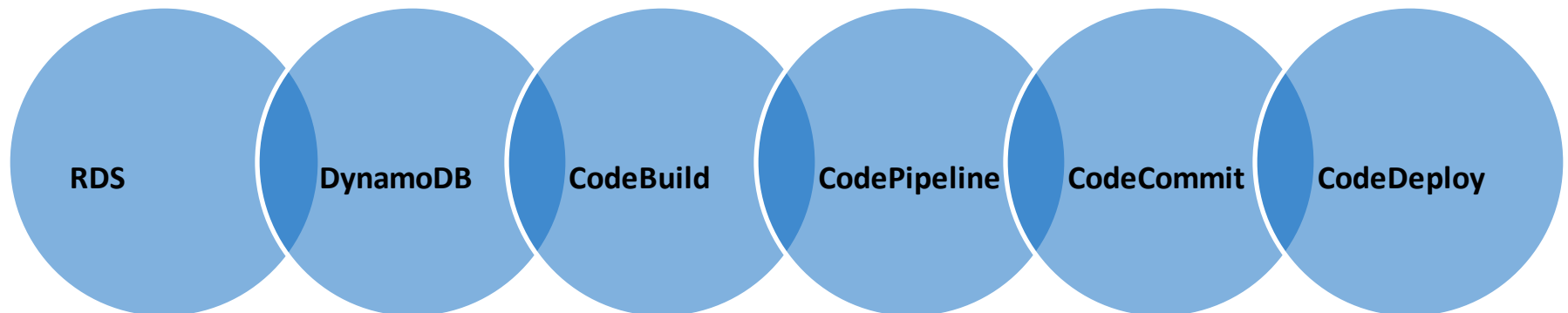


Amazon Web Services

By Shreyal Shah



Day 2: Database Services and Developer Tools



Amazon Database Services

- AWS offers wide range of database services to fit your application requirements. These database services are fully managed and can be launched in minutes with just a few clicks .
 - Amazon Relational Database Service (Amazon RDS)
 - Amazon DynamoDB (NoSQL database service)
 - Amazon Redshift (petabyte-scale data warehouse)
 - Amazon ElastiCache (in-memory cache service)

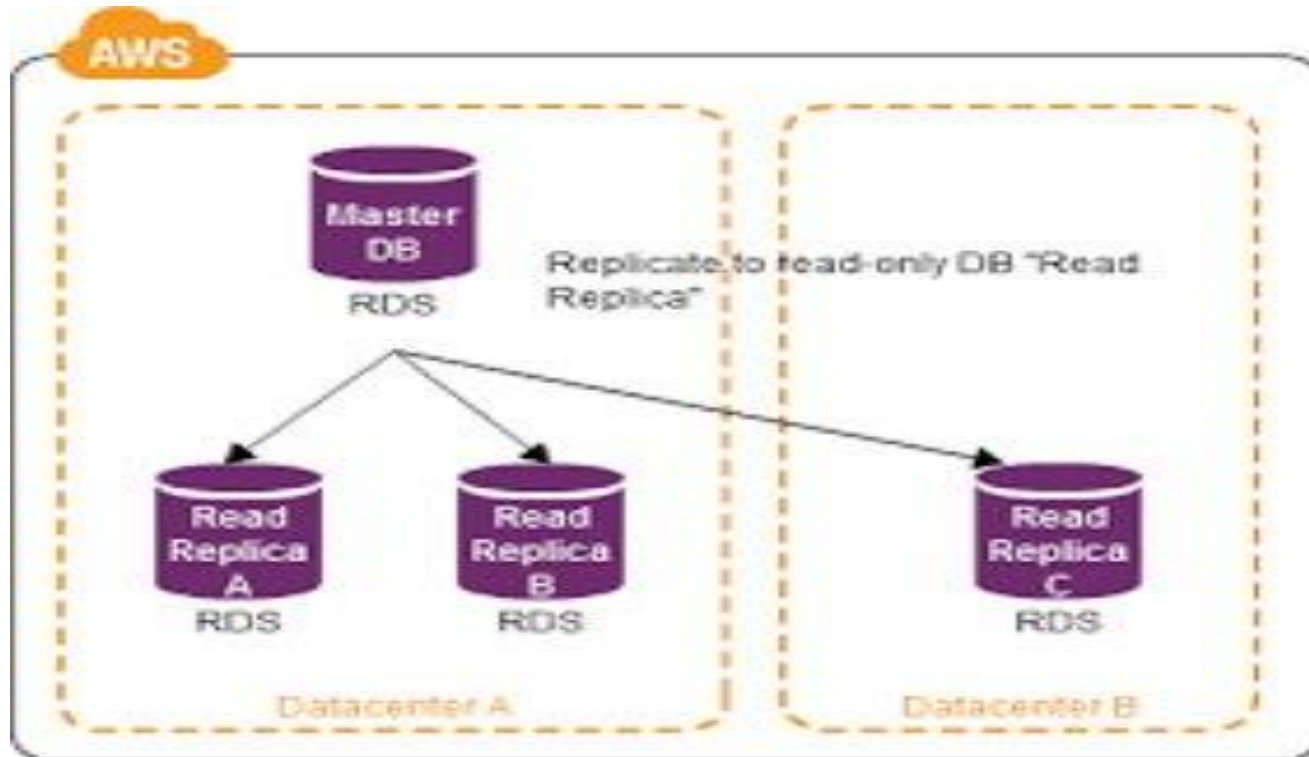
Amazon RDS

- Amazon Relational Database Service (Amazon RDS) makes it easy to set up, operate, and scale a relational database in the cloud.
- Fully managed
- Fast, predictable performance
- Simple and fast to scale
- Low cost, pay for what you use
- Support for multiple popular databases :Oracle, MySQL, Microsoft SQL Server, PostgreSQL and Amazon Aurora

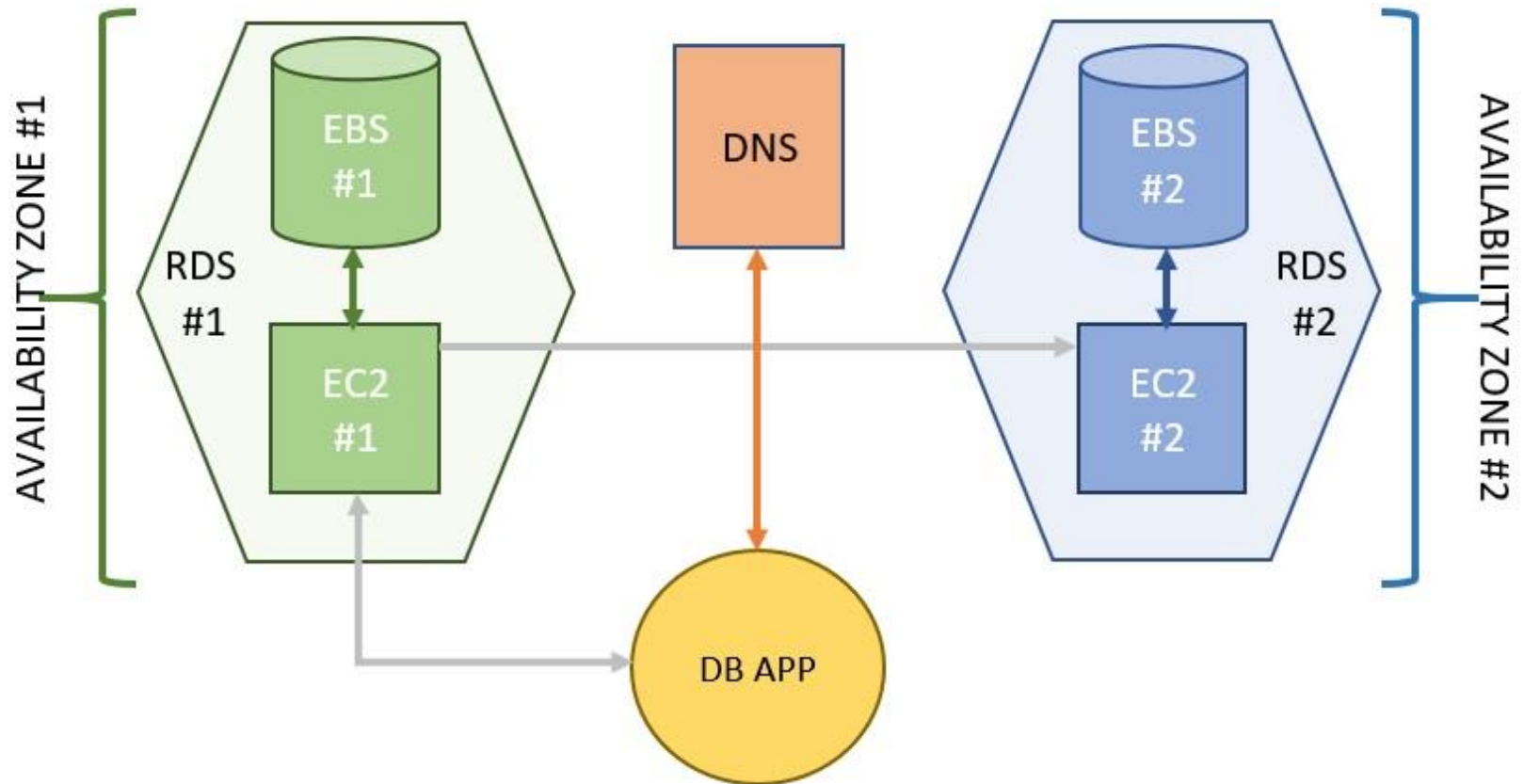
Amazon RDS- Read Replicas / Use Cases

- Read Replicas
 - Scale out beyond the capacity constraints of a single DB Instance for read-heavy database workloads.
 - Once read replica created, asynchronous replication using native engine will happen between Primary and replica.
 - Since replication is asynchronous, there will be a replication lag.
 - Can create multiple replicas from the same primary.
 - Read load can be distributed across the replicas.
 - Read replicas are for Scaling and not for Disaster Recovery
- Read Replicas Use Cases
 - Scaling beyond the compute or I/O capacity of a single DB Instance for read-heavy database workloads.
 - Serving traffic while the source DB Instance is unavailable.
 - Business reporting or data warehousing scenarios.

Amazon RDS- Read Replicas / Use Cases



Amazon RDS- Multi-AZ Deployment



Amazon Dynamo DB

- Fast and flexible NoSQL database service from AWS for all applications that need consistent, single-digit millisecond latency at any scale.
- Fully managed cloud database that supports both document and key-value store models
- Its flexible data model and reliable performance make it a great fit for mobile, web, gaming, ad tech, IoT, and many other applications.
- Stored on SSD
- Spread across 3 geographically distinct facilities/ data centers
- DynamoDB table is a collection of items and each item is a collection of one or more attributes.
- Max size of an item is 400KB
- <https://docs.aws.amazon.com/amazondynamodb/latest/developerguide/HowItWorks.CoreComponents.html#HowItWorks.CoreComponents.PrimaryKey>



DynamoDB DAX

- *DAX : DynamoDB Accelerator*
- Seamless Cache for DynamoDB
- Writes go through DAX
- Reads will be queried from DAX
- Solves the HotKey problem
- 5 minute TTL by default
- Multi AZ
- Secure



DynamoDB Provisioned Throughput

- Each table can have provisioned Read and Write
- Read Capacity Unit(RCU): Throughput for Reads
 - 1 RCU=1 strongly consistent read for 4KB/second
 - 1 RCU=2 eventually consistent read for 4KB/second
- Write Capacity Unit(WCU): Throughput for Writes (Costlier than RCU)
 - 1 WCU=1 write of 1KB/second
- Option of autoscaling of throughput on demand
- Throughput can be exceeded temporarily through “burst credit”



DynamoDB Stream

- Every CRUD/ Change to end up in DynamoDB Stream
- Records a Changelog
- This can be read by AWS Lambda for integrations
 - Eg. Send a welcome email to new Users
- Stream has 24 hour data retention



AWS Developer Tools

- AWS CodeBuild
- AWS CodePipeline
- AWS CodeCommit
- AWS CodeDeploy
- <https://aws.amazon.com/blogs/devops/complete-ci-cd-with-aws-codecommit-aws-codebuild-aws-codedeploy-and-aws-codepipeline/>



AWS
CodeCommit



AWS
CodeBuild



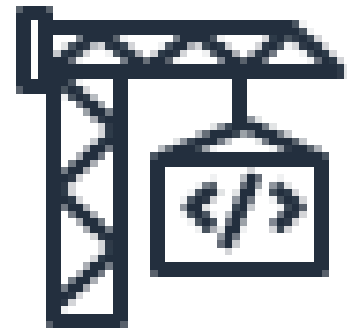
AWS
CodeDeploy



AWS
CodePipeline

AWS CodeBuild

- A build service that is fully managed, compiles source code, operates tests, and creates deployable software packages.
- CodeBuild scales endlessly and processes several builds simultaneously, so the builds are not in queue.
- **Benefits**
 - Secure
 - Allows Continuous Integration and Delivery
 - Extensible
 - Pay as You Go
 - Continuous Scaling
 - Fully Managed Build Service



AWS CodePipeline

- Fully managed [continuous delivery](#) service
- CodePipeline automates the build, test, and deploy phases of your release process every time there is a code change, based on the release model you define.
- Third party integrations like Github
- Benefits:
 - Rapid delivery: rapidly release new features to your users
 - Configurable workflow: model the different stages of your software release
 - Get started fast: no servers to provision or set up
 - Easy to integrate : can easily be extended to adapt to your specific needs



AWS CodeCommit

- AWS CodeCommit is a fully-managed [source control](#) service that hosts secure Git-based repositories
- It makes it easy for teams to collaborate on code in a secure and highly scalable ecosystem
- You can use CodeCommit to securely store anything from source code to binaries, and it works seamlessly with your existing Git tools.
- Benefits
 - Fully managed
 - Secure
 - High availability
 - Collaborate on code
 - Faster development lifecycle
 - Use your existing tools

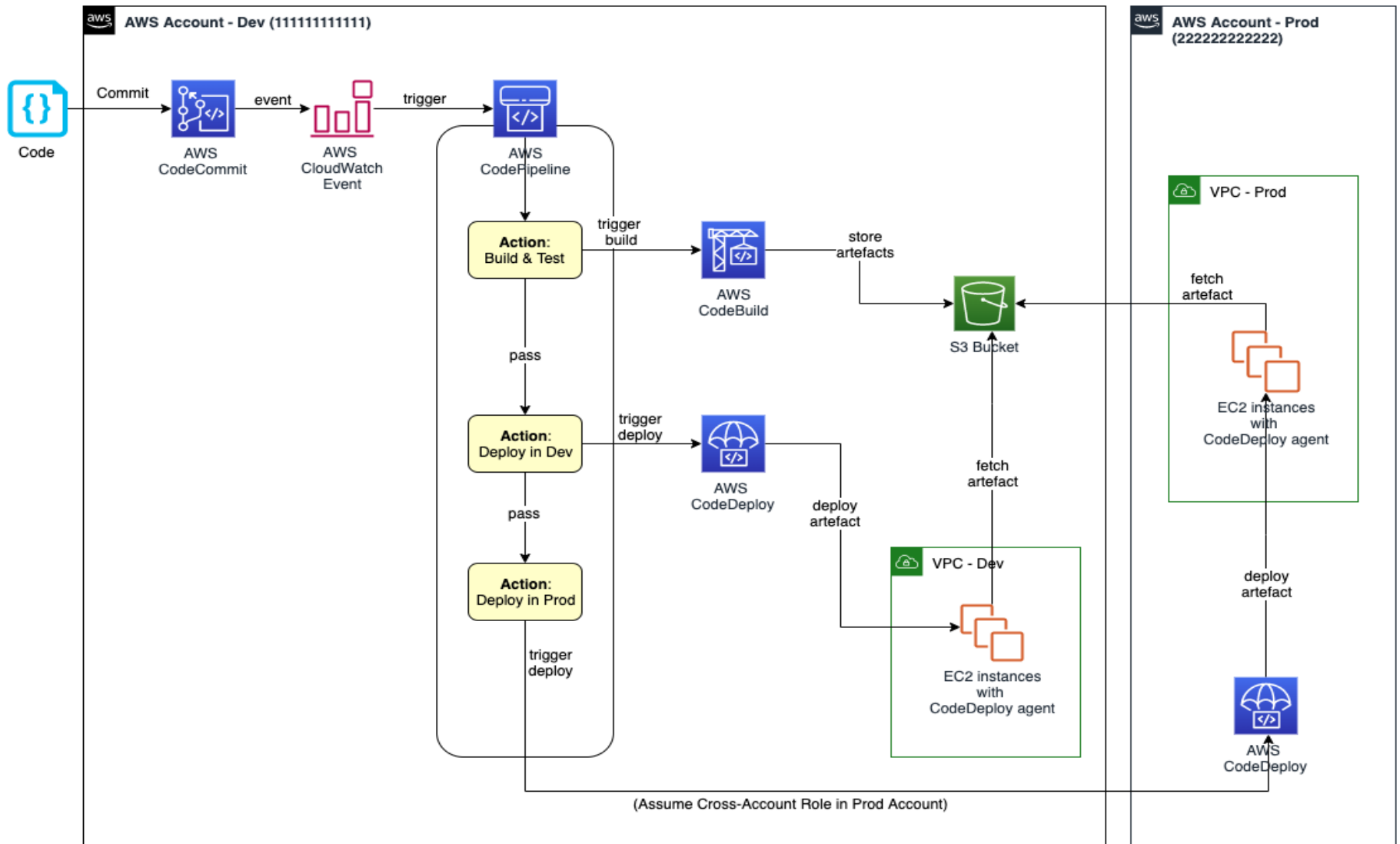


AWS CodeDeploy

- AWS CodeDeploy is a fully managed deployment service that automates software deployments to a variety of compute services such as Amazon EC2, AWS Fargate, AWS Lambda, and your on-premises servers.
- AWS CodeDeploy makes it easier for you to rapidly release new features, helps you avoid downtime during application deployment, and handles the complexity of updating your applications.
- You can use AWS CodeDeploy to automate software deployments, eliminating the need for error-prone manual operations.
- The service scales to match your deployment needs.
- Benefits
 - Automated deployments
 - Minimize downtime
 - Easy to adopt
 - Centralized control



CI/CD Workflow



Thank You
