CASE STUDY

Intel® Xeon® Processor E7-4807, Intel® Data Center Manager

Telecom/Service Provider
IT Efficiency

Powering down

Telecom Italia trials Intel® Data Center Manager and the Intel® Xeon® processor E7-4807 in bid to reduce energy consumption

Telecom Italia is Italy's main information and communications technology (ICT) group and an important player on the Latin American market, which represents 38 percent of the company's turnover (as at November 2012). Today, Telecom Italia infrastructures and technological platforms allow voice and data to be transformed into advanced telecommunications services as well as leading-edge ICT solutions. The company is constantly innovating and incorporating new technologies into its offerings. Such a demanding goal, however, is placing pressure on data center energy consumption. To find a way of improving energy efficiency and better managing power consumption it decided to run a proof of concept (PoC) on Intel® Data Center Manager (Intel® DCM) and the Intel® Xeon® processor E7-4807.

TELECOM ITALIA

INFORMATION TECHNOLOGY

"The pilot shows that using the latest Intel processors with Joulex Energy Master* and Intel DCM, we could potentially reduce server power consumption. We may also be able to identify servers that are using too much power and replace them. Based on our experience and results to date, we believe Intel Node Manager could also help us further reduce power consumption."

Luigi Bellani,
IT infrastructure engineering director
Telecom Italia

CHALLENGES

- **Power reduction.** With seven data centers across Italy and growing services, Telecom Italia needed to make its data center operations more energy-efficient
- **Future proof.** Its long-term strategy is to develop energy-efficient and cost-effective platforms from which to launch its new services.

SOLUTIONS

- **Energy monitoring pilot.** Runs a PoC on servers powered by Intel Xeon processors E7-4807, and Intel DCM, to regulate power consumption
- **Large fall.** Pilot shows Intel-based servers have the potential to reduce energy consumption by up to 20 percent

IMPACT

- **Strategic goals.** Intel® technology has the potential to help Telecom Italia meet its strategic objective of reducing operating expenses for power consumption while delivering the best possible service for fully managed cloud services
- **Pilot extension.** Now considering extending the pilot to incorporate Intel® Node Manager (Intel® NM) together with the Intel® Xeon® processor E5 family, to further explore the development of energy-efficient server platforms

Reducing needs

As Italy's main ICT group and an industry-leading innovator Telecom Italia depends on a smooth-running technology infrastructure. At the heart of this infrastructure are seven data centers located throughout the country.

These data centers hold thousands of servers and their growth and development have mirrored the company's expansion. However, Telecom Italia was acutely aware that energy consumption and the cost of electricity were rising significantly each year and if it didn't address this issue, the soaring prices and consumption of energy could act as a brake to growth.

Consequently, it set itself a number of objectives. Short-term goals consisted of monitoring closely customers' power consumption for the services they use, and establishing the most energy-efficient and cost-effective platform for the future. These two goals were also wrapped up in a wider long-term strategic aim.

This aim is to ensure that all technology components used in the company's business contribute towards reducing power consumption costs while delivering the best possible performance for fully-managed, cloud-based services. In turn, lower power costs mean greater energy-efficiency, more profit and the ability to launch further new services without power constraints.

As a first step towards meeting these objectives, the company initiated a pilot to test the effectiveness of specific technologies for monitoring and reducing power consumption. It implemented 57 servers in its test and development operations and from these also created virtual servers to simulate extra workloads.

PoC shows Intel DCM could help Telecom Italia reduce power consumption by 20 percent

Power management

The server models, and the processors powering them, were wide-ranging and mirrored the server farms across Telecom Italia's entire IT infrastructure. They included various Intel Xeon processors, including servers powered by the Intel Xeon processor E7-4807.

The Joulex Energy Manager* platform for remote management, analytics and reporting was used to monitor and manage energy consumption across the server platforms.

The Intel Xeon processors E7-4807 were included in the pilot because of their potential as a future platform and to assess the credibility of Intel DCM as a power management tool. Intel DCM, a power management solution stack for the data center, is designed to work with the Intel Xeon processor E7 family and provides real-time, accurate power and thermal consumption data. It supports the management for individual servers, groups of servers, racks and IT equipment such as power distribution units in the data center.

Cutting the costs

Intel DCM can also optimize power for specific workloads, allowing users to provide optimized power profiles for each server and workload or application to cut electricity costs. It can also help in increasing rack density to maximize the server count in each rack.

Luigi Bellani, IT infrastructure engineering director at Telecom Italia, said: "We use a wide range of servers within our data centers. Some of them are quite old and some are recent additions. We wanted to trial usage of the Joulex Energy Master and Intel DCM to see what levels of power monitoring and consumption we could actually achieve. We also wanted to find out how much power servers were using and measure this in relation to the workloads they were running."

By running a PoC on Intel DCM and the Joulex Energy Master with servers powered by the Intel Xeon processor E7-4807, Telecom Italia discovered it had the potential to save up to 20 percent on power usage. This was achieved through the monitoring of energy consumption to establish energy consumption levels and then active management of this power consumption.

"This is clearly a significant saving and one that made quite an impression," said Bellani. "We are now planning to trial Intel DCM and Joulex on older systems to get full insight into the power consumption of these systems. At the same time, we are considering implementing servers powered by the Intel Xeon processor E7 and E5 families with a view to delivering further energy-efficiency gains."

Automated capping

Telecom Italia is also considering using Intel NM as part of an extended pilot. This feature will be used with Intel Xeon processor E5 family. Similar to Intel DCM, Intel NM is a server management tool that allows a platform's management software to accurately monitor and control the platform's power and thermal behaviors through an industry-defined standard Intelligent Platform Management Interface and Data Center Manageability Interface.

Bellani added: "The majority of our servers are based on the x86 platform and powered by Intel processors. Our technology roadmap is closely aligned to Intel's processor roadmap. By using Intel NM, we believe we could further develop server platforms where processor usage is monitored and power usage is capped according to how they are deployed."

The second step of the pilot is to introduce automated capping of power consumption at 50 percent. By establishing pre-set levels of power consumption, the company aims to meet its strategic objective of developing an energy-efficient and cost-effective platform from which to launch future services.

Bellani said: "The early results of the pilot have shown that using the latest Intel processors with Joulex Energy Master and Intel DCM, we could potentially reduce server power consumption. We may also be able to identify servers that are using too much power and replace them. Based on our experience and results to date, we believe Intel NM, together with the Intel Xeon processor E5 family, could also help us further reduce power consumption."

Lessons learned

The pilot showed that Intel-based servers have the potential to reduce energy consumption by up to 20 percent. Ultimately this may help Telecom Italia to meet its strategic objective of reducing operating expenses for power consumption while delivering the best possible service for fully managed cloud services. Telecom Italia is now considering extending the pilot to incorporate Intel NM, together with the Intel Xeon processor E5 family, to further explore the development of energy-efficient server platforms.

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