



# **Amazon Web Services Data Engineering Immersion Day**

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Lab 1. AutoComplete DMS  
*July 2021*

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## Introduction

Labs in the Data Engineering workshop are to be completed in sequence. This lab is designed to automate the Data Lake hydration with AWS Database Migration Service (AWS DMS), so we can fast forward to the next Glue lab.

If you prefer to get hands-on with AWS DMS service, please skip this lab and go to Lab 1 - Hydrating Data Lake (DMS).



In this lab, the automated process will complete the following tasks on your behalf:

- Set up lab environment, including S3 bucket and IAM roles
- Create a DMS subnet group within the VPC
- Create a DMS replication instance
- Create a source endpoint for RDS source database
- Create a target endpoint for full data load
- Create a target endpoint for CDC
- Create a task to perform the initial full data migration
- Create a task to support the ongoing replication of data changes (CDC)

If you'd like to run the workshop on your own after the AWS hosted event, please follow the lab instruction here: <https://aws-dataengineering-day.workshop.aws/>

## Get Started Using the Lab Environment

Please skip this section if you are running the lab on your own AWS account.

Today, you are attending a formal event and you will have been sent your access details beforehand. If in the future you might want to perform these labs in your own AWS environment by yourself, you can follow instructions on GitHub - <https://github.com/aws-samples/data-engineering-for-aws-immersion-day>.

A 12-character access code (or 'hash') is the access code that grants you permission to use a dedicated AWS account for the purposes of this workshop.

1. Go to <https://dashboard.eventengine.run/>, enter the access code and click Proceed:

Who are you?

**Terms & Conditions:**

1. By using the Event Engine for the relevant event, you agree to the Event Terms and Conditions and the AWS Acceptable Use Policy. You acknowledge and agree that are using an AWS-owned account that you can only access for the duration of the relevant event. If you find residual resources or materials in the AWS-owned account, you will make us aware and cease use of the account. AWS reserves the right to terminate the account and delete the contents at any time.
2. You will not: (a) process or run any operation on any data other than test data sets or lab-approved materials by AWS, and (b) copy, import, export or otherwise create derivate works of materials provided by AWS, including but not limited to, data sets.
3. AWS is under no obligation to enable the transmission of your materials through Event Engine and may, in its discretion, edit, block, refuse to post, or remove your materials at any time.
4. Your use of the Event Engine will comply with these terms and all applicable laws, and your access to Event Engine will immediately and automatically terminate if you do not comply with any of these terms or conditions.

This is the 12 digit hash that was given to you or your team.

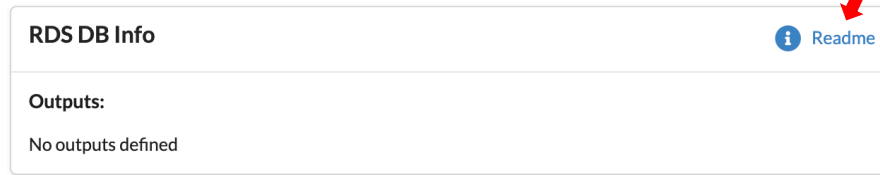
✓ Accept Terms & Login

2. On the Team Dashboard web page you will see a set of parameters that you will need during the labs. Best to save them to a text file locally, alternatively you can always go to this page to review them. Replace the parameters with the corresponding values from here where indicated in subsequent labs:

## Lab 1. AutoComplete DMS

Because you're at a formal event, some AWS resources have been pre-deployed for your convenience, for example:

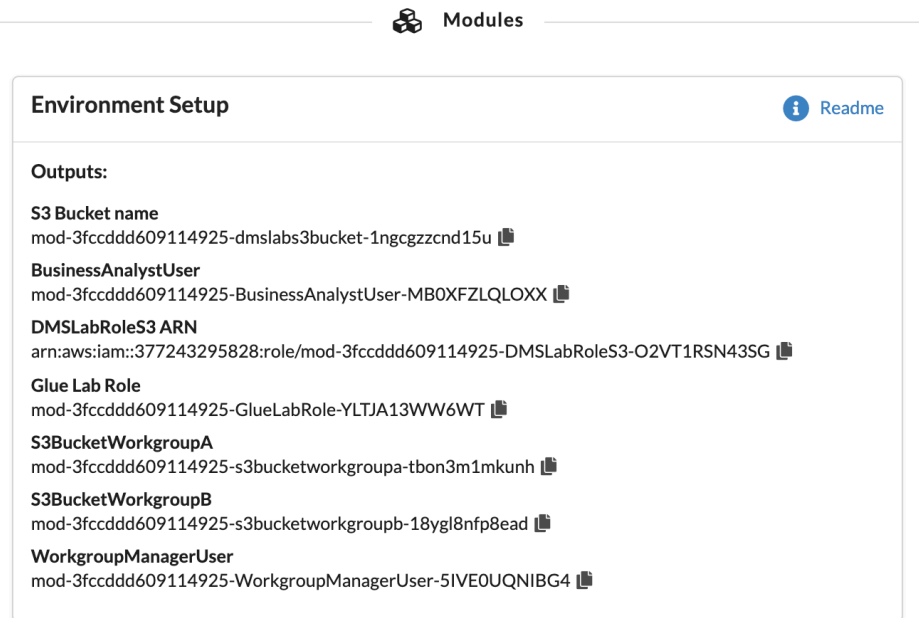
- The source database connection in RDS DB Info module



**RDS DB Info** [Readme](#)

**Outputs:**  
No outputs defined

- S3 Bucket, IAM role for the DMS lab etc

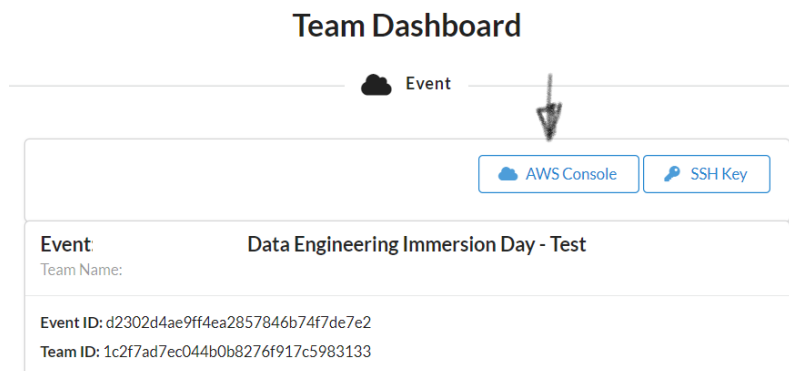


**Environment Setup** [Readme](#)

**Outputs:**

- S3 Bucket name**  
mod-3fccddd609114925-dmslabs3bucket-1ngcgzzcnd15u
- BusinessAnalystUser**  
mod-3fccddd609114925-BusinessAnalystUser-MBOXFZLQLOXX
- DMSLabRoleS3 ARN**  
arn:aws:iam::377243295828:role/mod-3fccddd609114925-DMSLabRoleS3-O2VT1RSN43SG
- Glue Lab Role**  
mod-3fccddd609114925-GlueLabRole-YLTJA13WW6WT
- S3BucketWorkgroupA**  
mod-3fccddd609114925-s3bucketworkgroupa-tbon3m1mkunh
- S3BucketWorkgroupB**  
mod-3fccddd609114925-s3bucketworkgroupb-18ygl8nfp8ead
- WorkgroupManagerUser**  
mod-3fccddd609114925-WorkgroupManagerUser-5IVE0UQNIBG4

3. On the Team Dashboard, please click AWS Console to log into the AWS Management Console:



**Team Dashboard**

Event

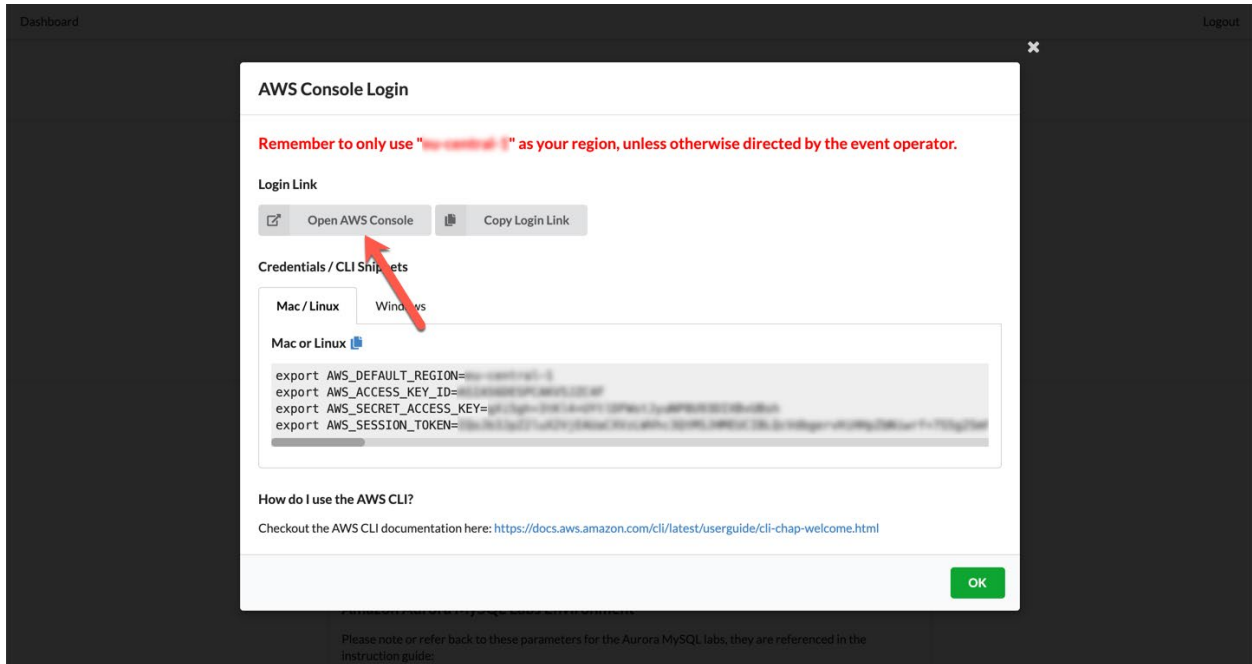
[AWS Console](#) [SSH Key](#)

**Event** Data Engineering Immersion Day - Test  
Team Name:

Event ID: d2302d4ae9ff4ea2857846b74f7de7e2  
Team ID: 1c2f7ad7ec044b0b8276f917c5983133

## Lab 1. AutoComplete DMS

4. Click Open AWS Console. For the purposes of this workshop, you will not need to use command line and API access credentials:

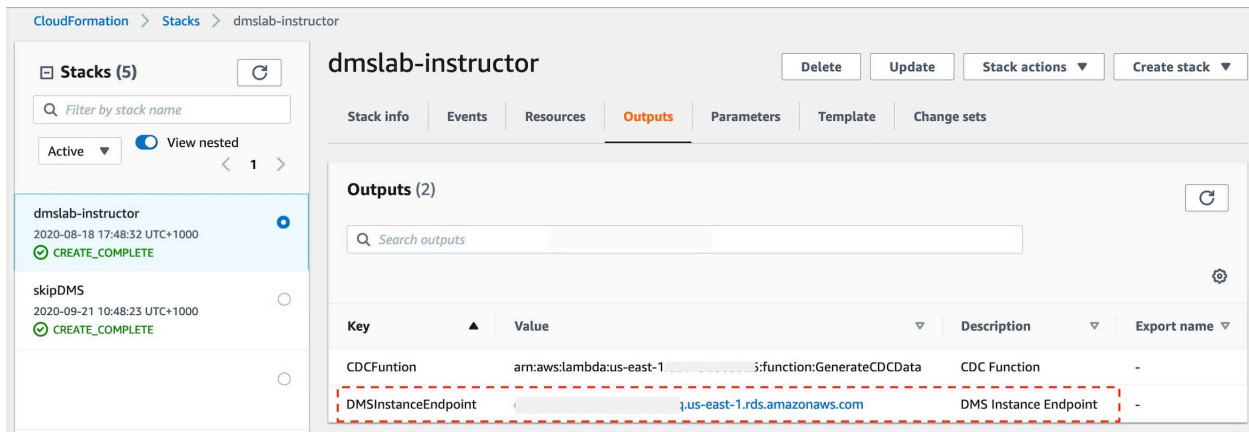


Once you have completed these steps, you can continue with the rest of this lab.

## Pre-requisite

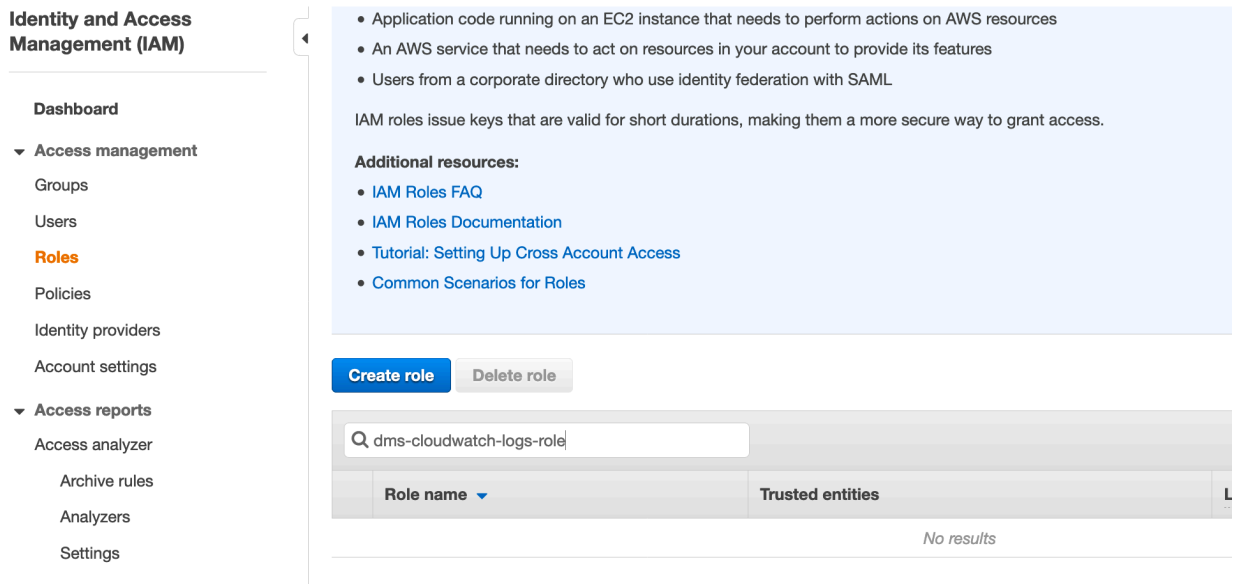
1. **RDS Database Server Name:** If you are on an AWS hosted event, you shall find this detail on Event Engine Team Dashboard under **Environment Setup** module.

Otherwise, check the *Outputs* tab on your [CloudFormation](#) Console, note down the RDS Server value.



2. **dms-cloudwatch-logs-role & dms-vcpc-role:** Check if the Identity and Access Management (IAM) roles exist in your lab account. Go to the [IAM console](#), copy & paste the names in the search box.

Note whether these roles are present or not. In this example screenshot the **dms-cloudwatch-logs-role** role is absent.



## AutoComplete DMS

**\*\* Warning: You may find duplicate S3 buckets and IAM roles in your lab environment, once deploy the following template. If that happens, please use resources with name prefix "auto-dmslab-". NOT "dmslab-student-" \*\***

1. Click the "Deploy to AWS" icon and open the link in a new web browser tab. It will load the CloudFormation dashboard to start the DMS automation process.



2. **Under Parameters:**

- *DMSCWRoleCreated*: - If the role exists, keep to **yes**. If doesn't exist, change to **no**.
- *DMSVPCRoleCreated*: - **no** if the role doesn't exist. Otherwise, **yes**
- *ServerName*: - Enter the RDS Database Server Name obtained from Environment Setup module in Event Engine Team Dashboard, e.g. ***dmslabinstance.xxxx<region>.rds.amazonaws.com***



## Lab 1. AutoComplete DMS

### Quick create stack

#### Template

Template URL  
https://s3.amazonaws.com/aws-dataengineering-day.workshop.aws/SkipDMSlab\_student\_CFN.yaml

Stack description  
-

#### Stack name

Stack name  
auto-dmslab

Stack name can include letters (A-Z and a-z), numbers (0-9), and dashes (-).

#### Parameters

Parameters are defined in your template and allow you to input custom values when you create or update a stack.

DMSCWRoleCreated  
dms-cloudwatch-logs-role already created in account?  
true

DMSVPCRoleCreated  
dms-vpc-role already created in account?  
false

ServerName

- Under **Capabilities** select the checkbox for **“I acknowledge that AWS CloudFormation might create IAM resources”** and select **“Create stack”**.

#### Capabilities

**The following resource(s) require capabilities: [AWS::IAM::Role]**

This template contains Identity and Access Management (IAM) resources. Check that you want to create each of these resources and that they have the minimum required permissions. In addition, they have custom names. Check that the custom names are unique within your AWS account. [Learn more](#)

I acknowledge that AWS CloudFormation might create IAM resources with custom names.

Cancel

- The stack launch may take 5-6 minutes. Wait until your stack status advances to **“CREATE\_COMPLETE”**.

## Lab 1. AutoComplete DMS

CloudFormation > Stacks > auto-dmslab

**Stacks (4)**

- auto-dmslab  
2020-09-26 23:11:06 UTC+1000  
CREATE\_COMPLETE
- kinesis-prelab  
2020-09-25 09:53:21 UTC+1000  
CREATE\_COMPLETE
- serverlessrepo-AthenaJdbcConnector  
2020-08-27 17:14:50 UTC+1000  
CREATE\_COMPLETE
- dmslab-instructor  
2020-08-18 17:48:32 UTC+1000

**auto-dmslab**

Stack info | **Events** | Resources | Outputs | Parameters | Template | Change sets

**Events (100+)**

Search events

Timestamp	Logical ID	Status	Status reason
2020-09-26 23:16:51 UTC+1000	auto-dmslab	CREATE_COMPLETE	-
2020-09-26 23:16:47 UTC+1000	CDCReplicationTaskParameter	CREATE_COMPLETE	-
2020-09-26 23:16:46 UTC+1000	CDCReplicationTaskParameter	CREATE_IN_PROGRESS	Resource creation Initiated

- At this point, the source data has been fully loaded from RDS database to your S3 bucket via DMS. Go to [AWS DMS console](#), you should see two **Database migration tasks** are 100% completed. If not, please wait until they are finished, then proceed to the Glue lab. **Going forward, ensure to use S3 bucket and IAM roles with name prefix "auto-dmslab-".**

**AWS DMS**

Dashboard

Migration

- Database migration tasks

Resource management

- Replication instances
- Endpoints
- Certificates

**DMS > Database migration tasks**

Database migration tasks (2)

Find database migration tasks

Identifier	Status	Progress	Type	Source	Target
cdctask	Replication ongoing	100%	Ongoing replication	rds-source-endpoint	rds-cdc-endpoint
dms-task-full-dump	Load complete	100%	Full load	rds-source-endpoint	s3-target-endpoint