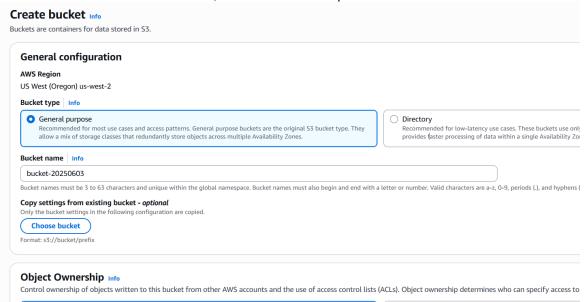Pre-requisiste: Lambda Execution Role

Lambda Execution Policy Example for Lambda Execution Role

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "logs:*"
            ],
            "Resource": "arn:aws:logs:*:*:*",
            "Effect": "Allow"
        },
        {
            "Action": [
                "s3:GetObject",
                "s3:PutObject"
            ],
            "Resource": "arn:aws:s3:::*",
            "Effect": "Allow"
        }
    ]
}
```

Create 2 S3 Buckets with default values, the other one is backup bucket

Create bucket Info

Buckets are containers for data stored in S3.

General configuration

AWS Region
US West (Oregon) us-west-2

Bucket type | Info

- ⦿ General purpose
  Recommended for most use cases and access patterns. General purpose buckets are the original S3 bucket type. They allow a mix of storage classes that redundantly store objects across multiple Availability Zones.

- ○ Directory
  Recommended for low-latency use cases. These buckets use only provides faster processing of data within a single Availability Zo

Bucket name | Info

```
bucket-20250603
```

Bucket names must be 3 to 63 characters and unique within the global namespace. Bucket names must also begin and end with a letter or number. Valid characters are a-z, 0-9, periods (.), and hyphens (

Copy settings from existing bucket - optional
Only the bucket settings in the following configuration are copied.

[Choose bucket]

Format: s3://bucket/prefix

Object Ownership Info

Control ownership of objects written to this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership determines who can specify access to

▶ **Account snapshot -** *updated every 24 hours* [All AWS Regions]
Storage lens provides visibility into storage usage and activity trends. Metrics don't include directory buckets. Learn more ⬈

General purpose buckets | **Directory buckets**

General purpose buckets (3) Info [All AWS Regions]

Buckets are containers for data stored in S3.

🔍 Find buckets by name

	Name ▲	AWS Region ▽	IAM Access Analyzer
○	awslabs-resources-krxqqla59sui8d-us-east-1-176449842503	US East (N. Virginia) us-east-1	View analyzer for us-east-1
○	awslabs-resources-r5b3y6ojjszcap-us-east-1-176449842503	US East (N. Virginia) us-east-1	View analyzer for us-east-1
○	bucket-20250603	US West (Oregon) us-west-2	View analyzer for us-west-2

Create bucket Info

Buckets are containers for data stored in S3.

General configuration

AWS Region
US West (Oregon) us-west-2

Bucket type Info

⦿ **General purpose**
Recommended for most use cases and access patterns. General purpose buckets are the original S3 bucket type. They allow a mix of storage classes that redundantly store objects across multiple Availability Zones.

○ **Directory**
Recommended for low-latency use cases. These buckets use only the S3 Express One provides faster processing of data within a single Availability Zone.

Bucket name Info

bucket-20250603-backup

Bucket names must be 3 to 63 characters and unique within the global namespace. Bucket names must also begin and end with a letter or number. Valid characters are a-z, 0-9, periods (.), and hyphens (-). Learn More ⬈

Copy settings from existing bucket - *optional*
Only the bucket settings in the following configuration are copied.

Choose bucket

Format: s3://bucket/prefix

Object Ownership Info

Control ownership of objects written to this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership determines who can specify access to objects.

Storage lens provides visibility into storage usage and activity trends. Metrics don't include directory buckets. Learn more

General purpose buckets | **Directory buckets**

General purpose buckets (4) Info [All AWS Regions]

Buckets are containers for data stored in S3.

⟳   Copy ARN   Empty   Delete   **Create bucket**

🔍 Find buckets by name

‹ 1 › ⚙

	Name	AWS Region ▽	IAM Access Analyzer	Creation date ▽
○	awslabs-resources-krxqqla59sui8d-us-east-1-176449842503	US East (N. Virginia) us-east-1	View analyzer for us-east-1	October 1, 2020, 09:35:17 (UTC+08:00)
○	awslabs-resources-r5b3y6ojjszcap-us-east-1-176449842503	US East (N. Virginia) us-east-1	View analyzer for us-east-1	February 2, 2024, 03:45:40 (UTC+08:00)
○	bucket-20250603	US West (Oregon) us-west-2	View analyzer for us-west-2	June 3, 2025, 06:27:23 (UTC+08:00)
○	bucket-20250603-backup	US West (Oregon) us-west-2	View analyzer for us-west-2	June 3, 2025, 06:28:37 (UTC+08:00)

Create Lambda Function

[Alt+S]   ▷_   🔔   ?   ⚙   United States (Oregon) ▼   AWSLabsUser-4zwjAtadyoMLka86mZjWTD/b59977c2-c959-42d1-bf3f-83... ▼

ⓘ   ⟳

Functions (2)

Last fetched 0 seconds ago ⟳   Actions ▼   **Create function**

🔍 Filter by attributes or search by keyword

‹ 1 › ⚙

	Function name ▽	Description ▽	Package type ▽	Runtime ▽	Last modified ▽
☐	LabEnforcer_Function	-	Zip	Python 3.12	6 minutes ago
☐	LabEnforcer_Helper_Function	-	Zip	Python 3.12	5 minutes ago

Create function Info

Choose one of the following options to create your function.

● **Author from scratch** Start with a simple Hello World example.	○ **Use a blueprint** Build a Lambda application from sample code and configuration presets for common use cases.	○ **Container ima** Select a contain

Basic information

Function name
Enter a name that describes the purpose of your function.

```
backupbucket
```

Function name must be 1 to 64 characters, must be unique to the Region, and can't include spaces. Valid characters are a-z, A-Z, 0-9, hyphens (-), and underscores (_).

Runtime | Info
Choose the language to use to write your function. Note that the console code editor supports only Node.js, Python, and Ruby.

```
Python 3.9                                                          ▼
```
⟳

Architecture | Info
Choose the instruction set architecture you want for your function code.
○ arm64
● x86_64

Permissions Info

By default, Lambda will create an execution role with permissions to upload logs to Amazon CloudWatch Logs. You can customize this default role later when adding triggers.

▼ **Change default execution role**

Execution role
Choose a role that defines the permissions of your function. To create a custom role, go to the IAM console [↗].

○ Create a new role with basic Lambda permissions
● Use an existing role
○ Create a new role from AWS policy templates

Existing role
Choose an existing role that you've created to be used with this Lambda function. The role must have permission to upload logs to Amazon CloudWatch Logs.

| lambda-execution-role ▼ | ⟳

View the lambda-execution-role role [↗] on the IAM console.

▶ **Additional configurations**
Use additional configurations to set up code signing, function URL, tags, and Amazon VPC access for your function.

Cancel   **Create function**

Add Triger:

✓ Successfully created the function **backupbucket**. You can now change its code and configuration. To invoke your function with a test event, choose "Test".

backupbucket   [Throttle] [🗐 Copy ARN] [Actions]

▼ **Function overview**   Info   [Export to Infrastructure Composer] [Download ▼]

[Diagram | Template]

┌─────────────────────────────┐   **Description**
│ λ **backupbucket**   │   -
│   │   **Last modified**
│ ▦ Layers   (0)   │   3 seconds ago
└─────────────────────────────┘   **Function ARN**
                                         🗐 arn:aws:lambda:us-west-2:176449842503:function:backupbu
[+ Add trigger]   [+ Add destination]   cket

                                         Function URL Info
                                         -

Code Test Monitor Configuration Aliases Versions

Add trigger

Trigger configuration Info

┌──┐
│ ▦ **S3**   │
│   aws   asynchronous   storage   │
└──┘

Bucket
Choose or enter the ARN of an S3 bucket that serves as the event source. The bucket must be in the same region as the function.

| 🔍 s3/bucket-20250603   ✕ | ⟳

Bucket region: us-west-2

Event types
Select the events that you want to have trigger the Lambda function. You can optionally set up a prefix or suffix for an event. However, for each bucket, individual events cannot have
match the same object key.

| ▼ |

[All object create events ✕]

Prefix - *optional*
Enter a single optional prefix to limit the notifications to objects with keys that start with matching characters. Any special characters [↗] must be URL encoded.

| e.g. images/ |

Suffix - *optional*
Enter a single optional suffix to limit the notifications to objects with keys that end with matching characters. Any special characters [↗] must be URL encoded.

| e.g. .jpg |

Recursive invocation

If your function writes objects to an S3 bucket, ensure that you are using different S3 buckets for input and output. Writing to the same bucket increases the risk of creating a recursive invocation, which can result in increased Lambda usage and increased costs. Learn more ☐

☑ I acknowledge that using the same S3 bucket for both input and output is not recommended and that this configuration can cause recursive invocations, increased Lambda usage, and increased costs.

Lambda will add the necessary permissions for AWS S3 to invoke your Lambda function from this trigger. Learn more ☐ about the Lambda permissions model.

Cancel   Add

☰ Lambda > Functions > backupbucket   ⓘ ⊘

backupbucket   Throttle   Copy ARN   Actions ▼

⊘ The trigger bucket-20250603 was successfully added to function backupbucket. The function is now receiving events from the trigger.   ✕

▼ **Function overview**   Info   Export to Infrastructure Composer   Download ▼

Diagram | Template   **Description**
                                                        -
              backupbucket
                                                        Last modified
         Layers   (0)   2 minutes ago

   S3   **Function ARN**
                                         + Add destination   arn:aws:lambda:us-west-2:176449842503:function:backupbucket
 + Add trigger
                                                        Function URL Info
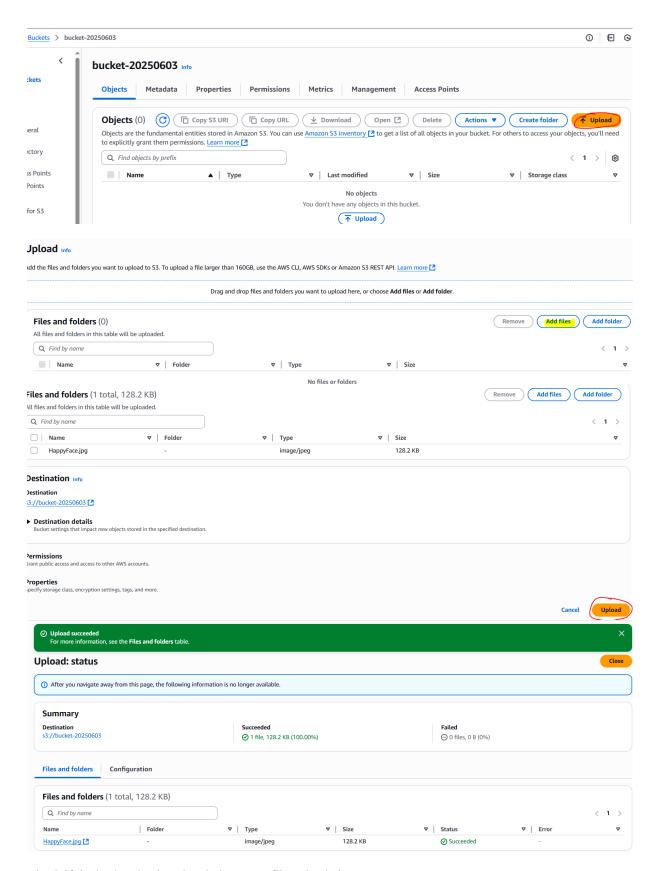   -

Put this to Code Section and Deploy:
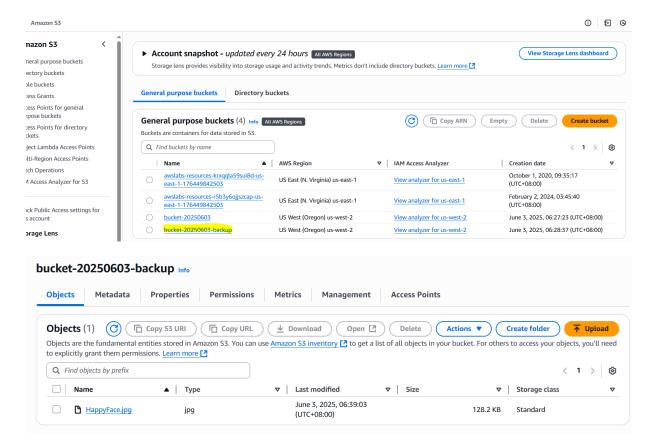import json
import uuid
import boto3

s3_client = boto3.client("s3")
s3 = boto3.resource("s3")

def lambda_handler(event, context):
    for record in event["Records"]:
        bucket = record['s3']['bucket']['name']
        print(bucket)
        key = record['s3']['object']['key']
        print(key)
        download_path = '/tmp/{}{}'.format(uuid.uuid4(), key)
        print (download_path)
        upload_path = download_path
        print (upload_path)
        s3_client.download_file(bucket, key, download_path)
        s3_client.upload_file(upload_path, '{}-backup'.format(bucket), key)

```python
 3    import boto3
 4
 5    s3_client = boto3.client("s3")
 6    s3 = boto3.resource("s3")
 7
 8    def lambda_handler(event, context):
 9        for record in event["Records"]:
10            bucket = record['s3']['bucket']['name']
11            print(bucket)
12            key = record['s3']['object']['key']
13            print(key)
14            download_path = '/tmp/{}{}'.format(uuid.uuid4(), key)
15            print (download_path)
16            upload_path = download_path
17            print (upload_path)
18            s3_client.download_file(bucket, key, download_path)
19            s3_client.upload_file(upload_path, '{}-backup'.format(bucket), key)
```

EXPLORER

BACKUPBUCKET
- lambda_function.py

DEPLOY [UNDEPLOYED CHANGES]

⚠ You have undeployed changes.

Deploy (Ctrl+Shift+U)

Test (Ctrl+Shift+I)

⊘ Successfully updated the function **backupbucket**.

Code   Test   Monitor   Configuration   Aliases   Versions

Code source   Info

🔍 backupbucket

EXPLORER

BACKUPBUCKET
- lambda_function.py

DEPLOY

Deploy (Ctrl+Shift+U)

Test (Ctrl+Shift+I)

lambda_function.py ✕
lambda_function.py

```python
 3    import boto3
 4
 5    s3_client = boto3.client("s3")
 6    s3 = boto3.resource("s3")
 7
 8    def lambda_handler(event, context):
 9        for record in event["Records"]:
10            bucket = record['s3']['bucket']['name']
11            print(bucket)
12            key = record['s3']['object']['key']
13            print(key)
14            download_path = '/tmp/{}{}'.format(uuid.uuid4(), key)
15            print (download_path)
16            upload_path = download_path
17            print (upload_path)
18            s3_client.download_file(bucket, key, download_path)
19            s3_client.upload_file(upload_path, '{}-backup'.format(bucket), key)
```

Then upload a file in the original bucket (no backup in name)

bucket-20250603 Info

Objects | Metadata | Properties | Permissions | Metrics | Management | Access Points

Objects (0) | Copy S3 URI | Copy URL | Download | Open | Delete | Actions ▼ | Create folder | ↑ Upload

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory ☑ to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more ☑

	Name ▲	Type ▽	Last modified ▽	Size ▽	Storage class ▽

No objects
You don't have any objects in this bucket.

↑ Upload

Upload Info

Add the files and folders you want to upload to S3. To upload a file larger than 160GB, use the AWS CLI, AWS SDKs or Amazon S3 REST API. Learn more ☑

Drag and drop files and folders you want to upload here, or choose **Add files** or **Add folder**.

Files and folders (0)
All files and folders in this table will be uploaded.

Remove | **Add files** | Add folder

	Name ▽	Folder ▽	Type ▽	Size ▽

No files or folders

Files and folders (1 total, 128.2 KB)
All files and folders in this table will be uploaded.

Remove | Add files | Add folder

	Name ▽	Folder ▽	Type ▽	Size ▽
	HappyFace.jpg	-	image/jpeg	128.2 KB

Destination Info

Destination
s3://bucket-20250603 ☑

▶ **Destination details**
Bucket settings that impact new objects stored in the specified destination.

Permissions
Grant public access and access to other AWS accounts.

Properties
Specify storage class, encryption settings, tags, and more.

Cancel | **Upload**

✓ **Upload succeeded** | ✕
For more information, see the **Files and folders** table.

Upload: status | Close

ℹ After you navigate away from this page, the following information is no longer available.

Summary

Destination	Succeeded	Failed
s3://bucket-20250603	✓ 1 file, 128.2 KB (100.00%)	⊖ 0 files, 0 B (0%)

Files and folders | Configuration

Files and folders (1 total, 128.2 KB)

Name	Folder ▽	Type ▽	Size ▽	Status ▽	Error ▽
HappyFace.jpg ☑	-	image/jpeg	128.2 KB	✓ Succeeded	-

Check if the backup bucket already has same file uploaded

Amazon S3

Amazon S3 ‹

neral purpose buckets
ectory buckets
le buckets
ess Grants
ess Points for general
rpose buckets
ess Points for directory
ckets
ject Lambda Access Points
lti-Region Access Points
tch Operations
A Access Analyzer for S3

ck Public Access settings for
s account

orage Lens

▶ **Account snapshot** - *updated every 24 hours* [All AWS Regions]   [View Storage Lens dashboard]

Storage lens provides visibility into storage usage and activity trends. Metrics don't include directory buckets. Learn more ⧉

| **General purpose buckets** | **Directory buckets** |

General purpose buckets (4) Info [All AWS Regions]   ↻ [Copy ARN] [Empty] [Delete] [Create bucket]
Buckets are containers for data stored in S3.

🔍 Find buckets by name   ‹ 1 › ⚙

	Name ▲	AWS Region ▽	IAM Access Analyzer	Creation date ▽
○	awslabs-resources-krxqqla59sui8d-us-east-1-176449842503	US East (N. Virginia) us-east-1	View analyzer for us-east-1	October 1, 2020, 09:35:17 (UTC+08:00)
○	awslabs-resources-r5b3y6ojjszcap-us-east-1-176449842503	US East (N. Virginia) us-east-1	View analyzer for us-east-1	February 2, 2024, 03:45:40 (UTC+08:00)
○	bucket-20250603	US West (Oregon) us-west-2	View analyzer for us-west-2	June 3, 2025, 06:27:23 (UTC+08:00)
○	bucket-20250603-backup	US West (Oregon) us-west-2	View analyzer for us-west-2	June 3, 2025, 06:28:37 (UTC+08:00)

bucket-20250603-backup Info

| **Objects** | Metadata | Properties | Permissions | Metrics | Management | Access Points |

Objects (1) ↻   [Copy S3 URI] [Copy URL] [↓ Download] [Open ⧉] [Delete] [Actions ▼] [Create folder] [↑ Upload]

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory ⧉ to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more ⧉

🔍 Find objects by prefix   ‹ 1 › ⚙

	Name ▲	Type ▽	Last modified ▽	Size ▽	Storage class ▽
☐	📄 HappyFace.jpg	jpg	June 3, 2025, 06:39:03 (UTC+08:00)	128.2 KB	Standard

Notice that the backup file is copied successfully using the Lamdba Function.

Check Lambda by going to monitor section and go to CloudWatch Logs to check trigger run details

| Code | Test | **Monitor** | Configuration | Aliases | Versions |

Monitor Info   [View CloudWatch logs ⧉] [View Application Signals ⧉] [View X-Ray traces ⧉] [View Lambda Insights ⧉] [View CodeGuru profiles ⧉]

Filter metrics by [Function ▼]

🔘 Alarm recommendations ♀   ⓘ Investigate with AI - *new*   [1h] [**3h**] [12h] [1d] [3d] [1w] [Custom ▦]   [UTC timezone ▼] [↻] [▼] [⊘ Explore related] ⋮

CloudWatch metrics

Lambda sends runtime metrics for your functions to Amazon CloudWatch. The metrics shown are an aggregate view of all function runtime activity. To view metrics for the unqualified or $LATEST resource, choose **Filter by**. To view metrics for a specific function version or alias, choose **Aliases** or **Versions**, select the alias or version, and then choose **Monitor**.

Invocations ⓘ ⋮	Duration ⓘ ⋮	Error count and success rate (%) ⓘ ⋮
Count	Milliseconds	Count No unit
2	800	1 • 100
1 •	799 •	0.5 99.5
0	799	0 • 99

/aws/lambda/backupbucket

▼ **Log group details**

Log class | Info
Standard

ARN
⎘ arn:aws:logs:us-west-2:176449842503:log-
group:/aws/lambda/backupbucket:*

Creation time
3 minutes ago

Retention
Never expire

Stored bytes
-

Metric filters
0

Subscription filters
0

Contributor Insights rules
-

KMS key ID
-

Anomaly detection
Configure

Data protecti
-

Sensitive dat
-

Field indexes
Configure

Transformer
Configure

| ‹ | **Log streams** | Tags | Anomaly detection | Metric filters | Subscription filters | Contributor Insight |

Log streams (1)   ↻   Delete   Create lo

🔍 Filter log streams or try prefix search   ☐ Exact match ☐ Show expired

☐	**Log stream**	▽	**Last event time**
☐	2025/06/02/[$LATEST]a1269335d8cc4808a9d87efdcfeb6dff		2025-06-02 22:39:02 (UTC)

Log events

You can use the filter bar below to search for and match terms, phrases, or values in your log events. Learn more about filter patterns 🔗

Actions ▼ | Start tailing | Create metric filter

Filter events - press enter to search

Clear | 1m | 30m | 1h | 12h | Custom ⊞ | UTC timezone ▼

Display ▼

	Timestamp	Message
		No older events at this moment. *Retry*
▶	2025-06-02T22:39:01.269Z	INIT_START Runtime Version: python:3.9.v94 Runtime Version ARN: arn:aws:lambda:us-west-2::runtime:b0187a72e2a0474a536ecdeed24a9131d8…
▶	2025-06-02T22:39:01.799Z	START RequestId: 8101a392-b876-4827-a363-7536e8543a78 Version: $LATEST
▶	2025-06-02T22:39:01.800Z	bucket-20250603
▶	2025-06-02T22:39:01.800Z	HappyFace.jpg
▶	2025-06-02T22:39:01.800Z	/tmp/12f546fd-4f5f-4cf7-a47a-e046f7d5af20HappyFace.jpg
▶	2025-06-02T22:39:01.800Z	/tmp/12f546fd-4f5f-4cf7-a47a-e046f7d5af20HappyFace.jpg
▶	2025-06-02T22:39:02.599Z	END RequestId: 8101a392-b876-4827-a363-7536e8543a78
▶	2025-06-02T22:39:02.599Z	REPORT RequestId: 8101a392-b876-4827-a363-7536e8543a78 Duration: 799.35 ms Billed Duration: 800 ms Memory Size: 128 MB Max Memory Us…