

Fiber Optic Disk Array Card



Overview

The Fibre Channel physical layer is based on serial connections that use fiber optics to copper between corresponding pluggable modules. The modules may have a single lane, dual lanes or quad lanes that correspond to the SFP, SFP-DD and QSFP form factors. Fibre Channel does not use 8- or 16-lane modules (like CFP8, QSFP-DD, or COBO used in 400GbE) and there are no plans to use these expensive and complex.

Key Takeaways

A Fiber Optic Disk Array Card is a host bus adapter (HBA) that connects servers to disk arrays over a high-speed Fibre Channel network, enabling fast, reliable block-level storage access.

A Fiber Optic Disk Array Card is essentially a Fibre Channel host bus adapter (HBA) installed in a server or NAS device to provide connectivity to a storage area network (SAN). It allows the server to communicate with disk arrays, tape libraries, or other SAN storage devices using high-speed optical fiber connections, typically at speeds of 8, 16, 32, or 64 Gbps depending on the card and network infrastructure.

Functionality

- High-speed data transfer: The card enables lossless, in-order delivery of block data between servers and storage arrays, which is critical for enterprise applications.
- Protocol support: Most cards use Fibre Channel Protocol (FCP) to transport SCSI commands over the network, allowing servers to access storage as if it were directly attached.

- SAN integration: By installing a Fibre Channel card, devices like QNAP NAS can join an existing SAN, supporting features such as LUN masking, port binding, snapshot protection, and SSD cache acceleration .

- Distance and flexibility: Single-mode SFPs are used for long-distance connections, while multi-mode SFPs are suitable for shorter distances within data centers .

Use Cases

- Enterprise storage arrays: Cards are used in systems like HPE MSA 2062, which supports 16 Gb Fibre Channel connectivity for hybrid flash or SAS storage arrays .

- NAS integration: QNAP NAS devices can use Fibre Channel cards (e.g., QXP-16G2FC or QXP-32G2FC) to act as SAN storage targets, providing cost-effective expansion of existing SANs .

- Disaster recovery and replication: Fibre Channel cards facilitate remote replication and high-speed backup solutions across SANs .

Key Considerations

- Compatibility: Ensure the card matches the SAN speed and SFP type (single-mode vs multi-mode) for optimal performance .

- Scalability: Fibre Channel cards allow multiple disk array enclosures (DAEs) to be connected, supporting large-scale storage deployments .

- Security: Features like LUN masking and port binding help control access to storage resources . In summary, a Fiber Optic Disk Array Card is a critical component in SAN environments, providing high-speed, reliable connectivity between servers and storage arrays, enabling enterprise-level storage management, replication, and data protection.

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