6.033 Computer System Engineering
Spring 2009

Atomic Action — Recoverable

Isolated

Multi site Atomicity

Travel Site

JetBlue

USAir

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Nested Atomic Actions

Recov.: Never modify
      only copy

Failure ——— Atomicity

Isolation → Serializability
         Locks

Two-phase locking

What if A, B conflict?

S ← A → When A t.c.s,

S ← B

S + its children sec A's updates

Multi Case

Two-phase commit

S

A

pending
T, C

_do x_

pending
X(T), t.c.

_do x_

log
Start x(T)

✗ did x

log
Start T

_do x_

⋮

t.c. x(T)

commits

did x

Phase 2

commit

✖

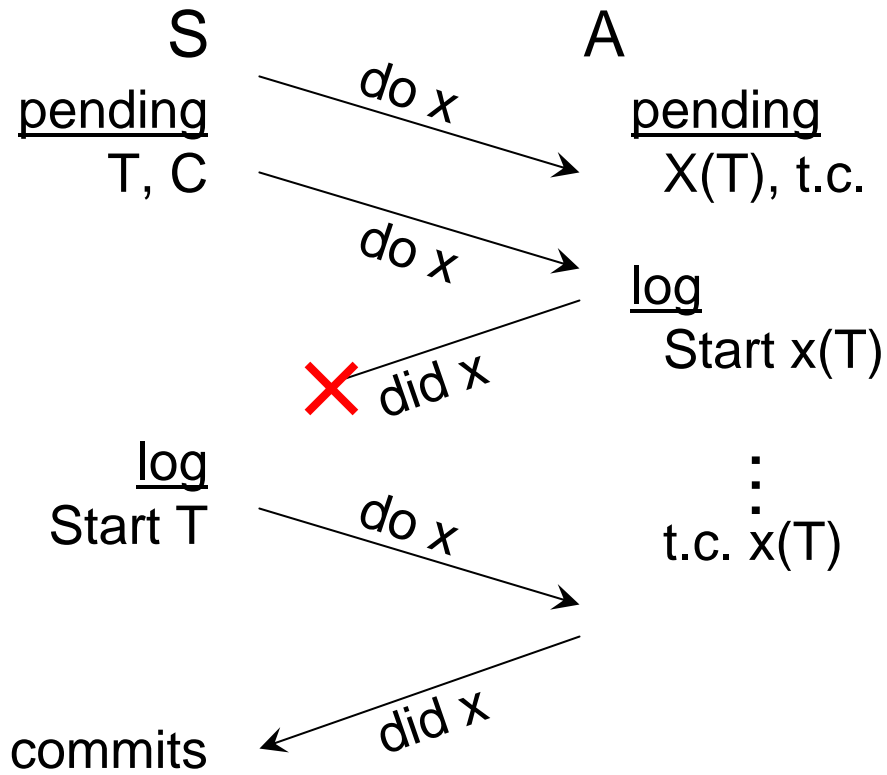did X
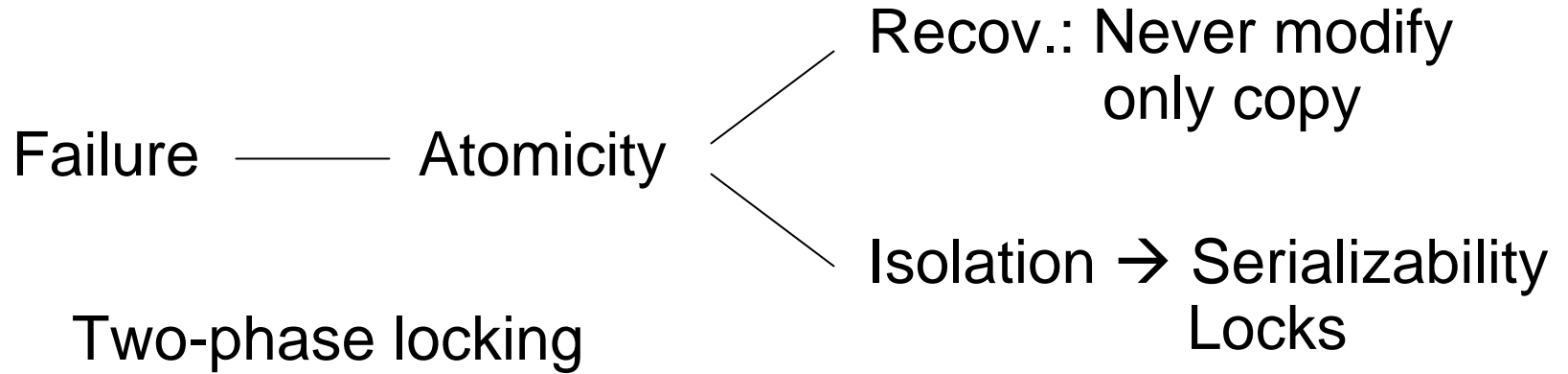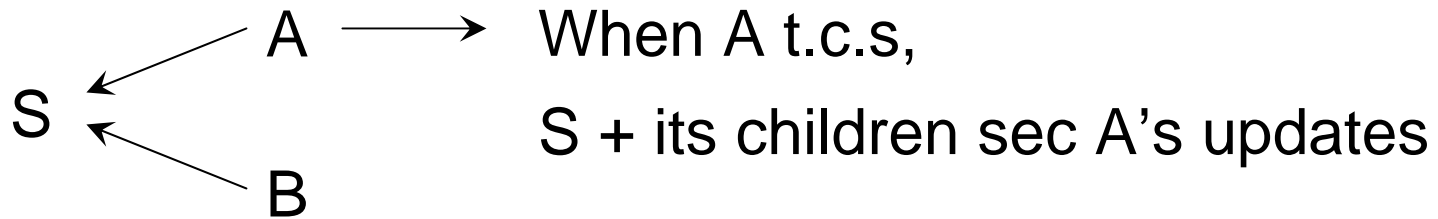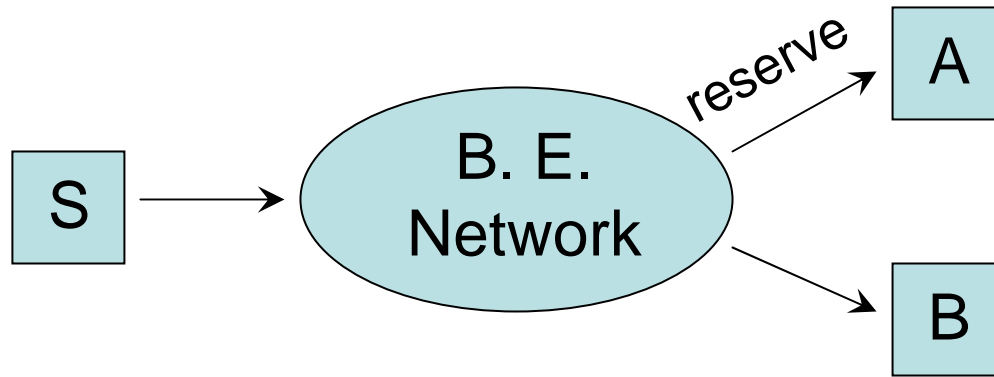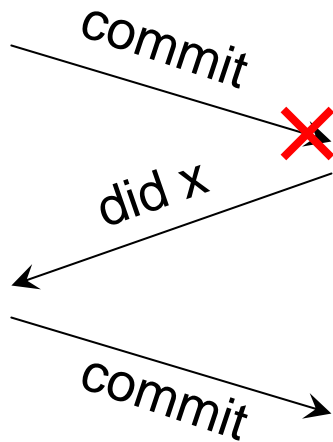
commit

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

Unfinished!!

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

No.   2 generals problem