

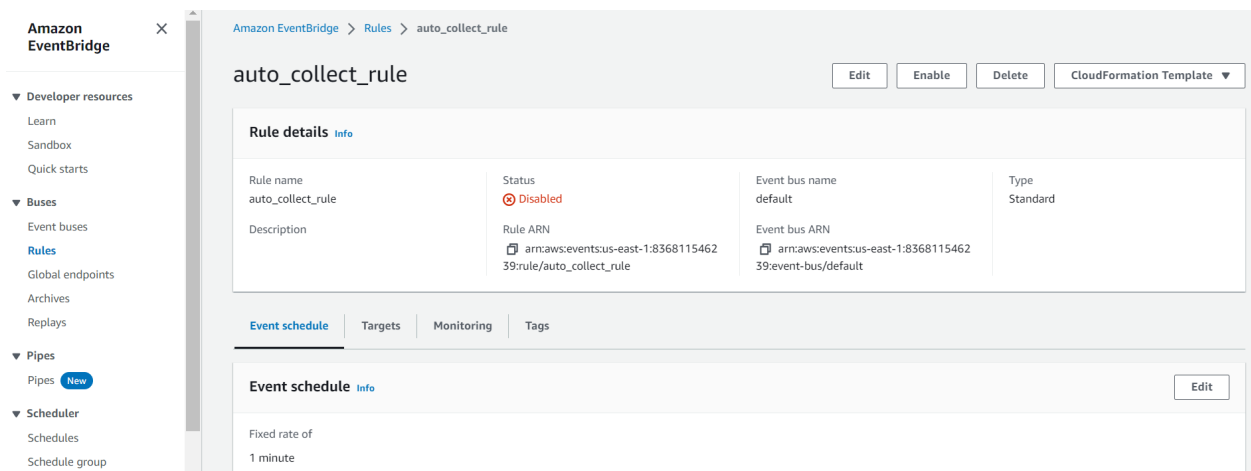
Project Title: Designing an Automatic Data Collection and Storage System with AWS Lambda

Technologies: AWS Lambda, Amazon RDS, CloudWatch

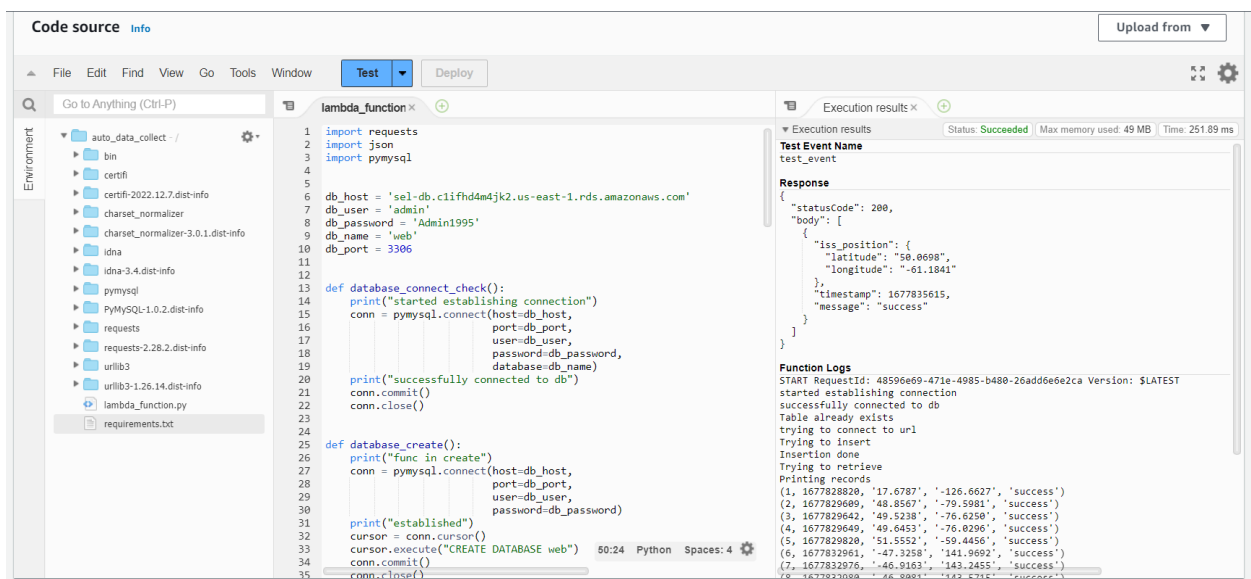
Requirement Setup

1. Creating an Event

Initially configured in **Disabled** state



2. Creating a Lambda function with its dependencies



3. Creating an RDS instance and the required networking interfaces to connect to lambda

Creating a VPC and the required public and private subnets

VPC > Your VPCs > vpc-0cfd3fbff6356f326

vpc-0cfd3fbff6356f326 / VPC1

Actions

Details info

VPC ID

vpc-0cfd3fbff6356f326

Tenancy

Default

Default VPC

No

Network Address Usage metrics

Disabled

State

Available

DHCP option set

dopt-0b4df64c68ad88484

IPv4 CIDR

10.1.0.0/16

Route 53 Resolver DNS Firewall rule groups

-

DNS hostnames

Disabled

Main route table

rtb-0bd8217723b0ee169

IPv6 pool

-

Owner ID

836811546239

DNS resolution

Enabled

Main network ACL

acl-0f20439a1d38d3a01

IPv6 CIDR (Network border group)

-

Resource map New

CIDRs

Flow logs

Tags

Resource map info

VPC

Show details

Your AWS virtual network

VPC1

Subnets (4)

Subnets within this VPC

us-east-1a

seldbsub1

seldbsub4

us-east-1b

seldbsub2

seldbsub3

Route tables (4)

Route network traffic to resources

public_RT

private-RT

private-DB-RDS

rtb-0bd8217723b0ee169

Network connections (2)

Connections to other networks

sel-igw-vpc1

my-NAT-GW

Subnets Created

<input type="checkbox"/>	seldbsub2	subnet-0b3fe4d5e34dba24a	Available	vpc-0cfd3fbff6356f326 VPC1	10.1.2.0/24	-	250	us-east-1b	use1-az2
<input type="checkbox"/>	seldbsub3	subnet-00bac814ac1428571	Available	vpc-0cfd3fbff6356f326 VPC1	10.1.3.0/24	-	250	us-east-1b	use1-az2
<input type="checkbox"/>	seldbsub4	subnet-01de742fa8bc789d4	Available	vpc-0cfd3fbff6356f326 VPC1	10.1.4.0/24	-	250	us-east-1a	use1-az1
<input type="checkbox"/>	seldbsub1	subnet-0b1e67836bc2ef30	Available	vpc-0cfd3fbff6356f326 VPC1	10.1.1.0/24	-	250	us-east-1a	use1-az1

Route Tables Created

Route tables (5) Info

Actions

Filter route tables

<input type="checkbox"/>	Name	Route table ID	Explicit subnet associat...	Edge associations	Main	VPC	Owner ID
<input type="checkbox"/>	public_RT	rtb-07f414a5791b9d546	subnet-0b1e67836bc2f...	-	No	vpc-0cfd3fbff6356f326 VPC1	836811546239
<input type="checkbox"/>	private-RT	rtb-03d951dfe3b9290ca	subnet-0b3fe4d5e34db...	-	No	vpc-0cfd3fbff6356f326 VPC1	836811546239
<input type="checkbox"/>	private-DB-RDS	rtb-0f196e7398931a5de	2 subnets	-	No	vpc-0cfd3fbff6356f326 VPC1	836811546239

Public Route Table mapped with Internet Gateway

<input type="checkbox"/>	sel-igw-vpc1	igw-020b91b461ee68e9a	Attached	vpc-0cfd3fbff6356f326 VPC1	836811546239
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VPC > Route tables > rtb-07f414a5791b9d546

rtb-07f414a5791b9d546 / public_RT

Actions

You can now check network connectivity with Reachability Analyzer

Run Reachability Analyzer

Details info

Route table ID

rtb-07f414a5791b9d546

VPC

vpc-0cfd3fbff6356f326 | VPC1

Main

No

Owner ID

836811546239

Explicit subnet associations

subnet-0b1e67836bc2fef30 / seldbsub1

Edge associations

-

Routes

Subnet associations

Edge associations

Route propagation

Tags

Routes (2)

Edit routes

Filter routes

Both

< 1 >

Destination	Target	Status	Propagated
0.0.0.0/0	igw-020b91b461ee68e9a	Active	No
10.1.0.0/16	local	Active	No

Private Route Table mapped with NAT Gateway

NAT gateways (1/1) Info

Filter NAT gateways

< 1 >

Name	NAT gateway ID	Connectivit...	State	Stat...	Primary public I...	Primary private ...	Primary ...	VPC
my-NAT-GW	nat-096d575a95d3fef52	Public	Available	-	3.233.248.229	10.1.1.131	eni-0a1fb6b...	vpc-0cfd3fbff6356f326 VPC1

VPC > Route tables > rtb-03d951dfe3b9290ca

rtb-03d951dfe3b9290ca / private-RT

Actions

You can now check network connectivity with Reachability Analyzer

Run Reachability Analyzer

Details info

Route table ID

rtb-03d951dfe3b9290ca

VPC

vpc-0cfd3fbff6356f326 | VPC1

Main

No

Owner ID

836811546239

Explicit subnet associations

subnet-0b3fe4d5e34dba24a / seldbsub2

Edge associations

-

Routes

Subnet associations

Edge associations

Route propagation

Tags

Routes (2)

Edit routes

Filter routes

Both

< 1 >

Destination	Target	Status	Propagated
0.0.0.0/0	nat-096d575a95d3fef52	Active	No
10.1.0.0/16	local	Active	No

Creating Security groups and assigning Inbound and Outbound rules

VPC > Security Groups > sg-0fa4e4bb9882f4cdc - mysql-sg

sg-0fa4e4bb9882f4cdc - mysql-sg

Actions

Details

Security group name

mysql-sg

Security group ID

sg-0fa4e4bb9882f4cdc

Description

Created by RDS management console

VPc ID

vpc-0cfd3fbff6356f326

Owner

836811546239

Inbound rules count

1 Permission entry

Outbound rules count

3 Permission entries

Inbound rules

Outbound rules

Tags

You can now check network connectivity with Reachability Analyzer

Run Reachability Analyzer

Inbound rules (1/1)

Manage tags

Edit inbound rules

Filter security group rules

	Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description
<input checked="" type="checkbox"/>	-	sgr-062bde3c5c9ae9256	IPv4	MySQL/Aurora	TCP	3306	0.0.0.0/0	-

Inbound rules

Outbound rules

Tags

You can now check network connectivity with Reachability Analyzer

Run Reachability Analyzer

Outbound rules (3)

Manage tags

Edit outbound rules

Filter security group rules

	Name	Security group rule...	IP version	Type	Protocol	Port range	Destination	Description
<input type="checkbox"/>	-	sgr-0379212b6c5afc098	IPv4	HTTP	TCP	80	0.0.0.0/0	-
<input type="checkbox"/>	-	sgr-078ef907a9282843e	IPv4	HTTPS	TCP	443	0.0.0.0/0	-
<input type="checkbox"/>	-	sgr-040778c332c6917...	IPv4	All traffic	All	All	0.0.0.0/0	-

RDS Instance associated with the created VPC

RDS > Databases > sel-db

sel-db

ModifyActions

Summary

DB identifier sel-db	CPU <div>2.62%</div>	Status <div>Available</div>	Class db.t3.micro
Role Instance	Current activity <div>0 Connections</div>	Engine MySQL Community	Region & AZ us-east-1a

Connectivity & security

MonitoringLogs & eventsConfigurationMaintenance & backupsTags

Connectivity & security

Endpoint & port

Endpoint
sel-db.c1ffhd4m4jk2.us-east-1.rds.amazonaws.com

Port
3306

Networking

Availability Zone
us-east-1a

VPC
VPC1 (vpc-0cfd3fbff6356f326)

Subnet group
sel-rds-grp

Subnets
subnet-00bac814ac1428571
subnet-01de742fa8bc789d4

Security

VPC security groups
mysql-sg (sg-0fa4e4bb9882f4cdc)

Active

Publicly accessible
No

Certificate authority
Info
rds-ca-2019

Certificate authority date
August 22, 2024, 22:38 (UTC+05:30)

4. Created VPC is configured in the lambda function to create connectivity between Lambda function and RDS instance.

Function overviewInfo

auto_data_collect

Layers(0)

EventBridge (CloudWatch Events)

Add trigger

Add destination

Description-

Last modified5 hours ago

Function ARNarn:aws:lambda:us-east-1:836811546239:function:auto_data_collect

Function URLInfo

CodeTestMonitorConfigurationAliasesVersions

General configuration

Triggers

Permissions

Destinations

Function URL

Environment variables

Tags

VPC

Monitoring and operations tools

Concurrency

Asynchronous invocation

VPCInfo

Edit

VPC
vpc-0cfd3fbff6356f326 (10.1.0.0/16) | VPC1

Subnets

- subnet-0b3fe4d5e34dba24a (10.1.2.0/24) | us-east-1b, seldbsub2
- subnet-00bac814ac1428571 (10.1.3.0/24) | us-east-1b, seldbsub3

Security groups

- sg-0fa4e4bb9882f4cdc (mysql-sg)

Inbound rules

Outbound rules

Security group ID	Protocol	Ports	Source
sg-0fa4e4bb9882f4cdc	Custom TCP	3306	0.0.0.0/0

7. Continuous logs will be captured in the CloudWatch

CloudWatch

Favorites and recents

Dashboards

▼ Alarms

In alarm

All alarms

Billing

▼ Logs

Log groups

Log Insights

► Metrics

► X-Ray traces

▼ Events

Rules

Event Buses

▼ Application monitoring

ServiceLens Map

Resource Health

Internet Monitor

Synthetics Canaries

Evidently

RUM

▶

2023-03-03T16:15:35.147+05:30

Successfully completed

▶

2023-03-03T16:15:35.148+05:30

END RequestId: 2edf1fa7-d539-4509-b619-4f8beb85f668

▶

2023-03-03T16:15:35.148+05:30

REPORT RequestId: 2edf1fa7-d539-4509-b619-4f8beb85f668 Duration: 230.82 ms Billed Duration: 231 ms Memory Size: 128 MB Max Memory Used: 50 MB

▶

2023-03-03T16:16:35.261+05:30

START RequestId: 564a240e-8b47-44ee-aa97-184b36a808bd Version: SLATEST

▶

2023-03-03T16:16:35.261+05:30

started establishing connection

▶

2023-03-03T16:16:35.271+05:30

successfully connected to db

▶

2023-03-03T16:16:35.282+05:30

Table already exists

▶

2023-03-03T16:16:35.282+05:30

trying to connect to url

▶

2023-03-03T16:16:35.448+05:30

Trying to insert

▶

2023-03-03T16:16:35.458+05:30

Insertion done

▶

2023-03-03T16:16:35.458+05:30

Trying to retrieve

▶

2023-03-03T16:16:35.463+05:30

Printing records

▶

2023-03-03T16:16:35.463+05:30

(1, 1677828820, '17.6787', '-126.6627', 'success')

▶

2023-03-03T16:16:35.463+05:30

(2, 1677829609, '48.8567', '-79.5981', 'success')

▶

2023-03-03T16:16:35.463+05:30

(3, 1677829642, '49.5238', '-76.6250', 'success')

▶

2023-03-03T16:16:35.463+05:30

(4, 1677829649, '49.6453', '-76.0296', 'success')

▶

2023-03-03T16:16:35.463+05:30

(5, 1677829820, '51.5552', '-59.4456', 'success')

▶

2023-03-03T16:16:35.463+05:30

(6, 1677832961, '-47.3258', '141.9692', 'success')

▶

2023-03-03T16:16:35.463+05:30

(7, 1677832976, '-46.9163', '143.2455', 'success')

▶

2023-03-03T16:16:35.463+05:30

(8, 1677832980, '-46.8081', '143.5715', 'success')

▶

2023-03-03T16:16:35.463+05:30

(9, 1677833912, '-6.5062', '-168.0296', 'success')

▶

2023-03-03T16:16:35.463+05:30

(10, 1677835615, '50.0698', '-61.1841', 'success')

▶

2023-03-03T16:16:35.463+05:30

(11, 1677840231, '30.3248', '-162.0163', 'success')

▶

2023-03-03T16:16:35.463+05:30

(12, 1677840274, '32.2410', '-159.8272', 'success')

▶

2023-03-03T16:16:35.463+05:30

(13, 1677840283, '32.5926', '-159.4090', 'success')

▶

2023-03-03T16:16:35.463+05:30

(14, 1677840285, '32.6802', '-159.3039', 'success')

▶

2023-03-03T16:16:35.463+05:30

(15, 1677840298, '33.2474', '-158.6153', 'success')

▶

2023-03-03T16:16:35.463+05:30

(16, 1677840334, '34.8154', '-156.6293', 'success')

▶

2023-03-03T16:16:35.463+05:30

(17, 1677840395, '37.3268', '-153.1541', 'success')

▶

2023-03-03T16:16:35.475+05:30

Total records on DB : (17,)

▶

2023-03-03T16:16:35.476+05:30

retrieve done

▶

2023-03-03T16:16:35.476+05:30

Successfully completed

▶

2023-03-03T16:16:35.477+05:30

END RequestId: 564a240e-8b47-44ee-aa97-184b36a808bd

▶

2023-03-03T16:16:35.477+05:30

REPORT RequestId: 564a240e-8b47-44ee-aa97-184b36a808bd Duration: 215.81 ms Billed Duration: 216 ms Memory Size: 128 MB Max Memory Used: 50 MB

CloudWatch

Favorites and recents

Dashboards

▼ Alarms

In alarm

All alarms

Billing

▼ Logs

Log groups

Log Insights

► Metrics

► X-Ray traces

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Rules

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ServiceLens Map

Resource Health

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RUM

▶

2023-03-03T16:16:35.477+05:30

REPORT RequestId: 564a240e-8b47-44ee-aa97-184b36a808bd Duration: 215.81 ms Billed Duration: 216 ms Memory Size: 128 MB Max Memory Used: 50 MB

▶

2023-03-03T16:17:35.058+05:30

START RequestId: 42b4a094-573b-4392-a6c0-eb75072d1d37 Version: SLATEST

▶

2023-03-03T16:17:35.058+05:30

started establishing connection

▶

2023-03-03T16:17:35.066+05:30

successfully connected to db

▶

2023-03-03T16:17:35.081+05:30

Table already exists

▶

2023-03-03T16:17:35.082+05:30

trying to connect to url

▶

2023-03-03T16:17:35.235+05:30

Trying to insert

▶

2023-03-03T16:17:35.247+05:30

Insertion done

▶

2023-03-03T16:17:35.247+05:30

Trying to retrieve

▶

2023-03-03T16:17:35.262+05:30

Printing records

▶

2023-03-03T16:17:35.262+05:30

(1, 1677828820, '17.6787', '-126.6627', 'success')

▶

2023-03-03T16:17:35.262+05:30

(2, 1677829609, '48.8567', '-79.5981', 'success')

▶

2023-03-03T16:17:35.262+05:30

(3, 1677829642, '49.5238', '-76.6250', 'success')

▶

2023-03-03T16:17:35.262+05:30

(4, 1677829649, '49.6453', '-76.0296', 'success')

▶

2023-03-03T16:17:35.262+05:30

(5, 1677829820, '51.5552', '-59.4456', 'success')

▶

2023-03-03T16:17:35.262+05:30

(6, 1677832961, '-47.3258', '141.9692', 'success')

▶

2023-03-03T16:17:35.262+05:30

(7, 1677832976, '-46.9163', '143.2455', 'success')

▶

2023-03-03T16:17:35.262+05:30

(8, 1677832980, '-46.8081', '143.5715', 'success')

▶

2023-03-03T16:17:35.262+05:30

(9, 1677833912, '-6.5062', '-168.0296', 'success')

▶

2023-03-03T16:17:35.262+05:30

(10, 1677835615, '50.0698', '-61.1841', 'success')

▶

2023-03-03T16:17:35.262+05:30

(11, 1677840231, '30.3248', '-162.0163', 'success')

▶

2023-03-03T16:17:35.262+05:30

(12, 1677840274, '32.2410', '-159.8272', 'success')

▶

2023-03-03T16:17:35.262+05:30

(13, 1677840283, '32.5926', '-159.4090', 'success')

▶

2023-03-03T16:17:35.262+05:30

(14, 1677840285, '32.6802', '-159.3039', 'success')

▶

2023-03-03T16:17:35.262+05:30

(15, 1677840298, '33.2474', '-158.6153', 'success')

▶

2023-03-03T16:17:35.262+05:30

(16, 1677840334, '34.8154', '-156.6293', 'success')

▶

2023-03-03T16:17:35.262+05:30

(17, 1677840395, '37.3268', '-153.1541', 'success')

▶

2023-03-03T16:17:35.262+05:30

(18, 1677840454, '39.6749', '-149.4908', 'success')

▶

2023-03-03T16:17:35.276+05:30

Total records on DB : (18,)

▶

2023-03-03T16:17:35.277+05:30

retrieve done

▶

2023-03-03T16:17:35.277+05:30

Successfully completed

▶

2023-03-03T16:17:35.278+05:30

END RequestId: 42b4a094-573b-4392-a6c0-eb75072d1d37

▶

2023-03-03T16:17:35.278+05:30

REPORT RequestId: 42b4a094-573b-4392-a6c0-eb75072d1d37 Duration: 220.12 ms Billed Duration: 221 ms Memory Size: 128 MB Max Memory Used: 50 MB