

# Migrating object-based storage from ONTAP S3 to StorageGRID

How to enable StorageGRID in your environment

NetApp October 09, 2024

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# Migrating object-based storage from ONTAP S3 to StorageGRID

# Enabling enterprise-grade S3 by seamlessly migrating object-based storage from ONTAP S3 to StorageGRID

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# **Migration Demo**

This is a demonstration on migrating users and buckets from ONTAP S3 to StorageGRID.

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# **Preparing ONTAP**

For demonstration purposes we will create an SVM object store server, user, group, group policy and buckets.

# Create the Storage Virtual Machine

In ONTAP System Manager, navigate to Storage VM's and add a new storage VM.

≡ <b>I</b> ONTAP Sy	stem Manager
DASHBOARD	cluster1 Version 9.14.1P1
INSIGHTS STORAGE ^ Overview	Health $\rightarrow$ $\bigcirc$ Cluster is healthy
Volumes LUNs Consistency groups NVMe namespaces Shares Buckets	SIMBOX
Qtrees Quotas Storage VMs Tiers	

Select the "Enable S3" and "Enable TLS" check boxes and configure the HTTP(S) ports. Define the IP, subnet mask and define the gateway and broadcast domain if not using the default or required in your environment.

# Add storage VM

STORAGE VM NAME

svm\_demo

## Access protocol

⊘ SMB/CIFS, NFS, S3	iSCSI FC NVMe			
Enable SMB/CIFS				
Enable NFS				
🛃 Enable S3				
S3 SERVER NAM		_		
s3portal.d	lemo.netapp.com			
Enable TL	s			
POI	रा			
	443 🛃			
CEF	RTIFICATE			
	Use system-generated certificate	D		
	Use external-CA signed certificate			
	(non-secure)			
POF				
Ľ	3080			
DEFAULT LANGUAGE				
c.utf_8	~			
NETWORK INTERFAC	E			
	c interfaces when client traffic is	high.		
onPrem-01				
IP ADDRESS	SUBNET MASK	GATEWAY	BROADCAST DOMAIN AND PORT	0
192.168.0.200	24	Add optional gateway	Default	~
Storage VM adm				
Enable maximum capacity The maximum capacity that all	v limit volumes in this storage VM can allocate. La	earn More		
Manage administrator acc	count			
Save Cance	al			
Cance	er			

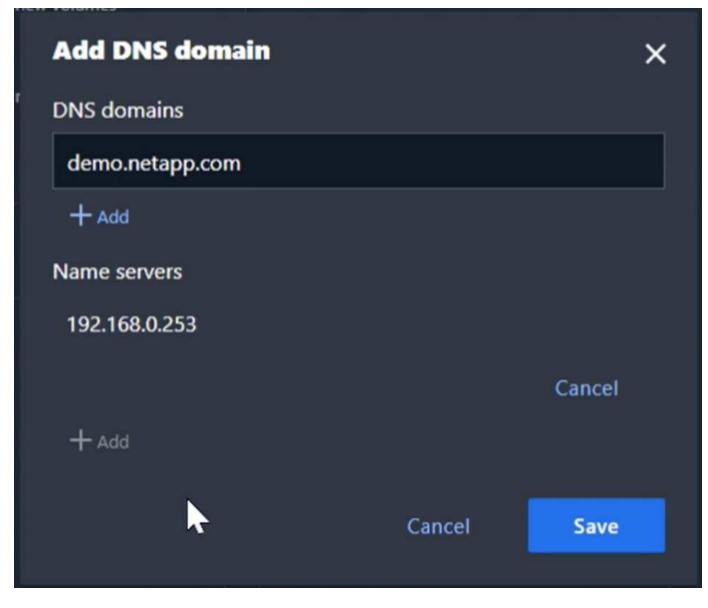
As part of the SVM creation a user will be created. Download the S3 keys for this user and close the window.

×

Added storage VM	;
STORAGE VM svm_demo	s3 server NAME s3portal.demo.netapp.com
User details user NAME sm_s3_user	
▲ The secret key won't be displaye ACCESS KEY	d again. Save this key for future use.
34EH21411SMW1YOV3NQY	đ
SECRET KEY Show secret key	
	Download Close

Once the SVM has been created, edit the SVM and add the DNS settings.

Services			
NIS Not configured	\$	¢	Name service switch Review of the services lookup order (i) HOSTS Files, then DNS GROUP Files NAME MAP Files NETGROUP
DNS Not configured	Ļ	• 🍅	



Create SVM S3 User

Now we can configure the S3 users and group. Edit the S3 settings.

Protocols				
NFS Not configured	A \$	SMB/CIFS Not configured	\$ \$	iS N
NVMe Not configured	\$ \$	S3 STATUS STATUS Enabled TLS Disabled HTTP Enabled	\$	

Add a new user.

Storage VMs			
+ Add : More			
Vame	S3 All settings		
✓ svm_demo	Enabled		
	Server rqon s3portal.demo.netapp.com TLS Disabled HTTP Enabled Users Groups Policies	✓ Edit TLS PORT 443 HTTP PORT 8080	
	+ Add User name	Access key	Key expiration time
	root		
	sm_s3_user	34EH21411SMW1YOV3NQY	Valid forever

Input the user name and key expiration.

Storage VMs			
+ Add : More			
Name	S3 All settings		
✓ svm_demo	Enabled		
	Server FQDN s3portal.demo.netapp.com TLS Disabled HTTP Enabled Users Groups Policies	<pre>     Edit  TLS PORT 443 HTTP PORT 8080 S</pre>	
	+ Add User name	Access key	Key expiration time
	root		
	sm_s3_user	34EH21411SMW1YOV3NQY	Valid forever

Download the S3 keys for the new user.

<b>S</b> 3	All settings		
	Added user	>	×
	USER NAME demo_s3_user		
S	ACCESS KEY		
FC S	3TVPI142JGE3Y7FV2KC0	đ	
π. D	SECRET KEY		
н1 Ei	75a1QqKBU4quA132twl4g4lC4Gg5PP30ncy0sPE8	þ	
r.	Hide secret key		
	KEY EXPIRATION TIME Valid forever		
	A The secret key won't be displayed again. Save this key for future use.		
	Download	Close	
		vanu iv	ever

## Create SVM S3 group

On the Groups tab of the SVM S3 settings, add a new group with the user created above and FullAccess permissions.

Add group		×
NAME		
demo_s3_group		
USERS		
demo_s3_user ×		
POLICIES		
FullAccess ×		
	Cancel	Save

Create SVM S3 buckets

Navigate to the Buckets section and click the "+Add" button.

■ ONTAP Sys	stem Manager	
DASHBOARD	Buckets	
INSIGHTS		
STORAGE ^	Name	Store
Overview		
Volumes		
LUNs		
Consistency groups		
NVMe namespaces		
Shares		
Buckets		
Qtrees		
Quotas		
Storage VMs		
Tiers		

Enter a name, capacity, and deselect the "Enable ListBucket access..." check box. and click on the "More options" button.

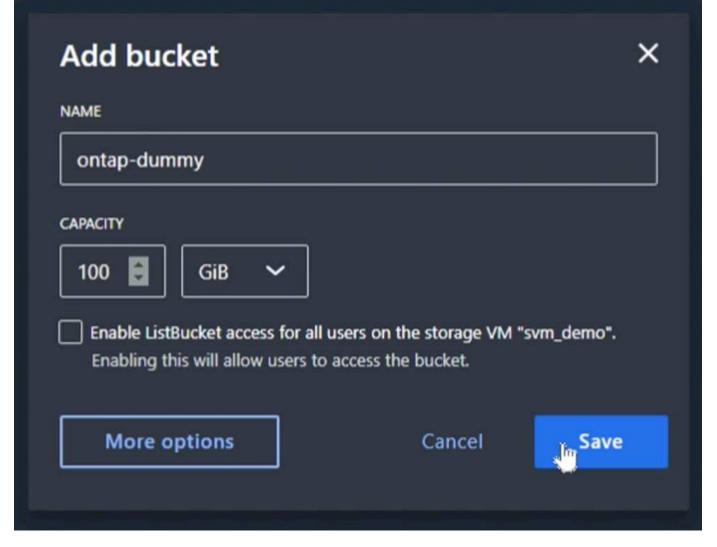
NAME		
bucket		
CAPACITY		
100 📑 🛛 GiB 🖌		
Enable ListBucket access for all u	users on the storage VM "	'svm_demo".
Enabling this will allow users to	access the bucket.	
More options	Cancel	Save

In the "More options" section select the enable versioning check box. and click the "Save" button.

# Add bucket

NAME	_
bucket	
FOLDER (OPTIONAL)	
	Browse
Specify the folder to map to this bucket. Know more	
Use for tiering	
If you select this option, the system will try to select low-cost media v	vith optimal performance for the tiered data.
Enable versioning	
Versioning-enabled buckets allow you to recover objects that were a disabled. However, you can suspend versioning.	cidentally deleted or overwritten. After versioning is enabled, it can't be
PERFORMANCE SERVICE LEVEL	
Extreme	~
Not sure? Get help selecting type	

Repeat the process and create a second bucket without versioning enabled. Enter a name, the same capacity as bucket one, and deselect the "Enable ListBucket access..." check box. and click on the "Save" button.



By Rafael Guedes, and Aron Klein

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# Preparing StorageGRID

Continuing the configuration for this demo we will create a Tenant, user, security group, group policy, and bucket.

### Create the tenant

Navigate to the "Tenants" tab and click on the "create" button

≡	NetApp	StorageGRID Grid Manager Search by page title Q
DASHB	ARD	
ALERTS	ø •	Tenants
NODES		View information for each tenant account. Depending on the timing of ingests, network connectivity, and node status, the usage data shown might be out of date. To view more recent values, select the
TENAN	s	tenant name.
ILM		Legate         Export to CSV         Actions ~         Search tenants by name or ID         Q         No results
CONFIG	URATION	Name 🕢 💠 Logical space used 🕢 💠 Quota utilization 🖉 💠 Quota a Quota 🕢 🗢 Object count 🚱 💠 Sign in/Copy URL 🕑
MAINTE	NANCE	
SUPPO	त	
		No tenants found.
		Create

Fill in the details for the tenant providing a tenant name, select S3 for the client type, and no quota is required. No need to select platform services or allow S3 select. You can choose to use own Identity source if you choose. Set the root password and click on the finish button.

Click on the tenant name to view the tenant details. **You will need the tenant ID later so copy it off**. Click on the Sign in button. This will bring you to the tenant portal login. Save the URL for future use.

Ter	nants					
View info tenant na		account. Depending on the timing of ing	ests, network connectivity, and node s	tatus, the usage data showr	might be out of date. To view m	ore recent values, select the
Create	Export to CSV Ac	tions v Search tenants by name or ID	Q			Displaying one result
	Name 🕜 🗢	Logical space used 🕢 💠	Quota utilization 👔 🗢	Quota 🕜 💠	Object count 👔 💠	Sign in/Copy URL 💡
	tenant demo	0 bytes	_	-	0	-) [
						$\leftarrow$ Previous $1$ Next $\rightarrow$

This will bring you to the tenant portal login. Save the URL for future use, and enter the root user credentials.

$\leftrightarrow \rightarrow c$	A Not secure	192.168.0.80/	?accountId=270416	510751165610501							
Lab Status	Power Controls	Accounts	cluster1-mgmt	S cluster2-mgmt	🕄 Blue XP						
											NetApp Support   NetApp
								StorageG	RID <sup>®</sup> Tenar	nt Manager	
								Recent	Optional	~	
								Account ID	27041610751	165610501	
								Linemenne	re et		
						•	letApp <sup>.</sup>	Username	root		
								Password	••••••		
										Sign in	

## Create the user

Navigate to the Users tab and create a new user.

=	🖬 NetApp 🛛	torageGRID Tenant Manager
DASHB	OARD	
STORA	GE (S3)	Users
My aco	ess keys	View local and federated users. Edit properties and group membership of local users.
Bucket	s	
Platfor	m services endpoints	luser Create user
ACCES	S MANAGEMENT	
Groups	;	Actions 🗸
Users		Username 🗢 Full Name 🗢 Denied 🗢 Type 🗢
Identit	y federation	Username 🗢 Full Name 🗢 Denied 🗢 Type 🗢
		root Root Local
		$\leftarrow$ Previous 1 Next $\rightarrow$

Full name 💡		
Demo S3 User		
Must contain at least 1 and no mo	re than 128 characters	
Jsername 😮		
demo_s3_user		
Password		
		0
Must contain at least 8 and no mo	re than 32 characters	
Confirm password		
		O
Deny access		

Now that the new user has been created, click on the users name to open the details of the user.

Copy the user ID from the URL to be used later.

A Not secure	https://192.168.0.80/ui/#/users	s/ebc132e2-cfc3-42c0-a44	45-3b4465cb523c		
	Accounts I cluster1-mgm				
NetApp   S	torageGRID Tenant	Manager			
es endpoints	Use	rs > Demo S3 User <b>Overview</b> Full name: <b>@</b>		Demo S3 User 🧳	
GEMENT A		Username: 🍘 User type: 🍘 Denied access: 🍘 Access mode: 🍘		demo_s3_user Local Yes No Groups	
tion		Group membership: 🕢		None	
		Password	Access	Access keys	Groups
	Cha	nange password	d.		
			C	hange Password	

To create the S3 keys click on the user name.

≡	🖬 NetApp	StorageGRID Tenan	t Manager				9
DASHB	OARD						
STORA	GE (S3)	l	Users				
Му асс	ess keys	View local and federated users. Edit properties and group membership of local users.					
Bucket	s	rich road and reactaice acts can projectors and group includes any or react acts to					
Platfor	m services endpoints	ns 2users Create user				Create user	
ACCES	S MANAGEMENT	_					
Groups	i		Actions ~				
Users			Username ≑	Full Name 🗢	Denied 🗢	Type 🗢	
Identity	y federation	_	- openiane -		Denico 🔻	.,,,,	
			root	Root		Local	
			demo_93_user	Demo S3 User	~	Local	
							$\leftarrow$ Previous $1$ Next $\rightarrow$

Select the "Access keys" tab and click on the "Create Key" button. There is no need to set an expiration time. Download the S3 keys as they cannot be retrieved again once the window is closed.

Create access key	×
Choose expiration time 2 Downle	oad access key
Download access key	
To save the keys for future reference, select <b>Download .csv</b> , o	r copy and paste the values to another location.
You will not be able to view the Access key ID or Secret access k	ey after you close this dialog.
Access key ID	
7CT7L1X5MIO5091E86TR	
Secret access key	
RIJnC5N5FX9RSWgFdj6SQ7wMrfRZYu5bQLdNQT0c	
Jownload .csv Finish	

# Create the security group

Now go to the Groups page and create a new group.

Create group	×					
1       Choose a group type       2       Manage permissions       3       Set S3 group policy       4       Add u         0       Option						
Choose a group type 📀						
Create a new local group or import a group from the external identity source.						
Local group Federated group						
Create local groups to assign permissions to any local users you defined in StorageGRID.						
Display name						
Demo S3 Group						
Must contain at least 1 and no more than 32 characters						
Unique name 😮						
demo_s3_group						
Cancel Continue						

Set the group permissions to Read-Only. This is the Tenant UI permissions, not the S3 permissions.

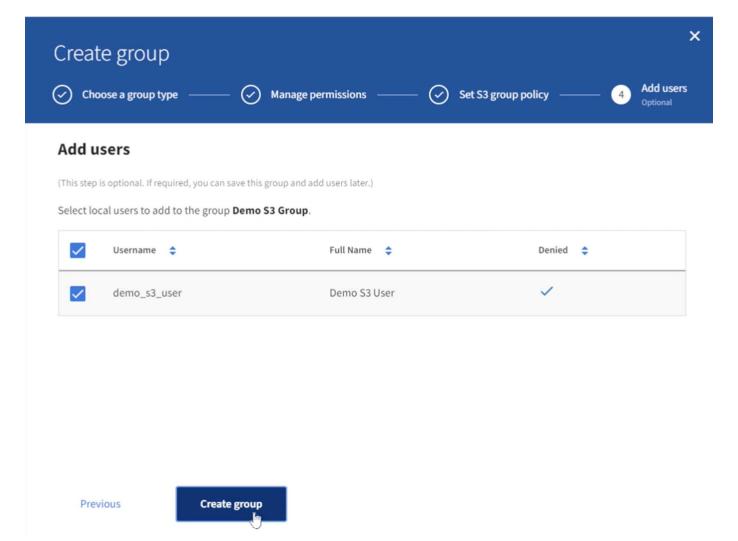
Choose a group type 2	Manage permissions — 3	Set S3 group policy	Add users Optional
Manage group permissions Select an access mode for this group and sele Access mode ② Select whether users can change settings and O Read-write ③ Read-only Group permissions ② Select the permissions you want to assign to t	perform operations or whether they c	an only view settings and featu	res.
Allows users to access all administrat	ion features. Root access permission s	upersedes all other permission	s.
Manage all buckets Allows users to change settings of all S3 buckets (or Swift containers) in this account.	Manage endpoints Allows users to configure endpoints for platform services.	Manage your own S credentials Allows users to create their own S3 access ke	and delete
Previous Con			

S3 permissions are controlled with the group policy (IAM Policy). Set the Group policy to custom and paste the json policy in the box. This policy will allow users of this group to list the buckets of the tenant and perform any S3 operations in the bucket named "bucket" or sub-folders in the bucket named "bucket".



Create group	×
	Ianage permissions 3 Set S3 group policy 4 Add users Optional
<ul> <li>Set S3 group policy ②</li> <li>An S3 group policy controls user access permises by default.</li> <li>No S3 Access</li> <li>Read Only Access</li> <li>Full Access</li> <li>Custom (Must be a valid JSON formatted string.)</li> </ul>	sions to specific specific S3 resources, including buckets. Non-root users have no access
Previous Continue	

Finally, add the user to the group and finish.



#### Create two buckets

Navigate to the buckets tab and click on the Create bucket button.

=	■ NetApp	StorageGRID Tenant Manager
DASHB	OARD	
STORA	IGE (S3)	Buckets
	ess keys	Create buckets and manage bucket settings.
Bucket Platfor	s m services endpoints	0 buckets Create lycket
	S MANAGEMENT	
Groups		Actions 🗸 Experimental S3 Console 📝
Jsers		Name 💠 Region 💠 Object Count 🚱 🗢 Space Used 🚱 🗢 Date Created 🗢
dentit	y federation	
		No buckets found
		Create bucket

Define the bucket name and region.

lanage object settings otional
t's region.
~
1

On this first bucket enable versioning.

Create bucket		
Enter details	2 Manage object settings Optional	

# Manage object settings Optional

# Object versioning

Enable object versioning if you want to store every version of each object in this bucket. You can then retrieve previous versions of an object as needed.

Enable object	versioning		
Previous	Create bucket		

Now create a second bucket without versioning enabled.

Enter details (2) Manage object settings Optional
inter the bucket's name and select the bucket's region.
Bucket name 🔞
sg-dummy
·
Region 😧
us-east-1 🗸

Do not enable versioning on this second bucket.

Create bucket		×
Senter details	Manage object settings Optional	

# Manage object settings Optional

#### **Object versioning**

Enable object versioning if you want to store every version of each object in this bucket. You can then retrieve previous versions of an object as needed.

Enable object	versioning		
	Create bucket		

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# Populate the Source Bucket

Lets put some objects in the source ONTAP bucket. We will use S3Browser for this demo but you could use any tool you are comfortable with.

Using the ONTAP user s3 keys created above, configure S3Browser to connect to your ontap system.

#### Add New Account



#### Add New Account

Enter new account details and click Add new account

#### Display name:

#### Bucket (original and post-migration)

Assign any name to your account.

#### Account type:

#### S3 Compatible Storage

Choose the storage you want to work with. Default is Amazon S3 Storage.

#### REST Endpoint:

#### s3portal.demo.netapp.com:8080

Specify S3-compatible API endpoint. It can be found in storage documentation. Example: rest.server.com:8080

#### Access Key ID:

#### 3TVPI142JGE3Y7FV2KC0

Required to sign the requests you send to Amazon S3, see more details at https://s3browser.com/keys

#### Secret Access Key:

#### 

Required to sign the requests you send to Amazon S3, see more details at https://s3browser.com/keys

#### Encrypt Access Keys with a password:

Turn this option on if you want to protect your Access Keys with a master password.

#### Use secure transfer (SSL/TLS)

If checked, all communications with the storage will go through encrypted SSL/TLS channel

advanced settings ...

Add ne Jaccount

🖉 Cancel

Now lets upload some files to the versioning enabled bucket.

×

~

online help

#### S3 Browser 11.6.7 - Free Version (for non-commercial use only) - Bucket (original and post-migration)

Accounts Buckets Files Bookmarks Tools Upgrade to Pro! Help

🕨 New bucket 🝦 Add external bucket 🧭 Refresh	Path: /					
<mark></mark> ontap-dummy <mark> bucket</mark>	Name		Size	Туре	Last Modified	Storage Class
	No.	load file(s)				
	Upl	load folder	(s)			
	Uploa	id •	Download	Delete Rew F	older Refresh	
asks (1) Permissions Headers Tags Properties Preview Version	s Event log					
Task	Size	%	Progress	Status	Speed	

→ ~ ↑ 🔸 > Ih	is PC > Downloads			✓ Ö Search	Downloads	
rganize 🔻 New folde	er				== •	
🕹 Downloads  🖈 ^	Name	Date modified	Туре	Size		
🗄 Documents 🖈	9141P1_q_image.tgz	3/22/2024 1:25 AM	TGZ File	2,641,058 KB		
📰 Pictures 🛛 🖈	cluster1_demo_s3_user_s3_user.txt	3/23/2024 11:04 PM	Text Document	1 KB		
This PC	cluster1_svm_demo_s3_details (1).txt	3/23/2024 11:03 PM	Text Document	1 KB		
	cluster1_svm_demo_s3_details.txt	3/23/2024 11:01 PM	Text Document	1 KB		
3D Objects	🚔 hfs.exe	3/22/2024 1:24 AM	Application	2,121 KB		
🛫 Cloud Storage o	hotfix-install-11.6.0.14	3/23/2024 11:55 AM	14 File	717,506 KB		
Desktop	滑 putty	7/18/2020 6:39 PM	Shortcut	2 KB		
Documents	s3browser-11-6-7.exe	3/23/2024 12:36 PM	Application	9,807 KB		
🕹 Downloads						
b Music						
Pictures						
Videos						
Local Disk (C:)						
~		N				
×	ame: "s3browselemo_s3_user_s3_user.bt" "clusi					

📼 🌩 i

33 Browser 11.6.7 - Free Version (for non-commercial use only) - Bucket (original and post-migration)

Accounts	Buckets	Files	Bookmarks	Tools	Upgrade to Pro!	Help

🖶 New bucket  🖶 Add external bucket 🥰 Refresh	Path: /				
ontap-dummy	Name	Size	Type Text Document	Last Modified	Storage Class
Copyling Please 107 Again	cluster1_svm		Text Document	3/23/2024 11:23:25 PM	
			Text Document	3/23/2024 11:23:25 PM	
				3/23/2024 11:23:25 PM	
	putty.exe	834.05 KB	Application	3/23/2024 11:23:25 PM	
	hfs.exe	2.07 MB	Application	3/23/2024 11:23:25 PM	
	s3browser-11	9.58 MB	Application	3/23/2024 11:23:26 PM	STANDARD
	Upload -	Download	Delete Delete New Fo	older Refresh	

📼 🌩 i 📘

Tasks (1) Permissions Headers Tags Properties Preview Versions Event log

Now lets create some object versions in the bucket.

### Delete a file.

New bucket 🖶 Add external bucket 🔁 Refresh	Path: / Name cluster1_dem cluster1_svm cluster1_svm putty.exe fhfs.exe s3browser-11	211 bytes 211 bytes 834.05 KB 2.07 MB	Type Text Document Text Document Application Application Application	Last Modified 3/23/2024 11:23:25 PM 3/23/2024 11:23:25 PM 3/23/2024 11:23:25 PM 3/23/2024 11:23:25 PM 3/23/2024 11:23:25 PM 3/23/2024 11:23:26 PM	STANDARD STANDARD STANDARD STANDARD
asks (1) Permissions Headers Tags Properties Preview Versions		Download	Delete Rew Fo	Confirm File Delete	to delete 'putty.exe'?

Upload a file that already exists in the bucket to copy the file over itself and create a new version of it.

→ < ↑ ↓ > Th	is PC > Downloads			✓ Ö Search	Downloads 🖌		
ganize 🔻 New folde	er					<b>3</b>	Storage Clas
🕹 Downloads  🖈 🔦	Name	Date modified	Туре	Size		И	STANDARD
🗄 Documents 🖈	9141P1_q_image.tgz	3/22/2024 1:25 AM	TGZ File	2,641,058 KB		И	STANDARD
📰 Pictures 🛛 🖈	cluster1_demo_s3_user_s3_user.txt	3/23/2024 11:04 PM	Text Document	1 KB		и	STANDARD
TIL	cluster1_svm_demo_s3_details (1).txt	3/23/2024 11:03 PM	Text Document	1 KB		и	STANDARD
This PC	cluster1_svm_demo_s3_details.txt	3/23/2024 11:01 PM	Text Document	1 KB			
3D Objects	hfs.exe	3/22/2024 1:24 AM	Application	2,121 KB			
🛫 Cloud Storage o	hotfix-install-11.6.0.14	3/23/2024 11:55 AM	14 File	717,506 KB			
Desktop	🗿 putty	7/18/2020 6:39 PM	Shortcut	2 KB			
Documents	s3browser-11-6-7.exe	3/23/2024 12:36 PM	Application	9,807 KB			
Downloads							
Music							
Pictures							
Videos							
Local Disk (C:)							
V							
File pr	ame: hfs.exe						
rite na	Ins.exe						

Tasks (1) Permissions Headers Tags Properties Preview Versions Event log

In S3Browser we can view the versions of the objects we just created.

Accounts Buckets Files Bookmarks Tools Upgrade to Pro!	(original and post-migration)			📼 🌩 i					- 0
New bucket 🍄 Add external bucket 💋 Refresh	Path: /								\$ / E
inververund worde defening bocket is Mettern i ontap-dummy i bucket	Vate Name Custer1_dem Custer1_svm Custer1_svm Custer1_svm This exe T_Sbrowser11	211 bytes 211 bytes 2.07 MB	Type Text Document Text Document Text Document Application Application	Last Modified 3/23/024 11/235 EM 3/23/024 11/235 EM 3/23/2024 11/235 EM 3/23/2024 11/2335 EM 3/23/2024 11/2336 EM	STANDARD STANDARD STANDARD				¥ * =
		Download	Delete 🙀 New Fo	older Refresh					S files (11.65 MB) and
	Versions Event log								-51
Fasks (1)         Permissions         Headers         Tags         Properties         Preview           URL:         http://bucket.s3portal.demo.netapp.com:8080/									(B)
URL: http://bucket.s3portal.demo.netapp.com:8080/ Key ]] cluster1_demo_s3_user_s3_user.bt	Last Modified		ETag			Size	Storage Class	Owner	Version Id
URL: http://bucket.s3portal.demo.netapp.com:8080/ Key Cluster1_demo_s3_user_s3_user.bt revision #: 1 (current)		25 PM		)543e97ef3678b2b6ed6a6	De1bc	Size 157 bytes	Storage Class STANDARD	Owner Unknown (Unknown)	
RL: http://bucket.s3portal.demo.netapp.com:8080/ /ev // clusterl_demo_s3_user_s3_userbt revision #.1 (current) // clusterl_svm_demo_s3_detais (1) bst revision #.1 (current)	Last Modified		acf4cs	 1543e97ef3678b2b6ed6a6 3b646a6cfef19fde71eefb5					Version Id
RL: http://bucket.s3portal.demo.netapp.com:8080/ evy evy descer_s3_user_s3_user bt revision # 1 (current) cluster1_svm_demo_s3_details (1) bt revision # 1 (current) cluster1_svm_demo_s3_details bt	Last Modified 3/23/2024 11:23:2 3/23/2024 11:23:2	25 PM	acf4c5	3b646a6cfef19fde71eefb5	#04	157 bytes 211 bytes	STANDARD	Unknown (Unknown) Unknown (Unknown)	Version ld Mzg0MjQ1MDAwL NDg0MjQ1MDAw
RL: http://bucket.s3portal.demo.netapp.com:8080/ @ clasterl_demo_s3_user_s3_user_bt evision #.1 (current) @ clasterl_svm_demo_s3_details (1) bst revision #.1 (current) @ clasterl_svm_demo_s3_details bt revision #.1 current)	Last Modified 3/23/2024 11:23:2	25 PM	acf4c5		#04	157 bytes	STANDARD	Unknown (Unknown)	Version Id Mzg0MjQ1MDAwL
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## Establish the replication relationship

Lets start sending data from ONTAP to StorageGRID.

In ONTAP System Manager navigate to "Protection/Overview". Scroll down to "Cloud object stores". and click the "Add" button and select "StorageGRID".

≡		AP Sy	stem Manage	er					Se	earch actio	ons, objects,	and pages		۹							?	<>	e
DASI	IBOARD			Peer cluster					umes for p e storage		if you		u select whi ud destinat		nes you w	ant to b	e backed u		ets you protect a c covery time object		roup with a ze	го	
INSIG							App Snap ection.	Center soft	ware simpli	ifies backup	), restore, and	clone manag	gement for th	he applicat	tions hosted	d across C	ONTAP enabl	led platforn	ns. <u>Use NetApp Sna</u>				
NETV	VORK																						
EVEN	ITS & JOBS						protec or (loca	tion I or remo	te)														
PROT					1												2 of the 2 b	ouckets area	n't protected.				
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							Others				netadata to ider to acce			lid data c	container	must be	created wi	ith the ob	ject store provide	er. This assum	es that the us	er has v	valid
						+ Add	~																

Input the StorageGRID information by providing a name, URL style (for this demo we will use Path-styl URLs). Set the object store scope to "Storage VM".

sgws_demo		
URL STYLE		
Path-style URL		~
OBJECT STORE SCOPE		
O Cluster	Storage VM	
USE BY 🕕		
	ONTAP S3 SnapMirror	

If you are using SSL, set the load balancer endpoint port and copy in the StorageGRID endpoint certificate

here. otherwise uncheck the SSL box and input the HTTP endpoint port here.

Input the StorageGRID user S3 keys and bucket name from the StorageGRID configuration above for the destination.

ACCESS KEY				
7CT7L1X5MIO5	091E86TR			
SECRET KEY				
••••••				
	•			
bucket				
bucked				
buckey				
	r cloud object sto	ore		Considerations
	r cloud object sto	Ore SUBNET MASK	BROADCAST DOMAIN	Considerations
Network fo			broadcast domain Default	
	IP ADDRESS 192.168.0.113	SUBNET MASK		GATEWAY
Network fo NODE onPrem-01	IP ADDRESS 192.168.0.113	SUBNET MASK		GATEWAY
Network fo NODE onPrem-01	IP ADDRESS 192.168.0.113	SUBNET MASK		GATEWAY

Now that we have a destination target configured, we can configure the policy settings for the target. Expand "Local policy settings" and select "continuous".

ONTAP System Manager	Search actions, objects, and pages Q	? ↔ 8
DASHBOARD INSIGHTS STORAGE ~ NETWORK ~ EVENTS & JOBS ~	Back up to cloud       2 of the 2 buck         0%       10%       20%       30%       40%       50%       60%       70%       80%       90%       100%         Protect buckets         Lets you select specific buckets for setting up SnapMirror protection to either an ONTAP destination or a cloud destination	ets aren't backed up to the cloud. on,
PROTECTION ~ Overview Relationships HOSTS ~ CLUSTER ~	<ul> <li>► Local policy settings ●</li> <li>Protection policies → Applicable when this cluster is the destination Applicable when this cluster is the source or wh Applicable when this cluster is the source or wh Sometace Constitute/pointert he stradates Constitute/pointert Ho stradates Constitute/pointert Ho stradates Constitute/pointert Ho stradates Constitute/pointert Ho stradates Constitute/pointert Ho stradates Constitute/pointert Ho stradates Constitute/pointert Ho stradates Constitute/pointert Ho stradates Constitute/pointert Constitute/pointert Ho stradates Constitute/pointert Constitute/pointert Constitute/pointert Constitute/pointert Constitute/pointert Constitute/pointert Constitute/pointert Constitute/pointert Constitute/pointert Constitute/pointert Constitute/pointert Constitute/pointert Constitute/pointert Constitute/pointert Constitute/pointert Co</li></ul>	Schedules     →     Smin     Al 0, 51, 01, 52, 02, 53, 03, 54, 04, 45, 50, and 55 minutes past the     hour, every hour     Echany     Al 1215 AM, 0615 AM, 1215 FM and 0615 FM, every day     Mour     Al 0215 AM, 1015 AM and 0615 FM, every day     Iomin     Al 0, 10, 20, 30, 40, and 50 minutes past the hour, every hour     Idmin

Edit the continuous policy and change the "Recovery point objective" from "1 Hours" to "3 Seconds".

Pol	icie	Protection o	overview			
	Prote	ection policies	Snapshot policies			
	+ 4	dd				
		Name		Description	Policy type	Scope
		= Continuous			(All) 🗸	
		Continuous	:	Policy for S3 bucket mirroring.	Continuous	Cluster
		HROTTLE Jnlimited	Edit	RECOVERY POINT OBJECTIVE 1 Hours		

Now we can configure snapmirror to replicate the bucket.

snapmirror create -source-path sv\_demo: /bucket/bucket -destination-path sgws\_demo: /objstore -policy Continuous

P cluster1-mgmt
Using username "admin".
Using keyboard-interactive authentication. Password:
Last login time: 3/24/2024 00:02:00
clusterl::> snapmirror create -source-path svm_demo:/bucket/bucket -destination-path sgws_demo:/objstore -policy Continuous [Job 220] Job is queued: Create an S3 SnapMirror relationship between bucket "svm_demo:bucket" and bucket "objstore/sgws_demo"
cluster1::>

The bucket will now show a cloud symbol in the bucket list under protection.

Buc	kets							
+ Ad	d					Q Search	<u>↓</u> Download @ Show/hi	de 💙 📼 Filter
	Name	s	Storage VM	Lifecycle rules	Capacity (available   total)		Protection	Path
	bucket		svm_demo			100 GiB 100 GiB	800	•
	ontap-dummy		svm_demo			100 GiB 100 GiB	800	

If we select the bucket and go to the "SnapMirror (ONTAP or Cloud)" tab we will see the snapmirror repationship status.

Buckets					
+ Add 🗊 Delete 🔿 Protect					Q Search = Filter
Name	bucket All Buckets				🖉 Edit : More
✓ bucket					
ontap-dummy	Overview Permissions Lifecycle rules S	inapMirror (ONTAP or cloud)			
	Source	Destination	Protection policy	Relationship health	State
	svm_demo:/bucket/bucket	sgws_demo:/objstore		⊘ Healthy	⊘ Mirrored

### The replication details

We now have a successfully replicating bucket from ONTAP to StorageGRID. But what is actually replicating? Our source and destination are both versioned buckets. Do the previous versions also replicate to the destination? If we look at our StorageGRID bucket with S3Browser we see that the existing versions did not replicate and our deleted object does not exist, nor does a delete marker for that object. Our duplicated object only has 1 version in the StorageGRID bucket.

New bucket 📲 Add external bucket 😥 Refresh	Path: /								\$ P	9
<mark>- ⊖</mark> bucket - <mark>⊖</mark> sg-dummy	Name Cluster1_dem cluster1_svm	211 bytes 211 bytes	Type Text Document Text Document Text Document	Last Modified 3/24/2024 12:13:53 AM 3/24/2024 12:13:53 AM 3/24/2024 12:13:53 AM	STANDARD STANDARD					
	■ hfs.exe ■ s3brd, ser-11	9.58 MB	Application Application	3/24/2024 12:13:53 AM 3/24/2024 12:13:53 AM						
		Download	Delete 🧱 New Fo	older Refresh					1 file (2.0	07 MB)
	eview Versions Event log									j (
asks (1) Permissions Headers Tags Properties Pro RL: http://192.168.0.80:8080/bucket/hfs.exe										-
	Last Modified		ETag			Size	Storage Class	Owner	Version Id	
RL: http://192.168.0.80:8080/bucket/hfs.exe	Last Modified 3/24/2024 12:13:	53 AM		57e98ed1269372ff0ace91	163477"	Size 2.07 MB	Storage Class	Owner tenant_demo (27041610751		
L: http://192.168.0.80:8080/bucket/hfs.exe y hfs.exe		53 AM			163477"		-			

In our ONTAP bucket, lets add a new version to our same object that we used previously and see how it replicates.

Accounts Buckets Files Bookmarks Tools Upgrade to R	Pro! Help		= 🌩 i	-					
New bucket 🚔 Add external bucket 😂 Refresh	Path: /							会 🖉	o y
- bucket	Name Size Cluster1_dem. 157bytes Cluster1_svm. 211bytes Cluster1_svm. 211bytes Cluster1_svm. 211bytes Cluster1_svm. 211bytes Cluster1_svm. 211bytes Cluster1_svm. 210bytes Cluster1_svm. 210b	Text Document Text Document Text Document Application Application	Last Modified 3/23/2024 11:23:25 PM 3/23/2024 11:23:25 PM 3/23/2024 11:23:25 PM 3/23/2024 11:23:25 PM 3/24/2024 12:14:52 AM 3/23/2024 11:23:26 PM	STANDARD STANDARD STANDARD STANDARD					
	Upload - Download	Delete 📴 New Folde	er Refresh					6 files (12.46 MB	B) and 0 fold
asks (1) Permissions Headers Tags Properties Pre uR1: http://bucket.s3portal.demo.netapp.com:8880/		Delete 🧱 New Folde							
URL: http://bucket.s3portal.demo.netapp.com:8080/		Delete Rew Folde			Size	Storage Class	Owner		
JRL: http://bucket.s3portal.demo.netapp.com:8080/	view Versions Event log	ETag		e1bc	Size 157 bytes	Storage Class STANDARD	Owner Unknown (Unknown)		
URL: http://bucket.s3portal.demo.netapp.com:8080/ Key cluster1_demo_s3_user_s3_user bt revision #1 (currend) cluster1_avm_demo_s3_details (1) bt revision #1 (current) cluster1_avm_demo_s3_details bt	view Versions Event log Last Modified 3/23/2024 11 23 25 PM 3/23/2024 11 23 25 PM	ETag acMc954 407753b6	3e97ef3678b2b6ed6a6C 546a6ctef19fde71eefb5ff	04	157 bytes 211 bytes	STANDARD	Unknown (Unknown) Unknown (Unknown)	Version Id Mzg0MjQ1MDAwL NDg0MjQ1MDAw	B) and 0 fold
JRL: http://bucket.s3portal.demo.netapp.com:8080/ Key Luster1_demo_s3_user_s3_user.bt revision #:1 (current) Luster1_svm_demo_s3_details (1) bt revision #:1 (current) Luster1_svm_demo_s3_details bt revision #:1 (current) This exe	view Versions Event log Last Modified 3/23/2024 11 23 25 PM 3/23/2024 11 23 25 PM 3/23/2024 11 23 25 PM	ETag acHc954 407753b6 17d20651	3e97ef3678b2b6ed6a60 346a6cfef19fde71eefb5ft 8856f480a587af39feccc1	04 0e2	157 bytes 211 bytes 211 bytes	STANDARD STANDARD STANDARD	Unknown (Unknown) Unknown (Unknown) Unknown (Unknown)	Version Id Mzg0MjQ1MDAwL NDg0MjQ1MDAwL	
JRL: http://bucket.s3portal.demo.netapp.com:8080/ Key luster1_demo_s3_user_s3_user.bt revision #: 1 (current) luster1_svm_demo_s3_details (1) bt revision #: 1 (current) luster1_svm_demo_s3_details bt revision #: 1 (current) Taks exe revision #: 2 (current) revision #: 2 (current)	view Versions Event log Last Modified 3/23/2024 11 23 25 PM 3/23/2024 11 23 25 PM	ETag acf4c954 407753b6 17d20651 9e885765	3e97ef3678b2b6ed6a6C 546a6ctef19fde71eefb5ff	04 0e2 3477	157 bytes 211 bytes	STANDARD	Unknown (Unknown) Unknown (Unknown)	Version Id Mzg0MjQ1MDAwL NDg0MjQ1MDAw	
RL: http://bucket.s3portal.demo.netapp.com:8000/ (dy) cluster1_demo_s3_user_s3_user bt revision ft (current) cluster1_sym_demo_s3_details (1) bt revision ft (current) cluster1_sym_demo_s3_details bt revision ft (current) Cluster1_sym_details bt revision ft (current) Cluster1_sym_details bt revision ft (current) Cluster1_sym_details bt revision ft (current) revision ft 1	view Versions Eventlog Last Modified 3/23/2024 11:23 25 PM 3/23/2024 11:23 25 PM 3/23/2024 11:23 25 PM 3/24/2024 12:14 52 AM	ETag acHc954 407753b6 17d20651 9u8557ef 9e8557ef	3e97ef3678b2b6ed6a6C 546a6cfef19fde71eefb5fi 1856f480a587af39feccc1 988af1269372fi)ace91dd	04 0e2 3477 3477	157 bytes 211 bytes 211 bytes 2.07 MB	STANDARD STANDARD STANDARD STANDARD	Unknown (Unknown) Unknown (Unknown) Unknown (Unknown) Unknown (Unknown)	Version Id Mzg0MjQ1MDAwL NDg0MjQ1MDAwL NTU2Nz0MDAwL NTYQNDgxMDAw	
URL: http://bucket.s3portal.demo.netapp.com:8080/ Key cluster1_demo_s3_user_s3_user.bt revision #: (current) cluster1_svm_demo_s3_details (1) bt revision #: (current) cluster1_svm_demo_s3_details bt revision #: (current) This eve revision #: 2(current) revision #: 2(current) revision #: 2(current)	view Versions Event log Last Modified 3/23/2024 11:23:25 PM 3/23/2024 11:23:25 PM 3/23/2024 11:23:25 PM 3/23/2024 11:23:35 PM	ETag ac44c954 407753bC 17d20651 9e8557e6 9e8557e5	3e97ef3678b2b6ed6a60 546a6cfef19fde71eefb5fi 1856f480a587af39feccc1 98acf1269372fil0ace91d6 88def1269372fil0ace91d6	04 0e2 3477 3477 3477	157 bytes 211 bytes 211 bytes 211 bytes 207 MB 207 MB	STANDARD STANDARD STANDARD STANDARD STANDARD	Unknown (Unknown) Unknown (Unknown) Unknown (Unknown) Unknown (Unknown) Unknown (Unknown)	Version Id Mzg0MjQ1MDAwL. NDg0MjQ1MDAwL. NTU2Nz0MDAwL. NTY0NDg2MDAw N2Q10F4MDAw.	

If we look on the StorageGRID side we see that a new version has been created in this bucket too, but is missing the initial version from before the snapmirror relationship.

Accounts Buckets Files Bookmarks Tools Upgra	y) - Bucket (Migration Temp) de to Pro! Help			= 🌩 i	1				
New bucket 🌵 Add external bucket 🔁 Refresh	Path: /								合 🖉 🕻
ucket d sg-dummy	Name Cutater1_dem. Cutater1_svm. Cutater1_svm. Sprowser-11.	211 bytes 211 bytes 834.05 KB 2.07 MB	Type Text Document Text Document Text Document Application Application Application	Last Modified 3/24/2024 12:13:53 AM 3/24/2024 12:13:53 AM 3/24/2024 12:13:53 AM 3/24/2024 12:13:53 AM 3/24/2024 12:14:56 AM 3/24/2024 12:14:56 AM	STANDARD STANDARD STANDARD STANDARD				
asks (1) Permissions Headers Tags Properties URL: http://192.168.0.80:808/bucket/hfs.exe		Download	Delete Rew Fo			Size	Storage Class	Owner	1 원e (2.4 Version Id
ey J									
ey hfs.exe revision #: 2 (current)	3/24/2024 12:14:	56 AM	"9e85	57e98ed1269372ff0ace91	163477"	2.07 MB	STANDARD	tenant_demo (27041610751	OEI4RjY4NDgtRT

This is because the ONTAP SnapMirror S3 process only replicates the current version of the object. This is why we created a versioned bucket on the StorageGRID side to be the destination. This way StorageGRID can maintain a version history of the objects.

By Rafael Guedes, and Aron Klein

# Enabling enterprise-grade S3 by seamlessly migrating object-based storage from ONTAP S3 to StorageGRID

Enabling enterprise-grade S3 by seamlessly migrating object-based storage from ONTAP S3 to StorageGRID

# **Migrate S3 Keys**

For a migration, most of the time you will want to migrate the credentials for the users rather than generate new credentials on the destination side. StorageGRID provides api's to allow s3 keys to be imported to a user.

Logging into the StorageGRID management UI (not the tenant manager UI) open the API Documentation swagger page.

=	■ NetApp	StorageGRID Grid Manager	Sear	rch by page title Q	? ^	L Ro
DASHB	OARD			Documentation Center		
ALERTS	; ⊘	Dashboard		API Documentation		
NODES				About		
TENAN	тs	Health 😔	Available Storage 😧			(
ILM		U License Status	Overall 🔒			
CONFIC	GURATION	1	Used			
MAINT	ENANCE	License				

Expand the "accounts" section, select the "POST /grid/account-enable-s3-key-import", click the "Try it out" button, then click on the execute button.

accounts	Operations on accounts				$\sim$
POST	/grid/account-enable-s3-key-import	Enables the Import S3 Credentials feature on this to have full access to tenant data. This feature sh	node. Warning: Enabling this feature allows Grid would be disabled immediately after use.	Manager users with Change Tenant Root Password permission	n 🔒
Parameters				Can	cel
No parameters					
					_
	Execute		)	Clear	

Now scroll down still under "accounts" to "POST /grid/accounts/{id}/users/{user\_id}/s3-access-keys"

Here is where we are going to input the tenant ID and user account ID we collected earlier. fill in the fields and the keys from our ONTAP user in the json box. you can set the expiration of the keys, or remove the ", "expires": 123456789" and click on execute.

POST	/grid/accounts/{id}/users/{user_id}/s3-access-keys Imports S3 credentials for a given user in a tenant account
Parameters	
Name	Description
<pre>id * required string (path)</pre>	ID of Storage Tenant Account
() /	27041610751165610501
user_id * require string (path)	ed ID of user in tenant account.
	ebc132e2-cfc3-42c0-a445-3b4465cb523c
body * required (body)	Edit Value   Model
	<pre>{     "accessKey": "3IVPI142JGE3Y7FV2KC0",     "secretAccessKey": "75alQqKBU4quA132twI4g41C4Gg5PP30ncy0sPE8" }</pre>

Once you have completed all of your user key imports you should disable the key import function in "accounts" "POST /grid/account-disable-s3-key-import"

POST /grid/account-disable-s3-key-import Disables the Import S3 Credentials feature on this node.	â
Parameters	Callscel
No parameters	
Execute	
Responses	Response content type application/json v

If we look at the user account in the tenant manager UI, we can see the new key has been added.

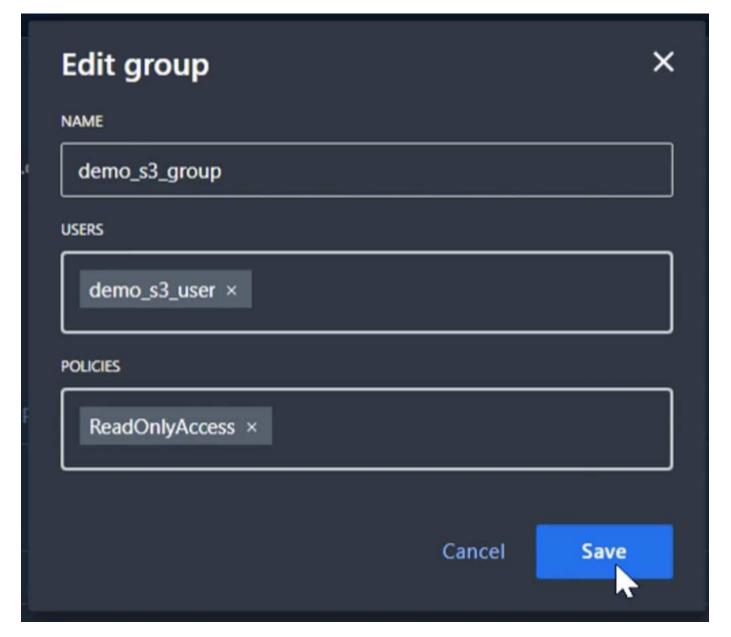
Users > Demo S.	3 User
-----------------	--------

Overview		
Full name: 🕖	Demo S3 User 🧪	
Username: 😮	demo_s3_user	
User type: 🍘	Local	
Denied access: ()	Yes	
Access mode: 💓	Read-only	
Group membership: 🍞	Demo S3 Group	
Password       Access         Manage access keys       Add or delete access keys for this user.         Create key       Actions ✓	Access keys Groups	
Access key ID 💠		Expiration time  🗢
*86TR		None
<u></u>		None

### The final cut-over

If the intention is to have a perpetually replicating bucket from ONTAP to StorageGRID, you can end here. If this is a migration from ONTAP S3 to StorageGRID, then its time to put an end to it and cut over.

Inside ONTAP system manager, edit the S3 group and set it to "ReadOnlyAccess". This will prevent the users from writing to the ONTAP S3 bucket anymore.



All that is left to do is configure DNS to point from the ONTAP cluster to the StorageGRID endpoint. Make sure your endpoint certificate is correct and if you need virtual hosted style requests then add the endpoint domain names in storageGRID

# Endpoint Domain Names

#### Virtual Hosted-Style Requests

Enable support of S3 virtual hosted-style requests by specifying API endpoint domain names. Support is disabled if this list is empty. Examples: s3.example.com, s3.example.co.uk, s3-east.example.com

Endpoint 1	s3portal.demo.netapp.com	
	Save	

Your clients will either need to wait for the TTL to expire, or flush DNS to resolve to the new system so you can test that everything is working. All that is left is to clean up the initial temporary S3 keys we used to test the StorageGRID data access (NOT the imported keys), remove the snapmirror relationships, and remove the ONTAP data.

By Rafael Guedes, and Aron Klein

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