



Success Brief

Intel® Xeon® processor
5100 series

Intel® Xeon® processor
5300 series

Telecommunications



“The Intel® technology-based platform has delivered strong performance improvements for our mission-critical online charging system, enabling better customer experience and more accurate billing.”

Luis Orfila,
Product Manager, Telefónica

Setting the stage for mobile growth

Telefónica leverages Intel® technology-based architecture to underpin mission-critical online charging system for mobile services

Company	Telefónica is Spain's incumbent telecommunications provider, offering fixed and mobile phone services to consumers and corporate customers. Telefónica I+D, its research and development division, aims to contribute to the competitiveness and modernity of the Group through technological innovation.
Product evaluated	Intel® Xeon® processor 5100 series and Intel® Xeon® processor 5300 series
Challenge	Meet demands of growing “Real Time” charging customers (pre-pay, corporate and even post-paid customers) while optimising performance of mission critical Online Charging System (OCS) to enable accurate billing and water-tight compliance.
Results	Intel Xeon processor 5300 series supporting a clustered Oracle 10gR2* database on Linux operating system using Real Application Clusters (RAC) option optimised with Intel® VTune™ Performance Analyzer, increased the number of network requests processed per second from 600 to 4,400.
Impact	With the new architecture, Telefónica I+D's Online Charging System (OCS) will be able to deal with a larger number of transactions to become Telefónica's real time charging system for all its customers. Improved system scalability and availability means more services can be introduced while its customer base also grows.
Next steps	Full deployment across pre and post-production environments to develop industry “reference architecture”.

Challenge

As Spain's incumbent provider and a key player across the Spanish-speaking market segments, Telefónica is one of the world's largest telecommunications companies. Like all incumbent telcos, it has historically focused on providing fixed line services, but as the industry evolves and consumer demands change, Telefónica now sees a large proportion of its revenue coming from mobile customers.

In order to deliver a compelling service to these customers, Telefónica operates a real time charging model. This allows a reduction in the time to market of new products and services, improving the user experience with new and more attractive promotions while enabling flexibility to include other customers within the billing solution.

The software for this online charging system (OCS) ran on a platform using a SUN Solaris* operating system running on Sun SPARC* servers and Oracle9i* database with Real Application Clusters (RAC), which had been in place since 1998 and evolving over time.

Telefónica recognised a need to upgrade its IT architecture in order to maximize the capabilities of its Oracle database environment.

Deployment

The team at Telefónica's Research and Development division chose to evaluate a number of solutions to determine the most responsive and scalable platform on which to run its OCS. It initially tested an Intel® technology-based solution using Intel® Xeon® processors 5100 series before switching to the newer Intel Xeon processor 5300 series.

The environment in which the tests were run consisted of Linux operating system and an Oracle 10gR2* RAC database, which had been identified as the most suitable for running the OCS for performance, scalability and availability reasons. It allowed the freedom to choose the hardware and operating system platform, enabling the organisation to deploy its charging system on different platforms. The RAC option provided horizontal scalability to grow on demand with maximum availability free of service disruption.

The key requirement for the chosen solution was the ability to smoothly and reliably process a large volume of network requests at any one time. The existing platform was capable of processing 600 requests per second but when the Intel Xeon processor 5100 series with HP ProLiant servers was tested, it was found that each CPU processed 1,748 items per second. With Intel Xeon processor 5300 series, this figure increased further to 3,169, an improvement of 428%.

Working with advisors from Intel, HP and Oracle, the Telefónica R&D team fine tuned the test solution to optimise the performance and interaction of the database and OCS system. This was achieved using Intel® VTune™ Performance Analyzer software, which enabled Telefónica engineers to identify where bottlenecks were likely to occur in the system and make adjustments as necessary to improve response time. In this way, the organisation can take on the characteristics of a Predictive Enterprise, sensing, predicting and acting on issues before they become problematic. Intel® Compiler for Linux was also used to accelerate software performance.

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Impact

The Telefónica team found the solution powered by Intel® Xeon® processors 5300 series very simple to use. "The Intel VTune Performance Analyzer has a very user-friendly interface and makes management of the system much smoother," says Carlos Corbacho. "Administrators are able to see more clearly what's going on in the system at any time, and measure performance to ensure targets are being met and bottlenecks avoided."

With better manageability and availability allowing real-time charging, Telefónica will be able to deliver more sophisticated mobile services to a larger customer base. A smoother and more accurate billing and revenue management process means that customer service can also be enhanced, with cost savings from a more efficient OCS platform being passed on to Telefónica's customers.



Results

Throughout its evaluation of the Intel® and Oracle technology-based solution, the Telefónica R&D team found that its availability and scalability were very strong. "The linear scalability of the system means that the volume of traffic handled by one server doubles when a second is added and so on," explains Carlos Corbacho, Database and Storage expert on the R&D team. "This makes it easy to grow the platform as new services and more customers come online, without affecting the system's performance."

This performance was optimised further by fine-tuning the new Intel platform to the needs of the Oracle 10gR2 RAC database and bespoke pre-pay OCS system, enabling it to process up to 4,400 items per second which resulted in a significant performance improvement. This also drives savings for Telefónica through more efficient running of the system without the need to invest in costly specialised hardware and operating systems.

Future

With the evaluation completed successfully, Telefónica made the decision to deploy HP ProLiant servers powered by Intel Xeon processor 5300 series and supporting Oracle 10gR2 RAC database on Linux to run its OCS system. The system included around 100 servers including some 200 Intel Xeon processor 5300 series. After deploying the platform across its pre-production environment, the company will deploy it across its production landscape and migrate its OCS application across. Once finalised, the company hopes that its new platform will act as a reference architecture for others in the Telefónica Group and in the telecommunications industry as a whole.

"The potential customer service and revenue enhancement opportunities that this platform will enable were compelling enough reasons for us to migrate to an Intel® technology-based solution," concludes Luis Orfila, Product Manager. "But we're also very excited about the chance to develop and demonstrate that this platform can be used as the Real Time Charging system not only for mobile services but also for the rest of Telefónica's offerings."

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