

UNDERSTANDING THE DIFFERENCE BETWEEN A ROUTER AND A SWITCH

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SUST

INTRODUCTION

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Key Network Devices: Router vs. Switch

Router: Connects different networks and directs data between them

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Switch: Connects devices within a single network, enabling communication between them.

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Why the Difference Matters: Understanding their roles helps in designing and troubleshooting network setups

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WHAT IS A ROUTER?

Router Overview:

- **Function:** Directs data packets between different networks (Layer 3 - Network Layer).
- **Primary Role:** Routes traffic based on IP addresses.
- **Key Features:**
 - Routes between different IP networks (e.g., LAN to WAN).
 - Assigns IP addresses using DHCP.
 - Supports advanced features like NAT, VPN, and firewall security.

Example: Internet router connecting a home network to the internet.



WHAT IS SWITCH

Switch Overview:

- **Function:** Connects devices within the same network and forwards data using MAC addresses (Layer 2 - Data Link Layer).
- **Primary Role:** Facilitates communication within a Local Area Network (LAN).
- **Key Features:**
 - Operates within a single network (LAN).
 - Uses MAC addresses for data forwarding.
 - Supports VLANs for network segmentation.

Example: Network switch connecting computers, printers, and servers within an office.



ROUTER VS. SWITCH: KEY DIFFERENCES

Feature	Router	Switch
Function	Routes traffic between different networks (Layer 3)	Connects devices within the same network (Layer 2)
Addressing	Uses IP addresses	Uses MAC addresses
Role in Network	Inter-network communication (LAN to WAN)	Intra-network communication (devices within a LAN)
Ports	Typically fewer ports, more focused on connections between networks	Typically more ports for connecting multiple devices in a LAN
Security Features	Includes NAT, VPN, Firewall features	Basic security with VLANs and ACLs



THANK YOU