Actifio GO

Backup and Disaster Recovery-as-a-Service

for Google Cloud

Protecting & Recovering Microsoft SQL Server Databases

Last updated on December 8, 2021

This document covers the steps to setup and configure backups of Microsoft SQL (MSSQL) databases running in Windows Server VM versions 2012, 2016, or 2019. No Linux support is offered at this time for MSSQL. This includes discovery of a MSSQL instance, protection of the databases in the instance, and mounting a backup to a target server.

This exercise includes:

Before You Begin on page 1 Set Up the Source Windows MS SQL Server VM on page 3 Configuring a Backup Policy in AGM on page 10 Adding a Microsoft SQL Server Host and its Databases to AGM on page 13 Protecting a SQL Server Instance/Database(s) on page 14 Running an On-Demand Backup Job on page 16 Listing the SQL Server Backups in SQL Server on page 17 Recover the MS SQL Instance/Database Image(s) on page 18 Recover the Source Database to an Alternate MS SQL Server VM on page 21 Unmount and Delete a Mounted Database Image on page 28 Using the Mount & Migrate Feature on page 29

Before You Begin

This document assumes the following:

- There will be one or two VMs running in GCE:
 - o Source (Production) VM hosting source databases
 - o Target (Recovery/Test/DR/Non-production) VM to mount virtual copies of the databases.
- Actifio GO has already been deployed, with Sky installed and the network firewall configured as directed to allow the required communications between Sky and the SQL Server VM(s)

For your deployment, you can create or use one or two Windows Server VMs in Google Cloud Engine (GCE).One is for the source database and the other is for recovery and testing mounts. If desired, the source host may be used for the recovery, but the database name will need to be different to avoid a conflict.

Regardless of whether you deploy new VMs or use existing ones, the following tasks must be performed:

- 1. Source and target VMs require the Actifio Connector (agent) setup.
- 2. Windows Server will also require the iSCSI service to be set to started and set to automatic start.
- 3. Microsoft SQL Server should be installed.

4. You can add additional drives to your SQL servers if this is a normal operating procedure, and if you run databases and logs on alternate disk drives.

Set Up the Source Windows MS SQL Server VM

Note: We perform all tasks here as a local administrator or equivalent user.

- 1. Log into the source VM.
- 2. Launch the iSCSI Initiator application: click on the Start Menu, type in **iSCSI** to find the application, and launch the process.



- 3. If you are prompted, click **Yes** to enable iSCSI and it will be set to auto-start upon boot. Once this is complete the iSCSI Initiator page will appear. Close this by clicking **OK**.
- 4. Open Server Manager if it's not already open.



5. In Server Manager, select Local Server.

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€ • Server Ma	anager • Local Ser			• @	Manage		Help
	PROPERTIES For windows					tasis -	
Local Server Re File and Storage Services	Computer name Warkgroup	windows WorkstRout	Last installed updates Windows Update Last checked for updates	Today at 332 AM Install updates automatically using Windows Update Today at 331 AM			
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	Operating system version Hardware Information	Microsoft Windows Server 2019 Detacenter Google Google Congune Engine	Processes Installed memory (UAM) Total disk spece	Inne(R) Kesn(R) CRU () 2,250Hz 4-08 49,89 CR			

6. Select "IE Enhanced Security Configuration", set it to **Off** for administrators, and click **OK**.

interne	et Explorer Enhanced Security Configuration (IE ESC) reduces the re of your server to potential attacks from Web-based content.
interne default	t Explorer Enhanced Security Configuration is enabled by for Administrators and Users groups.
Adminis	strators:
0	On (Recommended)
۲	● off
Jsers:	
0	On (Recommended)
8	Ooff
More a	bout Internet Explorer Enhanced Security Configuration

- 7. If not already installed, and if desired for the simplest experience, install SQL Server Management Studio (SSMS).
- 8. Next, open a browser, and download the Actifio Windows Connector (agent). Change the URL to the IP address of your Sky Appliance. It may be easier to download using http instead of https if you receive any security warnings or the download is being blocked. Click on the Windows Connector, and select **Run**.

YSTEM & NETWORK MANAGEMENT	CONNECTORS	
System & Network Management Login Page	Windows Connector	Deployment guide
	AIX Connector	View all connectors
DOCUMENTATION	HP-UX Connector	
Release Notes and Product Documentation via the Actifio NOW Website (Login Required)	Ubuntu Connector	
Download zipped Actifio Documentation Library	Linux Connector 32.Bit 64.Bit PPC	
	SNMP RESOURCES	
	MIB	

9. Select **Yes** to allow the installation to commence.

Note: You must be a local administrator for the installation to work.

10. Select the option to install the **Actific Connector With Change Tracking Driver**. This installs an additional Windows service that will track changes for databases larger than IGB in size.

Setup - Actifio Connector		-		×
Select Components				
Which components should be installed?			0	
Select the components you want to inst install. Click Next when you are ready t	tall; clear the compo o continue.	nents you do no	t want to	
Actifio Connector Without Change Trad	cking Driver		~	-
Actifio Connector Without Change Trac	cking Driver			1
1				
	< Back	Next >	Can	cel

- 11. Click **Next** and agree to install the connector in the default location.
- 12. Click Install to let the installation commence, and Finish when done.
- 13. Open the Services control panel and confirm there are two Actifio services running. If not then reinstall the Actifio Connector making sure to enable Change Block Tracking.

G Services File Action View	Help					
C Services (Local)	Services (Local)					
	Select an item to view its description.	Actifio Activity Monitoring Service	Description This Actifio Actifio Data	Running Running	Startup Type Automatic Automatic	Log On As Local Syste Local Syste

- 14. Launch the Microsoft SQL Server Management Studio from the Start menu and connect to the local SQL instance.
- 15. If this is a new server without any databases, you may add your own small local database called CRM: select New Query and paste the following. Then click Execute to run the script. Afterwards you can refresh the instance and a new database called CRM will be available.

```
USE master
GO
IF NOT EXISTS (
  SELECT name
   FROM sys.databases
  WHERE name = N'CRM'
)
CREATE DATABASE [CRM]
GO
USE [CRM]
CREATE TABLE [Customers] (
    [CustomersID] INTEGER NOT NULL IDENTITY(1, 1),
    [Name] VARCHAR(255) NULL,
    [Email] VARCHAR(255) NULL,
    [Company] VARCHAR(255) NULL,
    [Street] VARCHAR(255) NULL,
```

```
[City] VARCHAR(255) NULL,
    [Zip] VARCHAR(20) NULL,
    [Country] VARCHAR(100) NULL,
    [Code] VARCHAR(255) NULL,
    PRIMARY KEY ([CustomersID])
);
GO
INSERT INTO Customers([Name], [Email], [Company], [Street], [City], [Zip], [Country], [Code])
VALUES('Hayden Hartman', 'aliquet.Phasellus@Fuscealiquam.net', 'Risus Corp.', '118-8548
Elit St.', 'Cawdor', '7799', 'Uruguay', '7671'), ('Iola
Morin', 'Sed.nec.metus@mollisneccursus.com', 'Nunc Pulvinar Arcu Associates', 'Ap #260-
2255 Cras Rd.', 'Cambridge Bay', '366160', 'Tanzania', '6589'), ('Candice
Lowery', 'tellus.faucibus@justonecante.com', 'Semper Limited', 'P.O. Box 413, 7363 Lacus.
Road', 'Ludwigsfelde', 'Z3378', 'Lesotho', '8834'), ('Roanna
Butler', 'hendrerit.Donec@lacusvestibulumlorem.com', 'Dignissim Lacus Associates', 'P.O.
Box 362, 1068 Id Ave', 'Zona Bananera', '20754', 'Belize', '5042'), ('Ian
Clay', 'primis.in@vitaerisusDuis.co.uk', 'Dictum Placerat Limited', '540-9946 Sem,
Rd.', 'Bogaarden', '1612', 'Curaçao', '4307'), ('Yeo
Estrada', 'eleifend.nunc@liberoProinsed.ca', 'Porttitor Eros Ltd', '6276 Consectetuer
Road', 'Bradford', '753279', 'Sudan', '2207'), ('Ariel Ayers', 'amet@leo.com', 'Morbi
Accumsan Limited', '8407 Fusce Rd.', 'Negrete', '4821', 'Japan', '5340'), ('Erasmus
Bryant', 'Curabitur.egestas@congue.com', 'At Institute', 'Ap #297-2194 A, St.', 'Killa
Abdullah', '19358', 'India', '7948'), ('Wynne Prince', 'nascetur@Donec.com', 'Magna Lorem
Institute', 'Ap #987-3600 Nibh Rd.', 'Lourdes', '6790', 'Puerto Rico', '5804'), ('Howard
Hunt', 'natoque@dolorvitaedolor.com', 'Vel Limited', 'P.O. Box 482, 4991 Et
St.', 'Yaroslav1', '23795-69952', 'Ecuador', '3407');
```

16. If you created the CRM database above, verify the database is available. Select "New Query" and paste the following:

USE [CRM] SELECT * from [Customers];

The results should look like this example:

-

	CustomersID	Name	Email	Company	Street	City	Zip	Country	Code
1	1	Hayden Hartman	alquet.Phasellus@Fuscealquam.net	Risus Corp.	118-8548 Elt St.	Cawdor	7799	Uruguay	7671
2	2	Iola Morin	Sed nec metus@mollisneccursus.com	Nunc Pulvinar Arcu Associates	Ap #260-2255 Cras Rd.	Cambridge Bay	366160	Tanzania	6589
3	3	Candice Lowery	tellus faucibus@justonecante.com	Semper Limited	P.O. Box 413, 7363 Lacus. Road	Ludwigsfelde	Z3378	Lesotho	8834
4	4	Roanna Butler	hendrerit. Donec@lacusvestibulumlorem.com	Dignissim Lacus Associates	P.O. Box 362, 1068 ld Ave	Zona Bananera	20754	Belize	5042
5	5	lan Clay	primis in@vitaerisusDuis.co.uk	Dictum Placerat Limited	540-9946 Sem, Rd.	Bogaarden	1612	Curação	4307
6	6	Yeo Estrada	elefend.nunc@liberoProinsed.ca	Porttitor Eros Ltd	6276 Consectetuer Road	Bradford	753279	Sudan	2207
7	7	Ariel Ayers	amet@leo.com	Morbi Accumsan Limited	8407 Fusce Rd.	Negrete	4821	Japan	5340
8	8	Erasmus Bryant	Curabitur.egestas@congue.com	At Institute	Ap #297-2194 A, St.	Kila Abdullah	19358	India	7948
9	9	Wynne Prince	nascetur@Donec.com	Magna Lorem Institute	Ap #987-3600 Nbh Rd.	Lourdes	6790	Puerto Rico	5804
10	10	Howard Hunt	natoque@dolorvitaedolor.com	Vel Limited	P.O. Box 482, 4991 Et St.	Yaroslavi	23795-69952	Ecuador	3407

17. Change the Recovery Model of your databases to Full if you want transaction log backup to find any logs. The default is Simple, which means that Actifio Log backups will never find any logs to backup. Right select the database and select Properties. Then go to Options and change the Recovery model from Simple to Full.

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WINDOWS\SQLEXPRESS (SQL Server 1!					
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🐨 🛑 System Databases					(
Simples	Database Properties - CRM		_		×
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🗑 📁 Views	Element	Colution SQL I	atin1 General CP1 CLAS		-
External Resources	P Options 2		2		-
🗉 📁 Synonyms	and a second sec	Recovery model: Full			~
🗉 📁 Programmability	🔑 Permissions	Compatibility level: SQL S	erver 2019 (150)		
🕞 🛑 Service Broker	Extended Properties	Containment type: None			4
🛞 🃁 Storage	P Query Store				
🗑 🇰 Security		Other options:			
AdventureWorks2019		21 21			
🖂 🗰 Security		× Automatic			
😑 📁 Logins		Auto Close	True		- 61
##MS_PolicyEventProcessin		Auto Create Incremental Statistics	False		
##MS_PolicyTsqlExecutionL		Auto Create Statistics	True		
2 BUILTIN/Users		Auto Shink	False		
NT AUTHORITY/SYSTEM		Auto Update Statistics	True		
NT Service\MSSQLSSQLEXP		Auto Update Statistics Asynchronously	False		_ 10
NT SERVICE\SQLTELEMETRY		Containment Defa & G Bard Language LCID	1022		-
NT SERVICE\SQLWriter	Connection	Defailt Lavyuane	English		
NT SERVICE\Winmamt		Nested Triggers Enabled	True		
2 sa	WINDOWS\SOLEXPRESS	Transform Noise Words	False		
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😑 📁 Server Roles	WINDOWS www	✓ Cursor			
🐉 bulkadmin	ll in	Close Cursor on Commit Enabled	False		
25 dbcreator	YY View connection properties	Default Cursor	GLOBAL		-11
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- 18. If you intend on backing up a SQL database(s) with Transaction Logs (Full Recovery model), or if you wish to avoid the need to enter credentials for SQL Server into the AGM interface when performing recoveries, there are two options available to achieve this. Use one of these two approaches for the most seamless experience:
- Option 1: Go to the SQL Instance Security, Logins menu. Right click on the "NT AUTHORITY\SYSTEM" account and select properties. Then in Server Roles, select the sysadmin Server Role, and click OK. This allows the Actific Connector the elevated rights to run Log Backups and Log Recoveries without requiring additional user authentication.

Select a page			
& General	🖵 Script 🔻 🚱 Help		
Server Roles User Mapping Securables Status	Server role is used to grant server-wide security privileges to a user.		
	bulkadmin diskadmin diskadmin processadmin public securtyadmin securadmin settinattini		
Connection			
MSSQL1			
Connection: MSSQL1\jeffoconnor			
Y View connection properties			
Progress			
C Ready	2	 	

- Option 2 (three steps): Create a new Windows Administrator Account (domain or local OS):
 - a. Verify or grant the account permissions as follows:
 - o Allow the following rights in SQL: dbcreator server role, db_backup operator database role, db_owner database role

o In addition, assign the following securables in SQL: View any database, Create any database, Alter any database, Connect SQL

Here is an example of some of the securables granted to a Local Windows User "sqladmin".

Select a page	T Script - 1 Help	
 General Server Roles User Mapping 	Login name: MSSQL1\sqladmin	
Status	Securables:	Search
	Name INST-INSTALL-SQ	Type Server
Connection		
Connection Server: MSSQL1	Permissions for INST-INSTALL-SQ: Explicit Effective	
Connection Server: MSSQL1 Connection: MSSQL1Yelfoconnor WW connection properties	Permissions for INST-INSTALL-SQ: Explort Effective Permission AUTHENTICATE SERVER CONNECT ANY DATABASE CONNECT SQL CONTROL SERVER	^
Connection Server: MSSQL1 Connection: MSSQL1yeffoconnor WW very connection properties	Permissions for INST-INSTALL-SQ: Explicit Effective Permission AUTHENTICATE SERVER CONNECT ANY DATABASE CONNECT SQL CONTROL SERVER CREATE ANY DATABASE	

b. Next, the account should be in the local Windows administrator group, to ensure access to scripts in "C:\Program Files\Actifio\" and to make OS calls and handle the staging disks where backups will be stored.

Remote co	ntrol	Rem	ote Desktop	Services Profile	Dial-in	
General	Mem	ber Of	Profile	Environment	Sess	ion
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Adminis	trators	-				
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Add		Remove	Changes are not ef user logs	to a user's group m fective until the nex on.	embership d time the	p
Add		Remove	Changes are not ef user logs	to a user's group m fective until the nex	embershij d time the	P

c. Finally, update the "Actifio UDS Host Agent" service to run as this account, and restart the service.

G Services File Action View	Help	-				-	×
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G Services (Local)	Name Actifio Activity Monitoring Serv	Description This Actifio	Status Running	Startup Type Automatic	Log On As Local System		^
	Actific UDS Host Agent	Actifio Data	Running	Automatic	.\sqladmin		

Configuring a Backup Policy in AGM

Now we turn to the AGM to create a policy template that will determine when backups run, how long they are retained, and where they are stored. Several details related to how the backups will be performed are also specified.

1. Login to the Actifio Global Manager (AGM), and navigate to SLA Architect -> Templates. Then click + Create Template.

actifio	Dashboar	d Backup & Recover +	Test Data Management +	App Manager +	SLA Architect -	Manage	Report	Monitor +		Ŧ	1 #	min		
FILTER BY	ſ	Templates		0	Templates					8	+ cR	EATE T	empla	NTE
TEMPLATE NAME	•				Profiles									
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OVERRIDE	•	GCE Snaps					Yes		Yes					
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2. Enter a name for your new template and a description, then click the + symbol below the icon that represents production data.

TEMPLATE*	SQL Backups	ALLOW OVERRIDES ON POLICY SETTINGS?*
DESCRIPTION	4-day Snap, 7-day Logs, 3	80-day OnVault
		⊜ 8
		2 0
	•	
	The second se	MAPSHOT.

3. Enter the desired policy name, daily window, and retention for the snapshots of your databases. This retention is typically short, and it will be stored on PD storage to ensure recovery performance. Then click **Advanced Policy Settings**.

Production To Snapshot
Create/Edit Policy
POLICY NAME* Daily DB Backup
SCHEDULING Windowed
ON THESE DAYS Everyday EXCEPT Never ×
WITHIN THIS WINDOW 19:00 TO 07:00
EVERY 🖸 24 🕀 Hour(s) 💌
RETAIN FOR 🕒 4 🕀 Day(s) 🗸
SLA COMPLIANCE Default
PRIORITY Medium
Advanced Policy Settings

- 4. There are several options in the advanced policy settings; most of them should be left at the default values. For SQL Server, the most commonly changed settings, and best practices, are to set the following values:
 - o Truncate/Purge Log After Backup: Truncate
 - o Enable Database Log Backup: Yes
 - o Log Backup Retention: 7 days
 - o Replicate Logs: No
 - o Send Logs to OnVault Pool: Yes

Click Save Changes and then Update Policy after making the desired selections.

5. Now the Snapshot icon is colored. Click the + symbol between the Snapshot icon and the OnVault icon to add an OnVault policy.

TEMPLATE	SQL Backups	ALLOW OVERRIDES ON POLICY SETTINGS?* YES ONO
DESCRIPTION	4-day Snap, 7-day Logs,	30-day OnVault
		8 8
		ADDUCTION MIRROR
		00
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		SHAPSHOT

- 6. Enter the desired policy name, daily window, and retention for the OnVault copies of your database backups. The start time of the window should match the time specified in the snapshot policy. This retention is typically longer, ranging from 30 days to 90 days, and the copies will be stored in Google Cloud Storage to ensure the right balance of performance and cost. Click **Update Policy** when done.
- 7. Click **Save Template** to save your policies and settings.

When you deployed the AGM and Sky, an OnVault pool and a matching resource profile were created automatically. This resource profile will be used when protecting the databases.

Note: You can create multiple policies if tiered retentions are required. For example, if daily backups should be kept for 90 days, and monthly backups for 1 year, create two OnVault policies. The second policy should be configured to only run on the desired day of the month (i.e. last Sunday of the month, or first day of the month), and to have a longer retention period.

8. Now we can add the database(s) to AGM and protect them as needed. Continue to Adding a Microsoft SQL Server Host and its Databases to AGM.

Adding a Microsoft SQL Server Host and its Databases to AGM

To protect a SQL Server database, you must first add its host to the AGM and then discover the database.

1. From the **Backup & Restore** menu, select **SQL Server**.

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	/	19	t Huver on the Ican N	Select the typ	e of applicat To learn how to tri	tion you wish	to Add or Pr schop for an airead	otect ly protected application die	k here.		
5	iervers & Applications	214	Actor Handel	DB MargaCB	Maga Maga	OfficeLa Oracle	ep transporter	SAP AN	Enterit App Johann Loned	Crossiency Crossiency	
	(Connectors required)	SAP HANA	SARY IQ Sario	Max CO SAP Hundes	> SQL Server	-			V		
	Hypervisors	VIEwarp	-	aws	0						

- 2. If you have previously configured backups for GCE VM Instances and have credentials defined, you may use the discovery process for GCP to add your SQL Server VM. See *Protecting & Recovering GCE Instances* at https://docs.actifio.com/Actifio-GO for more information on this process. Skip to Step 5 to select your server if it has already been discovered. Otherwise proceed with the next steps to add the host.
- 3. At Manage Hosts, you will be shown a list of existing hosts, or a message that no hosts were found. Click **+ Add Host** to open the add host dialog.
- 4. Enter the Name and IP address (and click +) of your SQL Server VM. Then select your Sky appliance, and click **Add**.

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e to search	2
APPLIANCE IP	
sky1 10.138.0.	.6

5. Select your newly added server and click **Next** to discover the SQL Instances on the server. This process can take a minute to complete. If it fails, then you may need to verify the correct firewall policy is in place, to allow the Sky appliance access to the SQL server via TCP port 5106.

The SQL Server instances on the VM will be displayed.

ctifio	Dashboard	Backup & Recover -	Test Data Management +	App Manager •	SLA Architect +	Manage -	Report M	onitor 🖬 :		T.	1 admin	. 0
		Microsoft S	QL Server Onbo	arding	Discover	2 Select	3 Manage	4 Configure	S Finish			
		Select the host	on which you wish to	discover Micro	soft SQL Server	Instances / A	\Gs					
		Search by Host, I	P Address or Friendly Pa	ith q					+ Add Host			
		HOST	•	IP ADDRESS	O FRIEN	DLY PATH		O APPLIANCE	0			
		sql2019-a		10.138.0.2	sql201	9-8		sky1				

Protecting a SQL Server Instance/Database(s)

In this step, you apply the SLA policy that you created in Configuring a Backup Policy in AGM to a database discovered in Adding a Microsoft SQL Server Host and its Databases to AGM. According to the schedule in the policy, a backup job will run. It will take a snapshot of the database according to the snapshot policy and then copy it to the OnVault pool for longer storage according to the OnVault policy.

1. Select the SQL Server instance that has the database(s) you wish to backup and click **Next**.

OCTIFIO Dashboard	Backup & Recover - Test Data Management - App Manag	er + SLA Architect +	Manage - Report Mo	nitor +	Y 1 admin 🔺 🥹
	Microsoft SQL Server Onboarding	Discover	Select Manage	4 S Configure Finish	
	Specify the action you wish to take for each Micro	soft SQL Server Inst	ances / AGs.		
	By default all the databases are included for SQL Server Instance	es. To change click here.	0	0	
	For 1 SQL Server Instance Database Apply SLA	SQL Backups	GCSNearlineWest1-profile	• ОК	
			ROUP TEMPLATE	PROFILE PREVIEW	
0	SQL2019-A SQL Server Instance	enabilita :	ione Rone	None erections	

2. To apply an SLA, select the instance, then choose **Apply SLA** from the dropdown box above the instance list. As you select options, more dropdowns will appear. Select the Template and Profile that were previously created, then click **OK**.

Microsoft SOL Server Ophoarding	0	2	-3	4	5
Microsoft SQL Server Onboarding	Discover	Select	Manage	Configure	Finish
Specify the action you wish to take for each Misso	acoft COL Sacura		Cr.		

Specify the action you wish to take for each Microsoft SQL Server Instances / AGs.

By default all the databases are included for SQL Server Instances. To change click here.

Onboard Microsoft SQL Server Instances / AGs as Unmanaged or select application to choose an SLA or group.

APPLICATION	TYPE	INCLUDE	GROUP	TEMPLATE	PROFILE	PREVIEW
SQL2019-A	SQL Server Instance	All Databases	None	SQL Backups	GCSNearline sky1	• • • • •

3. If you wish to select individual databases to include or exclude from backups, you can click the **All Databases** link to bring up the Manage Membership dialog.

You may choose an inclusion rule to suit your needs for inclusion or exclusion of databases for backups. Auto-inclusion of new databases is controlled by this selection.

- o Include All, Include User, and Exclude Selected will result in new databases added to this instance to be backed up automatically.
- o Include User and Include Selected will result in a static list of databases to backup, and new databases will not be backed up without manual intervention.

The recommended selection is Include All.

4. After optionally changing the database inclusion rule and saving your changes, click **Next**. You now have the option to modify application settings that determine SQL Server specific behaviors during backups. Keep the defaults and select **Next**.

ctifio	Dashboard	Backup & Recover +	Test Data Management +	App Manager -	SLA Architect -	Manage +	Report M	onitor +		¥ 1 admin ♠
		Microsoft S	QL Server Onbo	parding	Discover	Select	Manage	ConFigure	5 Finish	
		This step is opti	onal and allows you t	to change appli	cation settings l	for database	to be protect	ed.		
		Search								
		Define settings fo	or each application belo	w, or define settir	ngs for all applicat	ions				
		SQL2019-A								
		app on host sql20	119-a							
		SLA SQL Backups w	ill be assigned Applicate	on settings						

5. From the summary display, click **Finish** to initiate the discovery and protection of your SQL Server database(s). You will be presented with a confirmation page reminding you to keep your browser window open, without refreshing, until the discovery is complete. Click **Finish** again.

Previous

Next

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	Microsoft SQ	L Server Onboard	ing	Discover	Select	Manage	Configure	Finish				
	Onboarding Sum	mary										
	1 SQL Server Instan	ce Database will have an SLA a	pplied									
	APPLICATION	TYPE	HOST		APPLIANCE	ACTI	ON	STATUS				
	50L2019-A	SOL Server Instance	sol2019-a		skyt	Apply	SLA	-				

- Previous Finish 6. Wait until you see the green checkbox before proceeding. Microsoft SQL Server Onboarding Finish Select Manage Discover Configure Onboarding finished successfully! View your Microsoft SQL Server in applications, or to onboard additional Microsoft SQL Server run this wizard again. APPLICATION TYPE HOST APPLIANCE ACTION STATUS SQL2019-A SQL Server Instance sql2019-a Apply SLA sky1
- 7. After the SLA is applied to the SQL instance, backups will begin automatically, based on the schedule within the Template policy, however you can run an on-demand backup job immediately; continue to Running an On-Demand Backup Job.

Running an On-Demand Backup Job

Once the SLA is set up, protection jobs will run as scheduled. You can also run a job on-demand:

1. Goto App Manager -> Applications, select the SQL Instance, and select Manage SLA.

actifio	Dashboard	di il	Backup	& Recover -	Test D	ata Management	•	App Managet - St	A Architect - Manag	e.+.	Report.	Monitor +**		Y	1 admin	
FILTER BY		Ap	plic	ations										1	+ ADD APP	LICATION
PPLICATION NAME	•															
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IOST IP	٠	type	to sea	inth.		Q,							C \$90	OW SELECTED (1)	25 ♥	C 🛓
EMPLATE NAME	•	E		APPLICATION	0	TEMPLATE	0	PROFILE 0	FRIENDLY PATH		HOST FRIEND	DLY	HOST NAME		TYPE	0
ROFILENAME	•	-	-		_		-		-				and the second s	-		
RIENOLY PATH	•	•	9	SQL2019-A		SQL Backups		GCSNearlineWest1	sql2019-a		sql2019-a[sql	2019-a)	sql2019-a	sky1	SQL Serve	r Instance
LASIAIUS			0	CRM		SQL Backups		GCSNearlineWest1	sql2019-a		sql2019-a(sql	2019-a)	sql2019-a	sky1	SQL Serve	r Database
Managed Unmanaged			•	msdb		SQL Backups		GCSNearlineWest1	sql2019-a		sql2019-a(sql	2019-a)	sql2019-a	sky1	SQL Serve	r Database
YPE				master		SQL Backups		GCSNearlineWest1	sql2019-a		sql2019-a(sql	2019-a)	sql2019-a	sky1	SQL Serve	r Database
siect: ALL NONE mizema AMS instance AMS instance Hyper-V VM System State VMware VM Atabases OK2 Database DK2 Instance MariaDB Database MariaDB Instance Mark0B MySQL Database Official State MySQL Database Official State MySQL Database		0	0	model		SQL Backups		GCSNearlinetWest1	sql2019-a		sql2019-ə(sql	2019-a)	sqi2019-a	sky1	SQL Serve	r Database
PostgreSQL Datab PostgreSQL Instar	kase Ke	1	- 5 of	5 applications					iei ei 1 0	f 1 p	sage in in				Aanage SLA	•

2. Expand the Snapshot policy (right-hand side), select **DB+Log** and enter a label if desired (optional), and click **Run SLA**.

actifio	Dashboard	Backup & Recover -	Test Data Management +	App Manager -	SLA Architect +	Manage - Report	Monitor +
MANAGE SLA	👘 🕲 MSS	QL1 mssql1 mssql1	Octails & Settings				
TEMPLATE DB ar	nd Logs Backup	*	PROFILE Local and On	lauit	•	Policy Overrides	A 0017
Database Incl	lusion Rule		sky1		None	O Poli	cies
RULE TOTAL DATABASES	Include User 4	1				Snapshot Daily Sn	0 Apshot
DATABASES INCLUDED DATABASES EXCLUDED INELICIBLE DATABASES	1 3 0		PAGENCTION 0			SCHEDUL FREQUE TIME WINC	UNC Windowed NCY Everyday IOW 00:00 to 23:00
Edk				10		REPEAT VA EXPIRE AF POLIC	NUE Once per window TER 7 days YID 8034
			SNAFSHOT	ORVAULT		O DS B D	B+LOG OLOG Cial Backup
			-				Run SLA

3. You can watch the progress of the job in the Monitor, Jobs section.

Now you have a backup image of your SQL Server database and you will have additional copies over time, appearing and expiring according to the criteria in the SLA policy.

Now is a good time to verify that the Actifio backups are done in much the same way that SQL Native backups are performed; continue to Listing the SQL Server Backups in SQL Server.

Listing the SQL Server Backups in SQL Server

After the initial capture job is completed you can run the following query to show that SQL can itself identify the database has been backed up correctly, including the Transaction Log file.

```
USE msdb;
GO
SELECT backupset.database_name,
MAX(CASE WHEN backupset.type = 'D' THEN backupset.backup_finish_date ELSE NULL END) AS 'Last
Full Backup',
MAX(CASE WHEN backupset.type = 'L' THEN backupset.backup_finish_date ELSE NULL END) AS 'Last
Log Backup'
FROM backupset
GROUP BY backupset.database_name
ORDER BY backupset.database_name DESC
```

The result will look like this, indicating both Full backup and Log backup have been completed.

	Results	Mess	ages	
	datab	ase_name	Last Full Backup	Last Log Backup
1	CRM		2021-06-24 03:32:48.000	2021-06-24 05:00:47.000

Recover the MS SQL Instance/Database Image(s)

1. The database should now be backed up successfully. After a few minutes of initiating the backup snapshot, return to the **App Manager**, **Applications** menu and find your backed up SQL instance or database(s), right-click and select **Access**.

actifio	Dashb	cert		chup & Recover +	Test Data M	anagement -	App Manage	1.1	SAAnhind +	Manage -	Arport	Monitor -						T Laten & O
PILTER BY	1	Ap	plic	ations		14												+ ADD APPLICATION
APPLICATION NAME																		
HOST MANNE	•	+30	M There															
HOSTIP	•	101	al l			D												HE 500- 12 A
TEMPLATE NAME		8		APPLICATION	•	TEMPLATE		٥.(PROFILE	6	FRIENDL	r PATH	ò.	HOST NAME	6	APPLIANCE	0	TYPE
FRIENDLY FAITH	•			CRM		D0 end Logi	Backup		Local and OnVaul		ripases			muqit		sky1		SQL Server Database
Unmanaged			0	master							rigue			maqt		sky1	1	SQL Server Database
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Select: ALL NORE			•	mudb				£12	K Organization	Merriden	- neti1	-		maqit		skyt		SQL Server Database
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C COP Instance									port OnVault In	ages								
D Myperv VM																		
U VMware VM																		
Databaset																		
C 062 Delabara									plicate Logs									

2. Depending on the SLA configured, You should be able to see captured images in the Timeline ramp or Table view. You may have image(s) in the Snapshot lane and additionally in the OnVault lane. Next, select one of the images and click **Mount**.

Note: If you see in the metadata fields on the right side you have a date and time for the 'Recovery Range' then this is a strong indication that log backups have succeeded in addition to the Full Backup.



3. The Mount screen is where you select the target host you want to mount the database(s) to. This can be back to the source host (choose a new name for the DB), or a different target host. You can also optionally enter a label for the mount, which may be helpful when referring to the mount job later. You also must select the database(s) to be mounted in the Select Item(s) area.

Next, you should provide a name for the database you are mounting. The User Name and Password fields can be left blank if the Actifio UDS Host Agent service has the permissions specified in step 18 of section "Source Windows MS SQL Server VM setup" above. Otherwise you will need to enter credentials with those permissions on this screen. Lastly, click **Submit** to run the job. The mount job may take 1-5 minutes, depending on the environment, and can be monitored from the Monitor, Jobs page.

Note: The target MS SQL Server must be running the same version or higher as the source server where the backup was run (even minor security patches can be an issue, so ensure they are the same exact version if possible).

tifio Dashboa	nd Backup & Recover +	Test Data Management - App Manager	SLA Architect - N	lanage - Report	Monitor -	▼ 1 admin 🌲
com +	💙 MSSQL1 misql1 mi	sig/1 Details & Settings				
A 2021-04-24 13	152.50	Mount				
Solition and a soliti	×	100				
NAME image_00	16216	TARGET LABEL				
STATUS Available		maau1 Test Mount				
TRANSPORT SAN Bases Storage	d, Out-Of-Band	and the second second				
IMAGE SIZE 19 MICH		Application Options				
EXPRESION 2021-07-0	11334.05	CREATE NEW VIRTUAL APPLICATION				
APP VERSION SQL Serve (15.0.412)	w 2018 3.1)	INCLUDED GATABASES				
APPLIANCE Sky1			Q.		SHOW SELECTED (1)	
RECOVERY 06-24 13-3 BANCE	12 To 06-24 13:33	C. In sector state				
LABLE Initial Beck	hup	E PROCEEDINGS				
CATALOG STATE None		CRM				
POOL NAME ALL PRID	0006000	BOUL BORNARD THEF		0		
Mount		HOLE FORMAND FIME	00 (301.00%)	• (mm) •	HOST TIME O USER TIME	
		SQL SERVER INSTANCE NAME *	MSSQL1			
			MSSQL1			
		SCI. SERVER DATABASE NAME *	Te-CIM.			
		MANAGE NEW APPLICATION				
		· Advanced Options				
		RECOVER DATABASE AFTER RESTORE		<u> </u>		
		RECOVER USER LOCING	(10)			
		Internation	Contraction of the local division of the loc	-		
		LISER ROOMS	Spapers			
		PASSWORD				
		RECOVERY MODEL	Barne as nos			
		OVERWRITE EXISTING DETAILARS	tig			
		Mapping Options				
		• Item Selection and Mount Loca	tions			
		Script Options				

If all has succeeded, you can see your Mount task in the App Manager, Active Mounts page:

actifio a	hashboard	Backup & Recover -	Test Data Management +	App Manager -	SLA Architect - Manage	- Report	Manitor	•);	3	7	1 admin	٠	9
FILTER BY		Active Mounts											
MAGENAME	-												
search by image name		+ hate filters								27		1.5	1.1
SOURCE ACTION	1.		ų							10	11 23	. 53	-
Select: ALL NONE			SOURCE HOST	MOUNTED HOST	CHILD APPLICATI	LABEL	0	IMAGE STATE	CONSISTENCY	0	CONSUM	ED 5/2	E (
Clone		MSSQL1	mssqi1	mssql1	DevCRM	Test Mount		Mounted	2021-06-24 13:32:	50	1		

4. Go back to the SQL Instance, and refresh the instance to see your newly mounted database.



5. Now verify the database is available. Select New Query and paste the following (remember to use the name of the mounted databse where DevCRM is below):

USE [DevCRM] SELECT * from [Customers]; The results should look like this:

	CustomeraID	Name	Enal	Company	Street	City	Zp	Country	Code
1	1	Hayden Hartman	alquet Phaselus@Fuscealquam.net	Raus Corp.	118-8548 Ett St.	Cawdor	7799	Unguay	7671
2	2	Iola Morin	Sed nec metus@mollaneccuraus.com	Nunc Pulvinar Arcu Associates	Ap #260-2255 Cras Rd.	Cambridge Bay	366160	Tanzania	6589
3	3	Candice Lowery	tellus faucibus @ustoriecante.com	Semper Limited	P.O. Box 413, 7363 Lacus. Road	Ludwigsfelde	23378	Lesotho	8834
4	4	Roanna Butler	hendrent.Donec@lacusvestbulumiorem.com	Dignissim Lacus Associates	P.O. Box 362, 1068 ld Ave	Zona Bananera	20754	Belize	5042
5	5	lan Clay	primis in @vitaerisusDuis.co.uk	Dictum Placerat Limited	540-9946 Sem, Rd.	Bogaarden	1612	Curação	4307
6	6	Yeo Estrada	elefend nunc@iberoProinsed.ca	Portitor Eros Ltd	6276 Consectetuer Road	Bradford	753279	Sudan	2207
7	7	Ariel Ayers	amet@leo.com	Morbi Accumsan Limited	8407 Fusce Rd.	Negrete	4821	Japan	5340
8	8	Erasmus Bryant	Curabitur egestas@congue.com	At Institute	Ap #297-2194 A. St.	Kila Abdullah	19358	India	7548
9	9	Wynne Prince	nascetur@Donec.com	Magna Lorem Institute	Ap #987-3600 Nbh Rd.	Lourdes	6790	Puerto Rico	5804
10	10	Howard Hunt	natoque@dolorvitaedolor.com	Vel Limted	P.O. Box 482, 4991 B St.	Yaroslavl	23795-69952	Ecuador	3407

Recover the Source Database to an Alternate MS SQL Server VM

Overview

To initiate the mount to an alternate host, first prepare the server for the mount and add it to AGM using the steps in the following two sections. Then perform the same procedure used when mounting to the original host, but select your desired host in the "Target" field at the top of the mount page.

Prepare the Alternate Windows Target MS SQL VM Add the Alternate Windows Target MS SQL VM to AGM Mount to the new target

Prepare the Alternate Windows Target MS SQL VM

Note: Perform all tasks here as a local administrator or equivalent user.

- 1. Log into the source VM.
- 2. Launch the iSCSI Initiator application: click on the Start Menu, type in **iSCSI** to find the application, and launch the process.



- 3. If you are prompted, click **Yes** to enable iSCSI and it will be set to auto-start upon boot. Once this is complete the iSCSI Initiator page will appear. Close this by clicking **OK**.
- 4. Open Server Manager if it's not already open.



5. In Server Manager, select Local Server.

E Server Manager						- 0	5
€ • Server Ma	inager • Local Ser			• @	Manage	Ven Hel	
	PROPERTIES For windows					tasis •	Î
tocal Server	Computer name Warkgroup	window Wolkshour	East installed updates Windows Update East checked for updates	Today at 3.32 AM Instal updates automatically using Windows Update Today at 3.31 AM			
	Windows Detender Frewalt Remote management Remote Desitap NC Texning Ethernet	Pasts: On Gradient Institut UN4 soldness assigned by DHCR, UN4 enabled UN4 soldness assigned by DHCR, UN4 enabled	Windows Defense Anthinss If Enhanced Society Configuratio Product ID	Real-Sime Protections On On Adversalia, Reytjanik Doklo-D0000-AAR80 Sachamed			
	Operating system version Marthware information	Microsoft Windows Server 2019 Detacenter Google Google Congune Engine	Processors Installed memory (RAM) Total disk space	Intel(R) Xeon(R) CRU (b 2.25GHz A CB 49,09 CB			

6. Select "IE Enhanced Security Configuration", set it to **Off** for administrators, and click **OK**.

interne	et Explorer Enhanced Security Configuration (IE ESC) reduces the re of your server to potential attacks from Web-based content.
interne default	t Explorer Enhanced Security Configuration is enabled by for Administrators and Users groups.
Adminis	strators:
0	On (Recommended)
۲	● off
Jsers:	
0	On (Recommended)
8	Ooff
More a	bout Internet Explorer Enhanced Security Configuration

- 7. If not already installed, and if desired for the simplest experience, install SQL Server Management Studio (SSMS).
- 8. Next, open a browser, and download the Actifio Windows Connector (agent). Change the URL to the IP address of your Sky Appliance. It may be easier to download using http instead of https if you receive any security warnings or the download is being blocked. Click on the Windows Connector, and select **Run**.

STEM & NETWORK MANAGEMENT	CONNECTORS	
System & Network Management Login Page	Mindows Connector	Opployment guide
	AIX Connector	View all connectors
OCUMENTATION	HP-UX Connector	
Release Notes and Product Documentation via the Actifio NOW Website (Login Required)	Solaris Connector SPARC x86	
Download zipped Actifio Documentation Library	Linux Connector 32.Bit 64.Bit PPC	
	SNMP RESOURCES	
	MIB	

- 9. Select **Yes** to allow the installation to commence.
- 10. Select the option to install the "Actific Connector With Change Tracking Driver". This installs an additional Windows service that will track changes for databases larger than IGB in size.

Select the components you want to install, clear the components you do not want install. Click Next when you are ready to continue. Actific Connector Without Change Tracking Driver Actific Connector With Change Tracking Driver Actific Connector With Change Tracking Driver due to the need to can files to identify changed blocks.			
Actific Connector Without Change Tracking Driver Actific Connector Without Change Tracking Driver Actific Connector With Change Tracking Driver due to the need togican files to identify changed blocks.	ick Next when you are ready to continue.	you do not want	to
Actific Connector Without Change Tracking Driver Actific Connector With Change Tracking Driver due to the need togican files to identify changed blocks.	Connector Without Change Tracking Driver		~
due to the need to can files to identify changed blocks.	onnector Without Change Tracking Driver		
1	1		

- 11. Click **Next** and agree to install the connector in the default location.
- 12. Click Install to let the installation commence, and Finish when done.
- 13. Open the Services control panel and confirm there are two Actifio services running. If not then reinstall the Actifio Connector making sure to enable Change Block Tracking.

Services File Action View	Help					
Services (Local)	Services (Local)					
	Select an item to view its description.	Alexander Contraction of Contractio	2iptim	C1.1	Startup Type	Log On As
		Actifio Activity Monitoring Service	This Actifio Actifio Data	Running Running	Automatic Automatic	Local Syste Local Syste

- 14. Launch the Microsoft SQL Server Management Studio from the Start menu and connect to the local SQL instance.
- 15. There are two options available to obtain the proper permissions required to perform database recoveries, if you wish to avoid the need to enter credentials into the AGM interface at the time of recovery. The options are:
- OPTION A: Go to the SQL Instance Security, Logins menu. Right click on the "NT AUTHORITY\SYSTEM" account and select properties. Then in Server Roles, select the sysadmin Server Role, and click **OK**. This allows the Actific Connector the elevated rights to run Log Backups and Log Recoveries without requiring additional user authentication.

Login Properties NT AUTI	HORITY\SYSTEM		-		\times
Select a page	🖵 Script 👻 😮 Help				
Server Roles User Mapping Securables Status	Server role is used to grant server-wide security pri Server roles:	vileges to a user.			
	diskadmin processadmin processadmin public securityadmin serveradmin estypadmin				
Connection					
Server: MSSQL1					
Connection: MSSQL1\jeffoconnor					
₩ Mew connection properties					
Progress					
${\displaystyle \int_{0}^{0}} {e^{i \pi \phi}}_{0} \text{Ready}$					
		ОК		Car	icel

- OPTION B (three steps): Create a new Windows Administrator Account (Domain or Local OS) with these three steps a-c:
 - a. Verify or grant the account permissions as follows:
 - o Allow the following rights in SQL: dbcreator server role, db_backup operator database role, db_owner database role
 - o In addition, assign the following securables in SQL: View any database, Create any database, Alter any database, Connect SQL

Here is an example of some of the securables granted to a Local Windows User "sqladmin".



b. Next, the account should be in the local Windows administrator group, to ensure access to scripts in "C:\Program Files\Actifio\" and to make OS calls and handle the staging disks where backups will be stored.

Permete co	otel	Per	unto Davilitoro	Consisten Deefile	Die	d in
General	Memb	per Of	Profile	Environment	Ses	sion
Member of:						
Adminis	trators	-				
			Changes	to a user's group m	nembersh	a
Add	F	Remove	Changes are not el user logs	to a user's group m fective until the ne on.	nembersh	ip e
Add	F	Remove.	Changes are not el user logs	to a user's group m fective until the ne on.	nembersh st time th	ipe

c. Finally, update the "Actifio UDS Host Agent" service to run as this account, and restart the service.

Services File Action View	Help					-	×
♦ ♦ 🖂 	🗟 🛛 🔛 🖉 🖬 🖬 🖬 🖬						
Services (Local)	Name Actific Activity Monitoring Serv	Description This Actifio	Status Running	Startup Type Automatic	Log On As Local System		^
	Actifio UDS Host Agent	Actifio Data	Running	Automatic	.\sqladmin		
	Active V Installer / Aulast SVA	Drouider He		Dirabled	Local Surtem		

Add the Alternate Windows Target MS SQL VM to AGM

We need to add our Target host to Actifio, so that it can be accessed.

1. Go to the Manage, Hosts menu and click **Add Host**.

actifio	Dashboard		Backup & Recover +	Test	Data Management +	App	Manager +	SLA Architect -	Hanage +	Report	Monitor -			#	¥ 1	admin	٠	9
FILTER BY		Но	sts													1	ADO H	057
OST NAME																_		
filter by host name		4 Nide	fibers		0													
P ADDRESS	•				4										10	1 0		
Filter by IP address			NAME	•	FRIENDLY PATH	9	APPLIAN	CE 0	1P	0	TYPE	0	OS RELEASE	C	VIR	TUAL MA	CHINE	<u></u>
OS MELEASE	•		coe-linux-1		coe-linux-1		sky1		10.60.1.12		Generic		CentOS Linux releas	e7.9	No			
Enter OS Ske Linux			coe-linue-2		coe-linux-2		uky1		10.60.1.14		Generic		CentOS Linux releas	e7.5	No			
OS TYPE			coe-sql-1		coe-spi-1		skyf		10.60.1.9		Ceneric		Microsoft Windows	Ger	No			

2. Enter the Name and IP address (and click +) of your SQL Server VM. Then select your Sky appliance, and click **Add**.

Add Host						
Name *						
mssqQ.						
Friendly Name						
3P Address *	-					
-	0					
10.60.1.17	н					
Description						
Applances*						
type to see		Q,			SHOW SI	LECTED (1)
	ANCE		1P			
B skyt.			10.60.1.7			
Host Type						
CHENERIC	*					
 Application Dis 	covery Credentials					
	lings					
 Connector Sett 						

- 3. Now right click on the host, and select **Edit**.
- 4. Scroll down to the Discovered Applications section and click **Discover Applications** in the upper right corner.
- 5. When prompted, in Application Discovery, select All or just the appliance you added and click **Discover**. After about a minute, the discovered database instance will appear in the list. You can also refresh the display if required. Click **Save** to save your changes and exit the Host edit page.

									Dis	cover Ap	oplica	io
ype	to search C	λ			-		\rightarrow	đ	ш	25 🛩	Ω	4
	APPLICATION	٠	TEMPLATE	0	PROFILE	0	APPLIANCE	0	TYPE			
0	MSSQL2						sky1		SQL S	erver In	stanc	e
0	master						sky1		SQL S	erver D	ataba	se
0	model						sky1		SQL S	erver D	ataba	se
0	msdb						sky1		SQL S	erver D	ataba	se

Unmount and Delete a Mounted Database Image

To unmount a mounted database:

1. Go to the **App Manager**, **Active Mounts** page. Select the mount you wish to remove from the SQL instance, and then right click on the application and select **Unmount & Delete**.

actifio Das	hboan	6	Backup & Recover -	Test Data Management -	App Manager +	SLA Architect - Manage -	Report Monit	er -		т	1	dmin	• •	9
FILTER BY		Ac	tive Mounts											
MAGENAME	•	. 100	fitters											
search by image name	-		te jejirstv]	٩					SHOW SELECTED (1)	2	7. III	25 w	13	۸
Select: ALL NONE		8	APPLICATION	SOURCE HOST	MOUNTED HOST	CHILD APPLICATI	LABEL	IMAGE STATE	CONSISTENCY .	. 0	co	NSUME	D SIZE	t C
Clone		۵	MSSQL1	tissen 🖌	masel1.	DevORM	Test Mount	Mounted	2021-06-24 13:	32:50				
Prep Mount			MSSQL1	mssql1	mssql2	TestCRM	Mount to other hos	Migrate	2021-06-24 13:	32:50	0			
Remote Mount								Unmount	1.1					
Testfollover								Unmount & Dele	ete					
Cilippini								and the second se	and the owner water of t					

2. From this menu below, you can click **Submit**, and the database will be removed from the running SQL instance.

If your account does not have enough privileges with SQL, then this job may fail. If that occurs, you will need to use SQL Studio to manually delete the database from SQL Server. Once that has been successfully completed, you can re-try the Unmount-Delete, and select the Force Unmount option. This will result in the Actifio presented disk(s) being removed from the server without warning SQL Server first.

Note: Force Unmount should never be used when unmounting a database that is known to a running instance of SQL Server as it can cause performance and stability issues.

actifio	Dashboard	Backup & Recover + Test Data Management + App Manager + SLA Architect + Manage + Report Monitor +	🝸 1 admin 🌲 😧
() 2021-04 mapped	6-24 13:32:50 d image	Unmount & Delete	
NAME IN	nage_0016574	Are you sure you want to unmount and delete Image_0016574?	
APPLICATION M	ISSQL1	Image name: Image_0016374	
MOUNTED M HOST	tipet	Mounted Host: mssql1	
APPLIANCE SA	kg1	Force Unmount?	
MAGE STATE M	lapped	(This may be used to unmount a disk where the filesystem is currently in use, we are unable to reach the hest	
LABEL TR	est Mount	or connector, or the host/wm on which the volume is mounted no longer exists)	
CHILD DA	evCRM	Carcel Subme	

After a short period of time, you can check the SQL instance, and the database should be removed.

Using the Mount & Migrate Feature

Mount & Migrate is a very valuable feature for DBA's, as it allows you to get access to a database quickly via the mount operation as above, and then restore the database while it is running, with a small interruption at a later time to switch from the mounted disks to the server's attached disks.

1. To initiate a Migrate for a database, go to the **App Manager**, **Active Mounts** page, right click on the database and select **Migrate**.

actifio	Dashboar	d i	Backup & Recover -	Test Data Management +	App Manager -	SLA Architect -	Manage -	Report P	lonitor ·			T	1 admir	•	0
FILTER BY		Acl	tive Mounts												
IMAGE NAME	•														
search by image name		+ Nide	ta search	Q,							SHOW SELECTED (1)	2	111 2	*	0 A
SOURCE ACTION		0		SOURCE HOST	MOUNTED HOST	CHILD APP	LICATI	LABEL	0	IMAGE STATE	CONSISTENCY	. 0	CONSU	MED	SIZE (
Clone		8	MS5QL1	mssalt.	massal2	TestORM		Mount to other	host	Mounted	2021-06-24 13:	32:50	8		
Prep Mount Remote Mount Restore Testfallover				1		Migrate Jomount Jomount & Delet									

2. Select the Frequency, which is the duration in hours between incremental refreshes of the mounted database to the server's attached disks. This process will repeat until the final switchover is done. Additionally you can configure the copy thread count (between 1-20), and optionally select the new file and folder location for the restored copy. Click Submit to start the process.

ctifio	Dashboard	Backup & Recover -	Test Data Management +	App Manag	sLA Architect -	Mana	ge - Report	Monitor -
ACCESS	- 0 /	455QL1 mssql1 ms	sql1 Details & Settings	-	20-			
() 2021 Snat	1-06-24 13:32:3 shot image	ю	Migrate	_				
NAME STATUS TRANSPORT IMAGE SZE EXPIRES ON APPLIANCE RECOVER RECOVER RANCE LABEL CATALOG STATE POOL NAME	Image_0016211 Available SAN Based, Ou Storage 59.86GB 2021-07-01 13: SQL Server 201 (15.0.4123.1) Sky1 06-24.13.32 To Initial Backup None Act_per_pool0	6 5-C/FBand 34:05 9 06-24 15:00 20	PREQUENCY REPARS TO MATCH! REPARS TO MATCH! DATABASE TO MATCH! COPY THERAD COUNT File Locations Select File Desting Copy files to the sam Copy files to the	Ation For M e drive/path as icons at the volu	grated Files.	IVER ()		
	lount		type to search		Q			
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MOUNTED	mssql2		CRM_log.ldf		C\Program Files\Micros	oft 5	C\DATA	
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- 3. During the migrate job the database will still be running as a mounted database hosted from the Snapshot pool in the Data Mover / Sky Appliance. When the first migrate job is complete, a locally restored copy of the SQL Database and Log files will be present on the target SQL server.
- 4. To verify this, run the following Query in Microsoft SQL Server Management Studio.

```
USE master;
SELECT name 'Logical Name', physical_name 'File Location'
FROM sys.master_files
The result should look like below, where the database files are running from the Actifio mounted
disk.
```

	Logical Name	File Location
	Logical Name	
1	master	C:\Program Files\Microsoft SQL Server\MSSQL15.MSSQLSERVER\MSSQL\DATA\master.mdf
2	mastlog	C:\Program Files\Microsoft SQL Server\MSSQL15.MSSQLSERVER\MSSQL\DATA\mastlog.ldf
3	tempdev	C:\Program Files\Microsoft SQL Server\MSSQL15.MSSQLSERVER\MSSQL\DATA\tempdb.mdf
4	templog	C:\Program Files\Microsoft SQL Server\MSSQL15.MSSQLSERVER\MSSQL\DATA\templog.ldf
5	temp2	C:\Program Files\Microsoft SQL Server\MSSQL15.MSSQLSERVER\MSSQL\DATA\tempdb_mssql_2.ndf
6	temp3	C:\Program Files\Microsoft SQL Server\MSSQL15.MSSQLSERVER\MSSQL\DATA\tempdb_mssql_3.ndf
7	temp4	C:\Program Files\Microsoft SQL Server\MSSQL15.MSSQLSERVER\MSSQL\DATA\tempdb_mssql_4.ndf
8	modeldev	C:\Program Files\Microsoft SQL Server\MSSQL15.MSSQLSERVER\MSSQL\DATA\model.mdf
9	modellog	C:\Program Files\Microsoft SQL Server\MSSQL15.MSSQLSERVER\MSSQL\DATA\modellog.ldf
10	MSDBData	C:\Program Files\Microsoft SQL Server\MSSQL15.MSSQLSERVER\MSSQL\DATA\MSDBData.mdf
11	MSDBLog	C:\Program Eleo\Mismool SOL Server\MSSOL15 MSSOL9EP\/EP\/ASSOL\DATA\MSDPLeo1#
12	CRM	Z:\Program Files\Microsoft SQL Server\MSSQL15.MSSQLSERVER\MSSQL\DATA\CRM.mdf
13	CRM log	Z:\Program Files\Microsoft SQL Server\MSSQL15.MSSQLSERVER\MSSQL\DATA\CRM_log.ldf

5. Now is a good time to make some changes to the mounted database. Run a "New Query" on the SQL database called TestCRM as below. This will update the last column for all customers to '0000'.

```
USE TestCRM
GO
UPDATE Customers
SET
Code = '0000'
WHERE
CustomersID > 0;
```

6. You can now verify this with the following query:

USE [TestCRM]
SELECT * from [Customers];

The results should look as follows:

	CustomersID	Name	Email	Company	Street	City	Zp	Country	Code
1	1	Hayden Hartman	alquet.Phasellus@Fuscealquam.net	Risus Corp.	118-8548 Elit St.	Cawdor	7799	Uruguay	0000
2	2	Iola Morin	Sed nec metus@mollisneccursus.com	Nunc Pulvinar Arcu Associates	Ap #260-2255 Cras Rd.	Cambridge Bay	366160	Tanzania	0000
3	3	Candice Lowery	tellus faucibus@justonecante.com	Semper Limited	P.O. Box 413, 7363 Lacus. Road	Ludwigsfelde	Z3378	Lesotho	0000
4	4	Roanna Butler	hendrent.Donec@lacusvestibulumlorem.com	Dignissim Lacus Associates	P.O. Box 362, 1068 ld Ave	Zona Bananera	20754	Belize	0000
5	5	lan Clay	primis in @vitaerisusDuis.co.uk	Dictum Placerat Limited	540-9946 Sem, Rd.	Bogaarden	1612	Curação	0000
6	6	Yeo Estrada	elefend.nunc@liberoProinsed.ca	Portitor Eros Ltd	6276 Consectetuer Road	Bradford	753279	Sudan	0000
7	7	Ariel Ayers	amet@leo.com	Morbi Accumsan Limited	8407 Fusce Rd.	Negrete	4821	Japan	0000
8	8	Erasmus Bryant	Curabitur.egestas@congue.com	At Institute	Ap #297-2194 A, St.	Killa Abdullah	19358	India	0000
9	9	Wynne Prince	nascetur@Donec.com	Magna Lorem Institute	Ap #987-3600 Nbh Rd.	Lourdes	6790	Puerto Rico	0000
10	10	Howard Hunt	natoque@dolorvitaedolor.com	Vel Limited	P.O. Box 482, 4991 Et St.	Yaroslavl	23795-69952	Ecuador	0000

7. Now we will finalize the migration. This will take the database offline, perform a final synch of the current data to the server's attached disks, switch SQL Server to reference the restored database files, and then bring the database back online. This is usually very quick, as it is only an incremental backup and recovery process. For many large databases this process can run less than 5 minutes depending on the rate of change. From the **App Manager**, **Active Mounts** page, select the database you want to finalize the migration for, and select **Finalize Migration**.

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8. Confirm the finalize task, and click the Proceed option.



 At the completion of the finalize task, the database will be switched to run from the local disk, with all changes intact. To verify this, run the following Query in Microsoft SQL Server Management Studio:

```
USE master;
SELECT name 'Logical Name', physical_name 'File Location'
FROM sys.master files
```

The result should look like below, where the database files are running from the local disk as requested.

	Results 📲 Me	isages					
	Logical Name	File Location					
1	master	C:\Program Files\Microsoft SQL Server\MSSQL15.MSS					
2	mastlog	C:\Program Files\Microsoft SQL Server\MSSQL15.MSS					
3	tempdev	C:\Program Files\Microsoft SQL Server\MSSQL15.MSS					
4	templog	C:\Program Files\Microsoft SQL Server\MSSQL15.MSS					
5	temp2	C:\Program Files\Microsoft SQL Server\MSSQL15.MSS					
6	temp3	C:\Program Files\Microsoft SQL Server\MSSQL15.MSS					
7	temp4	C:\Program Files\Microsoft SQL Server\MSSQL15.MSS					
8	modeldev	C:\Program Files\Microsoft SQL Server\MSSQL15.MSS					
9	modellog	C:\Program Files\Microsoft SQL Server\MSSQL15.MSS					
10	MSDBData	C:\Program Files\Microsoft SQL Server\MSSQL15.MSS					
11	MSDBLog	C:\Program Files\Microsoft SQL Server\MSSQL15.MSS					
12	TestCRM	C:\LOGS\TestCRM.mdf					
13	TestCRM log	C:\DATA\TestCRM log.ldf					

10. Lastly let's confirm the changes have been written to our local running database. You can now verify this with the following query:

USE [TestCRM] SELECT * from [Customers]; The results should look as follows:

	CustomersID	Name	Email	Company	Street	City	Zp	Country	Code
1	1	Hayden Hartman	alquet.Phasellus@Fuscealiquam.net	Risus Corp.	118-8548 Elit St.	Cawdor	7799	Uruguay	0000
2	2	Iola Morin	Sed nec metus@mollisneccursus.com	Nunc Pulvinar Arcu Associates	Ap #260-2255 Cras Rd.	Cambridge Bay	366160	Tanzania	0000
3	3	Candice Lowery	tellus faucibus@ustonecante.com	Semper Limited	P.O. Box 413, 7363 Lacus. Road	Ludwigsfelde	Z3378	Lesotho	0000
1	4	Roanna Butler	hendrent Donec@lacusvestibulumlorem.com	Dignissim Lacus Associates	P.O. Box 362, 1068 ld Ave	Zona Bananera	20754	Belize	0000
5	5	lan Clay	primis in @vitaerisusDuis.co.uk	Dictum Placerat Limited	540-9946 Sem, Rd.	Bogaarden	1612	Curação	0000
6	6	Yeo Estrada	elefend nunc@lberoProinsed.ca	Portitor Eros Ltd	6276 Consectetuer Road	Bradford	753279	Sudan	0000
7	7	Ariel Ayers	amet@leo.com	Morbi Accumsan Limited	8407 Fusce Rd.	Negrete	4821	Japan	0000
8	8	Erasmus Bryant	Curabitur.egestas@congue.com	At Institute	Ap #297-2194 A. St.	Kila Abdullah	19358	India	0000
9	9	Wynne Prince	nascetur@Donec.com	Magna Lorem Institute	Ap #987-3600 Nbh Rd.	Lourdes	6790	Puerto Rico	0000
10	10	Howard Hunt	natoque@dolorvitaedolor.com	Vel Limited	P.O. Box 482, 4991 E St.	Yaroslavl	23795-69952	Ecuador	0000

Finally, Actifio will also clean up the previous mounted disks as part of the finalize task, so there is no need to clean up, this was taken care of for you.