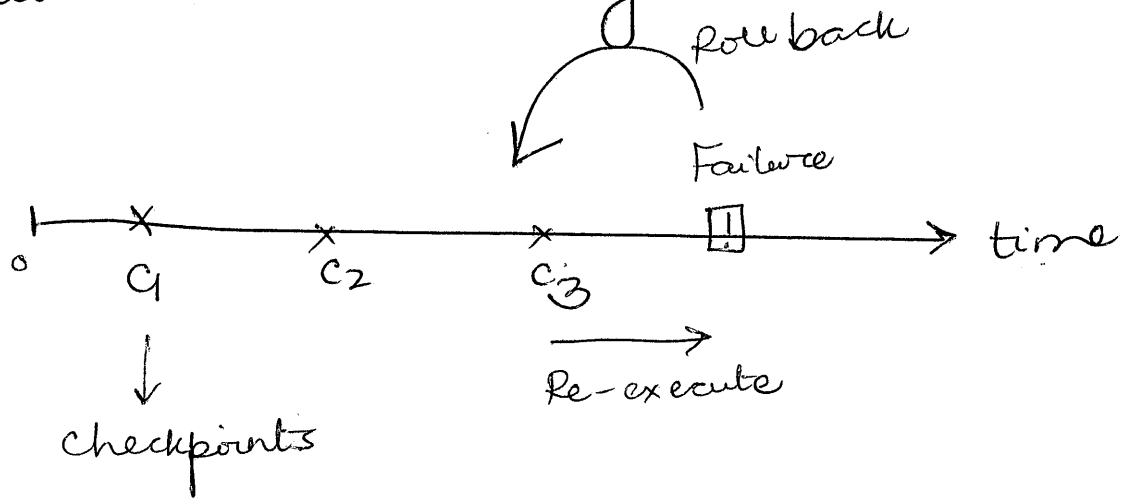# Recovery

Backward error recovery

checkpoints

Transient error condition ✓

Real-time → forward error recovery

Permanent error condition ✗

Checkpoint period C_p (time)
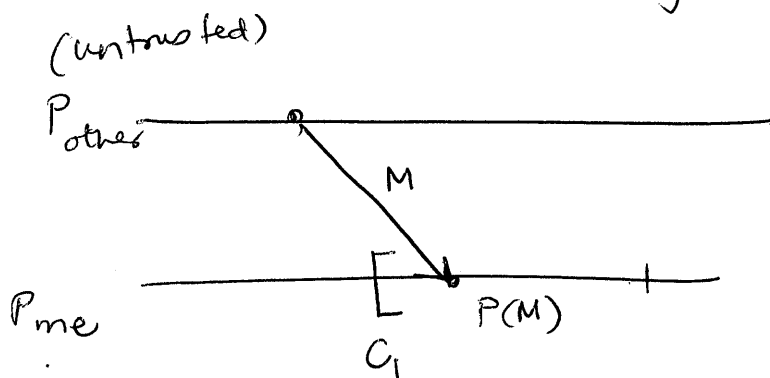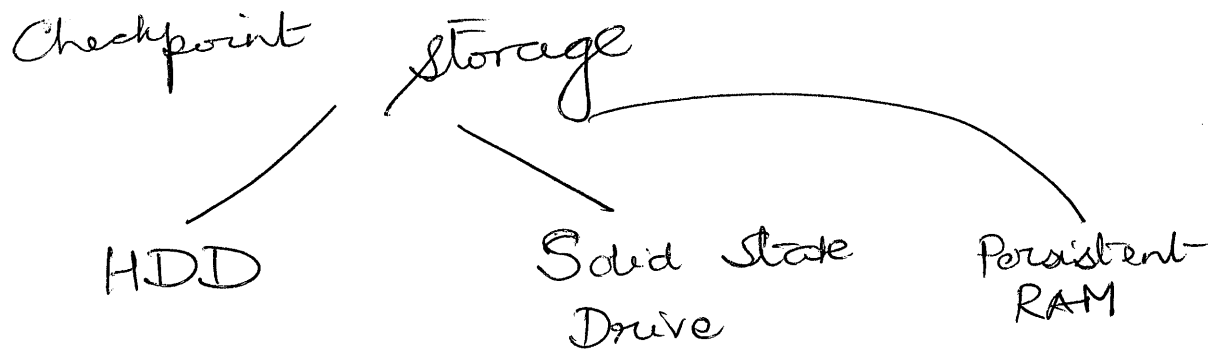
Failure rate ↑ C_p ↓

Time to take a checkpoint ↑ C_p ↑

Error detection latency ↑ $C_p >$ Error detection latency

After that, no effect

(untrusted)

P_{other}

M

P_{me} $P(M)$

C_1

Checkpoint Storage

HDD   Solid State   Persistent-
           Drive   RAM

Checkpoint period C_P

$C_{P,H}$ $C_{P,S}$ $C_{P,R}$

$$C_{P,R} < C_{P,S} < C_{P,H}$$

because $Latency_R < L_{SSD} < L_{HPD}$

Strongly Consistent global state : GS_1

Consistent   ↳   : GS_3

Inconsistent   : GS_2

Synchronous checkpointing & rollback

Asynchronous   "   "

Failure rate ↓   Asynchronous