# Refreshing Servers for the Ericsson* Multi Mediation Provides Quick Payback

Power-efficient computing reduces OpEx and environmental impact

With mobile data traffic forecasted to double every year through 2014[1], service providers are upgrading their infrastructure to increase capacity and capabilities – at the right price. A key question is how to upgrade server farms: add more servers to an existing system, or start over and deploy the latest computing technologies? In fact, the latter approach – refreshing the entire system – will, in many cases, provide a quick payback. Demonstrating this point, this paper details the cost savings resulting from migrating the Ericsson* Multi Mediation to a platform based on power-efficient Intel® Xeon® processors. Additionally, deploying the latest servers is environmentally-friendly since it reduces energy consumption and carbon footprint.

Ericsson is developing Multi Mediation to help operators manage the explosive growth in subscriber demand for content, data and voice services. Multi Mediation is a convergent product offering that handles file, event and session mediation interfaces. It provides business and operations processing systems with one stable, flexible and uniform integration point for online and offline and online data collection – even when the network consists of several different technologies and equipment from various vendors. From a central point, located between connectivity networks and business support systems (Figure 1), the solution can improve operators' marketing capabilities, cost efficiency and financial risk management.
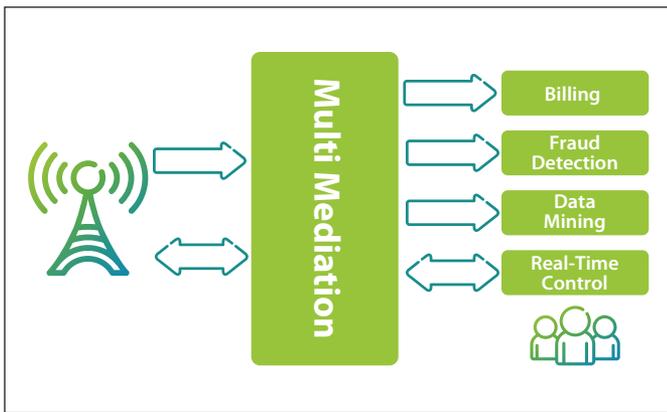
Figure 1: Multi Mediation Positions Between Connectivity Networks and Business Support Systems

Multi mediation enables fast and flexible introduction of real-time control of new multimedia and connectivity services in complex business and operations environments. Ericsson Multi Mediation achieves this while simplifying the operator network solutions, leading to CapEx and OpEx savings. Additional cost reductions are possible through an efficient graphical user interface structure and centralized management of users, operations and maintenance. Multi Mediation runs on the high performance, yet power efficient, Sun* Blade X6270 M2 server modules equipped with powerful Intel Xeon processors.

Hardware Refresh Considerations

There's a natural tendency to believe the least expensive upgrade strategy is to maintain older servers and just add new ones as needed. However, older server farms typically consume more power and footprint, require more maintenance and deliver less performance than today's offerings. These are major drawbacks for operators looking to expand capacity and support new applications. When legacy systems are throttling back business growth, operators can turn to the Intel® Xeon® processor 5600 series, which delivers exceptional power-efficient performance.

For instance, if by March 2010, the Intel Xeon processor 5600 series replaced 1 million servers that weren't retired in 2009, and assuming they replaced single-core servers purchased back in 2005, then over the next 12 months the industry could have[2]:

- Saved a total of 6.3 billion kWh of electricity or
- Saved approximately one-third the power production of the Hoover Dam or
- Saved the annual power consumption of 250,000 US homes and/or
- Reduced CO_2 production by a total of 6.6 billion lbs by the end of 2010, the equivalent of removing almost 500,000 cars from the road

This translates into significant savings since the Intel Xeon processor 5600 series can reduce energy-related costs by as much as 95 percent compared to the 2005 single core predecessor generation[3].

These processors also deliver up to 40 percent better performance per watt than previous generations[4], providing more computing performance headroom in the same space to run new services.

Reducing Environmental Impact

The Intel® Xeon® processor 5600 series is incorporated into certified products and is produced on environmentally sound manufacturing processes:

- 80 PLUS*. An incentive program funded by electric utilities, 80 PLUS focuses on integrating power supplies that are more energy efficient into computers and servers. Registered resellers and consumers gain a monetary incentive from purchasing certified products.
- Climate Savers Computing*. In 2007, Intel co-founded the Climate Savers Computing Initiative, whose goal is to reduce global IT-related CO_2 emissions by 50 percent by 2010 using a combination of more efficient components and power management features.
- RoHS Compliance. Intel complies with the European Union Restriction of Hazardous Substances (RoHS) Directive, which sets stringent limitations on the use of certain hazardous materials.

Over the past six years, the pace of computing technology advancement has been truly staggering. For example, multiple generations of Intel® Xeon® processors have delivered over 16 times more performance[5], as shown in Figure 2. Equally impressive are the power efficiency improvements, such as the 40 percent better performance per watt for the Intel Xeon processor 5600 series compared to its predecessor, the Intel® Xeon® processor 5500 series.[6]
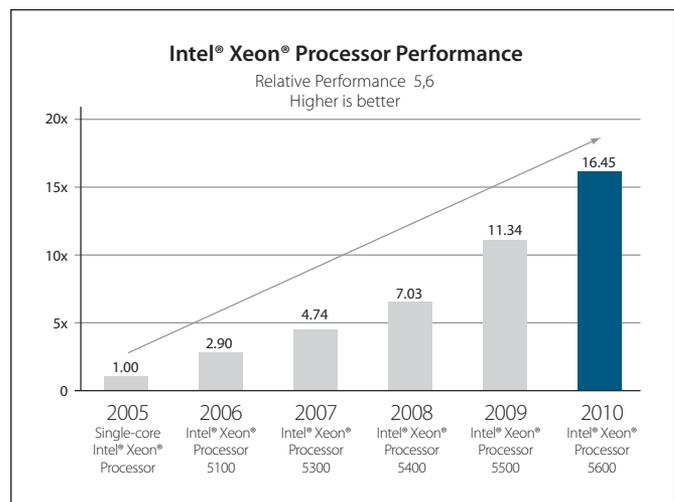
Figure 2: Normalized Intel® Xeon® Processor Performance Improvements over Six Years

On the other hand, operators may be surprised by the substantial advantages from a full system refresh that is greener, smaller and easier to maintain due to standardization. This can be seen in the following example, where deploying new servers to support one Ericsson Multi Mediation deployment has a payback period of less than a year[7].

Fast Payback

An operator with 15 million mobile subscribers recently upgraded from Multi Mediation 5.0 to 7.0. In addition to benefiting from new functionality and higher performance software, the operator was given the option of migrating away from older SPARC-based servers to less expensive Intel Xeon processor-based servers. Despite the CapEx spending for new servers, the net cash effect from the hardware migration was positive in the first year, due to significantly lower operating expenses for maintenance, energy and licenses, including those for operating systems and databases.

Legacy Deployment

The operator ran the Multi Mediation system on six Sun Fire* V890 servers, grouped in three clusters. The annual cost of running these servers based on the UltraSPARC* IV+ processor was approximately $60,000 (USD), with server maintenance and energy as the main cost components, detailed in Figure 3.
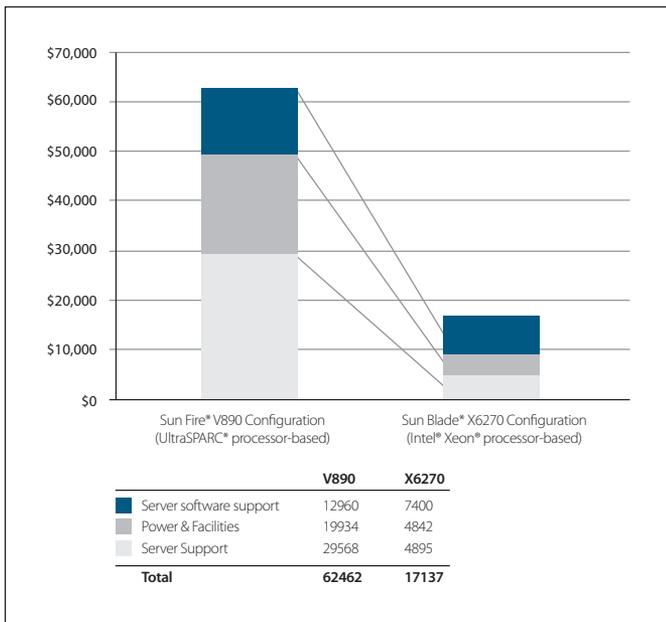

	V890	X6270
Server software support	12960	7400
Power & Facilities	19934	4842
Server Support	29568	4895
Total	**62462**	**17137**

Figure 3: Operating Cost Comparison: Legacy and New Solution

New Deployment

The new system uses five Sun Blade X6270 M2 server modules in two clusters, which significantly improves performance and provides computing headroom for subscriber growth. The blades are powered by the Intel Xeon processor 5600 series with six cores. The total annual cost for running the servers is about $15,000, a quarter of the cost for the legacy system. The largest portion of the savings comes from an approximate 80 percent reduction in the cost of server maintenance and licenses, and 75 percent lower energy consumption.

Results

Refreshing the server farm produced real savings for the operator, based on an initial capital expenditure (CapEx) of about $35,000 for the new servers and an annual operating expenditure (OpEx) savings of $45,000, as shown in Figure 4. Over a five year period, the cumulative savings are projected to be about $190,000. Not only was the new system greener than the legacy system, its footprint was smaller because the number of servers decreased from six to five. By running the latest Multi Mediation software on Intel® processor-based servers, Ericsson enables operators to significantly lower both their energy and server maintenance costs.
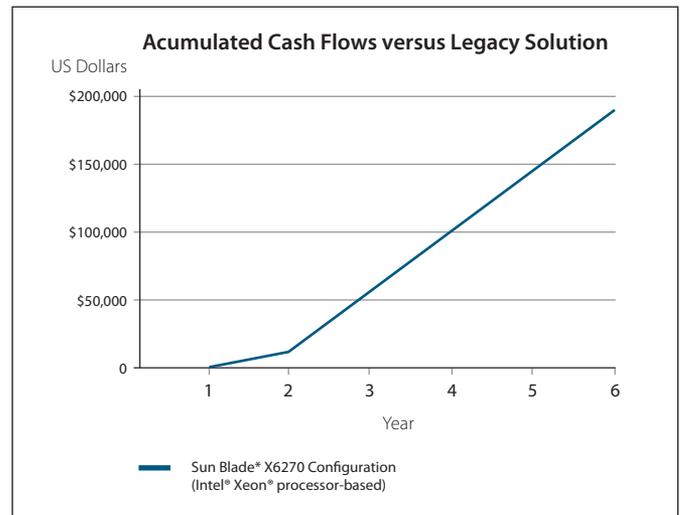

Figure 4: Cash Flow Analysis

Multi Mediation includes the following components, which support large network configuration and further reduce OpEx:

- An enhanced graphical tool for business logic configuration
- Improved architecture with centralized operation and maintenance
- New business logic engine, which can be quickly set up with an integrated development environment

Save With a Total Refresh

When mobile operators decide to upgrade their infrastructure, they may find that holding onto legacy equipment systems is far more expensive than a total refresh of server-based systems. New systems based on Intel Xeon processors supply the computing headroom needed to expand services, while providing cost savings associated with energy consumption, maintenance and system footprint. Demonstrating a payback in less than a year, the Multi Mediation product offering from Ericsson running on Intel processors enables operators to cost-effectively increase capacity and capabilities.

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For more information about Ericsson's Multi Mediation, visit:

http://www.ericsson.com/ourportfolio/products/multi-mediation?nav=fgb_101_146

For more information about embedded Intel® products, visit:

http://www.intel.com/embedded

[1] Source: http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.html, February 2010.

[2] Source: http://communities.intel.com/community/openportit/server/blog/2010/04/21/xeon-5600-doing-its-part-on-earth-day. All calculations using default values for the Intel® Xeon® processor ROI Tool (http://www.intel.com/go/xeonestimator), highest SPECint*_rate_2006 numbers published on www.spec.org, and server utilization rate (averaged of 24hrs) of 33%. Conversion of CO_2 to number of car values @ www.carbonify.com, assuming 21mpg vehicle/12k miles per year. Estimated domestic power consumption @ http://en.wikipedia.org/wiki/Domestic_energy_consumption Hoover Dam power rating @ http://www.usbr.gov/lc/hooverdam/faqs/powerfaq.html.

[3] Source: www.intel.com/en_US/Assets/PDF/general/323503.pdf.15:1 consolidation and 5 month ROI claim estimated based on comparison between 2S single-core Intel Xeon processor 3.80 with 2M L2 Cache and 2S Intel® Xeon® processor X5670 series-based servers. Calculation includes analysis based on performance, power, cooling, electricity rates, operating system annual license costs and estimated server costs. This assumes 8kW racks, $0.10 per kWh, cooling costs are 2x the server power consumption costs, operating system license cost of $900/year per server, per server cost of $7200 based on estimated list prices and estimated server utilization rates. All dollar figures are approximate. Performance and power comparisons are based on estimated server side java benchmark results (Intel Corporation Jan 2010). Platform power was estimated during the steady state window of the benchmark run and at idle. Performance gain compared to baseline was 15x.

• Baseline platform: Intel® server platform with two 64-bit Intel Xeon processor 3.80Ghz with 2M L2 Cache, 800 FSB, 8x1GB DDR2-400 memory, 1 hard drive, 1 power supply, Microsoft* Windows* Server 2003 Ent. SP1, Oracle* JRockit* build P27.4.0-windows-x86_64 run with 2 JVM instances.

• New platform: Intel server platform with two Intel® Xeon® processor X5680 (12M Cache, 3.33 GHz, 6.40 GT/s Intel® QPI), 24 GB memory (6x4 GB DDR3-1333), 1 SATA 10krpm 150 GB hard drive, 1 800w power

[4] Source: www.intel.com/en_US/Assets/PDF/general/323503.pdf. Up to 40% higher performance/watt compared to Intel® Xeon® processor 5500 series claim supported by performance results on a server side java benchmark in conjunction with power consumption across a load line. Intel internal measurement (Jan 15, 2010). Configuration details: server side java benchmark in conjunction with power consumption across a load line.

• Baseline platform: Intel preproduction server platform with two Quad-Core Intel® Xeon® processor X5570, 2.93 GHz, 8MB L3 cache, 6.4QPI, 8GB memory (4x2GB DDR3-1333), 1 PSU, Microsoft Windows Server 2008 Enterprise SP2. Intel internal measurement as of January 15, 2010.

• New platform: Intel preproduction server platform with two Intel® Xeon® processor X5670 (12M Cache, 2.93 GHz, 6.40 GT/s Intel® QPI), 8GB memory (4x2GB DDR3-1333), 1 PSU, Microsoft Windows Server 2008 Enterprise SP2. Intel internal measurement as of January 15, 2010.

[5] Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel® products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit Intel Performance Benchmark Limitations

[6] Source: Published/submitted/measured results for SPECint*_rate_base2006 as of February 2010. Intel® Xeon® processor 5600 series performance based on published Fujitsu performance measurements published for the PRIMERGY RX300 S6, Intel® Xeon® processor E5620, 2.40 GHz (score 114) and the PRIMERGY BX920 S2, Intel® Xeon® processor E5507, 2.27 GHz (score 78.6.

[7] The real cost of different hardware configurations must be discussed and calculated specifically for each installation, this paper serves only as an indication of the advantages with upgrading to newer hardware.