REPLICATION
FOR LONG-TERM
PERSISTENCE

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LIBRARY 2000
Desired Time of Persistence

=>

MTB Site Failure

- Earthquake
- Hurricane
- Flood
- Meteor Strike
- City Fire
- Revolution
Desired Time of Persistence

MTB Site Failure

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Strategy:
Full Replication, with Geographic Diversity
Time Between Reads

- day
- mo
- yr
- decade
- century

MTB Media Failure
MTB Media Failure

Strategy:
READING Daemon
Repository

Data
Append-Only Write Semantics
Stateless Commit: Majority of R's accept
dc: reading daemon
d2: repair ordeu daemon
ds: repair execution daemon (one/replica)
Construct repair list for replica J:

acquire list\_k, k = 1...n
let U = union ( list\_k, k = 1...n )
for each entry in U
  if entry checked in majority of k
    if entry is unchecked or missing in list\_j
      issue repair order:
        "copy entry to j"
    endif
  endif
otherwise
  if entry in list\_j
    issue repair order:
      "delete entry at j"
  endif
endif
endfor
Simplicity

- Relaxed Consistency
- Stateless Protocols
- Append-only Semantics
- Idempotent Repair
- Unique file name = MD5 checksum