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Chapter 6.4 Data Center Networking

6.4.1 Data Center Networks

- **Data center networks** has 10s to 100s of thousands of hosts, and they are often closely coupled in close proximity.
- e-businesses like Amazon, content-servers like YouTube or Microsoft, and search engines like Google are all examples of data center networks.
- Data center networks have challenges in running multiple applications, since each is serving a massive number of clients.
- It may also have trouble managing and balancing loads to avoid processing, networking, and data bottlenecks.
- A **load balancer**, in the application-layer, directs workload within the data center when external client requests are received. It also returns results to external clients so that data center internals are hidden from the client.
- Data center networks have rich interconnection among switches, with hosts typically being stacked in **racks**. The top of each rack *contains a switch*, the **Top of Rack (TOR) switch**, which interconnects hosts in the rack with each other and with other switches in the data center. This means that every host in the rack has a network interface card which connects to a TOR switch.
- With so much interconnection, throughput between racks is increased, since multiple routing paths are possible. Reliability is also increased because of this reason.
- See **slide 5-60** for a diagram showing the connection between switches and racks in a data center network.