

USE ROLLER LIMITING STRUCTURAL METHODS THAT INCREASE THE PROTECTION OF COMPUTER NETWORKS

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Now there's additional complexity. How can each device know whether incoming data is meant for them or for their neighbor? This simple network will need an addressing scheme.

Let's jump to six devices. There are actually many ways we can connect six devices together in a computer network:

A diagram of 5 different network topologies for networks that each have 6 computing devices.

- * The ring topology looks like a circle of connected devices, where each device is connected to two neighbors (one on either side).

- * The mesh topology looks like a circle with lines inside it, showing that every device is connected to every other device.

- * The star topology has a device at the center and then a connection between that center device and the other five devices.

- * The bus topology shows a center line with connections coming off the line for each device. No device is directly connected to another device, but they are all connected via the central line.

- * The tree topology starts with a single device at the top which branches to connect with two more devices. The left child device branches to connect with two more devices, while the right child only has one branch connecting it to a child device. There are three layers to the tree.

The top row shows the ring, mesh, and star topologies. The bottom row shows the bus and tree topologies.

Each of those arrangements is a different network topology, and each topology has its advantages and disadvantages.

Imagine the journey of a piece of data through one of those larger networks. What path will it take? When there are multiple paths, how does it know which path is best?

Once networks become larger, routing strategies become more important. There isn't a big difference between two stops and three stops in a path, but there is a big difference between 20 stops and 300 stops.

Whenever computing devices are connected together in a network, they need protocols to communicate with each other.

If the devices want to communicate over the Internet, they must use the Internet networking protocols. There are many networks that aren't connected to the Internet that also use the Internet protocols, due to how well designed they are for networking.

However, there are networks that use other protocols that are more suited for their task. Data center networks often opt to use networking protocols that take advantage of the incredibly closely knit architecture of the data center. That enables data centers to more efficiently run intensive algorithms, such as training a deep learning network.

As we go forward in this unit, we will focus specifically on the Internet protocols that power the majority of computer networks. In the future, networks might be using protocols that haven't even been invented yet. Fortunately, the concepts underlying the Internet protocols are relevant to all networked systems

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