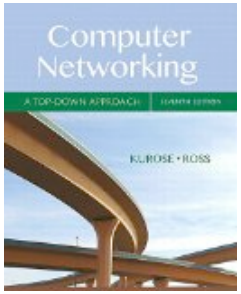
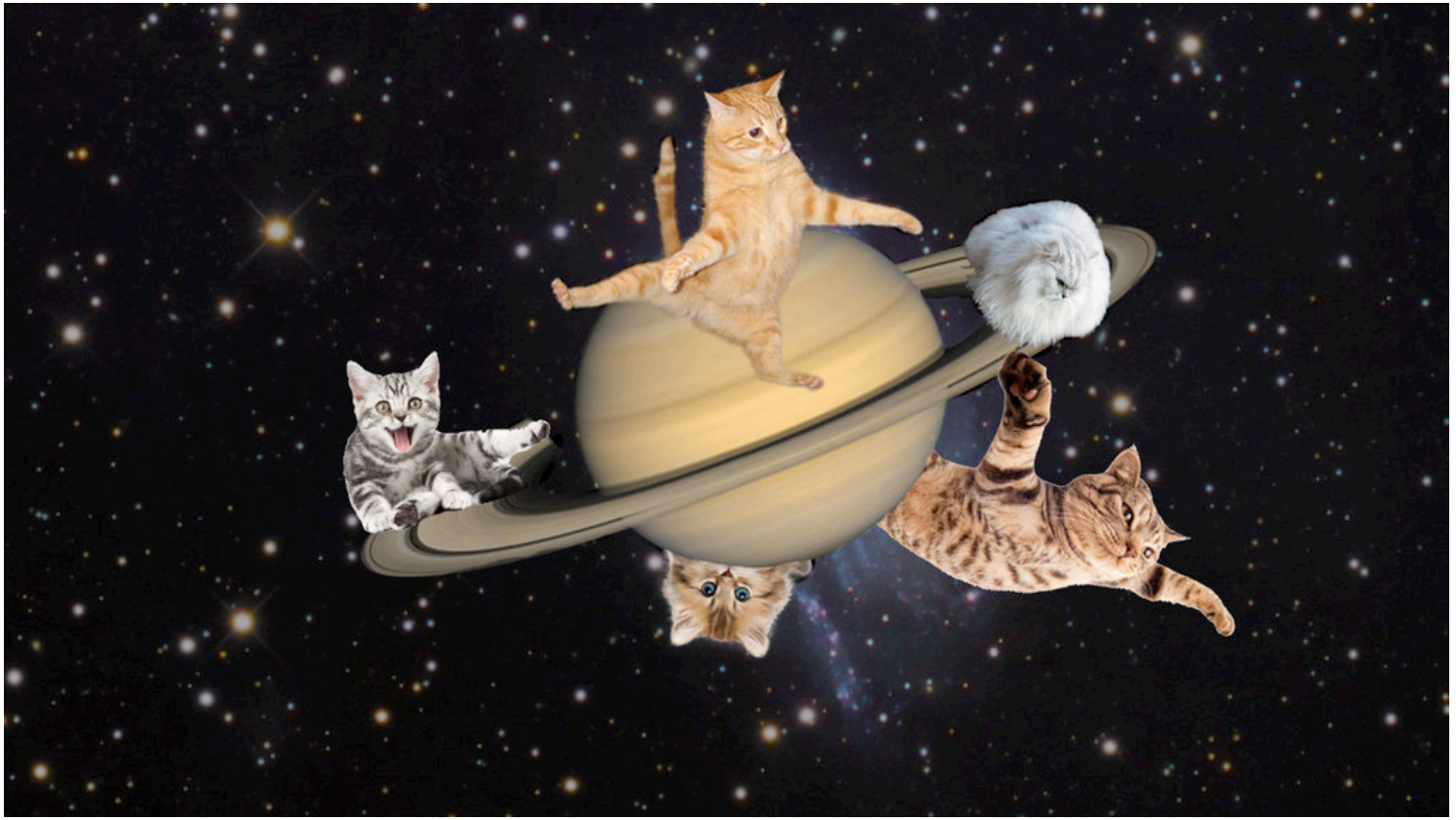
COMP 375: Lecture 35



- **News & Notes:**
  - Quiz #8 in class today
  - Project #5 due Wednesday
- **Reading (Mon, Apr. 30)**
  - Review Section 6.3

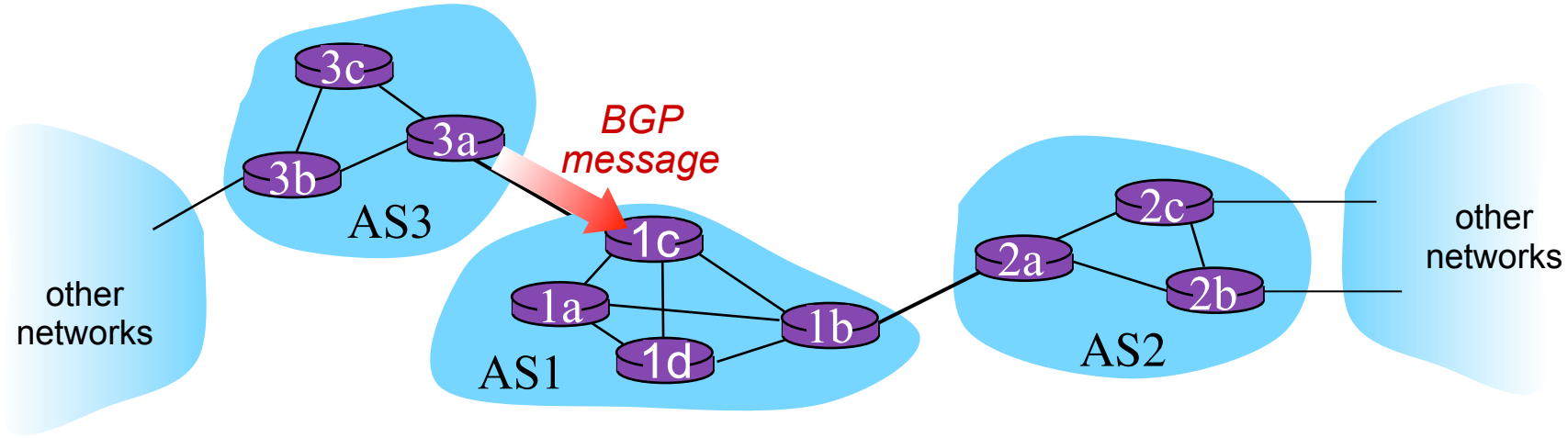
Quiz #8

- Closed book, closed notes.
- Happy International Astronomy Day!



BGP sessions involve advertising paths to different subnets/prefixes.

- When AS3 advertises a prefix to AS1:
  - AS3 *promises* it will forward datagrams towards that prefix
  - AS3 can aggregate prefixes in its advertisement



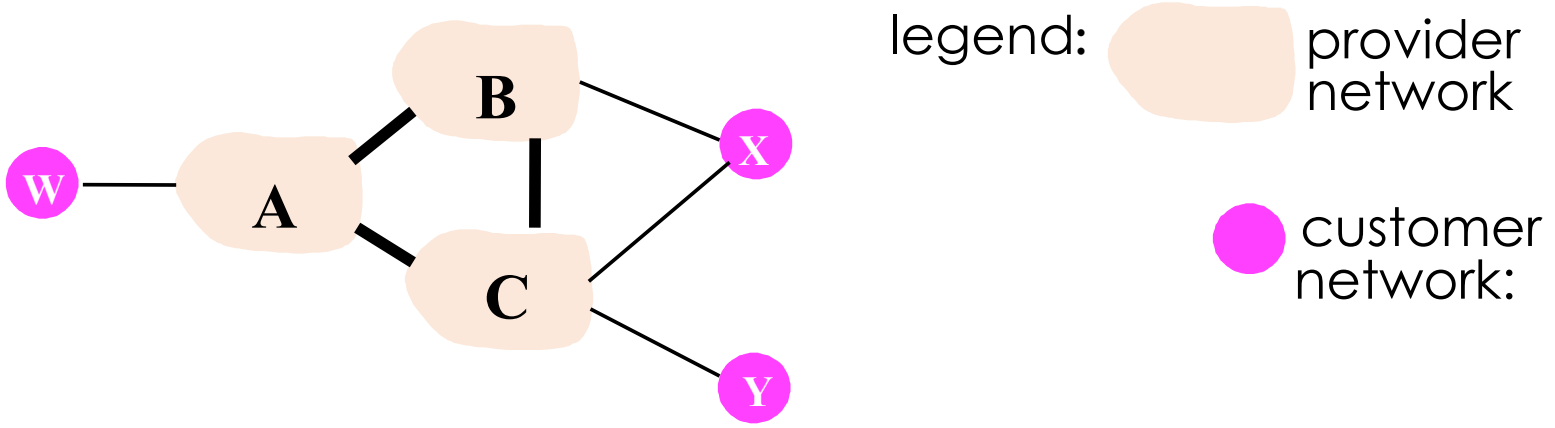
A BGP **route** includes *both* a **destination prefix** and some **attributes**.

- Key Attributes:
  - **AS-PATH**: List of ASs through which prefix advertisement has passed
  - **NEXT-HOP:** Router interface that begins AS-PATH
  - **Local Preference**: Weighting set by the network admin

Which routes are **advertised** will depend on which of the following?

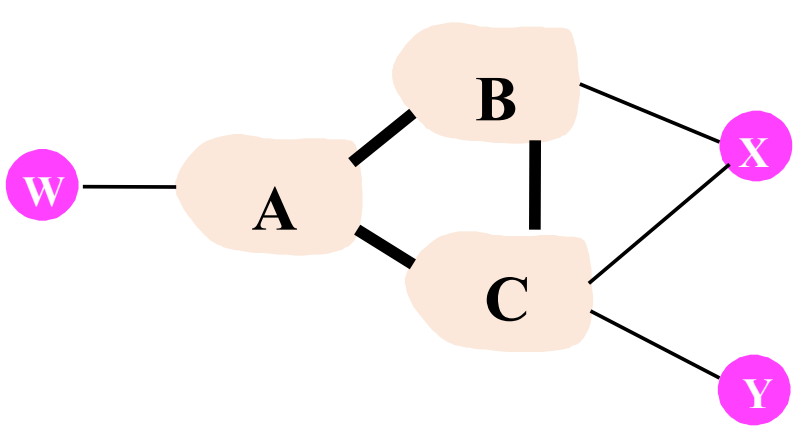
A.	Which ISPs have contractual agreements.
B.	The shortest path to a subnet/prefix.
C.	Which subnets are customers of an ISP.
D.	Exactly two of the above.
E.	All of the above (i.e. A, B, and C)

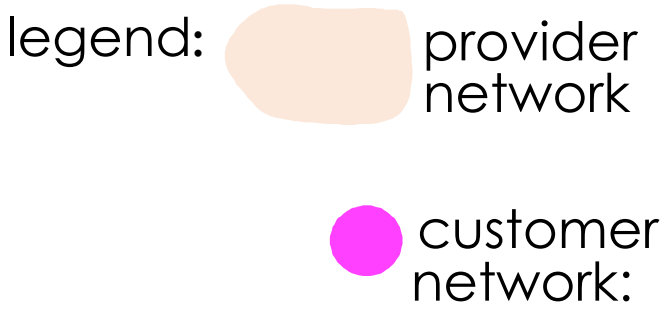
BGP allows AS admins to make policy decisions about routing.



- X is ***dual-homed***: attached to two networks
  - X does not want to route from B to C via X
  - .. so X will not advertise that it has a route to C

Should B advertise path B-A-W to C?





A.	**Yes**, it is required by BGP.
B.	**Yes**, it's good policy.
C.	**No**, it's bad policy.
D.	**No**, it isn't possible!

There are numerous reasons for separating Intra- from Inter-AS routing.

Inter-AS

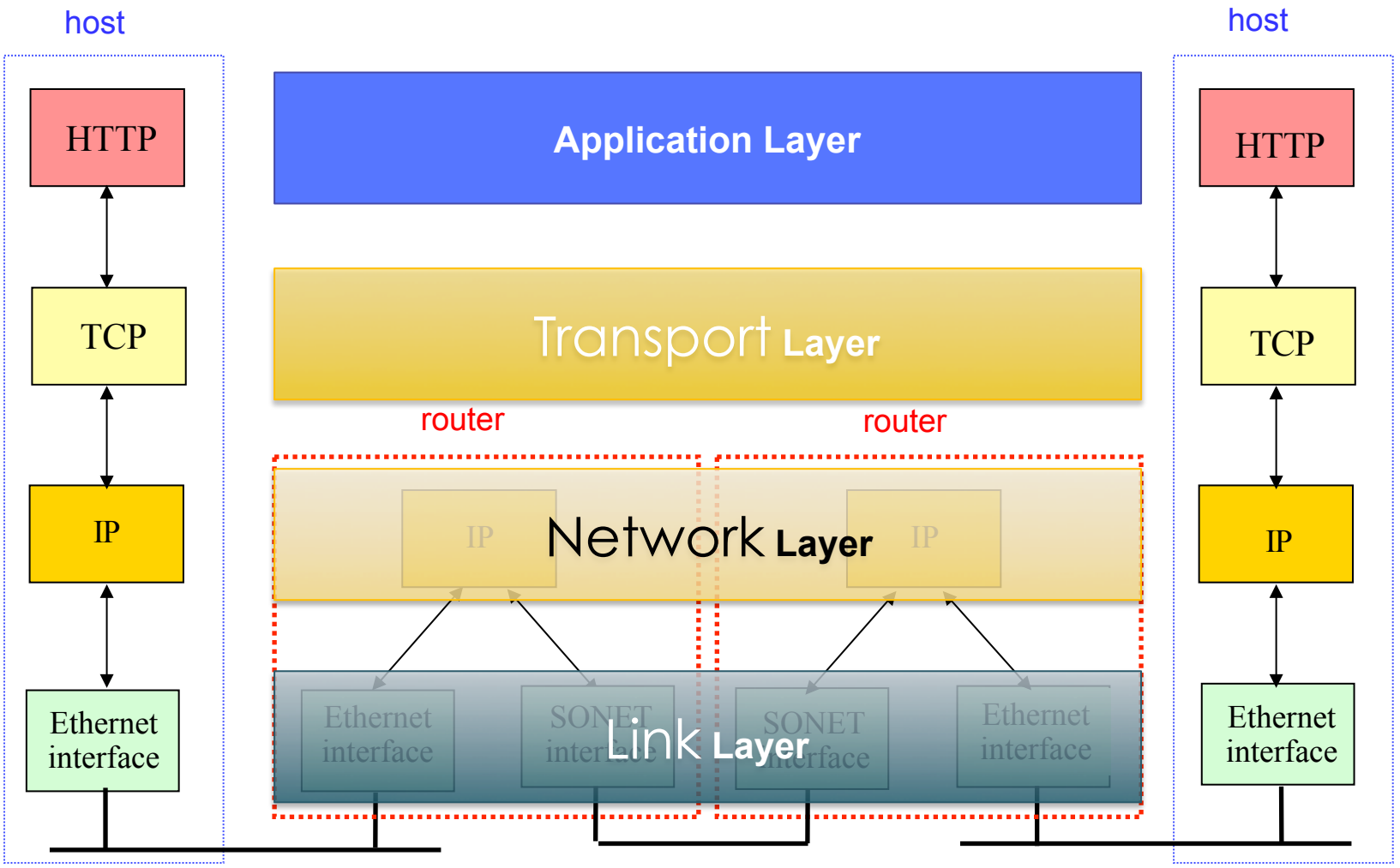
- Admin wants control over how its traffic is routed, who routes through its net.
- Huge in scale: complexity a big issue!
- Main concern is policy

Intra-AS

- Single admin, so no policy decisions needed.
- Limited in scale: AS can be split up if needed.
- Main concern is performance

LINK LAYER

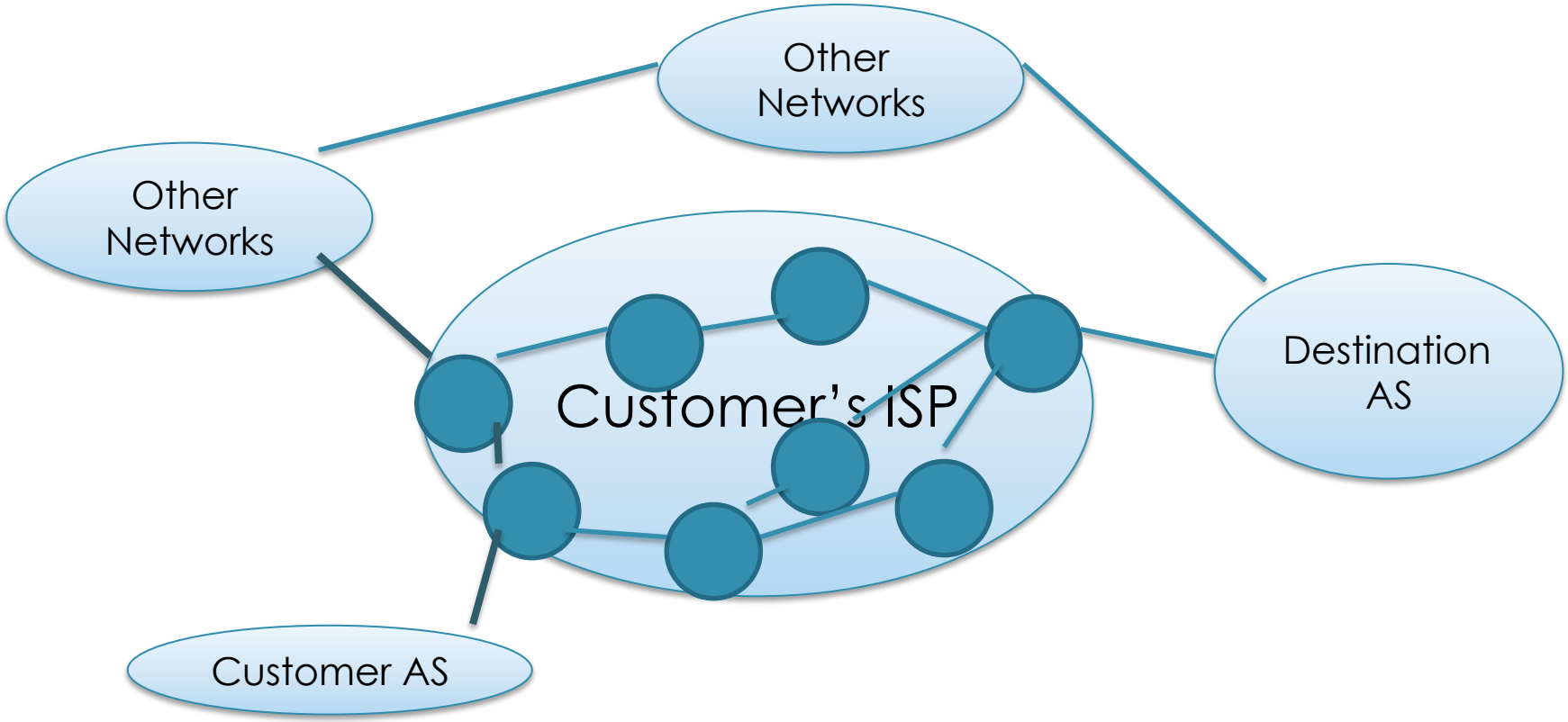
TCP/IP Protocol Stack



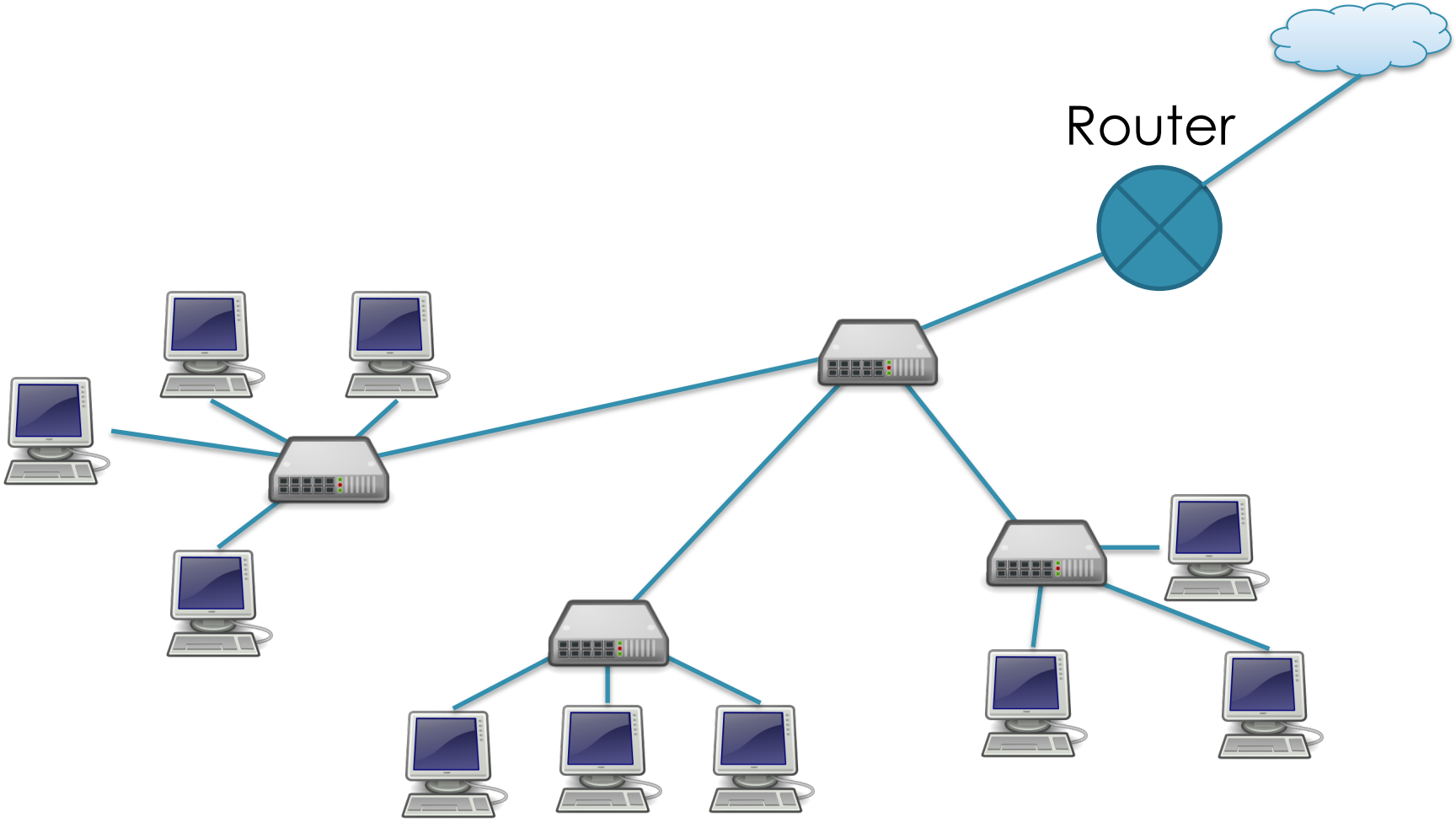
Discussion

How do the goals of the network and link layers compare to each other?

The network layer is tasked with determine routes between hosts.



The link layer is tasked with getting data from one node to the next.



There are many link-layer challenges, even for a single medium (e.g. Ethernet)

1. How do we format and signal data?
2. How do we handle contention?
3. How do we address endpoints?
4. How do we locate destinations?

Discussion

- *What are the major functions that the link layer needs to provide?*

The Link Layer provides three basic functions.

1. **Framing**: Dividing data into pieces that are sized for the network to handle.

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1. **Framing**: Dividing data into pieces that are sized for the network to handle.

- Data pieces:
  - Transport: Segments
  - Network: Datagrams (or packets)
  - Link: Frames
  - Physical: Bits