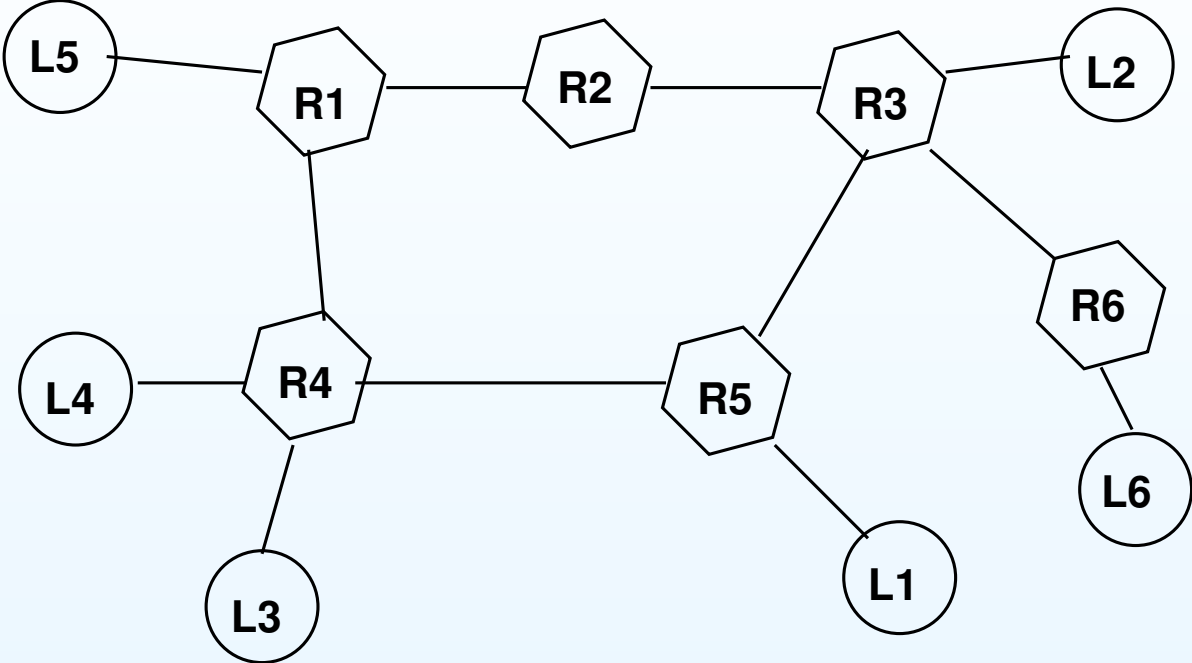


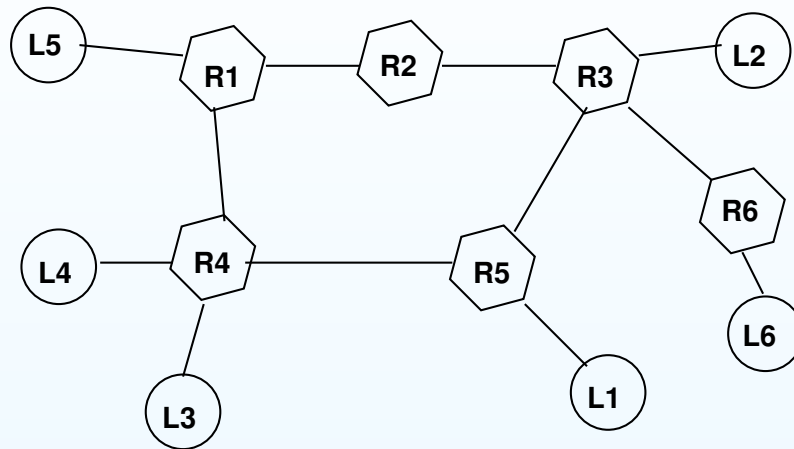
Distance Vector Routing

- Routers exchange their routing tables with immediate neighbors.
- Information includes the network and the distance.
- Changes in the network propagate at the rate of 1 unit of diameter per exchange period.
- Typical exchange periods are 30 sec to several minutes.

Distance Vector Routing Example



Slow Convergence



- R6 loses contact with L6.
- R6 doesn't know if there is another path to L6.
- In a table exchange it finds that R3 has a route to L6 with distance 2.
- R6 advertises that route to R3 with distance 3.
- R3 advertises that route with distance 4 to R6 and R2.
- Erroneous information propagates through the network.

Slow Convergence Solutions

- Split Horizon - don't advertise routes to the destination node.
- Poison Reverse - advertise routes with infinite distance.
- Hold Down - when a major change occurs advertise the change quickly, but don't accept new routes for a period of time.

Routing Information Protocol (RIP)

A distance-vector routing scheme that is quite popular.

Command	Version	Zero
Family of Net 1		Address of Net 1
Address of Net 1 ... (14 Bytes)		
Distance to Net 1		
Family of Net 2		Address of Net 2
Address of Net 2 ... (14 Bytes)		
Distance to Net 2		
.....		

RIP Packet Format

Link State Routing

- Routers broadcast their neighbor connections with all routers in the network.
- Information is primarily connectivity and distance.
- Every node has a complete graph of the network.
- Distance minimization algorithms (Dijkstra's Shortest Path Algorithm) can be used to select the best route.
- No slow convergence problems.
- Somewhat larger capacity requirement.

Open Shortest Path First (OSPF) Protocol

- Networks are divided into areas and networks hierarchical.
- Authentication used to protect routers.
- Allows load balancing.