

Creating a global, zero-downtime network environment

Size: 130,000 employees | Industry: Automotive | Location: Munich

Challenges

- Support 24x7 manufacturing operations around the world
- Deliver uninterrupted connectivity and services to nearly 10 million vehicles
- Establish an evolutionary path to cloud-based applications

Solutions

- High-performance, high-density network switches with high-availability (HA) features:
 - System-level HA via In-Service Software Upgrade (ISSU) service
 - Network-level HA with redundancy and multi-pathing such as virtual port channels (vPCs)

Results

- Eliminated network downtime worldwide
- Increased north-south and east-west network bandwidth
- Future-proofed environment with software-defined networking options

For More Information

- Visit: [cisco.com/c/en/us/products/switches/nexus-9000-series-switches/index.html](https://www.cisco.com/c/en/us/products/switches/nexus-9000-series-switches/index.html)

Challenge: Eliminating network downtime

With a host of processors, sensors, cameras, integrated circuits, and even radar and sonar capabilities, modern automobiles are sophisticated, mobile computing platforms. They generate, send, and receive data every second they are on the road.

Contemporary BMW vehicles, for example, generate and transmit upwards of 100 KB each day. With nearly 11 million connected BMW vehicles around the world, the auto manufacturer must process and analyze roughly 1 TB of encrypted data on a daily basis. The data is used for performance improvements, firmware updates, and first-party services, which are transmitted back to the vehicles on the road. And with the car owner's permission, some of the data is anonymized and shared with cloud-based data marketplaces and third-party service providers.

What's good for business is challenging for IT.

The BMW Group's factories run 24 hours a day, seven days a week. Its R&D teams are working feverishly to bring new electric and autonomous vehicles to market. And its sales channels and revenue-generating services—like BMW ConnectedDrive—must be continuously available.

With all of these operations supported by the BMW Group's enterprise data center, finding maintenance windows to update hardware and software systems was proving increasingly difficult.

The auto manufacturer wanted a zero-downtime network solution.

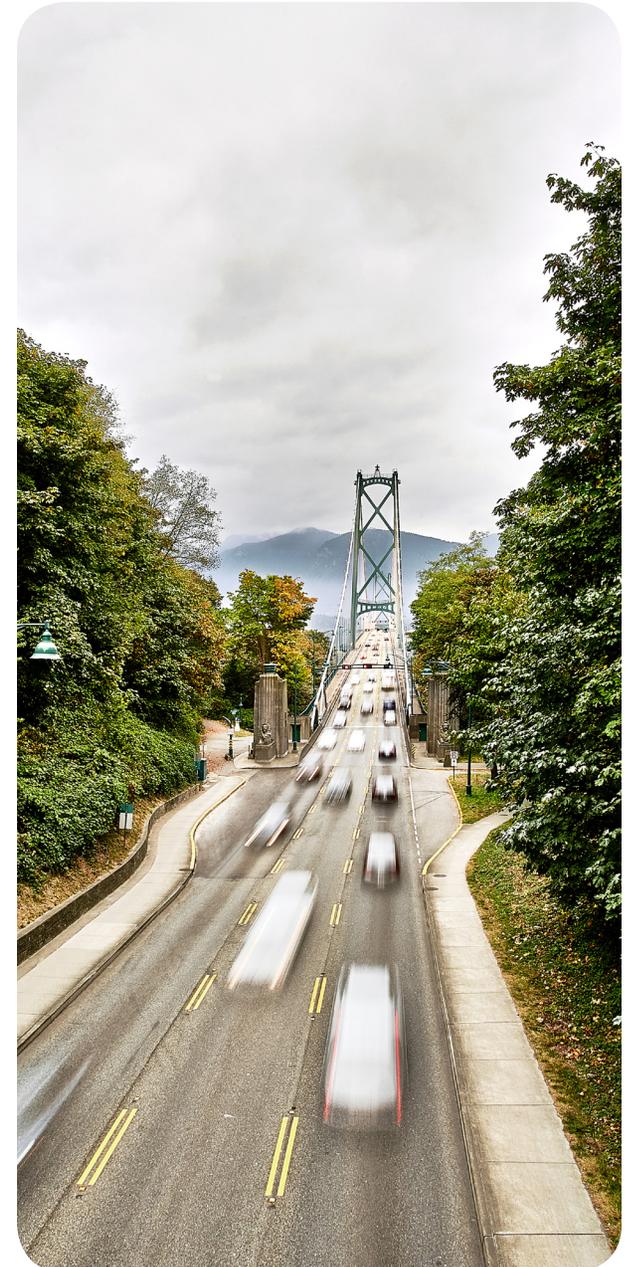
Responsive development and collaboration

The BMW Group's former network environment had to be taken offline for maintenance and software updates. It didn't support east-west traffic at high data rates. And there was no upgrade path to higher bandwidth or cloud-based application support.

When the Cisco Nexus® 9000 Series Switches were announced, the BMW Group immediately expressed interest.

The switches offered the high performance, small form factor, and large number of interfaces the company was seeking. Only one thing was missing: In-Service Software Upgrade (ISSU) functionality, which allows the switches' software to be updated without taking them offline.

Undeterred, the BMW Group asked Cisco if it would add the zero-downtime feature to its newly announced switches. Cisco was receptive, and the two companies worked together to establish a timeline for delivery.



Increased bandwidth

With ISSU functionality now built-in, the BMW Group adopted the Nexus 9000 as its global standard for data center switching. The switches were initially installed in the company's enterprise data center in Munich, creating a 24x7 network operations hub. The Nexus 9000 was later deployed as a data center and core Layer 3 switch in all of BMW's main production sites around the world, including Austria, China, England, Germany, Singapore, South Africa, and the U.S.

The Nexus 9000 has given the BMW Group consistency and a single point of control to manage all of its network devices. And the auto manufacturer now has the stability, reliability, and performance it needs to support its mission-critical applications.

Compared to the BMW Group's legacy switches, which were geared toward north-south, client-server traffic and only offered 1 Gb connections, the Nexus 9000 switches come with 10 Gb interfaces. They also deftly support east-west traffic—the biggest limitation of the BMW Group's former solution—with 40 Gb or 100 Gb connections within the fabric.

Utilizing IPv6, the latest Internet Protocol standard, the network environment supports a staggering number of devices and connections. Each of the BMW Group's manufacturing plants has thousands of hardware devices, all of which connect to the company's enterprise data center in Munich. If the network goes down, production comes to a standstill.

Fortunately, there is no downtime with the Nexus 9000. The switches can continue to receive and forward traffic even as their software is being updated. And if one crashes, the network automatically fails over to a secondary switch.

Product

- Cisco Nexus 9000 Series Switches

