PostgreSQL DBA's Guide to Actifio Copy Data Management

Updated August 24, 2022





Actifio VDP 10.0

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1 Introducing Actifio VDP for PostgreSQL Databases

Actifio Data Virtualization

An Actifio appliance is a highly scalable copy data management platform that virtualizes application data to improve the resiliency, agility, and cloud mobility of your business. It works by virtualizing data in much the same way other technologies have virtualized servers and networks. This enables you to capture data from production systems, manage it in the most efficient way possible, and use virtual copies of the data however they are needed.

PostgreSQL is a powerful, open source object-relational database system that uses and extends the SQL language combined with many features that safely store and scale the most complicated data workloads. The origins of PostgreSQL date back to 1986 as part of the POSTGRES project at the University of California at Berkeley and has more than 30 years of active development on the core platform.

PostgreSQL backup API used by Actifio

Linux CBT and LVM snapshot: Postgres "pg_start_backup(<label>)" and "pg_stop_backup()" API with Linux CBT and LVM snapshot

File-based backups: PostgreSQL "pg_dump" File-based backups API

This provides the full backup of the database in backup format. Recovery API restore db will recover the database by physically overwriting the data area

PostgreSQL log backup: During a log backup we physically copy all the PostgreSQL WALs (WriteAheadLog). To purge logs, we use the OS level command. (find \$WALS_LOC -type f -mtime +\$DELLOG -print -exec rm -f {} \;)



Data Capture

Actifio connector has CBT which keeps track of changed blocks in Postgre	eSQL database data area
Connector call PostgreSQL "pg_start_backup()" command before LVM sn	napshot
Connector creates LVM snapshot of PostgreSQL database data area and sy	nthesize a bitmap
Connector call PostgreSQL "pg_stop_backup()" command and copies cha	nged blocks
Connector deletes LVM snapshot and catalogs backup	
Sky issues an internal snapshot and synthesize point-in-time virtual full	
Data Recovery	
For recovery Actific instantly mounts re-writable staging disk & brings D	B online

How it Works: PostgreSQL with Linux CBT and LVM Snapshot



How it Works: PostgreSQL with File-Based Traditional Backup

2 Preparing the PostgreSQL Database

Prerequisites

For best results, create a backup user with the 'superuser' and 'Replication' privileges.

To create the backup user:

create user actuser;
alter user actuser with superuser;
alter user actuser with Replication;

- If there are multiple PostgreSQL instances running on a server, then the backup username (and password if required) must be common for all PostgreSQL instances running on that server.
- PostgreSQL archive mode (archive_mode) must be set to ON to take log backup. To configure the archive log mode option, update the postgresql.conf file in the data director of the instance and reload the postgres.

archive_mode = on
pg_ctl reload -D <datadir>

Adding a PostgreSQL Database Host and Discovering the Instances and Databases

Before you can protect a PostgreSQL database, you must add the host and discover the database. This requires:

- 1. Adding the Host from Manage Hosts on page 3
- 2. Discovering the PostgreSQL Database Application from the Application Manager on page 6
- 3. Finding the Discovered PostgreSQL Instances and Databases in the Application Manager on page 6

Adding the Host from Manage Hosts

Add the host to AGM. If the host is already added then edit the host and make sure to set all the configurations correctly.

1. From the AGM Manage tab, select Hosts and click +Add Host.

actifio	Dashboa	rđ	Backup & Recover 🗸	over 🗸 🔰 Test Data Management		App Manager 🗸 SLA Architect 🗸		Manage 🗸	Report	Monitor 🗸	or ~			👤 admin 🌲 📀	
FILTER BY	Î	Но	sts												+ ADD HOST
HOST NAME	•														
filter by host name		• hide	filters												
IP ADDRESS	•				Q										
filter by IP address			NAME	٥	FRIENDLY PATH	٥	APPLIANCE	0	IP	0	TYPE	0	OS RELEASE	٥	VIRTUAL MACHINE
OS RELEASE	•		Remote_29		Remote_29		postgres-targe	et	172.27.56.29		Generic		Red Hat Enterprise L	.in	No

2. On the Add Host page:

- a. Name: Provide the PostgreSQL database server name.
- b. IP Address: Provide the PostgreSQL database server IP and click the + sign to the right.
- c. Appliances: Select the check box for the appliance that will protect the host.
- d. Host Type: Make sure this is **Generic**.
- e. In Application Discovery Credentials, provide the credentials to discover the PostgreSQL instances and databases.
- f. At the bottom of the page, click **Add** to add the host.

actifio	Dashboard	Backup & Recover 🗸	Test Data Management 🛩	App Manager 🗸	SLA Architect 🗸	Manage 🛩	Report	Monitor 🗸	
Add Host									
Name myhost									
Friendly Name	,								
IP Address *		\frown							
		0							
192.168.18.	181								
Description									
Appliances*		0							
	IANCE	ų			IP				SHOW SELECTED (1)
Ø sky10	02-remote				172.17.205.181				
sky10)2-esp-rajesh				172.27.63.98				
Host Type		_							
Generic		~							
 Application Di 	scovery Crede	ntials							
User Name									
Paraword									

The Host will be added to the selected Actifio Appliance and managed from AGM.

- 3. On then next screen (Edit Host page), select the disk preference:
 - o For block-based backup with CBT, select **Block**
 - o For file-based backup with Full+Incremental file system backup: select Block or NFS

Ξ	APPLIANCE	IP
-		470.47.005.00
<u>ц</u>	postgres-target	172.17.205.89
	skypostgres	172.17.205.86
ost Ty	/pe	
ost Ty Sener	/pe	
ost Ty Gener	vpe nic ~	
ost Ty Gener	vpe nic ~	
ost Ty Gener	ype nc ~ g Disk Format	
aging	g Disk Format	
ost Ty Gener aging Block	ype nc ~ g Disk Format	

4. In Application Discovery Credentials, enter the username/password that you set up in Prerequisites on page 3.

Host Type				
Geniric	*			
Staging Disk Format				
Block	v			
Enable Auto Discovery				
2 22212 22 2				
Use Oracle Database Authenti	scation			
	Must be enabled for hosts ru	nning Microsoft Windows.		
Ports				
Application Discovery Creder	ntials			
100000000				
User Name				
accuser				
Password				
Password Filepath				
Connector Settings				
treasure and the second second				
 Discovered Applications 				
 Discovered Applications 				
Discovered Applications Organizations				
Discovered Applications Organizations				a constant

5. Click **Save** at the bottom of the page.

Discovering the PostgreSQL Database Application from the Application Manager

To discover PostgreSQL instances and databases:

1. From the AGM App Manager, Applications tab, select **Add Application** in the upper right corner.

actifio	Dashboa	ard	Backup	o & Recover →	Test Data I	Management 🗸	App Man	ager 🖌	SLA Architect 🗸	Manage 🗸	Report	Monitor 🗸				🕈 👤 ədmin	4 💡
🙁 clear all filters	j	Ap	oplic	ations												+ ADD APP	LICATION
APPLICATION NAME	•																
HOST NAME	•	< hk	de filters	O Application Typ	e: POSTGR	RESQL Instance											
TEMPLATE NAME	•					0										III. 25 ×	n 4
PROFILE NAME	•					~											L.J 168
FRIENDLY PATH	•			APPLICATION	٥	TEMPLATE	0	PROFILE	E Ô	FRIENDLY PAT	н 🗘	HOST NAME	0	APPLIANCE	0	TYPE	0
SLA STATUS	•			postaresal 600	1					postares 29		postares 29		skypostares		POSTGRESOL	stance 🌰
		-		postg. csq000						posigres_Es		postgres_co		skyposegres		rostatesqui	istance
Unmanaged			0	postgresql_600	4					Remote_29		Remote_29		postgres-target		POSTGRESQL In	nstance

2. On the Add Application page, select PostgreSQL, then follow the wizard.

actific	O Dashb	oard	Backup & Recover 🗸	Test Data Management 🗸	App Manager 🗸	SLA Architect 🗸	Manage 🗸	Report Monitor -		🝸 👤 admin 🌲 😧	
			Tip: Hove	Sele	ect the type of mation. To learn how	of application	n you wish l emand backup for	to add an already protected application	on click here.		
	Servers & Ap (Connectors	olicatio	Db2	MorioD8 MariaD8	MongoDB	Mysql	ORACLE	PostgreSQL	Generic Apps	Consistency Groups	
			SAP AS	E SAP HANA	SAP IQ	SAP MaxDB	SQL Server		All Apps		
	Hyp and Cloud Ir	erviso Istance	rs vmware es vMware	Hyper-V	aws	GCP					

This will run the discovery on the PostgreSQL database host and will discover all PostgreSQL databases running on it.

Finding the Discovered PostgreSQL Instances and Databases in the Application Manager

To find the newly-discovered instances and databases, go to the AGM App Manager Applications tab. All applications known to the AGM of all types are listed. Use the Type application filter on the left pane to show only PostgreSQL databases and instances.

The new PostgreSQL databases will appear in the list as unmanaged (the red shield icon).

actifio	Dashboa	rd	Backu	ip & Recover → 1	est Data	a Management 🗸	App Man	ager 🖌 🛛 S	iLA Architect 🗸	Manage 🗸	Report	Monitor -				🝸 👤 admin		9
🙁 clear all filters	Î	Ap	plic	ations												+ ADD A	PPLICAT	ION
APPLICATION NAME	•																	
HOST NAME	•	< hid	e filters	Application Typ	POSTO	GRESQL Instance												
TEMPLATE NAME	•					Q										111 25	v 0	*
PROFILE NAME	- • I																	-
FRIENDLY PATH	•			APPLICATION	٥	TEMPLATE	\$	PROFILE	0	FRIENDLY PA	гн 🗘	HOST NAME	0	APPLIANCE	0	TYPE		٥
SLA STATUS	•		0	postgresql_6004						postgres 29		postgres 29		skypostgres		POSTGRESQL	Instance	e ^
Managed		_	1.		_													_
Unmanaged			0	postgresql_6004	J					Remote_29		Remote_29		postgres-target		POSTGRESQL	Instance	e
	_			postaresal 6010		postares pura	e	onval auto	oprofile 11	postores 29		postares 29		skypostares		POSTGRESOL	Instance	p
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3 Configuring the Backup Method for a PostgreSQL Instance

After the instance is prepared and discovered as explained in Chapter 2, Preparing the PostgreSQL Database, you can configure a VDP backup method SLA for it. The procedures for developing SLAs are detailed in the AGM online help. This chapter provides information relevant to the PostgreSQL DBA.

You can capture PostgreSQL instances, with database inclusion and protection rules. After you capture the instance, you can mount individual databases and capture them for management.

You can back up an instance:

- Using Block-Based LVM Snapshots with CBT on Linux on page 7
- Using File-Based Traditional Backups on page 8

Protection is set for the entire PostgreSQL Instance. You can include/exclude specific databases during the process using a Database Inclusion Rule from the Manage SLA page.

Using Block-Based LVM Snapshots with CBT on Linux

This takes advantage of Actifio changed-block tracking through the Actifio Connector for faster backups and recoveries. Actifio takes one full backup, and then backs up only the changed data blocks afterward.



How it Works: PostgreSQL with Linux CBT and LVM Snapshot

Using File-Based Traditional Backups

These are full (dump based) backups. They are larger and thus take more time and storage than the volume-based backups with CBT.



How it Works: PostgreSQL with File-Based Traditional Backup

Whichever method you select involves these steps:

Configuring Application Details & Settings on page 9 Ensuring that the Backup Capture Method is Set Correctly on page 11 Ensuring that the Staging Disk Format on the Host is Set Correctly on page 12

Configuring Application Details & Settings

Table 1: Application Details & Settings

Setting	Block-Based LVM Snapshot with CBT on Linux	File-Based Backup and Recovery, Block <i>or</i> NFS						
Use Staging Disk Granularity as Minimum Staging Disk Size	For applications that are under the size of granularity setting that tend to periodically grow this new option is useful to avoid frequent costly FULL back Because the staging disk is thin provisioned, there is no initial cost to use a sto disk that is larger than required for immediate use. The values are 0 for No and the Staging Disk Granularity setting for Yes.							
Staging Disk Granularity	Maximum size of each staging disk when multiple staging disks are used for application. The default value is 1000GB.							
Last Staging Disk Minimum Size	Minimum size of the last staging c staging disks. This value is also use accommodate growth. The defau	lisk created for an application with multiple ed for additional disks allocated to It value is 250GB.						

Table 1: Application Details & Settings

Setting	Block-Based LVM Snapshot with CBT on Linux	File-Based Backup and Recovery, Block <i>or</i> NFS
Connector Options	Use this only under the direction c	of Actifio Support.
Percentage of Reserve Space in Volume Group	20% is recommended for LVM snapshot temporary space. Not applicable for protecting virtual databases.	Not applicable
Backup Capture Method	Use volume level backup	Use full+incremental filesystem backup
Force Full Filesystem Backup	Not applicable (PostgreSQL alway	rs takes a full backup)
Database Filesystem Staging Disk Size in GB	Not applicable	Size of the database dump staging disk in GB. The default value is 100GB.
Log Backup Staging Disk Size in GB	The default value is ((daily log generation * retention of log backup SLA) plus 20% buffer). Default is recommended. Providing a value overrides the default. This becomes a fixed size and the log disk will no longer grow dynamically.	Not applicable
Retention of Production DB Logs in Days	This value is used to purge the log Based on this setting the last data - the # days set) and the log will b value is 0 days. With default value	backup from basepath_logbackup destination. backup id will be selected (CURRENT_TIMESTAMP, be purged older than the data backup id. Default all logs prior to last data backup will be purged.
Script Timeout	The timeout value is applied to int connector. The default value is rea	ernal backup and recovery scripts called by commended.

Ensuring that the Backup Capture Method is Set Correctly

Backup capture settings depend upon the backup capture method that you need. It is important to be certain that you have set the right backup method for your needs:

1. In the App Manager, Applications list, right-click the database and select **Manage SLA**.

actifio	Dashboar	d I	Backup	a Recover	👻 Test Data	a Management 🗸	Арр Ма	nager 🗸	SLA Architect 🗸	Manage 🗸	Report	Monitor 🗸				Y 👤 admin	≜ 9
elear all filters	Î	Ap	plica	ations												+ ADD API	PLICATION
APPLICATION NAME	•																
HOST NAME	•	< hide	efilters	O Applica	tion Type: POST	GRESQL Instance											
TEMPLATE NAME	•					0								C SHOW SEL	ECTED (1)	111 25 -	
PROFILE NAME	•	-77				-											C7 88
FRIENDLY PATH	•	Ξ		APPLICA	TION Ĉ	TEMPLATE	\diamond	PROFILE	0	FRIENDLY PA	тн ்	HOST NAME	\diamond	APPLIANCE	\diamond	TYPE	0
SLA STATUS	•		0	postgres	ol_6004					Remote_29		Remote_29		postgres-target		POSTGRESQL	nstance 🍵
Managed Unmanaged			0	postgre	Manage SL4	λ				postgres_29		postgres_29		skypostgres		POSTGRESQL I	nstance
ТУРЕ	•		۲	postgre	Access					postgres_29		postgres_29		skypostgres		POSTGRESQL I	nstance
Select: ALL NONE			0	postgre	Edit Örgania	zation Members	hip	LocalProf	ile	postgres_39		postgres_39		skypostgres		POSTGRESQL I	nstance
Systems		-	-		Manage Exp	aracions											

2. At the top of the Manage SLA page, select the **Details & Settings** link:

actifio	Dashboard	Backup & Recover 🗸	Test Data Management 🗸	App Manager 🖌 🛛 S	LA Architect 🗸	Manage 🗸	Report	Monitor 🗸	Ţ	👤 admin	A 8
🖨 MANAGE SLA	• •	postgresql_6010 post	gres_29 postgres_29	ils & Settings							
TEMPLATE post	lgres_purge		PROFILE onval_auto	profile_117466	•	Pol	licy Override	s Apply •			
Database Inc	clusion Rule		skypostgres				(○ Policies			
									-		

This opens the details and settings for this database. Check the Backup Capture Method:

- o LVM Snapshot with Change Block Tracking: Use volume level backup
- o Traditional Backup and Recovery API "file-based" backups: Use full+incremental backup

Note: System databases on a root partition can be backed up as LVM Snapshots and later mounted as virtual databases, but they cannot be used in a traditional Restore operation, as the root partition cannot be unmounted. This will need manual restore and recovery from a simple mount back to the same host.

TEMPLATE Choose a template	Application Details & Settin	ngs	• Settings Help	2
	Settings		Reset All to Default	î
Database Inclusion Rule	CONNECTOR OPTIONS			
RULE: All Databases	PERCENTAGE OF RESERVE SPACE IN VOLUME GROUP	20		
DATABASES INCLUDED 0 DATABASES EXCLUDED 0	BACKUP CAPTURE METHOD	 Use volume level backup Use full+incremental backup 	Reset to Default	
ALLIABLE DAVABASES 3	FORCE FULL FILESYSTEM BACKUP	🔘 Yes 🖲 No		1
Edic	DATABASE FILESYSTEM STAGING DISK SIZE IN GB			1
	LOG BACKUP STAGING DISK SIZE IN GB			
	RETENTION OF PRODUCTION DB LOGS IN DAYS			l
	SCRIPT TIMEOUT	172800		1

3. Click **Save** at the bottom of the page if you had to change anything.

Ensuring that the Staging Disk Format on the Host is Set Correctly

To set staging disk format for storage snapshots:

1. From the Manage, Hosts list, right-click the host and select **Edit**.

actifio	Dashboa	rđ	Backup & Recov	ver 🗸 🛛 Test	: Data Management 🗸	Арр	Manager 🗸	SLA Architect	Manage 🗸	Report	Monitor 🗸			Y	👤 admin	≜ 0
FILTER BY	Î	Но	osts												+	ADD HOST
HOST NAME	•															
filter by host name		e hid	le filters tgres		O								SHOW SELECTED (1)	ß	f 25 v	0 1
IP ADDRESS	•	<u> </u>						-								
filter by IP address			NAME	0	FRIENDLY PATH	Ŷ	APPLIANC	E 🖓	IP	Ŷ	TYPE	Ŷ	OS RELEASE		VIRTUAL MA	CHINE
OS RELEASE	•		postgres_29		postgres_29		sky102-esp	⊢rajesh	172.27.56.29		Generic		Red Hat Enterprise Lin	. 1	No	
Enter OS like Linux				Edit												
OS TYPE	•			Edit Orga	nizations											
Enter OS like Linux				Delete												
ТҮРЕ	•															

This opens the details and settings for this database. Check the Backup Capture Method:

- o LVM Snapshot with Change Block Tracking: Block
- o Traditional Backup and Recovery API "file-based" backups: NFS or Block
- 2. Set Staging Disk Format to **Block**.

OCTIFIO Dashboard B	iackup & Recover 🖌 🛛 Test Data Manage	ment 🗸 🗛	p Manager 🗸	SLA Architect 🗸	Manage 🗸	Report	Monitor 🗸	T 1
OS VERSION 2.0.32-090.8003	K80_04	Prie	noty Name					
STAGING DISK BLOCK FORMAT		IP A	ddress .*					
		19	2.168.18.181	O				
		Des	cription					
		App	liances *					
		ty	pe to search		۹			
		E	APPLIANC	E			IP	
] postgres-ta	arget			172.17.205.89	
] skypostgre	S			172.17.205.86	
		Hos	t Type					
		Ge	neric	~				
		Stag	ing Disk Format					
		Bio	ock ock	~				
		NF Enal	S ble Auto Discove		J			

3. Then click **Save** at the bottom of the page.

4 Protecting a PostgreSQL Instance and its Databases and Logs

After the SLA is configured as detailed in Chapter 3, Configuring the Backup Method for a PostgreSQL Instance, you can configure a VDP backup method for the database.

Protection is set for the entire PostgreSQL Instance. You can include/exclude specific databases during the process using a Database Inclusion Rule from the Manage SLA page.

This chapter includes:

Protecting a PostgreSQL Instance on page 13 Protecting PostgreSQL Database Logs on page 15

Protecting a PostgreSQL Instance

To protect the instance:

1. From the App Manager, Applications list, right-click the instance and select Manage SLA.

actifio	Dashboa	ırd	Backu	ip & Recove	er 🕶 Te	ist Data	Management 🗸	App Ma	nager 🗸	SLA Architect 🗸	Manage 🗸	Report	Monitor -				▼ 👤 admin	≜ 9
🙁 clear all filters	Í	A	pplic	ations	5												+ ADD AP	PLICATION
APPLICATION NAME	•																	
HOST NAME	•	< h	de filter	O Appli	ication Type:	POSTG	RESQL Instance											
TEMPLATE NAME	•						0								C SHOW SELE	TED (1)	111 25 •	v 12 ±
PROFILE NAME	•						-											C 2 800
FRIENDLY PATH	•			APPLIC	ATION	٢	TEMPLATE	0	PROFILI	e û	FRIENDLY PAT	н 🗘	HOST NAME	0	APPLIANCE	0	TYPE	0
SLA STATUS	•		0	postgre	sh[_6004						Remote_29		Remote_29		postgres-target		POSTGRESQL	Instance
Managed Unmanaged			8	postgre	Manag	ge SLA					postgres_29		postgres_29		skypostgres		POSTGRESQL	Instance
туре	•		8	postgre	Access	s					postgres_29		postgres_29		skypostgres		POSTGRESQL	Instance





3. On the Apply SLA page, make sure that the backup capture method matches the type of backup set in Chapter 3, Configuring the Backup Method for a PostgreSQL Instance. Click **Apply SLA** or **Save Changes**.

OCTIFIO Dashboard Backup & Recover +	Test Data Management 🗸 App Ma	anager + SLA Architect + Manage	e 🔶 Report - Monitor 🗸	
C (MANAGESLA) Dostgresql_6004 Rem	nte 29 il Remote 29 Betalls & Setting	16		
TEMPLATE Choose a template	Application Details & Setti	ngs	Settings Help	
	Settings		Reset All to Default	
Database Inclusion Rule	CONNECTOR OPTIONS			
RULE All Databases TOTAL DATABASES 3	PERCENTAGE OF RESERVE SPACE IN VOLUME GROUP	20		
DATABASES INCLUDED 0 DATABASES EXCLUDED 0 INCLUSED E DATABASES 1	BACKUP CAPTURE METHOD	 Use volume level backup Use full+incremental backup 	Reset to Default	
enclastic protocides (3	FORCE FULL FILESYSTEM BACKUP	🔘 Wes 🔘 No		
Edit	DATABASE FILESYSTEM STAGING DISK SIZE IN GB			
	LOG BACKUP STAGING DISK SIZE IN GB			
	RETENTION OF PRODUCTION DB LOGS IN DAYS			
	SCRIPT TIMEOUT	172800		
			Cancel Save Changes	

The database will be protected when the snapshot job runs according to the schedule in the template. After the first successful snapshot job the database appears in the App Manager with a green shield icon.

4. You can include or exclude specific databases during backup. From the App Manager, Applications list, select the PostgreSQL Instance. You can use the Instance checkbox to filter the list. Select **Manage SLA**.

actifio	Dashbo	oard	Backu	ıp & Recover 🗸	Test Data	Management 🗸	Арр Ма	nager 🖌 🛛 S	LA Architect 🗸	Manage 🗸	Report	Monitor 🗸				Y 👤 adı
🙁 clear all filter	s	Â	pplic	ations												+ AD
APPLICATION NAME	•															
HOST NAME	•		hide filter	O Application	Type: POSTG	RESQL Instance										
TEMPLATE NAME	•					Q								C SHOW SELE	CTED (1)	
PROFILE NAME	•					~										
FRIENDLY PATH	•	E	3	APPLICATIO	n 🗘	TEMPLATE	¢	PROFILE	Ô	FRIENDLY PAT	н 🗘	HOST NAME	0	APPLIANCE	\$	TYPE
SLA STATUS	-	E	1 関	postgres 1_6	004					Remote_29		Remote_29		postgres-target		POSTGRE
Managed Unmanaged			1 🕲	postgre M	anage SLA					postgres_29		postgres_29		skypostgres		POSTGRE
ТҮРЕ	-		1 😵	postgre A	ccess					postgres_29		postgres_29		skypostgres		POSTGRE
Select: ALL NONE			J 🙂	postgre	dit Organiz	ation Membersh	nip	LocalProfile	e	postgres_39		postgres_39		skypostgres		POSTGRE

5. Under Database Inclusion Rule on the left, click **Edit**. If you do not see the Database Inclusion settings, you have a database, not an instance.

OCTIFIO Dasht	oard Backup & Recover 🖌 Test Da	ta Management 🗸 🔋 App Manager 🗸	SLA Architect 🗸	Manage 🖌 🛛 Rep	ort Monitor -		🝸 👤 admi
C+ MANAGE SLA	Manage Membership						
Database Inclusio	Eligible Databases INCLUSION RULE: Include All Include All Instance. Databases Enclude Selected Instance. Databases Enclude Selected Instance. Databases Enclude Selected Instance Selected	the lif a policy template option will be included in	is applied to this DB2 n data capture (or	Ineligible Dat Ineligible databas Management for • The database in • The database in • The database in	abases es cannot be included in DB2 Instance one of the following reasons: a member of a consistency group as created by an app-avare mount		
RULE All DA TOTAL DATABASES 1	type to search)		DATABASES	0	
DATABASES INCLUDED 0 INELIGIBLE DATABASES 0	SYSTST						
Edit					No Databases Found		

6. Select an Inclusion Rule (Include All, Include Selected, or Exclude Selected) and then select the databases to include or exclude, then click **Save**.

Protecting PostgreSQL Database Logs

To enable PostgreSQL database log backup:

1. From the SLA Architect Templates list, right-click the template for PostgreSQL database protection and click **Edit**.

actifio	Dashboar	d	Backup & Recover 🗸 🛛 Te	ist Data Ma	nagement 🗸	App Manager 🗸	SLA Architect +	Manage	• Report	Monitor 🗸		Y 1
elear all filters		Те	mplates				\square					+ 0
TEMPLATE NAME												
postgres	0	< hide	Name: postgres									
DESCRIPTION											SHOW SELECTED (1)	8 III
Search by description		⊡	NAME		0	DESCRIPTION		٥	OVERRIDE		MANAGED BY AG	м
OVERRIDE		Ø	postgres_purge								Yes	
			postgres_stream	(Edit)		Yes		Yes	
			Snap_progres_skypostg	res	Clone				Yes		No	
			onvault_slt_409091_sky	postgres	Edit Org	anizations			Yes		No	

2. Click the arrow beside the Snapshot policy to open up the details, then select **Edit Policy**.

actifio	Dashboard	Backup & Recover 🗸	Test Data Management 🗸	App Manager 🗸	SLA Architect 🗸	Manage 🗸	Report	Monitor 🗸		🍸 👤 ad
TEMPLATE	postgres	_purge	ALLOW OVERRIDES ON	POLICY SETTINGS?	• YES O NO				Save Template	
DESCRIPTION	Descripti	ion								
								○ Policie	s	
			•		9		- (napshot 1		
		PRODU	CTION		AIRROR			SCHEDULING	Windowed	
		2	Ò					FREQUENCY TIME WINDOW	Everyday 19:00 to 07:00	
				>				REPEAT VALUE	Once per window 2 days	
		Q		O				POLICY ID	27493	
		Shap							Edit Policy	

3. Near the bottom of the Create/Edit Policy page, select **Advanced Policy Settings**.

actifio	Dashboard	Backup & Recover 🗸	Test Data Manag	ement 🗸 🛛 App Manag	er 👻 SLA Architect 🗸	Mana	ige 🗸 Report	Monitor 🗸	▼ 1 ac
			Production	n To Snapshot					
		Crea	te/Edit Policy						
		POL	ICY NAME*	Snap					
Q Poli	cies	SCH	EDULING	Windowed 💌					
Snapshot Snap SCHEDU FIREQUI TIME WIN REPEAT V EXPIRE A POLI	LING Windowed ENCY Everyday DOW 19:00 to 07:00 ALUE Once per wind FTER 2 days CY ID 27493	eres) dow	ON THESE DAYS EX EXCEPT NEXCE × WITHIN THIS WINDO RUN ONCE PER WIN EVERY	есухаух рум 19:00 то пром СО 24 С	07:00 Hour(s) 💌				
Direct to D	Edit P		AIN FOR	0 2 0 0	lay(s) 🔻				
Direct to O	nVault 0	SLA	COMPLIANCE	Default					
OnVault Re	plication 0	PRIC	DRITY	Medium 💌					
Dedup 0		(1865)							
Dedup DR		(7.5)			Advanced Policy Settings				
Mirror 0		(1.63)		_					

- 4. Set the log policy options (you will have to scroll to see them all):
 - o Enable Truncate/Purge log after backup.
 - o Set Enable Database Log Backup to Yes.
 - o For **RPO (Minutes)**, enter the desired frequency of log backup.
 - o Set Log Backup Retention Period (in Days) for point in time recovery.
 - o Set **Replicate Logs (Uses StreamSnap Technology)** to **Yes** if you want to enable StreamSnap replication of log backup to a DR site.
 - o Set Log Staging Disk Growth Size to a percent value that reflects your anticipated usage.

		Policy Settings	O Settings Help	.0.
			C example segring node period operation	*
	(c) ;	TRUNCATE/PURGE LOG AFTER BACKUP	O Do not truncate/purge log after backup Truncate/Purge log after backup	Reset to Default
	5	SKIP OFFLINE APPLICATIONS	 Fail backup when offline applications are found Skip offline applications during backup 	
Policies Snapshot Snap	-	MAP STAGING DISK TO ALL ESX HOSTS IN A CLUSTER	Map staging disk to E5x host for VM only Map staging disk to all E5x hosts in the duster Map staging disk to 2 E5x hosts in the cluster	
SCHEDULING Windowed FREQUENCY Everyday TIME WINDOW 19:00 to 07 REPEAT VALUE Once per w	00 Indow	NODE BACKUP PREFERENCE FOR SQL AVAILABILITY CROUP	Use Availability Group Backup Preferences Primary Node Secondary Node Only Prefer Secondary Node Any Node	
EXPIRE AFTER 2 days POLICY ID 27493		ALLOW MIGRATING FROM OUT-OF- BAND TO IN-BAND DATA MOVEMENT	O YES . NO	
	raidea	FORCE OUT-OF-BAND BACKUP	🔿 Yes 💿 No	
		BACKUP SQL SERVER USER LOGINS	🔾 Yes 💿 No	
		ENABLE DATABASE LOG BACKUP	• Yes () No	Reset to Default
		RPO (MINUTES) *	60	
Dedup 0	CLD	N		
		LOG BACKUP RETENTION PERIOD (IN	2	
	000	una aj		

- 5. Click Save Changes.
- 6. From the App Manager, Applications list, right-click the PostgreSQL Instance and select **Manage SLA**.
- 7. At the top of the screen, select **Details & Settings**.

actifio	Dashboard	Backup & Recover 🗸	Test Data Management 🗸	App Manager 🗸	SLA Architect 🗸	Manage 🗸	Report	Monitor 🗸	١	7 👤 admin	٨	?
😝 MANAGE SLA	• •	postgresql_6010 postg	res_29 postgres_29	ails & Settings								
TEMPLATE post	gres_purge		PROFILE onval_auto	oprofile_117466	•	Po	licy Override	s Apply •				
Database Inc	lusion Rule		skypostgres			_	\langle	Policies				

- 8. Set the **Retention of Production DB Logs in Days**. This value is used to purge the logs from the production destination. Based on this setting the log will be purged older then the # of days specified. Default value is 0 days. With the default value, all logs prior to last log backups are purged.
- 9. Click Save.

5 Restoring, Accessing, or Recovering a PostgreSQL Database

This section describes:

Mounting and Refreshing from Block-Based Volume Snapshot to a Target PostgreSQL Server as a Virtual Application on page 17

Restoring and Recovering a PostgreSQL Instance Back to the Source on page 20

- o Recovering from Block-Based Volume Snapshot with CBT on page 20
- o Recovering from a Full+Incremental Database Backup on page 22
- Mounting and Migrating a PostgreSQL Database for Near-Zero Downtime Recovery to the Source on page 23

Restoring PostgreSQL Databases to a New Target Using a Block-Based Volume Snapshot on page 24

Mounting and Migrating a PostgreSQL Database to a New Target on page 26 Unmount and Delete the Image on page 28

Mounting and Refreshing from Block-Based Volume Snapshot to a Target PostgreSQL Server as a Virtual Application

To mount the database image as a virtual application (an application aware mount) to a new target:

1. From the App Manager, Applications list, right-click the database and select Access.

actifio	Dashboa	rd	Backu	p & Recover 🗸	Test Dat	a Management 🗸	App Man	ager 🗸 🔵 SLA Archite	ect 🗸	Manage 🗸	Report	Monitor 🗸				🝸 👤 admin	A 8	
🙁 clear all filters	Î	Ap	plic	ations												+ ADD A	PLICATIO	м
APPLICATION NAME	•																	
HOST NAME	•	• hid	e filters	O Application	Type: POST	GRESQL Instance)											
TEMPLATE NAME	•	type				Q											25 🗸	±.
PROFILE NAME	•																	-
FRIENDLY PATH	•	Ξ		APPLICATIO	м ≎	TEMPLATE	0	PROFILE	0	FRIENDLY PATH	• •	HOST NAME	\diamond	APPLIANCE	\diamond	TYPE	\diamond	
SLA STATUS	•		0	postgresql_6	004					Remote_29		Remote_29		postgres-target		POSTGRESQL	Instance	^
Managed Unmanaged			0	postgresql_6	004					postgres_29		postgres_29		skypostgres		POSTGRESQL	Instance	I)
туре	•		8	postgresql_6	010					postgres_29		postgres_29		skypostgres		POSTGRESQL	Instance	
Select: ALL NONE		Ø	0	postgresql_6	018	DB_LOG				postgres_39		postgres_39		skypostgres		POSTGRESQL	Instance	
Systems AWS Instance			8	p Manage	SLA					postgres_29		postgres_29		skypostgres		POSTGRESQL	Instance	
GCP Instance			0	p Access			244_s	onval_autoprofile_4	8	postgres_29		postgres_29		skypostgres		POSTGRESQL	Instance	
Hyper-V VM System State			8	p Edit Or	ganization	Membership				Remote_29		Remote_29		postgres-target		POSTGRESQL	Instance	
VMware VM				Manage	e Expiratio	ons	2440 s	onval autoprofile 4	8	nostores 29		nostares 29		skunostores		POSTGRESOL	Instance	

Note: You can use the Managed SLA Status filter to show only protected databases.

2. Select a snapshot image and choose **Mount**.

actific	D Dashboard	Backup & Recover 🗸	Test Data Management 🗸	App Manager 🗸	SLA Architect 🗸	Manage 🗸	Report	Monitor 🗸	🝸 👤 admin 🌲 😧
ACCESS	- 0	postgresql_6108 pos	gres_29 postgres_29 D	etails & Settings					TIMELINE TABLE
Jump to: 🛗	2020-08-03								2020-08-03 16:16:32
	2020-08-01								Snapshot Image
2020-08-04	2020-08-02	 Available II 2020-08-03 2020-08-03 2020-08-03 	nages 5:52:05 act_per_pool000 6:16:32 act_per_pool000						NAME Image_0482794 IMAGE SIZE 22.00CB EXPIRES ON 2020 06 03 17:18:43 APPLIANCE Skypostgres RECOVERY 06-03 10:57 To 08-03 11:12 RANCE More Details
									Current Active Mounts (3) Hide
-									NAME_Image_0515532 MOUNTED_postgres_29 HOST
M 🛑	Spanshot	Dedun	Remote Dedup	Remote Snapshot	OnVault				IMAGE STATE Mounted
	andpanoc	Deadp	Remote Bedup	Remote phapshot	Olivadit				CHILD ncg APPLICATION
									-41 -4 1 2 3 b 1b
									Actions

- 3. On the Mount page, from Target, choose the desired target PostgreSQL server port number from the dropdown.
- 4. Select **Host or VM**, not Container.
- 5. Under Application Options, enable **Create New Virtual Application**.
- 6. At Included Databases, Select Items, choose one or more databases to virtualize:
 - o A single database will be managed as standalone virtual copy
 - o Multiple databases will be managed as a consistency group

OCTIFIO Dashboard Backup & Recover 🗸	Test Data Management 🗸 🛛 App Manager 🗸 SLA Architect 🗸 🤅 Manage 🗸	Report Monitor 🗸
ACCESS	res_29 postgres_29 Details & Settings	
2020-08-03 16-16-32 Snapshot Image		
NAME Image_0482794 IMAGE SIZE 22.00GB EXPIRES ON 2020-08-03 17:18:43 APPLIANCE Skypostgres	TARCET* LABEL	
RECOVERY 08-03 10:57 To 08-03 11:12 RANGE More Details	Application Options CREATE NEW VIRTUAL APPLICATION INCLUDED DATABASES	Database Options * are mandatory
Mount	type to search Q SELECT ITEMS	SHOW SELECTED (2)
	Ø db1 □ db3	Clear Database Options
		Clear Database Options
	NAME OF CONSISTENCY GROUP * POSTGRESQL TARGET SERVER PORT * POSTGRESQL TARGET SERVER HOME DIRECTORY * MANAGE NEW APPLICATION Advanced Options	HOST TIME USER TIME

- 7. Click **Database Options** for each selected database to specify a target database name for the new virtual copy.
- 8. Choose a target point in time for a database protected with log roll-forward.
- 9. Enter details for the new database/consistency group:

Name of Consistency Group: This option will appear if more than one database is selected. Provide a unique name to manage the selected databases as a virtual copy.

PostgreSQL Target Server Port: Enter an unused port number on the target server where the new PostgreSQL instance will be created for the new child databases.

PostgreSQL Target OS User Name: Enter the name of the operating system user on the target server where the new POSTGRESQL Instance will get created.

PostgreSQL Target Server Home Directory: Enter the path to the base directory where the configuration files for POSTGRESQL Instance on the target server are stored.

Manage New Application: To protect the new virtual database, click and enable Manage New Application. Choose a template and a resource profile to protect the database.

- 10. Use **Advanced Options** to enter credentials and location of the target database messages directory. These are optional.
 - PostgreSQL Target DB User Name and PostgreSQL Target DB Password: New credentials for the target PostgreSQL Instance that will be created. If you do not specify anything, empty database credentials will be used. By default, a password is not required to log in from the local system.
 - o For the **Directory Path**, enter the path to the messages directory for the PostgreSQL Instance on the target server.
 - o **Snatch Port by Stopping Existing Instance** specifies whether to stop the existing instance and snatch the port if the target port is already in use by an existing instance.
- 11. Under Mapping Options:
 - o **Storage Pool**: Select a local or external storage pool for the mounted database.
 - o Mount Location: Specify a target mount point to mount the new virtual database to.
- 12. Click Submit.

Restoring and Recovering a PostgreSQL Instance Back to the Source

Depending on how you protected the database, you need the procedure for:

Recovering from Block-Based Volume Snapshot with CBT on page 20 Recovering from a Full+Incremental Database Backup on page 22

Recovering from Block-Based Volume Snapshot with CBT

Use this procedure to restore and recover the source PostgreSQL instance. This procedure uses physical recovery of the source data area. With this method you can roll-forward protected logs to a point in time.

Note: System databases on a root partition backed up as LVM Snapshots can be mounted as virtual databases, but they cannot be used in a traditional Restore operation as the root partition cannot be unmounted. This will need manual restore and recovery from a simple mount back to the same host.

Note: To recover a block-based database image with less downtime for users, see Mounting and Migrating a PostgreSQL Database for Near-Zero Downtime Recovery to the Source on page 23.

To recover back to the source:

1. From the App Manager, Applications list right-click the protected instance and select Access.

Note: You can use the Managed SLA Status filter to show only protected instances.

actifio	Dashboar	d Back	ıp & Recover 🗸	Test Data	Management 🗸	App Mar	ager 🗸 🔵 SLA Archit	ect 🗸	Manage 🖌 🛛 R	eport	Monitor -			🍸 👤 admin	۹	
clear all filters	Î	Applic	ations											+ ADD AP	PLICATION	
APPLICATION NAME	•															
HOST NAME	•	 hide filter 	Application Ty	pe: POSTO	RESQL Instance)										
TEMPLATE NAME	•				Q										25 - 3	ī.
PROFILE NAME	- • I															-
FRIENDLY PATH	•	Ξ	APPLICATION	٥	TEMPLATE	0	PROFILE	\$	FRIENDLY PATH	\diamond	HOST NAME	\diamond	APPLIANCE	\$ TYPE	\diamond	
SLA STATUS	•	0.0	postgresgl 600	4					Remote 29		Remote 29		postgres-target	POSTGRESOL	instance	^
Managed Unmanaged			postgresql_600	4					postgres_29		postgres_29		skypostgres	POSTGRESQL	instance	
ТҮРЕ	•		postgresql_601	0					postgres_29		postgres_29		skypostgres	POSTGRESQL	nstance	L
Select: ALL NONE		Ø 🧧	postgresql_601	8	DB_LOG	-	LocalProfile		postgres_39		postgres_39		skypostgres	POSTGRESQL	nstance	
AWS Instance		• •	p Manage S	LA					postgres_29		postgres_29		skypostgres	POSTGRESQL	instance	I
GCP Instance		0 🙂	p Access			244_s	onval_autoprofile_4	8	postgres_29		postgres_29		skypostgres	POSTGRESQL	instance	
Hyper-V VM System State		• •	p Edit Orga	nization	Membership				Remote_29		Remote_29		postgres-target	POSTGRESQL	instance	l
VMware VM			n Manage I	xpiratio	ns	2440 s	onval autoprofile 4	18	nostares 29		nostares 29		skynostares	POSTORESOL	Instance	



2. Select a snapshot image and choose Restore.

- 3. Use the **Roll Forward Time** to set the time of the latest good logs.
- 4. Select Items is not available for volume-based images.

actifio	Dashboard	Backup & Recover 🗸	Test Data Management 🗸	App Manager + SLA Architect +	Manage - Report Monitor -	🝸 👤 admin 🌲 🕄
C ACCESS	• •	postgresql_6108 post	tgres_29 postgres_29 Det	tails & Settings		
2020 Snap	+08-31 09:25:30 ishot Image		Restore Use this page to initiate a res	store operation. A restore will take the ex	isting database offline and overwrite their o	lata files.
NAME IMAGE SIZE EXPIRES ON	Image_0584923 22.00GB 2020-09-02 09:39	:10	ROLL FORWARD TIME	2020-08-31	C 05:47:31 O HOST TIME O USER T	IME
APPLIANCE RECOVERY RANGE	Sky102-Esp-Rajes 08-31 04:05 To 08	h -31 05:47	type to search	Q	SHO	W SELECTED (3)
LABEL More Details	Fresh1		SELECT ITEMS			
Re	store 👻					
			RESTORE WITH RECOVER			
					Cancel	ubmit

- 5. Enable **Restore With Recovery** to apply recovered logs to the Roll-Forward time selected above.
- 6. Click Submit.

Recovering from a Full+Incremental Database Backup

Use this procedure to restore and recover the source database. This overwrites the source data. Log roll-forward to a point-in-time is not supported for Full+Incremental images.

1. From the App Manager, Applications list, right-click the protected database and select Access.

Note: You can use the Managed SLA Status filter to show only protected databases.

actifio	Dashboar	d Backu	p & Recover 🖌 🛛 Test	t Data Management 🗸	App Man	ager 🗸 🔰 SLA Architect -	• Manage •	Report	Monitor -		🝸 👤 admin 🌲 😧
⊗ clear all filters	Î	Applic	ations								+ ADD APPLICATION
APPLICATION NAME	•										
HOST NAME	•	 hide filters 	O Application Type: F	POSTGRESQL Instance)						
TEMPLATE NAME	•	type to sea	arch	0							25 × ±
PROFILE NAME	•	-974		~							
FRIENDLY PATH	•	Ξ	APPLICATION	TEMPLATE	0	PROFILE 0	FRIENDLY PATH	े	HOST NAME	APPLIANCE	○ TYPE
SLA STATUS	•		postgresql_6004				Remote 29		Remote 29	postgres-target	POSTGRESQL Instance
Managed Unmanaged			postgresql_6004				postgres_29		postgres_29	skypostgres	POSTGRESQL Instance
ТҮРЕ	•		postgresql_6010				postgres_29		postgres_29	skypostgres	POSTGRESQL Instance
Select: ALL NONE		Ø 🧧	postgresql_6018	DB_LOG		LocalProfile	postgres_39		postgres_39	skypostgres	POSTGRESQL Instance
Systems AWS Instance			P Manage SLA				postgres_29		postgres_29	skypostgres	POSTGRESQL Instance
GCP Instance			P Access		244_s	onval_autoprofile_48	postgres_29		postgres_29	skypostgres	POSTGRESQL Instance
System State			p Edit Organiza	ation Membership			Remote_29		Remote_29	postgres-target	POSTGRESQL Instance
UMware VM		n n	Manage Expl	rations	2440 s	onval autoprofile 48	nostores 29		nostares 29	slomostares	POSTGRESOL Instance

2. Select a snapshot image and choose Restore.







- 4. Enable Restore With Recovery to apply all recovered logs.
- 5. Click **Submit**. This will start the source database physical recovery.

Mounting and Migrating a PostgreSQL Database for Near-Zero Downtime Recovery to the Source

A Mount and Migrate operation allows you to restore an application with near-zero downtime by first mounting it locally, and then migrating it to the original location or to a new location. Users have normal access to the application while it is mounted, and the migration step is very fast. This is similar to a VMware Storage VMotion operation.

You can recover SQL Server and file system data instantly using Actifio's existing capabilities, and then migrate the data in real-time to production storage, while the database is up and running.

To mount and migrate a database to a new target, see Mounting and Migrating a PostgreSQL Database to a New Target on page 26.

To recover a database to the source by mounting and migrating:

- 1. Shut down the source database.
- Login to AGM, select the application and create a virtual database from a good backup image as detailed in Mounting and Refreshing from Block-Based Volume Snapshot to a Target PostgreSQL Server as a Virtual Application on page 17.
 When setting up the virtual database, provide the source port number for PostgreSQL Target Server Port.
- 3. When the mount job is completed, run this script, with parameters in Arguments to the Script.

/act/custom_apps/postgresql/restore/ACT_POSTGRESQL_lvm_migrate_newTarget.sh DATAVOL_DISK_MAPPING=<Actifio_Mount>:<Production_LVM_device> BASEDIR=<BASEDIR> OSUSER=<OSUSER> PORT=<PORT> [DBUSER=<DBUSER>] [DBPASSWORD=<DBPASSWORD>] [JOBID=<JOBID>]

Arguments to the Script

DATAVOL_DISK_MAPPING=Comma separated list of<Actifio_mount_point>:<equivalent target host lvm device name>

BASEDIR=Target instance PostgreSQL home location

OSUSER=Target database osuser for PostgreSQL

- PORT=Target instance port number, which is given during appaware mount
- DBUSER=Target instance db username
- DBPASSWORD=Target instance password

JOBID=Actifio job id (AppAware mount)

Example

/act/custom_apps/postgresql/restore/ACT_POSTGRESQL_lvm_migrate_newTarget.sh DATAVOL_DISK_MAPPING=/chtst/pgData10.3:/dev/mapper/actdevdatapg103_1594980385483act_staging_vol BASEDIR=/home/postgres/postgresql_home_10.3 OSUSER=postgres PORT=6010 DBUSER=postgres JOBID=Job_0957580

Note: The target LVM devices must be empty.

4. Once the script has completed successfully, Unmount and Delete the Image.

Restoring PostgreSQL Databases to a New Target Using a Block-Based Volume Snapshot

See Configure a WAL Archive on a Secondary Server on page 27

To restore a dump-based backup to a new target:

1. Mount the image as detailed in Mounting and Refreshing from Block-Based Volume Snapshot to a Target PostgreSQL Server as a Virtual Application on page 17. Provide a mount point location but do **not** enable Create Virtual Database.

actifio	Dashboard	Backup & Recover 🗸	Test Data Management 🗸	App Manager 🗸	SLA Architect 🗸	Manage 🗸	Report	Monitor 🗸	🝸 👤 admin 🌲 📀
ACCESS	• •	postgresql_6108 pos	tgres_29 postgres_29 Det	ails & Settings					TIMELINE TABLE
Jump to: 🗰 2020-0	08-03								2020-08-03 16:16:32 Snapshot Image
1	1020-08-02								NAME Image_0482794 IMAGE SIZE 22.00CB
2020-08-0		 Available II 2020-08-03 2020-08-03 2020-08-03 	mages 15:52:05 act_per_pool000 16:16:32 act_per_pool000						EXPIRES ON 2020/06/317/1843 APPLIANCE Skypostgres RECOVERY 06/03/10.57 To 06/03/11:12 RANGE More Details
2020-08-04									Current Active Mounts (3) Hide
_									NAME lmage_0515532 MOUNTED postgres_29 HOST
Snar	oshot	Dedup	Remote Dedup R	emote Snapshot	OnVault				IMAGE STATE Mounted CHILD ncg APPLICATION
									4€ 4 1 2 3 ▶ ₩ Actions

- 2. On the Mount page, from Target, choose the desired target server from the dropdown.
- 3. Select Host or VM, not Container.
- 4. Under Application Options, **disable** Create New Virtual Application.

OCTIFIO Dashboard Backu	ip & Recover 🗸 👘 Test Data Management 🗸	App Manager + SLA Architect +	Manage 🖌 Report	Monitor -	🝸 👤 admin 🌲 😯
ACCESS 🔹 🕛 postgres	sql_6108 postgres_29 postgres_29 Deta	ails & Settings			
2020-08-12 17:01:44 Snapshot Image		CONTAINER			
NAME Image_0237252 IMAGE SIZE 22.00GB	TARGET* postgres_29	LABEL			
APPLIANCE Sky102-Esp-Rajesh RECOVERY 08-12 11:42 To 08-14 06:09 RANGE	▼ Application Option	ns	`		
More Details	CREATE NEW VIRTUAL)	Database Options * are mandatory	
Mount	type to search	Q		SHOW SELECTED (3)	
	SELECT ITEMS	S			
	🖬 db2				
	✓ Mapping Options				
	STORAGE POOL*	act_per_	baal000 (491€ 🔻		
	MOUNT LOCATION	/smpMnt			

- 5. Under Mapping Options:
 - o **Storage Pool**: Select a local or external storage pool for the mounted database.
 - o Mount Location: Specify a target mount point to mount the restored database to.
- 6. Click **Submit**.

 Login to the database server as root. On the server, change the directory to /act/custom_apps/ postgresql/dump

#cd /act/custom_apps/postgresql/dump

8. Run this script from the command line (as root) ACT_POSTGRESQL_dumprestore_newTarget.sh on the target with arguments in Arguments to the Script on page 25.

/act/custom_apps/postgresql/dump/ACT_POSTGRESQL_dumprestore_newTarget.sh OSUSER=<postgres_osuser> BASEDIR=<postgres_home> PORT=<postgres_port> DB_LIST=<comma separated db list> DUMPBKPLOC=<mountpoint name> [DBUSER=<db_user> DBPASSWD=<db_password>]

Arguments to the Script

OSUSER = < PostgreSQL instance OS user>

BASEDIR = < PostgreSQL software home location>

PORT = <Target PostgreSQL instance port number>

DB_LIST = <Comma separated database list, which need to restore>

DUMPBKPLOC = <Mountpoint provided during mount>

DBUSER = <PostgreSQL database username>

DBPASSWD = <PostgreSQL database user password>

Example

#/act/custom_apps/postgresql/dump/ACT_POSTGRESQL_dumprestore_newTarget.sh OSUSER=postgres BASEDIR=/home/postgres/postgresql_home_11.0 PORT=5434 DB_LIST=actdb,test1 DUMPBKPLOC=/smpMnt

9. Connect to PostgreSQL instance and check if the database was recovered.

[postgres@slave.postgres /home/postgres]\$ psql -p5434 -Upostgres -dpostgres psql (11.0) Type "help" for help.

postgres=# \1

Name

List of databases | Encoding | Collate | Ctype | Access privileges

		, , , , , , , , , , , , , , , , , , ,			
actdb	postgres	UTF8	en_US.UTF-8	en_US.UTF-8	
hari	postgres	UTF8	en_US.UTF-8	en_US.UTF-8	
postgres	postgres	UTF8	en_US.UTF-8	en_US.UTF-8	
template0	postgres	UTF8	en_US.UTF-8	en_US.UTF-8	=c/postgres +
					postgres=CTc/postgres
template1	postgres	UTF8	en_US.UTF-8	en_US.UTF-8	=c/postgres +
	_				postgres=CTc/postgres
test1	postgres	UTF8	en_US.UTF-8	en_US.UTF-8	
(6 rows)					

10. Unmount and Delete the Image.

l Owner

Mounting and Migrating a PostgreSQL Database to a New Target

See Configure a WAL Archive on a Secondary Server on page 27.

A Mount and Migrate operation allows you to restore an application with near-zero downtime by first mounting it locally, and then migrating it to the original location or to a new location. Users have normal access to the application while it is mounted, and the migration step is very fast. This is similar to a VMware Storage VMotion operation. You can move recovered data into other local or SAN storage while the databases are up and running, completing the process with almost no downtime.

To mount and migrate the database to the source, go to Mounting and Migrating a PostgreSQL Database for Near-Zero Downtime Recovery to the Source on page 23.

To create a copy of a database on different storage:

- 1. Login to AGM, select the database image, and create a virtual database as detailed in Mounting and Refreshing from Block-Based Volume Snapshot to a Target PostgreSQL Server as a Virtual Application on page 17.
- 2. When the mount job is completed, run this script, with parameters in Arguments to the Script.

```
/act/custom_apps/postgresql/restore/ACT_POSTGRESQL_lvm_migrate_newTarget.sh
DATAVOL_DISK_MAPPING=<Actifio_Mount>:<Production_LVM_device> BASEDIR=<BASEDIR>
OSUSER=<OSUSER> PORT=<PORT> [ DBUSER=<DBUSER> ] [ DBPASSWORD=<DBPASSWORD> ] [
JOBID=<JOBID> ]
```

Arguments to the Script

DATAVOL_DISK_MAPPING=Comma separated list of<Actifio_mount_point>:<equivalent target host lvm device name>

BASEDIR=Target instance PostgreSQL home location

OSUSER=Target database osuser for PostgreSQL

PORT=Target instance port number, which is given during appaware mount

DBUSER=Target instance db username

DBPASSWORD=Target instance password

JOBID=Actifio job id (AppAware mount)

Example

/act/custom_apps/postgresql/restore/ACT_POSTGRESQL_lvm_migrate_newTarget.sh DATAVOL_DISK_MAPPING=/chtst/pgData10.3:/dev/mapper/actdevdatapg103_1594980385483act_staging_vol BASEDIR=/home/postgres/postgresql_home_10.3 OSUSER=postgres PORT=6010 DBUSER=postgres JOBID=Job_0957580

Note: The target LVM devices must be empty.

3. Once the above script completed successfully, Unmount and Delete the Image.

Configure a WAL Archive on a Secondary Server

If you are recovering to a secondary server:

1. Create the directory to keep the WALs. As root user, run:

```
mkdir /<directory>
chown -R postgres:postgres /<directory>
```

2. 1. Configure the parameters for archiving. Run as postgres user:

```
Example assumes $PGDATA is /pgdata/11/data.
Add/update the parameters in the file /pgdata/11/data/postgresql.conf.
wal_level = replica
archive_mode = always
archive_command = 'test ! -f /pglog/%f && cp %p /pglog/%f'
```

3. Restart the PostgreSQL:

```
/usr/pgsql-11/bin/pg_ctl stop -D /pgdata/11/data
/usr/pgsql-11/bin/pg_ctl start -D /pgdata/11/data
```

4. Add/update entry in pg_hba.conf on the primary to accept database connection from the standby.

Syntax:host postgres <db-user> <standby-ip/32> <connection method> Example:host postgres postgres 10.128.0.29/32 trust

5. Test the archive generation (as postgres user)

```
ls -1 /pglog/
Then run this log switch command:
/usr/pgsql-11/bin/psql -h 10.128.0.28 -p5432 -c "select pg_switch_wal();"
sleep 5
Log shipping may take some time depending on network
ls -1 /pglog/
```

Unmount and Delete the Image

When you are finished with a mounted image, unmount and delete it to save system resources.

1. From the AGM App Manager, select **Active Mounts**.

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2. Right-click the database that the image is from and select **Unmount+Delete**.

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