



AWS Architecture Training

Relational Database Service

Module 7

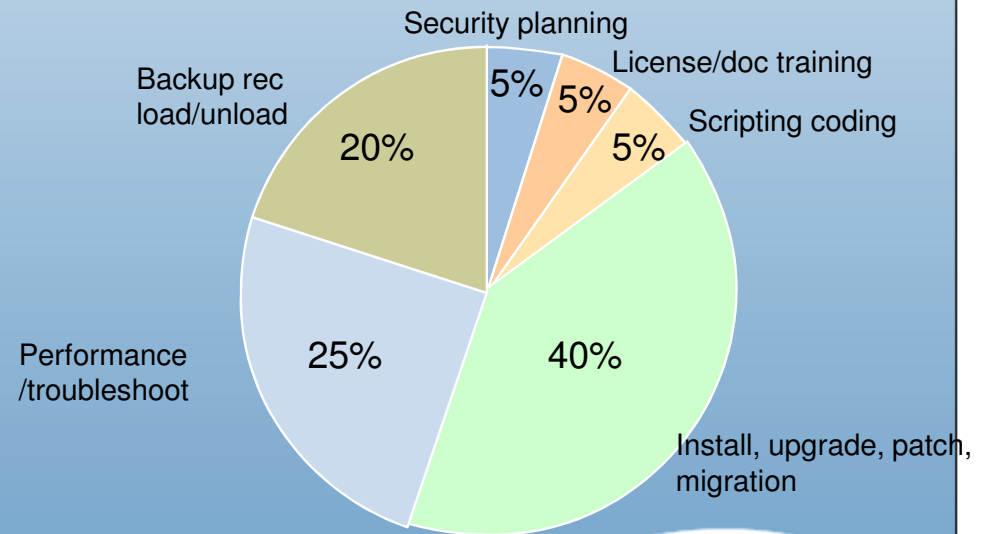
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What We Hear From DB Customers

- Install, upgrade, and migrations
- Troubleshooting and corrective actions
- Space and account management
- Database monitoring and reporting
- Performance and tuning
- Backup and recovery
- Capacity planning
- Data load/unload and synchronization

"Help us focus on applications – Shift database maintenance time to more productive app development time"



Distribution of time



Amazon RDS

RDS is a fully managed Relational database service that is simple to deploy, easy to scale, reliable and cost-effective



Amazon Relational Database Service (RDS)

Choice of Database Engines and App. compatibility

Ease of Deployment and Patching

Automated Backups and Disaster Recovery

User Snapshots and Cloning

Push Button Scalability

Monitoring and Auto. Host Replacement

Licensing Options and DB Engines

License-Included (LI) or hourly licensing	<ul style="list-style-type: none">• MySQL (5.1.x, 5.5.x)• MSSQL (2008 R2)<ul style="list-style-type: none">• Express (t1.micro and m1.small only – 10GB per database limit)• Web (Can only be used for public facing web applications)• Standard• Oracle (11gR2)<ul style="list-style-type: none">• Standard Edition One
Bring Your Own License (BYOL)	<ul style="list-style-type: none">• MSSQL (2008 R2)<ul style="list-style-type: none">• Standard• Enterprise• Oracle (11gR2)<ul style="list-style-type: none">• Standard Edition One• Standard Edition• Enterprise Edition




Ease of Deployment


 Push Button

Launch DB Instance Wizard

ENGINE SELECTION DB INSTANCE DETAILS ADDITIONAL CONFIGURATION MANAGEMENT OPTIONS REVIEW

To get started, choose a DB engine below and click **Continue**

	mysql MySQL Community Edition
	oracle-ee Oracle Database Enterprise Edition
	sqlserver-se Microsoft SQL Server Standard Edition

Select 

Launch DB Instance Wizard Cancel

ENGINE SELECTION DB INSTANCE DETAILS ADDITIONAL CONFIGURATION MANAGEMENT OPTIONS REVIEW

To get started, choose a DB Instance engine and class below

Engine: sqlserver-se

License Model: license-included

DB Engine Version: 10.50.2789.0 (default)

DB Instance Class: db.m1.small

Multi-AZ Deployment: No

Auto Minor Version Upgrade: ☒ Yes ☐ No


Provide the details for your RDS Database Instance.

Allocated Storage: 500 GB (Minimum: 250 GB, Maximum 1024 GB)
Higher allocated storage [may improve](#) IOPS performance.

DB Instance Identifier: tstssqlserver (e.g. mydbinstance)

Master User Name: admin (e.g. awsuser)

Master User Password: (e.g. mypassword)

Back **Continue** 

Ease of Backup & Patching

Launch DB Instance Wizard Cancel

ENGINE SELECTION DB INSTANCE DETAILS **ADDITIONAL CONFIGURATION** MANAGEMENT OPTIONS REVIEW

Provide the optional additional configuration details below.

Database Port:

Availability Zone:

If you have custom DB Parameter Groups or DB Security Groups for this DB Instance, select them below, otherwise proceed with default values.

DB Parameter Group: default.sqlserver-se-1

DB Security Groups: default

[< Back](#) [Continue](#)

Launch DB Instance Wizard Cancel

ENGINE SELECTION DB INSTANCE DETAILS **ADDITIONAL CONFIGURATION** **MANAGEMENT OPTIONS** REVIEW

The number of days for which automated backups are retained. Setting this parameter to a positive number enables backups. Setting this parameter to 0 disables automated backups.

Backup Retention Period: days

The daily time range during which automated backups are created if automated backups are enabled

Backup Window: ☐ No Preference ☒ Select Window

Start Time: : UTC

Duration: hours

The weekly time range (in UTC) during which system maintenance can occur.

Maintenance Window: ☐ No Preference ☒ Select Window

Start Time: : UTC

Duration: hours

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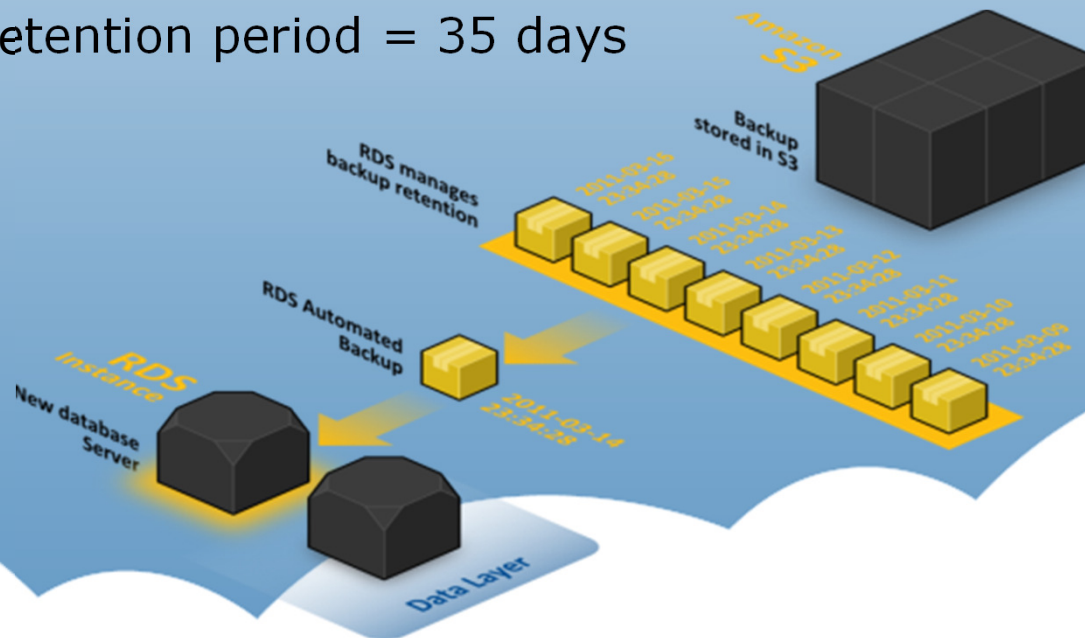
Backups and Disaster Recovery

DB Snapshots

- User-driven snapshots of database
- Kept until explicitly deleted

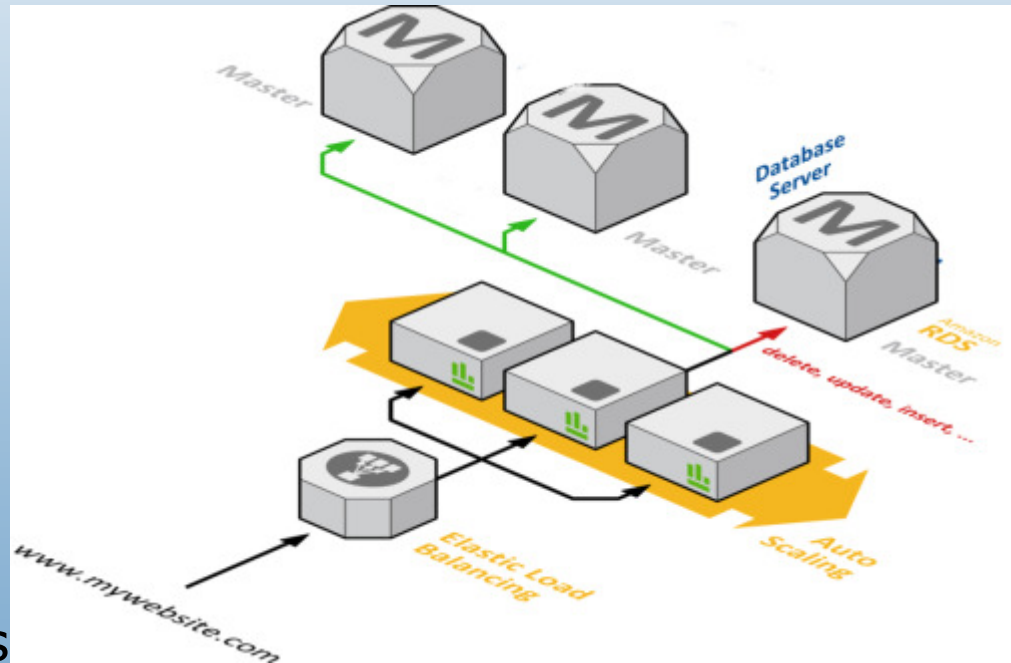
Automated Backups

- Nightly system snapshots + transaction backup
- Enables point-in-time restore to any point in retention period, up to the last 5 minutes
- Max retention period = 35 days



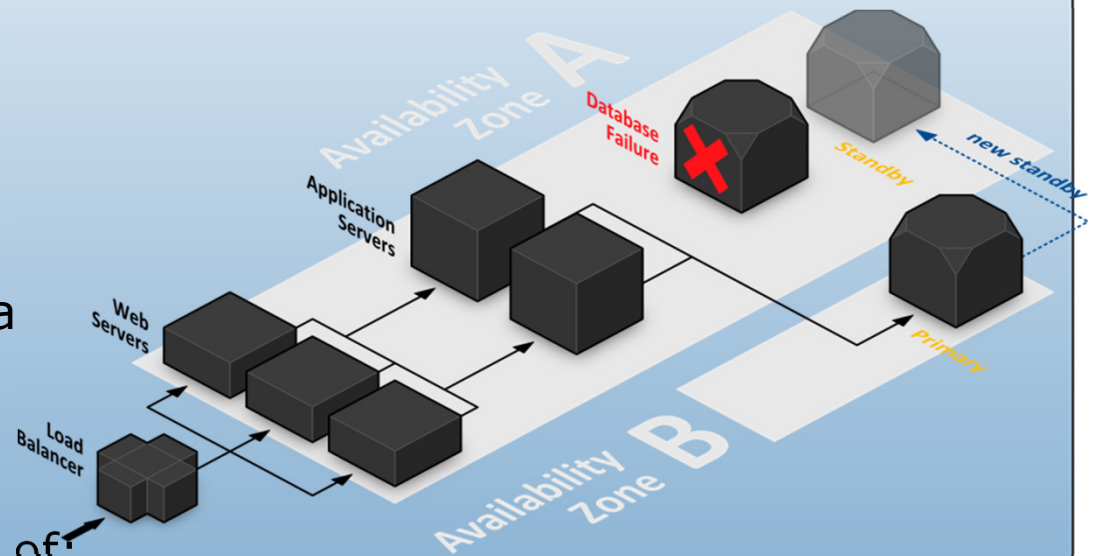
Push Button Scaling

- Scale nodes vertically up or down
 - M1.small (1 virtual core, 1.7GB)
 - M2.4XLarge (8 virtual cores, 64GB)
- Scale out nodes horizontally
 - Shard based on data or workload characteristics
- Storage Scaling to come soon



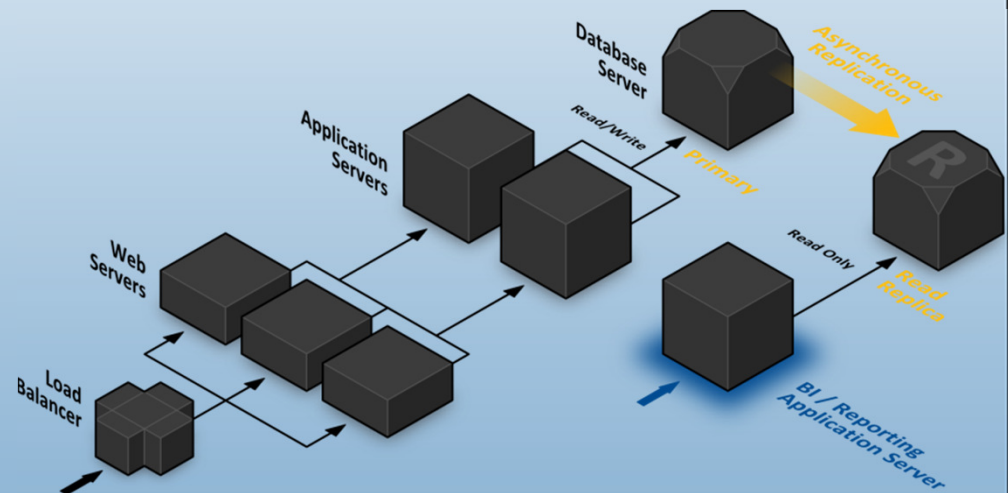
High Availability – Multi-AZ Deployments

- Enterprise-grade fault tolerance solution for **production** databases (MySQL and Oracle).
- Amazon RDS creates and synchronously maintains a standby in a different Availability Zone
- Automatic failover in case of:
 - Loss of availability in primary AZ
 - Loss of connectivity to primary
 - Host or storage failure on primary
 - Vertical Scaling
 - Software patching



Scalability – Read Replicas

- Copy of a specified **MySQL** DB Instance that can serve read traffic
- Intended Use Cases
 - Read scaling, business reporting
 - Not intended as a fault tolerance substitute for Multi-AZ
- Unlike Multi-AZ, uses native, asynchronous MySQL replication and replica can lag source
- Read Replica can use Multi-AZ deployment as source



Summary of Features

All DB Engines (MySQL, Oracle, MSSQL)

- Pre-configured DB Parameters
- Automated Backups and DR via Point-in-Time-Recovery
- Automated replacement of failed DB Instances (within a Single-AZ)
- Automatic Software Patching
- Monitoring via CloudWatch

RDS MySQL

- Multi-AZ (automated replacement and failover)
- Read Replicas (5 per source)
- VPC

RDS Oracle

- Multi-AZ (automated replacement and failover)



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Data Migration Options

- ❏ Database Export/Import
 - Binary dump file
- ❏ SQL*Loader
 - Delimited flat file
- ❏ Materialized View Replication (Oracle)
 - Sync over Database link
- ❏ Most migrations will require scripting
- ❏ Tsunami UDP for bulk data transfer
- ❏ AWS Import/Export Service

SQL Server Features*

Available at launch

- 📦 Core Database Engine features
- 📦 Visual Studio Integration
- 📦 Safe CLR
- 📦 Full-text search
- 📦 Spatial features
- 📦 Data Compression
- 📦 SQL Server client tools
 - Management Studio
 - Migration Assistant
 - CMD

Not currently available

- 📦 SQL Server Agent
- 📦 Maintenance Plans
- 📦 Tuning Advisor
- 📦 SSL
- 📦 Windows Authentication
- 📦 Mirroring/Replication
- 📦 Reporting, Analysis or Integration Services on the DB Instance

** Not an exhaustive list. See FAQ for details*



More information

- ❏ SQL Server (2008 R2) Editions and Features:
<http://msdn.microsoft.com/en-us/library/cc645993.aspx>
- ❏ Amazon RDS for SQL Server Details:
<http://aws.amazon.com/rds/sqlserver>
- ❏ Amazon RDS Documentation:
<http://aws.amazon.com/documentation/rds/>

Available Oracle EE Features/Options*

- ❏ Online Redefinition
 - ❏ Flashback and Total Recall (No Flashback DB)
 - ❏ Virtual Private DB (VPD)
 - ❏ Partitioning
 - ❏ Advanced Compression
 - ❏ Oracle Text
 - ❏ DB Gateway
 - ❏ Fine grained auditing
 - ❏ Database Link
 - ❏ Oracle AQ
- Management Packs
[Command line only]**
- ❏ Diagnostics Pack
 - ❏ Tuning Pack

* Not an exhaustive list. See FAQ for details

EE Features not supported^{*}

- ❏ RAC/RAC One Node
- ❏ ASM
- ❏ DataGuard/ADG
- ❏ Flashback DB
- ❏ In-memory DB
- ❏ Advanced Security
- ❏ Label Security
- ❏ DB Vault
- ❏ Oracle Secure Backup
- ❏ FailSafe
- ❏ DataPump
- ❏ Streams
- ❏ Transportable TableSpaces
- ❏ Application Express
- ❏ Oracle Enterprise Manager – Grid Control
- ❏ Most Management Packs

^{*} Not an exhaustive list. See FAQ for details

More information

- ❏ Oracle Database Editions and Features:
<http://www.oracle.com/us/products/database/product-editions-066501.html>
- ❏ Amazon RDS Documentation:
<http://aws.amazon.com/documentation/rds/>