

Case Study

# HPC Networking

FS Helps an Autonomous Vehicle Startup to Build a Data Center Network

Using FS's HPC network solution, an autonomous vehicle startup built a high-performance data center network, ensuring seamless operations and rapid business expansion in autonomous driving.



## FS Helps an Autonomous Vehicle Startup to Build a Data Center Network

### Country

United States

### Industry

Autonomous Driving

### Network Type

Enterprise Data Centers

### Solutions

HPC Networking

### Highlights

- The N8560-32C 100G switch combines high performance and density with features like MLAG, PFC, DCBX, and ECN to meet the demands of high-performance computing networks.
- The S3900-48T6S-T connects to the IPMI interfaces on servers and the management ports on core switches, allowing for separating business and management traffic.
- Firewalls and routers ensure the stability and privacy of network egress portions and external connections.
- FS equips GPU servers with the Ubuntu 22 system in California, facilitating remote testing for fast verification and delivery.
- FS provides a comprehensive suite of customized solutions for GPU, CPU and storage servers that meet customer budgets and needs.

### Key Stats

- A server cluster with six 4U GPU servers and three 2U CPU servers.
- Two 100G switches with MLAG for network redundancy.
- 7 global warehouses and a robust supply chain ensure a 100% on-time delivery rate.
- 24H post-sale technical support and maintenance services cut client workload by 70%.



### Overview

The advancement of autonomous driving technology has led to a surge in data processing needs, particularly in perception, decision-making, and control. These processes rely on high-performance computing and real-time data processing, making a data center specifically designed for autonomous driving technology critical. Our client, a startup company specializing in autonomous vehicle technology, plans to build a high-performance computing network within its data center to support the development of self-driving technology.

The client aims to establish a high-performance computing network that connects the data center with their office and warehouse, deploying GPU and CPU servers and 100G switches for computational needs. Additionally, they plan to lay out an enterprise office network in their offices and warehouses, providing employees with basic office conditions. Moreover, the client requires internet access, necessitating the use of firewalls and security gateways to ensure data security.

### Challenges

The client, a startup, requires a cost-effective solution that can deliver switches, servers, and other accessories by early December 2023 for their year-end project launch. With limited supply chain integration and unfamiliarity with switch CLI configuration, they need a solution provider to ensure equipment compatibility and offer technical support, including real-time operational assistance and training. Furthermore, they need server software (Ubuntu 22) installed at the FS integration center in California to facilitate remote testing of GPU server parameters and performance.

The client seeks a network solution provider that offers comprehensive services, including equipment

procurement, network design, and technical support. They need a partner who can help define the specifics of technology and products, ensuring the project is completed on time and with high quality.

### Solutions

The client has partnered with FS for the network design and product selection of their networking solution. Tailored to the client's environment and business requirements, FS provides a full suite of customized services for GPU, CPU, and storage servers, delivering a robust hardware foundation for the client's R&D business.

In the computational data center, FS deployed six 4U GPU servers with dual AMD EPYC processors and 8x NVIDIA RTX A6000 Ada GPUs, integrated with NVIDIA Mellanox MCX653106A-HDAT ConnectX®-6 adapters, offering immense processing power for tasks like big data analytics and autonomous driving research. Meanwhile, the three 2U RS5220 CPU servers utilize 40G Intel XL710-BM2 dual-port network cards to ensure the efficient and stable performance of critical business processes.

To realize core network expansion and connect servers and NAS devices, FS has implemented two N8560-32C switches that support MLAG technology for hardware-level redundancy, bolstering network stability while increasing the uplink bandwidth. The N8560-32C features 32x 100G interfaces and is equipped with PFC, DCBX, and ECN technologies to deliver high bandwidth with low latency, meeting the demands of high-performance computational networks.

For the enterprise office network, an N8550-32C is deployed to interconnect with the computational data center, and firewalls and routers are installed at the network exit, ensuring stable and secure connectivity to external networks. Data security between data centers is safeguarded using IPSec technology, and SSL VPN

technology ensures data safety while employees remotely access the internal network servers.

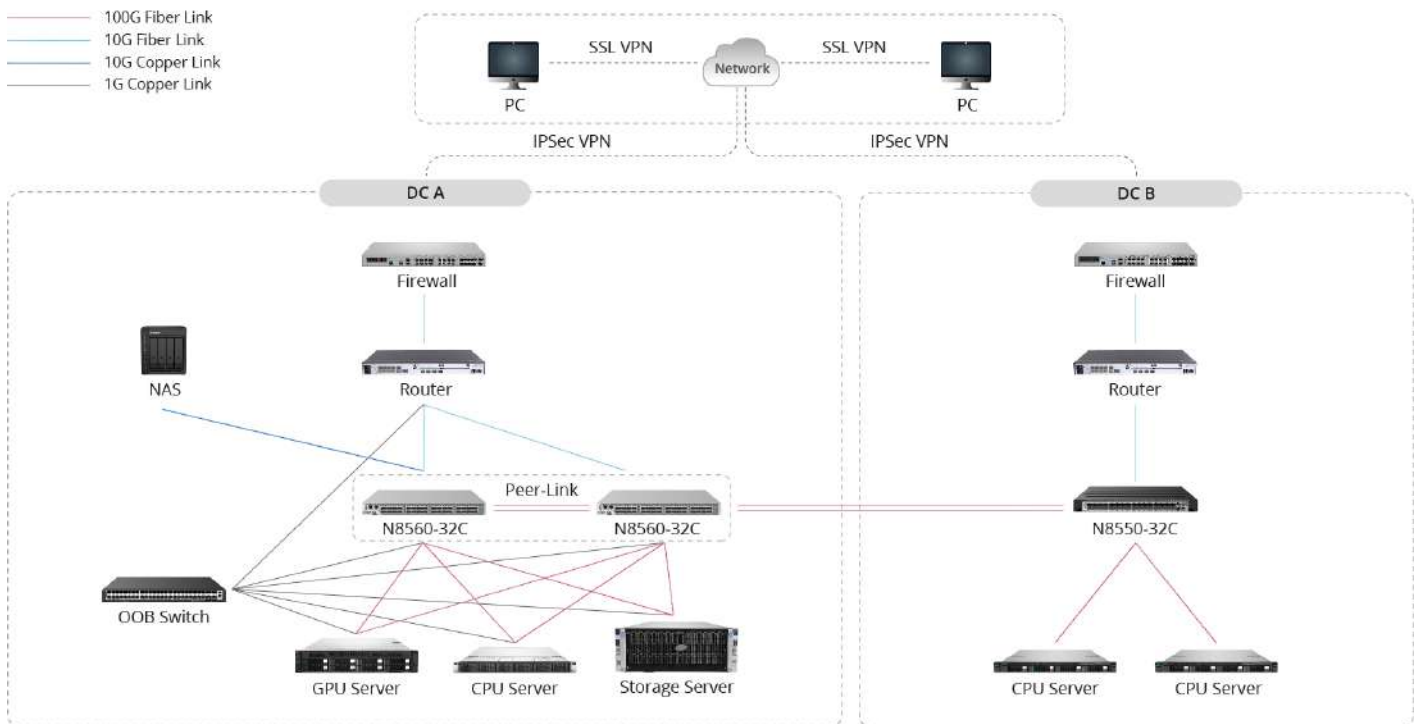
Additionally, FS has set up an S3900-48T6S-R management switch, connecting server IPMI interfaces and the core switch's management port to create an isolated management network. This separation of business and management traffic facilitates unified device management for the client.

In terms of product delivery and technical support, FS ensures rapid stock deployment and on-time delivery with 7 global warehouses and a robust supply chain. At the Integration Center in California, we provide on-site acceptance testing by installing Ubuntu 22 on GPU servers, assuring the quality of delivered products. The technical team provides online services including solution consultations, VLAN setup, routing configuration, and troubleshooting.

## Results

FS offers a one-stop global supply chain service that delivers highly compatible and stable product solutions, significantly reducing the risk of product incompatibility. Additionally, with FS's 24H operational maintenance service, the customer receives end-to-end technical assistance and training, slashing maintenance efforts by roughly 70%.

Committed to on-time delivery, FS prepares remote test environments and preloads GPU servers with Ubuntu 22 OS at our California integration center, ensuring quality and expedited product delivery. By analyzing customer network scenarios, we assist the client choose cost-efficient solutions tailored to their current network needs but also adaptable to future growth and changes.





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