RDS - BACK UPS, MULTI-AZ & READ REPLICAS

Automated Backups

A CLOUD GURU

- There are two different types of Backups for AWS: Automated Backups and Database Snapshots.
- Automated Backups allow you to recover your database to any point in time within a “retention period”. The retention period can be between one and 35 days. Automated Backups will take a full daily snapshot and will also store transaction logs throughout the day. When you do a recovery, AWS will first choose the most recent daily back up, and then apply transaction logs relevant to that day. This allows you to do a point in time recovery down to a second, within the retention period.

RDS - BACK UPS, MULTI-AZ & READ REPLICAS

Snapshots

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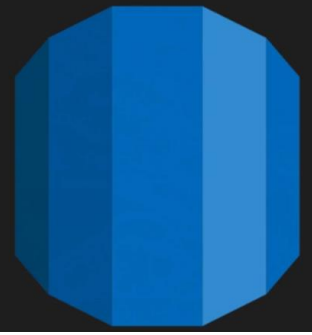
DB Snapshots are done manually (ie they are user initiated.) They are stored even after you delete the original RDS instance, unlike automated backups.



RDS - BACK UPS, MULTI-AZ & READ REPLICAS

Automated Backups

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Automated Backups are enabled by default. The backup data is stored in S3 and you get free storage space equal to the size of your database. So if you have an RDS instance of 10Gb, you will get 10Gb worth of storage.

Backups are taken within a defined window. During the backup window, storage I/O may be suspended while your data is being backed up and you may experience elevated latency.

RDS - BACK UPS, MULTI-AZ & READ REPLICAS

Restoring Backups

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Whenever you restore either an Automatic Backup or a manual Snapshot, the restored version of the database will be a new RDS instance with a new DNS endpoint.

original.eu-west-1.rds.amazonaws.com

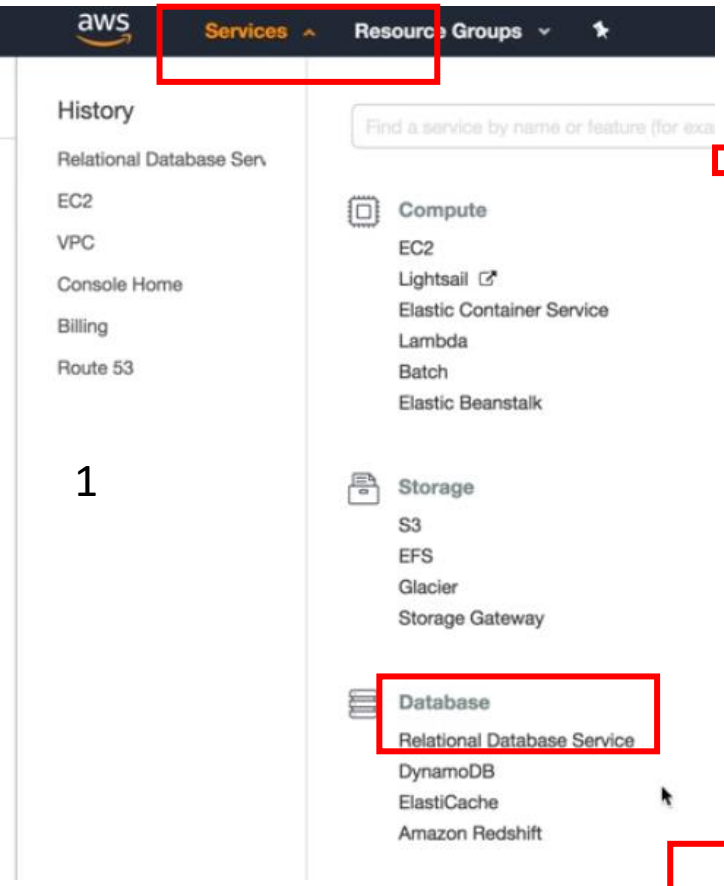
restored.eu-west-1.rds.amazonaws.com

Encryption

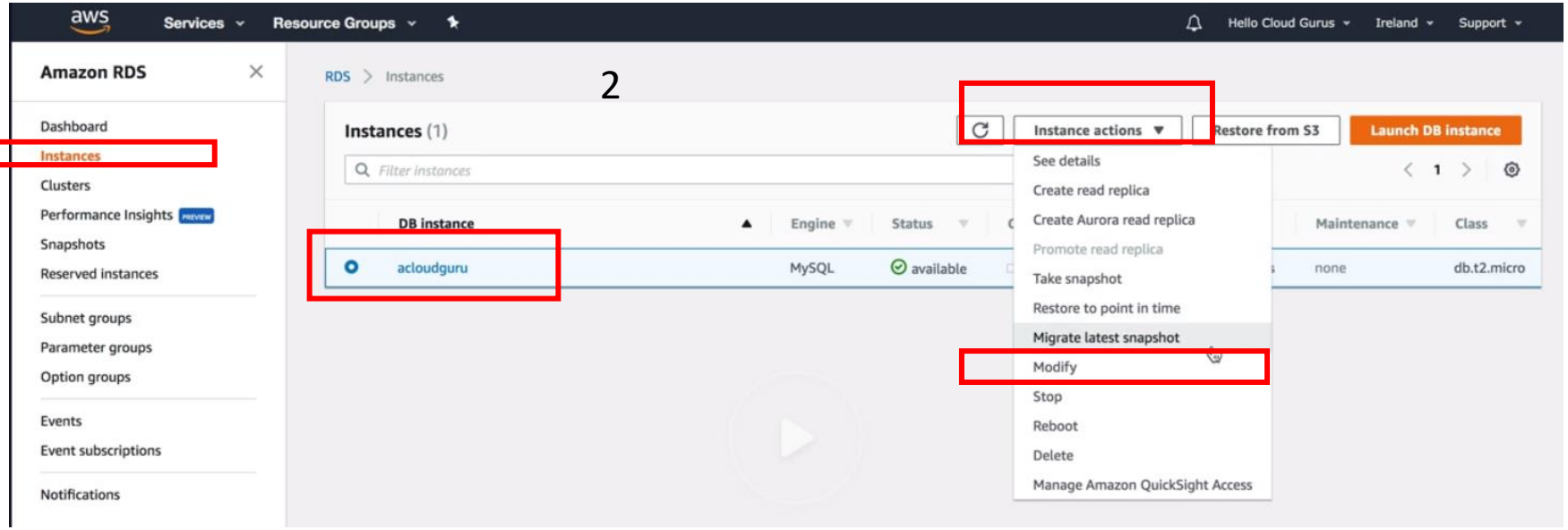
Encryption at rest is supported for MySQL, Oracle, SQL Server, PostgreSQL, MariaDB & Aurora. Encryption is done using the AWS Key Management Service (KMS) service. Once your RDS instance is encrypted, the data stored at rest in the underlying storage is encrypted, as are its automated backups, read replicas, and snapshots.

At the present time, encrypting an existing DB Instance is not supported. To use Amazon RDS encryption for an existing database, you must first create a snapshot, make a copy of that snapshot and encrypt the copy.

Creating DB Snapshot and Encryption



1



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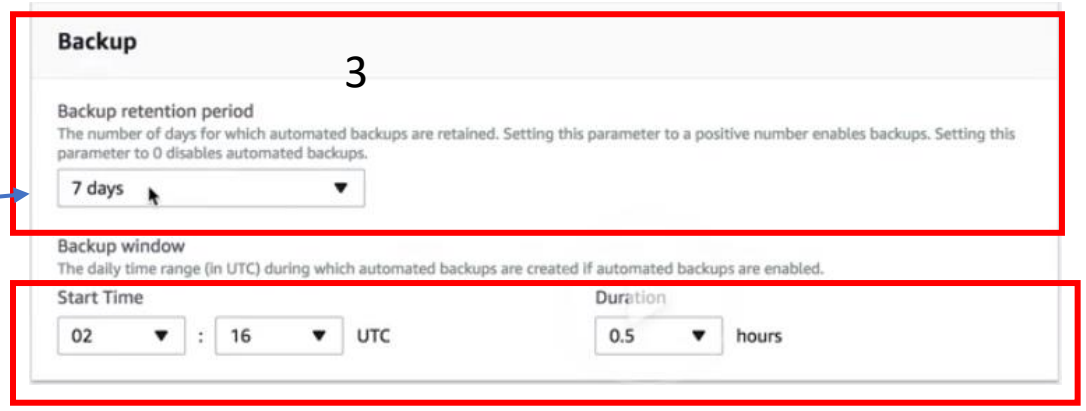
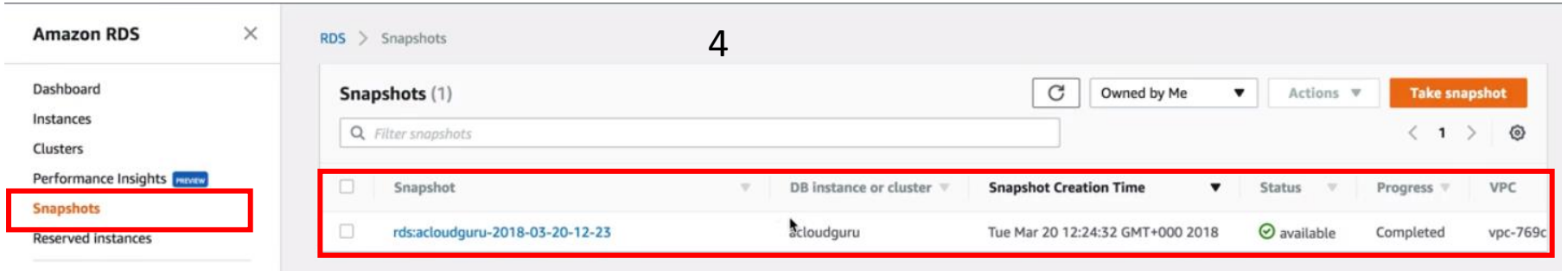


3

Start : 7 days to end : 35 days



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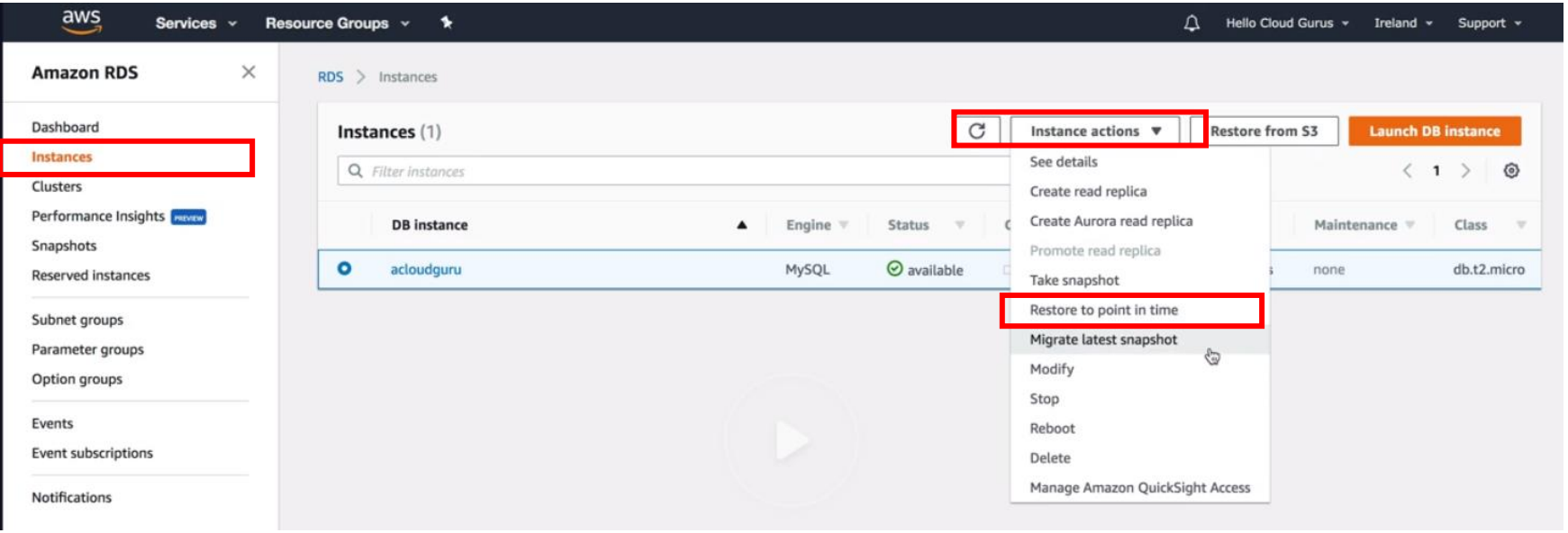
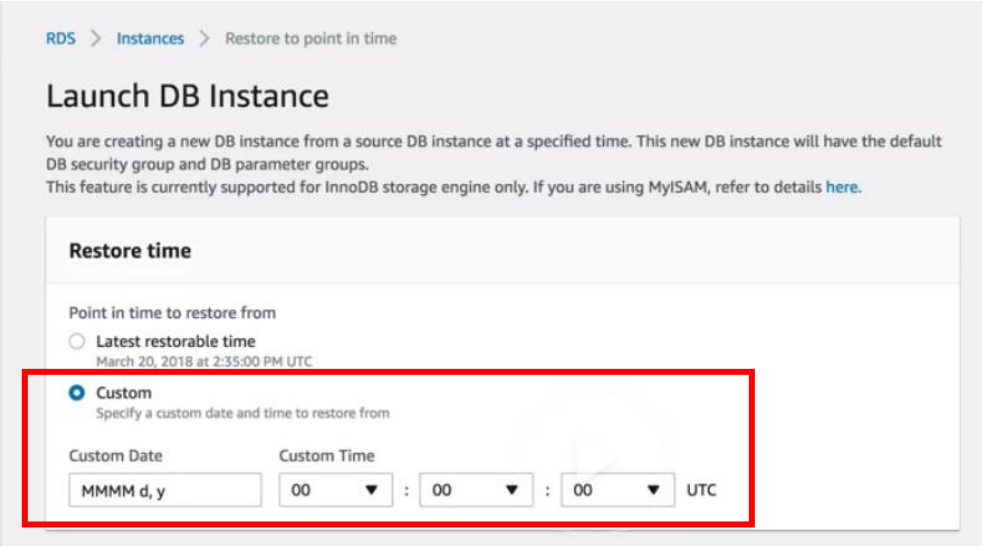
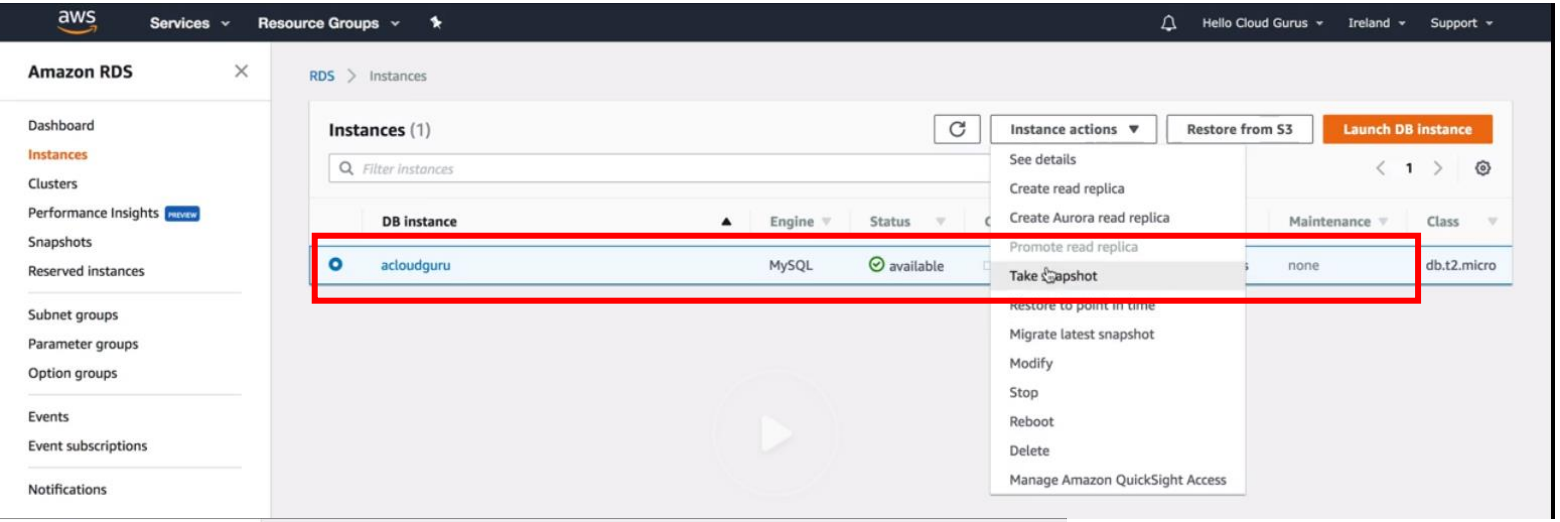

aws
Services
Resource Groups
Hello Cloud Gurus
Ireland
Support
Amazon RDS
Dashboard
Instances
Clusters
Performance Insights
Snapshots
Reserved instances
Subnet groups
Parameter groups
Option groups
Events
Event subscriptions
Notifications
RDS > Instances
Instances (1)
Instance actions
Restore from S3
Launch DB instance
Filter instances
DB instance
Engine
Status
Maintenance
Class
acloudguru
MySQL
available
none
db.t2.micro
See details
Create read replica
Create Aurora read replica
Promote read replica
Take snapshot
Restore to point in time
Migrate latest snapshot
Modify
Stop
Reboot
Delete
Manage Amazon QuickSight Access

5


RDS > Instances > Restore to point in time
Launch DB Instance
You are creating a new DB instance from a source DB instance at a specified time. This new DB instance will have the default DB security group and DB parameter groups.
This feature is currently supported for InnoDB storage engine only. If you are using MyISAM, refer to details here.
Restore time
Point in time to restore from
Latest restorable time
March 20, 2018 at 2:35:00 PM UTC
Custom
Specify a custom date and time to restore from
Custom Date
Custom Time
MMMM d, y
00
00
00
UTC

6


aws
Services
Resource Groups
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Support
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Dashboard
Instances
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Reserved instances
Subnet groups
Parameter groups
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Event subscriptions
Notifications
RDS > Instances
Instances (1)
Instance actions
Restore from S3
Launch DB instance
Filter instances
DB instance
Engine
Status
Maintenance
Class
acloudguru
MySQL
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See details
Create read replica
Create Aurora read replica
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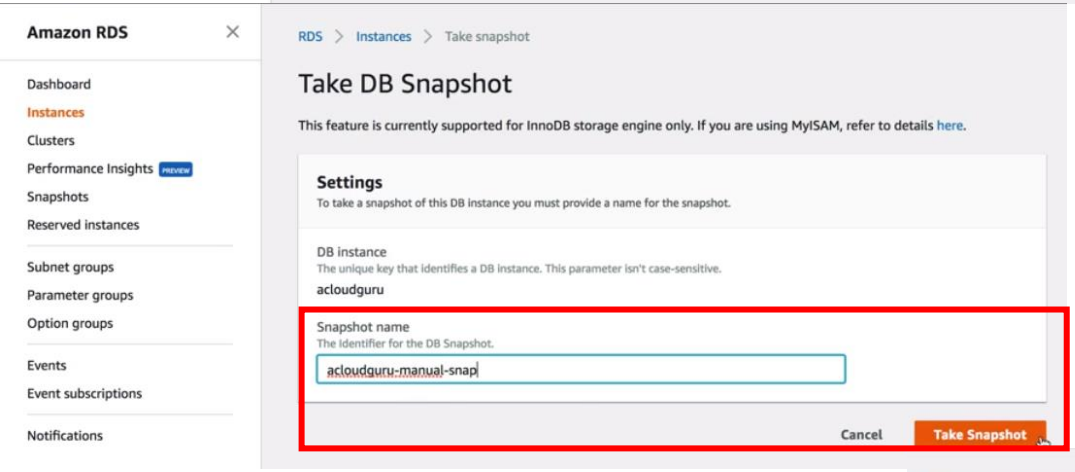
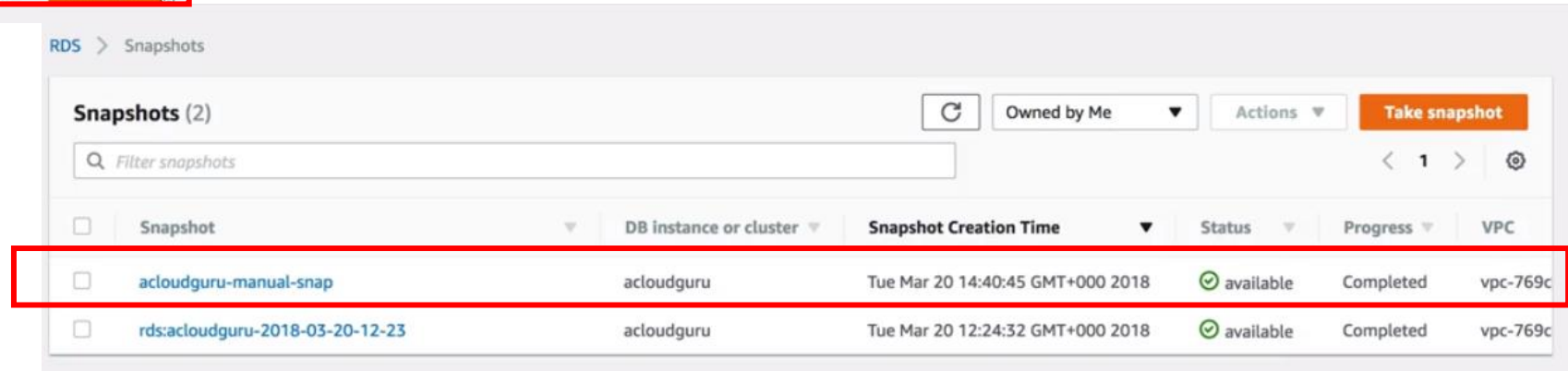
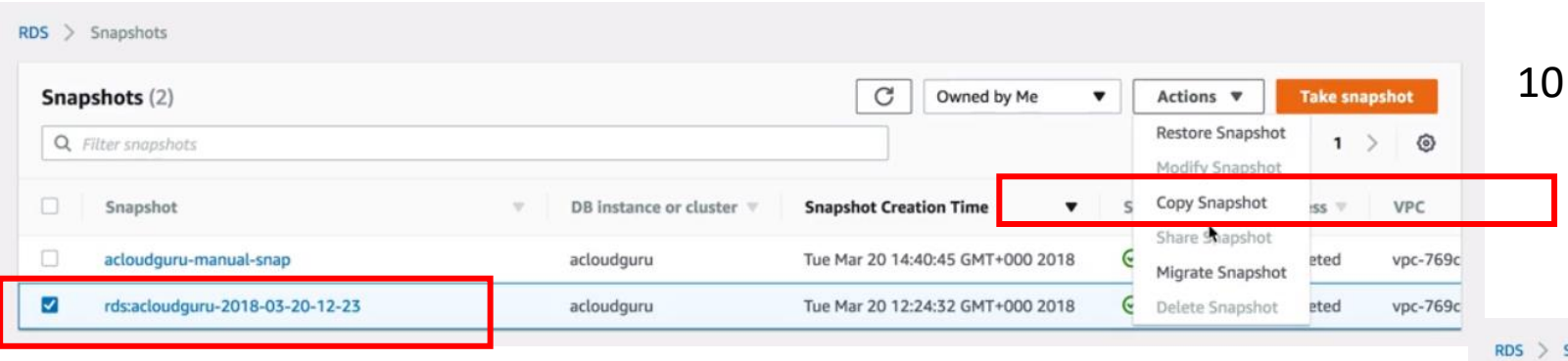

Amazon RDS
Dashboard
Instances
Clusters
Performance Insights
Snapshots
Reserved instances
Subnet groups
Parameter groups
Option groups
Events
Event subscriptions
Notifications
RDS > Instances > Take snapshot
Take DB Snapshot
This feature is currently supported for InnoDB storage engine only. If you are using MyISAM, refer to details here.
Settings
To take a snapshot of this DB instance you must provide a name for the snapshot.
DB instance
The unique key that identifies a DB instance. This parameter isn't case-sensitive.
acloudguru
Snapshot name
The identifier for the DB Snapshot.
acloudguru-manual-snap
Cancel
Take Snapshot

8

9


RDS > Snapshots
Snapshots (2)
Owned by Me
Actions
Take snapshot
Filter snapshots
Snapshot
DB instance or cluster
Snapshot Creation Time
Status
Progress
VPC
acloudguru-manual-snap
acloudguru
Tue Mar 20 14:40:45 GMT+000 2018
available
Completed
vpc-769c
rds:acloudguru-2018-03-20-12-23
acloudguru
Tue Mar 20 12:24:32 GMT+000 2018
available
Completed
vpc-769c

10


RDS > Snapshots
Snapshots (2)
Owned by Me
Actions
Take snapshot
Filter snapshots
Restore Snapshot
Modify Snapshot
Copy Snapshot
Share Snapshot
Migrate Snapshot
Delete Snapshot
Snapshot
DB instance or cluster
Snapshot Creation Time
VPC
acloudguru-manual-snap
acloudguru
Tue Mar 20 14:40:45 GMT+000 2018
vpc-769c
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acloudguru
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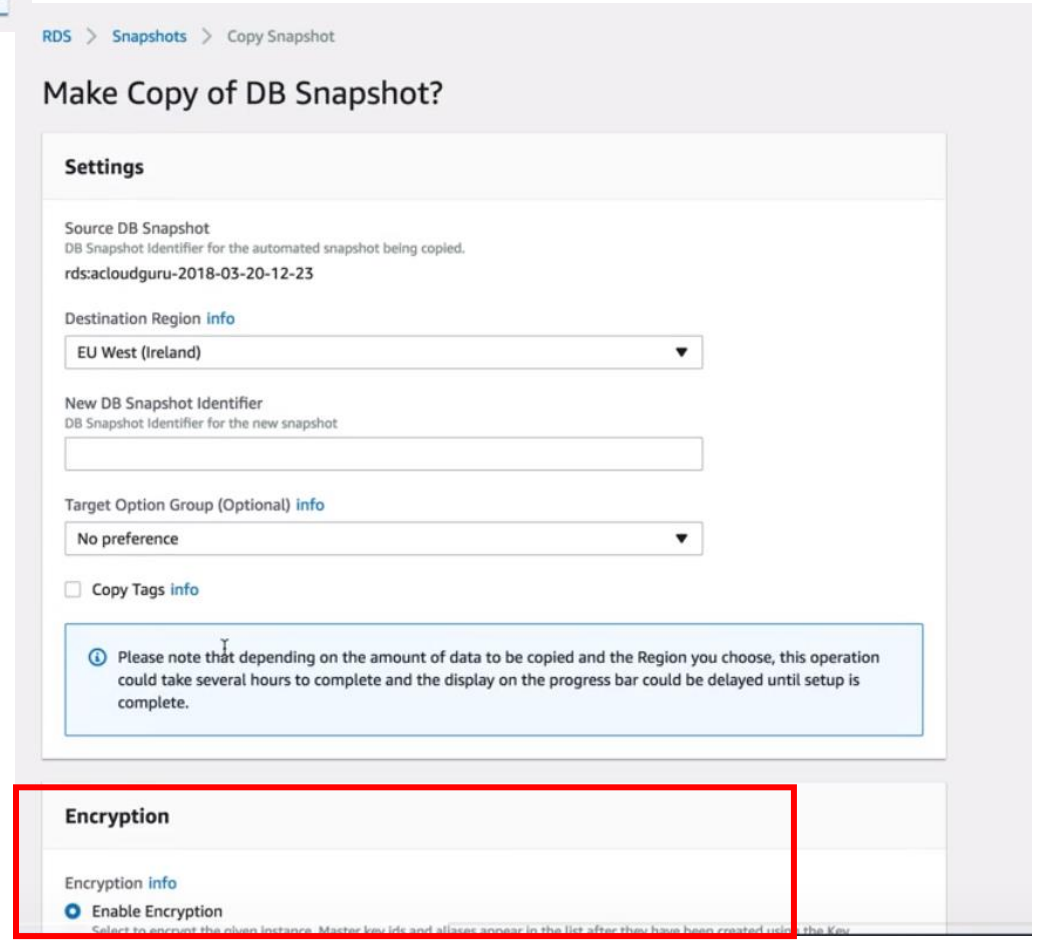
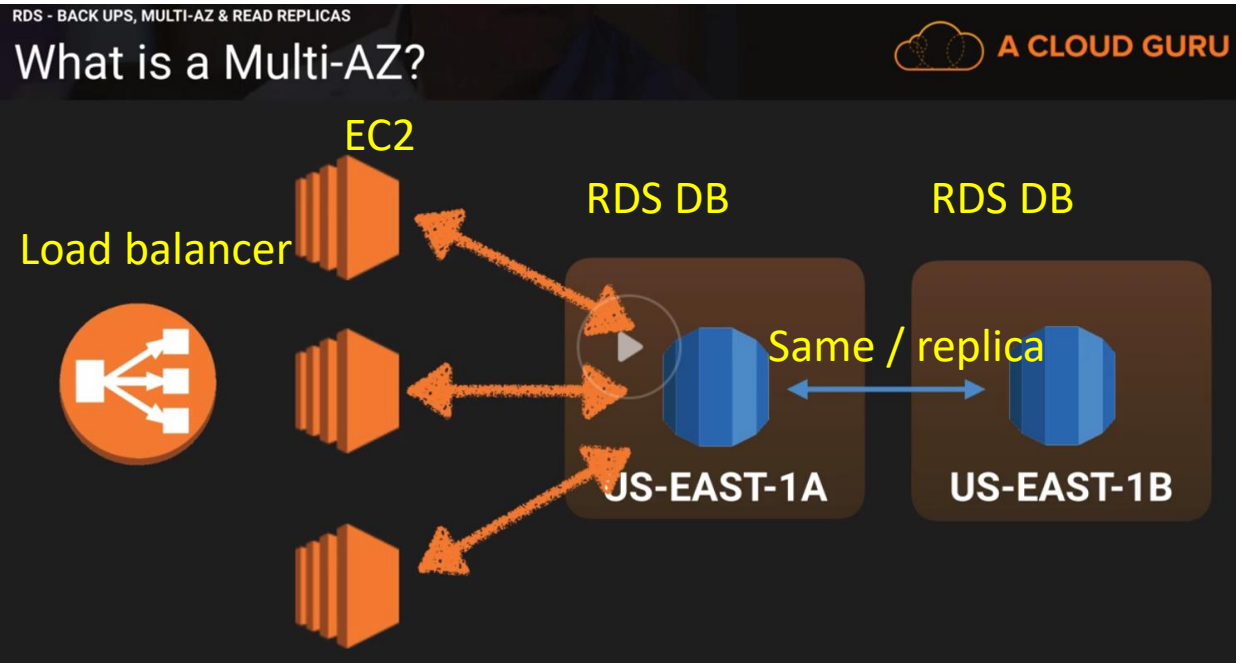
vpc-769c

11


RDS > Snapshots > Copy Snapshot
Make Copy of DB Snapshot?
Settings
Source DB Snapshot
DB Snapshot Identifier for the automated snapshot being copied.
rds:acloudguru-2018-03-20-12-23
Destination Region info
EU West (Ireland)
New DB Snapshot Identifier
DB Snapshot Identifier for the new snapshot
Target Option Group (Optional) info
No preference
Copy Tags info
Please note that depending on the amount of data to be copied and the Region you choose, this operation could take several hours to complete and the display on the progress bar could be delayed until setup is complete.
Encryption
Encryption info
Enable Encryption


RDS - BACK UPS, MULTI-AZ & READ REPLICAS
What is a Multi-AZ?
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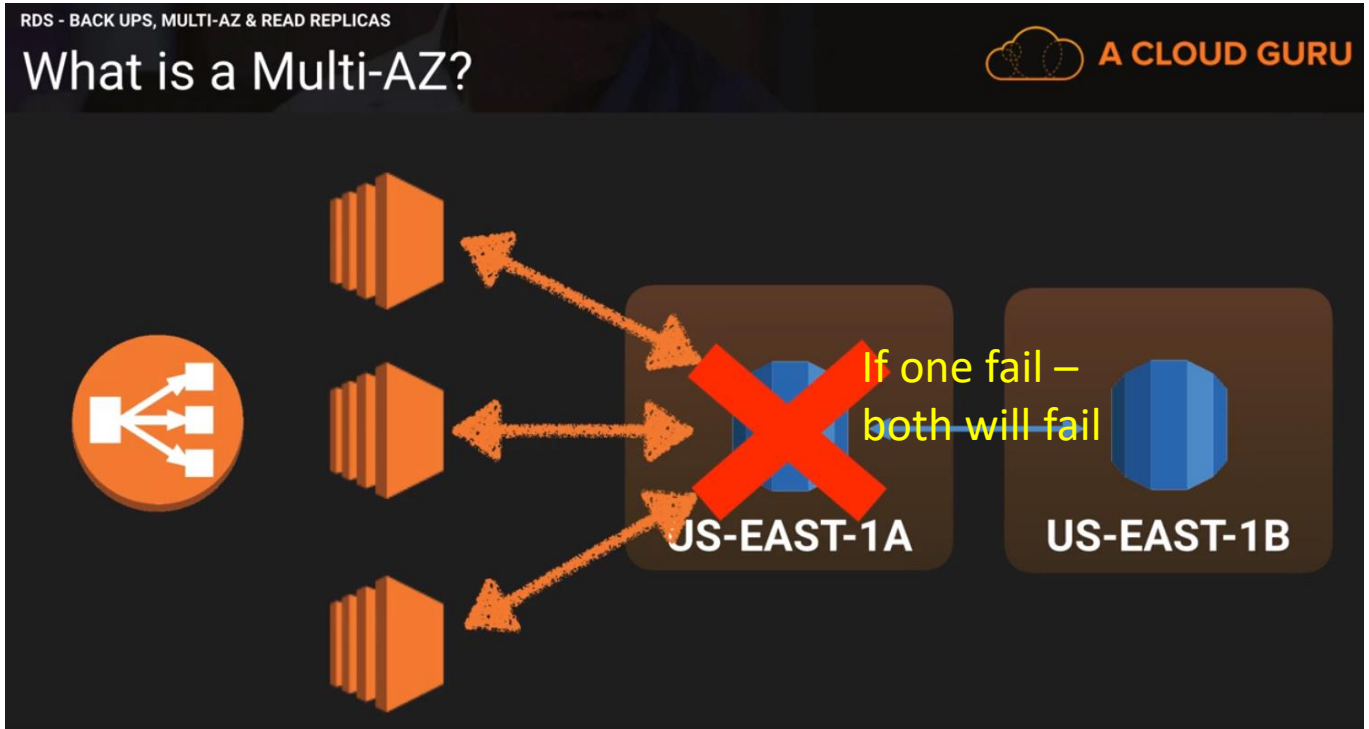
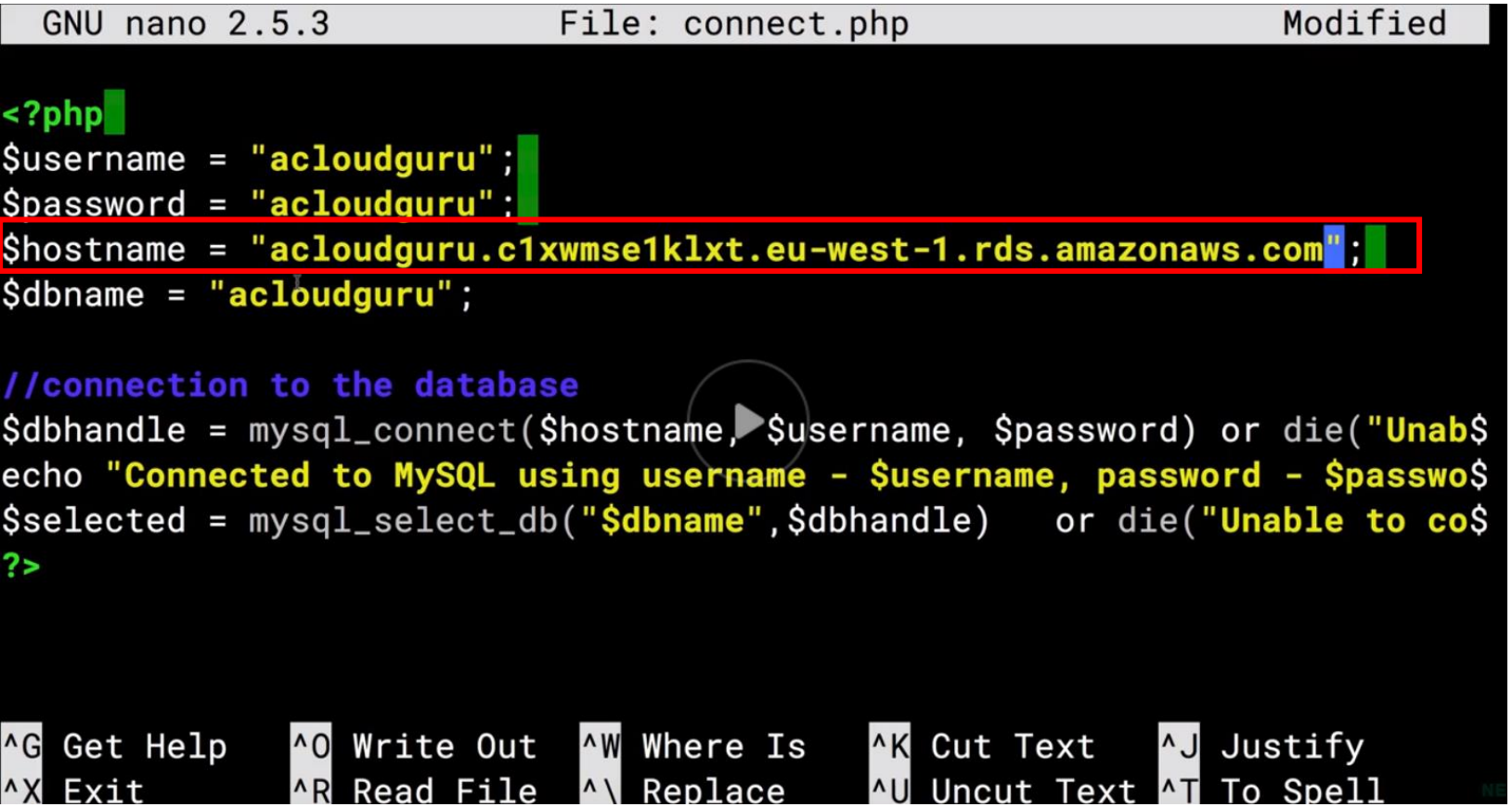
EC2
RDS DB
RDS DB
Load balancer
Same / replica
US-EAST-1A
US-EAST-1B


RDS - BACK UPS, MULTI-AZ & READ REPLICAS
What is a Multi-AZ?
A CLOUD GURU
If one fail –
both will fail
US-EAST-1A
US-EAST-1B



DNS end point.

If primary DB fails, AWS detects it and update DNS to point to IP of Multi AZ copy of DB

With RDS – its DNS and not IP.

RDS - BACK UPS, MULTI-AZ & READ REPLICAS

What is Multi-AZ RDS?

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Multi-AZ allows you to have an exact copy of your production database in another Availability Zone. AWS handles the replication for you, so when your production database is written to, this write will automatically be synchronized to the stand by database.

In the event of planned database maintenance, DB Instance failure, or an Availability Zone failure, Amazon RDS will automatically failover to the standby so that database operations can resume quickly without administrative intervention.

RDS - BACK UPS, MULTI-AZ & READ REPLICAS

What is Multi-AZ RDS?

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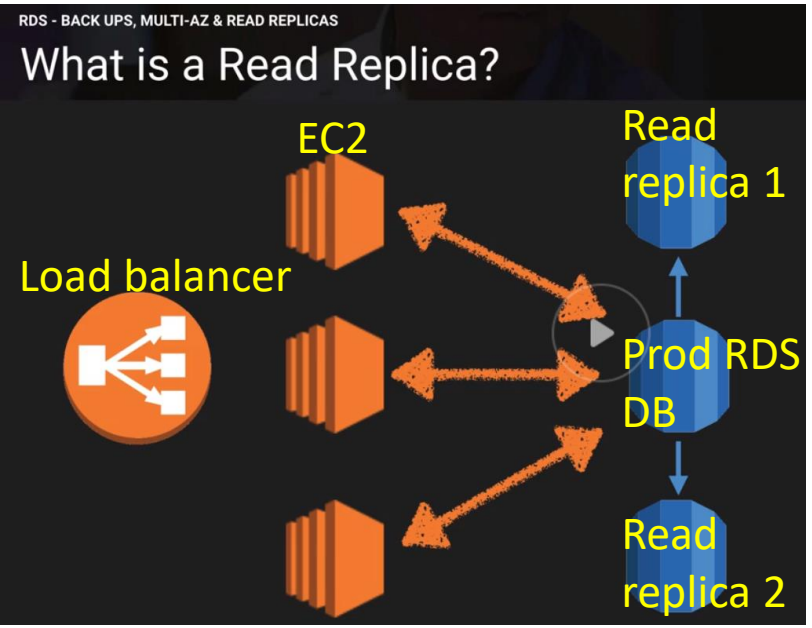
Multi-AZ is for Disaster Recovery only

It is not primarily used for improving performance. For performance improvement, you need Read Replicas.

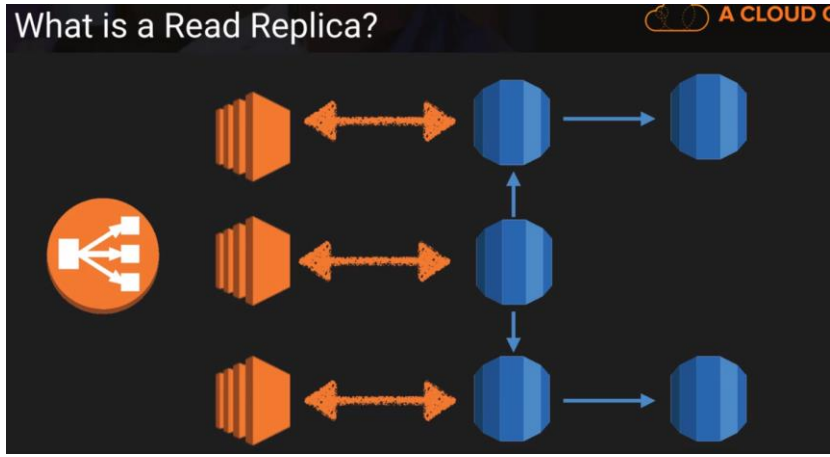
RDS - BACK UPS, MULTI-AZ & READ REPLICAS

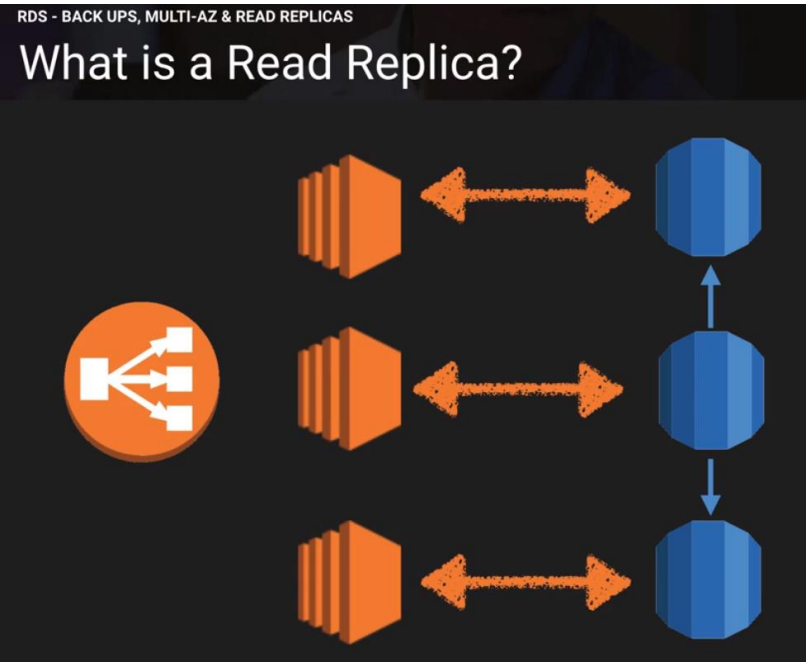
Multi-AZ Databases

- SQL Server
- Oracle
- MySQL Server
- PostgreSQL
- MariaDB



All ec2 instances are writing to production DB.
The production DB can be written to read replicas.
By default, there can be 5 read replicas per production db.





The load can be taken off from production db and made ec2 instance read from read replicas – avoiding trafficking.

Example – ec2 instances are reading from the db (90% of traffic). This can be scaled up by making ec2 instance read from replicas and one ec2 instance read from prod db.

RDS - BACK UPS, MULTI-AZ & READ REPLICAS

What is a Read Replica?

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Read replicas allow you to have a read-only copy of your production database. This is achieved by using Asynchronous replication from the primary RDS instance to the read replica. You use read replicas primarily for very read-heavy database workloads.

RDS - BACK UPS, MULTI-AZ & READ REPLICAS

Read Replica Databases

- MySQL Server
- PostgreSQL
- MariaDB
- Aurora

Read Replica Databases

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- Used for scaling, **not** for DR!
- Must have automatic backups turned on in order to deploy a read replica.
- You can have up to 5 read replica copies of any database.
- You can have read replicas of read replicas (but watch out for latency.)
- Each read replica will have its own DNS end point.
- You **can** have read replicas that have Multi-AZ.
- You **can** create read replicas of Multi-AZ source databases.
- Read replicas can be promoted to be their own databases. This breaks the replication.
- You can have a read replica in a second region.

Services

1

Database

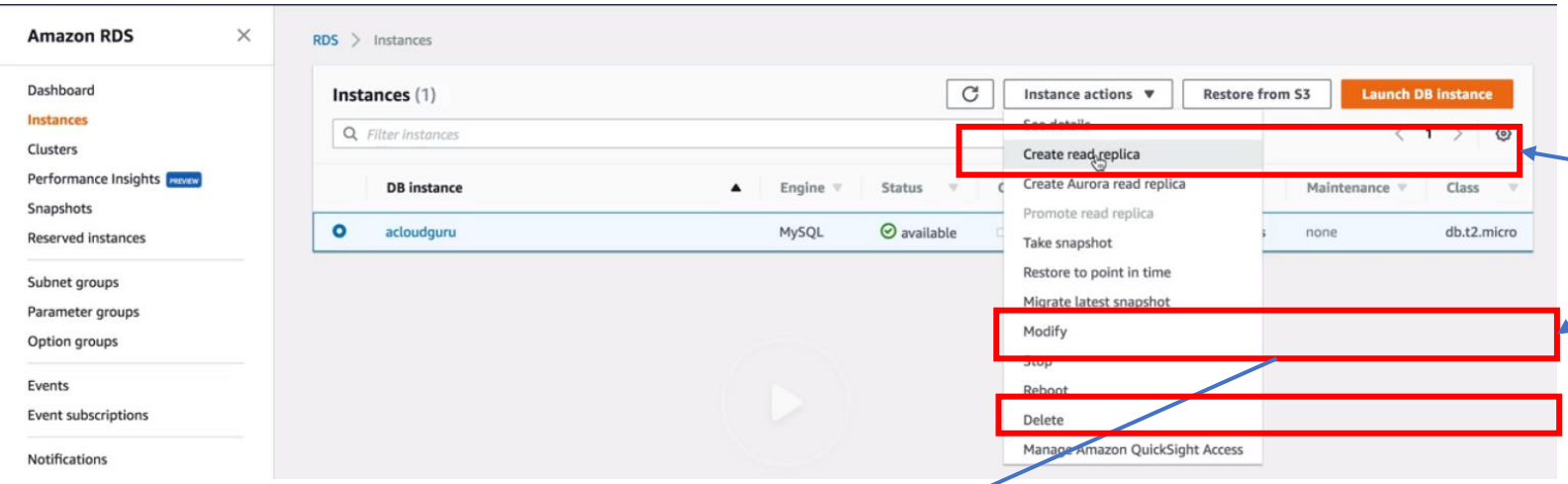
Relational Database Service

DynamoDB

ElastiCache

Amazon Redshift

2



Creating replicas and Multi AZ and delete db

3