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## Server Sprawl And Cost Reduction Bring New Customers To Mainframe/Linux Platform

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### EXECUTIVE SUMMARY

Trade press articles and industry pundits have been talking about the death of the mainframe for decades. Vendors use the phrase “mainframe modernization” as a euphemism for migrating applications from the mainframe to distributed platforms — what’s new? A pendulum swing in the other direction — the high cost of server sprawl has some firms coming back to consolidate on a modern mainframe destination.

### ADDRESSING THE DARK SIDE OF SCALE-OUT ARCHITECTURES — SERVER SPRAWL

In fashion circles, they say that if you wait long enough, once-fashionable attire will again become fashionable: Thin ties versus fat ties, narrow lapels versus wide lapels, long hemlines versus short hemlines — styles come and go. Who knew that fashion rules also apply to IT? Pundits pontificate that the mainframe platform fell out of fashion in the early 1990s — replaced by a modern (distributed) platform. Well, pundits can now quote Mark Twain by quipping, “The report of my death was an exaggeration.”<sup>1</sup> A modern mainframe is making inroads as a consolidation option for modern Linux workloads, including server consolidation.

The dark side of open and inexpensive scale-out x86 architectures is server sprawl — the proliferation of servers with relatively low utilization rates. Scaling out is simple: When you need to process higher volumes of production data, you simply spawn new virtual machines (VMs), production application servers, new database servers, storage, etc. However, each new server must be properly provisioned with new software licenses, so licensing costs scale fairly linearly, and the proliferation of small servers increases the administration burden. As applications scale out to meet increased business demand, the cumulative effect of sprawl takes its toll on the IT budget in terms of additional complexity, staff, floor space, electricity, etc.

To combat server sprawl, firms use virtualization to enable portability across servers and use consolidation to reduce the number of servers to fewer, larger servers that can run multiple virtual instances at higher utilization rates. In fact, 73% of respondents to a Forrester survey rated consolidating and virtualizing their servers as a high or critical priority.<sup>2</sup> Some customers see Linux on System z as a viable target destination that will contain server sprawl at attractive price/performance points.



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## PSP BATTLED THE HIGH COST OF CUSTOMER GROWTH WITH LINUX ON A MAINFRAME

Take the case of Payment Solution Providers (PSP), which hosts the point-of-sale (POS), ATM, and credit card transaction processing of banks and other client firms: It is experiencing solid organic growth and is poised for geographic expansion. It had grown its application portfolio on a scale-out architecture using HP blades, the Oracle database, and Cisco load balancers. Organic customer growth was driving its IT organization to grow linearly as it added processing capacity for each new client. Danny Gurizzan, executive vice president operations, told Forrester, “For each new customer, we’d typically add two application servers and two database servers for high availability and failover, and couple them to a Cisco load balancer.” Once the total environment grew to consume several racks worth of space, PSP knew something must change; its requirements for floor space, electrical power, air conditioning, software licenses, and staff were multiplying at an unsustainable rate, and it was considering larger real estate leases to house its expanding data center.

## Price, Performance, Reliability, And Security Drove PSP To Choose Linux On System Z

With a major geographic business expansion on the near-term horizon, PSP had to shrink its footprint, cost-to-scale, and complexity to support its expanding customer base. It evaluated several configurations from consortiums of vendors to virtualize and consolidate its current application processing.

Before consolidating its environment, PSP conservatively estimated that the new environment would yield savings of 25% — primarily based on reduced requirements for software licenses, electrical power, and floor space. It chose an IBM System z10 mainframe with just over 600 MIPS and 64 GB of memory, as well as a small tape subsystem.<sup>3</sup> Its Java applications now run within WebSphere on Linux; as PSP didn’t use stored procedures, they did not factor into the migration effort. However, the move from Oracle Database 11g to IBM DB2 did require some application code changes, which PSP identified with a parsing tool that IBM supplied. The migration occurred over a period of eight to nine months with the assistance of IBM.

PSP related the following results to Forrester:

- **A smaller footprint.** Its distributed footprint in the data center shrunk from six to eight racks of space down to the equivalent of 2.5 racks, and PSP no longer needed two of its four air-conditioning units.
- **Greater transaction throughput.** PSP tripled its transaction-processing volumes from 1,500 transactions per second to more than 5,000 per second.
- **Better than anticipated cost savings.** Although it justified the migration by anticipating savings of 25%, PSP notes actual post-implementation savings of 30% to 35%. “We’re currently running six LPARs and have the capacity to grow to 30; when we grow to reach 15 or 20, our margins will improve hugely,” Gurizzan said. At its current rate of new-customer growth, PSP

anticipates it will soon stabilize at a 40% overall reduction in total cost of ownership from its previous distributed environment.

- **Retention of most of the distributed operations staff.** According to Gurizzan, “We hit a few speed bumps as we transitioned our distributed staff to operate the mainframe, but we retained almost all of them.”
- **Pending PCI security compliance improvements via the cryptographic processor.** Gurizzan also noted that, “We can be forced to do quarterly compliance audits, but when we add the cryptographic features of the mainframe, our audits will become a breeze — the auditors really respect the security of the platform to meet PCI standards compliance requirements.”<sup>4</sup>

## RECOMMENDATIONS

### CONSIDER LINUX ON THE MAINFRAME AS A VIABLE CONSOLIDATION OPTION

The impetus for this case study is really about platform choice and bias. Should every company abandon their current vendor in favor of Linux on System z? No, but PSP clearly realized value from its choice. Has x86 server consolidation to Linux on System z reached epic proportions? No, but it has a firm start — IBM claims more than 40 public references, such as Allianz Life, Bank of New Zealand, Bank of Russia, Blue Cross and Blue Shield of Minnesota, Highmark, and Marriott International. How widespread is Linux adoption on System z? It is difficult to quantify precisely: IBM offers statistics of a 42% compound annual growth rate (CAGR) and 18% year-over-year growth, but it doesn't offer the base numbers to ground the percentages.

PSP's claim that it retained almost all of its operations staff is notable. In an age in which pundits question where the next generation of mainframe operations staff will emerge from, PSP's experiences suggest that perhaps the differences in skills to operate the environments are not as vast as the pundits profess.

The main point is that there is a new and viable choice for server consolidation that firms should evaluate without preconceived notions — platform bias cuts both ways, and it isn't healthy. End the cultural application platform wars in your firm, and base platform choice on the characteristics of the workloads you run and where they will run best. Modern distributed platforms and modern mainframe platforms offer a wealth of choice. Don't leave either option off your shortlist based on historical or cultural platform bias.

## WHAT IT MEANS

### THINK MAINFRAME APPLICATION MIGRATION IS A ONE-WAY STREET? THINK AGAIN

The term “modern” may not have applied to the mainframe in the 1990s; however, “modern” is no longer the sole domain of Intel-compatible technology vendors. Yes, today's mainframe runs

traditional data-serving and transaction-processing workloads with the kind of manageability, scale, reliability, and security for which it is legendary. The new news is that in addition to traditional workloads, modern mainframes also run modern workloads — such as Linux, Oracle applications and databases, SAP applications, and other technologies — at price/performance levels that some customers find compelling.<sup>5</sup>

On July 12, 2011, IBM took a more aggressive stance on pricing mainframe configurations at the lower end of the MIPS range with the announcement of the next chapter of zEnterprise — the z114.<sup>6</sup> The z114 retains all the options of its larger sibling, the z196, but it is aimed at midsize firms whereas the z196 supports the largest customers. The announcement offers aggressive pricing, performance, and product bundling for hardware and software configurations ranging from 26 MIPS to 3,100 MIPS. While it is too early to say for sure, the z114 could stem the loss of IBM customers in the sub-3000 MIPS range — assuming that IBM prices it correctly.

## ENDNOTES

- <sup>1</sup> The initial quote was the response of Mark Twain — a nom de plume for Samuel Langhorne Clemens — to an erroneous newspaper report that he was gravely ill. In fact it was Twain's cousin — James Ross Clemens — who fell ill. Source: Mark Twain quotations (<http://www.twainquotes.com/Death.html>).
  - <sup>2</sup> Respondents chose the answer “Consolidate IT infrastructure via server consolidation, data center consolidation, or server virtualization” as a top priority. Source: Forrester's Forrsights Hardware Survey, Q3 2010.
  - <sup>3</sup> Millions of instructions per second (MIPS) is a rough measure of the processing power of mainframe computers.
  - <sup>4</sup> Credit card processors must be certified as PCI-compliant. Source: PCI Security Standards Council (<https://www.pcisecuritystandards.org/>).
- Linux under System z has certain hardware security features integrated with the operating environment. Source: “Linux on System z can inherit world-class security features,” IBM (<http://www-03.ibm.com/systems/z/os/linux/solutions/security.html>).
- <sup>5</sup> The initial announcement of the IBM zEnterprise System (zEnterprise) collocated the zEnterprise BladeCenter eXtension (zBX) with the fastest-ever mainframe box (z196) and tied them together with private data networks and the Unified Resource Manager (formerly zManager) — a firmware-based feature that exposes the servers to central provisioning and management. See the August 27, 2010, “[zEnterprise Should Change The Role Of The Mainframe In Application Strategy Decisions](#)” report.
  - <sup>6</sup> Source: “Smarter Systems for a Smarter Planet,” IBM press release, July 12, 2011 ([http://www-304.ibm.com/partnerworld/wps/servlet/ContentHandler/pw\\_com\\_sys\\_announcement](http://www-304.ibm.com/partnerworld/wps/servlet/ContentHandler/pw_com_sys_announcement)).