Internet routing challenges

- Scale
  - *link-state would cause flooding*
  - *distance-vector would not converge*
  - *too many IP subnets => too many forwarding-table entries*
- Administrative autonomy
  - *an ISP may not want to do least-cost routing*
  - *may want to hide its link costs from the world*

Solution: hierarchy

- Each router communicates with every local router
- Each border router communicates with every external neighbor
- Each router keeps forwarding state for local IP subnets and foreign aggregate IP prefixes
- Each AS chooses its own intra-AS routing protocol

Two key Internet components

- IP: specifies forwarding
- BGP: the inter-domain routing protocol that enables each AS to learn routes to foreign ASes