Plan

1. Computer Networks and the Internet
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ISPs and Internet backbones

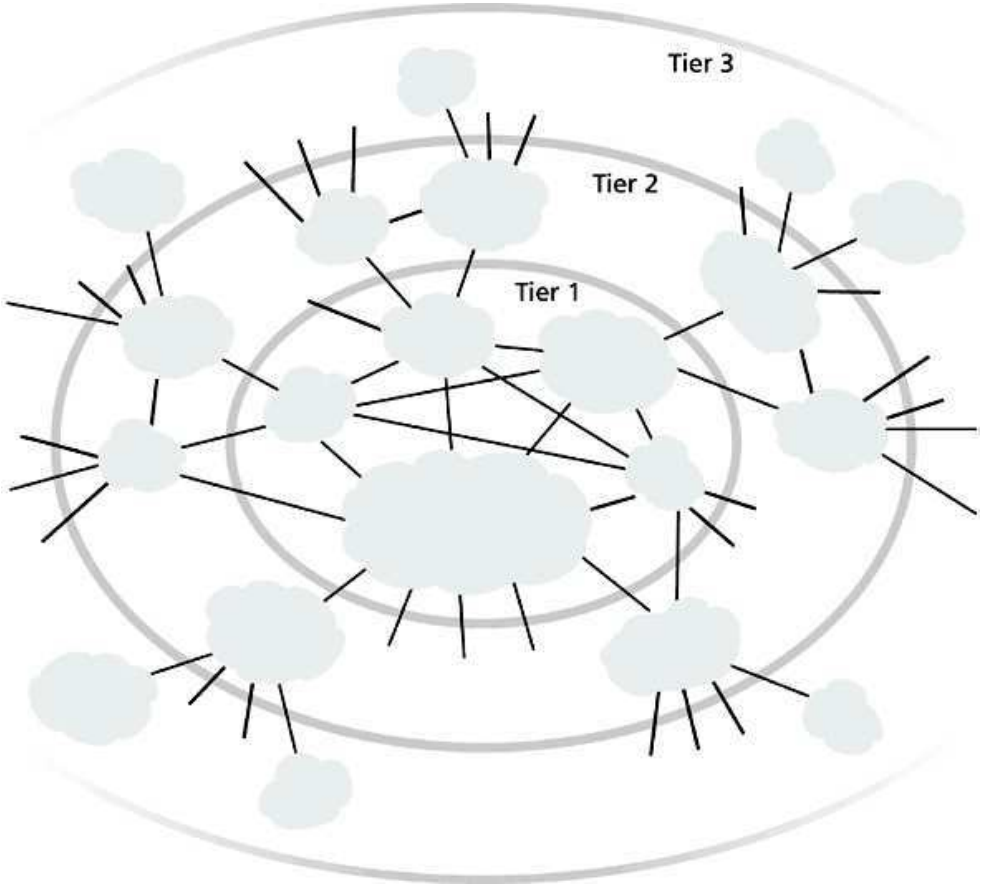
You may recall that ISPs are interconnected in a hierarchy. The most important level in this structure is the **backbone** or **tier-1 ISP** (level one is the top of the hierarchy).

Internet backbones are usual ISPs but

- its links speed is from 662 Mbps to 10 Gbps;
- it is directly connected to *each* other backbones;
- it is connected to a large number of tier-2 ISPs and other customers;
- it has an international coverage.

Hence their routers must be able to forward packets at a very high rate.

ISPs and Internet backbones (cont)



ISPs and Internet backbones (cont)

A tier-2 ISP has typically a regional or national coverage (depends on the size of the country, actually).

Thus, in order to reach a large portion of the Internet, a tier-2 ISP needs to route traffic through one of the backbones to which it si connected.

In this case, the tier-2 ISP is said to be a **customer** of the backbone and the backbone is said to be a **provider** to the tier-2 ISP.

Tier-2 ISP can be directly connected to each other. In general, when two ISPs are connected directly, they are said **to peer** each other.

Within an ISP, the points at which it peers another ISP are called **Points of Presence** (**POP**) and are a router or a group of routers.