

RAID 1 with backup availability

A RAID 1 in a very critical environment is composed by two disks that mirror the same data. On the average, every $MTTF = 100$ days, one of the disks fails. In this case, recovery consist in replacing the broken disk, reconstruct the data, and return to normal operation. This requires an average of $MTTR = 5$ days. Should also the second disk fail during the recovery stage, the system will go in a fault state, where to be restored, it will require a total reconstruction of the system from the backup. This will take an average 15 days.

Considering all failure and recovery time distribution exponential, and the system starts in a state where both disks are working:

- Draw the Markov Chain of the model
- Compute the infinitesimal generator and solve the corresponding differential equations
- Show the probability of the various states for the time $T = [0, 10000]$ days