



The Victoria & Albert Museum Chooses Gigabit Performance to Provide Fast, Reliable Backups for its Data-intensive Multimedia Information Systems

The use of Intel's Gigabit Ethernet adapters has dramatically reduced the backup times for essential data held on the V&A servers. It has removed potential bottlenecks from the V&A network, and increased the performance of its Web site by 60 percent.

SOLUTION SUMMARY

Profiled Organization	The Victoria & Albert Museum (V&A)
Challenge	The sheer volume and movement of data created by the multimedia technology that the V&A had introduced to enrich visitor experiences demanded more reliable, higher-performance connectivity throughout the backbone network, and between servers and storage devices.
Solution	Install a Gigabit backbone network and Storage Area Network (SAN) attached to NEC Express* 5800 and Dell PowerEdge* servers, equipped with Intel® PRO/1000 Server Adapters.
Benefits	Reduction in backup times from as much as 14 hours to as little as two hours each night. Greatly improved data transfer rates. Prevention of potential bottlenecks in the networks. Sixty percent improvement in Web site performance.

Summary

Established in 1852, and following the resounding success of the Great Exhibition the previous year, the V&A today is the UK's principal museum of art, craft and design. With as many visitors to its Web site as to its South Kensington galleries each year, the museum now ranks as the sixth most-popular British attraction. While it employs around 600 staff, it maintains some 1,000 desktop computers to accommodate a regular user community approaching 2,000 people made up of contractors, volunteers, visiting academics and students.

In 2001, following the introduction of multimedia technology in its newly unveiled British Galleries, the museum's aging network infrastructure became stretched to the limit and backups were a headache. Ian Croxford, Head of IT Systems Services, realized that the V&A would require much larger storage facilities and a significantly faster backbone infrastructure if it were to achieve its aim of applying multimedia to the museum's many other galleries.

His solution was to use Intel® Gigabit Ethernet to link the museum servers and storage devices across the backbone infrastructure, thereby increasing data processing and backup speeds, and preventing future traffic bottlenecks in the networks.

Challenge

BUILDING AN IT ENVIRONMENT TO SATISFY MODERN AUDIENCES

With 8 million objects in its collection, the V&A's stated mission is to educate, entertain and engage the 2.5 million visitors who pass through its doors each year. Its efforts are, therefore, focused on increasing the use of its displays, collections and expertise to further the learning, creativity and enjoyment of audiences from within and beyond the UK.

To this end, four years ago the V&A embarked on a 20-year "Futureplan" to redesign its galleries and make its objects of art and design more appealing to today's audiences by presenting them in a more modern light. Part of this process involved creating multimedia systems to engage with visitors and tell them more about the cultures that created the items on display. As a result, Ian Croxford

and his 15-member IT team were tasked with providing the information systems to deliver the multimedia experience to each gallery within the museum.

"It is no longer acceptable to have objects in glass cases and simply stick a text labels on them," he says. "Today, we have to provide educational resources and make the exhibits interesting for people.

For this reason, we

now offer exciting digital photography, real-time video clips, 3-D representations and interactive models. By their very nature, these systems are extremely content rich and require huge amounts of storage," he adds.

The PCs used in the galleries to display all this information also require rapid access to the central databases, which, in turn, need to be continually updated. This is why, he claims, the museum desperately needed a storage area network and a high-performance network to continually back up the stored data at speed.

"We realized we had a problem when, in 2001, with the opening of the British Galleries, we became the first art gallery in the world to provide truly comprehensive multi-

media to complement the objects on display. The experience made us realize that we needed to 'up the ante' by providing larger storage and a faster backbone. We knew we couldn't possibly repeat a project on this scale using our existing infrastructure."

Ian Croxford says the biggest single problem for the V&A was that insufficient capacity on its aging servers was limiting its ability to cope with the range of applications it needed to run. At the same time, he says, it was pointless trying to add more capacity to the existing servers because of the window of time available for backup.

"It was taking at least 14 hours, on average, to execute overnight backups using Arcserve* and Sun Solstice* over the 100-Mbps connections between the servers and the network," he says. "We were simply unable to back up certain files because we couldn't complete it by the following morning. This made us very vulnerable and was the over-riding reason behind our decision to implement Gigabit over our backbone network."

Process

REDUCING BACKUP TIMES AND IMPROVING OVERALL NETWORK PERFORMANCE

While the V&A had used Gigabit Ethernet for around four years to manage and segment its backbone network and make it work faster, its NEC Express* 5800 and Dell 1650 PowerEdge* servers, equipped with Intel® PRO/1000 Server Adapter cards, had previously been connected to the network at speeds of only 10 Mbps or 100 Mbps. Ian Croxford now decided to run Gigabit over the museum's copper wire by attaching the servers to it.

The IT department at the V&A had evolved gradually over the years, leaving it without a central computer facility. For years, the machines running its applications and performing backups were widely dispersed in various parts of the 26-acre site. Ian Croxford admits this was far from ideal from a network management viewpoint, so a plan was devised to build a centralized computer room.

The resultant facility was soon to house most of the V&A IT equipment. Furthermore, it enabled Ian and his team to install a Gigabit backbone and attach to it five new Dell PowerEdge servers fitted with Intel PRO/1000 Server Adapters. These, in turn, are linked through the network to a new Storage Area Network (SAN) and an Overland Storage LTO2 Tape Library* unit, which can now back up data at a phenomenal rate.

"In the past, we were limited by having such a basic network, connecting the servers at only 100 Mbps. Now, with our servers and network operating at Gigabit rates, we can truly contemplate developing many more exciting multimedia applications in the future."

Ian Croxford
Head of IT Systems Services

“This, of course, depends on getting the data to the storage devices at equally phenomenal speeds,” says Croxford. “In the past, we were limited by having such a basic network, connecting the servers at only 100 Mbps. Now, with our servers and network operating at Gigabit rates, we can truly contemplate developing many more exciting multimedia applications in the future.”

Solution

A FAST, RELIABLE NETWORK OFFERING CAPACITY FOR GROWTH

The V&A is now effectively running three Gigabit networks, with completely different IP addressing systems linking the servers together. Each server in the system contains two cards, enabling it to run backups totally independently of the main local area network and without causing any congestion issues. The first network is connected to the servers and allows users to access files. The second purely runs backups, while the third network is used to manage the museum e-mail and Web servers.

“Our existing servers were totally Intel® architecture-based in terms of the cards: motherboards; processors; video cards; and controllers,” he says. “When it came to choosing new servers, we could have bought cheaper machines, but we wanted industrial-strength machines that would be thoroughly reliable and support the essential systems of our organization.”

“The choice was between an Intel® processor-based system and a proprietary system, which can often be much more expensive. In terms of pure value for money and providing a reliable solution, it was a ‘no brainer.’ We’re a charity and we haven’t got money to throw around on ridiculously expensive systems. It had to be Intel processor-based because it provides us with the right level of reliability at a price we can afford,” he says.

“In the absence of sufficient resources to implement such a large project as this on our own, we put it out to tender and awarded the contract to Bull Information Systems. The servers they supplied are all Intel processor-based, and our main core applications are now installed and working smoothly,” he says.

Future

ALREADY A 60 PERCENT PERFORMANCE IMPROVEMENT

Ian Croxford claims that after launching the previous version of its Web site, the V&A became a victim of its own popularity. “The infrastructure could no longer cope with the number of people visiting the site,” he said. “It was actually running very fast, but with so many visitors there was significant demand and the system appeared to be slow.”

The Web site used to run on a complex arrangement involving three, very slow, non-Intel processor-based servers: a front-end server, a content management server and a back-end database server. Due to the way these servers interfaced with one another, they were prone to latency problems. A completely revamped Web site was launched in June 2004 when the current server arrangement was replaced by a high-performance Intel processor-based server.

As part of the changeover, Ian Croxford moved the current servers onto one of the three Gigabit backbone networks. “Although we have neither increased the speed of any of the servers, nor the connections to the Internet, we are experiencing a 60 percent improvement in performance of the Web site – simply by attaching it to the new backbone.”

“The performance improvement we’ve already experienced by running our existing Dell PowerEdge 1650 front-end server and an old Sun content management server on the backbone at full Gigabit speeds has provided us with the impetus to move as many applications as possible – as quickly possible – onto the new network,” Croxford concludes with a smile.

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Ian Croxford
Head of IT Systems Services

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