

Understanding Wavelength Division Multiplexing

Article Overview

Wavelength Division Multiplexing (WDM) is a fiber-optic technology that allows multiple data streams to be transmitted simultaneously over a single optical fiber by using different wavelengths of light.

How WDM Works

WDM works by assigning each data stream a unique wavelength (or color) of laser light. At the transmitting end, a multiplexer (MUX) combines these multiple optical signals into a single fiber, allowing them to travel together without interference. At the receiving end, a demultiplexer (DEMUX) separates the combined signal back into individual wavelengths, directing each to its corresponding receiver. This process is similar to turning a single-lane road into a multi-lane highway, dramatically increasing the data-carrying capacity of the fiber.

Key Components

- **Optical Fiber:** The medium that carries light signals over long distances with minimal loss.
- **Optical Carrier Signals:** Encoded light pulses that carry data, each on a distinct wavelength.
- **Multiplexer (MUX):** Combines multiple wavelengths into a single fiber.
- **Demultiplexer (DEMUX):** Separates the combined wavelengths at the receiver.
- **Optical Add-Drop Multiplexer (OADM):** Allows specific wavelengths to be added or...

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Wavelength Division Multiplexing (WDM)

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Types of Multiplexing in Data Communications

3. Wavelength Division Multiplexing Wavelength Division Multiplexing (WDM) is a multiplexing technology used to

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Wavelength-division multiplexing

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Understanding the Basics of WDM At its core, WDM is a method of multiplexing various optical carrier signals onto a

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