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Case Study
IISS





dsp helps International Institute for Strategic Studies meet Tier 1 high availability requirements with SQL server whilst achieving a 60% reduction in database instances and software costs.

Background

Systems failure is simply not an option for the International Institute for Strategic Studies (IISS), which is the world's leading authority on political-military conflict. Their role is to provide some of the oil to ease the friction of international affairs, through research, publications and conferences.

Behind the scenes private meetings and public global conferences attended by world bodies, including the United Nations and governments, are facilitated by IISS. They depend on access to real-time applications; cross global communications; and an IT infrastructure that is always on and does not lose data - ever. As non-profit organisation, conference hosting and organisation offers IISS a critical revenue stream.

By implementing a geographically dispersed SQL cluster of servers - and one of few organisations to do so successfully - IISS has achieved the highest systems' availability. Maximum recovery time is 30 seconds should disaster strike even in the form of a bomb, flood or loss of power or communications at the data centre. More importantly, this greater level of resilience is self-funding from the savings that dsp, whom the Institute turned to for advice and expertise, was able to deliver.

In 2011, IISS set out to build a high availability architecture for the enterprise, based on Citrix Xen Desktop 5 and VMware 4 as a virtualization solution, capable of transforming desktops and applications into an on-demand service for the several thousands of users that can access the system at conference time. This architecture underpins the whole business. It has a crucial role in supporting the real-time availability of the applications which facilitate the conferences.

IISS worked with their data centre provider, Maxima, who host the servers and network equipment in two

data centres, to achieve a high availability model for the application layer. However, it soon became clear that the SQL Server database that underpins the Citrix environment needed to be high availability too, and this called for a level of expertise that Microsoft Gold Data Platform Competency holder, dsp was asked to provide.

The requirement

dsp first set out to understand IISS ' goal. This was to achieve availability which was tolerant of a site outage - whether caused by a network communications failure, loss of a server, a storage area network (SAN) or complete data centre. The requirements specified 100 per cent data recovery in under one minute delivered as a scalable solution on a standardised platform.

The solution

Working with the hardware and infrastructure that IISS had already purchased, dsp carried out an assessment and recommended a geo cluster solution featuring geographically dispersed servers that can failover from one to another or from one data centre to another within 30 seconds, which is as fast as the technology allows. The solution was designed and built based on a four node Multi Instance Failover Cluster using SQL Server 2008 R2. Technically challenging to design and build, geo clusters are often described as "high availability Nirvana for Windows."



Table of Geo Cluster High Level Failure to Risk

Description	Loss of 1	Loss of 2	Loss of 3	Loss of 4
Node Failure	Likely	Possible	Possible	Unlikely
Datacentre Failure	Possible	Unlikely	NA	NA
Network Failure	Possible	Unlikely	Unlikely	NA
Quorum Failure	Possible	NA	NA	NA
SAN Failure	Possible	Unlikely	NA	NA
Disk Failure Local	Likely	Possible	Unlikely	Unlikely
Disk Failure SAN	Likely	Unlikely	Unlikely	Unlikely

As the project evolved, dsp recognised that IISS could further rationalise their costs and reap a higher return on their investment in the geo cluster infrastructure by extending high availability to more applications. Some soft dependencies on the critical business infrastructure for the conferencing facility around the main web site, the database of armed conflicts (used by governments and their agencies worldwide) and the enterprise CRM (customer relationship management) products were identified by dsp. These applications, used internal and external, were running on a mix of older, more costly and potentially more vulnerable environments. dsp advised that these too could be migrated to the geo cluster for bullet proof availability and resilience.

Neil Goodman, Chief Technology Officer at IISS said: “Over the years we have worked with many third parties. dsp is one of the most professional - once timescales were agreed they were met every step of the way.”

dsp carried out a risk assessment of the older hardware and produced a migration plan. Dev Nayak, Managing Director at dsp commented: “dsp was

brought in to fix a particular problem and in doing so we were able to point out that we could strengthen many more potential weaknesses, extend high availability and rapid disaster recovery to other critical applications, for the same investment.”

Business Benefits

Benefits at a glance

- 100 per cent availability
- Failover in 30 seconds
- 60 per cent reduction in hardware
- 60 per cent reduction in database instances and software costs
- Tenfold increase in performance
- Standardised, and easier to support
- Self-funding from savings

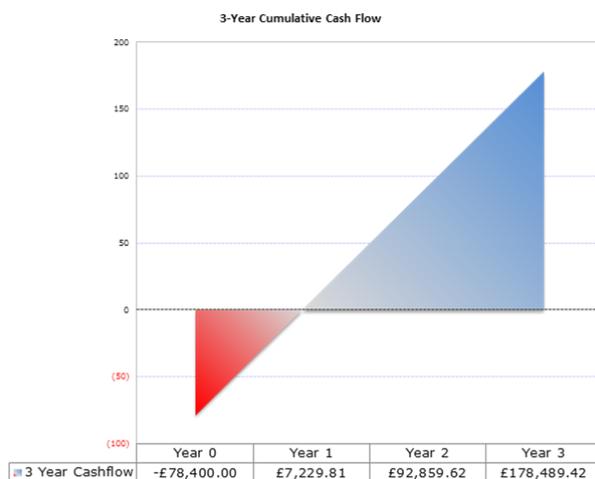
There are distinct advantages to the geo cluster for maintaining services to the organisation over the more common standard cluster. The latter only tolerates a server outage and failover to another server, whereas IISS’ geo cluster can lose a data centre or SAN, or power or network without interruption. The geo cluster is stretched across the two geographically separated locations underpinned by smart data replication which takes place behind the scenes to enable full recovery without data loss within 30 seconds. Failover is seamless requiring no additional operations’ or database administrator (DBA) support.

As part of the exercise, dsp profiled IISS’ older database servers. It was found that 10 servers had less than 50 per cent utilisation and so candidates for reducing costs. Taking into account the greater speed and capability of the new servers, the total number of servers is on schedule to reduce to four - a consolidation of 60 per cent of the hardware and database instances, too. Consolidation is more than virtualisation, which can reduce the hardware footprint but this alone will have no impact on the number of database instances to be managed and paid for.



The one month project delivered dramatic savings from a 60% reduction in hardware and hosting costs to a 60% reduction in software maintenance (patching & upgrade activities, backups, monitoring) and licensing costs. In fact the whole project is self-funding and will continue to deliver cumulative savings of over £170k over the next three years, though as Goodman says: “It will have paid for itself in the first year and it is much less labour-intensive to support.”

Chart illustrating 3 Year Cumulative Cash flow



Overall risk has been reduced in some instances from very high to minimal or very low. Neil Goodman commenting on some of the many benefits to result from the project said: “We’ve gone from a complex mixed environment of different SQL versions, some of which are at the end of their support lives, to one where our mission critical applications are unified on the geo cluster.”

Users have also benefited from the increased power and performance. “High availability is key and we rely on these systems to be available 24x 7 anywhere in the world,” Goodman continued. “Although the organisation has around 100 employees, at conference time our systems have to meet real-time demands from typically 400 delegates, 900 members of the world’s press and two thousand of police and security personnel as well as around 10,000 unique visitors to the web site which is also housed in the cluster. The geo clustered architecture has dramatically increased response times. Single points of failure and poor performance of the past have been put behind us. The solution load balances well

and I estimate we have achieved a tenfold increase in performance. It is also easier to maintain from a security perspective too.”

Less tangible savings will also be made in the future as whoever maintains the environment will only need to know and manage a single database technology. This is a great example of ‘less is more’ in action.

With the savings achieved by IISS being so great, why are geo clusters a relative rarity? According to dsp’s Dev Nayak: “Microsoft will say that successful deployments are rare and that is probably down to the technical abilities and expertise required being quite challenging. Customers face an investment in the server estate to bring it up-to-date, but this opens a door to innovation and a chance to take advantage of the savings. dsp is fortunate in having long-standing experience and a reputation for managing global enterprise level Oracle environments as well as Microsoft which together with the calibre of our people has equipped us to master the geo cluster. “

“Our investment in the skills and know-how means that the rewards for our clients adopting the technology can be very high.”