Cloud Data Center Interconnection



Overview

This white paper explains the need for multi-layer data center interconnection networks and how they need to support dynamic access to cloud applications and services.

Key Takeaways

Cloud Data Center Interconnection (DCI) enables high-speed, secure, and scalable connectivity between geographically distributed data centers, supporting cloud services, disaster recovery, and low-latency applications.

Overview

Data Center Interconnect (DCI) refers to the technology and infrastructure that connects two or more data centers, allowing them to share data, applications, and resources seamlessly across short, medium, or long distances ( ). In the cloud era, DCI is critical for enabling distributed computing, hybrid cloud architectures, and edge computing, ensuring that applications and services remain highly available and responsive ( ).

Key Technologies

Modern DC

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I relies heavily on optical fiber communication to achieve high bandwidth and long-distance transmission ( ). Key technologies include: Dense Wavelength Division Multiplexing (DWDM): Allows multiple data channels to be transmitted simultaneously over a single fiber using different wavelengths of light, supporting data rates of 400 Gbit/s and beyond per wavelength ( ). Coherent Optical Transmission: Enhances signal quality and distance, enabling ultra-long-haul connections, including transoceanic links ( ).

Hybrid IP/Optical Networks: Integrates IP routing with optical transport, dynamically optimizing paths across multiple domains for reliability and low latency ( ). Subsea Cables: Connect data centers across continents, supporting global cloud infrastructure ( ). BenefitsDCI provides several critical advantages for cloud and enterprise operations: High Bandwidth and Low Latency: Supports real-time applications, AI, 5G, IoT, and multimedia delivery ( ).

Scalability: Enables rapid expansion to new cloud regions or interconnection with additional providers without major infrastructure changes ( ). Disaster Recovery and Redundancy: Ensures data and applications remain synchronized and accessible across multiple sites ( ). Security and Reliability: Private and virtual interconnections reduce exposure to public networks while maintaining robust performance ( ).

Optimized Resource Utilization: Allows workload balancing and efficient use of compute and storage resources across data centers ( ). ApplicationsDCI is essential for: Hybrid Cloud Connectivity: Linking on-premises data centers with public cloud providers for seamless operations ( ). Edge Computing: Connecting edge data centers close to end users to reduce latency for critical applications ( ).

Global Cloud Services: Enabling multinational enterprises to maintain consistent service levels across regions ( ).

Content Delivery and Real-

Time Analytics: Supporting high-speed data transfer for media, financial transactions, and AI workloads ( ).

Conclusion

Cloud Data Center Interconnection is a foundational technology for modern digital infrastructure. By leveraging high-speed optical networks, hybrid IP/optical routing, and global interconnectivity, DCI ensures that distributed data centers can operate as a unified, resilient, and scalable cloud ecosystem, meeting the demands of latency-sensitive applications, disaster recovery, and global enterprise operations ( ).

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Article Content

Data center interconnection for the cloud era

This white paper explains the need for multi-layer data center interconnection networks and how they need to support dynamic access to cloud applications and services. Today''s multiple, costly, static

Data center interconnection for the cloud era

Tomorrow''s cloud infrastructure needs more integrated networks to provide data center interconnection that is more reliable, resilient and secure, and that reduces operating costs and improves efficiency

Data center interconnection for the cloud era

Network automation is key to enabling more dynamic access to cloud applications and services by providing software-programmable IP/optical data center connectivity and interconnection that is

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

Data Center Interconnect: A Guide to DCI and Connectivity

Explore how data center interconnect works, and what to consider when connecting facilities, clouds, carriers, and network partners.

Data Centers Decoded: Why Interconnection Is Key to Business

At its core, interconnection refers to the private physical and virtual connectivity links between different networks, cloud providers and enterprises inside a data center.

What is Data Center Interconnect (DCI)?

Data Center Interconnect (DCI) technology connects two or more data centers together over short, medium, or long distances using high-speed packet-optical connectivity. Data Centers house

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Data center interconnect (DCI) solutions enable direct connections between your infrastructure and multiple clouds, other enterprises, and service providers, all within a single facility or across a

What Is Data Center Interconnection

Data center interconnection is not a single feature. It is the combination of cross connects, internet exchanges, cloud on-ramps, carrier choice, and ecosystem depth that determines how much

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Data Center, Hyperscale, Cloud & AI Infrastructure

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From AI to cloud computing, data centers power today''s digital world. Learn about their function and why companies are racing to build more of them.

Equinix Interconnected Colocation | Equinix Global Data Center ...

Cloud Architects Design and optimize hybrid multi-cloud architectures with seamless interconnection across global data centers and cloud providers.

Eight Trends That Will Shape the Data Center Industry

What public discourse often lumps together now conceals two very different realities: AI factories built around sustained, power-dense GPU utilization, and general

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