

Suspicion Mechanisms in Cassandra

- Suspicion mechanisms to adaptively set the timeout based on underlying network and failure behavior
- Accrual detector: Failure Detector outputs a value (PHI) representing suspicion
- Apps set an appropriate threshold
- PHI calculation for a member
 - Inter-arrival times for gossip messages
 - $\text{PHI}(t) = -\log(\text{CDF or Probability}(t_{\text{now}} - t_{\text{last}})) / \log 10$
 - PHI basically determines the detection timeout, but takes into account historical inter-arrival time variations for gossiped heartbeats
- In practice, $\text{PHI} = 5 \Rightarrow 10\text{-}15$ sec detection time