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Mainframes And RISC Server Trends For IT Infrastructure Consolidation

by Brad Day

for IT Infrastructure & Operations Professionals

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by Brad Day
with Simon Yates, Walid Saleh, Rachel Batiancila, and Rachel Dines

EXECUTIVE SUMMARY

In a recent Forrester survey, more than half of the respondents who are consolidating servers as part of an IT infrastructure consolidation strategy are focusing on their mainframe environment. Long thought of as separate and largely untouchable, the big iron systems are on the table just like their x86 counterparts. This report looks primarily at the segment of firms focusing their consolidation efforts on reduced instruction set computer (RISC), Itanium, and/or mainframe systems, but not x86. These firms are driven to consolidate for operational efficiency and for opportunities to address application workload consolidation. IT consultancies provide guidance to a majority of these firms, and in the end it's important for mainframe and RISC professionals to make sure they have a seat at the table when broad-ranging consolidation decisions are being made.

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NOTES & RESOURCES

For our August 2007 US Enterprise IT Consolidation Online Survey, Forrester surveyed 246 IT executives and managers at US enterprises about their IT consolidation experiences and plans. Additional insight comes from more than 50 client inquiries from September through December 2007.

Related Research Documents

"Virtualization Trends On IBM's System P"
February 5, 2008

"How Large Enterprises Approach IT Infrastructure Consolidation"
December 28, 2007

"IBM System z: Trends And Drivers Catalyzing The Next Generation Midframe"
November 14, 2007

MAINFRAME AND RISC-BASED SYSTEMS ARE A BIG PART OF THE IT CONSOLIDATION EFFORT

With fixed budgets and increasing demands on infrastructure, consolidation is often the best way for enterprises to drive down operating costs. In August 2007, Forrester surveyed 246 IT executives and managers at US enterprises to learn how they are tackling IT infrastructure consolidation.[1]

While a majority of firms see x86 servers as good consolidation targets, another target — although not as widely discussed — is the mainframe and RISC server environment.[2] Of those respondents who had consolidated or were planning to consolidate servers, 54% were consolidating mainframes, and another 40% were looking at their RISC environments (see Figure 1).

We wanted to learn more about what was specifically driving mainframe and RISC consolidation efforts and uncover some differences from those firms that focused on consolidating x86 server environments. Ignoring plans for consolidating operating system instances, application workloads, or consolidating to blade servers, 20% planned to focus on the consolidation of their mainframe and/or RISC environments — with no plans for their x86 servers.[3] Conversely, a larger proportion, 27%, were focused on x86 servers as their only target (see Figure 2).

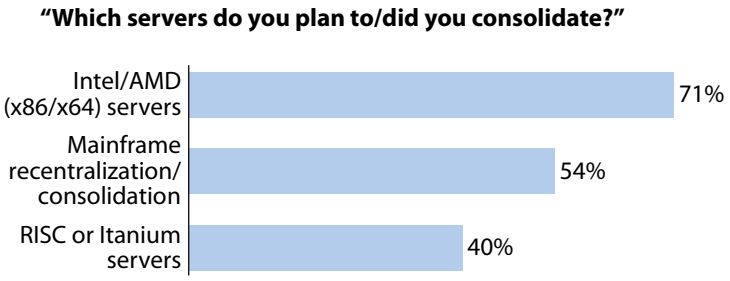
Many Firms Are Consolidating Multiple Server Platforms

We learned that firms focused on consolidating their mainframe and/or RISC environments but not x86 servers were at the same time consolidating other IT infrastructure components such as storage, data center facilities, networks, and IT staff (see Figure 3). IT infrastructure consolidation projects obviously have a lot of moving parts with many different systems and applications on the table. Therein lies one of the biggest challenges with server consolidation projects in particular. You will need to keep in mind that:

- **The pace of server inventory turnover differs by server type.** Differences in server life can really complicate your consolidation project. When a server refresh is part of an ongoing upgrade process or is triggered by a server consolidation project, the planned useful life of the system must be factored into the equation. For example, it rarely makes sense to ditch an expensive, two-year-old IBM Series p server just because your consolidation project calls for Linux apps to be moved onto the mainframe. The normal refresh cycles for standardized entry and midrange x86 servers are between two and three years, while RISC systems have longer refresh cycles of three to five years. Mainframes, of course, have the longest of all, with a life cycle of six to 10 years, on average.

- **Triggers for mainframe/RISC consolidation are different from x86 triggers.** Whether deployed with physical or virtual servers in mind, server turnover through consolidation is triggered by the intersection of three core objectives: higher use rates from consolidating workloads to more powerful servers, significantly better performance for a select application workload, and a significantly better price/performance for that same workload. These factors are much harder to calculate in the mainframe/RISC world.

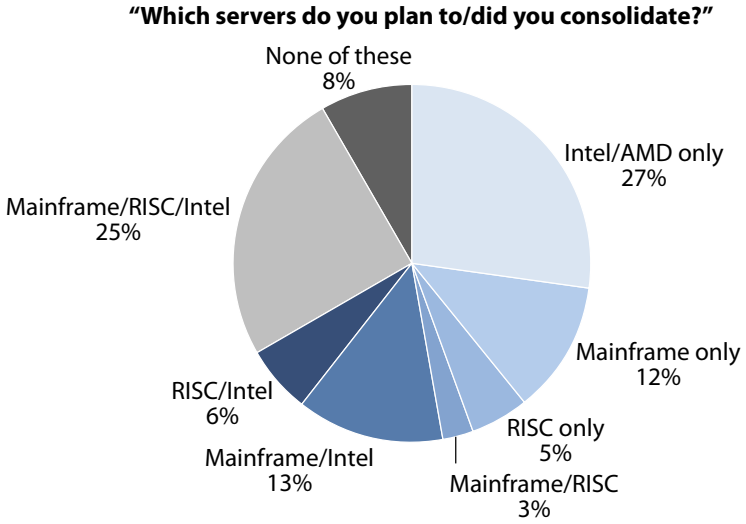
Figure 1 More Than Half Of Survey Respondents Are Consolidating Their Mainframe Environments



Base: 206 IT executives and managers at US enterprises that have consolidated or plan to consolidate servers (multiple responses accepted)
Source: August 2007 US Enterprise IT Consolidation Online Survey

42965 Source: Forrester Research, Inc.

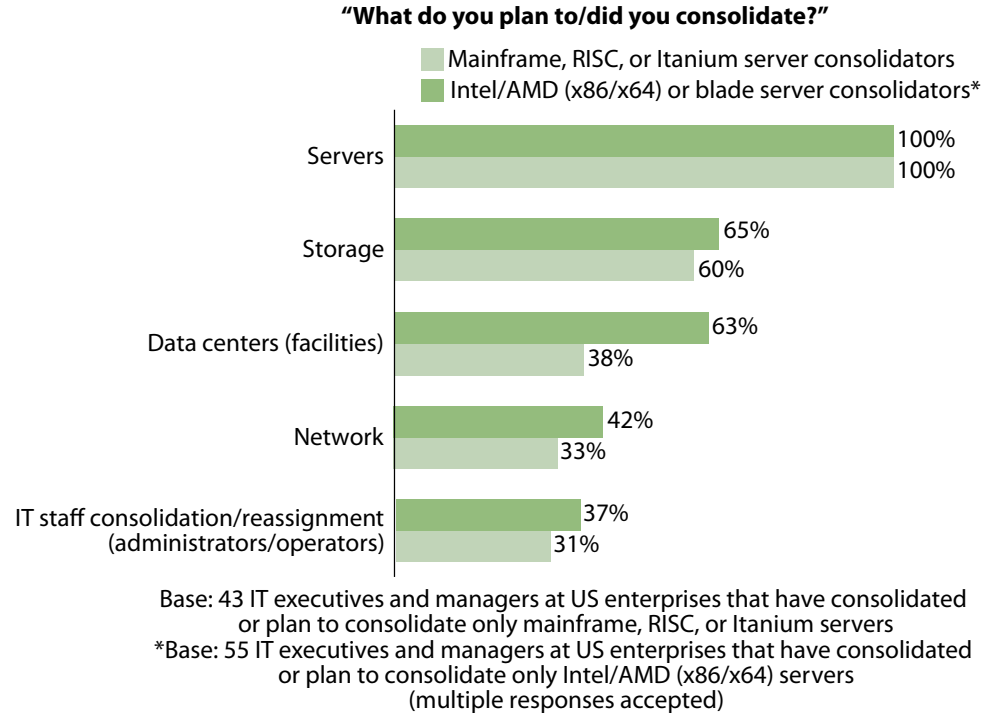
Figure 2 A Majority Of Systems Consolidation Projects Include Multiple Server Designs And Types



Base: 206 IT executives and managers at US enterprises that have consolidated or plan to consolidate servers (percentages do not total 100 because of rounding)
Source: August 2007 US Enterprise IT Consolidation Online Survey

42896 Source: Forrester Research, Inc.

Figure 3 Mainframe/RISC Consolidators Are Also Tackling Storage, Facilities, And Networks



Base: 43 IT executives and managers at US enterprises that have consolidated or plan to consolidate only mainframe, RISC, or Itanium servers
*Base: 55 IT executives and managers at US enterprises that have consolidated or plan to consolidate only Intel/AMD (x86/x64) servers
(multiple responses accepted)

Source: August 2007 US Enterprise IT Consolidation Online Survey

42965 Source: Forrester Research, Inc.

Application Workload Issues Help Drive Big Iron Consolidation

When asked to pick their top five motivations behind consolidation, both x86 and mainframe/RISC consolidators put improving operational efficiency at the top of the list (see Figure 4). And both groups put application workload consolidation as their second choice. Why are firms that are focused on mainframe and RISC system consolidation looking at application workload consolidation?

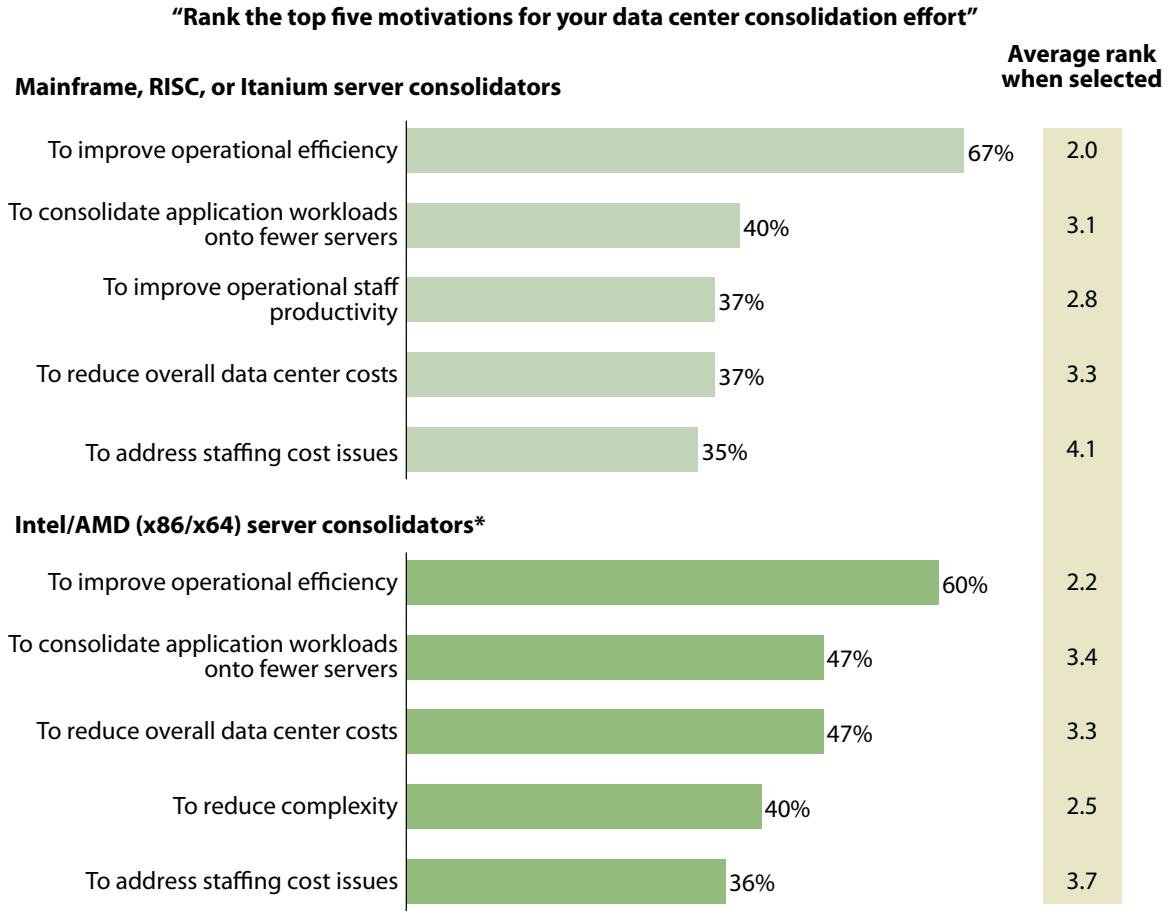
- **New, more powerful systems can carry a bigger workload at a lower cost.** Over the past year, the more powerful multicore RISC- and Itanium 2-based systems have driven significant applications performance scalability, and it has been substantial — up to 2.5 times more performance than previous server models and up to 50% better price/performance: One example is IBM's introduction of the POWER6 server. Consequently, it becomes appealing to collapse more and more operating system instances as well as a wider and larger mix of applications workloads onto fewer more powerful and more cost-efficient machines.

- **Virtualization makes application workload consolidation a compelling opportunity.** What feeds the interest in application consolidation on the big iron boxes is increased exposure to their advanced virtualization stacks. These virtualization stacks are a core underpinning to

consolidating the application workload onto larger, more powerful multicore server platforms. The virtualization stacks offered by the System z mainframe server, as well as RISC/Itanium 2 players, are advanced and proprietary to their platforms. The System z mainframe virtualization stack, consisting of the combination of zVM and PR/SM, is the most advanced. RISC (Sun's zone and containers and IBM's Advanced POWER Virtualization) and Itanium 2 (HP's Virtual Server Environment) battle it out for Unix- and Linux-led consolidation projects, where the features/functionalities of their virtualization stacks are critical enablers of the speed, efficiency, and optimization in their project's outcome.

Figure 4 Application Workloads Are A Strong Driver Of Mainframe/RISC Consolidation

A spreadsheet with additional data is available online.



Base: 43 IT executives and managers at US enterprises that have consolidated or plan to consolidate only mainframe, RISC, or Itanium servers
*Base: 55 IT executives and managers at US enterprises that have consolidated or plan to consolidate only Intel/AMD (x86/x64) servers

Source: August 2007 US Enterprise IT Consolidation Online Survey

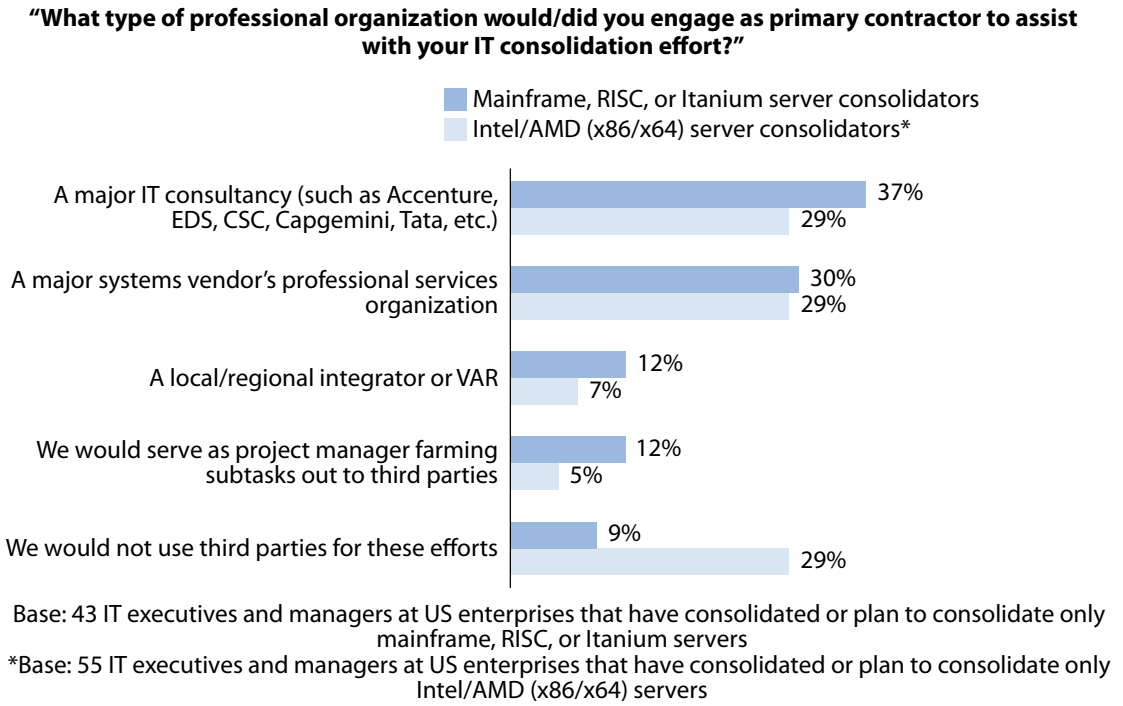
42965 Source: Forrester Research, Inc.

Big Iron Consolidators Look To IT Consultancies For Help

More than a third of the mainframe, RISC, and Itanium consolidators we spoke with reported that they would engage or had already engaged a major IT consultancy such as Accenture, CSC, EDS, or IBM Global Services as a primary contractor on their consolidation project, compared with only 29% of surveyed x86 consolidators (see Figure 5). An additional 29% of the x86 consolidators wouldn't use a third party at all, whereas few mainframe/RISC consolidators surveyed would tackle such a project alone. Why the big difference?

- **Complexity and customization.** It's not surprising that both mainframe and RISC customers seek the expertise of third-party services organizations. In general, the big iron systems — and their surrounding system and applications software stacks — are more complex and less standardized than the x86 server environment. Using outside IT consultancy services for systems consolidation significantly favors the special computing infrastructure requirements of the RISC and mainframe server customer. These consultancy firms must have both the deep technology and the project management skills required for the successful completion of a server consolidation project at the planning, analysis, and implementation phases of the project.

Figure 5 IT Consultancies Are Often The Best Equipped To Tackle Mainframe/RISC Complexity



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42965 Source: Forrester Research, Inc.

- **Unique requirements.** Firms whose server population includes RISC (Sun and IBM), Itanium 2 (mostly owned by HP), and IBM System z mainframes are most likely already engaging each vendor's virtualization stack as a core part of their server system design. They can be further differentiated as typically running more complex mission-critical applications and often supporting a variety of workload types on either Linux or their proprietary Unix operating system, often with a higher degree of fault resiliency and disaster tolerance and with a more complex set of life-cycle-ownership requirements.

GIVE BIG IRON A SEAT AT THE IT CONSOLIDATION DECISION-MAKING TABLE

This survey clearly demonstrates that in firms actively executing or planning IT consolidation, the mainframe/RISC environment is as important to the overall success of the effort as the more popular x86 server environment. For years, the big iron systems have been viewed as separate and largely untouchable when compared with the faster innovation and shorter refresh cycles of the x86 servers. When an IT consolidation project kicks off, however, you need to:

- **Integrate the efforts of x86 and big iron administrators and engineers.** The wall between the distributed x86 and centralized mainframe server teams needs to become a lot more porous when you take on an IT infrastructure consolidation project. The firms that can drive this collaboration start from a global perspective and often have a technology program office in place whose strategic project responsibilities can span the entire enterprisewide computing infrastructure.

- **Get the CIO to drive collaboration from the top down.** An effective global consolidation effort can only have sustainable acceptance as a high priority if the technology program office reports directly to the office of the CIO. With CIO sponsorship, the program office can work through both the centralized and distributed enterprise computing geographies to: 1) properly audit all of the computing infrastructure inventory; 2) be more efficient in developing the business case; 3) understand where consolidation efforts can have their highest impact, based on business, financial, and technology objectives; and 4) commence the actual consolidation implementation. Since successful consolidation often requires input and analysis from all parts of an IT organization, sponsorship at the highest level will break down any technological and organizational bias associated with one server system's architecture over another.

- **Ensure that application workload characteristics and optimization drive server choice.** In reality, only a limited set of applications from the x86 world are suitable for mainframe and RISC systems. As a Unix, Linux, or mainframe operations specialist, your view into those specific x86 applications workloads is probably somewhat limited. Modernization or refresh of a technology infrastructure should always start at the application workload level — the behavior, characteristics, and service-level requirement of each workload based on the type of end user the application supports. The next priority is to tie that workload to the most appropriate operating system environment. Application workloads are helped or hindered by how well the combination of server operating system, type, and design optimizes both the technological and cost of life-cycle-ownership objectives for that specific "silicon through services" enterprise computing stack.

- **Choose a prime contractor that has the chops to work in both x86 and non-x86 environments.** Our data shows that both mainframe/RISC and x86 consolidators are looking for outside help. The biggest difference is that x86 consolidators rely on a major systems vendor more often than they use an IT consultancy, or they go it alone and rely on their own staff. Your organization needs to choose an IT consultancy that best understands the nature of the workload, the importance of the workload, and how they serve each line of business. Most importantly, the consultancy needs to understand what features, functions, and benefits can be derived from choice of operating system, DBMS, systems software tools, and server design and type. In addition, it is important to know whether the consultancy has a joint selling incentive or shared commission structure with any of the strategic server platform vendors.

WHAT IT MEANS

MAINFRAME AND RISC SERVERS REMAIN STRONG CONSOLIDATION TARGETS

With its lower cost and the introduction of specialty engine processors such as the Integrated Facility for Linux, IBM's System z (the Business Class) is gaining traction as a cost-effective target for the Linux-led applications consolidation projects. Driven by its highly advanced zVM virtualization stack, System z offers a compelling competitive alternative to both IBM POWER6 and HP Integrity (Itanium 2) — in particular, when consolidation requires eliminating the server footprint of hundreds of distributed Linux/x86 machines. It is not uncommon to find production environments running 300-400 Linux instances on a single virtualized System z.

While SPARC systems have to rely on Solaris 10 and zones for application workload consolidation, HP's Integrity and IBM's POWER6 advanced virtualization stacks have the added flexibility of running Linux or Unix applications; at the same time, they have continued their longstanding position as the platforms of choice for running heavy-lifting applications and DBMS on extremely scaleable multicore, midframe alternatives.

The creation of a technology program office or technology infrastructure office reporting directly to the CIO has catalyzed the correct way to properly investigate, audit, and implement IT consolidation efforts, as well as how to eliminate any specific vendor bias, often created through IT stovepiped organizational politics. And an outside IT consultancy, whose advice is not wired to any specific vendor's server platform, was the most popular choice when undertaking an IT consolidation project focused on the mainframe or RISC server enterprise computing customer.

Most often, large global systems consolidation projects played out with highly integrated hybrid system solutions, with a blend of x86-based systems — often in bladed form factors — and their RISC/Itanium systems counterpart. This was particularly true where the best of applications scale out, scale up, and scale within (e.g., using comprehensive virtualization technology) were equally required in the balanced optimization outcome of a comprehensive system consolidation.

ENDNOTES

[1] Most IT shops are either down the path or plan to engage in IT infrastructure consolidation projects in the next year. How are they approaching it? Forrester surveyed 246 IT executives and managers at US enterprises to find of those actively pursuing consolidation projects what motivated the effort, how they measure success, and the types of servers and applications they are consolidating. See the December 28, 2007, "How Large Enterprises Approach IT Infrastructure Consolidation" report.

[2] Although Itanium and Itanium 2 processors are not considered true RISC processors like HP PA-RISC, IBM POWER, and Sun SPARC, for this report we group these processor architectures under the general banner of RISC.

[3] We asked respondents who indicated they plan to consolidate servers to specify which they were focusing on: mainframes, RISC or Itanium servers, Intel/AMD (x86/x64) servers, consolidation to blade servers, operating system instances, or application workloads. For this report, we did not include respondents' plans for blade servers, operating systems, and application workloads. In addition to increasing the number of valid respondents, we felt that application and operating system consolidation is common regardless of the server hardware consolidation target.

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