Virgin Media O2 selects Arista Networks for largest innovation of core UK telecommunications network to support next generation service delivery strategy.

Highlights

Challenge

Virgin Media O2 needed to upgrade its highly proprietary networking infrastructure to a more agile and open platform able to enhance its move towards software and cloud-based technologies.

Solutions

- Innovative Cognitive Cloud Networking technology with support for virtualisation and automation features.

- Arista 7000 series leaf and spine network with wire speed layer 2 and layer 3 features combined with SDN overlay technology.

Results

- 100G capable core network with flexible endpoints delivered as a single, unified networking environment

- Simplified network operation via the EOS® single image capability and enhanced through CloudVision® telemetry and automation capabilities

- Physical reduction in equipment footprint and operational complexity though modular design to allow improved operational efficiency.

As part of an ongoing project to modernise its UK telecommunication network, Virgin Media O2 has undertaken a major project to replace its legacy core IP network with a more flexible and largely cloud driven alternative. To meet its need for performance, reliability and support for its software defined future, Virgin Media O2 turned to Arista's Cognitive Cloud Networking technology to help deliver the resiliency, performance and open approach that would support next generation service delivery including the move to DevOps and successful delivery of 5G.

Company Background

Virgin Media O2 is a 50:50 joint venture between Telefónica SA and Liberty Global and is one of the UK's largest businesses with 47 million UK connections across broadband, mobile, TV and home phone. The fixed network currently passes 15.5 million premises alongside a mobile network that covers 99% of the nation's population with 4G, and almost 200 towns and cities with 5G services.

Challenge

Even prior to the merger and creation of the joint venture, Virgin Media O2 had been engaged in an ongoing plan to modernise its 4G network in the UK. In common with many other large telecommunication providers, it has a long-term strategy to make its network more efficient, reliable and able to scale easily to meet the growing capacity needs placed upon it by increasing demand for IP connectivity.

With a huge increase in demand and the need to deliver more bandwidth due to the transition from 3G through 4G and new 5G networks, Virgin Media O2 recognised the need to utilise more software and cloud centric technologies. However, this multi-year project would be the first time it deployed large scale virtualised architectures and needed to take place carefully to align with the 24/7 and mission-critical nature of its network.

Underpinning this transition is its core network architecture. Unlike in previous eras where the network was essentially static, in its cloud centric vision, the core network needed to be more agile and able to closely integrate with the new software and cloud elements.

However, the legacy network had highly proprietary elements that were difficult to deploy and challenging to manage – along with little integration to the software elements that sat on top of the network. The legacy network was also complex to integrate while the next generation needed to support a more standards-based approach that was inherently more open to match the need for agility – especially with 5G on the horizon.

Solution

"Our main criteria in selecting the network architecture and vendor was the ability to work seamlessly with our chosen VMware virtualisation platform. We also needed it to be simple to configure, yet offering the highest levels of reliability," explains Chris Buggie, Director of Infrastructure & Cloud Engineering & Delivery. "We looked at the usual vendors and made a short list, and honestly at that point, Arista was not that well known to us. However, during the testing process it became clear Arista was delivering the highest marks across all the evaluation metrics – and offered a few capabilities that were in many ways unique," he adds.

One such point was the Extensible Operating System (Arista EOS®) that effectively deploys the same operating system image across every single network element from the largest spine to the smallest leaf unit. This unified approach made deployment simpler and easier to repeat. The other was Arista CloudVision®, a network-wide workload orchestration and automation platform that is designed to complement SDN (virtualization) controller solutions that orchestrate virtual network overlays and initial or ongoing network provisioning across the underlying physical network. "CloudVision gives us levels of visibility and control that were far beyond anything we had access to within the legacy network – or even across the vendors we had looked at during evaluation," says Buggie.

The scale of the project was also significant. In total, Virgin Media O2 would build 8 new production sites, 2 reference sites, 2 test labs and a full R&D network. Hundreds of virtualised network functions would be supported by the network based on 100G links between leaf and spine – and 25G links from leaf to servers. The network is designed for high availability with dual homed servers and a test automation function that continually looks at performance telemetry to ultimately trigger automated processes to optimise the network based on usage and availability.
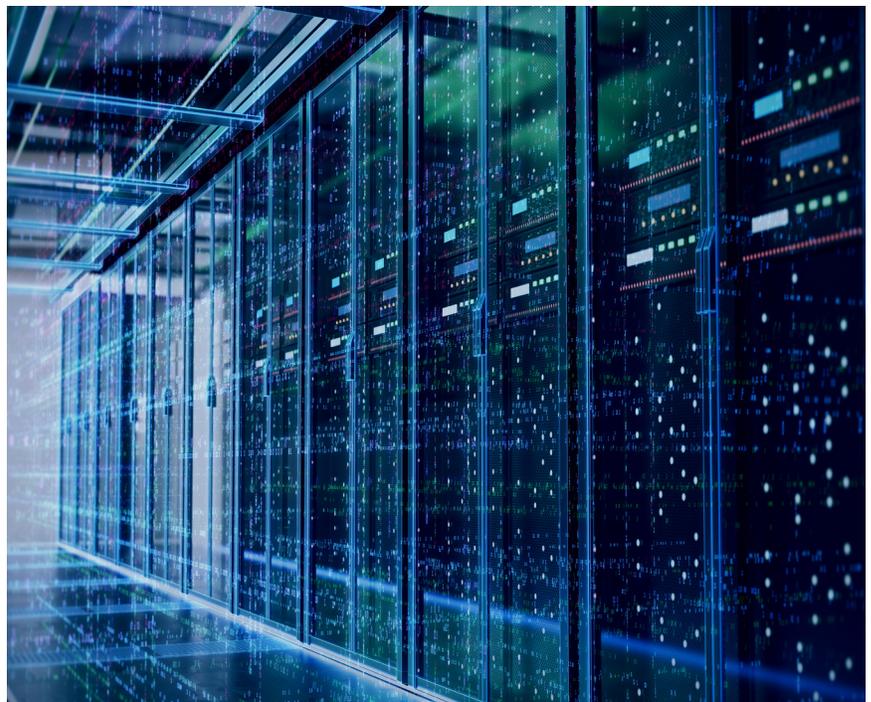
Conclusion

"A major trend within the organisation is to move towards a more DevOps way of working in which we can streamline the implementation of new functions," discloses Buggie. "In this approach, visibility and automation is critical and this is an area where the Arista elements have really shown their worth as part of the wider ecosystem."

Buggie highlights that, prior to Virgin Media O2's creation of its telco cloud and DevOps approach, deploying a single production site would take months – a process that is now measured in weeks. "We also have more granular control around how network changes are carried out through CloudVision that provides auditing and acceptance capabilities, which mean changes are much more automated and less prone to human error – this is a significant improvement for operational managers that have large teams with multiple stakeholders all working on different parts of the project."

With proof of concept complete and several production sites now online, Virgin Media O2 IT teams are using these learnings to accelerate the roll out of the telco cloud and supporting network at more sites across the UK. The project is running alongside significant changes for the business including the recent merger and the ongoing 5G rollout, but Buggie believes that the groundwork has been laid for a successful transition over the next few years.

"This is the largest and most significant project we have undertaken within Virgin Media O2 that will radically impact how we manage the network over the next decade," says Buggie. "Our selection of Arista as the core network technology has been carefully considered and extensively tested. To date, the results have either met or surpassed our expectations. For us, the relationship with Arista is a strategic partnership and our vision around areas such as open standards and the future technology roadmap are aligned which gives us confidence in the long-term success of this transformative project," he concludes.

Ken Kiser, Group Vice President Sales at Arista Networks adds, "The team at Arista Networks is thrilled to be working with Virgin Media O2 on such transformational step forward on their digital journey. We are energised to be part of a partnership that is implementing automation, visibility and flexibility in delivering essential functionality and services. We are looking forward to a continued relationship of innovation and disruption".

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