**MONROE WAREHOUSE NETWOR TOPOLOGY**

**Network Components**

1. **Routers**:
   * **Router27** and **Router28**: Interconnected via serial links and serve as core devices for routing traffic across networks.
2. **Switches**:
   * **2960-24TT Switches**: Layer 2 devices used to interconnect end devices in each subnet. They facilitate communication within the local LANs.
   * Each switch connects to multiple PCs and may be uplinked to a router for inter-VLAN or external communication.
3. **End Devices**:
   * **PCs**: Represent endpoints in various LANs. Each PC is connected to a switch via FastEthernet ports.

**Key Features of the Topology**

1. **Core Routing**:
   * The routers (Router27, Router28) are configured with serial links for WAN connectivity.
   * Redundant serial links (depicted in red) ensure failover and high availability between routers.
2. **Local Area Networks (LANs)**:
   * Multiple LANs are established, each connected to a switch.
   * PCs in the LAN are assigned to individual subnets, providing isolation and organization.
3. **Inter-VLAN Routing**:
   * Traffic between subnets is routed through the connected routers.
4. **Redundancy**:
   * The presence of multiple connections between routers ensures fault tolerance.

**Configuration Details**

1. **IP Addressing**:
   * Subnets are assigned per LAN for efficient traffic management and segmentation.
   * Routers use serial interfaces with appropriate subnet masks for inter-router communication.
2. **Routing Protocols**:
   * Dynamic routing protocols such as **OSPF** or **EIGRP** (to be configured) can be used for efficient routing between networks.
   * Static routes may also be implemented for smaller setups.
3. **Switch Configuration**:
   * **VLANs** are configured on switches to segregate traffic.
   * **Spanning Tree Protocol (STP)** can be implemented to prevent loops.
4. **Link Speeds**:
   * FastEthernet (100 Mbps) links for LAN connections.
   * Serial links for WAN interconnection between routers.

**Testing and Validation**

1. **Ping Tests**:
   * Verify connectivity between end devices in the same and different subnets.
   * Test redundancy by disabling one serial link and checking failover.
2. **Routing Table Verification**:
   * Check routing tables on the routers to ensure proper propagation of routes.
3. **Bandwidth and Latency**:
   * Measure the performance of links using tools like Packet Tracer's simulation mode.

**Future Improvements**

1. **Scalability**:
   * Introduce additional routers or switches to expand the network.
   * Configure DHCP servers for dynamic IP assignment.
2. **Security**:
   * Implement Access Control Lists (ACLs) on routers.
   * Enable switch port security to restrict access.
3. **Monitoring**:
   * **Network Components**
   * **Routers**:
   * **Router27**: Core router with multiple serial and gigabit Ethernet connections.
   * **Router28**: Connected to Router27 via redundant serial links, serving as a backup path for routing traffic.
   * **Switches**:
   * **2960-24TT Switches**: Layer 2 devices connecting PCs in each LAN.
   * **End Devices**:
   * **PCs (PC0 to PC19)**: Each connected to a switch, representing the endpoints in various subnets.
   * **IP Addressing Scheme**
   * **Network Subnets**
   * **Subnet 1**: 192.168.1.0/24
   * Devices: PCs connected to Switch0.
   * Default Gateway: 192.168.1.1.
   * **Subnet 2**: 192.168.2.0/24
   * Devices: PCs connected to Switch1.
   * Default Gateway: 192.168.2.1.
   * **Subnet 3**: 192.168.3.0/24
   * Devices: PCs connected to Switch2.
   * Default Gateway: 192.168.3.1.
   * **Router Interfaces**
   * **Router27**:
   * G0/0: 192.168.1.1/24 (Connects to Switch0).
   * S0/0/0: 10.0.0.1/30 (Serial link to Router28).
   * S0/0/1: 10.0.0.5/30 (Backup serial link to Router28).
   * **Router28**:
   * G0/0: 192.168.2.1/24 (Connects to Switch1).
   * S0/0/0: 10.0.0.2/30 (Serial link to Router27).
   * S0/0/1: 10.0.0.6/30 (Backup serial link to Router27).
   * **Device Configurations**
   * **Router27 Configuration**
   * # Assign IP addresses to interfaces
   * interface G0/0
   * ip address 192.168.1.1 255.255.255.0
   * no shutdown
   * interface S0/0/0
   * ip address 10.0.0.1 255.255.255.252
   * clock rate 64000
   * no shutdown
   * interface S0/0/1
   * ip address 10.0.0.5 255.255.255.252
   * clock rate 64000
   * no shutdown
   * # Enable routing protocol (e.g., OSPF)
   * router ospf 1
   * network 192.168.1.0 0.0.0.255 area 0
   * network 10.0.0.0 0.0.0.3 area 0
   * network 10.0.0.4 0.0.0.3 area 0
   * **Router28 Configuration**
   * bash
   * # Assign IP addresses to interfaces
   * interface G0/0
   * ip address 192.168.2.1 255.255.255.0
   * no shutdown
   * interface S0/0/0
   * ip address 10.0.0.2 255.255.255.252
   * no shutdown
   * interface S0/0/1
   * ip address 10.0.0.6 255.255.255.252
   * no shutdown
   * # Enable routing protocol (e.g., OSPF)
   * router ospf 1
   * network 192.168.2.0 0.0.0.255 area 0
   * network 10.0.0.0 0.0.0.3 area 0
   * network 10.0.0.4 0.0.0.3 area 0
   * Use tools like Wireshark for real-time network monitoring.