



## Atomic Weapons Establishment Case Study

### Vanix Deploy Greenfield HPC Network

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Vanix, a network, infrastructure and security solutions provider, was awarded the contract to deliver the Atomic Weapons Establishment's (AWE) high performance computing (HPC) network. AWE selected Vanix as their partner of choice to advance their sophisticated scientific and technological capabilities.

AWE is responsible, via a contract with the Ministry of Defence, for the provision of nuclear warheads to support the UK's nuclear deterrent, Trident. This encompasses the initial concept, assessment and design of the warheads, through component manufacture and assembly, in-service support, decommissioning and then disposal.

The Comprehensive Nuclear Test Ban Treaty prohibits any test that produces a nuclear yield underground, underwater, in the atmosphere or in space. AWE must therefore continually develop

methods to verify the safety and reliability of nuclear warheads through a science-based programme.

In 2013 Vanix secured the ongoing contract based on their knowledge of AWE's HPC technical, commercial and environmental requirements. Vanix successfully fulfilled the requirements to underwrite the design by building the entire network in proxy at a secure off site location. Vanix invested in Arista and Splunk technology to successfully demonstrate the networks capabilities and prove the connectivity, resilience and performance that AWE required.

Following the proof of concept's success Arista's 40 gigabit Ethernet switching technology was deployed as the core of the new HPC data network. This makes AWE one of the first organisations in Europe to deploy 40GbE Arista switch technology in such scale.

Arista's technology enables AWE to scale for the ever evolving requirements of their network and users. Operational intelligence, was provided by Splunk software, delivering real-time monitoring, behavioural patterns and reporting analytics within a highly secure environment.

AWE researched and sourced technology for the testing environment and chose to deploy Ixia technology, through Vanix. The testing environment is used to trial new technologies that increase network performance, this process enables AWE to simulate changes to the network with minimal risk or impact to its users and applications.

The demands placed on networking are significant; Neil McMahon, AWE's Deputy Head of High Performance Computing explains, *"The kind of technology and the lifecycle of equipment required in HPC environments is completely different to how standard corporate*

*IT networks are managed where you want to minimise risk, introduce stability and modularity. In contrast, HPC is at the forefront of technology where the pace of change is faster with shorter refresh cycles and a willingness to install cutting edge equipment in a bid to increase the performance of calculations which can take weeks to complete and generate output files tens of terabytes in size."*

The technology and solutions provided by Vanix give the visibility and information that's key to AWE's project planning. The next steps for AWE will see the move to 100 gigabit cross campus infrastructure that's needed to meet the increased throughput requirements of the HPC environment. Vanix has also been awarded an extension to the maintenance contract and is set to continue supporting AWE in its quest to process hundreds of terabytes of data on a daily basis.

*"Based on the commitments made to the business working with Vanix has meant we've achieved what we said we'd do. Our requirements have certainly been met."*

**Neil McMahon, HPC networking manager**

*"The AWE project was a great opportunity for us to rise to the challenge of creating a network of such notable size. We work with our customers to really achieve their business needs through technology that is fit for today's purpose and tomorrow's technology evolution. Our technical team are the key to understanding and designing the right technology for AWE's requirements." Russell Bristow, Managing Director, Vanix LLP.*

Vanix is part of the Ampito Group providing technology solutions, cloud services and digital media.

[www.ampito.com](http://www.ampito.com)

### **About the Atomic Weapons Establishment (AWE)**

The Atomic Weapons Establishment has been central to the defence of the United Kingdom for more than 50 years through its provision and maintenance of the warheads for the country's nuclear deterrent, Trident.

This encompasses the initial concept, assessment and design of the nuclear warheads, through component manufacture and assembly, in-service support, decommissioning and then disposal.

Around 4,500 staff are employed at the AWE sites together with over 2,000 contractors. The workforce consists of scientists, engineers, technicians, crafts-people and safety specialists, as well as business and administrative experts - many of whom are leaders in their field. The AWE sites and facilities are government owned but the UK Ministry of Defence (MOD) has a government-owned contractor-operated contract with AWE Management Limited (AWE ML) to manage the day-to-day operations and maintenance of the UK's nuclear stockpile. AWE ML is formed of three shareholders - Serco, Lockheed Martin and Jacobs Engineering Group.

**For further information visit,**

[www.awe.co.uk](http://www.awe.co.uk)

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