Case Study

SailGP accelerates its race day data with 5G.

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5G Advanced Network Solutions powers high-speed, low-latency data connections, enhancing the fan and athelete experience.

SailGP represents the pinnacle of racing, where superfast hydrofoiling boats are also massive extreme IoT devices capturing 48 billion data requests per day and traveling at 60mph during close-to-shore, stadium-style racing. Seamlessly transferring to the Oracle Cloud while traveling that fast on water is the ultimate test of any network solution —not just for bandwidth and latency, but also around the need to address complex data analysis and integrations.

All SailGP F50 race boats leverage fly-by-wire technology which means when a driver turns the steering wheel or an

SailGP

SailGP is the world's most exciting racing on water. The global championship features national teams battling in short, intense races at iconic stadium-style venues across the globe. The high-tech, high-speed action features sailing's best athletes racing in identical hydrofoiling F50 catamarans, flying at speeds approaching 100 km/h. Teams include Australia, Canada, Denmark, France, Great Britain, Japan, Spain, Switzerland, and the United States. SailGP also races for a better future, championing a world powered by nature.

240,000 data points from 800 sensors

Up to 50% reduction in latency

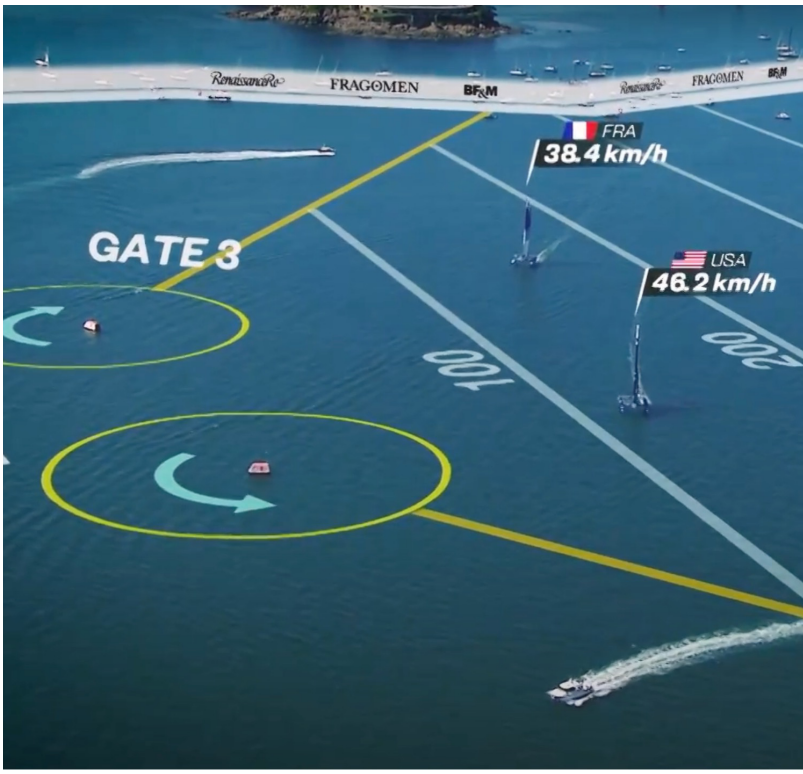
Live augmented reality creating an immersive customer experience

Seamless integration between event site and broadcast media partners in London.

athlete turns the handles on the grinding pedestal, rather than connecting to a rudder or control surface, it connects to a computer that translates that steering or turning motion into commands for the boat. So the network is critical in ensuring a flawless integration of the GPS, hydraulics, control surfaces, and rudders—everything needed to be working in concert so the crew can change the angle of the hydrofoil and optimally steer the boat.

All that technology is really important because the F50 drivers cannot actually see the race course boundaries from their boats while on the water, instead relying on technology to create a virtualized race course and ensure they're staying within the boundaries so they won't incur a penalty and in turn, need to slow the F50 down and fall behind the competition.

To make everything work properly and at high performance, SailGP looked to T-Mobile, because SailGP's real-time data needs were not being met by their existing network system. It had too many gaps and performed inconsistently. It simply could not handle the speed of connectivity needed as well as the dynamic conditions caused by racing over water.



Race course boundries, wind direction, and other critical boat data are integrated into real-time augmented reality.

Three core challenges

Challenge 1: Getting the data to the Oracle Cloud super fast

While the SailGP athletes could see the information onboard via the boat's computer system, support teams and fans of SailGP around the world had to rely on the Internet to watch the live event. To watch, they had to wait for the signals to be broadcast from the boats, go into the cloud, get processed within the cloud, then sent to them so they could experience, use, and enjoy the race's augmented reality in real time. With SailGP's cloud computing and media processing partners based in London, making all this work at the Chicago race location was a challenge. T-Mobile had to ensure that the data would move as fast as possible—from the boats, to the cloud, and back down to the support teams, coaches, and fans.

SailGP also wanted to provide unique race points of view to excite fans with great immersion experiences. To that end, they had cameras mounted in multiple locations on the F50 to capture a 360-degree experience throughout the races with thrilling shots and angles of the action, both on and between boats.

Prior to T-Mobile, SailGP's standard way of sending GoPro live streams was to send the entire data stream over open VPN to a secure instance in their London cloud. Yet, open VPN was adding 25–30% overhead to each already-massive data packet. Being too large, packets had needed to get broken into pieces while en route, then re-assembled and re-positioned into the right order at the back-end.

Unfortunately, video packet reading must happen with 100% accuracy. When it didn't, SailGP video streams experienced inconsistent frame rates and poor quality—unacceptable to the live viewing audience. T-Mobile had to find a better way.

Challenge 2: Ensuring 100% network uptime at ultra-high performance

In order for the boats fly-by-wire technology to work properly, it required the network to stay up at all times. This was the only way to ensure crew safety, because fly-by-wire responds to millisecond-by-millisecond steering inputs. If the system fails to capture those inputs in real time, it puts crew members at risk of serious injury and boats at risk of millions of dollars in damage. So, not only was T-Mobile tasked with ensuring uptime and high speed, flawless integrations were also needed for all system and network components to work in concert.

Challenge 3: Testing to plan

To ensure the boat crews' safety and that everything would work as planned, T-Mobile normally leverages a test lab environment that incorporates all the planned components of an implementation. But the SailGP race was only four days away, and SailGP's Wi-Fi connections did not allow for realistic testing. They were simply too slow and unreliable. Yet, knowing the criticality of testing, the T-Mobile team planned to find a way to test the environment—quickly.

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Russell Coutts CEO of SailGP

Solution

T-Mobile rapidly devised a solution to SailGP’s multi-faceted performance challenges that leveraged T-Mobile’s 5G Advanced Network Solutions (ANS) hybrid network architecture to integrate connectivity seamlessly into SailGP’s computers, broadcasting, and augmented reality (AR) solutions. The T-Mobile network was the ideal choice as the backbone for every technology running at the SailGP event, because it is the largest and fastest 5G network in America. This made it easy for the T-Mobile team to point a network tower toward the SailGP race location and capture data that was being generated more than two miles out, over the lake on which the teams were training.

Next, T-Mobile combined 5G network connectivity with on-boat connectivity. Each boat had its own industrial, enterprise-grade router with a 5G chip and SIM in it to integrate all the network information from the F50 and push it to the cloud. By flawlessly integrating the on-board computer with the network, T-Mobile ensured crew safety via real-time fly-by-wire command capture and broadcasting.

As for the unique live-action video streams from the GoPro cameras, T-Mobile’s public 5G network was more than capable of translating live action into fantastic live experiences for fans. To achieve this, T-Mobile moved the GoPro cameras off SailGP’s open VPN and onto the public internet to a media server which delivered amazing augmented reality experiences to both on-site fans and internet viewers around the world.

Of course, none of this would have been possible without thoroughly testing the T-Mobile 5G ANS proposed plan prior to race day. Recognizing the short, 4-day runway, T-Mobile’s team got highly creative. Instead of using their typical lab environment and dealing with slow Wi-Fi speeds from SailGP’s network, T-Mobile set up a 5G simulation of the event and its technologies in America to work out 95% of the solution. This robust lab environment was vital to integration testing and proving the solution.

Results

So, how was the race? Fantastic for crews and fans alike. Not only did T-Mobile’s 5G Hybrid Mobile Network deliver superior reliability in the most extreme conditions, it provided up to a 50% reduction in latency. This superfast data transfer helped coaches and athletes make better decisions while racing at highway-like speeds. It also brought fans closer to the action, giving them an unmatched viewing experience. “It’s not the conventional image of a sailboat, this is something completely different,” said Russell Coutts, CEO of SailGP. “To create the insights and the information needed to run these boats and provide the fans with the insights they want, it is critical to reduce the latency as much as we can. Certainly T-Mobile has provided, by far, the fastest solution that we’ve ever seen.”

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