

# The reality of distributed systems

Reality has been disappointing

- Worse availability - depend on every machine being up
  - Worse reliability - can lose data if any machine crashes
  - Worse security - anyone in world can break into system
- ◎ Coordination is more difficult - must coordinate multiple copies of shared state information (using only a network)

# Requirements

**Transparency** - the ability of the system to mask its complexity behind a simple interface

Possible transparencies

- Location - cannot tell where resources are located
  - Migration - resources may move without the user knowing
  - Replication - cannot tell how many copies of resource exist
  - Concurrency - cannot tell how many users there are
  - Parallelism - may speed up large jobs by splitting them into smaller pieces
  - Fault Tolerance - system may hide various things that go wrong
- ➔ Transparency and collaboration require some way for different processors to communicate with one another