

Data Sheet

How to Unzip the Zipped folder in AWS S3 from Snowflake

Quick Steps for Seamless Data Access

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Let's consider a scenario where we get data for a couple of tables to AWS S3 daily in a zip folder. We will unzip the zipped folder using the Lambda function, which is invoked by an external function from Snowflake.

• Upload the zipped folder to AWS S3 as shown below.

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luckets	ld-zip 🛶					
Access Grants						
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ashboards						
Storage Lens groups						
NWS Organizations settings		D.				
Feature spotlight 🕖						
W/S Marketplace for S3						

• Create an IAM Role that can create the lambda function and execute it. We are creating the role named "ld-zip_folder_storage" and attaching the policies to it, as shown below.

AmazonAPIGatwewayAdministrator AmazonAPIGatwewayInvokeFullAccess AmazonAPIGatwewayPushToCloudWatchLogs AmazonS3FullAccess Amazons3ObjectLambdaExecutionRolePolicy AWSLambda_FullAccess

AWSLambdaExecute



Identity and Access ×	Id sin foldor storage			
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Service control policies (SCPs)	en en AmazonAPiGatewayinvokeFullAccess	AWS managed	2	
Related consoles	e e AmazonAPiGatewayPushToCloudWatchLogs	AWS managed	5	
IAM Identity Center 🛃	e e Amazon53fullAccess	AWS managed	2	
AWS Organizations 🕑	Amazon530bjectLambdaExecutionRolePolicy	AWS managed	6	
	E E Att/SLambda_FullAccess	AWS managed		

• Create a lambda function named "ld_sf_zip_file_process" in Python by using the role that we created above "ld-zip_folder_storage".

oose one of the following options to create your function.		
Author from scratch Start with a simple Hello World example.	Use a blangrint build a Lambda application from sample code and configuration presets for common use cases.	
Basic information		
Function name Enter a name that describes the purpose of your function.		
ld_sf_zip_file_process		
Use only letters, numbers, hyphens, or underscores with no spaces.		
Runtiine info Choose the language to use to write your function. Note that the console code editor sup	goons only Node jt, Python, and Ruby.	
Python 3.12	* C	
Architecture info Choose the instruction set architecture you want for your function code.		
• x86_64		
) am64		
Permissions into By default, Lambda will create an execution role with permissions to uplead logs to Ama	azon GoudWatch Logis. You can customize this default note lator when adding triggers.	
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Permissions toto By othart, Lambda will oracle an execution rule with permissions to uplead logs to Ama Change default execution rule Execution rule Crosses are that defines the permissions of your function. To create a contem rule, po 1 Crosses are rule with basic Lambda permissions Vue an existing rule	aan CaudWaah Lags. Yau can cuatamise this defuult niet later when adding triggers.	
Permissions toto By othans, Lambas will oracle an execution rate with permissions to uplead logs to Ama Change default execution role Execution role Crosse a new role with basic Lambda permissions Oracle a new role from AWS policy templates	aan CaudWalah Lags. Yau can custamise this default niet later when adding siggers.	
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• Once we create the lambda function, we need to update the execution time for it.



dit basic settings	
Basic settings into	
Description - optional	
Memory tube	
Your function is allocated CPU propertional to the memory configured.	
Set memory to between 128 MB and 10340 MB	
Ephemeral storage units	
Vou can configure up to 10 GB of ophemeral storage (/timp) for your function. View pricing 🕑	
512 MB	
Set ophemeral storage (/tmg) to between 512 MB and 10240 MB.	
SnapStart who	
Reduce startup time by having Lambda cache a snapshot of your function after the function has initialized. To evaluate whether your function code is resilient to snapshot operations, review the SnapStart compatibility considerations 🙆	
None w	
Supported numbines: Java 11, Java 17, Java 21.	
Temeout	
3 ; min 3 50C	
Decution role	
Choose a role that defines the permissions of your function. To create a custom role, go to the IAM console 🔯	
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Disting role Dense to existing with that up the cost of the used with this Lands's function. The using must have exemising the using from the temperature	
Goudhisto Logs.	
ld-zip_folder_storage v C	

• Create a test function to test the lambda function.

Configure test event ×	
A test event is a JSDN object that mocks the structure of requests emitted by AIMS services to invoke a Lambda function. Due it to see the function's invocation result. To invoke usure function without cacino an event motivates the JSDN event then choose Test.	
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Cent name Md-dLaip_text	
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1×2 "Body": "(\"detaip\", \"detaip\", \"detaip\"))"	
• 2	
Cancel Invoke Save	

• Copy the code as shown below and deploy it:

```
import json
import boto3
from io import BytesIO
import zipfile
import sys
```



```
def lambda_handler(event, context):
    #Retrieve json_str from the event dictionary i.e rtetrive arguments
    #from snowflake(source and target bucket name for zip file processing)
    body = json.loads(event['body'])
    rows = body['data']
    print(rows)
    #print("len::"+str(len(rows)))
    for row in rows:
        source_bucket = row[1]
        target_bucket = row[2]
    print("source_bucket::"+str(source_bucket)+" target_bucket::"+str(target_bucket))
    #initializing s3 client
    s3_resource = boto3.resource('s3')
#accessing the zip file bucket
   my_bucket = s3_resource.Bucket(source_bucket)
    #checking for zip files in bucket
    print("checking for zip files in source_bucket...")
    for file in my_bucket.objects.all():
        if(str(file.key).endswith('.zip')):
            print("zip file found::"+str(file.key))
            zip_obj = s3_resource.Object(bucket_name=source_bucket, key=file.key)
            buffer = BytesIO(zip_obj.get()["Body"].read())
            print("reading the zip file and extracting the contents...")
            z = zipfile.ZipFile(buffer)
            for filename in z.namelist():
                file_info = z.getinfo(filename)
                try:
                    print("extracting the file from zip to target bucket..."+filename)
                    response = s3_resource.meta.client.upload_fileobj(
                        z.open(filename),
                        Bucket=target_bucket,
                        Key=f'{filename}'
                    )
                except Exception as e:
                    print("error uplaoding the file to target bucket"+str(e))
            print("Zip files extraction completed successfully!!")
            json_compatible_string_to_return = json.dumps({"data":[[0,str("Zip file
processing completed!")]]})
        else:
            print(file.key+ ' is not a zip file.')
    return {
        statusCode : 200,
        'body': json_compatible_string_to_return
    }
```





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Code Test Monitor Configuration Aliases Versions	
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• Test the code in AWS Console to check whether the lambda function is working or not. In the snapshot below, we can see that the lambda code is working, and it has unzipped the zipped folder.

Code source Info		Upload from 🔻	
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• Next, we create a REST API named "ld-sf_external_functions_zip_api".



API details			
New API Create a new REST API.	Clone existing API Create a copy of an API in this AWS account.		
Import API Import an API from an OpenAPI definition.	C Example API Learn about API Gateway with an example API.		
API name			
ld-sf_external_functions_zip_ap	T		
Description - optional			
this api is used for processing the ld zip file processing p	oc through snowflake		
API endpoint type Regional APIs are deployed in the current AWS Region. Edge-optim Private APIs are only accessible from VPCs.	ized APIs route requests to the nearest CloudFront Point of Presence.		
Regional	*		

• Create a resource for the REST API.

API Gateway X	Successfully created REST API 1d-sf_external_f	unctions_zip_api				× ©
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Documentation			No me	thods		
Dashboard						
API settings	-		No metho	ds defined.		
Usage plans						
API keys						
Client certificates						
Settings						

=	⊘ Successfully created REST API 16-sf_external_functions_zip_api	×
	API Gateway > APIs > Resources - Id-sf_external_functions_zip_api	
	Create resource	
	Resource details	
	Prony resource info Prony resources handle requests to all sub-resources. To create a prony resource use a path parameter that ends with a plus sign, for example (prony*).	
	Resource path Resource name / V	
	CORS (Cross Origin Resource Sharing) lade Create an OPTIONS method that allows all origins, all methods, and several common headers.	
	Cancel Create resource	
	4	



• After creating the resource, create a METHOD where we associate the lambda function that we created.

APis Custom domain names VPC tinks API Gateway > APis > Resources - Id-sf_external_functions_zig_apil APis VPC tinks Resources APis Id- sf_external_functions_zig_apil Resource details Create resource Path Ad-sf_zig_file_process Image: Create resource Path Ad-sf_zig_file_process Image: Create resource Path Ad-sf_zig_file_proces Image: Create resource Path Ad-sf_zig_file_proces Image: Create resource Path Ad-sf_zig_file_proces	Deploy API
API actions v	Deploy API
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• Edit the METHOD REQUEST and apply the authorization.

Cancel Create method

aws

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Lambda proxy integration
 Send the request to your La

Default timeout
 The default timeout is 29 second

6

Grant API Gateway permission to invoke your Lambda function. To turn off, update the fur policy yourself, or provide an invoke role that API Gateway uses to invoke your function.

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om domain names links	API Gateway > APIs > Resources - Id Resources	sf_external_functions_sip_spi		API actions ¥ Deploy
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• Create a stage for the REST API where we will get the endpoint URL which is supposed to invoke as shown below.

	Deploy API ×		
	Choose a stage where your API will be deployed. For example, a test version of your API could be deployed to a stage named beta.		
	State		
	"New stage"	Integration request	
	Stage name		
	fist deployment		
	③ A new stage will be created with the default settings. Edit your stage settings on the Stage page.	Providence response	
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Gateway X				
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Usage plans					
API keys					
Client certificates					
Settings					

- So far, we have created the lambda function and REST API and associated the lambda function with the REST API.
- Now let's create an IAM Role named "Id-zip_process_external_lambda_function" .



Management (IAM)	Id-zip_process_external_lambda_function www.	Delete
Q. Search MM	Summary	. Edit
bashboard Joer groups Joers toles	Creation date A January 19, 2024, 11:10 (UTC=05:30) C Last activity M - 1	UN Unk Unk to switch roles in console Industry process_external_Lambda_function Industry process_external_Lambda_function Assimum session duration Nour
olicies dentity providers locount settings locess reports	Permissions Trust relationships Tags Access Advisor Revoke se	resions
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• Create an API INTEGRATION in Snowflake named "ld_sf_zip_file_process_api_integration".

CREATE OR REPLACE api integration ld_sf_zip_file_process_api_integration api_provider = aws_api_gateway api_aws_role_arn = 'arn:aws:iam::<AWS_ACCOUNTNAME>:role/ldzip_process_external_lambda_function' enabled = true api_allowed_prefixes = ('<u>https:</u>

• Describe the API INTEGRATION and get the API_AWS_IAM_USER_ARN and API_AWS_EXTERNAL_ID.

DESC INTEGRATION ld_sf_zip_file_process_api_integration;

30 31 32 33 34 35 36 37 38 39 39 39 30 30 31 32 33 34 35 36 37 38 39 39 200 30 31 32 33 34 35 36 37 38 39 39 39 39 30 31 32 33 34 35 36 37 38 39 39 39 39 39 39 39 30 30 31 32 33 34 35 36 37 38 39 39 <th>api integration ld_sf_zip_fild ws_api_gateway = 'arn:aws:iam:: ixes = ('https d_sf_zip_file_process_api_intd</th> <th><pre>>_process_api_integration role/ld-zip_process_external_lambda_function* us-east-1.amazonaws.com/first_deployment*); agration;</pre></th> <th></th> <th></th>	api integration ld_sf_zip_fild ws_api_gateway = 'arn:aws:iam:: ixes = ('https d_sf_zip_file_process_api_intd	<pre>>_process_api_integration role/ld-zip_process_external_lambda_function* us-east-1.amazonaws.com/first_deployment*); agration;</pre>		
🕒 Results 📈 Chart				Q ID ± ⊙ D
property	property_type ····	property_value	property_default	Query Details ····
1 ENABLED	Boolean	true	false	Overy duration 330ms
2 API_KEY	String			
3 API_PROVIDER	String	AWS_APL_GATEWAY		Rows 9
4 API_AWS_IAM_USER_ARN	String	arncawssiams		Query ID 01b1c47b-0002-0275
5 API_AWS_ROLE_ARN	String	arn:aws:lam: role/ld-zip_process_external_lambda_function		property A
6 API_AWS_EXTERNAL_ID	String	174		100% filled
7 API_ALLOWED_PREFIXES	List	https://www.com/first_deployment	D	
8 API_BLOCKED_PREFIXES	List		D	property_type
9 COMMENT	String			String 6

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• Update the IAM Role policy with API_AWS_IAM_USER_ARN and API_AWS_EXTERNAL_ID with AWS and sts:ExternalId respectively.

Edit trust policy		
1 ▼ { 2 "Version": "2012-10-13", 3 ▼ "Statement": ∰ 4 ▼ (Edit statement
5 "fffet" "Allow", 6 " "Principal": { 7 "AuS": "arm:austian: 8 }, 9 "Action": "strikssumeRole", 10 " "Condition": { 11 " "Stringfouls": { 12 "strikstwermalid" 13 }		Select a statement Select an existing statement in the policy or add a new statement. + Add new statement
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• Update the resource policy for REST API as shown below such that Snowflake will be able to call the end point URL. Update the Snowflake IAM Role 'arn' to 'AWS' and 'API arn' to 'Resource'

API Gateway X	ATI Gateway > ATIs > Most external, functions, etc., etc., and a second policy > Bits resource policy	0
APIs Custom domain names VPC links	Edit resource policy in Amazon API Gateway resource policies are JSON policy documents that you attach to an API to control whether a specified principal (typically an IAM role or group) can invoke the API. Policy details	0
APE Id- sf_external_functions_sip_api Resources Stages Authorizes Gateway responses Models Resource policy Doomentation Dai/board API settings Usage plans API settings Usage plans API settings	Caston • C Poiry examples ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** <td></td>	
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• Create an external function named "ld_sf_zip_file_process_external_function".



1.amazonaws.com/first_deployment/ld-sf_zip_file_process';



LD.PUBLIC * Settings *	Code Versions Q,
<pre>42 43 44 45 46 47 47 47 48 49 48 49 49 49 49 49 49 49 49 49 49 49 49 49</pre>	
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status	Query Details ····
1 Function LD_SF_ZIP_FILE_PROCESS_EXTERNAL_FUNCTION successfully created.	Query duration 102ms
	Rows 1 Overy ID <u>01b1c481-0002-00ce-0</u>
	status 🛆 100% filled

• Now, we call the external function which will unzip the folder in AWS S3.

	LD.PUBLIC * Settings *				Code Versions
<pre>state to the state to the</pre>	within an inclusion open				COME RESIDENCE
<pre>situation true situation true s</pre>	api_provider = aws_ api_aws_role_arn =	api_gateway 'arn:aws:iam:	ld-zip_process_external_lamb	a_function'	
	enabled = true api_allowed_prefixe	s = ('https:	us-east-1.amazonaws.com	(first_deployment');	
	DESC INTEGRATION Ld.s	f zip file process api integrati	01:		
	CREATE OR REPLACE ext	ernal function ld_sf_zip_file_pr	ocess_external_function(sour	e_bucket string, target_bukcet string)	
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• In AWS, we can see the Lambda functions logs from "CLOUDWATCH", for debugging any issue.

LUMENDATA

CloudWatch ×	CloudWatch > Log groups > /aws/lambda	/d_sf_zip_file_process > 2024/01/19/[\$LATEST]1c1172c74cf340399742041bb1447ef0
Favorites and recents	Log events You can use the filter bar below to search for	and mutch terms, phrases, or values in your log events. Learn more about filter patterns [2] 🛛 Actions 🔻 Start tailing Create metric filter
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Logs Insights	2024-01-19711:39:51.067-05:30	STAAT RequestId: b00bela5-61cb-47eb-afe0-1fab0415b56a Version: SLATEST
Metrics New	2024-01-19711:39:51.068-05:30	({0, 'ld-rip', 'ld-rip')}
X-Ray traces	2024-01-19711:39:51.868-05:30	source_pucketrils-tip target_bucketrils-tip
Events	2024-01-19711:39:54.183-05:30	checking for tip files in source_bucket
Application Signals	2024-01-19711:30:54.957-05:30	zip file foundritest.zip
Network monitoring	2024-01-19711:30:55.023-05:30	reading the zip file and extracting the contents
lociable	▶ 2024-01-19711:39:55.062-05:30	extracting the file from zip to target buckettest/CDC.csv
nagas	2024-01-19711:39:55.142-05:30	extracting the file from zip to target buckettest/CDC_DELETE.csv
Settings Gatting Started	2024-01-19711:30:55.319-05:30	extracting the file from zip to target buckettextDiete_load.cov
What's new	2024-01-19711:30:55.300-05:30	extracting the file from zip to target buckettest/Inc_Doad_D4_06.cov
	▶ 2024-01-19711:39:55.442-05:30	extracting the file from zip to target buckettest/Inc_load_23_04.csv
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Sai Bharadwaja Senior Consultant

About LumenData

LumenData is a leading provider of Enterprise Data Management, Cloud & Analytics solutions. We help businesses navigate their data visualization and analytics anxieties and enable them to accelerate their innovation journeys.

Founded in 2008, with locations in multiple countries, LumenData is privileged to serve over 100 leading companies. LumenData is **SOC2 certified** and has instituted extensive controls to protect client data, including adherence to GDPR and CCPA regulations.



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Let us know what you need: <u>lumendata.com/contact-us</u>

