Riedel Networks

Riedel Networks Challenges Automotive Convention with Remotely Driven Race Car

Cisco SD-WAN and Catalyst 8300 Edge Platform provide connectivity to enable a race car to be driven at 150km/hour by a driver from 82km away

The customer summary

Customer name
Riedel Networks

Industry
Network services

Location
Frankfurt, Germany

Number of employees
75

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Challenge

- Establish flawless connectivity between race car and driver, 82km apart

- Ensure security of connection from potential hacks or disruption

Solution

- Cisco® Catalyst™ 8300 provides reliable data transmission with 99.999% availability

- Cisco Catalyst Cellular Gateways provide 5G over SD-WAN for failover connectivity

Benefit

- Enables remote connectivity to race car to facilitate speeds of up to 150km/hour

- Reduces need for on-site tech support

Accelerating the disruption of the automotive industry

Disruption is coming to the automotive industry. The future of the car is being shaped by innovations.

Start-ups and innovators are exploring new concepts in car ownership and car usage. Tests of autonomous vehicles have already racked up millions of miles. Car-as-a-service subscription models are springing up around the world. With clean air regulations, congestion charges, and a switch to remote working (meaning fewer commutes), some suggest we may have already reached the peak of motor use per capita.

It is an atmosphere that is ripe for new ideas.

Could a skilled driver navigate a vehicle through crowded city streets while sitting hundreds of miles away? The idea could transform the road haulage industry, taxis, last-mile delivery, and emergency services.

Michael Resl is the Director of Competition and Technology at ITR, the promoter of the Deutsche Tourenwagen Masters (DTM). He had a bold vision. Together with innovation partner, Schaeffler, the idea of the DTM Electric remote run was formed. The concept was not for a slow crawl around congested Vienna. Instead there was a more ambitious goal: to have an electric car tear around the Red Bull Ring in Spielberg, Austria, at speeds of 150km/hour. The driver would be in Graz, Austria—roughly 82km away from the track—in a racing simulator.

DTM invited Riedel Networks, a global network services provider based in Germany, to build the communication infrastructure. "We're pushing the limits. Controlling a race car at this speed from 82km away has never been attempted. Partnering with Cisco for a secure and responsive connection was essential," says Michael Martens, CEO, Riedel Networks.

> "This is innovation on a grand scale. We're using Cisco technology to bridge an 82km gap between the driver and the car. If we can do this, what else can we achieve?"
>
> **Julia Kirk**
> Manager Special Bids & Projects, Riedel Networks

"The pandemic has shown that many of us can work remotely," says Julia Kirk, Manager Special Bids & Projects, Riedel Networks. "Can a skilled driver work remotely?"

An unbroken connection between car and driver

Motor racing presents many challenges, and at speeds of 150km/hour there is very little room for error. On the circuit, a driver may have only a split second to make an adjustment.

"Clearly, latency is everything. Our driver in Graz would need to have a low latency connection to the vehicle on the track," Kirk explains. "At 150km/hour, 20 milliseconds of latency in the connection translates to a meter traveled. We cannot lose that connection for a moment."

Riedel, a Cisco partner, designed and built the communications architecture to control the race car using Cisco Software-Defined Wide Area Network (SD-WAN) and the Catalyst® 8300 Edge Platform for the primary connection with a direct Multiprotocol Label Switching (MPLS) over fiber link. The Cisco Catalyst 8300 Edge Platform provides reliable data transmission with the carrier-grade (99.999%) availability that is required between the car and the remote driving simulator.

"We also have a backup," says Kirk. With the exceptional speed of 5G, the architecture was designed to include a redundant backup connection using Cisco's Catalyst Cellular Gateways. It means 5G over SD-WAN can become the primary transport with multigigabit connectivity at up to 3.3Gbps.

"This ensures we have uninterrupted connectivity between the car and the driver," Kirk adds. "The onboard audio and video, plus all the performance readings, are fed back in real time to the driver in Graz."

Crucially, the connection is not just robust but secure, ensuring hackers cannot access the connection and take command of the car.

The experiment took place not behind closed doors on an empty track but ahead of the fifth round of the Deutsche Tourenwagen Masters (DTM)—a 16-leg touring car championship with races held across Europe. The DTM electric demo car was the pace car, running ahead of a field of high-spec, petrol-powered Audis, BMWs, and Mercedes-Benz.

"We've worked with DTM for a number of years," says Kirk. "They would have never requested our support unless they knew we could deliver."

The round-trip time between the simulator driver in Graz and the car on the Red Bull Ring track is only 2ms for the WAN. With tens of thousands of spectators lining the track, this remarkable piece of automotive innovation took place with barely anyone noticing something ground-breaking was taking place.

"It was an amazing sight to see a car driving round at 150km/hour, then coming into the pit lane, and there's no driver inside," says Kirk. "Even for those of us on the project, it was not possible to imagine it until you saw it with your own eyes."

Resl says the Riedel experiment reflects motorsport's continued quest for even the smallest gains. "I've been involved in this sport for 25 years and every year we find something new. The success of this project will impact on-track safety, race management, and car performance. A lighter car can be a faster car."

"At Riedel Networks, we know Cisco is a very reliable partner. We have great trust in Cisco technology."

Julia Kirk
Manager Special Bids & Projects, Riedel Networks

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Going forward

Remotely controlled pace cars will not become mandated at all future DTM events yet. But the success of the Red Bull Ring test will give race organizers confidence that the technology works and that new connectivity challenges can be attempted. For Riedel, it opens the door to the remote management of cameras and trackside facilities.

"We can have our technicians in the head office supporting an event many miles away," says Kirk. "Travel is not always possible, and remote working is necessary."

What is more likely is that there will be a touring car championship for electric cars. With sustainability a critical issue, the automotive industry is desperate to prove the performance and desirability of electric vehicles.

The success of this remote trial also demonstrates the impact connectivity can have away from the track. If a racing car can be driven at 150km/hour without incident, road haulers will be keen to see how a truck can be driven at 80km/hour. This can impact all industry sectors. As the world adapts, connectivity needs to adapt with it.

"This is innovation on a grand scale," says Kirk. "We're using Cisco technology to bridge an 82km gap between driver and car. If we can do this, what else can we achieve?"

Product list

- Cisco SD-WAN
- Cisco Catalyst 8300 Edge
- Cisco Catalyst Cellular Gateways

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