Server on the Go:

Bottlenecks, Benefits and the Future of Business

Eurocom Mobile Server

Capacity, Mobility and Portability

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Executive Summary

Enterprise business is about to undergo a sea change. For the last three decades, server computing was done in server rooms, but this has left modern IT departments with multiple bottlenecks. Most of today's servers draw too much power, consume too much space, and, worst of all, are chained to large, stationary racks. Inability to hurdle these obstacles is keeping many enterprises from evolving and developing the services that will keep them competitive tomorrow.

Fortunately, breakthroughs in server design are now opening up a wide range of ways in which enterprises can leverage mobility to solve current needs and enable future opportunities. Server on the Go (SotG) technology, represented today by Eurocom's 12-pound Panther 5SE, tackles many enterprise bottlenecks, including:

Space. SotG solutions allow considerable multi-server capability in spaces too small for even a single rack.

Mobility. Organizations can strengthen existing accounts and expand into untapped areas by taking SotG machines into environments that simply couldn't be addressed with conventional server designs.

Energy. Many enterprises have hit a brick wall with their site's power consumption. Server on the Go systems can consume up to 80% less energy than traditional servers and open up many new IT options.

Affordable Safety. All businesses need disaster plans, but conventional recovery options can take days and/or require massive spending on redundant sites. SotG can keep backup servers standing by and ready to run from anywhere in an emergency.

Ultimately, SotG creates new opportunities for the entire industry. When servers can go everywhere and run cutting edge apps with top performance, there are countless opportunities for new sales, a leap in customer service, and the ability to reshape enterprises so they can master tomorrow's unpredictable demands.

Tomorrow and Today

Imagine a future in which the rackmount servers of today were a quarter, even one-tenth, of their present size. How would this change businesses? First, it would allow "mobile mini-server rooms" to develop. In essence, companies will be able to run a 10 Gigabit Ethernet transaction server from a briefcase. Or consider what will happen to outbound client services and collaboration when developer teams can run full-blown server environments from a conference room tabletop. Will small/medium enterprises still need co-location facilities when the infrastructure needed for redundant operations can travel in a couple of carrying cases? Think how much easier it will be to run road show demonstrations when servers take up little more space than a bento box lunch.

Taken together, these changes will enable what could be called an "on-the-go enterprise." Companies will be able to unlock the rackmount shackles that have held them pinned within traditional server rooms. An increasing number of their operations and offerings will exist in the field without any sacrifice in speed or security.

These transitions won't appear from thin air. They are emerging today out of necessity. In the 1980s, businesses needed the improved cost efficiencies and modularity of x86-based application servers. In the '90s and '00s, companies wanted to outsource several server operations for lower maintenance and improved uptime, and cloud computing emerged to fill that demand. In those times, enterprises needed to grow along certain operational, service, or profit paths, but they could go no further with conventional technology solutions. New models emerged to meet these needs and demolish those business bottlenecks.

Today, enterprises need to increasing mobility and conserve more resources. These needs intersect with four major IT bottlenecks: space, portability, energy, and infrastructure.

According to clustered NAS provider ONStor, Inc., now part of LSI, 63% of IT decision makers report that their data centers have run out of space, power, or cooling capacity. Server on the Go solutions could help these problems in a wide variety of settings. Image source: eetd.lbl.gov.

Space. Particularly in confined server environments, such as small data centers or jumbo jet server rooms, ultra-compact servers can increase compute density, fitting more MIPS into a confined amount of cubic meters. In some cases, SotG solutions will allow considerable multi-server capability into spaces too small for even a single rack.

Portability. In an era of increasing "anytime anywhere" operations, it's bizarre that servers have remained too large and too tethered to be portable. Instead, organizations must resort to co-location facilities or simply do without. Whenever there has been a need for servers on the road, the industry has had no answer—until now.

Energy. As data centers continue to mature, many organizations find that they're reaching the limits of how much power they can consume. Michelle Bailey, Research Vice President for IDC's Enterprise Platforms and Datacenter Trends, notes that the average data center in the U.S. is over 12 years old, and the utility grid has not kept pace with the growth in business computing. Bailey notes, "Customers have found themselves at the edge of what they can get even from the utility company."

Infrastructure. From insufficient PDUs and UPSs to the sheer weight of transformers, many businesses simply lack the physical infrastructure to accommodate more server growth. IDC's Bailey points out that the average virtualization ratio is five legacy servers into every new virtualization-based server, but once that's done, businesses are soon back to facing the brick wall of physical infrastructure limits.

The technology solution that has emerged to solve these bottlenecks, increase mobility, conserve resources, and help enterprises meet emerging demands is a breakthrough product category called Server on the Go (SotG).

When Smaller Is Better

A Server on the Go solution fulfills four essential criteria:

- Ultra-compact size
- Enterprise-class server platform hardware
- Significant power savings
- Complete mobility

Taken together, these four qualities overcome the bottlenecks described above. What does a Server on the Go solution look like? Perhaps surprisingly, it looks like a regular, somewhat beefy notebook. But this is a bit like saying that a server rack in a cabinet looks quite a bit like a mainframe. It's what's inside and how the device gets applied that makes all the difference.

Enterprise-grade style carries into the mobile world with Eurocom's new SotG design, the Panther 5SE. For heightened security protection, note the inclusion of a fingerprint scanner. The system also offers full support for self-encrypting storage drives.

The world's first server able to meet all four Server on the Go criteria is Eurocom's Panther 5SE. Weighing in at 5.3 kg (11.7 lbs.), with a 60.7 mm (2.43 inches) thickness, the Panther 5SE evolved from high-end notebook designs. In addition to all of the expected notebook must-haves (17.3-inch 1920x1080 display, ExpressCard/34, optional webcam, 9-in-1 reader, etc.), Eurocom's SotG design offers the following server-oriented features:

- Intel Xeon processor (12 core Intel Xeon E5-2600 v2 processors up to E5-2697 v2)
- Up to 32GB of DDR3-1600 triple-channel memory
- Up to four 2.5-inch HDD or SSD drives in RAID 0/1/5/10
- Gigabyte Ethernet with an option for quad-port GbE

The code-name "Copper Mountain" would have been suitable for Eurocom's Panther server system. With a heatsink-fan mounted over the CPU, chipset, and both GPUs, the unit stays remarkably cool even under sustained load.

With these specifications in mind, consider some comparisons against traditional uni-processor rackmount servers:

- A racked system still requires a keyboard, mouse, and monitor, which are often placed on additional trays within the rack in order to minimize the total hardware footprint. With SotG, these peripherals are integrated.
- Conventional servers require attendant UPS capability rated for at least 10 to 15 minutes of runtime before shutdown. With SotG, the swappable polymer Li-Ion battery provides many times this amount.
- Whereas traditional servers typically require 800W to 1000W, SotG systems will run a full load at under 300W. Also consider how much less ambient cooling will be needed as a result of such power drops.
- If a unit needs to be swapped out for any reason, simply grab and go. Most of the wiring required in rackmount scenarios vanishes with SotG.
- Obviously, taking a racked server to a customer's site is problematic, and even tower-style servers are considerably more cumbersome. An SotG solution simply slips into a notebook carrying case.

In conventional IT, it can take the help of a notebook to decipher the complexity of a server rack. With Server on the Go, IT can now fit much of a server rack into a notebook, dramatically reducing complexity and maintenance issues.

Eurocom's Panther 5SE supports Windows 7, Windows Server 2012 R2, Windows Server 2008 R2 x64, Solaris, VMware, Red Hat, and other Linux distributions. SotG systems are every bit as adept at running virtualized environments as their rackmount counterparts. Also consider the appeal of server validation in vendor support. When a server application crashes and IT calls for vendor assistance, that vendor is much more likely to offer help for known, supported, enterprise-grade hardware components, such as the Intel Xeon and NVIDIA Quadro. Some vendors may refuse to support their software on desktop-class platforms.

We should emphasize a key point: SotG does not replace conventional server systems. In environments where space, weight, mobility, and energy bottlenecks don't exist, rackmount and tower servers remain the most cost-effective and highest density options. SotG addresses emerging needs and opens up new opportunities throughout the market.

SotG: Immediate Applications

We've already mentioned how Server on the Go can dramatically lower a server room's total power requirement—no small point in a time of dramatically rising oil costs. The energy cost savings alone are obvious and fairly simple to figure, both in direct consumption as well as environmental cooling. However, even more exciting SotG opportunities exist outside of the server room.

On-site training. Service providers often need to train customers on new products and procedures while on-premise. Examples might include a software vendor training a reseller or that reseller, in turn, training a new enterprise client. If the product employs a local server architecture, then it makes sense to train on a bona fide server platform. The numerous advantages of SotG make this training much easier and more cost-effective to execute.

Application development. In a similar vein, say a client is customizing a new accounting platform. The software engineering crew could substantially cut its development time and costs if the vendor were able to be on-site and working hand-in-hand with the client throughout prototyping, preproduction, testing, and final validation. Server on the Go makes this possible with unprecedented flexibility and little to no demand on the client's infrastructure.

Rapid Engineering Deployment (RED-Team Strategy). Following in line with application development, many organizations need on-site help with product engineering. Historically, this help has been done remotely, as servers and workstations were too bulky to mobilize. But SotG solutions pack the necessary compute capability into a form factor that can be carried under one arm. Eurocom's line of mobile servers and workstations can be deployed in tandem to engineers and project managers at the client site. Feedback from co-developers, stakeholders, and users can be integrated immediately, reducing development costs and time tables.

Standby backup servers. Small to mid-sized enterprises in particular often can't afford full-blown disaster recovery and failover to redundant or co-located data center sites. Additionally, while cloud services may be tremendously beneficial, not many organizations are yet ready to buy off on "five nines" uptime guarantees. When disaster hits, backup servers will be needed at a moment's notice, and it may not be possible to pick in advance where those servers will plug in. SotG options allow IT staff to maintain affordable, ready-to-run servers with which one could literally sprint to safety.

Emergency response. From military crews to organizations such as FEMA and the Red Cross, organizations need the ability to plant a fully functional data center anywhere in the world with only a few hours of notice. The infrastructure of traditional servers is simply too cumbersome to be feasible in many situations. With Server on the Go solutions, crews could run a complete mobile command data center from the back of a Jeep.

These are just some of the first application types already employing SotG solutions. More will certainly follow as server designs branch out and capabilities continue to expand.

A Glimpse Forward

Expect SotG solutions to grow and diversify. Already, Eurocom is finalizing its next-generation SotG design. The market can anticipate features such as:

- 6Gbit/s SAS & SATA 3.0 with expanded RAID options
- Dual Xeon CPU support with improved thermal specifications
- Six memory slots
- Integrated quad-port Gigabit Ethernet (Intel's "Barton Hills")
- Standby power per port reaching under 86mW
- Single- and dual-port 10 Gigabit Ethernet at roughly 5W per port

For all of its server-oriented components, the Panther remains a killer portable computer, complete with FireWire, HDMI output, USB 2.0 and 3.0, 802.11n, Bluetooth, SPDIF, and 5.1 speaker audio.

Even with SotG designs quickly evolving, organizations around the world are already embracing the advantages of this new category. "People use Server on the Go because they're smart," says Eurocom president Mark Bialic. "They're solving specific business limitations. With Server on the Go, these groups can generate more revenue and profits, they can use existing resources more efficiently, and they'll reduce overall operating costs."

To stay competitive and relevant, modern businesses must reinvent themselves and their offerings every few years. Server on the Go can be a key factor in that reinvention, and at this early stage the approach stands out as a significant competitive differentiator. Adopters will earn more business and complete that business with higher margins.

Tomorrow's enterprise IT will be far more flexible than it is today. There will be less and less need to bring staff and customers into resource-rich center. Instead, the enterprise will be able to maintain fewer resources at its core, distribute its people and computing power more effectively, and integrate with clients in ways that have never before been feasible. An on-the-go enterprise will preserve all of the IT abilities it has today, but it will execute with more efficiency in more

places than ever possible before. Server on the Go technology is going to make that future happen.

Contact Eurocom or your regional reseller to find out how SotG technology can relieve your business bottlenecks and open a field of new opportunities.

Server On The Go: Bottlenecks, Benefits, and the Future of Business

Imagine the future, when today's rackmount servers will be a fraction of their present size. How will this change businesses? For starters, companies will be able to run a 10 Gigabit Ethernet transaction server from a briefcase. Outbound developer teams can work on-site with clients and run full-blown server environments from a conference room tabletop. Will small/medium enterprises still need co-location facilities when the infrastructure needed for redundant operations could travel in a couple of carrying cases? And think how much easier it will be to run road show demonstrations when servers take up little more space than a bento box lunch.

These changes will enable "on-the-go enterprises" able to be unshackled from traditional server rooms. Fortunately, breakthroughs in server design are now making this future vision a reality. Server on the Go (SotG) technology, represented today by Eurocom's 12-pound Panther 5SE, is the first major step in liberating server room IT.

SotG tackles many enterprise bottlenecks, including:

Space. SotG solutions allow considerable multi-server capability in spaces too small for even a single rack.

Mobility. Organizations can strengthen existing accounts and expand into untapped areas by taking SotG machines into environments that simply can't be addressed with conventional server designs.

Energy. Many enterprises have hit a brick wall with their sites' power consumption. Server on the Go systems can consume up to 80% less energy than traditional servers and open up many new IT options.

Affordable Safety. All businesses need disaster plans, but conventional recovery options can take days and/or require massive spending on redundant sites. SotG can keep backup servers standing by and ready to run from anywhere in an emergency.

Eurocom's Panther 5SE is the world's first notebook-type design able to meet all four Server on the Go criteria. The Panther 5SE is fully configurable. With top-end options, the 17.3-inch LCD-equipped server can feature a six-core Intel Xeon 5600 CPU, dual NVIDIA Quadro 3800M (or GeForce GTX 4xxM) GPUs, 24GB of DDR3-1600 memory, four internal SSDs in RAID 0/1/5/10, and quad-port Gigabit Ethernet.

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- Whereas traditional servers typically require 800W to 1000W, SotG systems will run a full load at under 250W. Also consider how much less ambient cooling will be needed as a result of such power drops.
- Taking racked servers to a customer's site is problematic, and even tower-style servers are cumbersome. An SotG solution slips into a notebook carrying case.

Server on the Go opens up a spectrum of new business possibilities. Sales teams can conduct on-site training for server-based applications with unprecedented convenience and performance. Software engineering crews will cut development time and costs when vendors bring on-the-go servers and workstations on-site and work hand-in-hand with the client throughout prototyping, preproduction, testing, and final validation. Back within the server room, SotG options allow IT to maintain affordable, ready-to-roll servers with which one could literally sprint to safety.

Ultimately, SotG creates new opportunities for the entire industry. When servers can go everywhere and run cutting edge apps with top performance, there are countless opportunities for new sales, a leap in customer service, and the ability to reshape enterprises so they can master tomorrow's unpredictable demands.