



How a powerful AI data center was built with unprecedented speed and scale using EXFO's multi-fiber testing solution

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Challenges

- Unprecedented project timelines
- Hyper-complex fiber infrastructure
- Interoperability issues

EXFO solution

- [PXM/LXM](#)
- [FIP-500](#)

Benefits

- Speed and efficiency
- Widespread adoption

In the rapidly evolving world of data centers and artificial intelligence (AI), speed, precision, and scalability are critical. A leading hyperscaler embarked on an ambitious journey to build an incredibly powerful data center for AI. This fast-paced infrastructure project required unparalleled expertise and solutions to meet the scale and complexity of such a massive endeavor. Read on to know how innovative fiber testing solutions played a pivotal role in ensuring the project's success.

Challenges

The hyperscaler embarked on this project, and within months they were in full swing, aiming to deploy hundreds of thousands of GPUs and implement 400G and 800G technology across their new infrastructure. Given its scope, the project encountered several challenges:

- **Unprecedented project timelines:** The project's pace was unprecedented, moving from conceptualization to execution within months. Contractors and equipment providers were constantly adjusting to the rapid timeline, leaving little room for error or delays in sourcing, testing, and deploying fiber-optic infrastructure.
- **Hyper-complex fiber infrastructure:** The data center design relied on an extremely complex fiber network with a mix of multi-fiber and MPO-APC connectors for both singlemode and multimode fiber, which added layers of difficulty to the installation and testing processes.
- **Interoperability issues:** Multiple contractors and vendors were involved, resulting in conflicting test methods, fiber connector types, and test standards across various teams. Even major players in the test equipment space struggled to address these interoperability issues. The hyperscaler's testing needs were not being met, particularly for multimode fiber, causing delays and frustration among the teams involved.



EXFO overcame issues that other testing vendors could not resolve. Thanks to the flexibility and adaptability of EXFO's solutions, they were able to quickly diagnose and overcome compatibility issues.

Enter EXFO and deep expertise in fiber testing

EXFO's involvement began when the hyperscaler sought a solution that could meet their speed and reliability demands for multi-fiber testing. After trying various testing solutions from other vendors, EXFO was introduced to the project through a series of strategic interactions with multiple players.

The opportunity arose after several contractors and distribution partners recommended EXFO's solutions based on their past performance in similar high-demand environments. EXFO's PXM/LXM solution for multi-fiber testing, along with the FIP-500 single, duplex, and multi-fiber fiber inspection scope, quickly emerged as the top choice to address the hyperscaler's challenges.

- **Multi-fiber testing with the PXM/LXM:** EXFO's PXM/LXM provided the speed and accuracy that the project desperately needed. Capable of testing 12 fibers in just one second with high precision, this MPO optical loss test set dramatically reduced test times to meet the aggressive timelines. It saved critical time and costs, with hundreds of engineers able to perform tests faster and more efficiently.
- **Fiber inspection with the FIP-500 and SmartTips:** Fiber-optic connector endface cleanliness and inspection were equally important in such a complex build. The FIP-500, with its intuitive user interface, large selection of long-reach smart tips for dense panels, and 11-hour battery life for all-day testing, simplified the process of inspecting and verifying connectors. The ability to quickly swap out tips and scan optical connectors reduced training times and minimized errors on-site.
- **Custom solutions for complex test environments:** During testing, EXFO encountered various compatibility issues that other vendors could not resolve, such as the use of MPO-APC connectors for multimode fibers. Thanks to the flexibility and adaptability of EXFO's solutions derived from years of pioneering innovation in optical testing, they were able to quickly diagnose and overcome compatibility issues—much to the joy of hyperscaler and onsite contractors.

Positive outcomes

EXFO's solutions not only resolved the immediate challenges but also set the stage for long-term success in the hyperscaler's ongoing data center operations.

- **Speed and efficiency:** Onsite contractors found their work quality and efficiency boosted. With test times of one second per fiber, they reduced testing time on the floor, saving both time and money. This allowed contractors to focus on other critical aspects of the build.
- **Widespread adoption:** Initially, the data center had various test equipment from other testing vendors. However, after witnessing the superior speed and ease of use of EXFO's solutions and their compounded benefits, the hyperscaler made a decisive shift to EXFO solutions as the primary testing tools onsite.

EXFO's commitment throughout the project was demonstrated by strong collaboration with multiple stakeholders, including a major cabling vendor, contractors and distribution partners. EXFO's long-standing relationships with these organizations played a critical role in their ability to integrate seamlessly into the project.

Learn more

For further information on EXFO's data center solutions, access [EXFO.com](https://www.exfo.com)

Looking ahead

The project is far from over. With phase one of their supercomputer now online, boasting thousands of interconnected GPUs, the build-out process is yet to expand. The hyperscaler is now planning additional facilities and upgrades, including the deployment of 800G networks. These stages will also require industry-leading testing capabilities and expertise.

By deploying innovative multi-fiber testing solutions, the hyperscaler achieved unmatched speed, precision, and scalability in building their AI data center. Overcoming complex infrastructure challenges and ensuring seamless compatibility across vendors allowed them to meet ambitious timelines without compromising quality. This collaboration not only accelerated development but also set a strong foundation for future expansion, enabling efficient operations and reducing costs. The project highlights how the right partnerships can drive success in the fast-paced world of AI and data center innovation.

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