CCNA: Introduction to Network

**Module 4 – 4.5: Fiber-Optic Cabling**

**I. Advantages of Fiber Optics:** CCNA courses emphasize the benefits of fiber over copper, including:

* **Higher Bandwidth:** Fiber can ***carry much more data than copper***.
* **Longer Distances:** Signals ***travel much further*** without significant degradation.
* **Immunity (Chống nhiễu) to EMI/RFI:** Fiber is unaffected by electromagnetic and radio frequency interference.
* **Security:** Fiber is harder to tap into than copper.

**II. Types of Fiber Cable:** CCNA courses will introduce different fiber cable types:

* **Single-mode (SMF):** Used for ***long distances***, carries light in ***one mode***. More ***expensive.***
* **Multi-mode (MMF):** Used for ***shorter distances***, carries light in ***multiple modes.*** Less expensive. Different MMF types (OM3, OM4, OM5) are often discussed relating to their bandwidth capacity.

**III. Connectors:** Various fiber connectors are covered, such as:

* **LC:** Small form-factor connector commonly used.
* **SC:** Another common connector type.
* **ST:** Older connector type.

**IV. Fiber Optic Cable Construction:** The layers of a fiber cable are explained, including the core, cladding, buffer, and jacket.

**V. Light Propagation:** The principles of how light travels through fiber (total internal reflection) are usually explained.

VI. **Fiber Optic Standards:** Common standards related to fiber optics might be mentioned.

VII.**Applications of Fiber Optics:** CCNA courses will discuss where fiber is used, such as:

* **Backbone connections:** Connecting different buildings or network segments.
* **High-speed links:** Between switches or routers.
* **Long-distance communication:** Across cities or countries.

**VIII. Testing and Troubleshooting:** Basic fiber testing and troubleshooting methods might be introduced.