Nested Atomic Actions

Failure ——— Atomicity

Two-phase locking

Reov.: Never modify only copy

Isolation → Serializability

Locks
What if A, B conflict?

When A t.c.s, S + its children sec A’s updates
Multi Case

S \rightarrow \text{B. E. Network} \rightarrow A, B

RPCs
Two-phase commit
\[ S \quad \text{pending} \quad T, C \quad \text{do } x \quad \text{do } x \quad \text{log} \quad \text{Start } x(T) \quad \text{did } x \quad \text{commits} \]

\[ A \quad \text{pending} \quad X(T), \text{t.c.} \quad \text{log} \quad \text{Start } x(T) \quad \text{...} \quad \text{t.c. } x(T) \quad \text{did } x \quad \text{did } x \]
Phase 2

- S crashes before C
  - UNDO T, remembers T aborted
  - after C
    - REDO T, remembers T committed

- A crashes before T.C.
  - after T.C. → up to S

Commit

Commit

Did X

X

Commit
Unfinished!!
Do A, B make results visible at the same time?

No. 2 generals problem