Interconnection between active-active data centers

Overview

Data Center Interconnect: A Guide to DCI and ConnectivityExplore how data center interconnect works, and what to consider when connecting facilities, cloud.

Key Takeaways

Active-active data centers are interconnected using high-speed, low-latency private networks that enable simultaneous operation, workload mobility, and seamless failover across geographically distributed sites.

Overview of Active-

Active Data CentersActive-active data centers are designed to operate simultaneously, with both sites actively processing workloads and serving users. This configuration ensures high availability, disaster resilience, and load balancing, as traffic and applications can be distributed across multiple locations without downtime. Unlike active-passive setups, active-active architectures require synchronized data and consistent IP addressing to allow seamless application operation across sites.

Key Interconnection Technologies

Data Center Interconnect (DCI) DCI provides private, dedicated connectivity between data centers, enabling them to function as a unified environment. It supports low-latency, high-bandwidth communication for database replication, live workload migration, and distributed applications.

DC

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I can use technologies such as dark fiber, wavelength services, Ethernet circuits, or MPLS networks, ensuring predictable performance and enhanced security compared to public internet connections. SDN-Based Fabric with EVPN/VXLAN Modern active-active designs often leverage Software-Defined Networking (SDN) with EVPN/VXLAN overlays. This allows the extension of the same IP subnet across multiple data centers, enabling workload mobility without IP renumbering.

Applications can operate in active-active mode, and servers can be migrated seamlessly between sites while maintaining connectivity for end users.

WA

N Connectivity Options Interconnection typically relies on MPLS-based WAN links for enterprise-grade reliability. Alternatively, IPsec tunnels over the public internet can be used when cost or availability constraints exist, though this may introduce higher latency and require additional security considerations.

Design Considerations

Latency and Bandwidth: Active-active operations require low-latency links to maintain data consistency and application performance. Bandwidth must be sufficient to handle replication and inter-site traffic. Data Synchronization: Databases and storage systems must be synchronized in real-time or near real-time to prevent data conflicts.

SAN or NA

S extensions may be used for storage replication. Path Optimization: When extending VLANs or IP subnets across sites, routing paths must be optimized to reduce latency and ensure efficient server-to-server communication. Redundancy and Failover: Interconnected data centers provide automatic failover in case of hardware or network failures, ensuring continuous operations for mission-critical applications.

Benefits of Interconnected Active-

Active Data Centers

High Availability: Continuous service even during outages at one site. Disaster Recovery: Geographic diversity protects against regional failures. Workload Mobility: Applications and virtual machines can move seamlessly between sites.

Improved Performance: Reduced latency for end users through optimized routing and distributed workloads. Security: Private interconnects reduce exposure to internet-based threats. In summary, active-active data centers rely on robust interconnection strategies combining DCI, SDN fabrics, and optimized WAN links to provide seamless, resilient, and high-performance operations across multiple locations.

Proper design ensures synchronized workloads, low-latency communication, and continuous availability for critical applications.

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Article Content

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.

Understanding Interconnection in Colocation Data Centers

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

Active/Active Data Centers SDN fabric architecture (Part 1/3)

End users and both data centers are interconnected primarily through MPLS-based WAN connectivity, which is commonly used in enterprise and service provider environments.

An Intro to Data Center Interconnects

Data center interconnects (DCIs) refer to the networking technologies and solutions that enable seamless communication and data exchange between geographically dispersed data centers.

Data Center Interconnect Design Guide for Virtualized Workload

The VPLEX family uses a unique clustering architecture which breaks the boundaries of a data center and allows servers at multiple data centers to have read/write access to shared block

Active-Active Data Center Design

Indeed, network services interconnect all the devices in the data centers by performing required traffic switching and routing functions. The network should facilitate the forwarding of

Active-Active Multi-Data Center Topology Deployment

In this example, User 1 will always be routed to the New York Data Center and User 2 to the London Data Center. User requests in the respective data centers are intercepted by different WebGates

Data Center Interconnect with Enterprise SONiC: Multi-Pod ...

In this article, I''ll explore the different Data Center Interconnect (DCI) options available with Enterprise SONiC, focusing on Multi-Pod, Multi-Fabric, and Multi-Site architectures.

Intra-data center interconnects, networking, and architectures

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Many technologies are used in intra-data center interconnects, such as direct attach cables (DAC), active optical cables (AOC), and optical transceivers. The characteristics of each technology are

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Application Scenarios: Intra-data center interconnects: Connecting racks or devices within large data centers. Inter-data center links: Suitable for

Equinix: Equinix Fabric from Equinix Inc.

On-demand links between clouds Equinix Fabric is a software-defined interconnection service that allows enterprises to create private, on-demand network connections between their infrastructure in

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Project Risks Escalate as Grid Interconnection Delays Become the Primary Barrier to Deployment Grid interconnection delay has transitioned from a manageable

Why Data Centers Are Turning to Behind-the-Meter Power

Why Data Centers Are Turning to Behind-the-Meter Power Grid queues, community pressures, and AI demand push operators toward behind-the-meter generation, microgrids, and

POWER: 27% of US Data Centers to Use Onsite Generation

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By 2030, 27% of US data centers are projected to run on onsite generation, up from 1%, as reported by POWER Magazine on May 18, 2026.

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