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DATA COMMUNICATION WEEK 11

### 1. ROUTING TOOL INVESTIGATIONS:

When I ran the `netstat -r` command on my computer, I viewed my local routing table, which shows how data travels between networks. One important entry is the **default route (0.0.0.0)**. This route is used when there is no specific match for a destination address. It usually points to my router or gateway, allowing my computer to access the internet and external networks. Another common entry is the **loopback address (127.0.0.1)**, which is used for internal communication within the computer itself. It helps test network software and ensure that the system's network functions are working correctly. Lastly, the **local network route (for example, 192.168.1.0)** shows how data is sent to other devices connected to the same local area network (LAN). Together, these entries determine how my computer efficiently sends data to local, internal, and external destinations.

### 2. Troubleshooting Guide:

In this small office network, the **Sales** and **Engineering** departments each have their own **switch**, both connected to a **router** that handles inter-department communication. If a user in Sales cannot access a server in Engineering, follow these troubleshooting steps:

1. **Check IP Configuration:** Verify that the Sales user and the Engineering server both have correct IP addresses, subnet masks, and default gateways. Each department should be on a different subnet (e.g., Sales: 192.168.1.0/24, Engineering: 192.168.2.0/24). Ensure there are no duplicate IP addresses.
2. **Ping Tests:** From the Sales user's computer, ping the router's Sales interface. If successful, ping the router's Engineering interface, then the Engineering server's IP address to identify where communication fails.
3. **Switch Connection Verification:** Check that both devices are properly connected to their respective switches and that the switch ports are active and not in an error or disabled state.
4. **Router Configuration:** Confirm that the router has correct static routes or is configured for inter-VLAN routing, allowing traffic between subnets.
5. **Firewall or ACLs:** Ensure no access control lists (ACLs) or firewalls are blocking traffic between the two networks.