

Reliability

Fault is different from failure

- Fault v.s. failure
 - fault: one component of the system deviating from its spec
 - failure: the system as a whole stops providing the required service
- Deliberately inducing faults can exercise and test the reliability
 - The Netflix Chaos Monkey
- Prefer tolerating faults
 - when faults can be cured
 - otherwise, preventing faults is a better option

Reliability

Resilient to hardware or software faults

- Hardware faults
 - disk, memory, network, power grid
 - solutions: **redundancy** of hardware components, software fault-tolerance techniques (tolerate the loss of entire machines, rolling-upgrade)
- Software errors
 - A systematic error: software bug, resource leak, problematic service, cascading failures
 - alleviations: right assumptions, testing, process isolation, allowing processes to crash and restart, monitoring and alerting