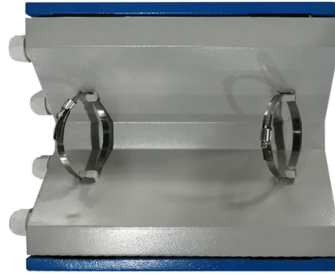


What is the light-deficient module in the AI computing center



Article Overview

Light-deficient modules in AI computing centers are typically located within the optical network layer, connecting high-performance switches and servers, often in QSFP-DD or OSFP slots in server racks or network cabinets.

Understanding Light-Deficient Modules

In AI data centers, optical modules such as QSFP-DD, OSFP112, and C-Light 400G/800G modules are used to transmit high-speed data between servers, switches, and storage systems. A "light-deficient module" usually refers to an optical transceiver experiencing reduced signal strength, which can occur due to fiber attenuation, connector issues, or module degradation.

Typical Placement

- **Server Racks and Cabinets:** Optical modules are installed in AI servers, GPU clusters, or network switches within the racks. In high-density AI setups, modules are often deployed in Leaf-Spine or flat network architectures, connecting multiple GPUs or AI chips for parallel processing.
- **Backbone and Core Layers:** High-bandwidth modules like QDD-FR4-400G link backbone switches (e.g., MSN4410-WS2FC) to core 800G switches, forming the main data paths. A light-deficient module in this layer would affect inter-rack or inter-cluster communication.
- **Optical Patch Panels and Cabling:** Modules interface with fiber optic cabling, which may run through top-of-rack or bottom-of-rack pathways. Any light deficiency can o...

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