CS 2204-01 Communications and Networking

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**Question: What is the fundamental difference between a Layer 2 switch and a Layer 3 router?**

The fundamental difference between a Layer 2 switch and a Layer 3 router is in the network layer in which they operate: Layer 2 switches operate at the data link layer (Layer 2 of the OSI model) and use MAC addresses to forward data packets within a local area network (LAN). This makes communication between devices more efficient. Layer 2 switches are primarily used to manage data forwarding between devices within a LAN.

Layer 3 routers, on the other hand, operate at the network layer (Layer 3 of the OSI model) and use IP addresses to route data packets between different networks. This allows communication between different networks or LANs, or across the entire Internet. Layer 3 routers are important because they allow communication between different network segments and are responsible for determining the best path for data packets to reach their destination.

In essence, Layer 2 switches facilitate communication between devices in a network, whereas Layer 3 routers are used to enable data forwarding and communication between different networks.

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