MODULE 9: Cloud Architecture

1. AWS Well Architected Framework
2. Reliability and Availability
3. AWS Trusted Advisor

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1. AWS Well Architected Framework

Features

- ➔ Secure
- ➔ High performing
- ➔ Resilient
- ➔ Efficient

A consistent approach to evaluate and implement cloud architecture.

Pillars

a. Operational excellence
b. Security
c. Reliability
d. Cost optimisation
e. Performance efficiency

Any Company architecture

- ➔ Fly and snap
- ➔ Show and sell
- ➔ Make and ship

Operational excellence

- ➔ Focuses on running and monitoring system to deliver business value.
- ➔ Design principles:
    a. Perform operations and code
    b. Make frequent small and reversible changes
    c. Refine operations, procedures frequently
    d. Anticipate failure
    e. Learn from all operations and failure

Security

- ➔ Focuses on protection of system and assets while delivering business values through risk management and mitigation strategies.
- ➔ Security Design principles:
    a. Implement a strong Identity foundation
    b. Enable traceability
    c. Apply security at all layers
    d. Automate security best practises
    e. Protect data in transit and at rest
    f. Keep people away from data
    g. Prepare for security events

Reliability

- ➔ Focuses to ensure a workload performs its intended function correctly and consistently when it is expected to.
- ➔ Reliability design principles:
    a. Automatic recover from failures
    b. Test recovery procedures
    c. Scale horizontally to increase workload availability
    d. Stop guessing capacity
    e. Manage changing automation

Performance

- ➔ Uses IT and computing resources efficiently to meet system requirements and to maintain that efficiency as demand changes and technologies evolve.
- ➔ Performance design principles:
    a. Democratise advance technologies
    b. Go global in minutes
    c. Use serverless architecture
    d. Experiment more often
    e. Consider mechanical sympathy

Cost Optimisation

- ➔ Focuses on avoiding unnecessary cost.
- ➔ Cost Optimisation:
    a. Implement cloud financial management
    b. Adopt consumption model
    c. Major overall efficiency
    d. Stop spending money on undifferentiated heavy lifting
    e. Analyse and attribute expenditures

2. Reliability and Availability

- ➔ It is a measure of a system's ability to provide functionality when desired by the user.
- ➔ **System includes all system components:** hardware, software, firmware.
- ➔ Probability that your entire system will function as intended for a specified period. Meantime between failures = Total time in service / no. of failures.
- ➔ **MTTR:** Meantime to repair
- ➔ **MTTF:** Meantime to failure

Availability

- ➔ Normal operation time / total time

High Availability

- ➔ System can withstand some degradation while still remaining available.
- ➔ Downtime is minimised.
- ➔ Minimal human intervention is required.

Availability tier

a. **99% Max disruption:** 3 days 15 hours. Used for batch processing and data extraction.
b. **99.9% Max disruption:** 8 hours 45 minutes. Used in project tracking.
c. **99.95% Max disruption:** 4 hours 22 minutes. Used in online commerce.
d. **99.99% Max disruption:** 52 minutes. Used in video delivery and broadcast systems.
e. **99.999% Max disruption:** 5 minutes. Used in ATM transactions and telecommunication systems.

Factors that influence availability

➔ Scalability
➔ Fault tolerance
➔ Recoverability

3. AWS Trusted Advisor

➔ Online tool that provides real time guidance to help you provision your resources by following AWS best practices.
➔ Look at your entire AWS environment and give your real time recommendation in 5 categories:
    a. Fault tolerance
    b. Security
    c. Service limits
    d. Cost optimisation
    e. Performance