

Fiber optic cable trunk or backbone



Overview

Structured cabling is the planned, documented cabling system that connects work areas, network rooms, equipment rooms and data center racks through a repeatable physical infrastructure.

Key Takeaways

A fiber optic trunk cable serves as the high-capacity backbone of a network, connecting major distribution points and enabling high-speed, high-density data transmission.

Overview

A fiber optic trunk cable, also known as a backbone cable, is a multi-fiber assembly designed to carry large volumes of data between key network aggregation points, such as equipment rooms, main cross-connects, and telecommunications rooms within a building or data center. Unlike horizontal cabling that connects end devices, trunk cables form the permanent or semi-permanent backbone, supporting high-speed links and future network expansion.

Structure and Components

Trunk cables typically consist of:

- Optical fibers: Multiple glass or plastic strands that transmit light signals, with fiber counts ranging from 12 to 144 or more, depending on network capacity requirements.
- Sheath: A protective outer layer that shields fibers from physical damage and environmental hazards.
- Connectors: Pre-terminated MPO/MTP or LC/SC connectors on both ends for plug-and-play deployment, ensuring consistent polarity and minimal insertion loss.

Enclosures and sub-units: Some trunks bundle multiple fiber sub-units within a single jacket, often reinforced with aramid yarn for tensile strength. Modern trunks may feature dual-jacket designs for added durability and are factory-tested to meet ultra-low loss requirements, essential for high-speed networks such as 100G, 400G, 800G, and beyond.

Function and Applications

Trunk cables act as the backbone of high-density fiber networks, providing:

- High-capacity aggregation: Connecting main distribution areas (MDAs) to horizontal distribution areas (HDAs) or between racks in data centers.
- Scalable infrastructure: Supporting current and future high-speed Ethernet standards while reserving fibers for network upgrades.
- Stable, long-distance transmission: Maintaining signal quality over longer distances compared to horizontal cabling.

In data centers, trunk cables are often paired with harness or breakout cables, which convert multi-fiber connectors into individual fibers for connection to end devices, enabling compatibility with different port types and speeds.

Key Considerations

When deploying fiber optic trunk cables:

- Connector type: MPO/MTP connectors are standard for high-density backbones, with MPO-16 becoming common for 800G-SR8 applications.
- Fiber type: OM4 or OM5 multimode fibers are recommended for high-speed building backbones.
- Installation environment: Plenum-rated jackets (OFNP) or CPR Euroclass-compliant jackets may be required depending on local codes.

Polarity and loss management: Proper planning ensures minimal insertion loss and correct signal routing across the backbone. By forming the central nervous system of a network, fiber optic trunk cables enable efficient, scalable, and high-speed communication across enterprise and data center infrastructures.

Article Content

Structured Cabling Guide: Fiber Backbone & MPO | PHILISUN

Structured cabling is the planned, documented cabling system that connects work areas, network rooms, equipment rooms and data center racks through a repeatable physical infrastructure.

Structured Cabling: Backbone Cabling vs Horizontal Cabling

Fiber optic cables are the preferred choice for backbone applications due to their superior bandwidth, long-distance capabilities, and ability to future-proof the network, making them ideal for

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Design scalable fiber backbone cabling for buildings using MPO/MTP trunk cables. Learn 40G/100G architecture, fiber types, and upgrade strategies.

Trunk Cable vs Harness Cable in Fiber Optic Networks

Trunk cables and harness cables serve fundamentally different roles in fiber optic network architecture. Although both are pre-terminated assemblies used to accelerate deployment,

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This article introduces the structural characteristics and application differences of these three cable types to help select the appropriate solution when planning fiber optic cabling.

What Is MPO Trunk Cable? Structure, Types, and

MPO Trunk cable integrates multiple optical fibers within a single pre-terminated cable — one deployment carries dozens to hundreds of high

What is the Difference Between MTP/MPO Trunk.

MTP/MPO trunk cables are pre-terminated, high-density fiber optic cables designed to aggregate multiple fibers into a single compact connection.

What Is MPO/MTP Trunk Cable? Data Center Backbone Complete

2. What Are MPO/MTP Trunk Cables? Core Definition & Industry Standards An MPO/MTP trunk cable is a factory pre-assembled, fixed-count multi-fiber optical cable designed specifically for permanent

Understanding the Complete Spectrum of Fiber Optic

A trunk cable is a type of fiber optic cable that can carry large amounts of data at once through a telecommunications system. It acts as the

MTP®/MPO Cables Explained: Types, Applications,

MTP®/MPO fiber cables can be classified from multiple perspectives, including cable structure, fiber count, polarity, fiber mode, and jacket rating.

mpo to lc cassette: 2026 Procurement Guide

The mpo to lc cassette serves as the critical transition point in this architecture, breaking out consolidated multi-fiber backbone trunks into switch-ready, discrete 2-fiber LC duplex ports.

Fibre Optics: The Backbone of Modern Telecommunications

Answering the question: why fibre is today's telecom backbone? Since the early 2000s, global telecommunications networks have steadily replaced traditional copper cables with fibre optic

Fiber Optic Cable Types: Single-Mode, Multimode, and

A fiber optic cable (frequently shortened to “fiber cable”) is a specialized transmission medium crafted to carry data as light pulses through

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An Optical Distribution Frame (ODF) is a specialized enclosure designed to manage, connect, protect, and distribute fiber optic cables in telecom and data networks. Think of it as a

Fiber Optic Backbone Office Design: 2026 Guide

Discover essential strategies for fiber optic backbone office design in 2026. Maximize your network's efficiency and scalability today!

Fiber Optic Cable Size Chart: Complete Guide

Fiber optic cable size chart with complete guide to core, cladding, and jacket dimensions, types, and specifications for networking and installation use.

Data Center Cable Management Best Practices | FSG Networks

Learn data center cable management best practices for high-density fiber networks, routing, labeling, and MPO solutions for reliable networks.

How Fibre Optic Communication Works – Wray Castle

Today, fiber optic cables carry approximately 99% of all intercontinental internet traffic. They form the backbone of 5G networks, connect massive data centres, and deliver gigabit speeds

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