# AI boom fuels surge in demand for high-speed data centre interconnects



Artificial intelligence is driving unprecedented growth in demand for data centre interconnect (DCI) infrastructure, reshaping how data centres are connected and provisioned. Central to this shift are wavelength services—optical connections at 100 Gigabits per second (Gb/s) and above—which are rapidly becoming essential for supporting AI workloads.

AI-related traffic is expanding at a remarkable pace. One major hyperscale operator reported internal AI backbone traffic growing at a 100% compound annual rate. Independent research suggests similar trends, with AI-driven traffic increasing at over 50% CAGR, compared with just 15% for non-AI traffic. This growth is fuelling a global boom in data centre construction and escalating demand for low-latency, high-resilience interconnects to support AI model training and inference.

Wavelength services—delivered via Dense Wavelength Division Multiplexing (DWDM) systems with technologies such as ROADMs and inline amplifiers—are the foundation of this connectivity. Operating at speeds of 100 Gb/s and higher, these links support key protocols including Ethernet, Optical Transport Network and Fibre Channel, linking data centres, enterprise sites and other critical locations.

Service providers are now migrating from 10 Gb/s to 100 Gb/s, and further to 400 Gb/s and 800 Gb/s, mirroring the uptake of 400 Gigabit Ethernet within data centres. Optical equipment vendors are enabling this transition with advances in coherent engines, broader spectral bands—from C to Super-C and C+L—and automation tools like zero-touch provisioning and real-time orchestration via platforms such as the Linux Foundation’s Transport API.

Customers are demanding more than speed. Fast activation, often within 24 hours, flexible provisioning via self-service portals, power-efficient operations and commercial options like pay-as-you-grow models are now baseline expectations. Key differentiators include low-latency routes, five-nines availability, end-to-end encryption and emerging quantum-safe security standards.

Market growth reflects this trend. The global DCI market, worth USD 10.7 billion in 2024, is forecast to reach between USD 25.9 billion and USD 35.9 billion within a decade, growing at 11% to 13.1% CAGR. Hardware—optical transceivers, routers and related infrastructure—accounts for more than half of this value. The U.S. currently leads the market, with key players including Ciena, Huawei, Nokia, Cisco and Fujitsu.

AI data centres themselves are expanding rapidly, with the market projected to grow from USD 13.7 billion in 2024 to nearly USD 79 billion by 2032, at a CAGR of 24.5%. Hyperscale facilities in the U.S. and China are driving this growth, placing intense pressure on power grids and prompting advances in energy-efficient cooling and power systems. AI-specific infrastructure—GPUs, TPUs and ultra-fast interconnects—is becoming the new standard.

Internal and external high-speed interconnects are also evolving, with PCIe Gen5/Gen6, 400GbE and 800GbE technologies supporting the massive data volumes required by AI and high-performance computing. For network operators, the opportunity lies in offering wavelength services that go beyond speed—combining rapid deployment, robust security, high availability and environmental sustainability. Real-time monitoring, automation and flexible pricing models are becoming essential for customers scaling rapidly to meet AI-driven demand.

As AI continues to transform computing, wavelength services are at the core of enabling this shift. With ongoing investment in optical innovation and agile infrastructure, the UK and global markets are poised to support AI’s growth while addressing the complex challenges of sustainability and scale.

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## Bibliography

1. <https://www.rcrwireless.com/20251002/reader-forum/wavelength-services> - Please view link - unable to able to access data
2. <https://www.datamintelligence.com/research-report/ai-data-centers-market> - The AI Data Center Market is projected to grow from US$ 13.67 billion in 2024 to US$ 78.91 billion by 2032, expanding at a compound annual growth rate (CAGR) of 24.5% during 2025–2032. This growth is driven by the surge in AI workloads, including large language model training and enterprise-scale inference, which demand unprecedented computing power, storage, and energy resources. In 2024, AI workloads accounted for nearly half of all new hyperscale deployments, with the U.S. and China emerging as the epicenters of investment. By 2030, AI data centers are expected to consume up to 10–12% of U.S. electricity and nearly 4% of China's national grid capacity, underscoring the global tension between innovation, sustainability, and energy infrastructure.
3. <https://www.globenewswire.com/news-release/2025/08/06/3128414/0/en/Future-of-Data-Center-AI-Data-Center-Market-worth-100-billion-by-2030-MarketsandMarkets.html> - According to MarketsandMarkets™, the Future of Data Center / AI Data Center Market is projected to reach USD 100 billion by 2030, growing at a CAGR of 30%. The rise of AI, particularly Generative AI, has propelled the demand for data centers capable of supporting AI workloads, including training and inference for deep learning models. Traditional data center infrastructure, designed for general-purpose computing, struggles to keep up with the unique demands of AI, which require parallel processing, high throughput, and low latency. This has fueled investments in specialized AI data centers equipped with advanced IT hardware, including GPUs, TPUs, low-bandwidth memory, and ultra-high-speed interconnects. The scale at which these components require power and heat dissipation further necessitates the adoption of sustainability solutions for thermal and power management.
4. <https://www.globenewswire.com/news-release/2025/09/26/3156865/28124/en/Data-Center-Interconnect-Market-Trend-Analysis-Report-2025-2034-Enterprises-Embrace-400G-800G-Optical-Solutions-for-Low-Latency-and-Secure-Transfers-Amid-AI-and-Hybrid-Cloud-Growth.html> - The global Data Center Interconnect (DCI) market was valued at USD 10.7 billion in 2024 and is estimated to grow at a CAGR of 13.1% to reach USD 35.9 billion by 2034. As digital transformation accelerates and data volumes continue to surge, the need for advanced interconnect solutions becomes critical. In 2024, the hardware segment accounted for 51% share and is expected to grow at a CAGR of 12% through 2034. Physical infrastructure remains the backbone of DCI implementations, enabling reliable and high-speed data movement between facilities. Core components like optical transceivers, routers, multiplexers, and switches are seeing increased demand, especially those supporting 400G and 800G coherent optics. These elements are vital for powering cloud computing, artificial intelligence, and IoT use cases, although they also command a significant portion of data center investment.
5. <https://www.aibriefingroom.com/ai-applications/big-data/2024/04/data-center-interconnect-market-size-worth-30-2-billion-globally-by-2031-at-14-98-cagr/> - The global Data Center Interconnect (DCI) market is projected to grow from $15.38 billion in 2025 to $25.89 billion by 2030, reflecting a compound annual growth rate (CAGR) of 11.0%. This growth is driven by the increasing complexity of interconnection infrastructures, the rise of AI-driven workloads, and the urgent need for scalable, secure, and automated solutions to manage distributed data ecosystems. The acceleration of digital transformation and the proliferation of AI applications are reshaping network-architecture priorities, leading to a surge in demand for high-speed, low-latency interconnect solutions.
6. <https://www.ainvest.com/news/high-speed-interconnect-market-reach-56-9-million-2030-7-2-cagr-2509/> - The global market for high-speed interconnects is projected to reach $56.9 million by 2030, growing at a CAGR of 7.2% from 2024 to 2030. The adoption of low-latency, high-bandwidth interconnects is accelerating due to the proliferation of AI, HPC, and machine learning. High-speed interconnects are playing a foundational role in transforming data-intensive sectors, including cloud computing, AI/ML, autonomous systems, and telecommunications. The need for higher throughput in hyperscale environments is driving the adoption of PCIe Gen5/Gen6, 400G and 800G Ethernet, and advanced InfiniBand interconnects.
7. <https://www.grandviewresearch.com/horizon/outlook/datacenter-interconnect-market-size/global> - In 2023, the United States generated US$ 3.2 billion in revenue and emerged as the largest contributor to the worldwide data center interconnect market. The hardware segment emerged with the largest revenue contribution of 56.3% in 2023, owing to the rising demand for larger storage facilities among cloud service providers to address the growing big data volumes. The Internet Content Providers and Carrier-Neutral Providers (ICPs/CNPs) end-user segment is expected to witness the fastest CAGR of 13.1% from 2024 to 2030. Ciena Corporation, Huawei Technologies, NOKIA, Cisco Systems, and Fujitsu are some notable companies offering data center interconnect solutions. In August 2023, Marvell Technology introduced the COLORZ 800 family of 800 Gb/s ZR/ZR+ pluggable modules for the rapid, economical, and efficient scaling of data center interconnects in the modern AI environment.