CLOUD PRIMER

Create Cloud Storage Using AWS Simple Storage Service (S3) Buckets

Amazon Web Services (AWS) S3 is <u>object-based storage</u>, where data (objects) are stored in S3 *buckets*. The AWS S3 *Standard* storage class provides safe, scalable, fast, and inexpensive storage and retrieval of any amount of data. The *Standard* class is designed for data that are accessed frequently. Other storage class options are available for different data storage requirements. <u>Read more</u> about the different types of storage available and their uses.

S3 has a basic monthly cost for storing data and this varies by AWS <u>region</u>. Transfer charges are applied for data moved out of an S3 bucket to the Internet, as well as data transferred between AWS regions, though these interregional transfer charges are much less. There are no charges for data uploaded to a bucket or transferred between S3 buckets (or any AWS services) in the *same region*.

This tutorial demonstrates the basic concepts of S3 buckets using the Amazon S3 console.

Important: There are no charges for creating an S3 bucket, but there are costs for storing data (objects) and transferring data into and out of a bucket.

You must have an AWS account. If you have one, click <u>HERE</u> to sign into it.

Create an S3 Storage Bucket

1. <u>SIGN IN</u> to AWS. The AWS Management Console will open (Figure 6.1).

VS Services • Resource Groups •	*		🗘 aws_recipes 👻 N. Virginia 👻 S	Support
AWS Manageme	ent Console			
AWS services			Access resources on the go	
Find Services You can enter names, keywords or acronyms. Q. Example: Relational Database Service, c	latabase, RDS		Access the Management Console using the AWS Console Mobile App. Learn more [2]	
Recently visited services			Explore AWS	
✓ All services Compute EC2 Lightsail 2 ECR ECS EKS Lambda Batch Elactic Renortalik	Management & Governance AWS Organizations CloudWatch AWS Auto Scaling CloudFormation CloudFormation CloudFrail Config OpsWorks Service Catalon	Security, Identity, & Compliance IAM Resource Access Manager Cognito Secrets Manager GuardDuty Inspector Amazon Macie 7	Open Distro for Elasticsearch A 100% open-source, community driven distribution of Elasticsearch with enterprise- grade security and alerting features Learn more [2] Amazon SageMaker Machine learning for every developer and data scientis: Learn more [2]	
Storage S3 EFS	Systems Ranager Trusted Advisor Managed Services Control Tower AWS License Manager	AWS Single Sign-On Certificate Manager Key Management Service CloudHSM Directory Service	Data Lake Storage Build your data lake on the most secure, durable, and scalable storage. Learn more [2]	

Figure 6.1

Tip: Clicking on the ass logo in the upper left corner will open the *Management Console* from any AWS window.

Cloud technology is evolving so fast that it is likely that some details in the primer may no longer match reality when you are trying to use it. If you find mismatches (e.g. broken third-party links), please send them to <u>support@earthdata.gov</u> so that we can feed them into the next release of the primer.



www.nasa.gov



2. Type *S3* in the search box under **Find Services**, and click on "S3 Scalable Storage in the Cloud" (Figure 6.2)

aws	Services 🗸 Resource Groups 🤟 🔭	Å aws_recipes + N. Virginia + Support +
	AWS Management Console	
	AWS services	Access resources on the go
	Find Services You can enter names, keywords or acronyms.	Access the Management Console using the AWS Console Mobile
	Q. \$3	X App. Learn more 🖄
	S3 Scalable Storage in the Cloud	
	S3 Glacier Archive Storage in the Cloud	Explore AWS
	AWS Transfer for SFTP Fully-managed SFTP service for Amazon S3	Amazon SageMaker
	Athena	Machine learning for every developer and data



3. Click on **Create bucket** in the *S3 console*, (Figure 6.3).

Services v	Resource Groups 👻 🛠	☐ aws_recipes ▼ Global ▼ Suppor	rt 🔻
Amazon S3	AWS Transfer for SFTP is a fully managed, secure file transfer with storage in Amazon S3. L	earn more » Documentation	
Buckets	S3 buckets	Ct Discover the console	
Batch operations	Q Search for buckets	All access types V	
Block public access (account settings)	+ Create bucket it public access settings Empty Delete	0_{Buckets} 0_{Regions} z	
Feature spotlight 2	You do not have any buckets. Here is how to ge S3.	et started with Amazon	

Figure 6.3.

4. Enter a **Bucket name** in the *Create bucket* pop-up window, (Figure 6.4).

	Create	bucket	
1 Name and region			
Name and region			
Bucket name 🜖			
cloudprimer-s3			
Region			
US East (N. Virginia)			×
Copy settings from an exist	ing bucket		
You have no buckets0 Bucket	s		~
Create			Cancel Next

Figure 6.4

5. For **Region**, select *US East (N. Virginia)* for this tutorial.

Important: There are extra costs associated with data that are transferred between AWS services across regions, but there are no costs for data that are transferred between AWS services *within the same region*. For example, if your bucket will be used to store data to be processed by an EC2 instance, make sure both are located in the same region.

6. Click Create

Your new bucket is displayed in the S3 buckets console (Figure 6.5)

aws servic	es 🗸 Resource Groups 🖌 🐂		众 aws_reci	pes 👻 Global 👻 Support 👻
Amazon S3	AWS Transfer for SFTP is a fully managed, secure file transfer with	storage in Amazon S3. Learn more »		Documentation
Buckets	S3 buckets			Discover the console
Batch operations	Q Search for buckets		All access type:	s 🗸
Block public access (account settings)	+ Create bucket Edit public access settings Empty Delete		1 Buckets	1_{Regions}
Feature spotlight	Bucket name 👻	Access 🚯 👻	Region -	Date created 👻
reature apolly it	Cloudprimer-s3	Bucket and objects not public	US East (N. Virginia)	Jul 5, 2019 1:46:37 PM GMT-0800

Figure 6.5

Add a file to a bucket

1. Click on the bucket name in the S3 buckets console (Figure 6.5) to open the bucket (Figure 6.6)

aw	S Services - Resou	irce Groups 👻 🔭			Ĺ	🕽 aws recipes	Global 👻	Support 👻	
	Amazon S3 > cloudprimer-s3	3							
5	Overview	Properties	Permissions	Management					
(Upload Foreate folder	Download Actions ~				US East (N	I. Virginia)	ø	
		This	bucket is empty. Uploa	d new objects to get st	arted.				
				-					

Figure 6.6

The bucket contents window shows that the bucket is empty.

2. Click on **Upload** (Figure 6.6).

You will then see an *Upload* pop-up window (Figure 6.7). In this window, you have the option to drag and drop files into the bucket, or to click on **Add files** and navigate to the location of the files on your computer.

		Upload	×
(1) Select files	2 Set permissions	3 Set properties	
To upload a file larger than 16	0 GB, use the AWS CLI, AWS SDK, or Amazon S	33 REST API. Learn more C	
	Drag and dr	op files and folders here	
		OR	
		Add files	
			Next

Figure 6.7

3. Click on **Upload** after selecting the files to add to your bucket, click on (Figure 6.8).



Figure 6.8

aws	Services 🗸 Reso	ource Groups 🗸 🔺			۵	aws recipes 👻	Global 👻	Support	•
Ama	azon S3 > cloudprimer-s	53							
	Overview	Properties	Permissions	Management					
1	Upload + Create folder	Download Actions ~				US East (N. V	/irginia)	C	
		This	bucket is empty. Uploa	ad new objects to get st	arted.				

When the upload is complete, the files appear in your bucket (Figure 6.9).



4. Select the check box next to a filename to view information on the file (Figure 6.10). The information appears on the right side of the window.

av	AWS Services - Resource Groups - + 🗘 aws_recipes - Global - Support -						
	Amazon S3 → cloudprimer-s3						
•	Overview	Properties	Permissions	Management		l	
	C Type a prefix and press Enter Lipload + Create folder	r to search. Press ESC to clear.			20190622_092439.jpg X Download Copy path Select from		
					Latest version 💌	1	
	□ Name ▼		L	ast modified 🕶	Overview Key 20190622 002/39 ing		
. (Z0190622_092439.jpg		J	ul 5, 2019 4:55:18 PM GMT-0800	Size 1.7 MB Expiration date N/A	1	
	bill-download-all-2019-0	06-21_23-31-03.py	J	ul 5, 2019 4:55:18 PM GMT-0800	Expiration rule N/A	J	

Figure 6.10

Download a file from a bucket

- 1. Open a bucket to display the contents.
- 2. Check the box in front of a file to open the file information window (Figure 6.10).
- 3. Click on **Download** (Figure 6.11).



Working with files in a bucket

Files can be organized in a bucket by creating a folder and copying and pasting files into the folder.

1. Click on **Create folder**, give the folder a name, then click **Save** (Figure 6.12).

	AWS Services - Resource Groups - *
	Q Type a prefix and press Enter to search. Press ESC to clear.
•	▲ Upload + Create folder Download Actions ~
	python scripts
	When you create a folder, S3 console creates an object with the above name appended by suffix "/" and that object is displayed as a folder in the S3 console. Choose the encryption setting for the object:
	None (Use bucket settings)
	AES-256
	Use Server-Side Encryption with Amazon S3-Managed Keys (SSE-S3)
	◯ AWS-KMS
	Use Server-Side Encryption with AWS KMS-Managed Keys (SSE-KMS)
	Save Cancel

Figure 6.12

2. Check the box in front of the file(s) you want to move to the new folder (Figure 6.13).



Figure 6.13

- 3. Click on **Actions** to open the dropdown menu, then select **Copy**.
- 4. Click on the *folder name* to open the folder.
- 5. Click on Actions again and select Paste.
- 6. Use the browser back arrow to return to the main level of the bucket (or use the breadcrumbs at the top of the bucket window to move one level up).
- 7. Select the file(s) you moved, click on Actions, then select Delete.
- 8. Confirm that you want to delete the files in the *Delete objects* pop-up window. Click **Delete** (Figure 6.14).

Amazon S3 → cloudprimer-s3	
Overview Pro	Delete objects ^
Q Type a prefix and press Enter to search. Pre	Selection: 2 Objects, 0 Folders Total size: 37.3 KB Total objects: 2
▲ Upload + Create folder Download	ыll-download-all-2019-06-21_23-31-03.py - 23.4 КВ
	Procs1gmt5sar.py - 13.9 KB
□ Name ▼	
python scripts	
20190622_092439.jpg	
☑ ⓓ bill-download-all-2019-06-21_23-31-03	
Config.s1a.txt	
insar_with_gmt5sar_v2.2.pdf	
Direcs1gmt5sar.py	
	All affected objects will be deleted
	Cancel Delete

Figure 6.14

Delete a bucket

Deleting a bucket deletes the bucket as well as its contents. If you want to keep the bucket for future use and preserve the name, you can delete the content files individually (see previous section). Or you can empty the bucket, which deletes the contents without deleting the bucket.

Empty a bucket

1. Check the box in front of the bucket name in the *S3 buckets* list and click on the **Empty** button (Figure 6.15).

aws Service	s 🗸 Resource Groups 🤟 🛠		↓ aws_recipe	s 🕶 Global 👻 Support 👻
Amazon S3	AWS Transfer for SFTP is a fully managed, secure file transfer with st	orage in Amazon S3. Le	earn more »	Documentation
Buckets	S3 buckets		cloudprimer-s3	
latch operations	Q Search for buckets		Copy Bucket ARN	
Block public access account settings)	Create bucket Edit public access settings Empty Delete		Properties Even	ts 0 Active notifications
	Bucket name 💌	Access 🚯 👻	MFA dele	te Disabled
eature spotlight	R doudprimer-s3	Bucket and objects	Loggir	ng Disabled
			Static web nostir	ng Disabled ns 0 Tags
			Requester pay	ys Disabled
			Object loo	ck Disabled
			Transfer acceleration	on Disabled



2. Type or copy and paste the bucket name in the *Empty bucket* pop-up window, then click on **Confirm** (Figure 6.16).

Empty bucket	×
Are you sure you want to empty the bucket "cloudprimer-s3" ?	٦
Type the name of the bucket to confirm:	
cloudprimer-s3	
Cancel	
Figure 6.16	

Delete a bucket

1. Check the box in front of the bucket name in the *S3 buckets* list, and click **Delete** (Figure 6.17)





2. Type or copy and paste the bucket name in the *Delete bucket* pop-up window, then click **Confirm** (Figure 6.18)



Figure 6.18