

HP customer case study: Arup provides its Environmental Physics team with a cost-effective and reliable new Linux-based HP cluster.

Industry: Design and consulting

Arup chooses more cost-effective computational fluid dynamics – with the reliability of HP and Linux



ARUP

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Objective:

The Environmental Physics team of Arup, a global firm of designers, engineers, planners and business consultants, required a new, more cost-effective server platform to run its complex computational fluid dynamics software.

Approach:

- Arup commissioned IT partner OCSL to design and deliver a more affordable server platform.
- The existing leased system was replaced by a cluster of HP ProLiant servers running Red Hat Enterprise Linux.

IT improvements:

- Three times better price/performance ratio compared to leased system.
- More reliability, performance and application availability from the Linux based HP cluster compared to other Windows based systems for example.
- Better task management, improved queuing and automated request processing.
- Improved maintenance and hardware support.

Business benefits:

- The improved cost-efficiency of the system has reduced expenditure.
- There is scalability to add new users and enable the team to grow.

Arup is a global firm of designers, engineers, planners and business consultants that provides a diverse range of professional services to clients around the world. It includes the London-based Environmental Physics team – a small, yet expanding group of experts within Arup whose core activity is in the field of fluid mechanics.

Fluid mechanics looks at the properties and behaviour of liquids and gases, and determines how heat, mass and contaminants are transported within specific environments. A wide range of analytical and numerical modelling tools are used to provide a quantitative understanding of fluid mechanics, the most common of which is computational fluid dynamics (CFD).

In search of cost-efficiency

Until recently, the Environmental Physics team was running its CFD software on a UNIX[®]-based server platform. This was acquired on a leasing arrangement and was a highly flexible system that enabled the number of processors and capacity to be expanded as and when required.

However, when the lease expired recently, the team looked at changing the platform to something that, while still providing the performance and capacity needed by their high-end computing needs, was more cost-effective and easier to manage. They also required improved maintenance and hardware support. Furthermore, Arup wanted to switch to the Linux operating system for its reliability, performance, excellent application availability and attractive licensing costs.

It therefore contacted its long-standing IT advisor and HP Open Source Partner, OCSL, a certified member of

Customer solution at a glance

Primary hardware

- HP ProLiant DL380 G4 server
- 12 x HP ProLiant DL145 G2 server
- HP StorageWorks MSA30 Enclosure

Primary software

- Red Hat Enterprise Linux operating system

the HP Open Source program for advice. OCSL had already installed a Linux cluster for a different department within the same London offices.

During the initial consultation stage, the Arup team outlined exactly what it required from the new solution, stressing the importance of cost-efficiency and providing specific performance benchmarks it had to achieve. From this, OCSL proposed the best-fitting solution, which involved a cluster of HP ProLiant DL380 G4 servers and DL145 G2 servers running Red Hat Enterprise Linux.

As a previous HP customer, Arup knew that this would provide the performance and resilience it required, but also give the team a stable platform that they could expand in the future. As Roger Hollamby, of Arup, explains: "HP systems not only provide the reliability we require, they also bring stability and dependability. We know we can buy the same hardware configuration a few months down the line, unlike some other vendors, whose configurations can be discontinued very quickly."

But the main attraction for Arup was the cost benefit, as Hollamby confirms: "The overall cost to purchase the new solution outright was similar to what we were paying to lease the old one! In fact, when we work it out, the price/performance ratio of the new HP Linux cluster is three times as great."

An effective, efficient packaged solution

The new solution comprises an HP ProLiant DL380 G4 server, which acts as the main access node to a cluster of 12 HP ProLiant DL145 G2 servers. These have a variety of memory configurations and run on the Red Hat Enterprise Linux operating system. The cluster is attached to an HP StorageWorks 30 Modular Smart Array (MSA) Enclosure, which is an external storage array that provides a total storage capacity of 4.2 TB.

This whole solution was planned and built by OCSL as a packaged cluster. The majority of the server and cabling configuration was performed offsite, which

minimised onsite installation time and operational disruption. Furthermore, HP and OCSL provide the level of maintenance and hardware support that Arup requires to ensure continued operations should any unlikely failures occur.

A platform for the future

The new solution has allowed the Environmental Physics team to continue running its four main software applications, Star-CD, Ansys CFX, Harpoon and Ensign, in support of its pioneering fluid dynamics work – at a reduced cost due to the ability to buy the facility rather than rent it per annum at the same cost.

Powered by the multi-processing capability and powerful memory configurations of the Linux-based HP cluster, these advanced codes allow multi-million cell models to be created in a matter of days. And as Arup looks to ever-more complex applications, such as numerical wind models, the cluster allows scalability of up to 48 server nodes to provide additional performance and capacity.

Dr. Darren Woolf, an Associate Director of Arup, is extremely satisfied with the new solution: "We are very happy with the implementation of the new Linux based HP cluster. It gives us better management of tasks, with improved queuing for the graphics server and automated processing of requests."

Based on the success of this implementation, which incidentally marked the sale of HP's 100,000th Linux server installation within the UK, Arup has already commissioned a further HP Linux-based cluster for another UK office, and Dr. Woolf is confident that the relationship with HP and OCSL will continue long into the future.

He concludes: "We are always looking at new ways of providing high-end computer performance at an affordable cost. HP and OCSL are already looking at new innovations such as dual-core and quad-core systems that will help us as we continue to move forward."

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