AWS – S3 (SIMPLE STORAGE SERVICE)

KESHAV KUMMARI

S3 – SIMPLE STORAGE SERVICE

- S3 ESSENTIALS
- S3 PERMISSIONS
- S3 STORAGE CLASSES
- OBJECT VERSIONING
- S3 LIFE CYCLE POLICIES
- S3 EVENTS
- WEBSITE HOSTING WITH \$3
- CROSS-ORIGIN RESOURCE SHARING(CORS)
- GETTING DATA INTO AND OUT OF \$3
- LAB: USING S3 FOR STATIC WEB-HOSTING
- LAB: CONFIGURE BACKUP & ARCHIVING SOLUTIONS IN S3
- QUIZ

WHAT IS S3



S3 is a safe place to store your files.

It is Object based storage.

The data is spread across multiple devices and facilities

USAGE OF S3



S3 provides developers and IT teams with secure, durable, highly-scalable object storage. Amazon S3 is easy to use, with a simple web services interface to store and retrieve any amount of data from anywhere on the web.

ABOUT S3

- S3 IS OBJECT BASED I.E. ALLOWS YOU TO UPLOAD FILES.
- FILES CAN BE FROM 0 BYTES TO 5 TB.
- THERE IS UNLIMITED STORAGE
- FILES ARE STORED IN BUCKETS.
- S3 IS A UNIVERSAL NAMESPACE, THAT IS, NAMES MUST BE UNIQUE GLOBALLY.
- HTTPS://S3-AP-SOUTH-1A.AMAZONAWS.COM/KESHAVKUMMARI
- WHEN YOU UPLOAD A FILE TO S3 YOU WILL RECEIVE A HTTP 200 CODE IF THE UPLOAD WAS SUCCESSFUL.

DATA CONSISTENCY MODEL OF S3:

- READ AFTER WRITE CONSISTENCY FOR PUTS OF NEW OBJECTS
- EVENTUAL CONSISTENCY FOR OVERWRITE PUTS AND DELETES(CAN TAKE SOME TIME PROPAGATE)

- BUILT FOR 99.99% AVAILABILITY
- TIERED STORAGE AVAILABLE
- LIFECYCLE MANAGEMENT
- ENCRYPTION
- SECURE YOUR DATA USING ACCESS CONTROL LISTS AND BUCKET POLICIES
- S3 IS A SIMPLE KEY, VALUE STORE
- S3 IS OBJECT BASED. OBJECTS CONSISTS OF THE FOLLOWING:
 - KEY(NAME OF THE OBJECT)
 - VALUE(DATA IS MADE UP OF A SEQUENCE OF BYTES)
 - VERSION ID(IMPORTANT FOR VERSIONING)
 - METADATA(DATA ABOUT THE DATA YOU ARE STORING)
 - SUBRESOURCES
 - ACCESS CONTROL LISTS

S3 – STORAGE TIERS/CLASSES

- 1. \$3 99.99% AVAILABILITY, DURABILITY, STORED REDUNDANTLY ACROSS MULTIPLE DEVICES IN MULTIPLE FACILITIES AND IS DESIGNED TO SUSTAIN THE LOSS OF 2 FACILITIES CONCURRENTLY.
- 2. \$3 IA(INFREQUENTLY ACCESSED) FOR DATA THAT IS ACCESSED LESS FREQUENTLY, BUT REQUIRES RAPID ACCESS WHEN NEEDED. LOWER FEE THAN \$3, BUT YOU ARE CHARGED A RETRIEVAL FEE.
- 3. REDUCED REDUNDANCY STORAGE DESIGNED TO PROVIDE 99.99% DURABILITY AND 99.99% AVAILABILITY OF OBJECTS OVER A GIVEN YEAR.
- **4. GLACIER** VERY CHEAP, BUT USED FOR ARCHIVAL ONLY. IT TAKES 3-5 HOURS TO RESTORE FROM GLACIER.

S3 – STORAGE TIERS/CLASSES

	Standard	Standard - Infrequent Access	Reduced Redundancy Storage
Durability	99.99999999%	99.99999999%	99.99%
Availability	99.99%	99.9%	99.99%
Concurrent facility fault tolerance	2	2	1
SSL support	Yes	Yes	Yes
First byte latency	Milliseconds	Milliseconds	Milliseconds
Lifecycle Management Policies	Yes	Yes	Yes

WHAT IS GLACIER?



Glacier is an extremely low-cost storage service for data archival. Amazon Glacier stores data for as little as \$0.01 per gigabyte per month, and is optimized for data that is infrequently accessed and for which retrieval times of 3 to 5 hours are suitable.

S3 VS GLACIER

	Standard	Standard - IA	Amazon Glacier
Designed for Durability	99.99999999%	99.99999999%	99.99999999%
Designed for Availability	99.99%	99.9%	N/A
Availability SLA	99.9%	99%	N/A
Minimum Object Size	N/A	128KB*	N/A
Minimum Storage Duration	N/A	30 days	90 days
Retrieval Fee	N/A	per GB retrieved	per GB retrieved**
First Byte Latency	milliseconds	milliseconds	select minutes or hours***
Storage Class	object level	object level	object level
Lifecycle Transitions	yes	yes	yes

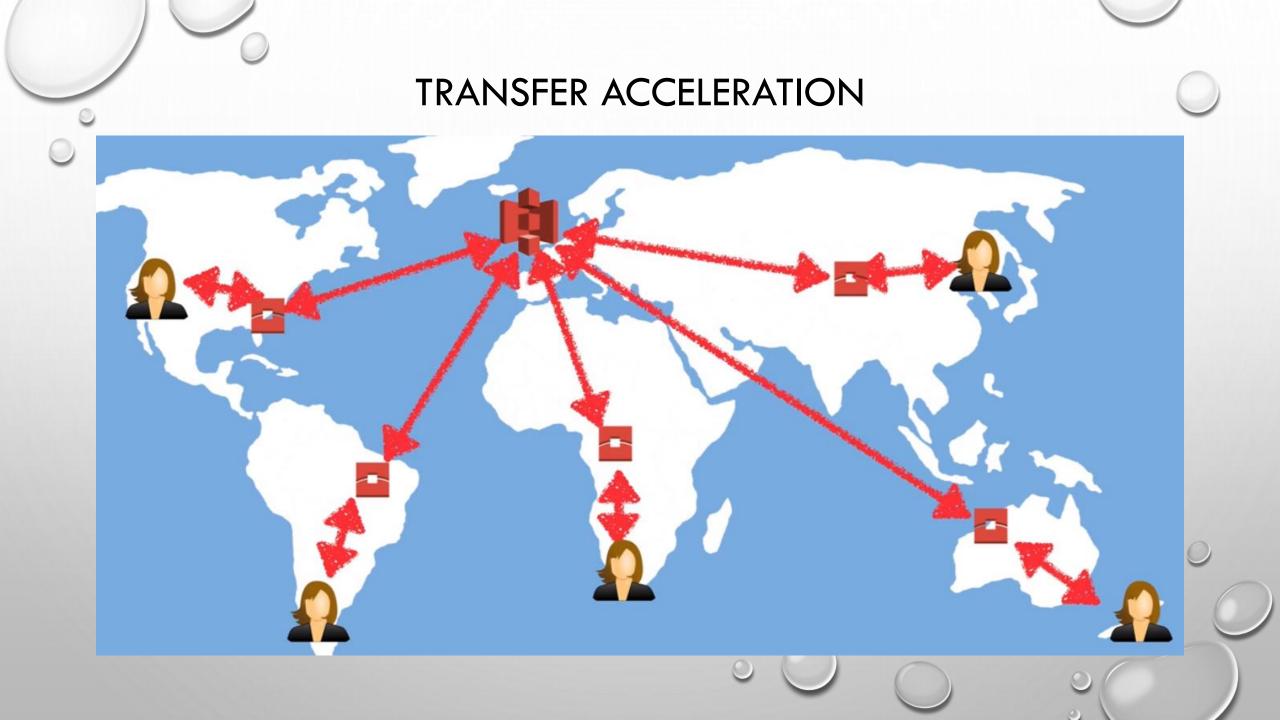
S3 – CHARGES

- CHARGED FOR:
- STORAGE REQUESTS
- STORAGE MANAGEMENT PRICING
 DATA TRANSFER PRICING
- TRANSFER ACCELERATION



Amazon S3 Transfer Acceleration enables fast, easy, and secure transfers of files over long distances between your end users and an S3 bucket.

Transfer Acceleration takes advantage of Amazon CloudFront's globally distributed edge locations. As the data arrives at an edge location, data is routed to Amazon S3 over an optimized network path.



S3 - SUMMARY

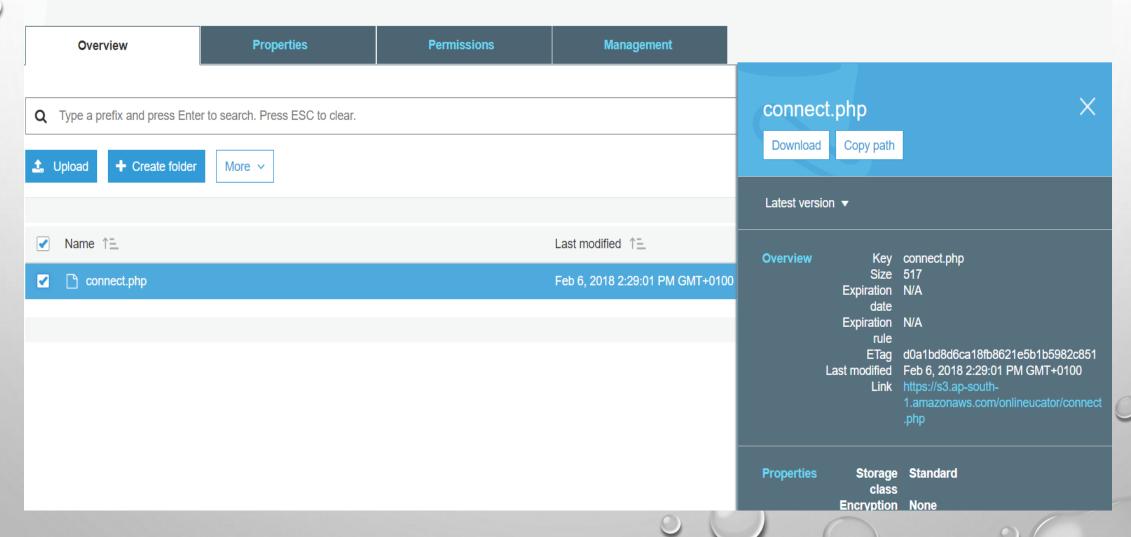
- REMEMBER THAT S3 IS OBJECT BASED I.E. ALLOWS YOU TO UPLOAD FILES.
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SUMMARY

- S3 STORAGE CLASSES/TIERS
- S3 (DURABLE, IMMEDIATELY AVAILABLE, FREQUENTLY ACCESSED)
- S3 IA(DURABLE, IMMEDIATELY AVAILABLE, INFREQUENTLY ACCESSED)
- S3 REDUCED REDUNDANCY STORAGE(DATA THAT IS EASILY REPRODUCIBLE, SUCH AS THUMB NAILS ETC)
- GLACIER ARCHIVED DATA, WHERE YOU CAN WAIT 3 5 HOURS BEFORE ACCESSING.
- REMEMBER THE CORE FUNDAMENTALS OF AN \$3 OBJECTS:
 - KEY(NAME)
 - VALUE(DATA)
 - VERSION ID
 - METADATA
 - SUBRESOURCES
 - ACL



Amazon S3 > onlineucator



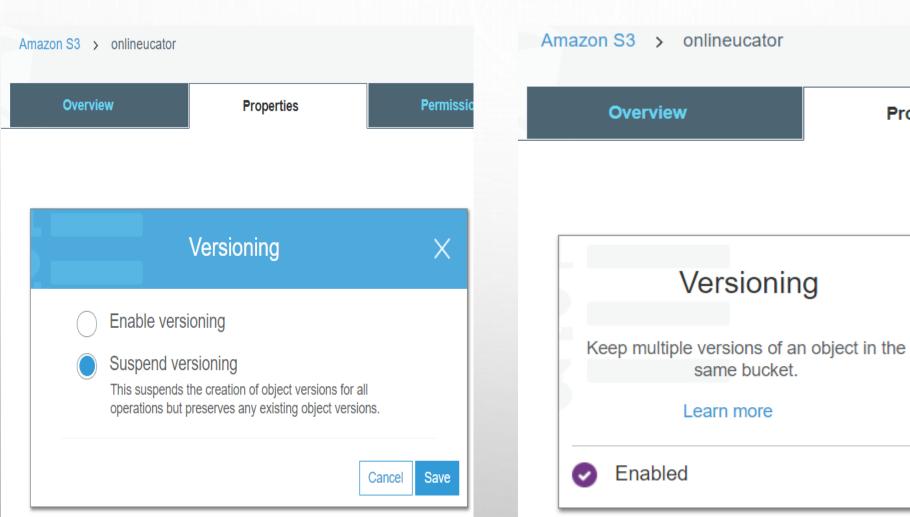
S3 – BUCKET OVERVIEW

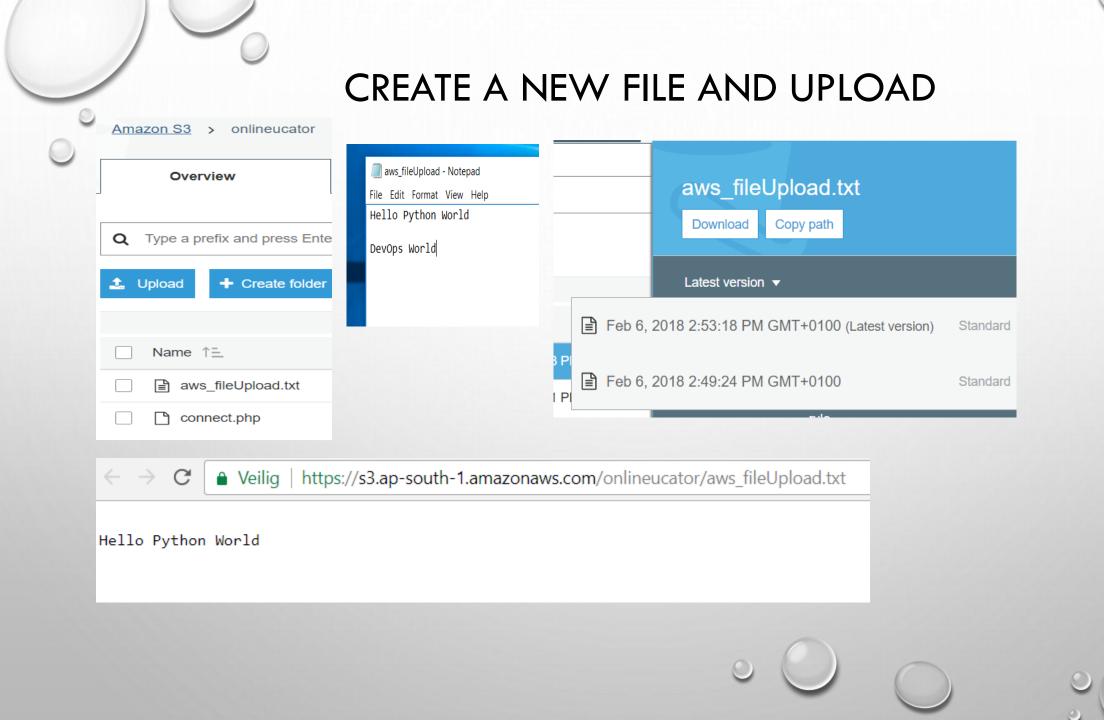
- Buckets are a universal name space
- Upload an object to S3 receive a HTTP 200 Code
- · S3, S3 IA, S3 Reduced Redundancy Storage
- Encryption
 - Client Side Encryption
 - Server Side Encryption
 - Server side encryption with Amazon S3 Managed Keys (SSE-S3)
 - Server side encryption with KMS (SSE-KMS)
 - · Server side encryption with Customer Provided Keys (SSE-C)
- · Control access to buckets using either a bucket ACL or using Bucket Polices
- BY DEFAULT BUCKETS ARE PRIVATE AND ALL OBJECTS STORED INSIDE THEM ARE PRIVATE



VERSIONING

Properties





VERSIONING - OVERVIEW

- Stores all versions of an object (including all writes and even if you delete an object)
- Great backup tool.
- Once enabled, Versioning cannot be disabled, only suspended.
- Integrates with Lifecycle rules
- Versioning's MFA Delete capability, which uses multi-factor authentication, can be used to provide an additional layer of security.

SECURE THE S3 OBJECTS USING MFA(MULTI-FACTOR AUTHENTICATION)



MFA Delete

You can optionally add another layer of sed rity by configuring a bucket to enable MFA (Multi-Factor Authentication) Delete, which requires additional authentication for either of the following operations.

- · Change the versioning state of your bucket
- · Permanently delete an object version

MFA Delete requires two forms of authentication together:

- Your security credentials
- The concatenation of a valid serial number, a space, and the six-digit code displayed on an approved authentication device

MFA Delete thus provides added security in the event, for example, your security credentials are compromised.

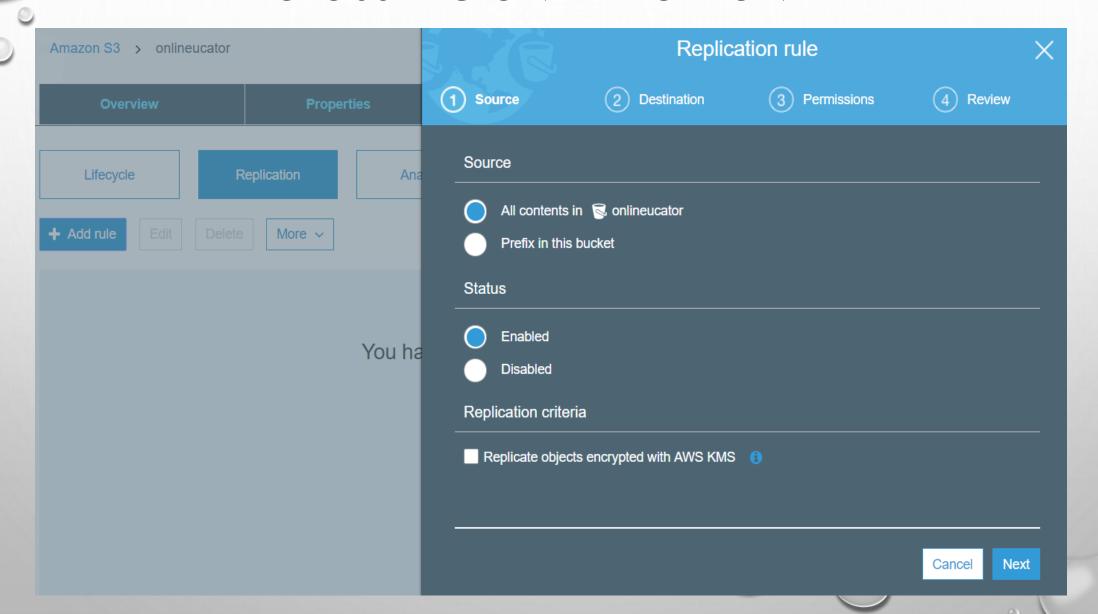
To enable or disable MFA delete, you use the same API that you use to configure versioning on a bucket. Amazon S3 stores the MFA Delete configuration in the same *versioning* subresource that stores the bucket's versioning status.



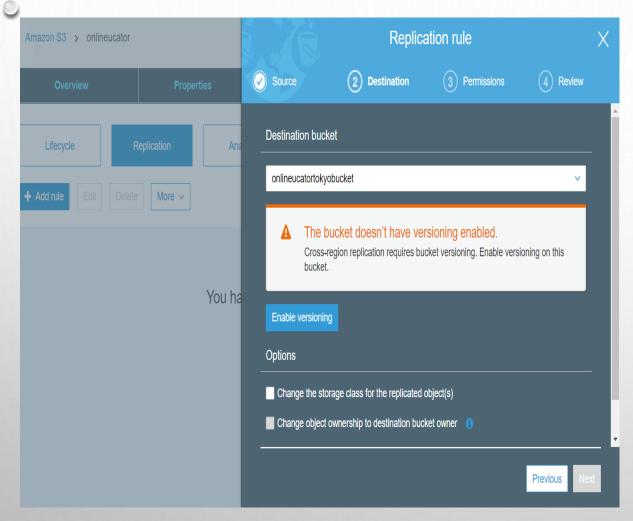
To use MFA Delete, you can use either a hardware or virtual MFA device to generate an authentication code. The following example shows a generated authentication code displayed on a hardware device.

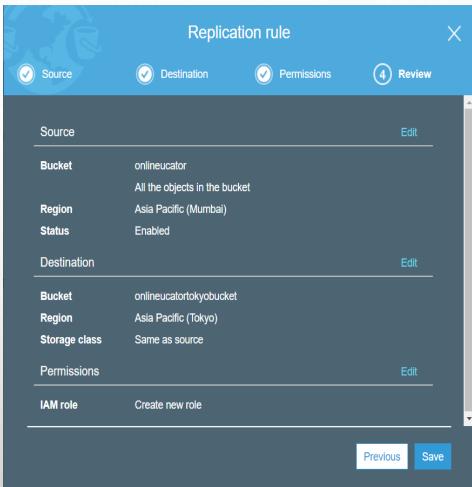


CROSS REGION REPLICATION - LAB



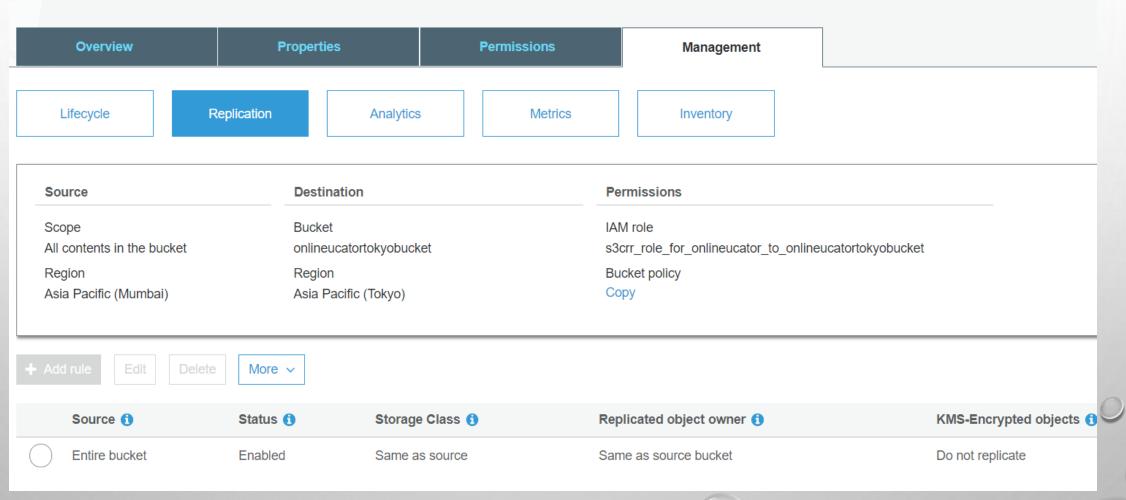
CROSS REGION REPLICATION







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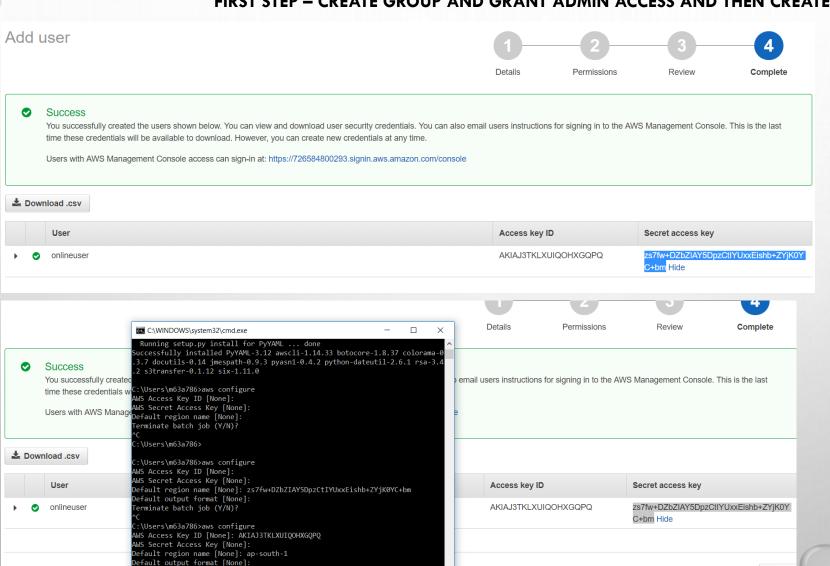


AWS - COMMAND LINE TOOLS

```
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.
 :\Users\m63a786>pip install awscli
Collecting awscli
 Downloading awscli-1.14.33-py2.py3-none-any.whl (1.2MB)
                                         1.2MB 327kB/s
Collecting colorama<=0.3.7,>=0.2.5 (from awscli)
 Downloading colorama-0.3.7-py2.py3-none-any.whl
Collecting rsa<=3.5.0,>=3.1.2 (from awscli)
 Downloading rsa-3.4.2-py2.py3-none-any.whl (46kB)
   100%
                                          51kB 94kB/s
Collecting docutils>=0.10 (from awscli)
 Downloading docutils-0.14-py3-none-any.whl (543kB)
                                          552kB 595kB/s
Collecting botocore==1.8.37 (from awscli)
 Downloading botocore-1.8.37-py2.py3-none-any.whl (4.1MB)
                                          4.1MB 216kB/s
Collecting PyYAML<=3.12,>=3.10 (from awscli)
 Downloading PyYAML-3.12.tar.gz (253kB)
                                          256kB 655kB/s
Collecting s3transfer<0.2.0,>=0.1.12 (from awscli)
 Downloading s3transfer-0.1.12-py2.py3-none-any.whl (59kB)
                                          61kB 2.6kB/s
 collecting pyasn1>=0.1.3 (from rsa<=3.5.0,>=3.1.2->awscli)
  Downloading pyasn1-0.4.2-py2.py3-none-any.whl (71kB)
   100%
                                           71kB 118kB/s
Collecting python-dateutil<3.0.0,>=2.1 (from botocore==1.8.37->awscli)
 Downloading python_dateutil-2.6.1-py2.py3-none-any.whl (194kB)
   100%
                                           194kB 189kB/s
Collecting jmespath<1.0.0,>=0.7.1 (from botocore==1.8.37->awscli)
 Downloading jmespath-0.9.3-py2.py3-none-any.whl
Collecting six>=1.5 (from python-dateutil<3.0.0,>=2.1->botocore==1.8.37->awscli)
 Downloading six-1.11.0-py2.py3-none-any.whl
Installing collected packages: colorama, pyasn1, rsa, docutils, six, python-dateutil, jmespath,
 Running setup.py install for PyYAML ... done
Successfully installed PyYAML-3.12 awscli-1.14.33 botocore-1.8.37 colorama-0.3.7 docutils-0.14
```

CREATING IAM USER

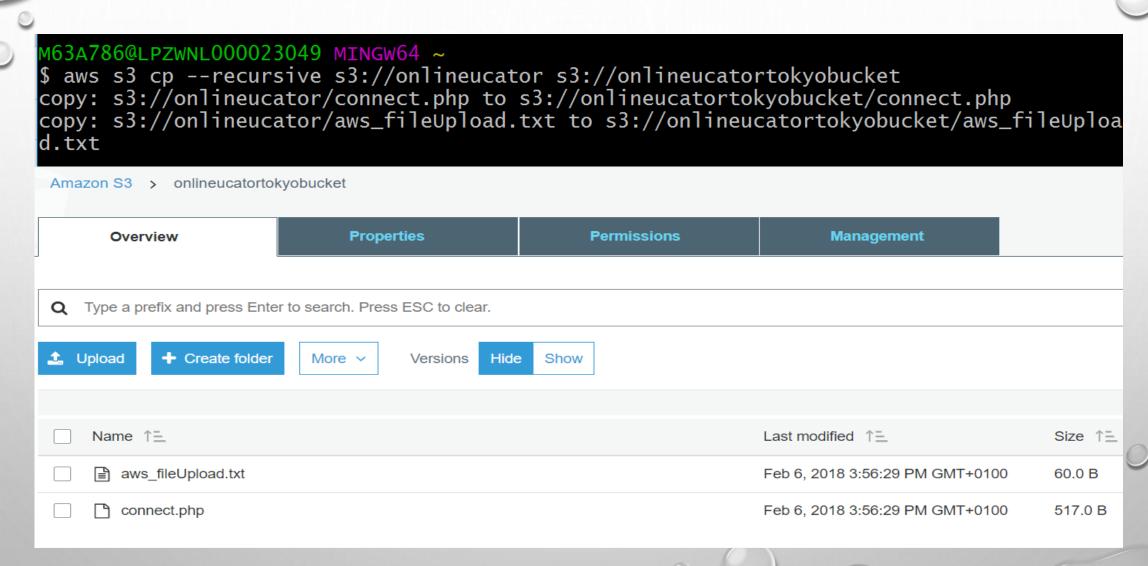
FIRST STEP – CREATE GROUP AND GRANT ADMIN ACCESS AND THEN CREATE USER



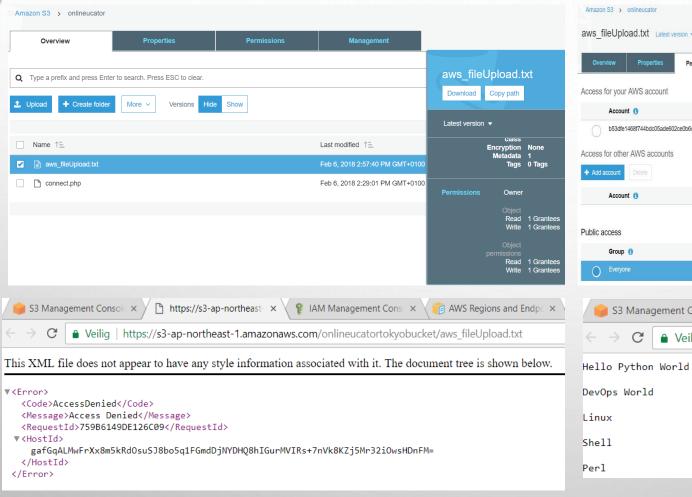
CONNECTING USING GITBASH OR CMD AND CHECKING THE S3 BUCKETS

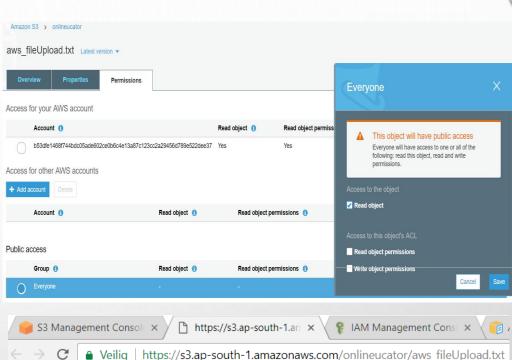
```
MINGW64:/h/
M63A786@LPZWNL000023049 MINGW64 ~
$ aws configure
AWS Access Key ID [None]: AKIAJ3TKLXUIQOHXGQPQ
AWS Secret Access Key [None]: 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
Default region name [None]: ap-south-1
Default output format [None]:
M63A786@LPZWNL000023049 MINGW64 ~
$ aws s3 ls
2018-02-04 18:48:43 dbcheck.ap-south-1
2018-02-05 06:31:37 keshavdb
2018-02-06 15:26:41 onlineucator
2018-02-06 15:25:27 onlineucatortokyobucket
2018-01-13 11:22:06 www.ckk.com
2018-01-13 11:07:36 www.keshavkumari.com
2018-01-13 15:51:49 www.keshavkummari.com
2018-01-13 11:39:23 www.mywebsiteckk.com
```

COPY THE FILES FROM ONE BUCKET TO OTHER BUCKET AND GO TO THE UI AND CROSS CHECK



CROSS REGION REPLICATION



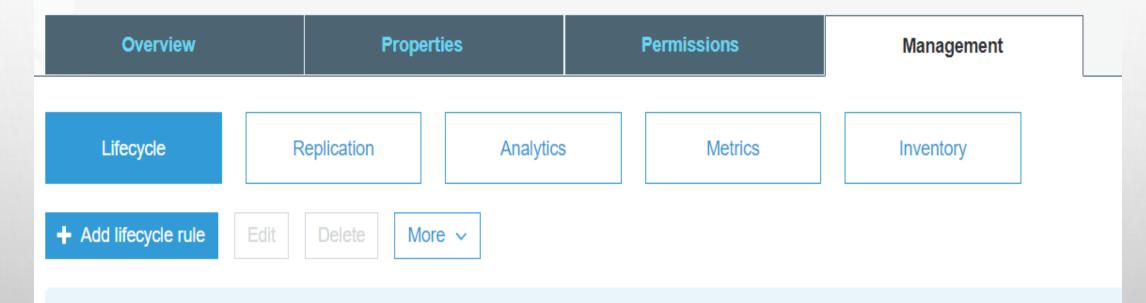


CROSS REGION REPLICATION - OVERVIEW

- Versioning must be enabled on both the source and destination buckets.
- Regions must be unique.
- Files in an existing bucket are not replicated automatically. All subsequent updated files will be replicated automatically.
- You cannot replicate to multiple buckets or use daisy chaining (at this time.)
- Delete markers are replicated.
- Deleting individual versions or delete markers will not be replicated.
- Understand what Cross Region Replication is at a high level.

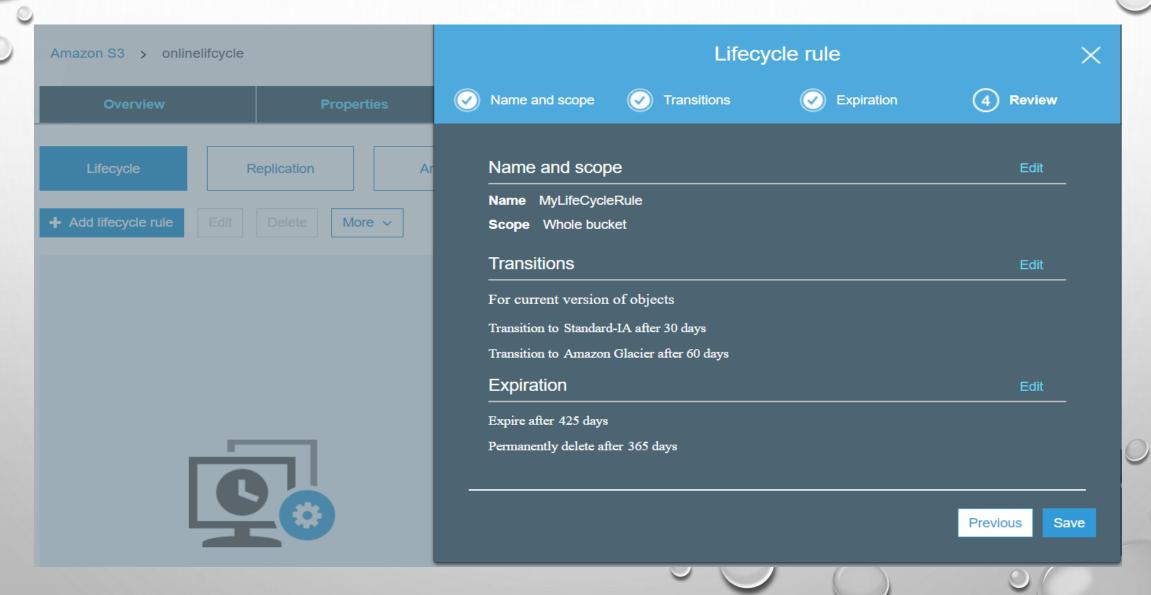
LIFE CYCLE MGMT, S3 -IA & GLACIER LAB

Amazon S3 > onlinelifcycle



There is no lifecycle rule applied to this bucket. Here is how to get started.

CREATING LIFE CYCLE BUCKET WITH RULE



OVERVIEW OF LIFE CYCLE MGMT

- · Can be used in conjunction with versioning.
- · Can be applied to current versions and previous versions.
- · Following actions can now be done:
 - Transition to the Standard Infrequent Access Storage Class (128Kb and 30 days after the creation date.)
 - Archive to the Glacier Storage Class (30 days after IA, if relevant)
 - Permanently Delete

WEBSITE HOSTING WITH S3

Amazon S3 > onlinepython

Overview Properties Permissions Management

Versioning

Keep multiple versions of an object in the same bucket.

Learn more

Disabled

Server access logging

Set up access log records that provide details about access requests.

Learn more

Disabled

Static website hosting

Endpoint : http://onlinepython.s3-website.ap-south-1.amazonaws.com

Use this bucket to host a website 1 Learn more
Index document 1

index.html

Error document (1)

error.html

Redirection rules (optional) 1

UPLOAD THE HTML FILES

