

# Common Networking Hardware

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# Overview



**Hub**

**Switch**

**Routers**

**Access Point**

**Cable / DSL Modem**

**Optical Network Terminal**

**Firewall**

**Network Interface Card (NIC)**

**Patch Panel**

**Power over Ethernet (PoE)**

**Software-defined networking**

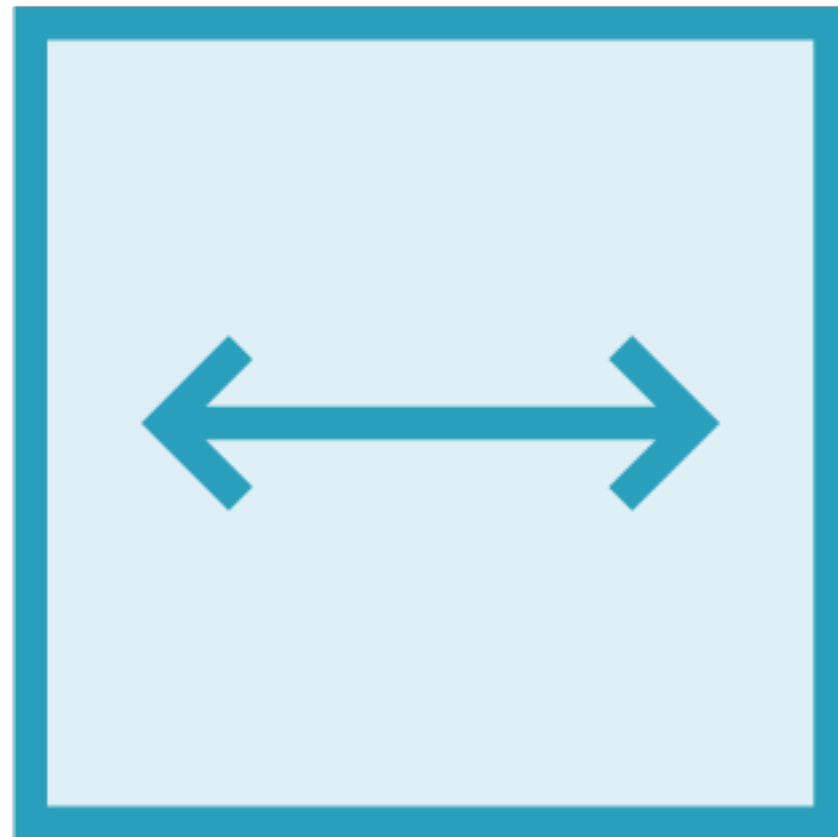


# Networking Hardware Devices

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# Hub



**One of the first devices to connect networks together**

**Often called Multiport repeater**

- No intelligence in where signals are transmitted**

**Operating at half-duplex**

- Less efficient as traffic increases**

**Communicating at 10/100Mbit/s**

**Legacy device**

# Switch

**More intelligent than a hub**

**Forwards traffic to the right interface  
based on destination**

**ASIC (Application Specific integrated  
circuit)**

**Vary in size depending on intended use**

**Two categories**

**Unmanaged**

**Managed**



# Routers



**Used to route traffic from one subnet to another**

- **Makes forwarding decisions based on destination IP**
- **Uses routing table inside the device**

**Connects multiple types of networks together**

- **Ex: a LAN and a WAN connected in the same router**

**A router inside of a switch is called a layer 3 switch**



# Access Point

**Bridge that connects wired and wireless networks**

**A wireless router is a wireless access point and router in one**

**Smart forwarding of traffic**



# Cable / DSL Modem



**Stands for modulator/demodulator**

**Converts signal between analog and digital**

**First used standard phone line**

- Remember dial up!**

**Cable modems are still used today**

- DSL is on its way out**

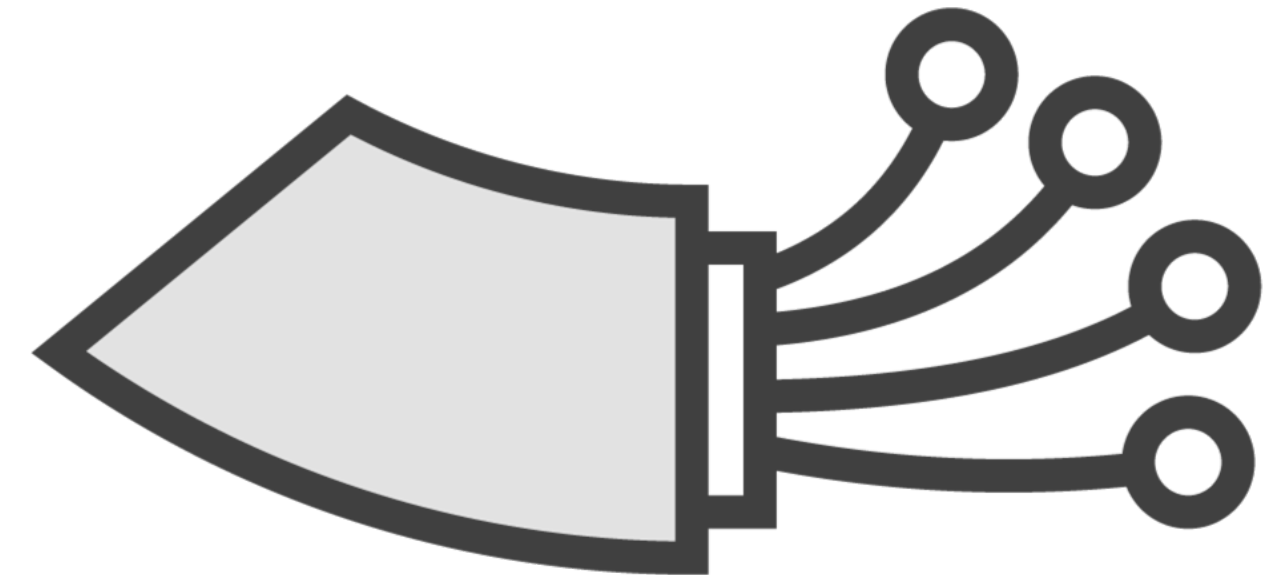


# Optical Network Terminal (ONT)

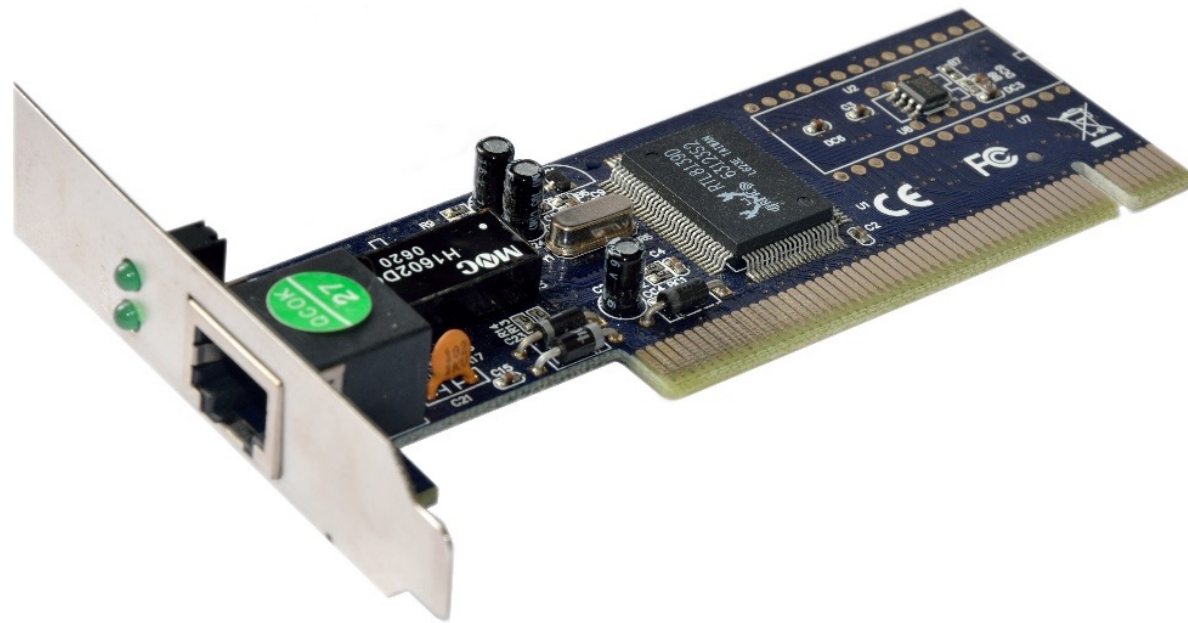
**ONT are just like a Cable modem but for fiber technology**

**Converts signal from optical to electrical and vice versa**

**ONT sits between your ISP and your ethernet devices**



# Network Interface Card (NIC)



**Connecting a device to the network**

- **Picture shows a desktop card**
- **A smartphone also contains a NIC but smaller**

# Patch Panel

**Used for larger networks**

**Endpoint for connecting from a person's desk to the switch/router**

**Contains no intelligent circuitry**





# Power over Ethernet (PoE)



**Sending power over an ethernet connection**

**Common for security cameras, VoIP telephones**

**Capability often found in switch**

- **Power over ethernet injector can add capability**
  - **Placed between switch and end device**

**Multiple PoE standards based on how much power it can deliver**

# PoE Standards

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PoE++	IEEE 802.3bt (Type 4)	71.3 W	Laptops, screens





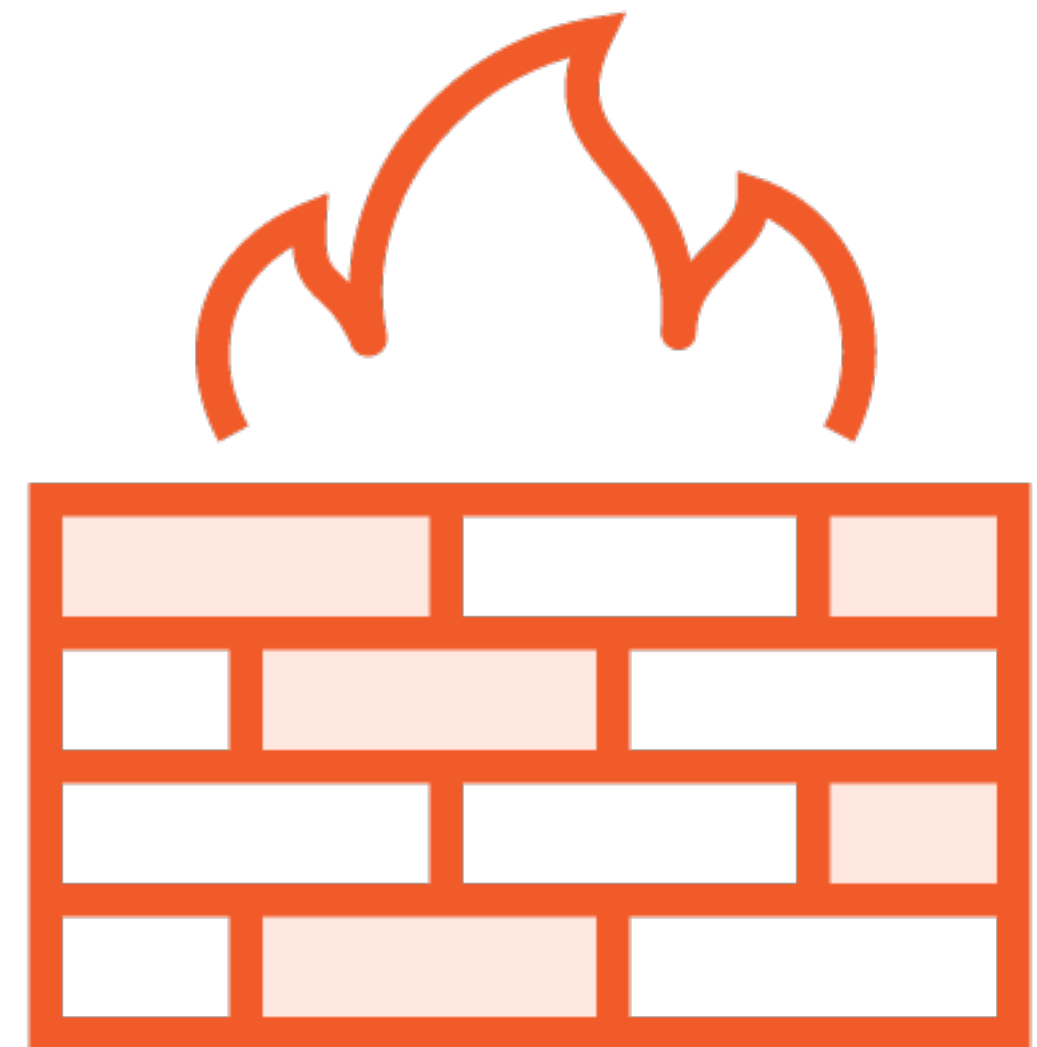
# Firewall

On router or dedicated hardware

Filters traffic

By port number

By application



# Software-Defined Networking (SDN)



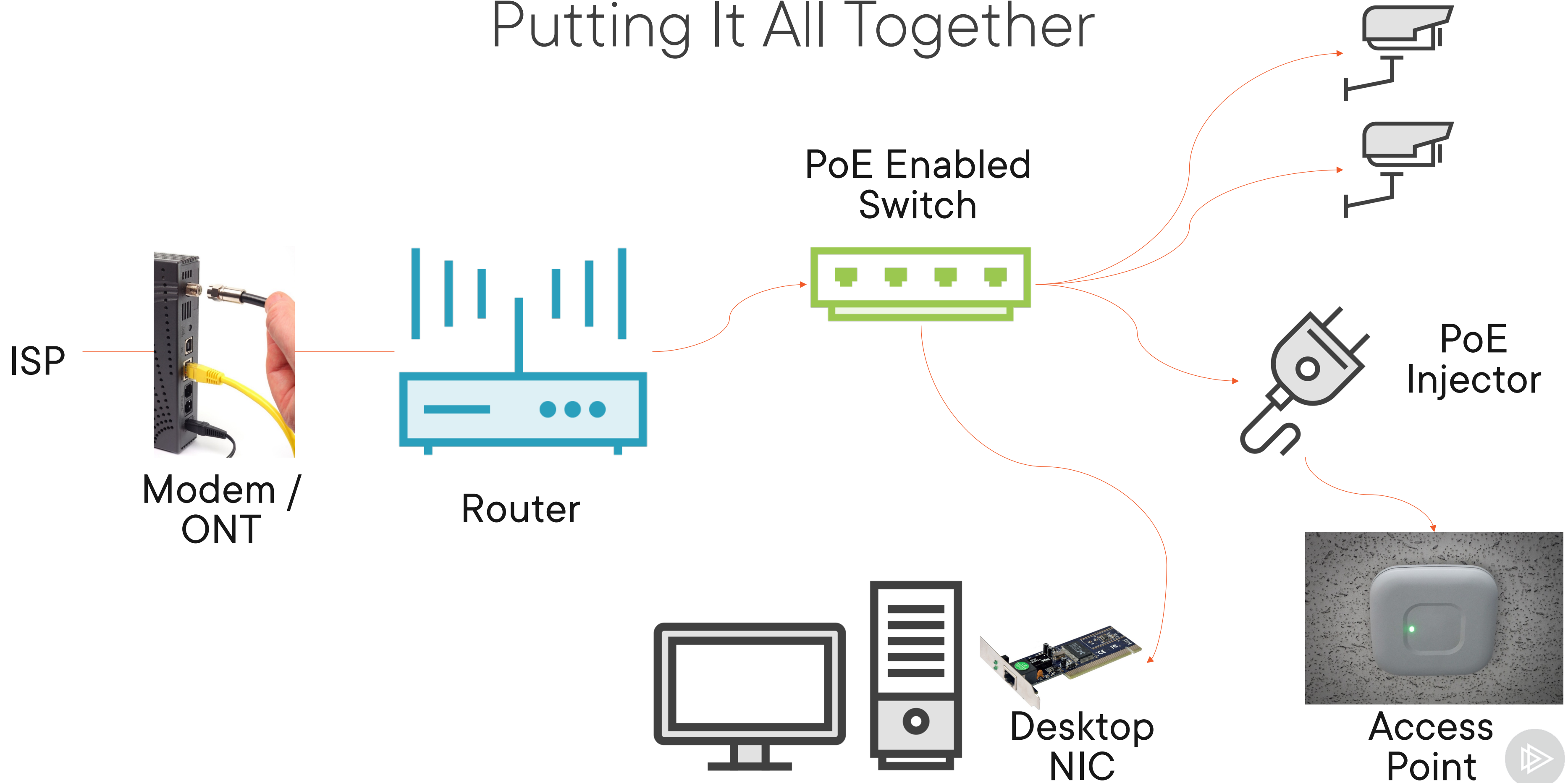
**Newer approach to managing networking hardware**

**Uses software-based controllers & APIs to communicate with the underlying hardware**

**Multiple benefits:**

- **Control the entire network via a single pane of glass**
- **Control hardware from multiple vendors from a central console**
  - **Instead of controlling each hardware piece individually**

# Putting It All Together



# Conclusion



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- Switch
- Injector
- Standards

**Firewall**

**Software-defined networking**



Up Next:

Network Types and Internet Connection Types

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