS2 (ACTSQLS2)	
ACTSOLS22014 (ACTSOLS2	
Q ACTSOLS3 (ACTSOLS3)	Roll Forward Time:
ACTSQL532014 (ACTSQL53	2016-04-12 🗰 10:57:03 🔀
(ACTSOLS4 (ACTSQLS4)	2016-04-12 10:57:03
C ACTSQL542014 (ACTSQL54	2016-04-12 09:11:51
AdventureWorks2008R2 (AC	
(SKY)	
🙆 DBA (SKY)	Hosts (1) Selected Hosts Remove All
W HRADE (SQL2012LISTNERA)	172.16.119.90 O actsqls2 O
HRDB (DUKEC1)	172.17.177.61
WHEDB (DUKECLUSTER4)	172.17.177.72
REPOB (OUKECLUSTER4)	ACTCLIENT22012 ACTSRM2.C
S REPOB (DUKEC1)	Man to all EQV horte
S ReportServer (ACTSQLS3R)	Done Cancel
Q ReportServer (ACTSQLS2)	
* .	
8- C	

- 6. In the Run Now Settings screen, select the **Source (scrubbed) Image** to use for provisioning.
- 7. If the application is a database and it is captured along with its logs, then the log recovery pane appears with a slider above the target host selection pane. Select whether to use the time of the host or the time of your workstation, and then select the recovery point by using the slider, the calendar and arrows, or by simply typing a value into the field.
- 8. If the creator of the Workflow did not specify the host to be provisioned in the Workflow, click the green + icon next to a host name to add it to the list of hosts to be provisioned. When provisioning/re-provisioning a virtual application, only one host can be selected.

Application Manager	a Protect @ Pr	olicles O Restore 🗇 Repli	ication BR Wolling	Corgs	
APP VM GROUP HOST           ALL         \$           Q, enter search         \$	Workflow Name: SQLWorkflow	images LiveCl	è 🤤	Mount	
LOCAL     ORACLE     ORACLE     ORACLE     ORACLE     ORACLE     ORACLE     ORACLE     ORACLE     ACTSOLS12014 (ACTSOLS1     ACTSOLS2/ACTSOLS2)     ACTSOLS2/ACTSOLS3)	-2016-04-12 09:11:51	Roll Forward 2016-04-12	I Time: 10:57:03 😫	2015-01-12 10-57-03	THIRE .
ACTEQLE32014 (ACTEQLES	Hosts	(1) 5	elected Hosts	Remove All	
ACT50L54 (ACT50L54)     ACT50L542014 (ACT50L54)     AdventureWorks2008R2 (AC     CLUSTERDB (SK/)     DBA (SK/)	172.16.119.90 172.17.177.51 172.17.177.72 ACTCLIENT22012.ACTSRM	O actsql O (2 C O	s2	0	
HRADB (SQL2012LIST)/ERA(     HRDB (DUKEC1)     HRDB (DUKECLUSTERA)     REFDB (DUKECLUSTERA)     REFDB (DUKECL)     ReFDB (DUKEC1)     ReportServer (ACTSOLSSR)	Map to all ESX hosts	e mount lication 🕢 Refresh Existing Vi	itual Application	Done	Cancel
ReportServer (ACTSQLS2)				Dolle	cancer

## **Run Now Settings (Continued)**

Note: You may have to scroll down to see all options.

- 9. Check the box for **Perform application aware mount**.
- 10. Select Refresh Existing Virtual Application.
- 11. At the **Application** drop-down, select the application to refresh.
- 12. Click **Done** and the new virtual application will be mounted as defined by the Workflow. Access to the virtual application is controlled by the server on which it is mounted.

## LiveClone Run Now: Scrubbed Application Data

This section shows how to run a LiveClone Workflow like the one created in LiveClone Workflow: Scrubbed Application Data on page 18.

Running this Workflow allows a user with the proper privileges to provision servers with scrubbed data from an application.

To provision an environment with scrubbed data from an application:

- 1. Open the Application Manager to the **Workflow** tab.
- 2. In the Navigation pane, select the application used to provision the environment. The associated Workflow schedule appears in the Workflow screen.

Desktop				
Application Manager	a Protect @ Policie	is 🛛 Restore 🗇 Replicat	ion of Volument Corps	E ×
APP VM GROUP HOST			and a state of the	
APP IN GROUP HUST	Workflows Add			
ALL 🛟				
Q enter search	DirectMountStandardMount	DirectMountVirtualApp O Not running	LiveCioneStandardMount	LiveCLoneVirtual
* LOCAL			or rectaining	
► ORACLE III	Workflow Name: Type: LiveCloneStandardMount liveClone	Schedule Type: scheduled		
* SQL INSTANCE				
DB01 (UT-WN2K8-SDL)		Current Run		
DB02 (UT-WN2K8-SQL)	Previous Run		Next Run	
DB03 (UT-WN2KB-SQL)	There are no previous runs	Not running	2016-05-01 11.41.0	00
DB04 (UT-WN2K8-SQL)	Construction in the second second			
BEDB (01-WIN2K8-SQLS) (0) HRDB (WIN2K8-SQLSISQLSE)				
(8) HRDB01 (WW2K8-SQL5/SQL				
W HR0802 (WIN2K8-SQL5/SQL				
WHRDB03 (WIN2K8-SQL5/SQL				
WHRDB04 (WW2K8-50L5/SQL	1	_		
S HEDBOS (WINZK8-SOLSISOL				
🚫 LogSmartResizeTest (WN2K				
🔕 Mount-D801 (UT-WIN2K8-SQ				Run Now
Mount-D803 (UT-WIN2K8-SQ				
Mount-Win2K8-SQL-CG-080				
() Mount-Win2K8-SQL-CG-mas				
Mount-WinZKB-501-CG-mod				
8. 0				
** C				

#### **Workflow For Selected Application**

3. Click **Run Now** and the Run Now Settings page is displayed:

Application Manager	a Protect	Ø Policies	O Restore	3 Replication of <u>vio</u>	ittinue Corgs
VM GROUP HOST	Workflow Name: SQLWorkflow	Images	9	iveClone	Mount
ESVSTEM (2) LINSTANCE (2) DB01 (UT-WH2K8-SQL) DB02 (UT-WH2K8-SQL)	Run Now Settin	1.940 C	or a virtual appl	ication	
DB03 (UT-WN2K8-SQL)	Hosts			(1) Selected Hosts	Remove All
DB04 (UT-WN2K8-SQL)	WIN-E2BKSVMA5P	J	01	UT-Win2KB-SQL	0
DB05 (UT-WN2K8-SQL)	alaska dev actifio co	m	0		
HRDB (WIN2K8-SIDL5/SIDL5E	asmracnode1		0		
HRDB01 (WN2K8-SQL5(SQL	asmracnode2		0		
HRDB02 (WIN2K8-SQL5\SQL			1		
HRDB03 (WIN2K8-SQL5\SQL	Perform application	in aware mount			
HRDB04 (WN2K8-50L5/SQL					
HRDBOS (WINZK8-SQL5/SQL					
LogSmartResizeTest (WN2K					
Mount-DB03 (UT-WIN2K8-SQ					
Mount-D801 (UT-WN2K8-SD           Mount-D803 (UT-WN2K8-SQ           Mount-Wn2K8-SQL-CG-D80           Mount-Wn2K8-SQL-CG-mest					Done Cance

- 4. Select the **Source Image** to use for provisioning.
- 5. If the application is a database and it is captured along with its logs, then the log recovery pane appears with a slider above the target host selection pane. Select whether to use the time of the host or the time of your workstation, and then select the recovery point by using the slider, the calendar and arrows, or by simply typing a value into the field.
- 6. If the creator of the Workflow did not specify all the hosts to be provisioned in the Workflow, click the green + icon next to a host name to add it to the list of hosts to be provisioned.
- 7. Click **Done** and the application data will be mounted as defined. Access to the data is controlled by the server on which it is mounted.

## Direct Mount Run Now: Virtual Application

This section shows how to run a Direct Mount Workflow like the one created in Direct Mount Workflow: Virtual Application on page 22.

Running this Workflow allows a user with the proper privileges to provision a selected server with a new virtual application.

- 1. Open the Application Manager to the **Workflow** tab.
- 2. In the Navigation pane, select the application that will be used to provision the new virtual application. The associated Workflow schedule appears in the Workflow screen.

ALL	Workflows Add			
a enter asarch 🔅	DirectMountStandardMount	DirectMountVirtualApp O Not running	LiveCloneStandardMount O Natrunning	UveCLoneVirtual >
LOCAL ORACLE () FILESYSTEM () SQL INSTANCE ()	Workflow Name: Type: DiractMountVirtualApp directmount	Schedule Type: scheduled		
SQL INSTANCE		Current Run		
5 DE02 (UT-A/N2K8-SQL)	Previous Run		Next Run	
DB03 (UT-W12KK-SQL)     DB03 (UT-W12KK-SQL)     DB05 (UT-W12KS-SQL)     WH2KS-SQL)     HR0B01 (W12KS-SQLSSQL)     HR0B01 (W12KS-SQLSSQL)     HR0B02 (W12KS-SQLSQL)     HR0B03 (W12KS-SQLSQL)     HR0B03 (W12KS-SQLSQL)     HR0B04 (W12KS-SQLSQL)	There are no previous runa	Not running	2016-05-01 11:42-0	0
HRDB05 (WNI2K8:SQLISQL     LegSmatRes/26Tast (WNI2K     Mount-D801 (UT-WNI2K6:SQ     Mount-D803 (UT-WNI2K8:SQL     Mount-WNI2K8:SQL:CG-Mas     Mount-Wni2K8:SQL:CG-mas     Mount-Wni2K8:SQL:CG-mas			Run How Disable	Delete Edit

**Workflow For Selected Application** 

3. Click **Run Now** and the Run Now Settings page is displayed:

Application Manager	a Protect O Policies O Restore: Replication of Vorinting 🗢	Orgs
AFF VM DROUF HOST ALL 2 Q enter search 3 LOCAL > ORACLE 2	Workflow Name: SQLWorkflow Images	
SQL INSTANCE     GO     ACTSQLS12014 (ACTSQLS1	Source Image*         2016-04-12 12:12:12 (Image_2652958)         ~ @	
ACTS0LS2 (ACTS0LS2)     ACTS0LS2014 (ACTS0LS2     ACTS0LS3 (ACTS0LS3)     ACTS0LS32014 (ACTS0LS3)     ACTS0LS32014 (ACTS0LS4)     ACTS0LS4 (ACTS0LS4)     ACTS0LS42014 (ACTS0LS4)	Roll Forward Time: 2016-04-12 10:67.03 2 2016-04-12 10:57.03	st Time User Time
AdventureWorks2006R2 (AC     CLUSTERDB (SKY)     BBA (SKY)	Hosts (1) Selected Hosts	Remove All
HRADB (SQL2012LISTNERA)     HRADB (DUKEC1)     HRDB (DUKEC1)     HRDB (DUKECLUSTER4)     REPOB (DUKECLUSTER4)	172.16.119.90 C actsq/s2 172.17.177.51 C 172.17.177.72 C	0
REPDB (DUKEC1)     ReportServer (ACTSQLS3R)     ReportServer (ACTSQLS32)	Monte all ESY horiz	Done Cance

- 4. From the drop down menu, select the source image to use for the virtual application.
- 5. If the application is a database and it is captured along with its logs, then the log recovery pane appears with a slider above the target host selection pane. Select whether to use the time of the host or the time of your workstation, and then select the recovery point by using the slider, the calendar and arrows, or by simply typing a value into the field.
- 6. If the creator of the Workflow did not specify the host to be provisioned in the Workflow, click the green + icon next to a host name to add it to the list of hosts to be provisioned. When provisioning/re-provisioning a virtual application, only one host can be selected.

VM OROUP HOST	Workflow Name:				_	
ALL (\$)	SQLWorkflow	6.4	(m) <>	CON EE		
antersearch x						
LOCAL		Images	LiveClone	Mount		
ORACLE						
FILE SYSTEM	172 16 119 90		O () actsqls2			n (
SQL INSTANCE	172.17.177.61		0			
ACTSOLS12014 (ACTSOLS1	172.17.177.72		0			
📑 ACTSOLS2 (ACTSOLS2)	ACTCLIENT2201:	ACTOONS C	o			
ACTS0L522014 (ACTS0L52			0.0			1
S ACTSOL53 (ACTSQL53)	Map to all ESX	hosts				
ACTSOLS32014 (ACTSOLS5	Perform applic	ation aware mount				
(8) ACTSOLS4 (ACTSOLS4)	Oreate New V	intual Application	Refresh Existing Virtual	Application		- 1
SACTSOLS42014 (ACTSOLS4	SQL Server Insta	ince Name*	ACTSQLS2 - AC	TSQLS2	(7)	
AdventureWorks2008R2 (AC						
S CLUSTERDB (SKY)	SQL Server Data	base Name*	SQLServerDB	1		
(SKY)	-		~			
W HRADE (SQL2012LISTNERA)	Recover Data	base After Restore	(J)			
() HRDB (DUKEC1)	User Name		actsrm\administrator	(?)		
W HRDB (DUKECLUSTER4)			(and contact and the			
REPOB (DUKECLUSTER4)	Password		[	10		
REPOB (DUKEC1)						
ReportServer (ACTSQL53R)					Done	Cancel
ReportServer (ACTSQLS2)						

#### **Run Now Settings (Continued)**

Note: You may have to scroll down to see all options.

#### 7. Check the box for **Perform application aware mount**.

If you are re-provisioning an environment:

- o Select Refresh Existing Virtual Application.
- o Click **Done** and the virtual application will be updated with the new data.

If you are provisioning a new environment:

o Select Create New Virtual Application.

If the creator of the Workflow did not specify the options for the virtual application:

- o Select an SQL Server Instance on the selected host.
- o In the space provided, enter a name for the new virtual SQL Server Database. The username and password is only required if the Actific Connector used does not have privileges to apply logs or detach the database during an unmount operation.
- 8. Click **Done** and the new virtual application will be mounted as defined. Access to the virtual application is controlled by the server on which it is mounted.

## Direct Mount Run Now: Application Data

This section shows how to run a Direct Mount Workflow like the one created in Direct Mount Workflow: Application Data on page 26.

Running this Workflow allows a user with the proper privileges to provision servers with just the data from an application.

To provisioned an environment with just the data from an application:

- 1. Open the Application Manager to the **Workflow** tab.
- 2. In the Navigation pane, select the application used to provision the environment. The associated Workflow schedule appears in the Workflow screen.

Application Manager	a Protect Ø Policie	es O Restore 🖾 Replicati	n of Walder Corgs	_		
VM GROUP HOST	Vorkflows Add DirectMountStandardMount O Not running	DirectMountVirtualApp	LiveCloneStandardMount O Net running	UveCLoneVirtual O Not running		
ORACLE 111 FILESYSTEM 270 SQL INSTANCE 22	Workflow Name: Type: Direct/VountStandardMount direct					
0801 (UT-WN2K8-SQL)		Current Run				
0503 (UT-WN2K8-SQL)	Previous Run	Not running	Next Run	Next Run 2016-06-01 11:44:00		
DB04 (UT-WN2K8-SQL) DB05 (UT-WN2K8-SQL) HR05 (WN2K8-SQL5/SQL55 HR050 (WN2K8-SQL5/SQL HR0502 (WN2K8-SQL5/SQL	There are no previous runs		2016-05-01 11:44:0			
HRDB03 (WN2K8-SQL5/SQL						
HRD804 (WIN2K8-SQL5\SQL	L					
HRDBBS (WIN2K8-SOLS/SOL						
LogSmartResizeTest (WN2K						
Mount-DB01 (UT-WIN2K8-SQ			Run Now Disable	Delete Edit		
Mount-DB03 (UT-WIN2K8-SQ						
Mount-Win2K8-SQL-CG-DB0						
Mount-Win2K8-SQL-CG-mas						
Mount-Win2K8-SQL-CG-mod						

#### **Workflow For Selected Application**

3. Click **Run Now** and the Run Now Settings page is displayed:

P VM GROUP HOST	Workflow Name: SQLWorkflow	<b>F</b>	8 6		
enter search (x)		Ð	S		
LOCAL		Images	LiveClone	Mount	
ORACLE			- 2		
FILESYSTEM 🛛	10 A 10 M				
* SQL IN STANCE	Run Now Setting	S			
ACTSQL512014 (ACTSQL51	Source Image*	2016-04-12 12:12:12 (I	nage_2652958)	. 0	
ACTSQLS2 (ACTSQLS2)					
ACTSOL522014 (ACTSOL52				Host Time DU	lser Time
S ACTEOLES (ACTEOLES)		Roll F	orward Time:		
ACTSOLS32014 (ACTSOLS3		2016-04-12	10:57:03 🕃		
() ACTSOLS4 (ACTSOLS4)		2016-04-	12 10:57:03		
() ACTSQL542014 (ACTSQL54	2016-04-12 05:11:51			2015-04-12 10:57	03
AdventureWorks2008R2 (AC					
CLUSTERDB (SKV)					-
🙆 DBA (SKY)	Hosts		(1) Selected Hosts	Remove /	711
W HRADE (SOL2012LISTNERA)	172.16.119.90	01	actsqls4		0
(O HRDB (DUKEC1)	172.17.177.61 O 172.17.177.72 O				
WHRDE (DUKECLUSTER4)					
REPOB (DUKECLUSTER4)	ACTCLIENT22012 AC	1000			
S REPOB (DUKEC1)	Mon to all ESY has				_
S ReportServer (ACTSQL53R)				Done	Cancel
( ReportServer (ACTSQLS2)				14	-

- 4. Select the **Source Image** to use for provisioning.
- 5. If the application is a database that is captured along with its logs, then the log recovery pane appears with a slider above the target host selection pane. Select whether to use the time of the host or the time of your workstation, and then select the recovery point by using the slider, the calendar and arrows, or by simply typing a value into the field.
- 6. If the creator of the Workflow did not specify all of the hosts to be provisioned in the Workflow, click the green + icon next to a host name to add it to the list of hosts to be provisioned. When provisioning/reprovisioning application data, only one host can be selected.
- 7. Click **Done** and the application data will be mounted as defined. Access to the data is controlled by the server on which it is mounted.

# 5 Workflow Pre and Post Scripts

This chapter is made up of the following topics:

- Introduction on page 44
- Environment Variables on page 44
- High-Level Examples on page 45
- Variables Used to Mount Databases on page 46
- In All Cases on page 51
- Example Script on page 52

## Introduction

Workflows mount and unmount captured images according to a schedule or on demand. In a Workflow you can call:

- A pre script that runs before an image is mounted and/or unmounted
- A post script that runs after an image is mounted and/or unmounted

Scripts before and after data is mounted or unmounted allow you to perform operations on the data such as:

- Scrubbing for sensitive information
- Generating reports
- Warehousing, especially when extracting, transforming, and loading (ETL) is required
- Copying to removable media

The pre and post scripts must reside in a folder on the server that hosts the mounted Workflow image:

- Windows: C:\Program Files\Actifio\Scripts\
- Linux: /act/scripts

**Note:** For Workflows that involve a database with its logs, configure pre and post scripts that are not applied to the logs. See Example Script on page 52 for a script example that contains a command that will skip a database's log.

When using PRE or POST scripts to provision a new virtual database, it is important to include logic to detect what operation triggered the script's execution.

This logic is necessary because pre and post scripts are run not only during the original database provisioning and during subsequent refreshes, but also during restores of snapshots of the virtual database (i.e. rolling the virtual database back to a previous point in time).

It is common for these scripts to perform some database preparation that would not be needed or applicable during a restore from a snapshot of an earlier point in time.

To determine if a script was run as a result of a restore from a snapshot of the virtual database, check for the environment variable ACT\_MOUNT\_REPLACERESTORE to be set to a value of true and avoid running any processes that are not applicable in this situation.

## Environment Variables

Environment variables are set by the Actific Connector before launching pre/post scripts. These environment variables provide information about the tasks being performed by the Connector. When you create pre/post scripts, you can employ these environment variables to implement the script's desired logic. Actific Connector-defined environment variables are prefixed with ACT\_.

For example, an environment variable ACT\_APPNAME indicates that the Connector is performing some operation for an application pointed to by the environment variable.

These are common environment variables, with sample values in parentheses.

- JOBNAME: The name of the job (e.g. Job\_0123456)
- APPID: The ID of the application (e.g. 4186)
- APPNAME: Name of the application (e.g. My-DB)
- HOSTNAME: The name of the host which is the target of this job (e.g. Jupiter)
- SOURCEHOST: The name of the host that was the source for this application (e.g. Saturn)
- JOBTYPE: a text version of the job class (e.g. mount, unmount)
- PHASE: A text string that describes the job phase (e.g. pre, post)
- TIMEOUT: Define the duration of the script, how long the script is allowed to run
- OPTIONS: Policy options that apply to this job
- ACT\_MOUNT\_REPLACERESTORE: If set to true, indicates script was run as the result of a restore operation.

## High-Level Examples

The following examples are high-level descriptions of some of the more common pre and post script combinations.

## Provision a New Database, Log Capture Not Enabled

This example is the most common use. There is a single action: Mount the database image. In this example, you will:

- Call Pre-Script before performing the database image mount
- Call the Post-Script after performing the database image mount and performing any app-aware activities (i.e. call the script after the database is online when using an app-aware mount).

### Refresh a Previously Provisioned Database, Log Capture Not Enabled

Instead of just performing a mount, the script performs an unmount of the previous database image, then a mount of the new one. In this example, you will:

- Call Pre-Script before unmounting the existing database
- Call Post-Script after unmounting the existing database
- Call Pre-Script before mounting the new database
- Call Post-Script after mounting the new database and doing app-aware activities

Most often if there is a problem with this script, it is usually an issue with the script call during Post Unmount. This is usually because the Post-Script is doing some database work and fails when run as a Post Unmount and there is no database to work on at that time.

## Provision a New Database with Log Capture Enabled

Capturing the database and its logs add another level of complexity to the scripting effort. IIn this example, you will:

- Call the Pre-Script before mounting the database logs
- Call the Post-Script after mounting the database logs
- Call the Pre-Script before mounting the database image
- Call the Post-Script after mounting the database image and performing app-aware activities i.e. after the database is online and has been rolled forward to the desired point-in-time using the logs.
- Call the Pre-Script before unmounting the database logs
- Call the Post-Script after unmounting the database logs

In this very common scenario, the Pre-Script and the Post-Script are run three times. If you run into a problem it will most likely be the first call to the Post-Script. The first Post-Script performs some database action, but the first time it is run the database is not yet on line and the logs have been mounted.

## Variables Used to Mount Databases

When a Pre or Post script is called as a result of a mount or unmount, several environment variables are set before the scripts is actually executed. This is done to help the script author understand the circumstances under which the script was called.

## Variables Set for a Database Mount Without Logs

- ACT\_APPNAME=bigdb
- ACT\_JOBNAME=Job\_37204210
- ACT\_JOBTYPE=mount
- ACT\_MULTI\_END=true
- ACT\_MULTI\_OPNAME=mount
- ACT\_PHASE=pre
- ACT\_POLICY=Production to Snap 1
- ACT\_PROFILE=AWS Profile
- ACT\_SCRIPT\_TMOUT=600
- ACT\_SOURCEHOST=hq-sql
- ACT\_TEMPLATE=StreamSnap
- PHASE=pre
- dbname=bigdbtest
- recover=true
- sqlinstance=DEMO-SQL-11

The highlighted variables ACT\_JOBTYPE, ACT\_MULTI\_OPNAME, and ACT\_PHASE show this is a run of a Pre-Script on a mount job.

Pay particular attention to the difference between ACT\_JOBTYPE vs. ACT\_MULTI\_OPNAME. The value for ACT\_JOBTYPE may be "mount", "unmount", or "reprovision". This is the job type shown in the job monitor.

However, for a reprovision job, there will be an unmount and a mount job. The variable ACT\_MULTI\_OPNAME was created to tell the script which specific action is being taken when a job will perform multiple actions, like the case with reprovision jobs. ACT\_MULTI\_OPNAME will always be "mount" or "unmount" and is typically the better choice to use when checking what actions a script should perform.

## Variables Set for a Database Reprovision With Logs

- 1. Unmount db pre
- ACT\_APPNAME=smalldb
- ACT\_JOBNAME=Job\_37201405
- ACT\_JOBTYPE=reprovision
- ACT\_LOGSMART\_TYPE=db
- ACT\_MULTI\_END=true
- ACT\_MULTI\_OPNAME=unmount
- ACT\_PHASE=pre
- ACT\_POLICY=12hr Snap
- ACT\_PROFILE=Remote Profile HQ to DR
- ACT\_SCRIPT\_TMOUT=600

- ACT\_SOURCEHOST=hq-sql
- ACT\_TEMPLATE=Silver LogSmart
- PHASE=pre
- dbname=smalldbtest
- recover=true
- sqlinstance=DEMO-SQL-11
- 2. Unmount db post
- ACT\_APPNAME=smalldb
- ACT\_JOBNAME=Job\_37201405
- ACT\_JOBTYPE=reprovision
- ACT\_LOGSMART\_TYPE=db
- ACT\_MOUNT\_POINTS=C:\actifio\smalldb\;
- ACT\_MULTI\_END=true
- ACT\_MULTI\_OPNAME=unmount
- ACT\_PHASE=post
- ACT\_POLICY=12hr Snap
- ACT\_PROFILE=Remote Profile HQ to DR
- ACT\_SCRIPT\_TMOUT=600
- ACT\_SOURCEHOST=hq-sql
- ACT\_TEMPLATE=Silver LogSmart
- PHASE=post
- dbname=smalldbtest
- recover=true
- sqlinstance=DEMO-SQL-11
- 3. Mount log pre
- ACT\_APPNAME=smalldb
- ACT\_JOBNAME=Job\_37201405
- ACT\_JOBTYPE=reprovision
- ACT\_LOGSMART\_TYPE=log
- ACT\_MOUNT\_REPROVISION=true
- ACT\_MULTI\_OPNAME=mount
- ACT\_PHASE=pre
- ACT\_POLICY=12hr Snap
- ACT\_PROFILE=Remote Profile HQ to DR
- ACT\_SCRIPT\_TMOUT=600
- ACT\_SOURCEHOST=hq-sql
- ACT\_TEMPLATE=Silver LogSmart
- PHASE=pre

- dbname=smalldbtest
- recover=true
- sqlinstance=DEMO-SQL-11
- 4. Mount log post
- ACT\_APPNAME=smalldb
- ACT\_JOBNAME=Job\_37201405
- ACT\_JOBTYPE=reprovision
- ACT\_LOGSMART\_TYPE=log
- ACT\_MOUNT\_POINTS=C:\Windows\act\Job\_37201405\_mountpoint\_150169372132911\;
- ACT\_MOUNT\_REPROVISION=true
- ACT\_MULTI\_OPNAME=mount
- ACT\_PHASE=post
- ACT\_POLICY=12hr Snap
- ACT\_PROFILE=Remote Profile HQ to DR
- ACT\_SCRIPT\_TMOUT=600
- ACT\_SOURCEHOST=hq-sql
- ACT\_TEMPLATE=Silver LogSmart
- PHASE=post
- dbname=smalldbtest
- recover=true
- sqlinstance=DEMO-SQL-11
- 5. Mount db pre
- ACT\_APPNAME=smalldb
- ACT\_JOBNAME=Job\_37201405
- ACT\_JOBTYPE=reprovision
- ACT\_LOGSMART\_TYPE=db
- ACT\_MOUNT\_REPROVISION=true
- ACT\_MULTI\_END=true
- ACT\_MULTI\_OPNAME=mount
- ACT\_PHASE=pre
- ACT\_POLICY=12hr Snap
- ACT\_PROFILE=Remote Profile HQ to DR
- ACT\_SCRIPT\_TMOUT=600
- ACT\_SOURCEHOST=hq-sql
- ACT\_TEMPLATE=Silver LogSmart
- PHASE=pre
- dbname=smalldbtest
- recover=true

- sqlinstance=DEMO-SQL-11
- 6. Mount db post
- ACT\_APPNAME=smalldb
- ACT\_JOBNAME=Job\_37201405
- ACT\_JOBTYPE=reprovision
- ACT\_LOGSMART\_TYPE=db
- ACT\_MOUNT\_POINTS=C:\actifio\smalldb\;
- ACT\_MOUNT\_REPROVISION=true
- ACT\_MULTI\_END=true
- ACT\_MULTI\_OPNAME=mount
- ACT\_PHASE=post
- ACT\_POLICY=12hr Snap
- ACT\_PROFILE=Remote Profile HQ to DR
- ACT\_SCRIPT\_TMOUT=600
- ACT\_SOURCEHOST=hq-sql
- ACT\_TEMPLATE=Silver LogSmart
- PHASE=post
- dbname=smalldbtest
- recover=true
- sqlinstance=DEMO-SQL-11
- 7. Unmount log pre
- ACT\_APPNAME=smalldb
- ACT\_JOBNAME=Job\_37201405
- ACT\_JOBTYPE=reprovision
- ACT\_LOGSMART\_TYPE=log
- ACT\_MULTI\_OPNAME=unmount
- ACT\_PHASE=pre
- ACT\_POLICY=12hr Snap
- ACT\_PROFILE=Remote Profile HQ to DR
- ACT\_SCRIPT\_TMOUT=600
- ACT\_SOURCEHOST=hq-sql
- ACT\_TEMPLATE=Silver LogSmart
- PHASE=pre
- dbname=smalldbtest
- recover=true
- sqlinstance=DEMO-SQL-11
- 8. Unmount log post
- ACT\_APPNAME=smalldb

- ACT\_JOBNAME=Job\_37201405
- ACT\_JOBTYPE=reprovision
- ACT\_LOGSMART\_TYPE=log
- ACT\_MOUNT\_POINTS=C:\Windows\act\Job\_37201405\_mountpoint\_150169372132911\;
- ACT\_MULTI\_OPNAME=unmount
- ACT\_PHASE=post
- ACT\_POLICY=12hr Snap
- ACT\_PROFILE=Remote Profile HQ to DR
- ACT\_SCRIPT\_TMOUT=600
- ACT\_SOURCEHOST=hq-sql
- ACT\_TEMPLATE=Silver LogSmart
- PHASE=post
- dbname=smalldbtest
- recover=true
- sqlinstance=DEMO-SQL-11

Variables of interest are in bold and include:

- ACT\_JOBTYPE (mount, unmount, reprovision)
- ACT\_MULTI\_OPNAME (mount, unmount)
- ACT\_PHASE (pre, post)
- ACT\_MULTI\_END (true) not always present
- ACT\_LOGSMART\_TYPE (db, log) not always present

## In All Cases

Check

- ACT\_MULTI\_END. Only take action when this variable exists, and is set to true. Otherwise you are taking an action during a log volume mount or unmount, and will almost certainly end up running your logic at the wrong time.
- ACT\_MULTI\_OPNAME. This will always be unmount or mount. The two most common times you will
  want to run scripts are on POST scripts when ACT\_MULTI\_OPNAME is set to mount, or on PRE scripts
  when ACT\_MULTI\_OPNAME is set to unmount (i.e. before removing the database during an unmount
  portion of a refresh).

You very rarely if ever will need to check the following:

- You do not need to check ACT\_LOGSMART\_TYPE if you check ACT\_MULTI\_END
- You do not need to check ACT\_JOBTYPE if you check ACT\_MULTI\_OPNAME)

## Example Script

The following script example uses three environment variables:

- ACT\_JOBTYPE Identifies whether the job is a mount or unmount operation
- ACT\_PHASE Identifies whether the phase is either pre or post
- **ACT\_MULTI\_END** Used only if both a database and its log are mounted. When this is "true" the database is in a state where it can be accessed.

Note: The following example script is not to be used in a production environment. It is not warranted by Actifio.

#### @echo off

setlocal enabledelayedexpansion

echo "\*\*\* Running user script: Job - %ACT\_JOBNAME% Type - %ACT\_JOBTYPE% Phase - %ACT\_PHASE% \*\*\*" set desiredJobType=true

REM Use the first if clause to perform application specific operations during mount and in this example, scrubmount operation.

REM Use the second if clause to perform any application specific operation during unmount and in this example, scrub-unmount operation.

### REM if "%ACT\_JOBTYPE%" neq "mount" if "%ACT\_JOBTYPE%" neq "scrub-mount" set desiredJobType=false

if "%ACT\_JOBTYPE%" neq "unmount" if "%ACT\_JOBTYPE%" neq "scrub-unmount" set desiredJobType=false if "%desiredJobType%" neq "true" (

echo "NO-OP for job type %ACT\_JOBTYPE%"

goto :END

)

## REM Use the first if clause to perform application specific operations during the pre phase REM Use the second if clause to perform application specific operations during the post phase

## REM if "%ACT\_PHASE%" neq "post" (

if "%ACT\_PHASE%" neq "pre" ( echo "NO-OP for phase %ACT\_PHASE%" goto :END

)

## REM For multi-phase jobs (database and logs) check if the database has been mounted and the logs applied then skip logs.

## REM If the operation needs to be performed in phases other than the last phase, modify the clause

if "%ACT\_MULTI\_END%" neq "" if "%ACT\_MULTI\_END%" neq "true" (

echo "NO-OP for multi-phase opearation"

goto :END

)

cd "C:\Program Files\Actifio\scripts"

echo "\*\*\* Running application specific logic: Job - %ACT\_JOBNAME% Type - %ACT\_JOBTYPE% Phase - %ACT\_PHASE% \*\*\*"

## REM Any application specific commands will go here

echo "\*\*\* Finished running application specific logic : Job - %ACT\_JOBNAME% Type - %ACT\_JOBTYPE% Phase - %ACT\_PHASE% \*\*\*"

:END

endlocal