

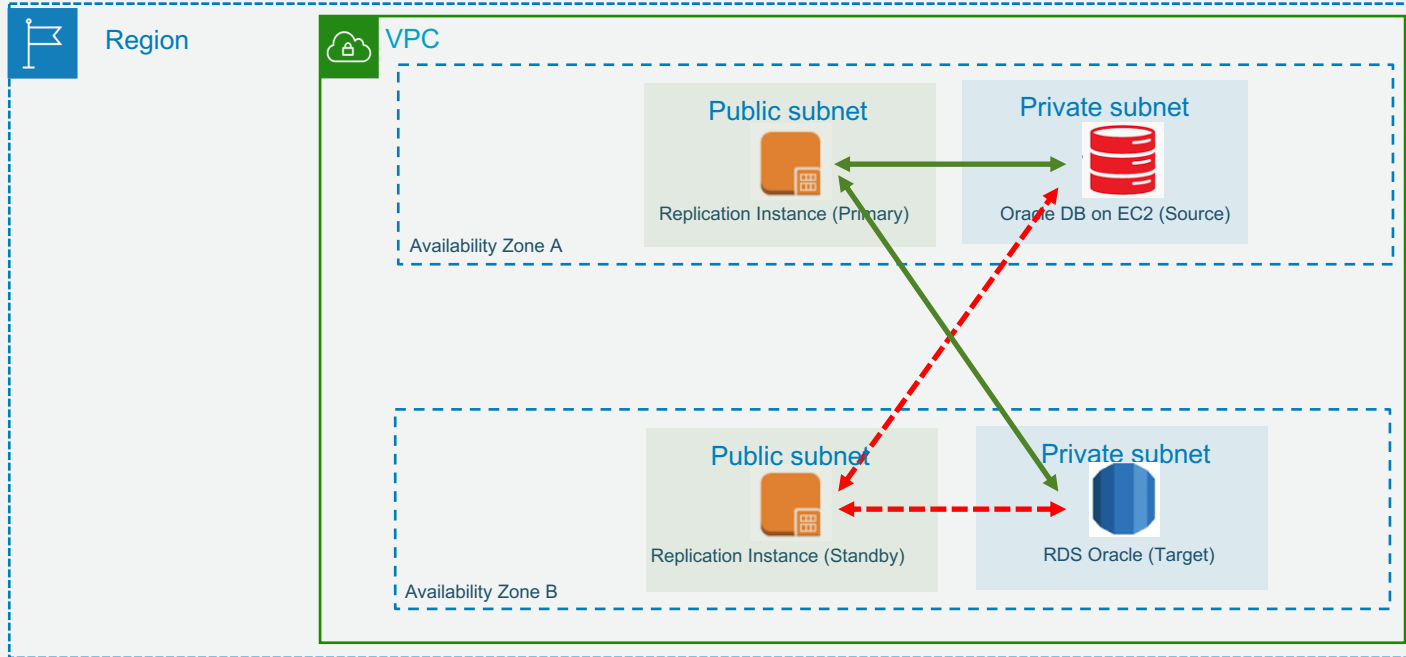


# Data Migration Service Architecture

November 21, 2019

# DMS High Level Architecture

## Multi-AZ Solution



# DMS Architecture

## Configuration Options and Tips

- ✓ DMS Multi-AZ is an active / passive configuration that fails over automatically. Option should always be used with CDC.
- ✓ Use Schema Conversion Tool (SCT) to generate and apply DDL to target databases
- ✓ Source can be RDS Oracle, Oracle on EC2, or Oracle On-Premises (many other databases are available)
- ✓ For Oracle sources, 'Endpoint-specific settings', 'Extra connection attributes' must be set to the value below in DMS
  - ✓ `addSupplementalLogging=Y`
- ✓ VPC Security Group inbound rules must be properly set on sources and targets
- ✓ VPC Peering should be setup between DMS replication instance VPC and source & target VPCs
- ✓ Enable Logging to troubleshoot DMS issues (logs are pushed to CloudWatch)

# DMS Architecture

## Configuration Options and Tips

- ✓ DMS can use Oracle LogMiner or Oracle Binary Reader for Change Data Capture (CDC)
- ✓ Binary Reader is an AWS DMS feature that reads and parses the raw redo log files directly
- ✓ Oracle LogMiner is used by default
  - ✓ Binary Reader doesn't support all Oracle options, in particular options for encryption and compression
  - ✓ Binary Reader doesn't support table clusters
  - ✓ Binary Reader is better for high volumes of CDC changes
  - ✓ Binary Reader is better when using Oracle ASM (set parallel threads and read ahead buffers)
  - ✓ Log Miner does not support CDC for LOBs
  - ✓ Log Miner does not support PDBs
- ✓ To enable Binary Reader, setup 'Endpoint-specific settings', 'Extra connection attributes'
  - ✓ `useLogMinerReader=N;useBfile=Y;`
- ✓ The DMS Oracle user must have the following privileges for self managed Oracle sources
  - ✓ Grant EXECUTE ON `dbms_logmnr`
  - ✓ Grant LOGMINING
  - ✓ Alter any table

<https://docs.aws.amazon.com/dms/latest/userguide/dms-ug.pdf>

# DMS Architecture

## Configuration Options and Tips

- ✓ To pull data from Oracle views, setup 'Endpoint-specific settings', 'Extra connection attributes'
  - ✓ `exposeViews=true`
- ✓ Make sure your archive log retention policy is properly set (interval is hours)
- ✓ Drop primary key indexes, secondary indexes, referential integrity constraints, and data manipulation language (DML) triggers prior to full loads
- ✓ If applicable, divide your migration into multiple tasks

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# DMS Architecture

## DDL Task Settings

- ✓ DDL changes handled “out-of-the-box” by default
  - ✓ HandleSourceTableDropped, HandleSourceTableTruncated, HandleSourceTableAltered
  - ✓ BatchApplyEnabled must be set to ‘false’
- ✓ Can be modified using ‘aws dms --replication-task-settings *JSON-Filename...*’
- ✓ Task settings (JSON) can be viewed from the AWS Management Console

# DMS Architecture

## Limitations – Per account, per region

✓ [https://docs.aws.amazon.com/dms/latest/userguide/CHAP\\_Limits.html](https://docs.aws.amazon.com/dms/latest/userguide/CHAP_Limits.html)

Resource	Default Limit
Replication instances	20
Total amount of storage	6 TB
Event subscriptions	20
Replication subnet groups	20
Subnets per replication subnet group	20
Endpoints	100
Tasks	200
Endpoints per instance	20

# DMS Architecture

## Limitations with Oracle Sources

- ✓ DMS doesn't capture changes made by the Oracle DBMS\_REDEFINITION package, such as changes to table metadata and the OBJECT\_ID value
- ✓ DMS doesn't support index-organized tables with an overflow segment in CDC mode when using BFILE. An example is when you access the redo logs without using LogMiner.
- ✓ Tables with LOBs must have a primary key to use CDC
- ✓ DMS doesn't replicate data changes resulting from partition or subpartition operations - data definition language (DDL) operations such as ADD, DROP, EXCHANGE, or TRUNCATE
- ✓ The DDL statement ALTER TABLE ADD <column> <data\_type> DEFAULT <> doesn't replicate the default value to the target. The new column in the target is set to NULL.
- ✓ DMS versions prior to 3.1.3 doesn't support CTAS. CREATE TABLE AS creates a new table on the target but no data is migrated to it.
- ✓ If a DMS task is resumed, it must be within the past five days. DMS maps a timestamp to the Oracle system change number (SCN). Oracle keeps only five days of the timestamp to SCN mapping.
- ✓ Does not support virtual columns



# Questions