

Summary of Routing Algorithms

Properties

Distance Vector

- Decentralized
 - Router knows link costs to physically-connected neighbors
 - Iterative process of computation during exchange of info with neighbors
- Message passing only between nearest neighbors
- Variable convergence time

Link State

- Global
 - All nodes have estimate of complete topology and all link costs
- Message flooding
 - With N nodes with E links $O(NE)$ messages
- $O(n^2)$ convergence

Why is Routing Hard?

- Inherently distributed problem
 - Information about links and neighbors is local to each node, but we want global reach
- Handling dynamic conditions difficult
 - Must tolerate link, switch, and network faults
 - Failures and recovery could be arbitrarily timed, messages could be lost, etc.
- Scaling to large sizes difficult
- On the Internet, ISPs must cooperate for packet delivery