How does the Network work?

Understanding Network Topology

How Does a Modern Network Work?

Whether it's a home, office, farm, hotel or large estate, most networks follow the same basic structure.

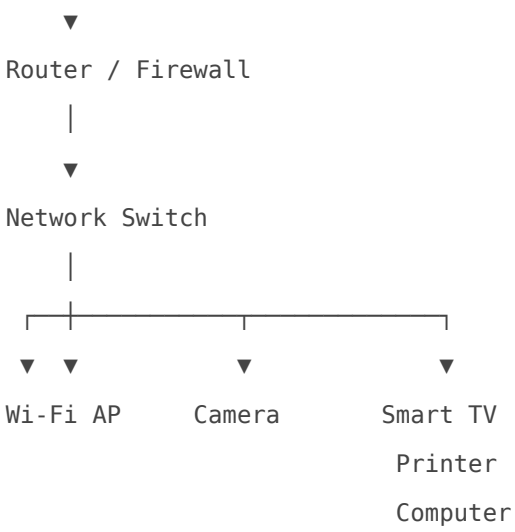
Think of your network like a water system:

- The internet is the water supply.
- The router is the main stopcock.
- Switches are the pipework.
- Wireless access points are taps around the building.
- Devices are the people using the water.

Each component has a specific role.

A Typical Network Layout

```
Internet
    |
    ▼
Modem / ONT
    |
```



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1. Internet Connection

The internet connection enters the property through a service provided by:

- Openreach
- CityFibre
- Virgin Media
- Starlink
- Mobile Broadband

This is simply the connection between your property and the outside world.

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2. Modem or ONT

The modem or ONT converts the provider's signal into a standard network connection.

Examples:

- Openreach Fibre → ONT
- Virgin Media → Cable Modem
- Starlink → Starlink Router/Adapter

The ONT does **not** manage your network.

Its job is simply to hand over the internet connection.

Think of it as the water meter outside your house.

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3. Router / Firewall

The router is the brains of the network.

Its responsibilities include:

✓ Connecting your network to the internet
✓ Providing security and firewall protection
✓ Managing IP addresses
✓ Controlling traffic between devices
✓ Managing VLANs and network segregation

Without a router, devices cannot communicate with the internet.

Examples:

- UniFi Dream Machine
- DrayTek Router
- Firewalla
- pfSense
- ISP Router

Think of the router as the receptionist controlling who enters and leaves the building.

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4. Network Switch

A switch expands the number of available network connections.

For example:

A router may have 4 ports.

A switch may provide:

- 8 ports
- 16 ports
- 24 ports
- 48 ports

Switches allow multiple devices to communicate simultaneously.

Typical devices connected to switches:

- Computers
- Cameras
- Wi-Fi Access Points
- Printers
- Smart TVs
- Door Access Systems

Think of the switch as a distribution hub.

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5. Wireless Access Points

Access Points provide wireless coverage.

Many people mistakenly call these "routers".

A Wi-Fi Access Point:

✓ Provides wireless coverage
✓ Connects wireless devices to the network

A Wi-Fi Access Point does **not**:

✗ Provide internet by itself
✗ Manage security
✗ Perform routing

Examples:

- UniFi U7 Pro
- UniFi U7 Outdoor
- UniFi U6 Mesh
- Aruba Access Points
- Cisco Access Points

Think of access points as Wi-Fi transmitters.

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6. End Devices

These are the devices that actually use the network.

Examples:

- Phones
- Tablets
- Laptops
- Smart TVs
- CCTV Cameras
- Printers
- Gate Controllers
- Smart Home Systems

Each device receives an IP address from the router and communicates through the switch and access points.

Example: Viewing a Camera on Your Phone

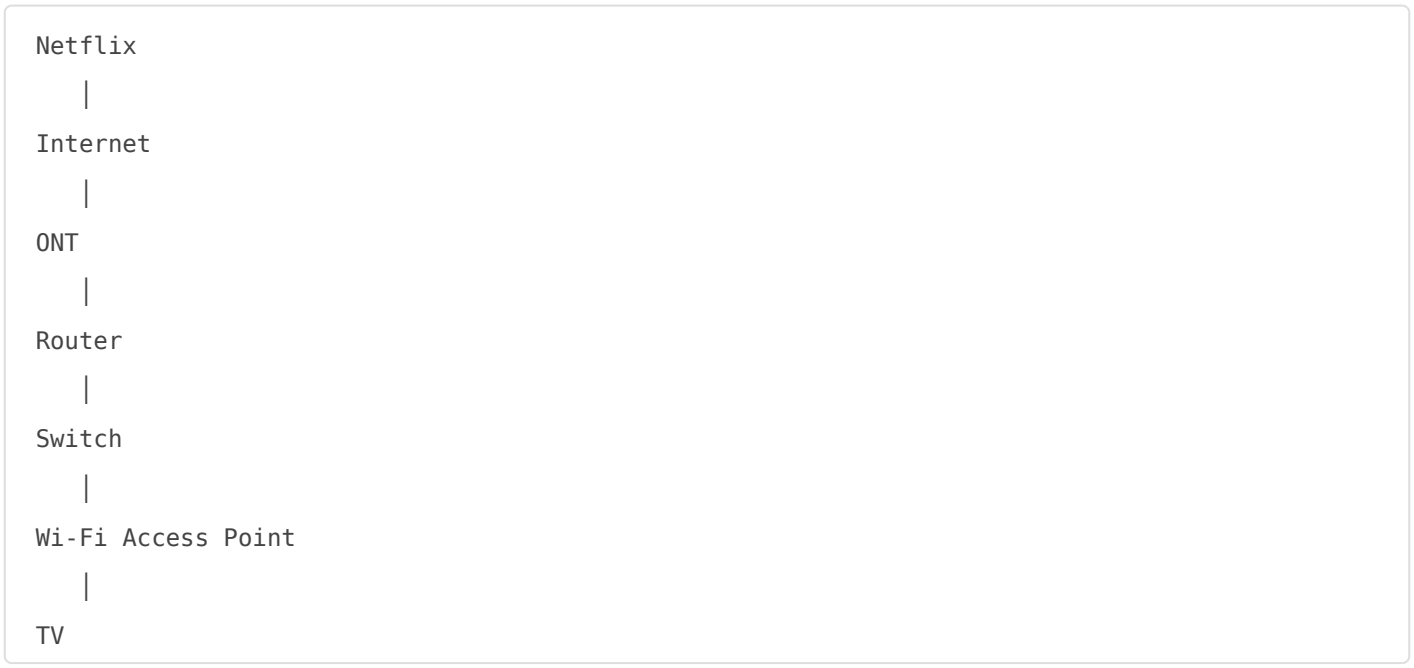
When viewing a security camera:

```
Phone
  |
Wi-Fi Access Point
  |
Network Switch
  |
Network Video Recorder
```

The traffic never needs to leave your property.

The router is not heavily involved because everything is local.

Example: Watching Netflix



The router manages the connection between your property and Netflix.

What About Large Properties?

Modern estates often use multiple switches and access points.

This is known as a hierarchical network design.

Benefits:

✓ Better performance
✓ Easier troubleshooting
✓ Greater reliability
✓ Easier expansion

The Automated Integrations Approach

For reliability and future growth, we typically design networks using:

1. ISP Connection / ONT
2. Enterprise Router (UniFi Dream Machine)
3. Core Managed Switch
4. Dedicated PoE Switching
5. Multiple Access Points
6. Structured Cabling
7. CCTV & Access Control Integration

This ensures every device has a clear path through the network while maintaining security, performance and reliability.

In Simple Terms

A modern network usually follows this path:

```
Internet
    |
Modem / ONT
    |
Router
    |
Switch
    |
Wi-Fi Access Point
    |
Device
```

Each component performs a different job, and together they create a fast, secure and reliable network for all devices within the property.

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