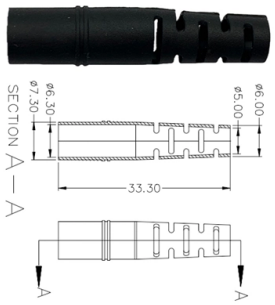
Data Center Interconnection Access



Overview

Explore key interconnection approaches in colocation data centers to boost connectivity, agility, and business performance with real-world examples.

Key Takeaways

Data Center Interconnection (DCI) provides private, dedicated connectivity between multiple data centers, enabling secure, low-latency, and high-bandwidth access for applications, data, and workloads. What is DCI? Data Center Interconnection (DCI) refers to dedicated network connections between geographically separated data centers, allowing them to operate as a unified infrastructure environment.

Unlike public internet connections, DCI uses private circuits such as dark fiber, wavelength services, Ethernet circuits, or MPLS networks, ensuring predictable latency, guaranteed bandwidth, and enhanced security. This connectivity supports critical operations like disaster recovery, live workload migration, database replication, and distributed applications across multiple sites.

Types of DC

I ConnectivityLAN Extension (Layer 2): Extends a single Layer 2 domain across data centers, useful for legacy applications or virtual machine mobility. It allows seamless distribution of physical resources while maintaining application transparency. Layer 3 Extension: Provides routed connectivity between data centers, supporting segmentation, virtualization, and file server backups.

This often involves Layer 3 VPNs and requires careful bandwidth and QoS planning.

SA

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N Extension: Enables storage area network connectivity across sites, addressing distance and latency challenges. Fibre Channel traffic may require specialized transport mechanisms over IP networks. Path Optimization and Overlay Technologies: Tools like Overlay Transport Virtualization (OTV) allow Layer 2 connectivity between separate domains while preserving fault isolation, resiliency, and load balancing.

Benefits of DCI Access

Performance: Low-latency, high-bandwidth connections improve database replication, application responsiveness, and backup operations. Security: Private circuits reduce exposure to internet-based attacks and provide inherent traffic isolation. Scalability and Flexibility: Supports multi-site infrastructure, regional expansion, and access to cloud providers and partner ecosystems.

Reliability: Dedicated connections ensure predictable performance for tightly coupled applications, unlike variable internet paths.

Practical Considerations

When planning DCI access, organizations should consider: Geographic diversity for disaster recovery and regional user coverage. Interconnection with cloud providers and ISPs to improve service delivery and reduce latency. Energy and grid interconnection for large-scale data centers, including hybrid or islanded power strategies to maintain uptime.

Technology selection based on application requirements, distance, and latency sensitivity, including Layer 2, Layer 3, and SAN extensions. By implementing DCI, organizations can treat multiple data centers as a single, cohesive environment, improving operational efficiency, resilience, and user experience while maintaining strict security and performance standards.

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What is data center interconnect (DCI)?

DCI technology links data centers together to share resources. DCI provides several benefits. It lets organizations share resources by dynamically

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