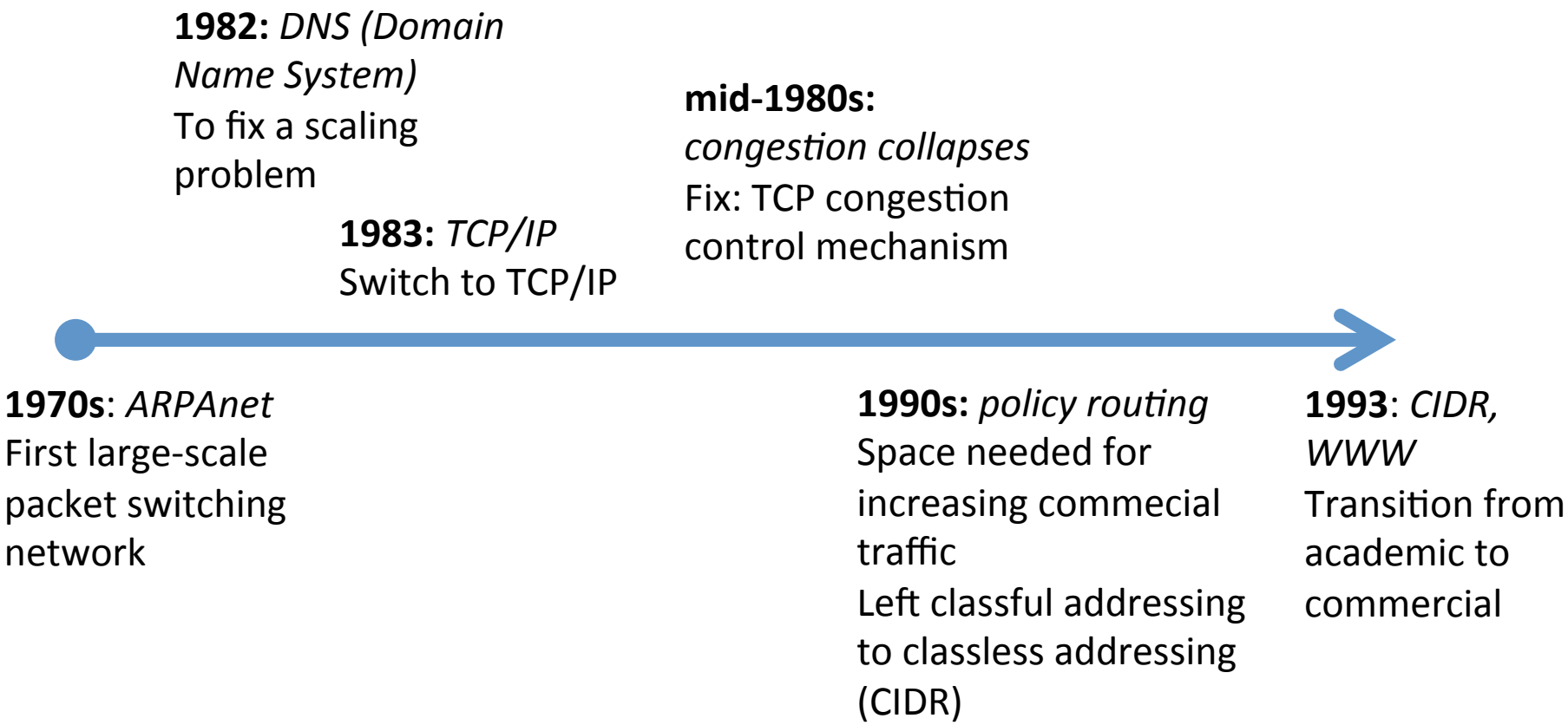
1982: *DNS (Domain Name System)*
To fix a scaling problem
1983: *TCP/IP*
Switch to TCP/IP
mid-1980s:
congestion collapses
Fix: TCP congestion control mechanism
1970s: *ARPAnet*
First large-scale packet switching network
1990s: *policy routing*
Space needed for increasing commecial traffic
Left classful addressing to classless addressing (CIDR)
1993: *CIDR, WWW*
Transition from academic to commercial

Short-term Problems

- SPAM
  - Rise in Spam over internet telephony (SPIT)
  - Can be contained, but not completely erased
- Security
  - Viruses, worms, phishing, spyware
  - Possible fix: taint-tracking
- Denial-of-Service (DoS) attacks
  - Bots flooding systems with unwanted traffic
- Application Deployment
  - Fitting applications with the Internet architecture

Medium-Term Problems

- Congestion Control
  - TCP congestion control: probes network for traffic
  - Issues with TCP's limited dynamic range
    - Solution has to take into about: transmission, TCP range and fairness
- Inter-domain Routing (policy routing)
  - Each routing domain can decide which routes to accept and pass on to neighbors
  - BGP to enable policy routing
    - Problem: BGP is slow to converge, error-prone and difficult to debug

Medium-Term Problems (cont.)

- Mobility
  - Mobile IP: support for mobile hosts
  - Problems of deployment
- Multi-Homing
  - Connecting via more than one internet provider
  - Unclear how to deal with a massive increase in routes
- Architectural Stagnation

- **Longer Term**: Address Space Depletion
  - CIDR → IPv6