



Great teamwork leads to success on the track

F1™ racing team maintains its fast pace of development after getting off to a flying start with high-performance IT



Customer profile



| | |
|------------------|--|
| Company | Caterham F1 Team |
| Industry | Sport |
| Country | United Kingdom & Malaysia |
| Employees | 355 |
| Website | www.caterhamf1.com |

Business need

Caterham F1 Team knows that success on the track relies on teamwork. As such, it looks for IT providers that can develop strong relationships and meet increasing demands on IT.

Solution

Together with Dell, the team built an Intel® Cluster Ready HPC cluster for designing cars and a resilient trackside infrastructure.

Benefits

- Intel Cluster Ready HPC saves time and money
- EqualLogic storage performs in harsh environments
- Dell IT Advisory Services ensures two-hour response anywhere in the world
- IT collaboration maximises performance in extreme heat
- Caterham F1 Team gains cutting-edge IT for UK headquarters

Application areas

- Deployment Services
- Disaster Recovery
- End User Computing
- HPC
- Infrastructure Consulting
- Mobility
- Networking
- Server Solutions
- Storage Solutions
- Support Services
- Unified Communications
- Virtualization

“We realised that Dell understood our industry – everything from the technology needed to design an F1 car, to our requirement for trackside mobility and storage that could withstand extreme temperatures and vibrations.”

Bill Peters, Head of IT, Caterham F1 Team

Teamwork is key to success in F1™. Winning drivers always pay tribute to the people behind the scenes, knowing for certain that racing talent doesn't guarantee victory. The Caterham F1 Team sees teamwork as a core value. From the office staff controlling daily operations, to the pit crews and drivers – they're all working towards success on the track.

The company has always chosen to work with suppliers that share its beliefs, and for this reason it decided to partner with Dell. Caterham F1 Team has been working with Dell for a number of years to develop its IT in line with the expansion of the team and the increasing demands on technology in F1 racing. The relationship continues to evolve, with Dell providing the solutions and services to support Caterham F1 Team at its ground-breaking new headquarters in Oxfordshire and worldwide throughout the F1 season.

Relationship gets off to a great start

Collaboration between Caterham F1 Team and Dell was great from day one. They worked together on getting the team's IT ready for the start of the 2010 F1 season. This was no ordinary task though – Dell had to design and deploy an enterprise-class environment, including a high-performance computing (HPC) cluster, in less than 22 weeks. Bill Peters, Head of IT at Caterham F1 Team explains why he thought Dell was the right IT solution provider for the job. "We spoke to a number of suppliers, but only Dell proved it could deliver in every category. Against other IT solution providers, Dell was more responsive. The Dell Consulting team came in and listened to our requirements, quickly turning them into a statement of work," he says.

An enterprise-class environment designed in partnership

Peter's decision paid off, not least because he was now working with a partner that had experience in the world of F1. "Dell did a fantastic job of bringing everything together. It understood how an F1 company works and the

"We needed the maximum amount of processing power in the minimum amount of space – and we needed it quickly. The Intel Cluster Ready HPC that Dell recommended is ideal for us because it offers the right performance at the right price."

*Bill Peters, Head of IT,
Caterham F1 Team*

Technology at work

Services

Dell Infrastructure Consulting

Dell Support Services
– Dell IT Advisory Services
– Dell ProSupport™

Hardware

Intel® Cluster Ready HPC

Dell™ PowerVault™ MD3200
and MD1200 storage arrays

Dell EqualLogic PS6000S
storage array

Dell PowerEdge™ R210 and
R710 servers with Intel® Xeon®
processors X5570

Dell PowerEdge M610 blade
servers with Intel Xeon
processors X5570

Dell PowerEdge M1000e
modular blade enclosures

Dell Latitude™ E6500 and
E4300 laptops with Intel®
Core™ 2 Duo processors

Dell Precision™ M6600 and
M4600 mobile workstations
with Intel Core i7-920XM
Quad Core Extreme Edition
processors

Dell PowerConnect™
6xxx/7xxx/8xxx series switches

Dell Force10 switches for iSCSI

Dell PowerVault™ TL2000
backup appliance

Dell Latitude™ ST Tablets

Dell Alienware™ Area-51
desktops

Software

Microsoft® Lync™ Server 2010

VMware® vSphere™ 4

importance of our timeframes,” he says. “We realised that Dell understood our industry – everything from the technology needed to design an F1 car, to our requirement for trackside mobility and storage that could withstand extreme temperatures and vibrations.” Dell consultants held a series of workshops covering the design and implementation of servers, storage, networks and infrastructure applications. This process mapped the team’s short and long-term business goals to its IT strategy. Dell then worked with the in-house IT team to design the optimal HPC environment for Caterham F1 Team.

Building a powerful HPC environment for computational fluid dynamics (CFD)

Caterham F1 Team needed the HPC solution to run advanced CFD processing – a way of accurately simulating wind tunnels in a virtual space. With their knowledge of the F1 industry, Dell’s consultants worked alongside the in-house IT team to design the solution. The initial designs were completed on a cloud-based HPC environment provided by Cambridge University. When ready, the project was migrated to Caterham F1 Team’s own HPC platform.

The team selected an Intel® Cluster Ready HPC – a production-ready system that comes in a configuration with pre-tested Dell hardware, and independent software vendor applications for wind tunnel simulation. The system consists of 186 Dell™ PowerEdge™ M610 blade servers with Intel® Xeon® processors. These are housed in energy-efficient Dell PowerEdge M1000e modular blade enclosures and connected to Dell PowerVault™ MD3200 and MD1200 storage arrays. Dell PowerConnect™ 6xxx/7xxx/8xxx series switches also manage the HPC environment’s data traffic.

Today, Caterham F1 Team is driving car development with the HPC solution, which can perform 163,398 calculations per second. It also uses Dell Alienware™ Area-51 desktops to support the work and continues to collaborate with Dell and Intel to gain greater processing speed without increasing the infrastructure’s physical footprint. Peters says: “We needed the maximum amount of processing power in the minimum amount of space – and we needed it quickly. The Intel Cluster Ready HPC that Dell recommended is ideal for us because it offers the right performance at the right price. This cluster is critical to the success of the team. It works 24/7 simulating aerodynamics and helps us design the cars. It gives us our competitive edge.”

Creating a resilient trackside IT environment to travel the world

All the great work developing the cars can be quickly undone if the technology supporting the team on the day of the race isn’t up to scratch. Today, Caterham F1 Team is giving its technical staff the IT support they need in F1, where 20 gigabytes of data can be generated on a race weekend. Dell designed an environment featuring Dell PowerEdge R210 and R710 servers, virtualized with VMware® vSphere™ 4 server software. It also added Dell EqualLogic PS6000S storage arrays with solid-state drives, plus Dell PowerConnect and Dell Force10 switches for iSCSI. To protect data, Dell added a Dell PowerVault™ TL2000 backup appliance and back-up software.

Peters says: “I had a high-level idea of what we needed, but Dell designed and deployed everything to meet our challenges. When an F1 engine starts, the ground shakes, so we have solid-state drives in our EqualLogic storage, plus Dell demonstrated that the PowerEdge servers and storage had been tested in extreme heat – more than 40 degrees Celsius, as we experience in Abu Dhabi.”

Keith Saunt, Chief Operating Officer at Caterham F1 Team, says: “To make things the way we need them, we have to have a partner in the true sense of the word. That’s what we get from Dell.”

Maximising performance in extreme trackside temperatures

Caterham F1 Team and Dell have continued working together to overcome the challenges of trackside temperatures. The technology often sits in locations without dedicated cooling, relying on the immediate environment to dissipate heat. But when you’re racing in places such as Abu Dhabi or Malaysia, this isn’t easy. For this reason, Dell engineers collaborated with IT personnel at Caterham F1 Team to adjust the servers and storage to operate at higher temperatures than usual. Thanks to their design, Dell solutions can operate in extreme conditions because the built-in warning systems allow for greater operational temperatures. They raised the performance threshold – refining the number of alerts – so warnings would commence much later. It means the technical teams can continue working without a stream of alerts disrupting them. They’re notified only when there’s a critical issue.

On-track performance supported by a powerful network and mobile technology

A key element of the trackside environment is the network. Peters explains: “At the track, a strong network is essential. We pull huge amounts of data from the cars because they’re racing every lap, so high performance and stability are paramount. The team uses Dell Latitude E6500 and E4300 laptops with Intel® Core™ 2 Duo processors and Dell Precision M6600 and M4600 mobile workstations with Intel Core processors to process more than 2 gigabytes of data streaming from cars on the track.”

Anthony Smith, Senior IT Support Engineer at Caterham F1 Team, says: “The Dell laptops that we have are very powerful. They allow us to see all the data and manipulate it in real time – that’s absolutely critical for what we’re doing.”

These laptops are perfect for Caterham F1 Team because they’re extremely powerful, but they’re also tough – built with magnesium-alloy chassis and display backs that meet rigorous

standards for durability. Peters says: "We tested the trackside environment, PowerEdge servers, EqualLogic storage, the network and our Latitude and Precision laptops in a live environment only a couple of days before our first race."

Drivers gain instant picture of performance with tablet devices

The trackside technical team and drivers are working together more closely than ever to maximise the performance of the cars. They now have Dell Latitude™ ST Tablets so drivers can obtain a detailed picture of their performance while still strapped into their race cars. With touch-screen functionality and application compatibility, the drivers have a reliable device that enables them to navigate easily through a range of dashboards to access the data they need fast.

Delivering support in less than two hours worldwide

Caterham F1 Team travels the world throughout the year for races and pre-season testing. But wherever the team is it knows that Dell support is no more than two hours away. Peters says: "On race day, we're entirely reliant on our trackside IT environment and support. Quite simply, if our IT fails, we can't race. We need excellent communications within the team, plus a lot of storage capacity and powerful systems to handle our data."

Because the infrastructure operates in extreme environments, there is a risk that parts may fail. However, a

Dell Service Delivery Manager, part of Dell IT Advisory Services, ensures that support is locally available so the team can focus on racing. Peters says: "Our Dell Service Delivery Manager helps us resolve issues quickly, and gives us fast escalation when there's a serious issue. It's another reason we're confident that we can deliver maximum uptime for the team."

Smith says: "We have Dell ProSupport for all of our equipment – this has been exceptional for us because it means we can get support in any country 24 hours a day, seven days a week."

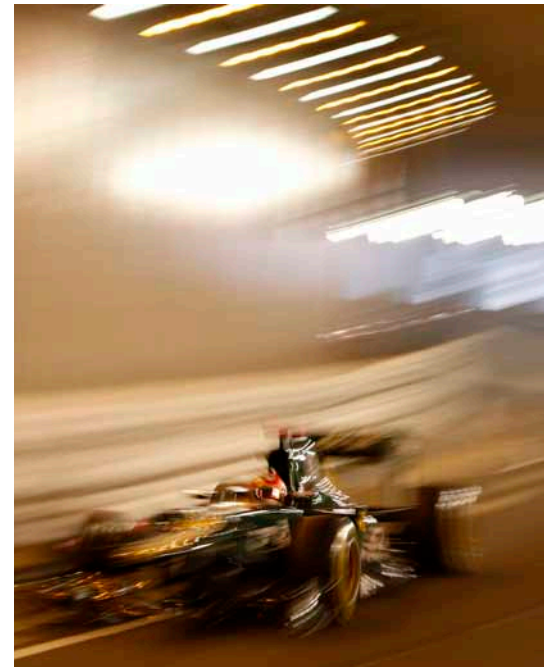
Efficient IT reduces freight costs and increases development resources

The team is investing more in car development thanks to the efficiency of its trackside infrastructure and the responsiveness of Dell. The Caterham F1 Team trackside infrastructure fits into just half a rack, whereas infrastructures of other teams fill an entire rack. This significantly lowers shipping costs when travelling around the world. Costs are further reduced by the two-hour support offered by Dell worldwide, which means the team carries a smaller stock of servers. It has reduced the weight of the infrastructure by between 20 and 30 kilograms. And, with each kilogram costing around US\$350 (£220) to ship, that's a saving of up to US\$10,500 per race.

Helping to design cutting-edge headquarters for future success

The collaboration between Dell and Caterham F1 Team continues to evolve

beyond the track too. Dell is working closely with the team to create the IT infrastructure for its new head office in Oxfordshire. The site marks a big step forward in the development of Caterham F1 Team, which expects to grow to more than 1,000 employees by 2013. The IT infrastructure will enable continued scaling of the virtualized environment and use technologies such as Dell Force10 switches and Microsoft® Lync™ Server 2010 for unified communications. A key part of the infrastructure will be the design of the data centre. Caterham F1 Team is applying the same rigor to its new site in terms of energy efficiency as it does to its cars. And Dell is helping to design a free-cooling data centre to save resources and lower carbon emissions.



View all Dell case studies at dell.com/casestudies

Availability and terms of Dell Services vary by region. For more information, visit dell.com/servicesdescriptions

© June, 2012 Dell Inc. Dell is a trademark of Dell Inc. Intel, Intel Core and Intel Xeon are registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft, Microsoft Office and Windows, SQL and SharePoint are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. This case study is for informational purposes only. DELL MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS CASE STUDY. Reference number: 10011276

