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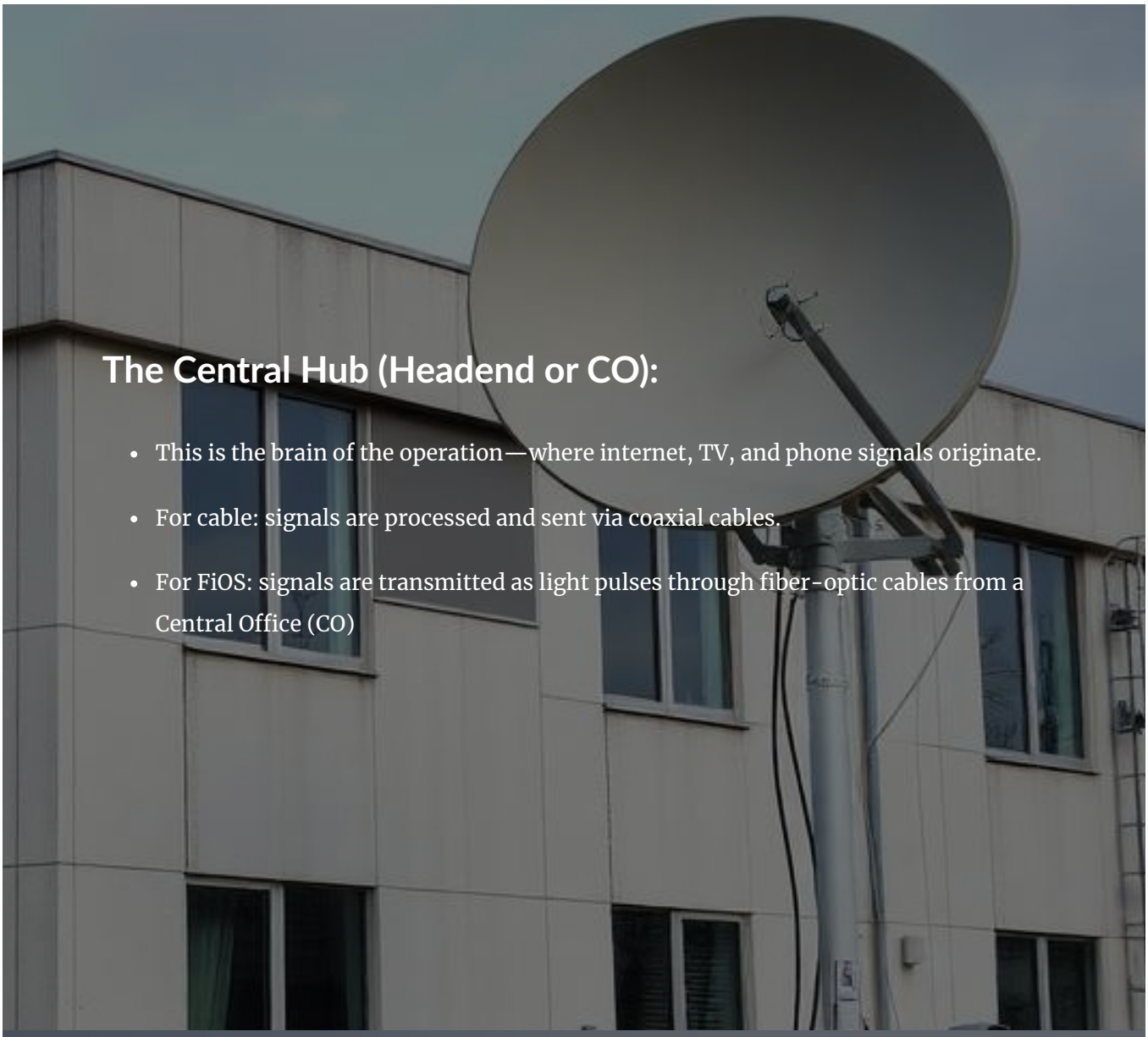
Cable & FiOS Network Overview

Discover the backbone of modern connectivity. Learn how Cable and FiOS networks power seamless communication and entertainment in today's digital world.

Lesson 1: The Backbone of Connectivity — Central Hubs & Network Infrastructure

In this lesson, learners will uncover the foundational architecture behind cable and FiOS networks. We'll explore how signals originate at central hubs—like headends and central offices—and travel through a web of fiber-optic and coaxial lines. By understanding the roles of distribution nodes, splitters, and amplifiers, learners will gain insight into how large-scale connectivity is engineered to serve entire communities.

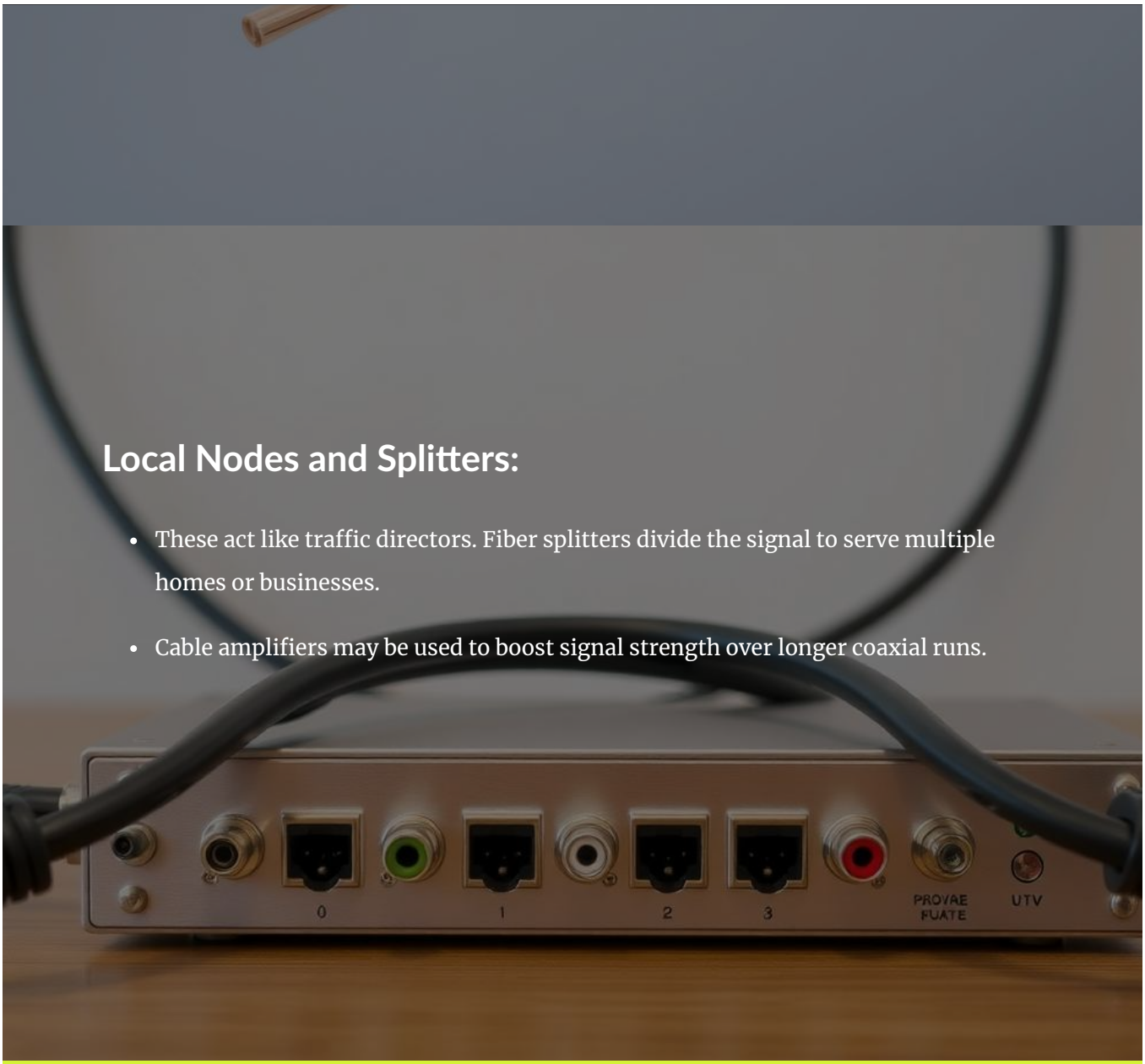


The Central Hub (Headend or CO):

- This is the brain of the operation—where internet, TV, and phone signals originate.
- For cable: signals are processed and sent via coaxial cables.
- For FiOS: signals are transmitted as light pulses through fiber-optic cables from a Central Office (CO)

Distribution Network:

- **Cable:** Uses a hybrid fiber-coaxial (HFC) system. Fiber runs to neighborhood nodes, then coaxial cables carry signals the rest of the way.
- **FiOS:** Pure fiber-optic lines run all the way to the premises (FTTP—Fiber to the Premises), offering higher speeds and reliability



Local Nodes and Splitters:

- These act like traffic directors. Fiber splitters divide the signal to serve multiple homes or businesses.
- Cable amplifiers may be used to boost signal strength over longer coaxial runs.

Flashcards are a great way to learn! Simply click on any card to reveal its hidden description. Each card provides a concise explanation or detail to help reinforce your understanding. Tap or click to explore and discover more!

What is the Central Hub?

The Central Hub, or Headend/CO, is the brain of operations where internet, TV, and phone signals originate.

Role of the Central Hub in cable?

For cable, the Central Hub processes signals and sends them via coaxial cables to end users.

Role of the Central Hub in FiOS?

For FiOS, the Central Hub transmits signals as light pulses through fiber-optic cables from a Central Office (CO).

What is a Headend?

A Headend is another term for the Central Hub, managing signal processing and distribution for cable systems.

What is a Central Office (CO)?

A Central Office (CO) is the hub for FiOS systems, transmitting data as light pulses via fiber-optic cables.

Difference between cable and FiOS hubs?

Cable hubs use coaxial cables for signal transmission, while FiOS hubs use fiber-optic cables and light pulses.

What is the role of a central hub in a cable or FiOS network?

- To store customer data
- To originate and distribute service signals
- To power home devices
- To manage billing systems

SUBMIT

Which type of cable carries light signals in a FiOS network?

- ◯ Coaxial cable
- ◯ Twisted pair cable
- ◯ Fiber-optic cable
- ◯ HDMI cable

SUBMIT

What component splits fiber signals to serve multiple homes?

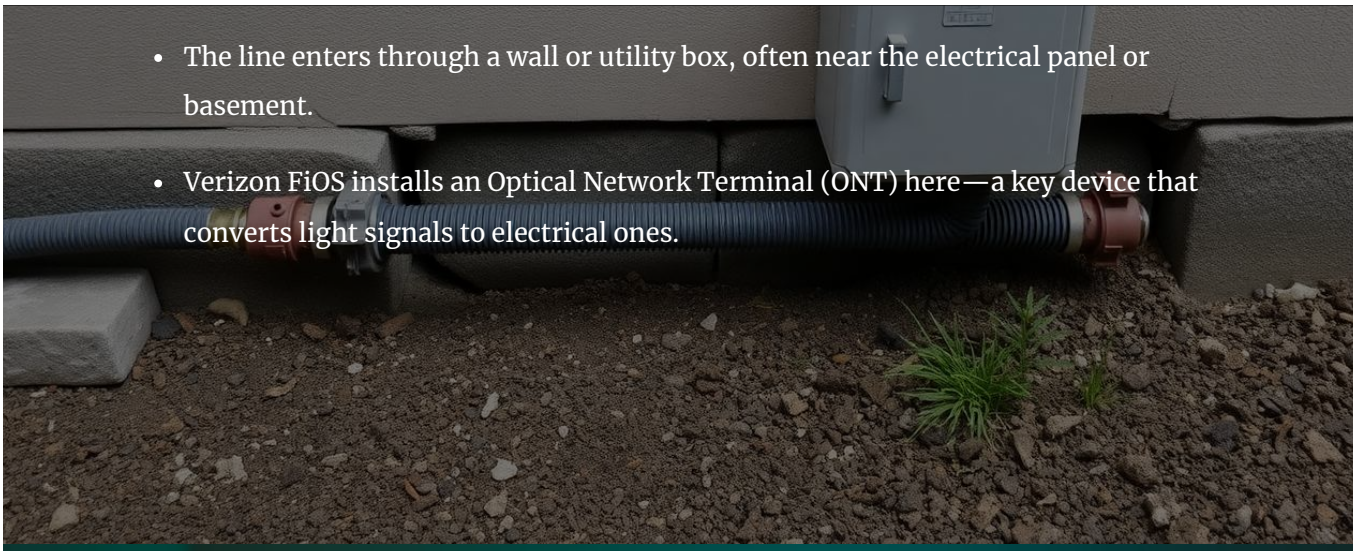
- ◯ Amplifier
- ◯ Splitter
- ◯ Router

- ◯ Modem

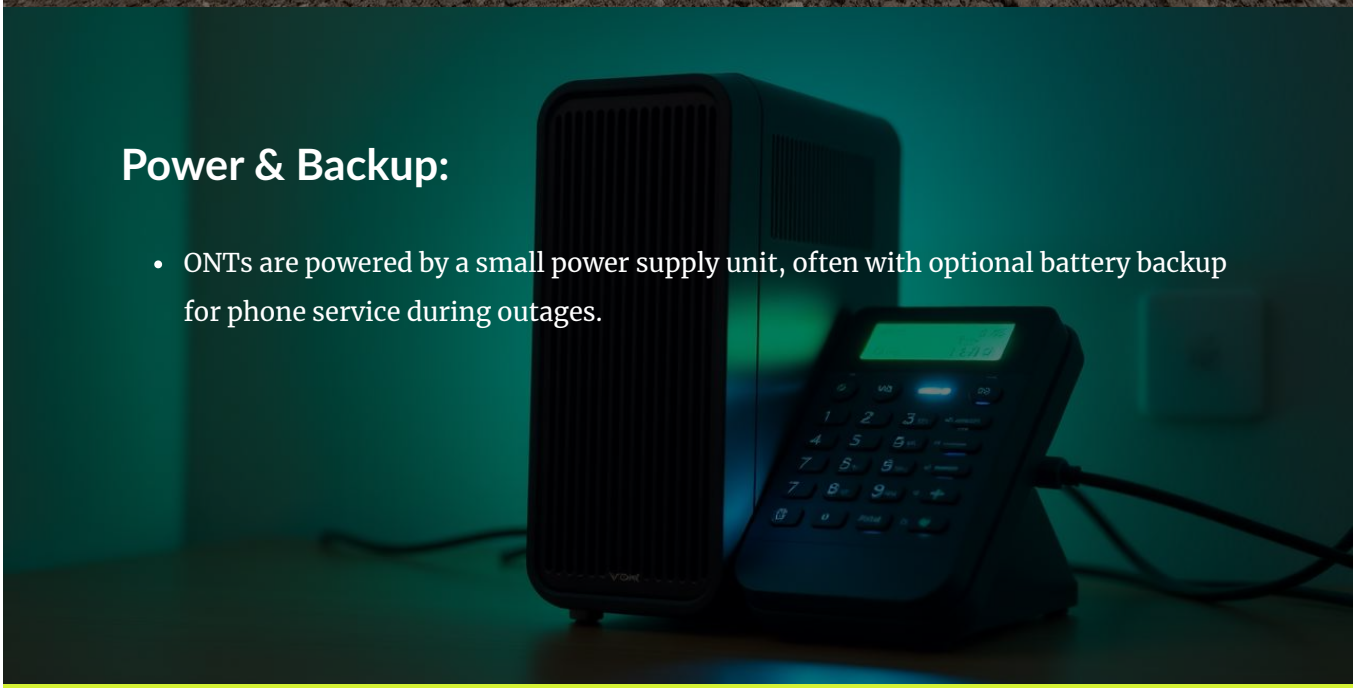
SUBMIT

Lesson 2: The Last Mile — Connecting Homes & Businesses

This lesson zooms in on the "last mile" of network delivery—the critical stretch where infrastructure meets individual addresses. Learners will follow the path of fiber and coaxial lines as they're routed from neighborhood nodes to homes and businesses, discovering how drop lines, ONTs, and entry points bring high-speed service to the doorstep. We'll demystify the physical setup and highlight the differences between cable and FiOS installations.



- The line enters through a wall or utility box, often near the electrical panel or basement.
- Verizon FiOS installs an Optical Network Terminal (ONT) here—a key device that converts light signals to electrical ones.



Power & Backup:

- ONTs are powered by a small power supply unit, often with optional battery backup for phone service during outages.

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What is a Drop Line?

A Drop Line is a fiber or coaxial line run from the nearest node or pole to the building.

FiOS vs Cable Drop Line?

FiOS uses a dedicated fiber strand, while cable systems use a coaxial drop line for connectivity.

What is the Entry Point?

The Entry Point is where the line enters the building, often near the electrical panel or basement.

Role of the ONT?

The Optical Network Terminal (ONT) converts light signals to electrical ones for FiOS systems.

ONT Power Supply?

ONTs are powered by a small unit, often with optional battery backup for phone service during outages.

Why is Backup Important?

Battery backup ensures phone service remains available during power outages for FiOS systems.

Which type of line is typically used for cable service delivery to homes?

- Fiber-optic
- Twisted pair
- Coaxial
- HDMI

SUBMIT

What device is installed at the premises to convert fiber signals?

- Router
- ONT (Optical Network Terminal)
- Set-top box
- Amplifier

SUBMIT

What is the “last mile” in network infrastructure?

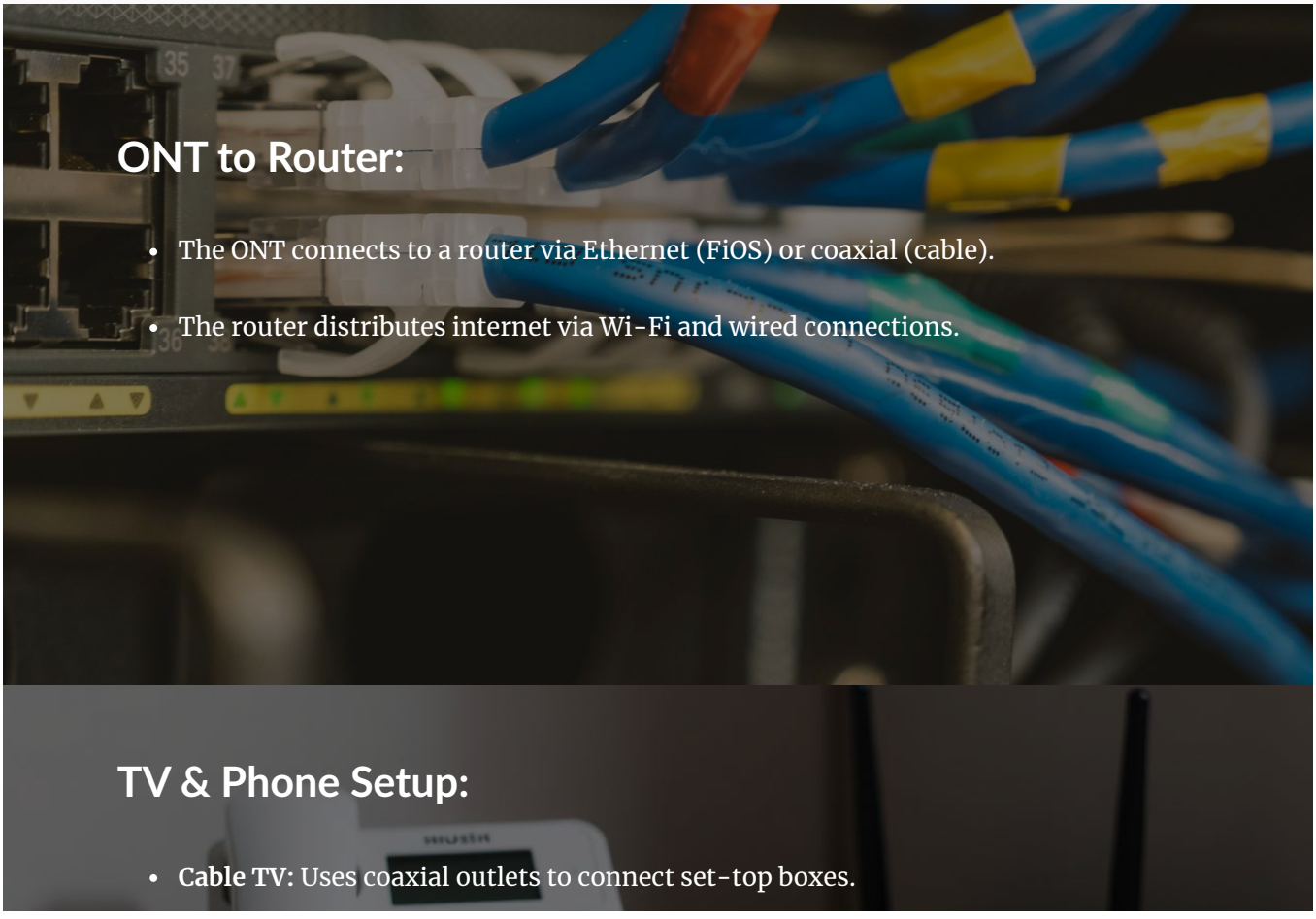
- The distance between two central hubs
- The connection from the router to devices
- The final stretch from node to home/business

- ◯ The length of fiber cable inside the ONT

SUBMIT

Lesson 3: Inside the Home — Wiring, Devices & Signal Flow

In our final lesson, learners will step inside the home to see how network signals are distributed to devices. We'll break down the roles of ONTs, modems, routers, and set-top boxes, showing how internet, TV, and phone services are wired and accessed. By tracing the signal flow and understanding device connections, learners will be equipped to troubleshoot, optimize, and appreciate the invisible systems that power everyday digital life.

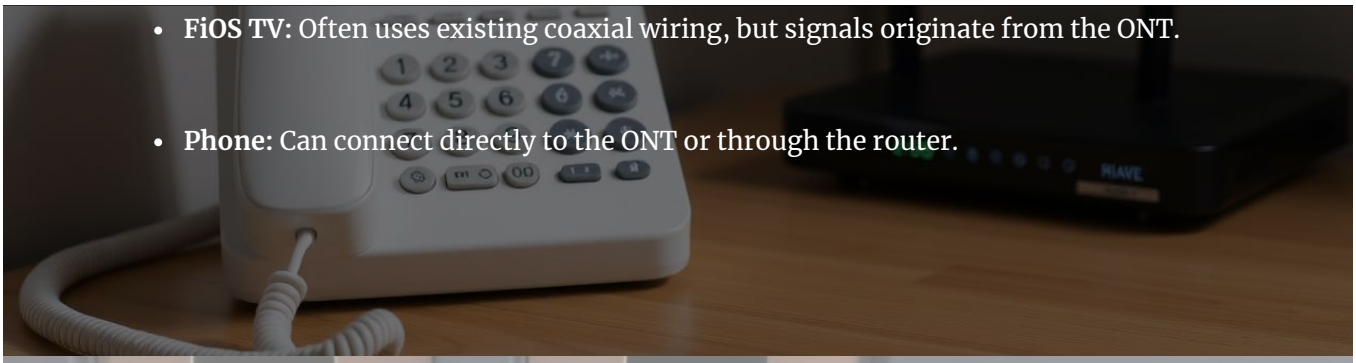


ONT to Router:

- The ONT connects to a router via Ethernet (FiOS) or coaxial (cable).
- The router distributes internet via Wi-Fi and wired connections.

TV & Phone Setup:

- **Cable TV:** Uses coaxial outlets to connect set-top boxes.



- **FiOS TV:** Often uses existing coaxial wiring, but signals originate from the ONT.
- **Phone:** Can connect directly to the ONT or through the router.

Device Connectivity:

- Ethernet ports on the router allow direct connections for desktops, smart TVs, or gaming consoles.
- Wi-Fi handles mobile devices, laptops, and smart home gear.

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ONT to Router Connection	The ONT connects to the router via Ethernet (FiOS) or coaxial cable (cable systems) for internet distribution.

Router's Role	The router distributes internet through Wi-Fi and wired connections to various devices in the home or office.
Cable TV Setup	Cable TV uses coaxial outlets to connect set-top boxes for delivering television services.

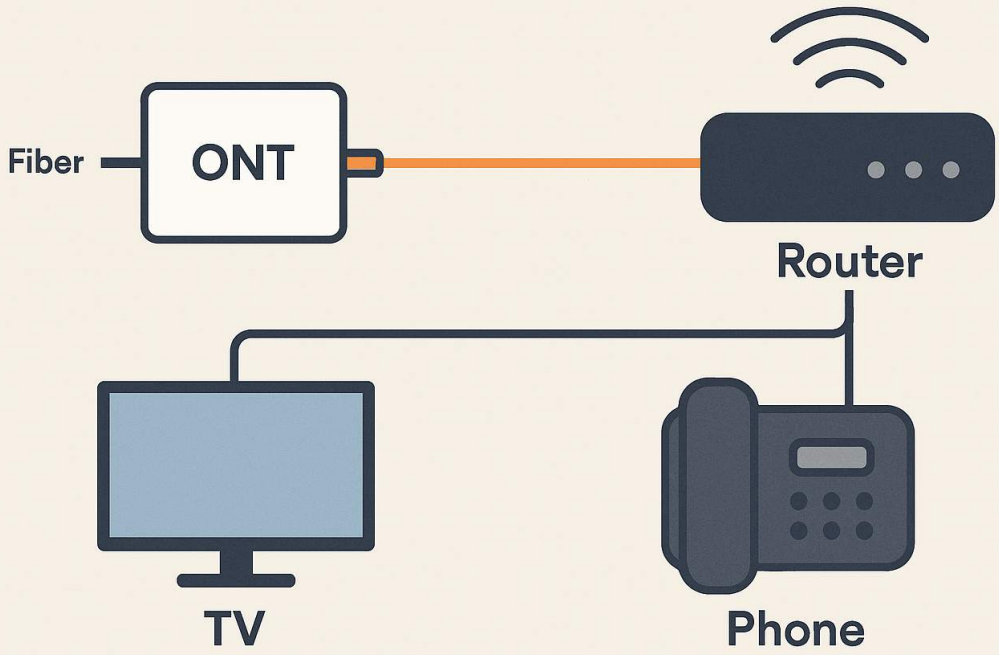
FiOS TV Setup

FiOS TV uses existing coaxial wiring, with signals originating from the ONT for television services.

Phone Connection Options

Phones can connect directly to the ONT or through the router, depending on the system setup.

Ethernet Device Connectivity	Ethernet ports on the router allow direct connections for desktops, smart TVs, and gaming consoles.
Wi-Fi Device Connectivity	Wi-Fi supports mobile devices, laptops, and smart home gear for wireless internet access.



From light to life: how fiber signals flow through the ONT to power internet, TV, and phone connections inside the home.

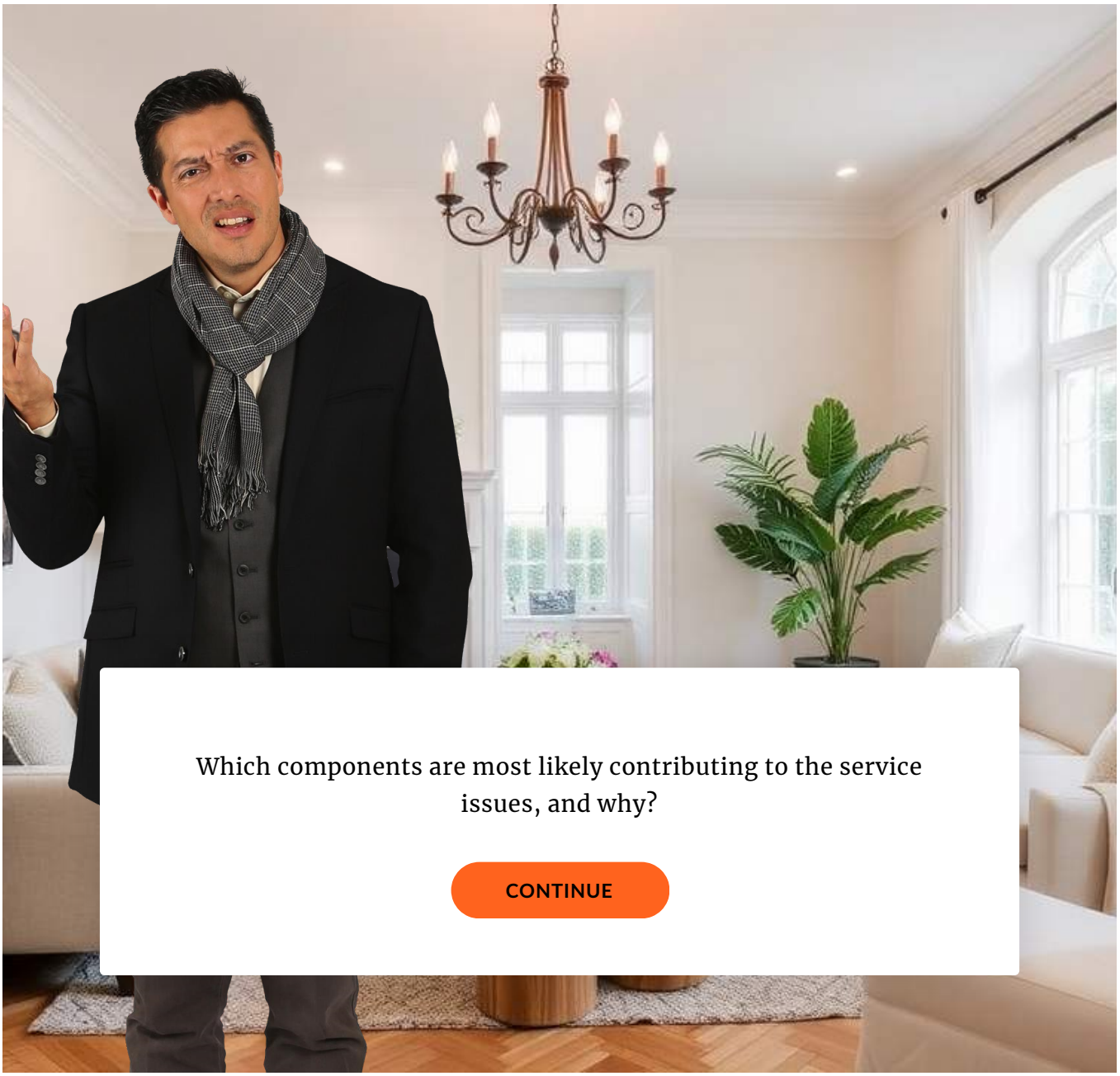
Scene 1 Slide 1

A technician investigates slow internet and TV issues in a neighborhood. The central hub checks out, but a local node is overloaded and an amplifier is failing.

START OVER

Scene 1 Slide 2

Continue → End of Scenario



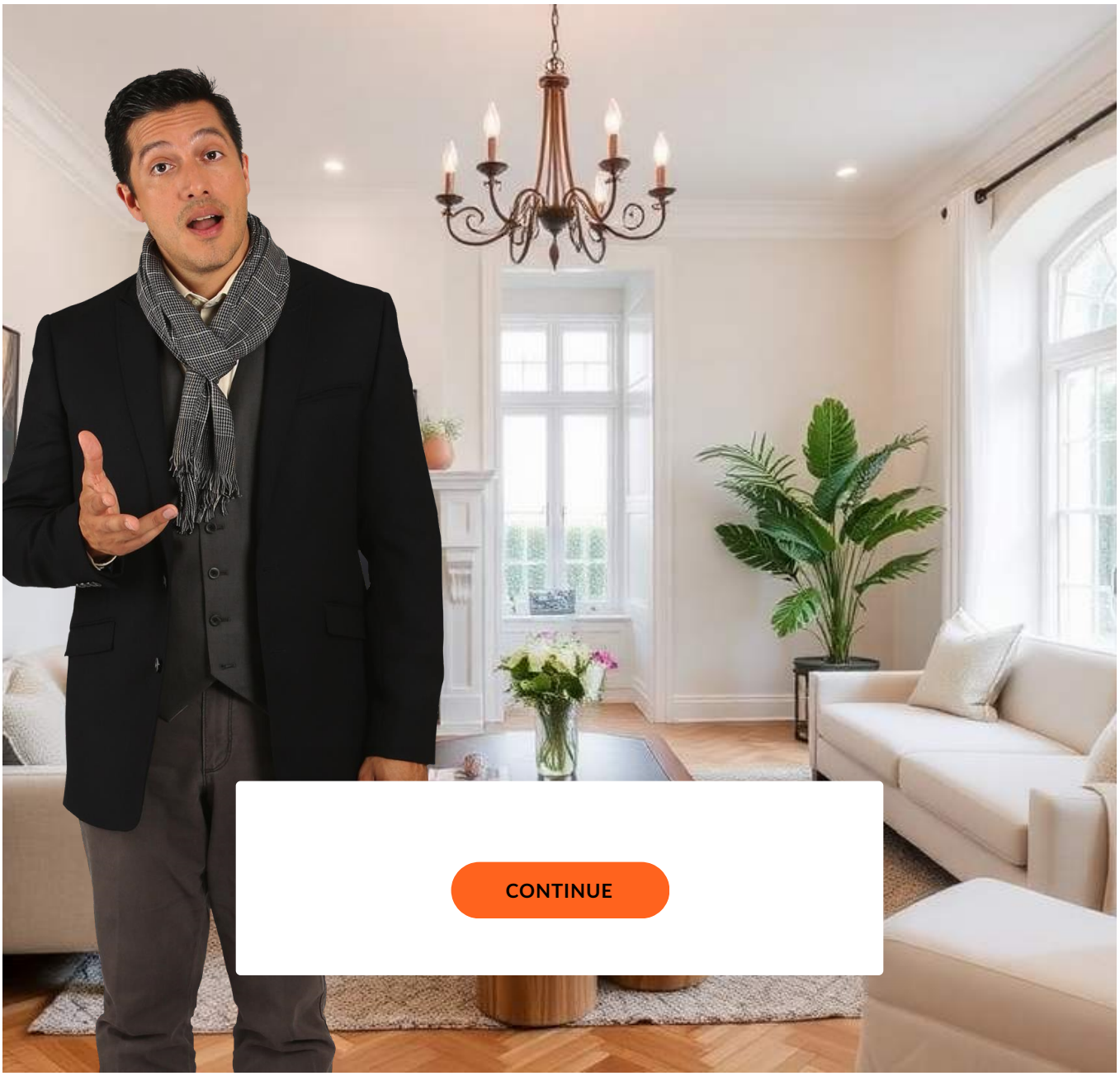
Scene 1 Slide 3

Continue → Scene 1 Slide 4

Scene 1 Slide 4

Scene 1 Slide 5

Scene 1 Slide 6



Scene 1 Slide 7

Continue → Next Slide

Scenario End

The distribution node and amplifier are part of the neighborhood-level infrastructure. If the node is overloaded or the amplifier is failing, signals may weaken or become unstable.

START OVER

Scene 1 Slide 8

Continue → End of Scenario

What device distributes internet access via Wi-Fi and Ethernet?

- ( ) ONT
- ( ) Modem
- ( ) Router
- ( ) Splitter

SUBMIT

How does FiOS TV typically connect inside the home?

- ( ) Through HDMI cables only
- ( ) Via coaxial wiring from the ONT
- ( ) Directly from the router
- ( ) Through fiber-optic cable to the TV

SUBMIT

Summary of Network Infrastructure

Network infrastructure is essential for delivering internet, TV, and phone services to homes and businesses. Central hubs, such as headends and central offices, originate and distribute signals through fiber-optic and coaxial cables, ensuring reliable connectivity. These systems are designed to handle large-scale data transmission efficiently.

Key components like distribution nodes, splitters, and amplifiers optimize signal flow to serve multiple locations. By understanding these elements, learners gain insight into how modern networks are engineered to meet the demands of seamless communication and entertainment.