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Ideas International's Server Consolidation Tool Moves Online with Enhanced Features

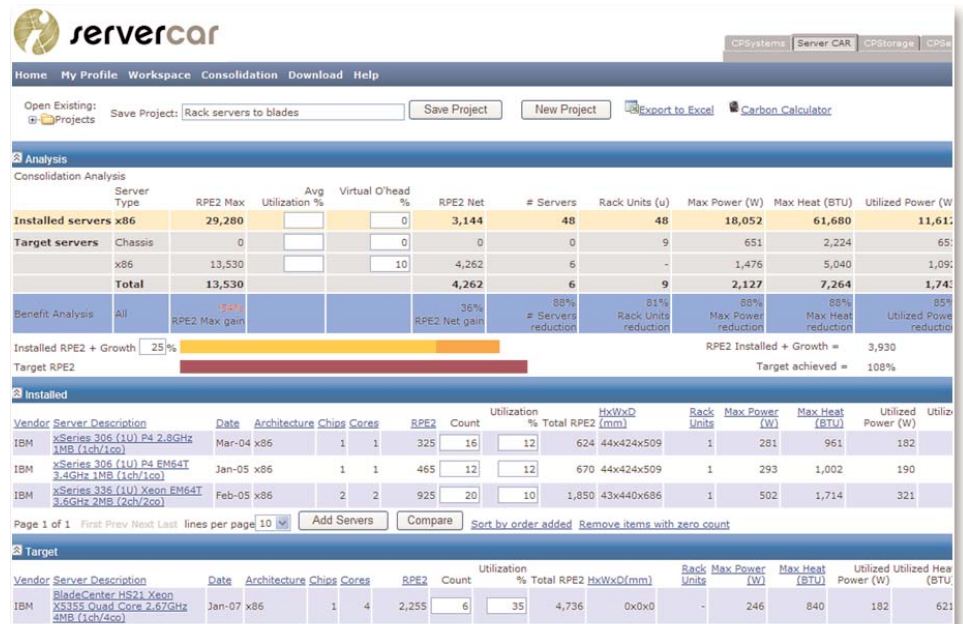


Figure 1. The Server CAR Workspace

This month, IDEAS launched Server CAR (Consolidation Analysis Resource), an innovative consolidation planning tool with an integrated Carbon Calculator. The new web-based Server CAR replaces an Excel-based tool that has been deployed in many large organizations over the past five years.

The purpose of Server CAR is to provide organizations embarking on consolidation projects with a quick and flexible methodology for comparing their existing servers against target replacement servers. The tool helps users record and analyze the performance and environmental profiles of their installed servers, and then match their existing and future requirements against potential virtualized replacement servers.

The integrated Carbon Calculator, a new feature of Server CAR, is preloaded with worldwide energy costs and carbon emission conversion factors, enabling energy financial savings and carbon impact statements to be measured and quantified for the first time.

IT groups can then quantify the performance capabilities and power loads of their installed server assets to establish a base line for demonstrating how the impact of consolidation activities contribute to the achievement of corporate carbon emission policies going forward.

Server CAR is fully integrated with the IDEAS Competitive Profiles portal of product intelligence, covering servers, storage, and

[Continued on page 2]

[Consolidation Tool . . . continued from page 1] services. This integration allows Server CAR users to click through to detailed product information within the Competitive Profiles modules, such as product features, local pricing, and cost of ownership data.

Underpinning the Server CAR operation are four feature elements not found in other consolidation planning products: comprehensive server identification; server performance matching; server energy analysis; and carbon emissions quantification.

Comprehensive Server Identification

Large corporations usually have a wide range of installed servers, with models older than five years frequently still in production use. The Server CAR database covers all leading manufacturer server families marketed from 1996 onward. At present, Server CAR contains over fourteen thousand discrete server description data points covering x86, IA-64, and RISC technologies from Dell, Fujitsu/Fujitsu Siemens, HP, IBM, and Sun.

Server Performance Matching

The industry is very poorly served by comparative performance data. Most users and capacity planning tools resort to using “clock rate” and/or low level SPEC_CPU benchmarks, even though these performance indicators correlate poorly to real-world applications.

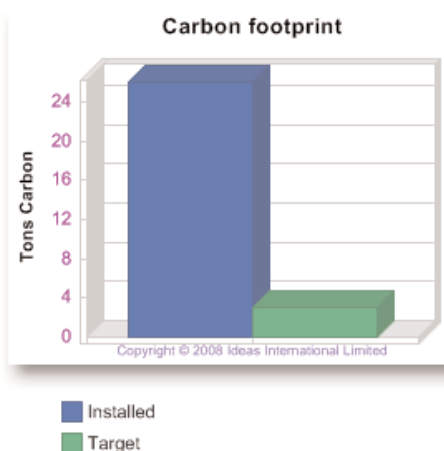
IDEAS resolved the performance comparison quandary in 2005 with the release of the first fully comprehensive server ranking series – Relative Performance Estimate Version 2 (RPE2). The objective behind RPE2 was to provide both a historical and ongoing performance calculation methodology that was not reliant or dependent on any single benchmark or technology.

RPE2 is a theoretical composite of the six leading industry benchmarks; it embraces the diverse application workloads of the SAP-SD, TPC-C, TPC-H, and SPECjbb benchmarks as well as the two SPEC_CPU_Rate bench-

marks. RPE2 is the only transparent and non-proprietary performance ranking system that can provide instant server comparisons irrespective of age or technology.

Within Server CAR, users are able to specify measured or estimated server utilization by server type (e.g. x86, IA-64, or RISC) or by individual server description. Any user-applied processor utilization is factored in with the RPE2 performance value to arrive at the net RPE2 units of performance, which are totalled over the selected server populations. Users can also specify virtual environment overheads to modify RPE2 totals within prescribed limits.

Figure 2. The Carbon Calculator Predicts Carbon Footprint Reduction



Server Energy Analysis

Up to a few years ago, vendors were not required to make any statements of server power consumption other than the pessimistic regulatory nameplate ratings for the enclosures.

Fortunately, over the past few years, manufacturers have been providing a portfolio of web and spreadsheet-based tools that calculate power and heat loadings for user-specified server content. These tools are still evolving and some effort has been made to retrospectively apply coverage to obsolete models. Most servers under four years old can be analyzed in these tools.

Server CAR includes preprocessed output from these manufacturer power tools that

defines the maximum selectable heat/power loadings for fully populated internal cabinet options, with each of the processor/core count options being the variable factor. This calculation results in a realistic component-based maximum power loading for each server model that aligns the marketed processor options with the matching RPE2 performance values. Users can immediately make power load versus performance selections between power-efficient chips or performance-optimized chips in a configured server context and, via the links into Competitive Profiles, bring the cost options into the decision analysis as well.

As the user applies processor utilization factors to reduce the RPE2 to net cumulative values, the same factors are applied to reduce the cumulative server power load. These adjustments are important because real server power loads only vary between 60% and 95% of maximum load as the server utilization rises from idle to 100% utilization. For example, in the context of a typical virtualized x86 server replacing ten low utilization servers, the resultant energy reduction can be a seven-fold saving in energy consumption.

Carbon Emissions Quantification

In a typical consolidation project, the Server CAR analytical summaries will show that an 80 to 90% reduction in server power and heat output is possible. Server CAR's built-in Carbon Calculator allows the user to quantify these energy savings in financial and carbon emission terms with fully automated or customizable parameters. All the user need do is decide whether datacenter cooling loads should be included in the calculations (the default selection) and select the location of the datacenter.

At present, the Carbon Calculator contains preset data for 19 countries around the globe with their average local power costs per kWh and the official power generation conversion factors from kWh to CO2 emissions.

[Continued on page 3]

[Consolidation Tool . . . continued from page 2]
Alternatively, a user can apply and save custom parameters to be used in this calculation.

Other Uses for Server CAR Data

In addition to deploying Server CAR for consolidation and datacenter environmental studies, existing users are leveraging the data for a range of other purposes. These include:

- » Exploring a range of server replacement options to establish the most cost effective solutions.
- » Populating the Server Asset Register to maintain an ongoing record of available server capacity.
- » Directly comparing old versus new server family performance to quantify replacement needs.

- » Establishing "charge back" algorithms for user departments according to a standardized performance rating.
- » Gaining an independent view of performance and a common capacity measure for negotiating outsourcing agreements.

The major attraction of Server CAR data for these users is the comprehensive coverage and easy accessibility to the vast repository of normalized and consistent detailed server information.

The IDEAS Bottom Line

Many organizations have set medium- or long-term goals to reduce their carbon footprint throughout their operations. The IT group is likely to be one of the heaviest energy consumers in the organization, but it is a

hard task to quantify and establish the base point from which energy and carbon emission savings can monitored over time. The introduction of Server CAR takes users a giant step forward in helping them achieve their corporate goals by providing the means to rapidly analyze alternative consolidation strategies and to quantify and monitor changes to the carbon footprint in the installed server population. ■

More information about Server CAR and the Carbon Calculator can be found on the IDEAS public website at:

<http://www.ideasinternational.com/Products/PRD020.htm>

GATEWAY TO GREEN IT INFORMATION RESOURCES

This month, IDEAS launched the Green Gateway, a free service on our public website that provides links to key sources of information relevant to climate change and green IT.

Linked sources include agencies such as the US Environmental Protection Agency and the European Environment Agency; organizations such as The Green Grid and Climate Savers Computing Initiative; and green IT resources such as the latest SPEC power benchmark results, IT vendor green portals, and power calculators.

The Green Gateway builds on the success of the IDEAS Benchmark Gateway, a popular reference source for the top results in all major industry benchmarks.

Links within the Green Gateway will be reviewed and updated over time as information sources change and new ones are introduced. We also encourage suggestions for new links to be added; a feedback feature is provided on the page for this purpose.

We trust the Green Gateway proves a useful information portal to you, and encourage you to bookmark it for future reference. ■

Visit the Green Gateway at <http://www.ideasinternational.com/green/GRN010.aspx>

THE GREEN GATEWAY

POWER CALCULATORS

- ▶ Dell: DataCenter Capacity Planner
- ▶ HP: BladeSystem Sizer, ProLiant Power Calculators
- ▶ IBM: Power Load Calculator, System x Power Calculator
- ▶ Sun: Power Calculators

AGENCIES

- North America**
 - ▶ Energy Star
 - ▶ US Environmental Protection Agency
 - ▶ US Department of Energy
- Europe**
 - ▶ Environment Agency – England & Wales
 - ▶ European Commission Climate Change
 - ▶ European Commission Environment
 - ▶ European Environment Agency
 - ▶ Ministry for the Environment – Germany
- Asia**
 - ▶ Green Growth
 - ▶ Ministry of the Environment – Japan
 - ▶ State Environmental Protection

RESOURCES – IT SPECIFIC

- ▶ **All SPECpower_{ssj2008} Results**
All currently published results for SPEC's first industry-standard benchmark that evaluates the power and performance characteristics of volume server class computers.
- ▶ **Climate Savers Computing Initiative**
By 2010, Climate Savers seeks to reduce global CO2 emissions from the operation of computers by 54 million tons per year, equivalent to the annual output of 11 million cars or 10 to 20 coal-fired power plants.
- ▶ **Electronic Product Environmental Assessment Tool (EPEAT)**
EPEAT is a system to help purchasers in the public and private sectors evaluate, compare and select desktop computers, notebooks and monitors based on their environmental attributes.
- ▶ **GreenerComputing.com**
Current stories relevant to environmentally responsible computing.
- ▶ **Green Grid**
The Green Grid is a global consortium dedicated to advancing energy efficiency in data centers and business computing ecosystems.
- ▶ **Green Storage**
The SNIA Green Storage Initiative is dedicated to advancing energy efficiency and conservation in all networked storage technologies and minimizing the environmental impact of data storage operations.

RESOURCES – GENERAL

- ▶ **ASHRAE**
The American Society of Heating, Refrigerating and Air-Conditioning Engineers advances technology to serve humanity and promote a sustainable world.
- ▶ **CARMA**
CARMA is produced and financed by the Confronting Climate Change Initiative at the Center for Global Development, an independent and non-partisan think tank located in Washington, DC. CARMA is a massive database containing information on the carbon emissions of over 50,000 power plants and 4,000 power companies worldwide.

NEWSLETTER
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VENDOR GREEN PORTALS

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- ▶ HP
- ▶ IBM
- ▶ Intel
- ▶ Sun

SERVER CAR

VIEW FLASH DEMO >>

Server CAR (Consolidation Analysis Resources) provides a Carbon Calculator feature to automatically calculate electricity savings and carbon footprint reduction from server consolidation scenarios... more >>

FEEDBACK
We would appreciate your feedback and suggestions for additional coverage and links.
CONTACT IDEAS NOW >>

Sun and Fujitsu Announce SPARC Enterprise T5440 Server

Andrew Dun, Senior Analyst - Server Information Services

Sun and Fujitsu have announced the latest product in their joint SPARC Enterprise product line. The SPARC Enterprise T5440 is a 4U, four-socket UltraSPARC T2 Plus-based server; it is the first product using Sun's "CoolThreads" multicore technology to scale beyond two processor sockets.

Back in April, Sun announced the UltraSPARC T2 Plus processor, which added SMP support to the multicore CoolThreads technology. At that time, servers were launched with two processor sockets. Now, by announcing a four-socket T2 Plus server, Sun has doubled the processor scalability of the CoolThreads architecture and extended the product line to a much wider variety of applications.

The SPARC Enterprise T5440 is a 4U rack-dense server with four processor sockets, each supporting eight-core UltraSPARC T2 Plus processors running at 1.2 GHz or 1.4 GHz. Fully configured, the T5440 will support a total of 32 processor cores and 256 threads. The maximum amount of memory supported is 512 GB, which is more than most four-socket UNIX servers currently support.

The additional scalability of the T5440 compared to other CoolThreads products means it is very well suited for a wider range of applications and workloads. Single- and dual-socket CoolThreads servers have been targeted toward "edge-of-network" applications that involve a large number of transactions with less workload per transaction, such as web servers and content streaming. However, according to Sun, with more processors on board and the extended memory capacity, the T5440 is also suited for larger workloads, such as databases, ERP, CRM, and other midrange enterprise applications. These are the same

kinds of applications that the SPARC64-based M4000 and M5000 servers manufactured by Fujitsu are targeting. Both companies will need to be clear in their messaging as to which of these products are the most appropriate for their users.

... the SPARC Enterprise T5440 can fit a lot of computing capacity into a very small space ...

Performance

Sun has backed up some of its claims about midrange enterprise performance with new benchmark results showcasing the T5440's performance on SAP and Oracle workloads. On the SAP SD 2-tier benchmark, a T5440 with four eight-core 1.4 GHz T2 Plus processors recorded a result of 7,520 users. This is the best result to date with four processor chips and the second best with 32 cores.

Significantly, this T5440 result has outperformed a SPARC Enterprise M8000 result with 16 dual-core 2.4 GHz SPARC64 processors (7,300 users) as well as an IBM System x3950 M2 result with 8 quad-core Xeon X7250 processors (6,615 users). The T5440 has also recorded the best result to date on the Oracle Siebel CRM benchmark. The T5440, again with 1.4 GHz UltraSPARC T2 Plus processors, achieved a result of 14,000 users. The next-

best result belongs to the SPARC Enterprise T5220, which scored 10,000 users by using two 1.4 GHz T2 Plus processors.

Competitive Landscape

The SPARC Enterprise T5440 will mainly compete against other midrange UNIX servers. From IBM's POWER6 stable we see the Power 550 (4U, 4 ch/8 co), the recently announced Power 560 (8U, 8 ch/16c o), and the Power 570 (8U, 8 ch/16 co) as typical competitors to the T5440. Similarly, the HP Integrity rx6600 (7U, 4 ch/8 co) and rx7600 (10U, 8 ch/16 co) will be the main competing systems among HP Itanium-based machines.

The T5440 will also be used to compete against Linux installations, including some larger clustered configurations on industry-standard x86 platforms. Key competing systems here are four-socket rackmount servers using multicore Intel Xeon and AMD Opteron processors. Examples include the Dell PowerEdge R900 and R905; the HP ProLiant DL580G5 and DL585 G5; and the IBM System x3755, x3850 M2, and x3950 M2.

The IDEAS Bottom Line

By introducing a four-socket CoolThreads server, Sun and Fujitsu have taken the CoolThreads architecture from the entry-level arena into the midrange enterprise computing market. Extending the scalability of the CoolThreads platform creates more choices for customers. With the architecture no longer aimed at just edge of the datacenter applications, it will overlap with the SPARC64 product line. Having said that, the SPARC Enterprise T5440 can fit a lot of computing capacity into a very small space by offering up to 32 cores, 256 threads, and 512 GB of memory in a 4U rackmount form factor. ■

IBM Enhances POWER6 Servers

Andrew Dun, Senior Analyst - Server Information Services

IBM has increased the processor density of its midrange POWER6 servers, doubling the capacity of the Power 570 and introducing a new model in the Power 560. Also announced were higher-speed processors for the Power 570; enhanced availability and increased memory capacity for the Power 595; and increased processor capacity for entry-level Power 520 and 550 servers running the IBM i operating environment.

Overview of Announcements

Reviving memories of the Quad Core Module (QCM) offered on previous-generation POWER5+ boxes, IBM has introduced a new processor card that houses two dual-core POWER6 processors. Previously, each processor card on the Power 570 housed a single POWER6 processor, so this new card effectively doubles the processing capacity of the 570 from 8 chips/16 cores to 16 chips/32 cores. The new four-core processor cards are available at 4.2 GHz. New dual-core options have also been added, offering speeds of 4.4 GHz and 5 GHz – the fastest processor previously available on the 570 was 4.7 GHz. The Power 570 now scales up to 32 cores at 4.2 GHz, or up to 16 cores when using dual-core 3.5 GHz, 4.2 GHz, 4.4 GHz, 4.7 GHz, or 5 GHz modules.

The four-core processor card, which has doubled the capacity of the 570, has also been used in the new Power 560. This is an 8U rackmount server that scales up to 16 cores using 3.6 GHz POWER6 processors. The Power 560 uses 4U building blocks, similar to those in the 570. While the 570 can consist of up to four of these building blocks, the 560 is limited to two. While half the size, the 560 has the same processor capacity of the 570 when it is configured with dual-core

processor cards. Being half the size of the 570, the 560 naturally offers less in terms of memory, I/O, and disk scaling. The 560 currently offers up to 384 GB of memory, up to 14 internal slots, and houses up to 5.4 TB of disk storage. By comparison, the 570 scales up to 768 GB of memory, 28 internal I/O slots, and 7.2 TB of internal disk storage.

... IBM has introduced a new processor card that houses two dual-core POWER6 processors.

While on the topic of processor density, IBM has increased the capacity of entry-level Power 520 and 550 servers using the i operating environment. When these systems were first announced in April, IBM i (formerly i5/OS and before that OS/400) users were restricted to half the number of processors when compared to AIX or Linux installations on the same hardware. This announcement brings the i editions up to parity; the 520 now supports four cores, and the 550 eight cores, regardless of whether AIX, Linux, or i is installed on the machine.

Finally, IBM has also announced some enhancements to its flagship Power 595 server. System availability has been enhanced with the ability to “hot” add processor books without powering down; deactivate a proces-

sor book (to carry out repairs or alter the memory configuration); and then reactivate it without powering down. The enhancements also allow GX I/O adapters to be added without powering down. IBM also announced a new 5 GHz processor book, which supports forthcoming 64 GB memory features, doubling the memory capacity from 2 TB to 4 TB.

These announced enhancements all become available on November 21.

The IDEAS Bottom Line

The increased processor capacity of the new four-core POWER6 module enables IBM to round out its midrange Power offerings. By increasing the capacity of the 570 to 32 cores, IBM has effectively filled the void left by the former p5-590, which was not replenished when the POWER6 chip was launched earlier in the year. The new Power 560 server offers great density in the midrange, similar to that previously offered by the POWER5+ Quad Core Module. However, this density does come at a cost in terms of speed – the new four-core cards run at 3.6 GHz (560) or 4.2 GHz (570) compared to the top speed of 5 GHz currently available. Another important tradeoff is memory capacity. Because memory slots are housed on the processor cards, by increasing the number of processors on each card IBM is effectively reducing the amount of memory that can be installed per processor. In some situations that can mean having to install expensive higher density memory. However, in situations where rack space is at a premium, these concessions may be a small price to pay. ■



OCTOBER BLOG BITES (From IDEAS Insights: <http://www.ideasint.blogs.com>)

...the new **Intel SSD** implemented with **Sun Solaris ZFS** can offer a good example of how a **host-based file system** enables both **HSM** and **ILM** for tier-0.

From "SSD Shines New Light on HSM and ILM"
Joseph Zhou | October 17, 2008
<http://ideasint.blogs.com/ideasinsights/2008/10/ssd-shines-new.html>



...the **TPC-C** benchmark stands out both in terms of the number of **results** and **longevity**. Transaction processing has, of course, always been the mainstay of the **TPC**.

From "Twenty Years of TPC Benchmarks"
Andrew Dun | October 12, 2008
<http://ideasint.blogs.com/ideasinsights/2008/10/twenty-years-of.html>



Ideas International (IDEAS) is the leading worldwide research and advisory firm for the provision of analytical decision support information that compares the ownership costs, performance, and product/service features of high-technology offerings. In January of 2004, IDEAS acquired **D.H. Brown Associates, Inc. (DHBA)**, creating a new global leadership company for the comparative assessment of IT infrastructure products and services.

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