**Network Devices Overview**

**🔌 Hub**

* **Function**: Connects multiple devices in a network, broadcasting data to all ports.
* **OSI Layer**: Layer 1 (Physical Layer).
* **Collision Domain**: Single; all devices share the same domain.
* **Duplex Mode**: Half-duplex; data transmission in one direction at a time.
* **Bandwidth**: Shared among all ports, leading to potential inefficiencies.
* **Security**: Low; data is sent to all connected devices, posing risks.
* **Status**: Largely obsolete; replaced by switches in modern networks.

**🌉 Bridge**

* **Function**: Connects and filters traffic between two network segments.
* **OSI Layer**: Layer 2 (Data Link Layer).
* **Collision Domains**: Two; each segment has its own domain.
* **Ports**: Typically fewer; connects two segments.
* **Security**: Improved over hubs; filters traffic based on MAC addresses.
* **Status**: Less common; functionality integrated into modern switches.

**🔀 Switch**

* **Function**: Connects multiple devices, forwarding data only to the destination port.
* **OSI Layer**: Layer 2 (Data Link Layer); some operate at Layer 3.
* **Collision Domains**: Multiple; each port has its own domain.
* **Duplex Mode**: Full-duplex; simultaneous two-way communication.
* **Bandwidth**: Dedicated per port; efficient data handling.
* **Security**: Enhanced; supports features like VLANs and port security.
* **Status**: Widely used in both home and enterprise networks.

**🌐 Router**

* **Function**: Routes data between different networks; connects LANs to WANs.
* **OSI Layer**: Layer 3 (Network Layer).
* **Ports**: Fewer compared to switches; focuses on inter-network connections.
* **Capabilities**: Assigns IP addresses, manages traffic, and provides security features.
* **Status**: Essential for internet connectivity and network traffic management.