ONE PAGE SUMMARY

IT & Software › System Design › Reliability

Introduction to Reliability

Mastering Reliability: The Backbone of System Design

DEFINITION

> Reliability refers to the ability of a system to consistently perform its intended function without failure. It is crucial for ensuring user trust and system efficiency.

KEY CONCEPTS

Availability

This is the proportion of time a system is operational and accessible for use.

Fault Tolerance

This is the capability of a system to continue functioning even when one or more components fail.

Redundancy

This involves having extra components or systems in place to take over in case of failure.

Mean Time Between Failures (MTBF)

This is a measure of the average time between system failures, indicating reliability.

Error Detection

This is the process of identifying and correcting errors to maintain system performance.

EXAMPLES

→ A backup server that activates when the primary server fails.

→ An online service that remains operational 99.9% of the time.

→ A car's redundant braking system that ensures safety even if one brake fails.

MEMORY TIPS

★ Remember 'R.A.F.E.' for Reliability: Redundancy, Availability, Fault Tolerance, Error Detection.

★ Think of reliability as a safety net that catches failures.

★ Use the phrase 'Always Be Ready' to recall the importance of system reliability.

COMMON MISTAKES

✗ Confusing reliability with performance; they are related but distinct.

✗ Neglecting to test redundancy measures during system design.

✗ Underestimating the importance of error detection mechanisms.

QUICK RECAP

Reliability is essential for system design, ensuring consistent functionality without failures. Key concepts include availability, fault tolerance, and redundancy, all contributing to a system's overall reliability.