Project Title: Cloud-based Disaster Recovery Using AWS Elastic Disaster Recovery (AWS DRS)

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Overview:

This project implements a disaster recovery (DR) solution using AWS services, with a focus on AWS Elastic Disaster Recovery (AWS DRS). The goal is to ensure business continuity by replicating critical workloads to AWS and enabling failover in the event of an outage. The solution includes setting up EC2 instances, configuring IAM policies, installing the AWS DRS agent on a Linux machine, and performing recovery operations using snapshots.

Key Objectives:

- Ensure minimal downtime and reduce data loss.
- Automate failover and failback processes.
- Optimize recovery time (RTO) and recovery point (RPO).
- Enhance security and cost management.

AWS Services Used:

- Amazon EC2: Source instance creation for replication.
- AWS IAM: Secure access and role configuration.
- AWS DRS: Continuous replication, snapshot management, and recovery execution.
- Linux Machine: Replication agent installation and management.
- Amazon S3: Backup data and logs storage.
- AWS CloudFormation: Automates infrastructure deployment.
- AWS CloudWatch: Monitors DR metrics.
- AWS SNS: Sends notifications for DR events.

Architecture:

- The architecture involves creating a source EC2 instance for replication, configuring AWS DRS agents for continuous data replication, performing snapshot-based recovery, and ensuring monitoring throughout the recovery process.

Implementation Steps:

- Configure AWS DRS and set up replication.
- Create IAM users and configure networking for DR.
- Monitor replication status and verify consistency.
- Test failover and recovery using AWS DRS snapshots.
- Use CloudWatch and SNS for monitoring and alerts.
- Clean up resources to minimize costs.

Challenges:

- Delays in initial replication and snapshot storage costs.
- Security concerns and networking issues between source and recovery regions.

Best Practices:

- Regular DR testing, cost management, security through IAM, automation with AWS Lambda, and multi-region redundancy.

Conclusion:

- The project successfully demonstrated the implementation of a cloud-based disaster recovery solution using AWS. It provided hands-on experience with EC2, IAM, AWS DRS, and S3, with a focus on cost management, security, and minimal downtime during recovery.

Future Enhancements:

- Integrating AWS Lambda for automated recovery, enhancing security, testing multi-region failover, and improving compliance with AWS Config.