

HD Flex™ 2.0 Fiber Cabling System - Data Economy

Flexible Fiber Infrastructure Boost Serviceability and Uptime

Introduction

Unforeseen downtime within enterprise and data centers is an expensive occurrence that can damage a company's reputation for quality service and uptime. This occurrence is also one that data center operators can minimize in many instances.

Data center operators are targeting increased data transaction rates to maximize usage of active, revenue-generating equipment. This may involve optimizing installed infrastructure or retro-fitting higher bandwidth capabilities. Evolving the data center infrastructure to a higher density performance platform enables the operator to leverage technological advances in expensive processor and storage real estate. Increased processing efficiency through high speed fiber use is an evolutionary step to advance performance in a market where annual global data traffic will soon pass the zettabyte milestone.

Where the cost of fiber connections and the associated hardware were previous barriers to introduction, growing numbers of organizations are transitioning from 10G Ethernet to 40G/50G/100G Ethernet, or from 8G Fibre Channel to 16G/32G/64G Fibre Channel. Data center operators are using distinct infrastructure strategies to deploy fiber circuits in mission critical or high return areas of the site. This strategy uses specific cabling to defined areas within the data center to provide high speed connections where necessary.

A fundamental challenge in today's increasing volume of data is how to improve uptime. The cost of unplanned outages has more than doubled over the past six years from \$1 million to \$2.4 million (Figure 1). And 91% of data centers will experience unplanned down time during their first two years of operation. With 59% of downtime attributed to the physical layer, operators and owners can minimize expensive outages through the right infrastructure choice.

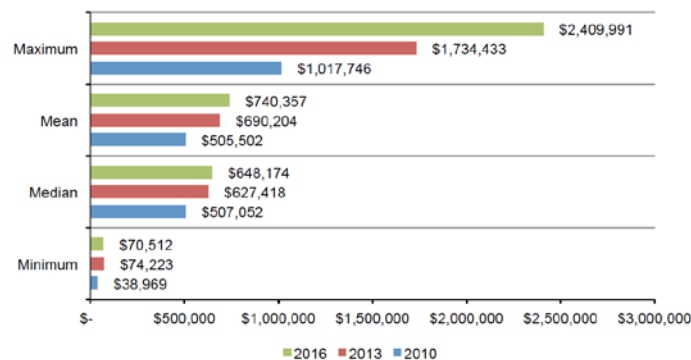


Figure 1. Cost of data center outages.

Today's high-density fiber optic cabling systems can help to optimize existing data center space, enabling organizations to meet business demands for higher data rates and capacity while minimizing the costs of space and new equipment.

Optimizing Connection Density to Meet Increased Data Demand

While traditional high-density fiber enclosures support required port counts, their design results in hard to manage clusters of cables in the back of the enclosure. This bunching of cables creates crowded access points and components that are difficult and time consuming to access. For example, fiber cables positioned in the front and rear of the enclosure often block access to connectors or cassettes. Poor approaches to structured cabling systems make it difficult for engineers to undertake IT equipment moves, adds, and changes (MACs). In addition, this can constrict air movement in the cabinet, increasing cooling costs and driving up IT equipment fan speeds. In an environment where power utilization effectiveness (PUE) has become a serious consideration, it is essential to achieve and maintain the correct PUE rating.

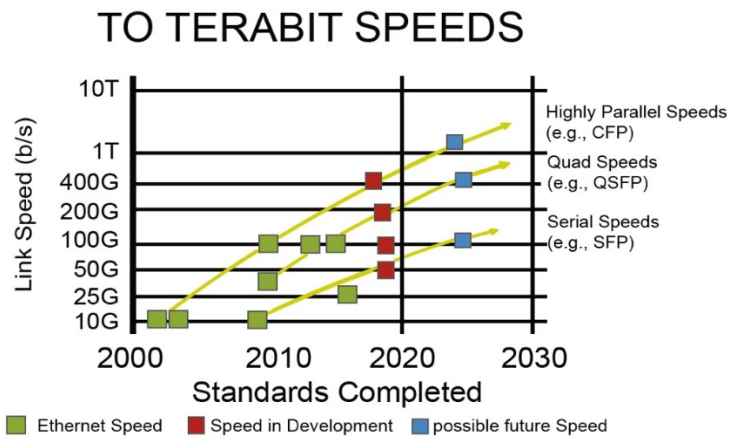


Figure 2. High data speeds require optimized infrastructure.

Time-consuming to deploy and even more challenging to service, the traditional fiber enclosure has become a barrier to fulfilling MACs, making it difficult to complete service tasks without disrupting adjacent circuits. The result is often costly outages, especially in revenue-producing applications such as e-commerce.

Current enclosures surround components built for a specific network design. As requirements have changed, the traditional enclosure hinders serviceability, network reliability, and deployment, and therefore needs more flexible systems.

A solution to affordable, flexible fiber infrastructure requires new thinking regarding the fundamental components of the system. Developers need to understand the requirements of enclosure systems and high-speed data channels. They should also understand data center operators' requirement for easier MACs and the flexibility to migrate to higher data speeds as businesses push for greater transaction volumes (Figure 2). The HD Flex™ 2.0 Fiber Cabling System addresses these needs with several innovative approaches.

This high-density fiber cabling system provides optimized serviceability and manageability for IT managers as they provide higher data speeds and control costs by maximizing return on assets. The system enables installers and data center technicians to quickly and safely complete MACs while providing the scalability for increasing density as business demands evolve.

Cable Management Increases Installation and Maintenance Efficiency

Fulfilling MACs can put a data center at risk of service interruptions, making it vital to perform these daily tasks without disrupting adjacent circuits. A recent Gartner report stated, "...the cost of network downtime, based on industry surveys, is \$5600 per minute, which extrapolates to well over \$300,000 per hour."¹ The HD Flex™ 2.0 Fiber Cabling System has the following cable management features to increase installation and maintenance efficiency for data center operators.

Side Trunk Cable Management

Cable management within the cabinet splits left and right to channel the cables away to the side of the enclosure, improving trunk installation and management. This arrangement eliminates cable congestion, a key cause of service delays. Cables are easily accessible from the left and right sides of the fiber enclosure. This provides greater access to installed connectors and cassettes and the ability to add new cabling, even when cable density reaches peak capacity.

Rear Trunk Cable Management

The rear trunk cable manager provides a template for mounting cables and side channel managers to direct fiber cable away from the rear of the enclosures, allowing easy access to critical connections.

Enclosure temperature is more efficiently controlled with clear airflow around the cables and equipment to the front and rear of the cabinet, optimizing cooling to equipment operating at high output.

Front and Back Cassette Accessibility

Installers can position cassettes from the front or the back of the enclosure. The modular cassettes are convertible between 4, 6 or extra wide 12-port configurations providing a highly flexible fiber system that can accommodate a wide range of current and future transceivers. Flexible options are necessary when deploying a fiber infrastructure as the operator migrates to higher network speeds. The cassettes are available with integrated, shuttered LC adapters for dust protection of unused adapter and ease of link tracing.

Installers can convert current enclosures and panels to support either 6-port (12-fiber) or 12-port (24-fiber) cassettes and adapters. This provides operators the maximum flexibility to deploy any network architecture, fiber infrastructure, and network type (either duplex or parallel). Operators can adapt their infrastructure to meet future requirements as they arise.

Split-tray Design

The split-tray design allows operators to simply slide and lock a cassette into place. This not only speeds serviceability and deployment but also streamlines migrations from 10G Ethernet to 40G/ 50G/100G Ethernet, when installers replace cassettes with fiber adapter panels (FAPs). The split-tray design enables maintenance technicians to minimize circuit disruption as they only move half of the fiber connections within any tray, providing greater access to both connections and cassettes without impacting nearby circuits. Technicians can install and remove cassettes by dropping in or pulling out vertically. This allows technicians to service cassettes without disturbing adjacent cassette patch cords, which will minimize a major cause of service disruption.

¹ Lerner, A. "The Cost of Downtime." Gartner.com. Accessed July 16, 2014.

Split Tray with Cable - Enclosures with Drop-down Fascia

To increase the engineers' MAC speed, trays come with slide and lock capabilities and can sit in three locations: home (closed), service (fully extended), or midway in the MAC position, simplifying connection management and cassette access. This system requires a single technician for installation. For example:

- A multi-fiber push on (MPO) parking feature enables a single installer to perform rapid cable plant migrations to 40G/100G Ethernet
- High-density shuttered cassettes with 72 LC ports and 72 MPO ports per rack unit (RU) enable one-for-one port migrations from 10G to 40G/100G Ethernet within the same RU.

Conclusion

The HD Flex™ 2.0 Fiber Cabling System addresses today's requirements for increasingly higher density levels, delivering simplified management while helping data center operators maximize return on assets and minimize downtime. This modular, integrated fiber system can save up to two-thirds of the RU space compared to 24-port systems and one-third for 48-port systems, for both LC and MPO connectivity, providing no loss of density at the panel when migrating LC ports to MPO. The system accommodates the dynamic life cycle of today's high-performance data centers, delivering serviceability, network reliability, and ease of deployment.

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