



Success Brief

Intel® Xeon® processor
5500 series
Transportation



“Thanks to the Intel® Xeon® processor 5500 series and VMware hypervisor, SETAO is now able to provide mainframe-class quality of service and ensure easy deployment of new virtual machines and applications while reducing total cost of ownership.”

Olivier Parcollet,
Chief Technology Officer, SETAO

All Change

SETAO turns to Intel® Xeon® processor 5500 series to strengthen and build on its service offerings.

Company	SETAO runs the public transportation network of street cars and buses in the French city of Orleans.
Product evaluated	Intel® Xeon® processor 5500 series
Challenge	Provide mainframe-class quality of service for the transport network and reduce the total cost of ownership (TCO), while meeting its energy-efficiency goals
Results	Three times performance increase over the previous generation of Intel® Xeon® processors and doubling of virtualisation ratio
Impact	Lower overall TCO, lower energy costs, high system availability and greater flexibility for introducing new services
Next steps	SETAO expects to introduce 10 to 15 new servers into its data centre in September 2009, each one powered by Intel® Xeon® processor 5500 series

Challenge

Société d'Exploitation des Transports de l'Agglomération Orléanaise (SETAO) runs the public transportation network of street cars and buses in the city of Orleans operating under the brand name SEMTAO. Approximately 100,000 people use the service every day and SETAO provides real-time information about traffic conditions for the entire network to facilitate customer travel and ensure smooth-running services.

The transportation service operates 22 hours a day, 365 days a year delivering the data required to provide the service, including traffic light operations and scheduling information, from a data centre with Dell* servers powered by Intel® Xeon® processor 5300 series with Intel® Xeon® processor 5400 series.

Implemented in 2008, the servers enable a virtualisation ratio of 12 virtual machines to one physical server, which has provided greater energy-efficiency and lower operating costs.

However, while the service delivered to the transportation network was of an extremely high quality, SETAO wanted to take it to the next level and provide mainframe-class quality of service and ensure easy deployment of new virtual machines and applications while reducing the total cost of ownership (TCO).

Deployment

To achieve its objectives SETAO tested an Intel® white box powered by Intel® Xeon® processor 5500 series developed on the next-generation Intel® microarchitecture. Oracle* 9i and Microsoft SQL* server databases were on the white box. VMware ESX* Server 3.5 was used to create twelve virtual machines for the test.

Besides wanting to enhance service levels and make virtualisation easier, SETAO also aimed to establish the performance of the Intel Xeon processor 5500 series. More data was being used by the enterprise, for example, a new digital video system was introduced into the transport network, and the data needed to be captured and backed up, so higher levels of processing were important.

SETAO also specifically aimed to measure the virtual machine consolidation level of the Intel® Xeon® processor 5500 series. To this end, SETAO also wanted to assess Intel® Virtualization Technology (Intel® VT) FlexMigration and VMware VMotion*.

Intel® VT FlexMigration is a built-in hardware-assist feature that allows virtualisation software vendors to deliver live migration solutions across different generations of Intel® Xeon® processor-based servers. VMware's VMotion dovetails with this Intel technology so when used together, IT managers can easily add current and future Intel Xeon processor-based systems to the same resource pool.

SETAO also has a stringent green policy so establishing energy-efficiency was also given high prominence.

Results

One of the first results SETAO saw was a three times performance increase from the Intel Xeon processor 5500 series compared to the Intel® Xeon® processor 5400 series, when running a single virtual server.

Thanks to the Intel Xeon processor's multi-threading capability SETAO also established that a higher consolidation ratio for physical to virtualised servers was easily enabled. For example, its current virtualisation ratio is about 12 virtual servers to one physical server. With the Intel Xeon processor 5500 series SETAO expected to double this ratio to 24 virtual servers for one physical server.

Intel VT FlexMigration with VMware VMotion* also enabled high availability and greater flexibility making it easier for IT managers to optimise performance, cost, power and reliability without having to be concerned about forward and backward compatibility across future generations of Intel Xeon processors.

Increased flexibility and greater scalability also led to the disappearance of virtual machine latency, so the virtualisation of Oracle® 9i and Microsoft SQL* databases became very straightforward.

Furthermore, central processing unit (CPU) overhead was reduced and the running of VMware ESX* Server 3.5 became a lot smoother and immediately reactive when the IT managers required it to be.

Impact

The higher virtualisation ratio enabled by the Intel® Xeon® processor 5500 series enables SETAO to create a highly flexible, secure and high-performing pool of servers. These features are very important for SETAO, since it must be able to monitor in real time, possible breakdowns in the transport network.

For example, if a set of traffic lights fails or one of the streetcars suddenly breaks down, this information needs to be immediately relayed to a management centre, where appropriate action can be taken.

Intel® VT FlexMigration and VMware VMotion* introduces even greater flexibility because it is now possible to move a virtual machine from a physical server to another without interrupting the virtual machine. This reduces the maintenance requirements for the IT team and ensures greater compatibility between machines.

Importantly, it also means that if SETAO needs to extend its virtualisation capability, for example new services are introduced into the transport system, it can quickly and securely do so with confidence that the system will be highly available and high-performing.

There is also the important ability to save space in the SETAO data centre by consolidating the number of physical servers it requires. In fact, SETAO estimates that it will be able to save at least half of the space it is currently using. This dovetails with SETAO's Green IT policy in which it aims to reduce the organisation's overall carbon footprint.

Furthermore, the total cost of ownership is set to fall with less hardware required; lower management costs and lower spend on power, thanks to increased virtualisation capacity. SETAO estimated that it could save approximately 40 percent on energy costs due to the higher server consolidation ratio and greater CPU energy consumption management. This energy-saving also means reducing the need to invest in its air cooling infrastructure and it also dovetails with SETAO's sustainable development strategy.



From the energy-efficiency perspective, SETAO had over the previous years reduced its server energy consumption from 27KW for each server to 8KW, thanks to intense virtualisation usage. It anticipated that by introducing the Intel Xeon processor 5500 series, this would fall by approximately 20 per cent for each physical server.

Future

SETAO has about 55 physical servers in its data centre and in September 2009 is aiming to replace these with 10 to 15 new physical servers each powered by Intel Xeon processor 5500 series. It will create approximately 24 virtual machines on each of these physical servers.

As a result, it will reduce the number of physical servers in its data centre, while ensuring it has the flexibility, availability and performance required to quickly add new services for the transport network as the need arises. In short, it will meet its original objective of delivering a mainframe-class quality of service, while meeting energy-efficiency goals and lowering its operating costs.

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Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM) and, for some uses, certain computer system software enabled for it. Functionality, performance or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

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