Intel IT Center

JANUARY 2013

Peer Research

Mission-Critical Workload Migration

Intel's IT Manager Survey on How Organizations Are Approaching Mission-Critical Application Migration

Why You Should Read This Document

This report describes key findings from a survey of 200 IT professionals about mission-critical workload migration. Specifically, this survey covered the migration of mission-critical applications from RISC/UNIX* systems to Intel®-based architecture running Linux* or Windows* operating systems. This guide provides a perspective on what these results mean for the IT industry, and can help you:

- Identify the state of the data center modernization landscape and IT manager plans for the next 18 to 24 months.
- Understand the drivers that are compelling organizations to move forward with mission-critical workload migration.
- Gain insight into challenges that companies experience as they migrate mission-critical workloads to more modern architecture.
- Pinpoint the numerous benefits achievable in moving mission-critical workloads from RISC/UNIX systems to Intel-based architecture.

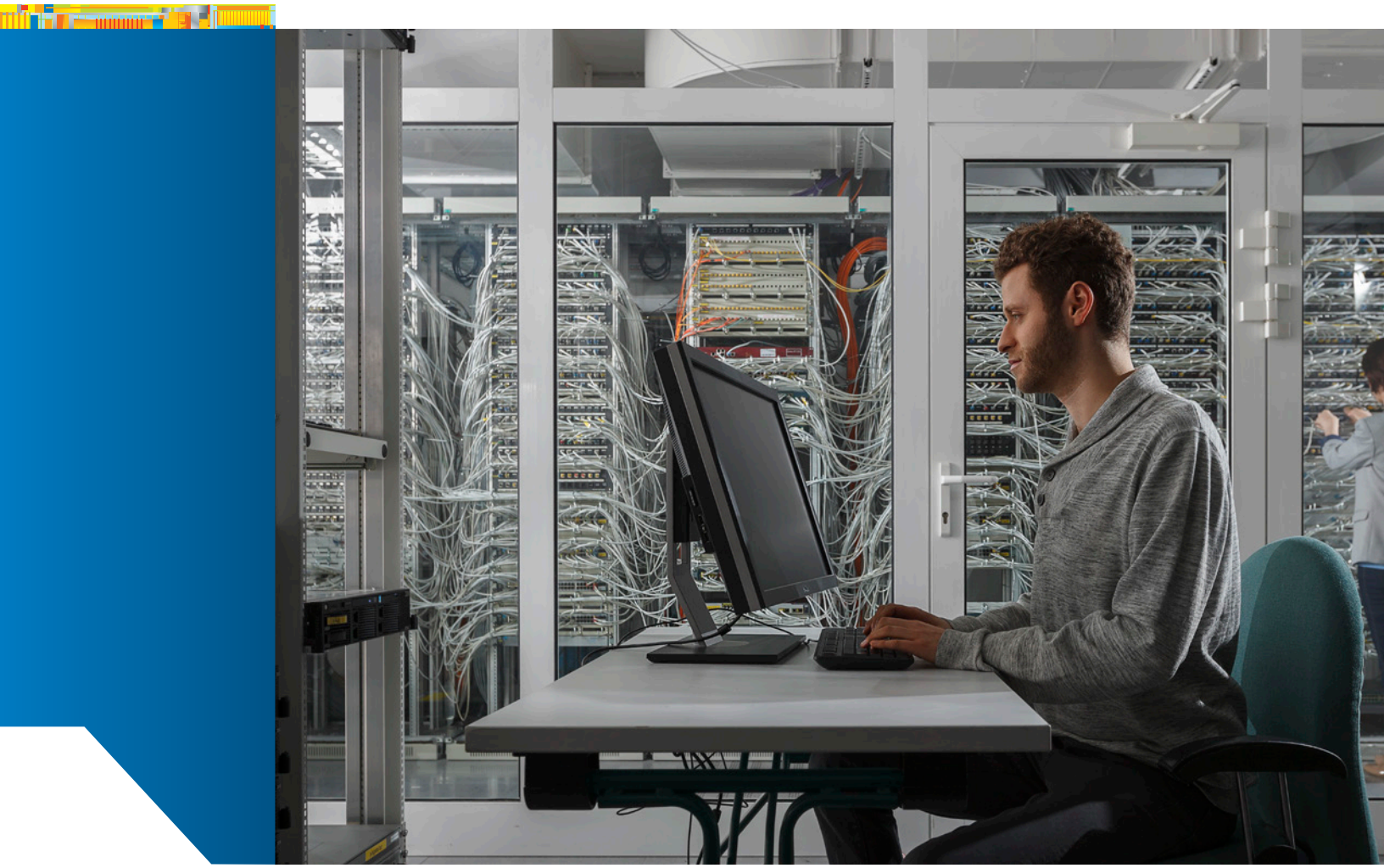
Intel IT Center

JANUARY 2013

Peer Research

Mission-Critical Workload Migration

Intel's IT Manager Survey on How Organizations Are Approaching Mission-Critical Application Migration



Sponsors of Tomorrow.™ intel

Contents

About This Report

In a time when IT is under increasing pressure to do more with less, mission-critical IT is increasingly expected to provide new levels of service, performance, security, and data reliability for their organizations with flat or even declining budgets. If a mission-critical application that represents the bread and butter of the business goes down, it can negatively affect both revenue and the company's reputation. Many of these mission-critical workloads are still housed in proprietary, expensive RISC/UNIX-based systems—platforms that are aging, very expensive to maintain, and increasingly difficult and complex to upgrade.

The aim of this report is to provide benchmark data you can use for your own mission-critical application migration efforts.

As a result, there is significant effort under way to modernize the data center and deploy cutting-edge technology while reducing cost. To keep up with the constantly changing demands of the enterprise and prepare for the future, IT managers are finding significant benefit in migrating their core applications to open-standard Intel® Xeon® processor-based solutions running Linux or Windows operating systems. Specifically, this includes the Intel Xeon processor E7 family of servers—top-of-the-line processors designed to support most data-demanding workloads—as well as the Intel Xeon processor E5 family, and other platforms.

We surveyed 200 IT professionals in large companies to find out how they are approaching their mission-critical migration efforts. We looked to measure the degree of current data center migration to Intel architecture and identify the most commonly used hardware platforms. We wanted to understand the drivers behind the decision to move specific workloads to Intel Xeon processor-based systems, and the greatest benefits (expected or derived) of such a migration. We also wanted to assess the significance of hardware, software, and business challenges faced as part of the migration effort. Finally, we sought to identify the long-term strategic plans that IT professionals identified for their mission-critical workloads.

The results of our survey are detailed in this report. The goal is to provide benchmarking data about how your peers are approaching mission-critical application migration as part of their data center modernization efforts. For more information on data center modernization, or to get advice on these topics from your peers as well as key OEMs and ISVs, visit intel.com/servermigration.

Executive Summary

Today more than ever, IT is an agent of change. And data center modernization is an important step to prepare an organization to take advantage of promising and disruptive new technologies that will provide a competitive advantage, such as big data analytics and cloud technology. To get there, IT managers are finding significant benefit in migrating mission-critical workloads from an expensive, proprietary RISC/UNIX-based infrastructure to open-standard Intel Xeon processor-based systems running Linux or Windows operating systems.

That journey is the focus of this peer research. Our findings pinpoint a number of insights related to mission-critical application migration, including:

- **The cloud is top of mind for the future.** IT is moving to the cloud to respond quickly and inexpensively to the needs of their business-unit partners. In fact, 62 percent of respondents indicated their future mission-critical strategy would include the exploration of cloud technology to reduce their data footprint, increase virtualization, and address scalability.
- **Data center modernization is going strong.** On average, respondents have migrated half of their mission-critical infrastructure from RISC/UNIX systems to Intel Xeon processor-based systems running Linux or Windows operating systems. That move is expected to continue, with more than a third of respondents expecting to fully migrate mission-critical systems to Intel architecture in the next 12 to 24 months.
- **RAS rules.** Users of both Linux and Windows technologies for mission-critical workloads experience a wide array of gains in moving to modern, highly available architecture, topped by increased reliability, scalability, and performance.
- **Big data is a key driver.** The need to support large amounts of data and an increasing number of transactions is the greatest driver in the decision to move specific workloads to more modern architecture.
- **Migration challenges are diverse.** There's a relatively equal distribution of software- (36 percent), hardware- (32 percent), and business-related challenges (32 percent) in migrating systems to Intel architecture. Generally, hardware-related challenges tend to receive more "significant" ratings than average. And the greatest budget-related challenge comes from existing platforms not being fully depreciated (42 percent).
- **Working with business units can be tough.** Over half of respondents say business units are uncomfortable with any change in the environment (54 percent) and that IT has trouble with end-user buy-in and support for training (51 percent).

- *The need to support big data and more transactions is the greatest driver in data center modernization.*
- *Nearly two-thirds of respondents are exploring the cloud as part of their long-term IT strategy.*
- *Respondents have migrated half of their mission-critical infrastructure from RISC/UNIX* systems to Intel® Xeon® processor-based systems running Linux* or Windows* operating systems.*
- *A third of our survey group is expecting to fully migrate systems to Intel architecture in the next 12 to 24 months.*

Where Things Are Going

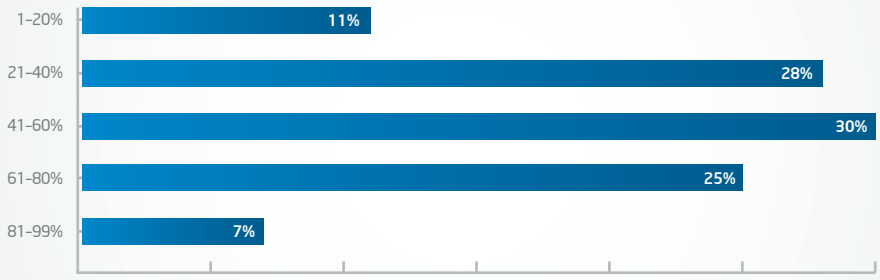
Migration Has Momentum

Data center modernization is going strong. On average, respondents have migrated half of their mission-critical data center infrastructure from RISC/UNIX systems to Intel Xeon processor-based systems running Linux or Windows operating systems.

Interestingly, Intel® Xeon® processor-based systems running Linux or Windows* operating systems account for more than half of the average platform allocations of mission-critical infrastructure.*

% Migrated to Intel® Architecture

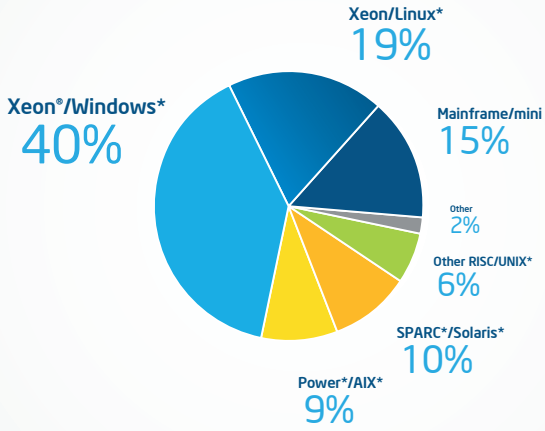
n=200



Q: *In the past five years, what percentage of your company's data center infrastructure has been migrated from RISC/UNIX* systems to Intel®-based architecture running Linux* or Windows* operating systems?*

Average Platform Allocation

n=200



Q: *Of your company's mission-critical infrastructure, what percentage is allocated among each of the following platforms?*

Average Migrated to Intel® Architecture

The breakout by company size is fairly similar, with slightly more mission-critical workload migration completed in medium-sized enterprise companies.

Number of Employees	
Overall	50%
500–999 employees	54%
1,000+ employees	49%

Across key vertical industries, the majority of organizations have migrated more than half of their mission-critical infrastructure.

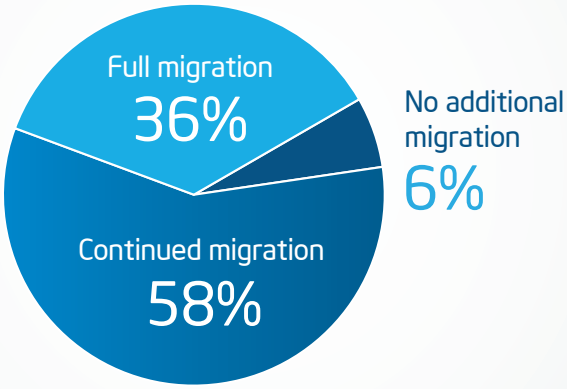
Industry	
Overall	50%
Financial services	43%
Manufacturing	48%
Retail	52%
All others	52%

RISC/UNIX* System Migration Plans

The move to modernize the mission-critical platform is expected to continue, with more than a third of respondents expecting to fully migrate systems to Intel architecture in the next 12 to 24 months.

RISC/UNIX* System Migration Plans

n=200



Q: *Which of the following statements best describes your company's mission-critical environment migration plans over the next 12 to 24 months?*

Drivers in Migrating to Intel® Architecture (IA)

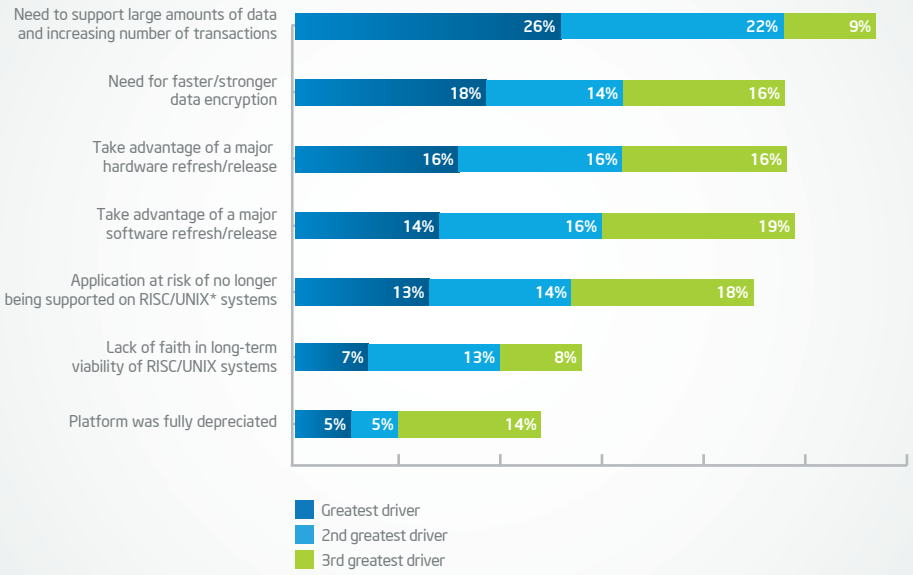
IT managers are continually being challenged to do more with less, and to do it faster. When dollars are allocated to mission-critical solution migration, there is a clear return on this investment. There are also a number of drivers that influence the decision to move forward.

Interestingly, the need to support the exponential growth of data and provide increased data security utilizing industry-standard architecture ranked among the largest drivers. And even as IT managers focus now on managing and securing the large amounts of structured and unstructured data and handling an increasing number of transactions, the sheer magnitude of data growth will undoubtedly keep this effort at the forefront. That's because the digital universe of data is expected to grow to 2.72 zettabytes (ZB) this year and double every two years to reach 8 ZB by 2015[1]. Finding ways to take advantage of the volumes of information generated daily is a key factor in staying competitive.

And when it comes to determining when to migrate mission-critical applications, IT managers are thinking strategically: Taking advantage of major hardware or software releases or refreshes was also selected as a significant driver.

Drivers in Migration Decision

n=200



Q: *Rank the top three drivers in the decision to move specific workloads from RISC systems or other technologies to Intel®-based architecture for mission-critical applications.*

Long-Term Mission-Critical Plans

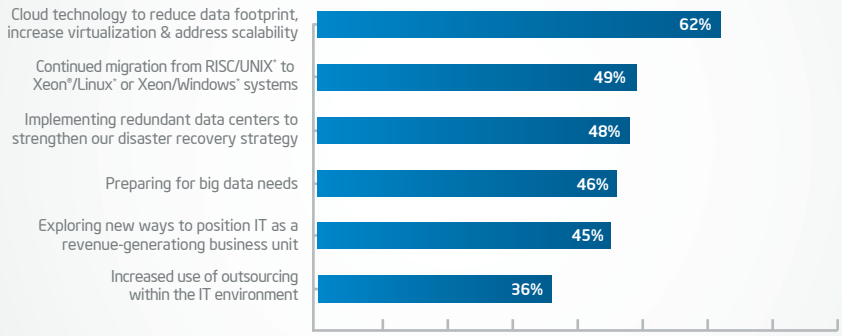
Nearly two-thirds of IT professionals intend to explore the cloud as a way to reduce the data center footprint, increase virtualization, address scalability, and respond to user demands. Additionally, those planning a full migration of servers to Intel Xeon processor-based systems are significantly more likely to mention a strategy that addresses the need to support big data analytics.

Not surprisingly, the need to strengthen disaster recovery rated high as well, with 48 percent of respondents looking to implement redundant data centers as a means to shore up their ability to recover from a significant event. Essentially, IT managers can exploit virtualization and private cloud architectures to help address redundancy without having to acquire duplicates of expensive RISC-based systems to support UNIX-based mission-critical applications.

Another interesting trend: Many IT professionals are looking for ways to turn the IT organization into a revenue-generating profit center. Increasingly, IT professionals are being asked by senior management to look for ways to package their department's services, custom-built applications, and even the data center infrastructure itself to generate incremental revenue and increase their employer's bottom line.

Five-Year Mission-Critical Plan

n=200



Q: *What does your strategy for mission-critical systems look like for the next five years?*

Benefits in Migration to IA

Several benefits have been seen, or are expected, from migrating the company's mission-critical environment to Intel architecture.

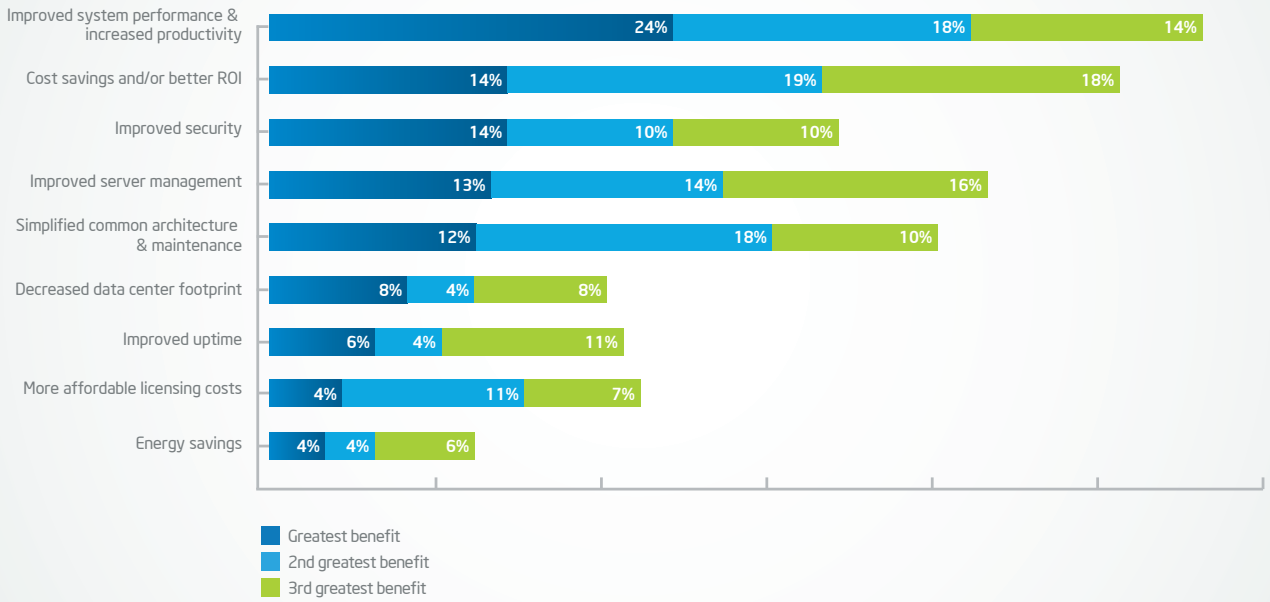
Most notably, improved system performance and increased productivity is rated as the greatest benefit by one-fourth of IT professionals, much more than any other tested benefit. It continues to rank highest when combining the first, second, and third greatest benefits together.

Other notable improvements receiving ratings as the greatest benefit include:

- Cost savings and a better return on investment (14 percent)
- Improved security (14 percent)
- Better server management (13 percent)
- A simplified common architecture (12 percent)

Benefits from Migration to Intel® Architecture

n=200



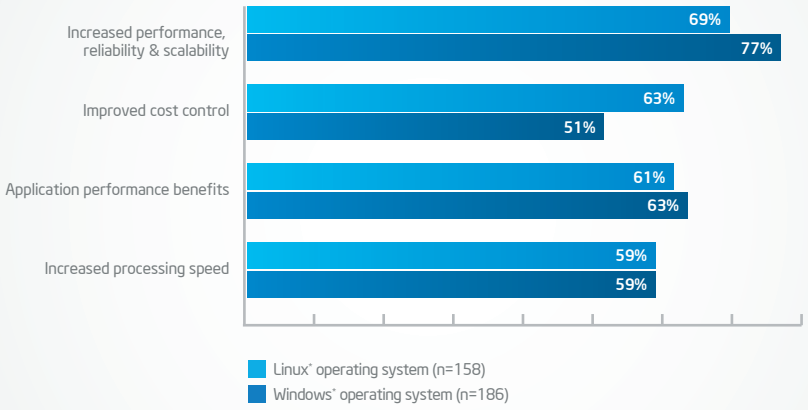
Q: *What benefits have you derived, or do you expect to derive, in migrating your company's mission-critical environment to an Intel®-based architecture?*

Platform-Specific Benefits

Generally, similar gains were experienced regardless of using Linux or Windows operating systems. And companies using Linux operating systems are significantly more likely to mention improved cost control than companies using Windows operating systems.

Smaller companies are seeing gains with higher frequency across either Linux or Windows platforms. Specifically, application performance benefits and increased processing speed are mentioned significantly more often by smaller companies with 500 to 999 employees.

Platform-Specific Benefits



Q: *What gains have you made in using Linux* technology for mission-critical systems?*

Q: *What gains have you made in using Windows* technology for mission-critical systems?*

Migration Challenges

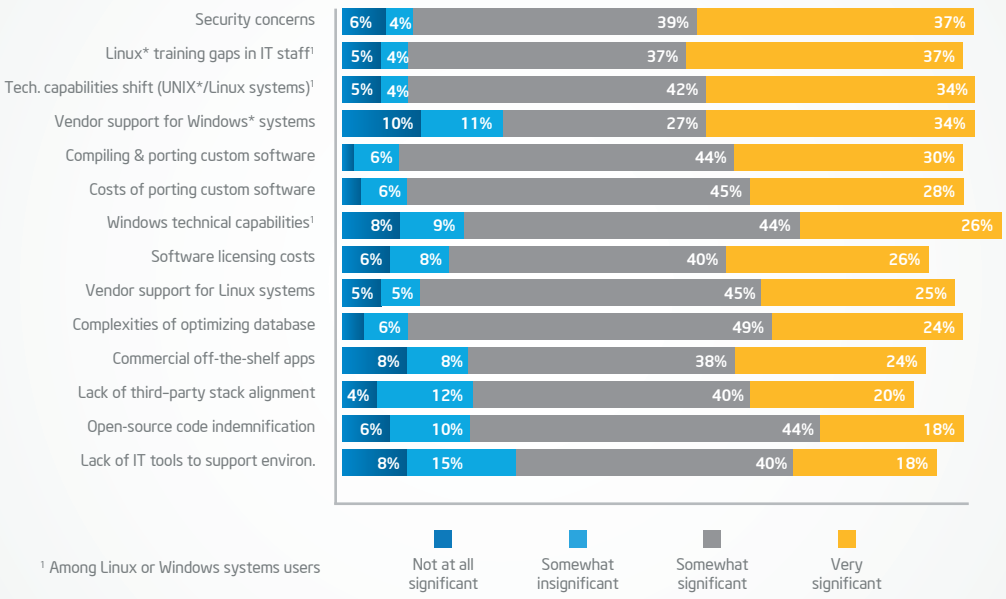
As with any large-scale enterprise-level project, data center modernization includes a range of accompanying challenges. At 36 percent, software challenges ranked only slightly higher than hardware and business challenges, which each weighed in at 32 percent. This remains consistent across vertical industries and company sizes as well.

Software

When asked to rank their software-related challenges, our survey group gave the most "very significant" ratings to security concerns. Just as significant, respondents are concerned about their IT staff's knowledge and training on Linux operating systems. Similarly, the technology capability shift in moving from UNIX systems to Linux systems is a challenge, receiving the same percentage of "very significant" ratings as concerns over the availability of vendor support for Windows operating systems.

Software Migration Challenges

n=200



Q: Please rate the significance of the following software-related items in terms of the gaps or pain points your company discovered as part of the migration process of mission-critical systems to Intel®-based architecture.

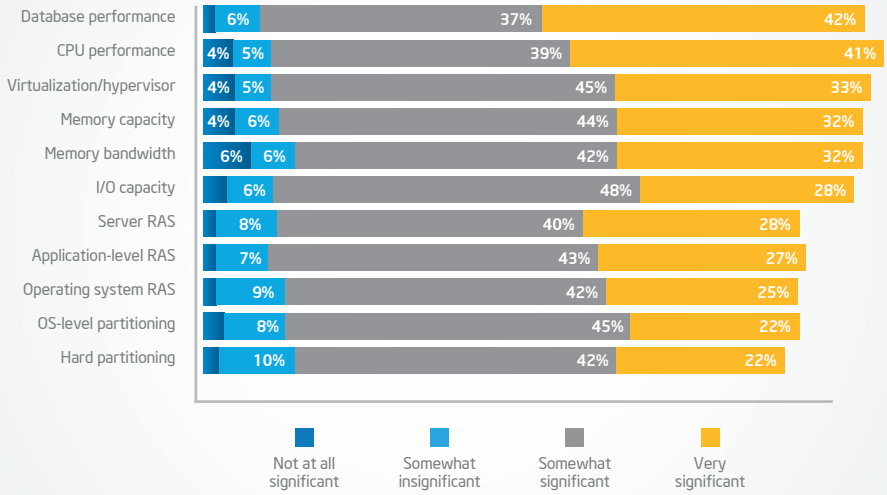
Hardware

When we asked IT managers about their top hardware-related migration challenges, we found that most were rated as at least somewhat significant by two-thirds or more of the respondents. Additionally, no single hardware challenge stood out as more pressing than others.

These challenges also seem to align to the response from IT professionals on page 10 that supporting big data and an increasing number of transactions is a top driver in mission-critical workload migration plans.

Hardware Migration Challenges

n=200



Q: *Please rate the significance of the following hardware-related items in terms of the gaps or pain points your company discovered as part of the migration process of mission-critical systems to Intel®-based architecture.*

It is interesting to note that while database performance (42 percent) and CPU performance (41 percent) received the most "very significant" ratings, improved system performance and increased productivity were also rated as the strongest benefits of migration on page 10. This could suggest that while hardware challenges are perceived to be great challenges during migration, in actuality they do not turn out to cause significant issues. Alternatively, it could be that database and CPU performance receive the greatest focus in the premigration stages to ensure that both the system and application deliver the benefits needed in migrating to the newer platform.

Business

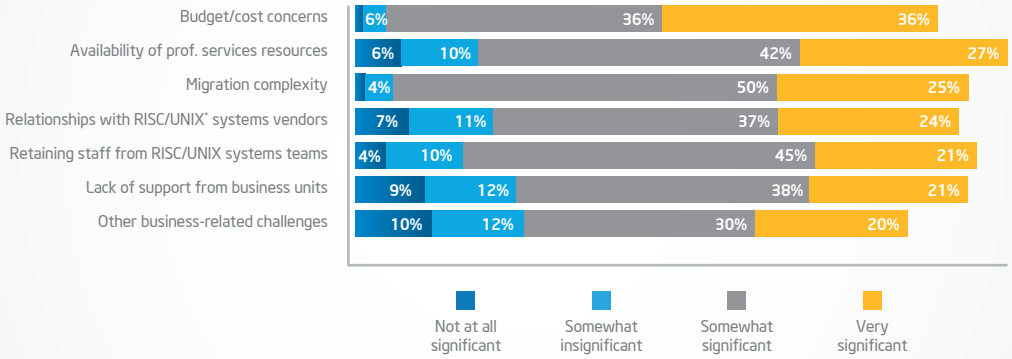
A variety of business challenges are cited as part of mission-critical workload migration, as well. Since IT departments continually grapple with a scarcity of dollars and tight budgets, it's no surprise to find that cost is a leading concern.

Other business challenge findings include:

- Migration complexity rated the highest when combining "somewhat significant" and "very significant" answers.
- The availability of professional services resources is a high-ranking business concern, as are an organization's existing relationships with RISC/UNIX system vendors.

Business Migration Challenges

n=200



Q: *Please rate the significance of the following business-related items in terms of the gaps or pain points your company discovered as part of the migration process of mission-critical systems to Intel®-based architecture.*

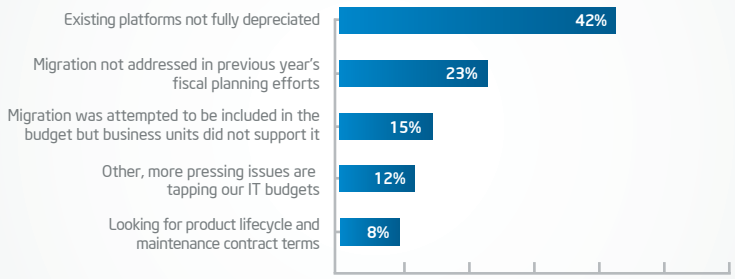
Budget Concerns

Specific Budget Challenges

For those who have experienced budget concerns in the migration, the fact that existing platforms are not fully depreciated from an accounting perspective is by far the most commonly mentioned challenge (42 percent). As might be expected, depreciation schedules do not rank as a significant driver in moving migration forward.

Specific Budget Challenges

n=142



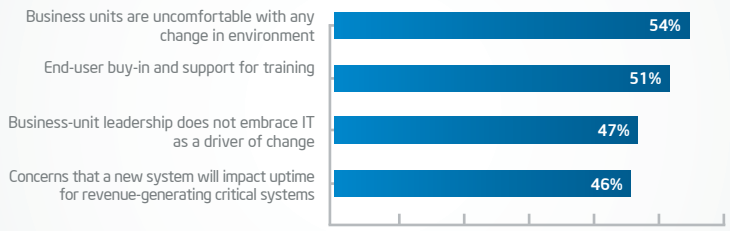
Q: *You mentioned budget and cost concerns as a gap or pain point in the migration process. Specifically, which challenges are you facing as budget and cost concerns are impacting your migration schedule?*

Specific Business-Unit Challenges

Those who have experienced a lack of business-unit support have faced a variety of business challenges. And smaller companies (by both employee size and revenue) are significantly more likely to mention trouble generating end-user buy-in and support for training.

Specific Business-Support Challenges

n=117



Q: *You mentioned a lack of support from business units as a gap or pain point in the migration process. Specifically, which challenges are you facing as a lack of business-unit support is impacting your migration strategy?*

Most and Least Challenging Aspects of Migration

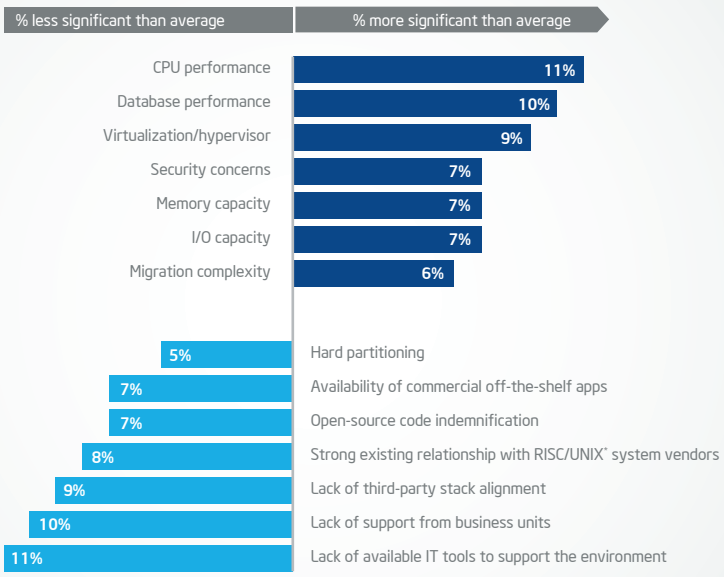
As mentioned on page 10, while performance is one of the strongest benefits achievable in mission-critical application migration, it also represents a leading challenge. Across all three migration categories (hardware, software, and business), the most challenging issues relate to CPU and database performance, virtualization, capacity, and migration complexity.

Again, this could suggest that while hardware challenges are perceived to be great challenges during migration, in actuality they do not turn out to cause significant issues. Alternatively, it could be that database and CPU performance receive the greatest focus in the premigration stages to ensure that both the system and application deliver the benefits needed in migrating to the newer platform.

At the same time, the availability of tools to support the environment and third-party stack alignment are less challenging to our survey respondents. Additionally, lack of support from business units also stacks up as one of the less challenging aspects of the migration effort.

Relatively Most/Least Challenging Migration Issues

% Distance from Average Top Box (4–5) rating



This chart presents the most and least challenging aspects of migration by showing the percentage difference of each attribute's "somewhat significant" or "very significant" rating from the aggregate average top box score.

Conclusions: Making Sense of the Results

Most of our respondents are past the early evaluation stages for migrating their mission-critical workloads from RISC/UNIX systems to open-standard Intel Xeon processor-based solutions running Linux or Windows operating systems, so their experiences go beyond speculation. They are already seeing the tangible benefits of moving their core workloads to standards-based systems—better performance, uptime, and cost savings, just to name a few. In fact, 94 percent of organizations plan to continue with migration-related efforts, and one-third of organizations expect to fully migrate their mission-critical systems in the next 12 to 24 months.

We found that the pressures from managing an increasing number of transactions and securing data across the enterprise are a key driver for modernizing the data center. Not surprisingly, application migration and system modernization can be involved projects for the enterprise, with business, hardware, and software factors contributing equally as project challenges. Still, it's clear that successfully tackling these issues can result in significant benefit to the organization and position IT for success.

Technology advancements within the Intel Xeon processor E7 family now fully support mission-critical uptime and response-time requirements, providing an opportunity for IT managers to adopt a cost-effective strategy to support their mission-critical needs. Migration from RISC/UNIX systems to Intel Xeon processor-based solutions running Linux or Windows operating systems can help businesses improve reliability and uptime, reduce costs, and realize the performance benefits that users require. Our conclusion is that businesses that adopt a cost-effective strategy that offers performance, reliability, availability, and serviceability (RAS) features, and a common compute platform for traditional mission-critical applications, cloud computing, and big data analytics, can position themselves for competitive advantage.

Learn more about how Intel can support your mission-critical workload migration initiatives at intel.com/missioncritical.

Appendix

Methodology and Audience

A total of 200 completed responses to this survey were gathered via online questionnaire between July 27 and August 6, 2012. Maximum quotas were established to ensure a mix of responses across vertical industries. A sample size of 200 has a maximum sampling variability of plus or minus 6.9 percent at the 95 percent confidence level.

Respondents were screened to ensure that they met the following conditions:

- Perform a wide range of IT-related job functions.
- Work in a company of 500 or more employees.
- Work in an organization with a high degree of mission-critical computing needs, such as transaction processing and analytics.
- Have migrated some portion, but not all, of their data center infrastructure from RISC/UNIX systems to Intel-based architecture running Linux or Windows operating systems.
- Work in a U.S. company—the only region targeted for this research.

Respondent Profile Information

Company Size	n=200
500–999 employees	20%
1,000 + employees	80%

Job Role	n=200
Chief information officer	26%
IT director	20%
VP of IT	14%
IT manager	12%
Senior IT manager	9%
Chief technology officer	8%
Manager of IT operations	8%
Owner/president	2%
Other	2%

Responsibilities *(Multiple Mention)*	**n=200**
Evaluating, recommending, or making purchase decisions for hardware and software related to mission-critical computing, including servers, operating systems, and networking	100%
Participating in strategic technology planning and implementation	98%
Leading a team of IT specialists to make detailed recommendations and making decisions to support business initiatives	92%
Working with most senior IT management to set the strategic IT direction for the company	91%
"Hands-on" implementation responsibilities	76%

Reports to: *(Multiple Mention)*	**n=200**
Chief information officer	41%
VP of IT	32%
Chief technology officer	92%
Chief executive officer	3%
Other	2%
None of the above	26%

Annual Revenue	n=200
$500,000–$0.9M	1%
$1M–$3.9M	4%
$4M–$9.9M	4%
$10M–$49.9M	18%
$50M–$99.9M	20%
$100M or more	50%
Unsure	4%

Worldwide Locations	n=200
1 location	8%
2–4 locations	12%
5–9 locations	22%
10–14 locations	27%
15–19 locations	29%
20 or more locations	29%
Unsure	2%

Industry	n=200
Manufacturing	18%
Financial services	15%
Retail	14%
Professional services	11%
Healthcare	10%
Education	6%
Computer-related business/service	4%
Transporation & logistics	4%
Utilities	3%
Telecommunications	3%
Government	2%
Wholesale & distribution	2%
Construction	2%
Other	4%

More from the Intel® IT Center

Peer Research: Mission-Critical Workload Migration is brought to you by the Intel® IT Center, Intel's program for IT professionals. The Intel IT Center is designed to provide straightforward, fluff-free, unbiased information to help IT pros implement strategic projects on their agenda, including virtualization, data center design, cloud, and client and infrastructure security. Visit the Intel IT Center for:

- Planning guides, peer research, and vendor round tables to help you implement key projects
- Real-world case studies that show how your peers have tackled the same challenges you face
- Information on how Intel's own IT organization is implementing cloud, virtualization, security, and other strategic initiatives
- Information on events where you can hear from Intel product experts as well as from Intel's own IT professionals

Learn more at intel.com/ITCenter.

Share with Colleagues

[1] "Google Chief Eric Schmidt on the Data Explosion." I-Global Intelligence for the CIO (August 4, 2010). i-cio.com/features/august-2010/eric-schmidt-exabytes-of-data

0113/RF/ME/PDF-USA 328389-001

Sponsors of Tomorrow.™