

Cloud Computing Assignment 1

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Github link: <https://github.com/gurupad93/Hadoop-mapreduce-on-AWS>

Program 1 - Single word count

- Project is created using Maven on eclipse.
- There are 3 classes.
 1. WordCount - It acts as an entry point and has the main function. Arguments are parsed and hadoop Job is created and configured with Main class, Mapper class, Reducer Class, Input and Output directories. Job would start after configuration.
 2. WordCountMapper - Mapper class which splits the words and emits (word,1). WordCountReducer - Reducer class which aggregates and sums up the values of each word.
- AWS S3 link of Output

<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/output/part-r-00000>
<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/output/part-r-00001>
<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/output/part-r-00002>
<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/output/part-r-00003>
<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/output/part-r-00004>

- Five output files are generated from 3 instances. Each line in the output file is of the below form.

<word, number of occurrences>

Program 2 - Double word count

- Project is created using Maven on eclipse.
- There is one .java file which contains Main class, Mapper class and Reducer class.
- Mapper class is similar to the mapper of last question except there is a part of handling 2 words as a single word. For treating 2 words as one, isFirst variable is maintained in the beginning. For first word it would be true which gets assigned to false. Next word will be combined with first word as isFirst is false. Second word will become first word. Next will be second word and it is combined with first word from previous step. These steps will repeat until the end.
- Reducer class would aggregate and sums up the values of each word.
- AWS S3 links of output

<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/outputDoubleWordCount/part-r-00000>
<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/outputDoubleWordCount/part-r-00001>
<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/outputDoubleWordCount/part-r-00002>

<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/outputDoubleWordCount/part-r-00003>

<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/outputDoubleWordCount/part-r-00004>

- Each line in output files is of the form below.

<word(every two words separated by space in input files), number of occurrences>

Program 3 - Distributed Cache

- Project is created using Maven on eclipse.
- There is one .java file which contains Main class, Mapper class and Reducer class.
- In addition to configuring job with usual parameters, URI of word-patterns.txt is added as distributed cache file using addCacheFile function. It will be accessed locally in Mapper class. Mapper will only map the words which are present in word-patterns.txt. Word patterns file is passed as a third parameter.
- Reducer class would aggregate and sums up the values of each word.
- AWS S3 links of output

<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/dcoutput/part-r-00000>

<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/dcoutput/part-r-00001>

<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/dcoutput/part-r-00002>

<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/dcoutput/part-r-00003>

<https://s3.us-east-2.amazonaws.com/hadoopassignmentgurupad/dcoutput/part-r-00004>

- Each line in output files is of the form below.

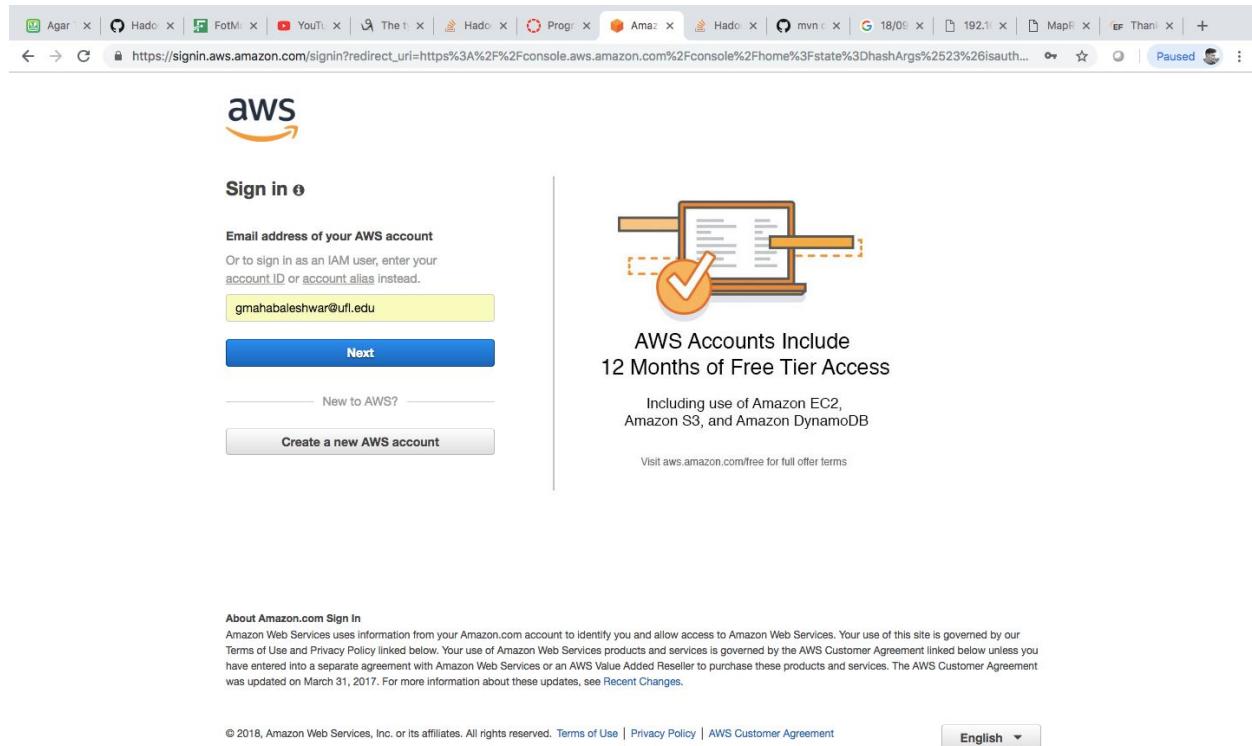
<Each word of word-patterns.txt, number of occurrences in input files>

General Steps followed:

1. Create Maven project in eclipse.
2. Update dependencies in pom.xml. This will include all the JAR files required for the project. In this case, hadoop-client libraries are needed.
3. Create Java classes to include mapper and reducer code.
4. Run as java application to check if it is error free.
5. Export it as runnable JAR file with all the required libraries in extracted jar.
6. Create AWS account.
7. Create S3 bucket to store the files.
8. Upload input files(10 copies) and JAR file created in step 5 to s3 bucket.
9. Create EC2 key pair.
10. Create cluster in EMR. Choose path of s3 bucket created in previous step. Choose the EMR release. In applications check Core hadoop option. Make sure the hadoop versions here and the one in pom.xml are same.

11. Choose instance type in hardware configuration. For this project m4.large is chosen. Number of instances are 4 (1 master and 3 core nodes).
12. Choose EC2 key pair created in step 9 in security section. Permissions are default. Click on create cluster.
13. It takes some time to setup the instances. Wait till the Running status are shown for Master and Core nodes.
14. Go to steps tab. Click on Add step. In JAR location, enter the s3 path of the JAR file. In arguments box, enter the arguments like s3 path of input files, output directory. Click on Add.
15. Monitor the status and can view the output files in s3 once status changes from Running to Completed.
16. Terminate the EC2 instances once the run is complete.

Screenshots:



<https://us-east-2.console.aws.amazon.com/console/home?region=us-east-2#>

The screenshot shows the AWS Home Page. At the top, there's a navigation bar with links for Services, Resource Groups, and a user profile for Gurupad Hegde. Below the navigation is a search bar and a sidebar titled "AWS services" with sections for Recently visited services and All services.

In the main content area, there's a "Build a solution" section with several quick-start options:

- Launch a virtual machine (With EC2, ~2-3 minutes)
- Build a web app (With Elastic Beanstalk, ~6 minutes)
- Build using virtual servers (With Lightsail, ~1-2 minutes)
- Connect an IoT device (With AWS IoT, ~5 minutes)
- Start a development project (With CodeStar, ~5 minutes)
- Register a domain (With Route 53, ~3 minutes)

Below these are "Learn to build" sections for Websites, DevOps, and Backup and recovery, each with video and tutorial links.

On the right side, there's a "Helpful tips" section with links to Manage your costs and Create an organization, and an "Explore AWS" section with links to Machine Learning with Amazon SageMaker, Amazon Relational Database Service (RDS), and AWS Fargate Runs Containers for You.

<https://us-east-2.console.aws.amazon.com/console/home?region=us-east-2#>

This screenshot shows the AWS Services Catalog. It features a search bar at the top and a sidebar with History and Console Home. The main area is organized into several categories:

- Compute:** EC2, Lightsail, Elastic Container Service, EKS, Lambda, Batch, Elastic Beanstalk.
- Storage:** S3, EFS, Glacier, Storage Gateway.
- Database:** RDS, DynamoDB, ElastiCache, Neptune, Amazon Redshift.
- Migration:** AWS Migration Hub.
- Developer Tools:** CodeStar, CodeCommit, CodeBuild, CodeDeploy, CodePipeline, Cloud9, X-Ray.
- Management Tools:** CloudWatch, AWS Auto Scaling, CloudFormation, Config, OpsWorks, Service Catalog, Systems Manager, Trusted Advisor, Managed Services.
- Analytics:** Athena, EMR, CloudSearch, Elasticsearch Service, Kinesis, QuickSight.
- Customer Engagement:** Amazon Connect, Pinpoint, Simple Email Service.
- Business Productivity:** Alexa for Business, Amazon Chime, WorkDocs, WorkMail.
- Desktop & App Streaming:** WorkSpaces, AppStream 2.0.
- Internet Of Things:** IoT Core, IoT 1-Click, IoT Device Management, IoT Analytics, Greengrass, Amazon FreeRTOS, IoT Device Defender.
- Mobile Services:** WAF & Shield, Artifact.

At the bottom, there are "close" and "Backup and recovery" buttons.

AWS Services ▾ Resource Groups ▾ Gurupad Hegde ▾ Ohio ▾ Support ▾

History Console Home

Find a service by name or feature (for example, EC2, S3 or VM, storage).

Group A-Z

Compute Developer Tools Analytics Customer Engagement

EC2 CodeStar Athena Amazon Connect

Lightsail CodeCommit CloudSearch Pinpoint

Elastic Container Service CodeBuild Elasticsearch Service Simple Email Service

EKS CodeDeploy Kinesis

Lambda CodePipeline QuickSight

Batch Cloud9 Data Pipeline

Elastic Beanstalk X-Ray AWS Glue

Storage Management Tools Security, Identity & Compliance Business Productivity

S3 CloudWatch IAM Alexa for Business

EFS AWS Auto Scaling Cognito Amazon Chime

Glacier CloudFormation CloudTrail WorkDocs

Storage Gateway Config GuardDuty WorkMail

Database Media Services Internet Of Things

RDS Service Catalog Amazon Macie IoT Core

DynamoDB Systems Manager AWS Single Sign-On IoT 1-Click

ElastiCache Trusted Advisor CloudHSM IoT Device Management

Neptune Managed Services Directory Service IoT Analytics

Amazon Redshift Elastic Transcoder Artifact Greengrass

Migration Kinesis Video Streams Amazon FreeRTOS

AWS Migration Hub MediaConvert IoT Device Defender

▲ close

https://us-east-2.console.aws.amazon.com/elasticmapreduce/home?region=us-east-2

AWS Services ▾ Resource Groups ▾ Gurupad Hegde ▾ Global ▾ Support ▾ Documentation

Amazon Glacier now offers expedited retrievals, typically in 1-5 minutes. [Learn More](#)

Amazon S3

Discover the new console Quick tips

Search for buckets

+ Create bucket Delete bucket Empty bucket 0 Buckets 0 Public 0 Regions

You do not have any buckets. Here is how to get started with Amazon S3.

Create a new bucket

Buckets are globally unique containers for everything that you store in Amazon S3.

Learn more

Upload your data

After you create a bucket, you can upload your objects (for example, your photo or video files).

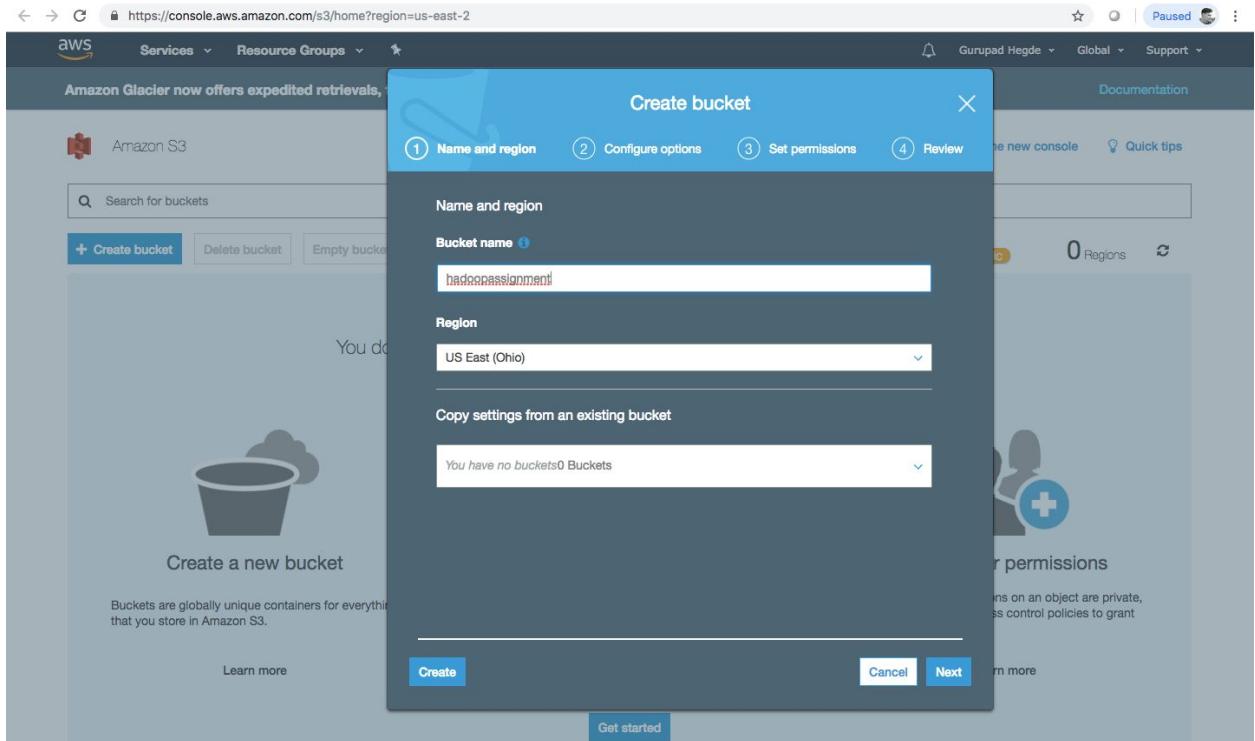
Learn more

Set up your permissions

By default, the permissions on an object are private, but you can set up access control policies to grant permissions to others.

Learn more

Get started



The screenshot shows the AWS S3 bucket list. A single bucket named 'hadoopassignmentgurupad' is listed. The bucket details are: Access: Not public, Region: US East (Ohio), Date created: Sep 29, 2018 1:59:46 PM GMT-0400. The bucket has 0 objects and is located in 1 region.

Bucket name	Access	Region	Date created
hadoopassignmentgurupad	Not public *	US East (Ohio)	Sep 29, 2018 1:59:46 PM GMT-0400

AWS Services Resource Groups Gurupad Hegde Global Support

Amazon S3 > hadoopassignmentgurupad

Overview Properties Permissions Management

Upload + Create folder Actions US East (Ohio)

This bucket is empty. Upload new objects to get started.

 Upload an object

Buckets are globally unique containers for everything that you store in Amazon S3.

[Learn more](#)

 Set object properties

After you create a bucket, you can upload your objects (for example, your photo or video files).

[Learn more](#)

 Set object permissions

By default, the permissions on an object are private, but you can set up access control policies to grant permissions to others.

[Learn more](#)

[Get started](#)

AWS Services Resource Groups Gurupad Hegde Global Support

Amazon S3 > hadoopassignmentgurupad

Overview Properties

Upload + Create folder Actions US East (Ohio)

 Upload an object

Buckets are globally unique containers for everything that you store in Amazon S3.

[Learn more](#)

Upload

1 Files Size: 8.6 MB Target path: hadoopassignmentgurupad

+ Add more files

bible - 8.6 MB

[Upload](#) [Next](#)

 permissions

By default, the permissions on an object are private, but you can set up access control policies to grant permissions to others.

[Learn more](#)

[Get started](#)

AWS Services Resource Groups Gurupad Hegde Global Support

Amazon S3 > hadoopassignmentgurupad

Overview Properties Permissions Management

Type a prefix and press Enter to search. Press ESC to clear.

Upload + Create folder Actions US East (Ohio)

Name	Last modified	Size	Storage class
bible	Sep 29, 2018 2:02:50 PM GMT-0400	8.6 MB	Standard

Viewing 1 to 1

Operations 0 In progress 1 Success 0 Error

https://us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#Home: Paused

EC2 Dashboard Services Resource Groups Gurupad Hegde Ohio Support

Events Tags Reports Limits

INSTANCES Instances Launch Templates Spot Requests Reserved Instances Dedicated Hosts

IMAGES AMIs Bundle Tasks

ELASTIC BLOCK STORE Volumes Snapshots Lifecycle Manager

NETWORK & SECURITY Security Groups Elastic IPs Placement Groups Key Pairs Network Interfaces

LOAD BALANCING Load Balancers Target Groups

Resources You are using the following Amazon EC2 resources in the US East (Ohio) region:

0 Running Instances	0 Elastic IPs
0 Dedicated Hosts	0 Snapshots
0 Volumes	0 Load Balancers
0 Key Pairs	1 Security Groups
0 Placement Groups	

Learn more about the latest in AWS Compute from AWS re:Invent 2017 by viewing the EC2 Videos.

Create Instance To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

Launch Instance

Note: Your instances will launch in the US East (Ohio) region

Service Health Service Status: US East (Ohio): No events

Availability Zone Status: us-east-2a: Availability zone is operating normally us-east-2b: Availability zone is operating normally us-east-2c: Availability zone is operating normally

Scheduled Events

AWS Marketplace Find free software trial products in the AWS Marketplace from the EC2 Launch Wizard. Or try these popular AMIs:

- Barracuda CloudGen Firewall for AWS - PAYG
- Provided by Barracuda Networks, Inc.
- Rating ★★★★☆
- Starting from \$0.60/hr or from \$4,599/yr (12% savings) for software + AWS usage fees
- View all Infrastructure Software
- Matillion ETL for Amazon Redshift

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← → C https://us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#KeyPairs:sort=keyName

AWS Services Resource Groups

EC2 Dashboard Events Tags Reports Limits

INSTANCES Instances Launch Templates Spot Requests Reserved Instances Dedicated Hosts

IMAGES AMIs Bundle Tasks

ELASTIC BLOCK STORE Volumes Snapshots Lifecycle Manager

NETWORK & SECURITY Security Groups Elastic IPs Placement Groups Key Pairs Network Interfaces

LOAD BALANCING Load Balancers

Create Key Pair Import Key Pair Delete

Filter by attributes or search by keyword

You do not have any Key Pairs in this region.

Click the "Create Key Pair" button to create your first Key Pair.

Create Key Pair

Select a key pair

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← → C https://us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#KeyPairs:sort=keyName

AWS Services Resource Groups

EC2 Dashboard Events Tags Reports Limits

INSTANCES Instances Launch Templates Spot Requests Reserved Instances Dedicated Hosts

IMAGES AMIs Bundle Tasks

ELASTIC BLOCK STORE Volumes Snapshots Lifecycle Manager

NETWORK & SECURITY Security Groups Elastic IPs Placement Groups Key Pairs Network Interfaces

LOAD BALANCING Load Balancers

Create Key Pair Import Key Pair Delete

Filter by attributes or search by keyword

You do not have any Key Pairs in this region.

Click the "Create Key Pair" button to create your first Key Pair.

Create Key Pair

Create Key Pair

Key pair name: mykeypair

Cancel Create

Select a key pair

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https://console.aws.amazon.com/s3/buckets/hadoopassignmentgurupad/?region=us-east-2&tab=overview

Amazon S3 > hadoopassignmentgurupad

Overview Properties Permissions Management

Type a prefix and press Enter to search. Press ESC to clear.

US East (Ohio) Viewing 1 to 2

Name	Last modified	Size	Storage class
input			

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)

WordCountArtifact-0.0.1-SNAPSHOT.jar	Sep 29, 2018 2:04:43 PM GMT-0400	6.0 KB	Standard
bible	Sep 29, 2018 2:02:50 PM GMT-0400	8.6 MB	Standard

Viewing 1 to 2

Operations 0 In progress 2 Success 0 Error

mykeypair.pem

Show All

AWS Services Resource Groups

Amazon S3 > hadoopassignmentgurupad

Overview

Type a prefix and press Enter to search

There are no objects under this path.

Downloads myworkspace

Recent Documents

Devices Remote Disc

Shared Sourabh's Mac...

Tags Red

Options

Name Date Modified Size

Name	Date Modified	Size
DoubleWordCount-0.0.1-SNAPSHOT-1.jar	Today at 3:28 PM	5 KB
bible/	Today at 2:35 PM	9.1 MB
bible10	Today at 2:35 PM	9.1 MB
bible9	Today at 2:35 PM	9.1 MB
bible8	Today at 2:35 PM	9.1 MB
bible7	Today at 2:35 PM	9.1 MB
bible6	Today at 2:35 PM	9.1 MB
bible5	Today at 2:35 PM	9.1 MB
bible4	Today at 2:35 PM	9.1 MB
bible3	Today at 2:35 PM	9.1 MB
bible2	Today at 2:35 PM	9.1 MB
bible1	Today at 2:35 PM	9.1 MB
bible.	Today at 2:35 PM	9.1 MB
mykeypair.pem	Today at 2:30 PM	2 KB
WordCount-0.0.1-SNAPSHOT.jar	Today at 1:48 PM	5 KB
word-patterns.txt	Today at 1:41 PM	628 bytes
b.txt	Today at 1:36 PM	87 bytes
eclipse-inst-mac64 (1).tar.gz	Today at 1:28 PM	50.1 MB

Cancel Open

OR

Add files

Upload Next

Operations 0 In progress 2 Success 0 Error

mykeypair.pem

Show All

← → C https://console.aws.amazon.com/s3/buckets/hadoopassignmentgurupad/input/?region=us-east-2&tab=overview

Amazon S3 > hadoopassignmentgurupad / input

Overview

Type a prefix and press Enter to search. Press ESC to clear.

Upload + Create folder Actions ▾

US East (Ohio)

Viewing 1 to 2

<input type="checkbox"/>	Name	Last modified	Size	Storage class
<input type="checkbox"/>	bible10	Sep 29, 2018 3:44:27 PM GMT-0400	8.6 MB	Standard
<input type="checkbox"/>	bible9	Sep 29, 2018 3:44:47 PM GMT-0400	8.6 MB	Standard

Viewing 1 to 2

Upload (640.0 KB/s) 29.05% Successful Uploading file: bible8

Operations 1 In progress 2 Success 0 Error

mykeypair.pem Show All X

← → C https://us-east-2.console.aws.amazon.com/elasticmapreduce/home?region=us-east-2#quick-create:

aWS Services Resource Groups ▾ Paused Guruped Hegde - Ohio - Support -

Create Cluster - Quick Options [Go to advanced options](#)

General Configuration

Cluster name MapreduceAssignment

Logging S3 folder s3://hadoopassignmentgurupad/

Launch mode Cluster Step execution

Software configuration

Release emr-5.17.0

Applications Core Hadoop: Hadoop 2.8.4 with Ganglia 3.7.2, Hive 2.3.3, Hue 4.2.0, Mahout 0.13.0, Pig 0.17.0, and Tez 0.8.4 HBase: HBase 1.4.6 with Ganglia 3.7.2, Hadoop 2.8.4, Hive 2.3.3, Hue 4.2.0, Phoenix 4.14.0, and Zookeeper 3.4.10 Presto: Presto 0.206 with Hadoop 2.8.4 HDFS and Hive 2.3.3 Metastore Spark: Spark 2.3.1 on Hadoop 2.8.4 YARN with Ganglia 3.7.2 and Zeppelin 0.7.3 Use AWS Glue Data Catalog for table metadata

Hardware configuration

Instance type m4.large The selected instance type adds a default 32 GiB GP2 EBS volume per instance. Learn more

Number of Instances 4 (1 master and 3 core nodes)

Security and access

EC2 key pair mykeypair Learn how to create an EC2 key pair.

Permissions Default Custom Use default IAM roles. If roles are not present, they will be automatically created for you with managed policies for automatic policy updates.

EMR role EMR_DefaultRole

EC2 instance profile EMR_EC2_DefaultRole

Cancel Create cluster

https://console.aws.amazon.com/s3/buckets/hadoopassignmentgurupad/?region=us-east-2&tab=overview

Services Resource Groups

Gurupad Hegde Global Support

Amazon S3 > hadoopassignmentgurupad

Overview Properties Permissions Management

Type a prefix and press Enter to search. Press ESC to clear.

Upload Create folder Actions

US East (Ohio)

Viewing 1 to 2

Name	Last modified	Size	Storage class
input	--	--	--
bible	Sep 29, 2018 2:02:50 PM GMT-0400	8.6 MB	Standard

Viewing 1 to 2

Upload (238.8 KB/s) 20.7% Successful Uploading file: AssignmentQ1.jar

Operations 1 In progress 4 Success 0 Error

Services Resource Groups

Gurupad Hegde Ohio Support

Amazon EMR

Clusters Security configurations VPC subnets Events Help What's new

Cluster: MapreduceAssignment Starting

Clone Terminate AWS CLI export

Summary Application history Monitoring Hardware Events Steps Configurations Bootstrap actions

Connections: -- Master public DNS: -- Tags: -- View All / Edit

Summary ID: j-2BY5Z1AR8N5R Release label: emr-5.17.0
Creation date: 2018-09-29 17:04 (UTC-4) Hadoop distribution: Amazon 2.8.4
Elapsed time: 53 seconds Applications: Ganglia 3.7.2, Hive 2.3.3, Hue 4.2.0,
Auto-terminate: No Mahout 0.13.0, Pig 0.17.0, Tez 0.8.4
Termination Off Change protection: Log URI: s3://hadoopassignmentgurupad/
EMRFS consistent Disabled view:
Custom AMI ID: --

Network and hardware Availability zone: us-east-2b Key name: mykeypair
Subnet ID: subnet-261c805c EC2 instance profile: EMR_EC2_DefaultRole
Master: Provisioning 1 m4.large EMR role: EMR_DefaultRole
Core: Provisioning 3 m4.large Visible to all users: All Change
Task: -- Security groups for sg-04ea3acde7986532f [Master: (ElasticMapReduce-master)
Security groups for sg-0478d4c6f67df72a5 [Core & Task: (ElasticMapReduce-slave)]

⚠ Core Instance Group: Your account is currently being verified. Verification normally takes less than 2 hours. Until your account is verified, you may not be able to launch additional instances or create additional volumes. If you are still receiving this message after more than 2 hours, please let us know by writing to aws-verification@amazon.com. We appreciate your patience.

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Screenshot of the AWS EMR Cluster Details page for 'MapreduceAssignment'. The cluster status is 'Waiting'.

Cluster: MapreduceAssignment Waiting Cluster ready after last step completed.

Steps

ID	Name	Status	Start time (UTC-4)	Elapsed time	Log files
s-3S687018A75SH	Setup hadoop debugging	Completed	2018-09-29 17:14 (UTC-4)	2 seconds	View logs

Screenshot of the 'Add step' dialog box.

Add step

Step type: Custom JAR

Name*: Custom JAR

JAR location*: s3://hadoopassignmentgurupad/AssignmentQ1.jar

Arguments: s3://hadoopassignmentgurupad/input
s3://hadoopassignmentgurupad/output

JAR location maybe a path into S3 or a fully qualified java class in the classpath.

These are passed to the main function in the JAR. If the JAR does not specify a main class in its manifest file you can specify another class name as the first argument.

Action on failure: Continue

What to do if the step fails: [checkbox]

Cancel **Add**

← → ⌂ ⓘ https://us-east-2.console.aws.amazon.com/elasticmapreduce/home?region=us-east-2#cluster-details;j-2BYS7Z1AR8N5R

AWS Services Resource Groups

Gurupad Hegde Ohio Support

Amazon EMR

- Clusters
- Security configurations
- VPC subnets
- Events
- Help
- What's new

Cluster: MapreduceAssignment Waiting Cluster ready after last step completed.

Summary Application history Monitoring Hardware Events Steps Configurations Bootstrap actions

Add step Clone step Cancel step

Steps

View all interactive jobs | View all jobs

Filter:	All steps	Filter steps ...	2 steps (all loaded) C					
ID	Name	Status	Start time (UTC-4)	Elapsed time	Log files			
s-26NHMHQIP5NYH	Custom JAR	Completed	2018-09-29 17:20 (UTC-4)	1 minute	View logs			
s-3S687018A75SH	Setup hadoop debugging	Completed	2018-09-29 17:14 (UTC-4)	2 seconds	View logs			

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EC2 Dashboard

- Events
- Tags
- Reports
- Limits
- INSTANCES**
- Instances
- Launch Templates
- Spot Requests
- Reserved Instances
- Dedicated Hosts
- IMAGES
- AMIs
- Bundle Tasks
- ELASTIC BLOCK STORE
- Volumes
- Snapshots
- Lifecycle Manager
- NETWORK & SECURITY
- Security Groups
- Elastic IPs
- Placement Groups
- Key Pairs
- Network Interfaces

Launch Instance Connect Actions

Filter by tags and attributes or search by keyword

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP
i-04b07406235de911f	i-04b07406235de911f	m4.large	us-east-2b	running	2/2 checks ...	None	ec2-18-188-238-35.us...	18.188.238.35
i-0921e457ba34bd0ae	i-0921e457ba34bd0ae	m4.large	us-east-2b	running	2/2 checks ...	None	ec2-52-14-6-248.us...	52.14.6.248
i-09ff4d11607c42c96	i-09ff4d11607c42c96	m4.large	us-east-2b	running	2/2 checks ...	None	ec2-18-223-180-100.us...	18.223.180.100
i-0c2b2d8c11a27ac14	i-0c2b2d8c11a27ac14	m4.large	us-east-2b	running	2/2 checks ...	None	ec2-18-188-179-207.us...	18.188.179.207

Instances: i-04b07406235de911f, i-0921e457ba34bd0ae, i-09ff4d11607c42c96, i-0c2b2d8c11a27ac14

Description Status Checks Monitoring Tags

i-04b07406235de911f: ec2-18-188-238-35.us-east-2.compute.amazonaws.com
i-0921e457ba34bd0ae: ec2-52-14-6-248.us-east-2.compute.amazonaws.com
i-09ff4d11607c42c96: ec2-18-223-180-100.us-east-2.compute.amazonaws.com
i-0c2b2d8c11a27ac14: ec2-18-188-179-207.us-east-2.compute.amazonaws.com

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part-r-00001 part-r-00000 Show All X

https://us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#instances:sort=instanceId

Services ▾ Resource Groups ▾

EC2 Dashboard

Events

Tags

Reports

Limits

INSTANCES

Instances

Launch Templates

Spot Requests

Reserved Instances

Dedicated Hosts

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

Lifecycle Manager

NETWORK & SECURITY

Security Groups

Elastic IPs

Placement Groups

Key Pairs

Network Interfaces

Feedback English (US)

Launch Instance Connect Actions ▾

Terminate Instances

Warning

On an EBS-backed instance, the default action is for the root EBS volume to be deleted when the instance is terminated. Storage on any local drives will be lost.

Are you sure you want to terminate these instances?

i-0921e457ba34bd0ae (ec2-52-14-6-248.us-east-2.compute.amazonaws.com)
i-04b07406235de911f (ec2-18-188-238-35.us-east-2.compute.amazonaws.com)
i-09ff4d11607c42c96 (ec2-18-223-180-100.us-east-2.compute.amazonaws.com)
i-0c2b2d8c11a27ac14 (ec2-18-188-179-207.us-east-2.compute.amazonaws.com)

Cancel Yes, Terminate

Instances: I-04b07406235de911f: ec2-18-188-238-35.us-east-2.compute.amazonaws.com
I-0921e457ba34bd0ae: ec2-52-14-6-248.us-east-2.compute.amazonaws.com
I-09ff4d11607c42c96: ec2-18-223-180-100.us-east-2.compute.amazonaws.com
I-0c2b2d8c11a27ac14: ec2-18-188-179-207.us-east-2.compute.amazonaws.com

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Create Cluster - Quick Options Go to advanced options

General Configuration

Cluster name My cluster

Logging S3 folder s3://hadoopassignmentgurupad/

Launch mode Cluster

Software configuration

Release emr-5.17.0

Applications

Core Hadoop: Hadoop 2.8.4 with Ganglia 3.7.2, Hive 2.3.3, Hue 4.2.0, Mahout 0.13.0, Pig 0.17.0, and Tez 0.8.4

HBase: HBase 1.4.6 with Ganglia 3.7.2, Hadoop 2.8.4, Hive 2.3.3, Hue 4.2.0, Phoenix 4.14.0, and ZooKeeper 3.4.12

Presto: Presto 0.206 with Hadoop 2.8.4 HDFS and Hive 2.3.3 Metastore

Spark: Spark 2.3.1 on Hadoop 2.8.4 YARN with Ganglia 3.7.2 and Zeppelin 0.7.3

Use AWS Glue Data Catalog for table metadata

Hardware configuration

Instance type m4.large

The selected instance type adds a default 32 GB GP2 EBS volume per instance. Learn more

Number of instances 4 (1 master and 3 core nodes)

Security and access

EC2 key pair mykeypair

Permissions Default Custom

Use default IAM roles. If roles are not present, they will be automatically created for you with managed policies for automatic policy updates.

EMR role EMR_DefaultRole

EC2 instance profile EMR_EC2_DefaultRole

Cancel Create cluster

Feedback English (US)

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https://console.aws.amazon.com/s3/buckets/hadoopassignmentgurupad/?region=us-east-2&tab=overview

AWS Services Resource Groups

Amazon S3 > hadoopassignmentgurupad

Overview Properties Permissions Management

Type a prefix and press Enter to search. Press ESC to clear.

Upload + Create folder Actions US East (Ohio)

Name	Last modified	Size	Storage class
input	--	--	--
j-2BYS7Z1AR8N5R	--	--	--

Viewing 1 to 2

Upload (477.6 KB/s) 55.46% Successful Uploading file: AssignmentQ1.jar

Operations 1 In progress 1 Success 0 Error

https://us-east-2.console.aws.amazon.com/elasticmapreduce/home?region=us-east-2#cluster-details:j-3MVEOBJTCU8IX

AWS Services Resource Groups

Amazon EMR Clusters Security configurations VPC subnets Events Help What's new

Cluster: My cluster Starting Configuring cluster software

Clone Terminate AWS CLI export

Summary Application history Monitoring Hardware Events Steps Configurations Bootstrap actions

Connections: Enable Web Connection – Hue, Ganglia, Resource Manager ... (View All)
Master public DNS: ec2-18-224-38-134.us-east-2.compute.amazonaws.com SSH
Tags: -- View All / Edit

Summary ID: j-3MVEOBJTCU8IX
Creation date: 2018-09-29 17:37 (UTC-4)
Elapsed time: 2 minutes
Auto-terminate: No
Termination Off Change protection:

Configuration details Release label: emr-5.17.0
Hadoop distribution: Amazon 2.8.4
Applications: Ganglia 3.2, Hive 2.3.3, Hue 4.2.0, Mahout 0.13.0, Pig 0.17.0, Tez 0.8.4
Log URI: s3://hadoopassignmentgurupad/
EMRFS consistent view:
Custom AMI ID: --

Network and hardware Availability zone: us-east-2a
Subnet ID: subnet-59c2e431 []
Master: Bootstrapping 1 m4.large
Core: Provisioning 3 m4.large
Task: --

Security and access Key name: mykeypair
EC2 instance profile: EMR_EC2_DefaultRole
EMR role: EMR_DefaultRole
Visible to all users: All Change
Security groups for sg-04ea3acde7986532f []
Master: (ElasticMapReduce-master)
Security groups for sg-0478d4c6f67df72a5 []
Core & Task: (ElasticMapReduce-slave)

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AWS Services Resource Groups

Amazon EMR

Clusters Security configurations VPC subnets Events Help What's new

Clone Terminate AWS CLI export

Cluster: My cluster Running Running step

Summary Application history Monitoring Hardware Events Steps Configurations Bootstrap actions

Connections: Enable Web Connection – Hue, Ganglia, Resource Manager ... (View All)

Master public DNS: ec2-18-224-38-134.us-east-2.compute.amazonaws.com SSH

Tags: -- View All / Edit

Summary Configuration details

ID: j-3MVEOBJTCU8IX Release label: emr-5.17.0

Creation date: 2018-09-29 17:37 (UTC-4) Hadoop distribution: Amazon 2.8.4

Elapsed time: 8 minutes Applications: Ganglia 3.7.2, Hive 2.3.3, Hue 4.2.0, Mahout 0.13.0, Pig 0.17.0, Tez 0.8.4

Auto-terminate: No Log URI: s3://hadoopassignmentgurupad/

Termination Off Change protection: EMRFS consistent Disabled view: Custom AMI ID: --

Network and hardware Security and access

Availability zone: us-east-2a Key name: mykeypair

Subnet ID: subnet-59c2e431 EC2 Instance profile: EMR_EC2_DefaultRole

Master: Running 1 m4.large EMR role: EMR_DefaultRole

Core: Running 3 m4.large Visible to all users: All Change

Task: -- Security groups for sg-04ea3acde7986532f

Master: (ElasticMapReduce-master) Security groups for sg-0478a4c6f67df72a5

Core & Task: (ElasticMapReduce-slave)

Feedback English (US)

AWS Services Resource Groups

Amazon EMR

Clusters Security configurations VPC subnets Events Help What's new

Clone Terminate AWS CLI export

Cluster: My cluster Running Running step

Summary Application history Monitoring Hardware Events Steps Configurations Bootstrap actions

Add step

Add step

Step type: Custom JAR

Name*: Custom JAR

JAR location*: s3://hadoopassignmentgurupad/AssignmentQ1.jar

Arguments: s3://hadoopassignmentgurupad/input s3://hadoopassignmentgurupad/output

Action on failure: Continue

What to do if the step fails.

Cancel Add

View all interactive jobs | View all jobs

Feedback English (US)

AWS Services Resource Groups

Amazon EMR

Clusters Security configurations VPC subnets Events Help What's new

Clone Terminate AWS CLI export

Cluster: My cluster Running Running step

Summary Application history Monitoring Hardware Events Steps Configurations Bootstrap actions

Add step Clone step Cancel step

Steps

View all interactive jobs | View all jobs

ID	Name	Status	Start time (UTC-4)	Elapsed time	Log files
s-3KXAVRKPAUS3V	Custom JAR	Running	2018-09-29 17:47 (UTC-4)	3 seconds	View logs
s-1RW09LKJCE0F6	Setup hadoop debugging	Completed	2018-09-29 17:45 (UTC-4)	2 seconds	View logs

Feedback English (US)

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AWS Services Resource Groups

Amazon S3 > hadoopassignmentgurupad

Overview Properties Permissions Management

Type a prefix and press Enter to search. Press ESC to clear.

Upload + Create folder Actions US East (Ohio) ▾

Name	Last modified	Size	Storage class
input	--	--	--
j-2BYS7Z1AR8N5R	--	--	--
j-3MVEOBJTCU8IX	--	--	--
output	--	--	--
AssignmentQ1.jar	Sep 29, 2018 5:37:12 PM GMT-0400	34.6 MB	Standard

Viewing 1 to 5

Operations 0 In progress 2 Success 0 Error

https://console.aws.amazon.com/s3/buckets/hadoopassignmentgurupad/output/?region=us-east-2&tab=overview

Services Resource Groups

Amazon S3 > hadoopassignmentgurupad / output

Overview

Type a prefix and press Enter to search. Press ESC to clear.

Upload Create folder Actions US East (Ohio)

Name	Last modified	Size	Storage class
SUCCESS	Sep 29, 2018 5:48:45 PM GMT-0400	0 B	Standard
part-r-00000	Sep 29, 2018 5:48:29 PM GMT-0400	98.2 KB	Standard
part-r-00001	Sep 29, 2018 5:48:45 PM GMT-0400	94.9 KB	Standard
part-r-00002	Sep 29, 2018 5:48:44 PM GMT-0400	93.9 KB	Standard
part-r-00003	Sep 29, 2018 5:48:45 PM GMT-0400	96.3 KB	Standard
part-r-00004	Sep 29, 2018 5:48:44 PM GMT-0400	94.3 KB	Standard

Viewing 1 to 6

Operations 0 In progress 2 Success 0 Error

part-r-00004 part-r-00003 part-r-00002 part-r-00001 part-r-00000 Show All

AWS Services Resource Groups

Gurupad Hegde Ohio Support

Amazon EMR Clusters Security configurations VPC subnets Events Help What's new

Clone Terminate AWS CLI export

Cluster: My cluster Waiting Cluster ready after last step completed.

Summary Application history Monitoring Hardware Events Steps Configurations Bootstrap actions

Add step Clone step Cancel step

Steps View all interactive jobs | View all jobs

ID	Name	Status	Start time (UTC-4)	Elapsed time	Log files
s-3IOXAVRKPAUS3V	Custom JAR	Completed	2018-09-29 17:47 (UTC-4)	1 minute	View logs
s-1RW09LJKJCE0F6	Setup hadoop debugging	Completed	2018-09-29 17:45 (UTC-4)	2 seconds	View logs

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part-r-00004 part-r-00003 part-r-00002 part-r-00001 part-r-00000 Show All

The screenshot shows the AWS S3 console interface. On the left, there's a sidebar with 'Favorites' like Recents, iCloud Drive, Applications, Desktop, Documents, and Downloads. The 'Downloads' section is currently selected. In the main area, a file browser lists several files under 'AssignmentQ2.jar' and 'AssignmentQ1.jar'. A modal dialog box is open, prompting the user to 'Add files' or 'Upload'. Below the modal, there are 'Upload' and 'Next' buttons. At the bottom, an 'Operations' bar shows 0 in progress, 4 Success, and 0 Error.

This screenshot shows the 'Overview' tab for the 'hadoopassignmentgurupad' bucket. It lists the same files as the previous screen: AssignmentQ2.jar, AssignmentQ1.jar, and their respective parts. The 'Properties' tab is selected at the top. The 'Actions' dropdown menu is open, showing options like 'Upload', 'Create folder', and 'Actions'.

This screenshot shows the 'Properties' tab for the same bucket. The files listed are AssignmentQ2.jar, AssignmentQ1.jar, and their parts. The 'Actions' dropdown menu is open, showing options like 'Upload', 'Create folder', and 'Actions'.

This screenshot shows the 'Upload' progress for AssignmentQ2.jar. The progress bar indicates 19.3% successful. The file is being uploaded at 1.7 MB/s. The 'Operations' bar at the bottom shows 1 In progress, 4 Success, and 0 Error. The file list below includes part-r-00004 through part-r-00000.

https://us-east-2.console.aws.amazon.com/elasticmapreduce/home?region=us-east-2#cluster-details:j-3MVEOBJTCU8IX

Services Resource Groups

Clusters Security configurations VPC subnets Events Help What's new

Clone Terminate AWS CLI export

Cluster: My cluster Waiting Cluster ready after last step completed.

Summary Application history Monitoring Hardware Events Steps Configurations Bootstrap actions

Add step

Step type: Custom JAR
Name*: Custom JAR
JAR location*: s3://hadoopassignmentgurupad/AssignmentQ2.jar
Arguments: s3://hadoopassignmentgurupad/input s3://hadoopassignmentgurupad/outputDoubleWordCount

JAR location maybe a path into S3 or a fully qualified java class in the classpath.
These are passed to the main function in the JAR. If the JAR does not specify a main class in its manifest file you can specify another class name as the first argument.

Action on failure: Continue What to do if the step fails.

Cancel Add

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part-r-00004 part-r-00003 part-r-00002 part-r-00001 part-r-00000

https://us-east-2.console.aws.amazon.com/elasticmapreduce/home?region=us-east-2#cluster-details:j-3MVEOBJTCU8IX

Services Resource Groups

Clusters Security configurations VPC subnets Events Help What's new

Clone Terminate AWS CLI export

Cluster: My cluster Waiting Cluster ready after last step completed.

Summary Application history Monitoring Hardware Events Steps Configurations Bootstrap actions

Add step Clone step Cancel step

Steps

View all interactive jobs | View all jobs

Filter: All steps Filter steps ... 3 steps (all loaded) C

ID	Name	Status	Start time (UTC-4)	Elapsed time	Log files
s-1VLN1URFMA79I	Custom JAR	Completed	2018-09-29 18:11 (UTC-4)	1 minute	View logs
s-3KXAVRKPAUS3V	Custom JAR	Completed	2018-09-29 17:47 (UTC-4)	1 minute	View logs
s-1RW09LKJCE0F6	Setup hadoop debugging	Completed	2018-09-29 17:45 (UTC-4)	2 seconds	View logs

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part-r-00004 part-r-00003 part-r-00002 part-r-00001 part-r-00000

https://console.aws.amazon.com/s3/buckets/hadoopassignmentgurupad/?region=us-east-2&tab=overview

AWS Services Resource Groups

Amazon S3 > hadoopassignmentgurupad

Overview Properties Permissions Management

Type a prefix and press Enter to search. Press ESC to clear.

Actions

Upload Create folder Actions US East (Ohio)

Viewing 1 to 7

Name	Last modified	Size	Storage class
input	--	--	--
j-2BYSTZ1AR8NSR	--	--	--
j-3MVEOBJTCU8IX	--	--	--
output	--	--	--
outputDoubleWordCount	--	--	--
AssignmentQ1.jar	Sep 29, 2018 5:37:12 PM GMT-0400	34.6 MB	Standard
AssignmentQ2.jar	Sep 29, 2018 6:08:21 PM GMT-0400	35.8 MB	Standard

Viewing 1 to 7

Operations 0 In progress 5 Success 0 Error

part-r-00004 part-r-00003 part-r-00002 part-r-00001 part-r-00000 Show All

https://console.aws.amazon.com/s3/buckets/hadoopassignmentgurupad/?region=us-east-2&tab=overview

AWS Services Resource Groups

Amazon S3 > hadoopassignmentgurupad

Overview Properties Permissions Management

Type a prefix and press Enter to search. Press ESC to clear.

Actions

Upload Create folder Actions US East (Ohio)

Viewing 1 to 7

Name	Date Modified	Size
bible6	Today at 2:35 PM	9.1 MB
bible5	Today at 2:35 PM	9.1 MB
bible4	Today at 2:35 PM	9.1 MB
bible3	Today at 2:35 PM	9.1 MB
bible2	Today at 2:35 PM	9.1 MB
bible.	Today at 2:35 PM	9.1 MB
mykeypair.pem	Today at 2:30 PM	2 KB
WordCount-0.0.1-SNAPSHOT.jar	Today at 1:48 PM	5 KB
word-patterns.txt	Today at 1:41 PM	628 bytes
b.txt	Today at 1:36 PM	87 bytes
eclipse-inst-mac64 (1).tar.gz	Today at 1:28 PM	50.1 MB
org.apache.commons.cli-1.2.0.jar.zip	Today at 12:50 PM	38 KB
eclipse-inst-mac64.tar.gz	Today at 11:32 AM	50.1 MB
hadoop-core-0.20.2-cdh3u0.jar.zip	Today at 11:20 AM	3.2 MB
a.txt	Yesterday at 10:32 PM	220 bytes
Assignment3.pdf	Yesterday at 7:32 PM	52 KB
bible	Yesterday at 1:42 AM	9.1 MB
bible (1)	Yesterday at 1:26 AM	9.1 MB
bible (1) o7	Yesterday at 1:26 AM	3 MB

Cancel Open

Add files OR

Upload Next

word-patterns (1).txt

Screenshot of the AWS S3 console showing the 'Downloads' folder contents. A modal dialog is open, prompting for file upload.

Downloads Folder Content:

Name	Last modified	Size
AssignmentQ3.jar	Today at 10:11 PM	37.5 MB
word-patterns (1).txt	Today at 10:02 PM	628 bytes
part-r-00000	Today at 6:14 PM	1.3 MB
AssignmentQ2.jar	Today at 6:07 PM	37.5 MB
Desktop	Today at 5:50 PM	9.1 MB
AssignmentQ1.jar	Today at 5:36 PM	36.2 MB
DoubleWordCount-0.0.1-SNAPSHOT-1.jar	Today at 3:28 PM	5 KB
bible/	Today at 2:35 PM	9.1 MB
bible10	Today at 2:35 PM	9.1 MB
bible8	Today at 2:35 PM	9.1 MB
bible7	Today at 2:35 PM	9.1 MB
bible6	Today at 2:35 PM	9.1 MB
bible5	Today at 2:35 PM	9.1 MB
bible4	Today at 2:35 PM	9.1 MB
bible3	Today at 2:35 PM	9.1 MB
bible2	Today at 2:35 PM	9.1 MB

Modal Dialog (Add files):

OR

Add files

Cancel Open

Operations Bar:

- Upload
- Create folder
- Actions

Viewing 1 to 8

Screenshot of the AWS S3 console showing the 'Overview' tab for a bucket named 'hadoopassignmentgurupad'. The 'Properties' tab is selected.

Bucket Overview:

- Region: US East (Ohio)
- Storage class: Standard
- Viewing 1 to 8

Bucket Contents:

Name	Last modified	Size	Storage class
word-patterns (1).txt	--	--	--
input	--	--	--
j-2BY57Z1AR8N5R	--	--	--
j-3MVEOBJTCU8IX	--	--	--
output	--	--	--
outputDoubleWordCount	--	--	--
AssignmentQ1.jar	Sep 29, 2018 5:37:12 PM GMT-0400	34.6 MB	Standard
AssignmentQ2.jar	Sep 29, 2018 6:08:21 PM GMT-0400	35.8 MB	Standard
word-patterns.txt	Sep 29, 2018 10:04:24 PM GMT-0400	628.0 B	Standard

Operations Bar:

- Upload
- Create folder
- Actions

Viewing 1 to 8

Screenshot of the AWS S3 console showing an upload progress bar for 'AssignmentQ3.jar'.

Upload Progress:

- Upload (2.0 MB/s)
- 3.1% Successful
- Uploading file: AssignmentQ3.jar

Operations Bar:

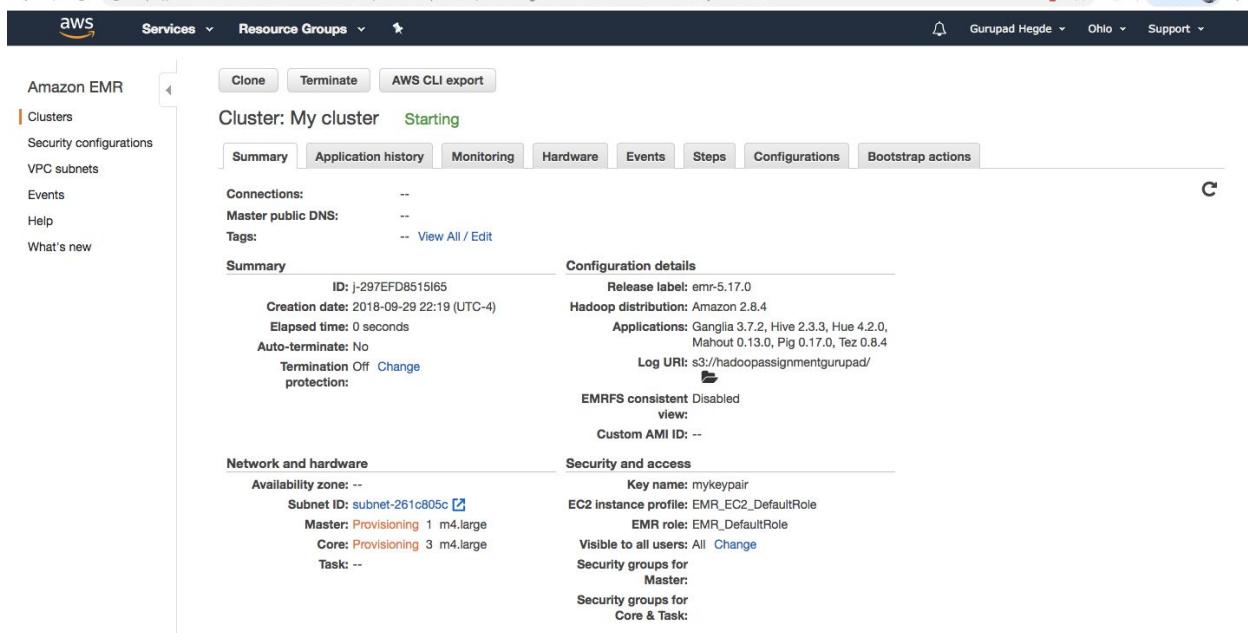
- Operations
- 1 In progress
- 6 Success
- 0 Error

Bucket Contents:

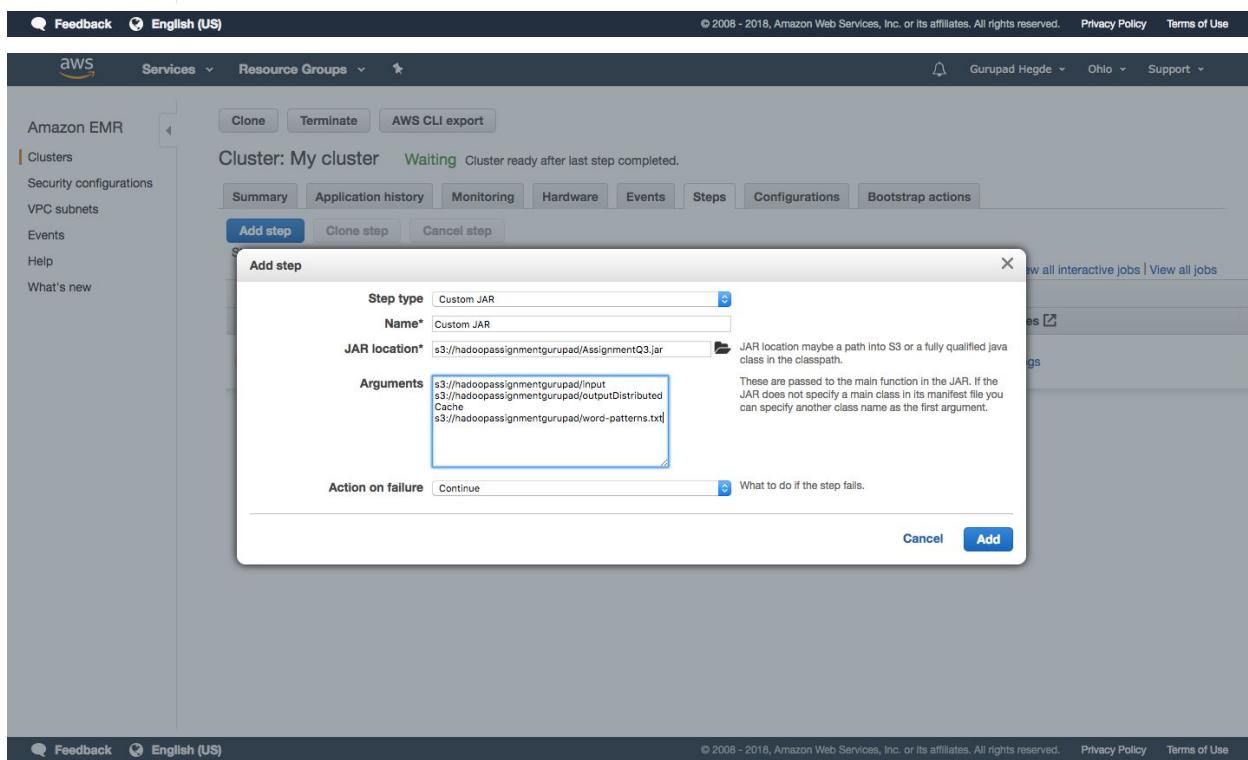
- word-patterns (1).txt

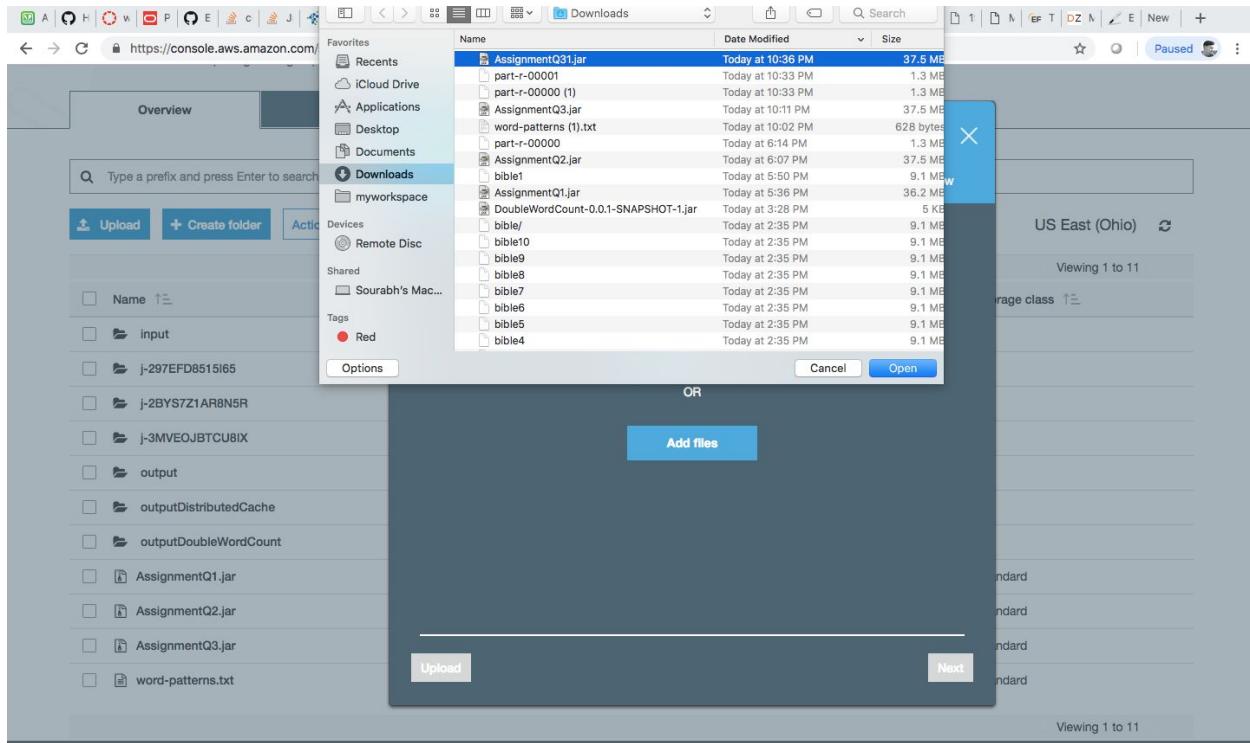
Show All X

<https://us-east-2.console.aws.amazon.com/elasticmapreduce/home?region=us-east-2#cluster-details:j-297EFD8515I65>



<https://us-east-2.console.aws.amazon.com/elasticmapreduce/home?region=us-east-2#cluster-details:j-297EFD8515I65>





A screenshot of the AWS EMR console. The top navigation bar includes the AWS logo, 'Services', 'Resource Groups', and user information. The main content area is titled 'Cluster: My cluster' with a status of 'Waiting'. It says 'Cluster ready after last step completed.' Below this are tabs for 'Summary', 'Application history', 'Monitoring', 'Hardware', 'Events', 'Steps', 'Configurations', and 'Bootstrap actions'. Under the 'Steps' tab, there's a sub-section for 'Interactive jobs' with 'View all interactive jobs' and 'View all jobs' links. A table lists four steps: 's-2CMDLBLUTOAZI' (Custom JAR, Completed, 2018-09-29 22:48 UTC-4, 1 minute, logs), 's-3AO6CBPCPDORA' (Custom JAR, Completed, 2018-09-29 22:39 UTC-4, 1 minute, logs), 's-30KATDIY664ZA' (Custom JAR, Completed, 2018-09-29 22:29 UTC-4, 1 minute, logs), and 's-2GJ7BS11JVY94' (Setup hadoop debugging, Completed, 2018-09-29 22:28 UTC-4, 2 seconds, logs). The bottom of the page includes a footer with 'Feedback', 'English (US)', and links to 'Privacy Policy' and 'Terms of Use'.

https://us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#Home:

Resources

You are using the following Amazon EC2 resources in the US East (Ohio) region:

Category	Count
Running Instances	4
Dedicated Hosts	0
Volumes	8
Key Pairs	1
Placement Groups	0
Elastic IPs	0
Snapshots	0
Load Balancers	0
Security Groups	3

Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

Launch Instance

Note: Your instances will launch in the US East (Ohio) region

Service Health

Service Status: US East (Ohio): No events

Availability Zone Status:

- us-east-2a: Availability zone is operating normally
- us-east-2b: Availability zone is operating normally
- us-east-2c: Availability zone is operating normally

Scheduled Events

AWS Marketplace

Find free software trial products in the AWS Marketplace from the EC2 Launch Wizard. Or try these popular AMIs:

- Barracuda CloudGen Firewall for AWS - PAYG
- Provided by Barracuda Networks, Inc.
- Rating: ★★★★☆
- Starting from \$0.60/hr or from \$4,599/yr (12% savings) for software + AWS usage fees
- View all Infrastructure Software

Matillion ETL for Amazon Redshift

https://us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#Instances:sort=desc:instanceState

Actions

- Connect
- Get Windows Password
- Launch More Like This
- Instance State**
 - Start
 - Stop
 - Reboot
 - Terminate**
- Networking
- CloudWatch Monitoring

Instances: i-09f84df097d4e7879, i-0a3e4e97370c5e8d0, i-0b1eecdea05b22cfb, i-0be51bd48191386f2

Description **Status Checks** **Monitoring** **Tags**

i-09f84df097d4e7879: ec2-18-223-247-174.us-east-2.compute.amazonaws.com
i-0a3e4e97370c5e8d0: ec2-18-218-144-153.us-east-2.compute.amazonaws.com
i-0b1eecdea05b22cfb: ec2-18-221-199-187.us-east-2.compute.amazonaws.com
i-0be51bd48191386f2: ec2-18-224-170-137.us-east-2.compute.amazonaws.com