

Amazon Web Services for hosting Oracle DB

What is Amazon AWS

- Biggest Cloud Computing Vendor
- Amazon Managed Global Data Centres
- On Demand Computing
- Pay as you Go price model
- Elasticity
- Many Technologies (Services) available
- Lots of acronyms to learn EC2, S3, EBS, ALB, IAM, ENI, EFS.....



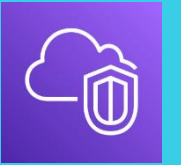
AWS Identity and Access Management (IAM)



AWS Identity &
Access Management

- Provides access to AWS Services and Cloud Console
- Can be Integrated with on premise Directory Services
- Permissions based on Roles and Policies

Amazon Virtual Private Cloud (Amazon VPC)



Amazon VPC

- Customers virtual, private, secure Network area in Cloud
- Its our Virtual Data Centre to launch resources
- All resources run in our VPC

- The VPC can be split using Subnets
- Each AZ will be in a separate subnet

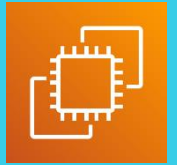
AWS Regions and Zones



Region

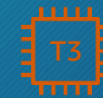
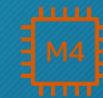
- Geographical Location where AWS Data Centres are located
- Each Region will contain a minimum of 3 Data Centres to provide fault tolerance
- A Data Centre can also be referred to as an Availability Zone (AZ)
- Running Services in multiple (Multi AZ) provides HA and DR
- Certain Services created in a Region are only visible in that region

AWS Elastic Compute Cloud (Amazon EC2)



Amazon EC2

- Amazon Elastic Compute Cloud (Amazon EC2)
- Provides secure, resizable compute capacity in the cloud.
- This is our Unix or Windows Server
 - Elastic, so we can scale up or down rapidly
- Instance Types : CPU and Memory
- Generally (T2/3) , (M4/5) and R types for RDS
- Security Groups control Network access rules



AWS Simple Storage Service (S3)



Amazon Simple
Storage Service (S3)

- Amazon Simple Storage Service (Amazon S3)
- Provides Object Storage
- Different classes
 - Standard
 - Glacier
- Feature rich
- Used for Oracle Datapump Dumps
- Backups/Snapshots
- Long Term dumps

AWS Elastic Block Store



Amazon Elastic
Block Store

- Block storage is usually attached to EC2
- Its used for Server filesystems
- Its used for running Databases
- Different classes
 - GP2, GP3 (Preferred over GP2)
 - IO1/IO2
 - ST/SC

AWS CloudWatch



Amazon
CloudWatch

- Monitors the AWS infrastructure
- EC2 CPU utilisation, Server health, Storage...
- Oracle RDS
 - Integrated to Monitor Logs
 - Database metrics
- Integrated with 3rd Party Monitoring products like DataDog



AWS Tags



- Many resources and services support tags
 - Setup meta data about a resource we have created
 - EC2 name 'dbserver01'
 - Database category could be 'Production'
- Allows easy identification of related resources
- Used in Billing
- Used in automation

Amazon Relational Database Service (RDS)



Amazon RDS

- Managed Database Service from Amazon
- Create an Oracle Database in a few clicks
- High Availability using Multi AZ
- Automated Backups
- Automated Patching

- Performance Tuning still falls to the Customer (i.e. PaaS)
- Database Auditing still falls to Customer

- No RAC
- No ASM

RDS Oracle Licensing, Versions and Editions



- Licensing
 - Bring your own license
 - License included
- Versions
 - Supports 11g to 21c
 - Supported versions determined by AWS
- Editions
 - Standard Edition
 - Enterprise Edition

RDS Database Identifier and Endpoints



Endpoint

- Database Identifier
 - This a tag/alias that refers to the database
 - It is not the database Name
 - Used in cli/SDK to refer to database
- Endpoint
 - AWS Domain or URL for RDS it's the Host the database is running
 - Database endpoint format :
`<db identifier>.<account hash><region>.rds.amazonaws.com`

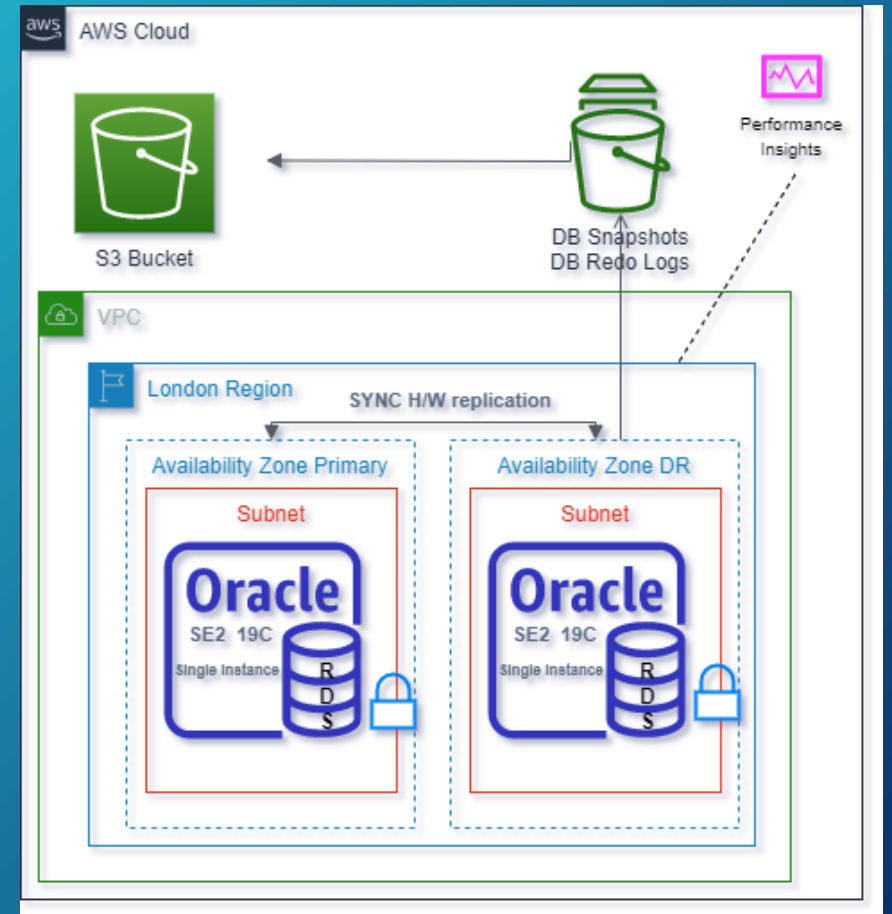
RDS Backups and Restores



- Backups
 - Enabled by default upto a window of 35 days
 - Uses snapshots and archive logs (no RMAN)
 - Snapshot runs on Standby AZ
 - Force log switch every 5 minutes
- Restores
 - Restore a snapshot and roll it forward
 - A restore will create a 'new' database - Out of Place
 - The old database and new database will both exist

RDS Disaster Recovery

- Dataguard and Read Replica's
- Multi AZ
 - Production will utilise Multi AZ
 - Disk based replicated operating in SYNC mode
 - Automatic Failover
- Failover can be simulated from console
 - Reboot with failover
- Endpoint name should persist, so no TNS change



RDS Oracle Custom and Regular



- RDS for Oracle comes in 2 flavours Regular and Custom
- RDS Regular Access to O/S is locked out

AWS RDS	On Premise	AWS EC2	RDS Custom	RDS Regular
Application optimization	Application Team	Application Team	Customer	Customer
Database troubleshooting	DBA/ Application Team	DBA/ Application Team	Shared	Shared
Scaling	Unix/ Storage Team	App team/ Cloud Team/ Unix Team	Shared	AWS
High availability	DBA/ Unix Team	DBA	Customer	AWS
Database backups	DBA/ Backup Team	DBA/ Backup Team	Shared	AWS
Database software patching	DBA Team	DBA Team	Shared	AWS
Database software install	DBA Team	DBA Team	Shared	AWS
OS patching	Unix/ Patching Team	App team/ Cloud Team/ Unix Team	Customer	AWS
OS installation	Unix Team	App team/ Cloud Team/ Unix Team	Shared	AWS
Server maintenance	Unix Team	AWS	AWS	AWS
Hardware lifecycle	Unix/ Architecture Team	AWS	AWS	AWS
Power, network, and cooling	Data Centre/ Unix/ Networks Team	AWS	AWS	AWS

RDS Option and Parameter Groups



- Option Group
 - Control options that can be enabled on database
 - NNE Encryption
 - Statspack
 - S3 Integration
 - EFS Integration
 - Timezone
- Parameter Group
 - Sets spfile/init file paramters
 - Supports underscore parameters

RDS Oracle



Oracle
instance

- admin account
 - sys equivalent account
- BIG file tablespaces
 - Eases administration and facilities elasticity
- View Alert log/traces
 - View using Console
- Data Encryption
 - At rest using KMS
 - In Transit using NNE or TLS
- Multitenant Architecture support

rdsadmin.rdsadmin_* package Part 1



Oracle
instance

More Common type commands

- Kill Session: `rdsadmin.rdsadmin_util.disconnect`
- Restricted Session: `rdsadmin.rdsadmin_util.restricted_session`
- Flush Shared Pool: `rdsadmin.rdsadmin_util.flush_shared_pool`
- Flush Buffer Cache: `rdsadmin.rdsadmin_util.flush_buffer_cache`
- Grant sys privs: `rdsadmin.rdsadmin_util.grant_sys_object`
- Purge Recyclebin: `rdsadmin.rdsadmin_util.purge_dba_recyclebin`

rdsadmin.rdsadmin_* package Part 2



Oracle
instance

- Enable Force Logging : `rdsadmin.rdsadmin_util.force_logging`
- LogFile switch: `rdsadmin.rdsadmin_util.switch_logfile`
- Add redolog : `rdsadmin.rdsadmin_util.add_logfile`
- Drop redolog: `rdsadmin.rdsadmin_util.drop_logfile`
- Checkpoint Database: `rdsadmin.rdsadmin_util.checkpoint`

rdsadmin.rdsadmin_* package Part 3



Oracle
instance

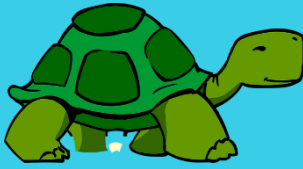
- Directory
 - Create: `rdsadmin.rdsadmin_util.create_directory`
 - List: `rdsadmin.rds_file_util.listdir`
- RMAN
 - Corruption Check: `rdsadmin.rdsadmin_rman_util.validate_database`
- ADR
 - `rdsadmin.rdsadmin_adrci_util`

Database Patching and Upgrades



- Patching is done by RDS functionality
 - Choose which patch then apply now or next maintenance window
 - May run a patchset(s) behind currently release RUR/RU
- One off patches are not supported
- Upgrades are done by RDS functionality
 - Some manual prerequisites like new parameters to use

RDS Performance Tuning SE2



- No EE features:
 - No AWS/ADDM/ASH
 - No tuning advisors
 - No Parallel, Partitioning, Bitmap Indexing
- RDS provides Performance Insights
 - Visual tool like Performance Page on OEM
 - Top SQL and Top Waits
- Oracle Statspack
- Single Plan Pinning on versions 18c and later

