Well-Architected Bootcamp 2020 Taipei
Reliability Pillar

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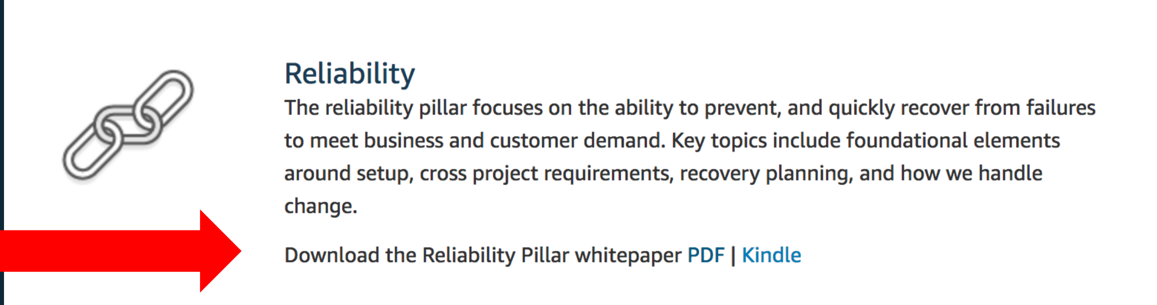
The reliability pillar focuses on the ability to prevent, and quickly recover from failures to meet business and customer demand. Key topics include foundational elements around setup, cross project requirements, recovery planning, and how we handle change.

Resources:

Website:

https://aws.amazon.com/architecture/well-architected/

Whitepaper



Reliability

The reliability pillar focuses on the ability to prevent, and quickly recover from failures to meet business and customer demand. Key topics include foundational elements around setup, cross project requirements, recovery planning, and how we handle change.

Download the Reliability Pillar whitepaper PDF | Kindle

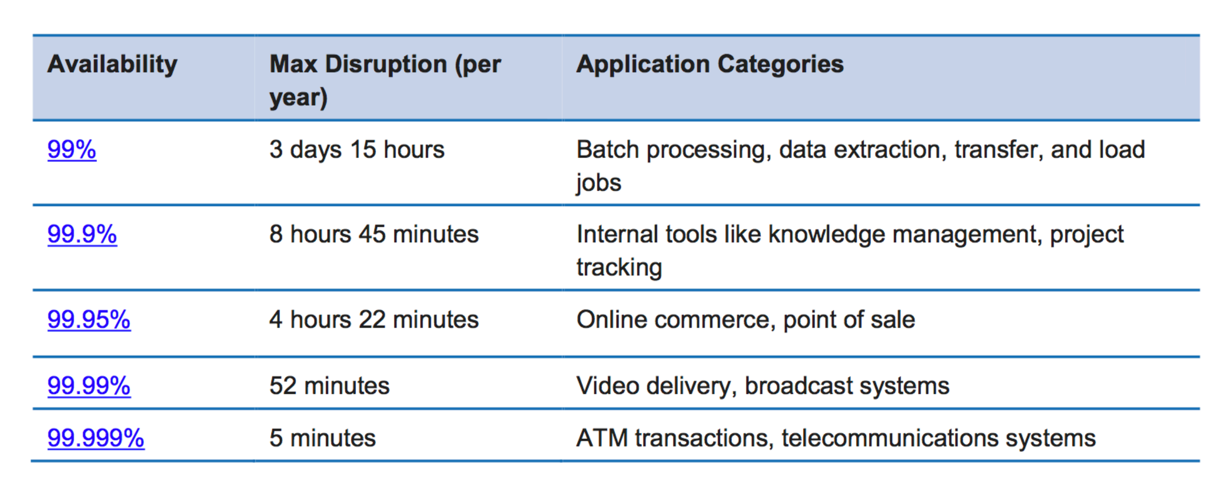
Resources:

HTML Version of Performance Pillar:

https://wa.aws.amazon.com/wat.pillar.reliability.en.html

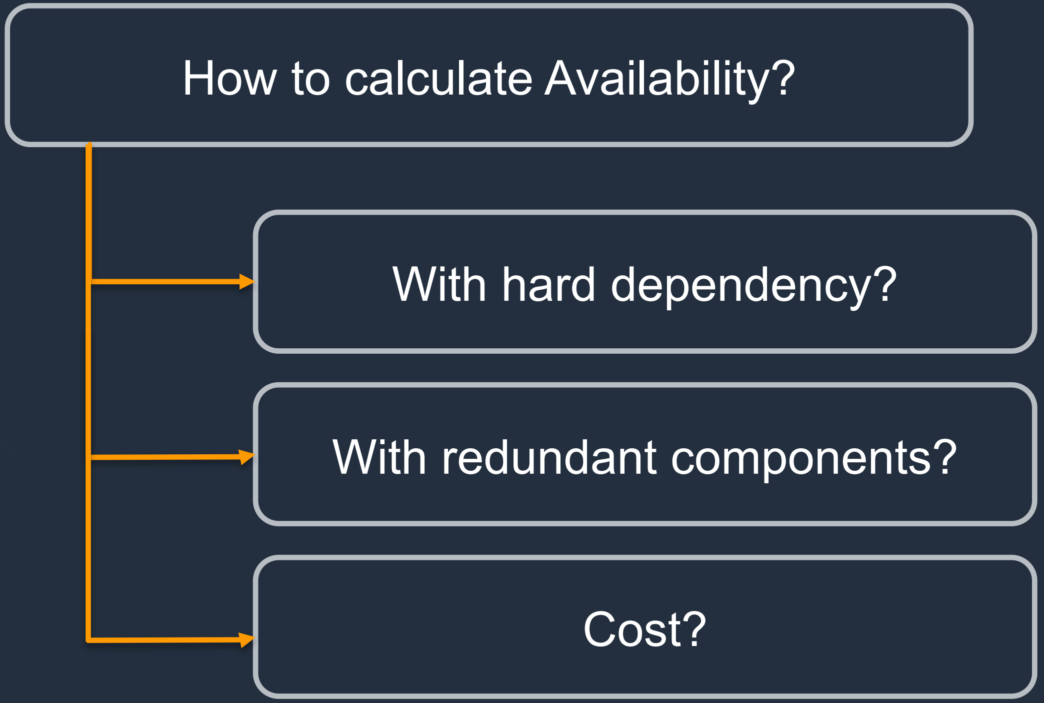
Background

How to calculate Availability? How many 9?



Availability	Max Disruption (per year)	Application Categories
99%	3 days 15 hours	Batch processing, data extraction, transfer, and load jobs
99.9%	8 hours 45 minutes	Internal tools like knowledge management, project tracking
99.95%	4 hours 22 minutes	Online commerce, point of sale
99.99%	52 minutes	Video delivery, broadcast systems
99.999%	5 minutes	ATM transactions, telecommunications systems

Background



How to calculate Availability?

With hard dependency?

With redundant components?

Cost?

Definitions:

Foundation - Networking

Application Design for Availability

Understand Availability Needs

Operational Consideration for Availability

Foundation - Networking

- Allow IP address space for more than one VPC per Region.
- Consider cross-account connections. For example, each line of business might have a unique account and VPCs. These accounts should be able to connect back to shared services.
- Within a VPC, allow space for multiple subnets that span multiple AZ.
- Always leave unused CIDR block space within a VPC.

- How are you going to be resilient to failures in your topology?
- What happens if you misconfigure something and remove connectivity?
- Will you be able to handle an unexpected increase in traffic/use of your services?
- Will you be able to absorb an attempted DoS attack?

Foundation - Networking

- Key Services for Network Topology
  - Amazon VPC
  - AWS Direct Connect
  - Amazon EC2
  - Amazon route53
  - Elastic Load Balancing
  - AWS Shield

Definitions:

- Foundation - Networking
- Application Design for Availability
- Understand Availability Needs
- Operational Consideration for Availability

Application Design for Availability

- Fault Isolation Zones
    - Multiple independent component in parallel
    - Multi-AZ
- Redundant components
- Micro-service architecture
- Recovery Oriented Computing
- Distributed systems best practices
    - Throttling
    - Retry with exponential fallback
    - Fail fast
    - Use of idempotency tokens → assume an action must occur exactly once
    - Constant work
    - Circuit breaker
    - Bi-modal behavior and static stability

Detective Controls

- Capture and Analyze Logs:
  - Capture: CloudTrial, AWS Config
  - Store: CloudWatch Logs, S3, Glacier
  - Analyze: Elasticsearch Service, EMR, Athena
- Integrate Auditing Controls with Notification and Workflow:
  - CloudWatch, CloudWatch Events
  - AWS Config Rules
  - CloudWatch API & AWS SDKs
  - Inspector

Definitions:

Foundation - Networking

Application Design for Availability

Understand Availability Needs

Operational Consideration for Availability

Operational Consideration for Availability

- Automate Deployments to Eliminate Impact
  - Canary deployment
  - Blue-Green deployment
  - Feature toggles
  - Failure isolation zone deployments
- Testing
- Monitoring and Alarming

Generation →Aggregation →Real-time processing and alarming →Storage →Analytics

- Operational Readiness Reviews
- Auditing

Operational Consideration for Availability

- Automate Deployments to Eliminate Impact
  - AWS Code Deploy
- Testing
- Monitoring and Alarming
  - Amazon Cloudwatch
  - AWS X-Ray
  - Amazon S3
  - Amazon EMR
- Operational Readiness Reviews
- Auditing
  - Amazon Cloudwatch Logs
  - AWS Config
  - AWS CloudTrail

Q: How are you managing AWS Service Limits for your Account(s)?

Unaware

Aware but not Tracking

Monitor and Manage Limits

Aware of Fixed Service Limits

Sufficient Buffer in Service Limits to Accommodate for Failover

Service Limits are Considered

?

Q&A

Thank you!