

# Why $\sqrt{N}$ ?

- Each voting set is of size  $K$
- Each process belongs to  $M$  other voting sets
- Total number of voting set members (processes may be repeated) =  $K*N$
- But since each process is in  $M$  voting sets
  - $K*N/M = N \Rightarrow K = M$  (1)
- Consider a process  $P_i$ 
  - Total number of voting sets = members present in  $P_i$ 's voting set and all their voting sets =  $(M-1)*K + 1$
  - All processes in group must be in above
  - To minimize the overhead at each process ( $K$ ), need each of the above members to be unique, i.e.,
    - $N = (M-1)*K + 1$
    - $N = (K-1)*K + 1$  (due to (1))
    - $K \sim \sqrt{N}$