



# Cloud Computing

SEPTEMBER 2014

AN EXCLUSIVE SURVEY  
AND RESEARCH REPORT

**COMPUTERWORLD**

Strategic Marketing Services

## Customers Speak: Cloud Needs Guarantees

Platform as a Service goes mainstream;  
enterprises demand mission-critical support

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## CLOUD COMPUTING

Customers Speak: Cloud Needs Guarantees

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# Executive summary

- Driven by needs for agility and cost savings, enterprises are continuing their strong adoption of public and private clouds.
- Commercial Java is the cloud platform leader, due to its wide adoption, standards support and active development community.
- Enterprise usage of private clouds is growing faster than that of the public cloud, due in part to public cloud concerns over legal issues, vendor viability, security and isolation from other customers.
- Application development and testing are among the fastest growing cloud workloads, but respondents are also moving more business-critical apps, such as enterprise resource planning and customer relationship management, to private clouds. Mobile back-end services is one particular area of growth.
- Traditional datacenter requirements, such as performance, service-level guarantees, application lifecycle management and integration, become more, not less, important in the cloud.
- Customers want unified, standards-based platforms for interoperability among public and private clouds and traditional datacenters.
- Enterprise eagerness to migrate to both public and private clouds is strong, yet tempered. Frequently cited concerns include migrating applications with very high performance, availability and security requirements; inability to easily migrate existing application data; lack of ability to manage/monitor or modify existing applications in the cloud; and inability to integrate with non-cloud applications.

# Methodology

To better understand the challenges of cloud deployment in the enterprise today and in the future, Computerworld Strategic Marketing Services and Triangle Publishing Services Co. Inc. conducted a global survey of IT executives in midsize to large enterprise organizations who are familiar with cloud development. The 15-question online survey was distributed via email invitation in spring 2014, and 303 responses were received. In addition, leading adopters of cloud technology, integrators and consultants were interviewed to provide context and examples of the trends identified in the survey.

In the questionnaire, IT executives were defined as executive IT management, including CIO, CTO, senior vice president or vice president; director or manager of IT; and senior IT professional. The size of companies ranged from \$251 million in revenue to more than \$10 billion in revenue. The survey findings highlight the technological factors most critical to success, as well as where cloud initiatives can provide the greatest business benefits, both now and in the future.

The results have a margin of error of plus or minus 5.5 percent. In this report, we only highlight data with clear statistical significance—that is, differences of 6 percentage points or more.

The objectives of the program were to:

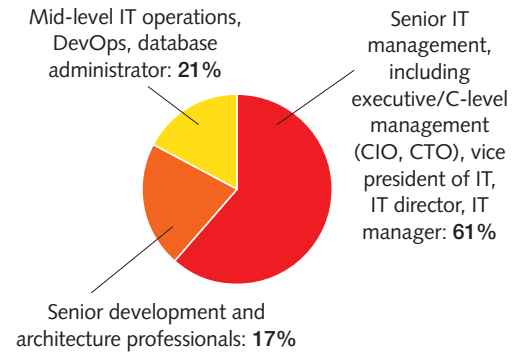
- Understand the current state of cloud adoption in the marketplace, the reasons behind it and how the market is evolving.
- Gain insights into the key challenges in using public and private cloud technologies.
- Identify which capabilities users regard as most critical in cloud platforms and service providers, now and in the future.
- Prioritize user requirements for cloud platforms in areas such as performance, management, interoperability and migration.

Computerworld Strategic Marketing Services and Triangle Publishing Services provided support in the development of the survey questionnaire, in addition to conducting the qualitative interviews and writing, editing and producing this report. Computerworld Strategic Marketing Services, Triangle Publishing Services and the author of this report, Robert L. Scheier, are grateful to everyone who provided their time and insights for this project.

## CLOUD COMPUTING

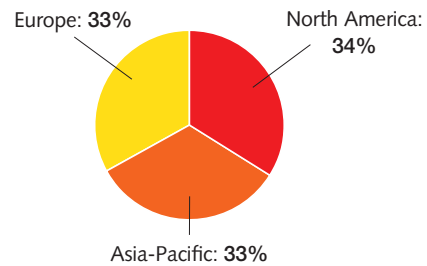
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### Respondents by IT Title\*

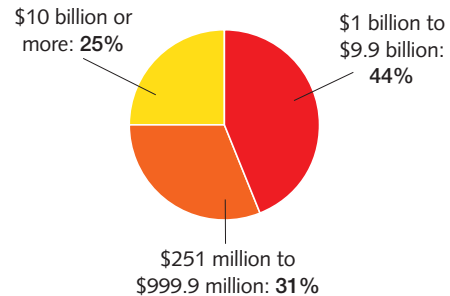


\*Total does not equal 100 percent due to rounding

### Respondents by Region



### Respondents by Company Global Annual Sales Revenue



Base: Survey of 303 executives at midsize and large enterprise organizations worldwide  
Source: Computerworld Strategic Marketing Services, February-March 2014 Cloud Survey

## CLOUD COMPUTING

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### INTRODUCTION

With benefits from “the cloud” now widely recognized by business and IT professionals alike, it’s hardly surprising that enterprises are moving more of their applications to this environment. But according to the results of a new IT executive survey from Computerworld Strategic Marketing Services and Triangle Publishing Services, some of their top reasons for doing so are less readily apparent than the more obvious ones covered by the mass media.

Along with strong interest in cloud is a healthy dose of caution. For example, 67 percent of survey respondents cite legal or regulatory requirements as their top public cloud challenges. Meanwhile, moving existing applications with very high requirements for performance, availability and security to even private clouds concerns 78 percent of respondents. Doubts linger, as well, over whether the cloud is ready to support mission-critical applications; can integrate properly with applications, data and services within internal datacenters; and can be easily managed with existing tools.

In the quest to retain control over their applications and data, enterprises in the next two years plan to move more workloads to private clouds managed internally than to those managed by private cloud service providers or the public cloud. In addition, deployment of core business applications, such as enterprise resource planning (ERP), customer relationship management (CRM), and human capital management (HCM), in the private cloud is expected to grow from 41 percent today to 50 percent in two years.

Even as enterprises shift more workloads to the cloud, they are moving cautiously. Up first is making certain their cloud infrastructure can support mission-critical business needs for performance, scalability, reliability, manageability and integration. Only then will the transition to cloud rapidly accelerate.

For example, the potential of the cloud to save money is well known, so the 87 percent of respondents ranking lower capital expenditures as important is to be expected (see Figure 1, “The Promise of Enterprise Cloud,” above). However, respondents also rank just as high, or higher, their desires to use the cloud to modernize operations and better compete in global markets. Along these lines, a large majority cite their desire to achieve greater business agility and move toward more rapid implementation of new business models.

### The Promise of Enterprise Cloud

How important are the following perceived benefits of cloud computing in your organization? (% responding either “very important” or “somewhat important”)

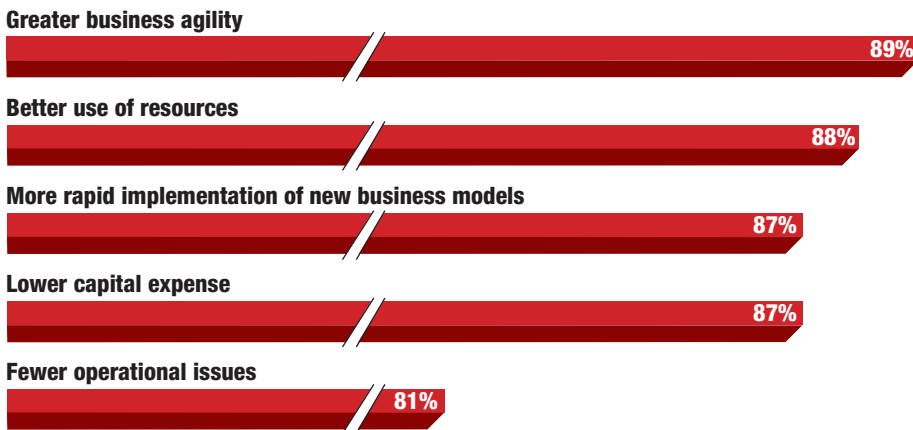


FIGURE 1 Base: Survey of 303 executives at midsize and large enterprise organizations worldwide  
Source: Computerworld Strategic Marketing Services, February-March 2014 Cloud Survey

## CLOUD COMPUTING

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### Private Cloud Grows Faster Than Public Cloud

What percentage of your organization's computing workloads is/will be running on each environment, both today and two years from now?

■ Using today ■ Using in 2 years

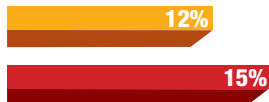
#### Non-cloud/on-premises



#### Private cloud



#### Public cloud



**FIGURE 2** Base: Survey of 303 executives at midsize and large enterprise organizations worldwide  
Source: Computerworld Strategic Marketing Services, February-March 2014 Cloud Survey

### CLOUD, BUT PRIVATE CLOUD

According to the survey, the use of private clouds is growing faster among respondents than the multitenant public cloud, where more than one customer shares the same server, storage and networking hardware. This is driven by respondents' concerns about issues such as legal compliance, security, isolation and risk if a cloud provider goes out of business. In two years, respondents expect to have 47 percent of their workloads running in a private cloud. That compares to just 15 percent expecting to run them in a pure public cloud environment (see Figure 2, "Private Cloud Grows Faster Than Public Cloud," above).

Another factor driving the continued popularity of the private cloud is its growing ecosystem of tools and best practices optimized for the more demanding applications enterprises choose to run on the private cloud.

Of the three most common cloud models, software as a service (SaaS, where a complete application is provided over the Web) is the most established among respondents in terms of running current workloads. However, platform as a service (PaaS, where the vendor provides components such as operating systems and development platforms) shows the highest growth in two years. The growth trajectory for PaaS also slightly surpasses infrastructure as a service (IaaS, where customers "rent" resources over the Web but supply their own software and management tools).

Frank Munz, the founder of munz & more, a consulting firm based in Germany focused on service-oriented architectures and cloud computing, believes PaaS will become more popular than IaaS because it's less expensive over the long run to operate. With IaaS, the customer requires a skilled staff who "still has to do administration," he says. "And you still need somebody who understands how to apply security patches and how to administer both legacy systems and the cloud."

As expected, respondents predict a big drop in on-premises/non-cloud use in two years. The United States is the region (at 64 percent of respondents) with the highest on-premises computing workload in use today, while the Asia-Pacific region has the highest percentage (17 percent) of public cloud usage. Enterprises in Europe and those with more than \$10 billion in sales plan to move the lowest share of their workloads to the public cloud.

Munz says many Europeans are skeptical, due in part to the prevalence of conservative industries such as financial services. "The cloud changes many processes, such as software development," he says. "Those traditional areas, like banking, are the last ones who want such changes."

## CLOUD COMPUTING

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### THE JAVA EDGE

Commercial Java-based tools are the cloud platform of choice, both now and in two years. Respondents say 66 percent of their cloud workloads have been developed for, or deployed on, Java platforms today, versus 19 percent on .NET and 13 percent on scripting languages (see Figure 3, “Java: The Leading Choice for Cloud,” at right).

“Java is so pervasive as a development platform that having it available in the cloud is a natural requirement,” says Jeff Kaplan, managing director of consulting firm THINKstrategies. Having developed Java skills and resources for their internal IT staffs, he says, organizations want to also leverage them in the cloud.

### TOP CLOUD USE CASES

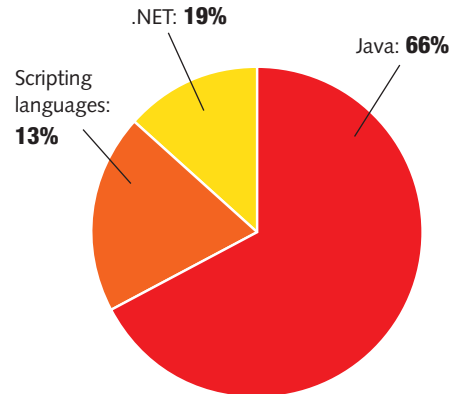
Application development and testing has long been one of the most popular uses of the private cloud. And it's still one of the fastest growing, rising from 39 percent of respondents today to 52 percent in two years (see Figure 4, “Fastest Growing Business Services in the Cloud” on page 8). This continued popularity may also reflect the moves of many organizations to “DevOps,” a software development method that combines development and operations functions to bring new applications to market more quickly.

The next most popular private cloud workloads are more mainstream. These include core business applications (rising from 41 percent to 50 percent); high-performance computing, such as analytics (rising from 38 percent to 47 percent); and data storage and retrieval (rising from 46 percent to 54 percent).

“There are still classes of highly sensitive workloads that aren't in the cloud. But by and large, nearly every business application is mainstream in the cloud right now.”

—CARL BROOKS, RESEARCH ANALYST,  
451 RESEARCH

**Java: The Leading Choice for Cloud**  
What percentage of your organization's cloud workloads have been developed for, or deployed on, the following platforms?



**FIGURE 3** Base: Survey of 303 executives at midsize and large enterprise organizations worldwide  
Source: Computerworld Strategic Marketing Services, February-March 2014 Cloud Survey

“The majority of enterprises we survey already have business-critical apps in the cloud and, what's more, most of the money spent on cloud services is directly tied to sales and business operations,” says Carl Brooks, a research analyst at 451 Research. “There are still classes of highly sensitive workloads that aren't in the cloud. But by and large, nearly every business application is mainstream in the cloud right now.” Back-end systems for mobile app development are expected to grow from 39 percent to 44 percent for the private cloud, taking advantage of its ability to rapidly scale to help deliver such applications quickly. Meanwhile, back-end systems relating to mobile app development will grow even faster in the public cloud, increasing from 39 percent today to 48 percent in two years.

Deployment of online transaction processing applications—long considered some of the most sensitive and business-critical—is expected to remain steady in the public cloud, at 36 percent of respondents, but rise in the private cloud, from 38 percent of respondents to 44 percent.



## CLOUD COMPUTING

Customers Speak: Cloud Needs Guarantees

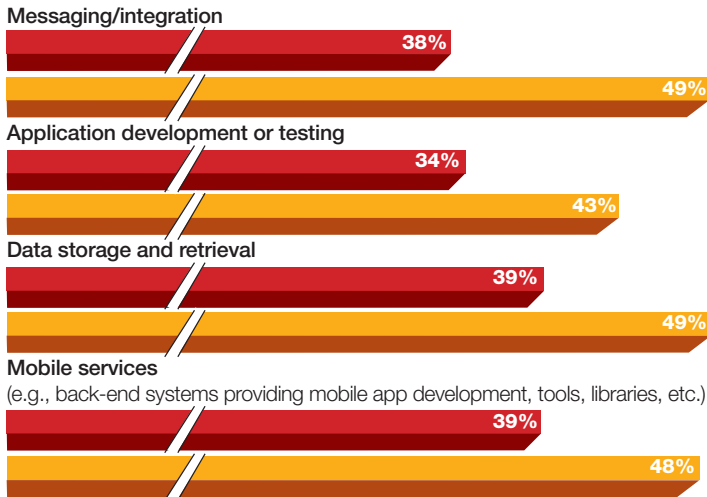
### Fastest Growing Business Services in the Cloud

■ Using today ■ Using in 2 years

#### Public Cloud

Please indicate which of the following business services are supplied to your organization via public cloud today and which you expect will be supplied via a public cloud in two years.

(% responding)



#### Private Cloud

Please indicate which of the following business services are supplied to your organization via private cloud today and which you expect will be supplied via a private cloud in two years.

(% responding)

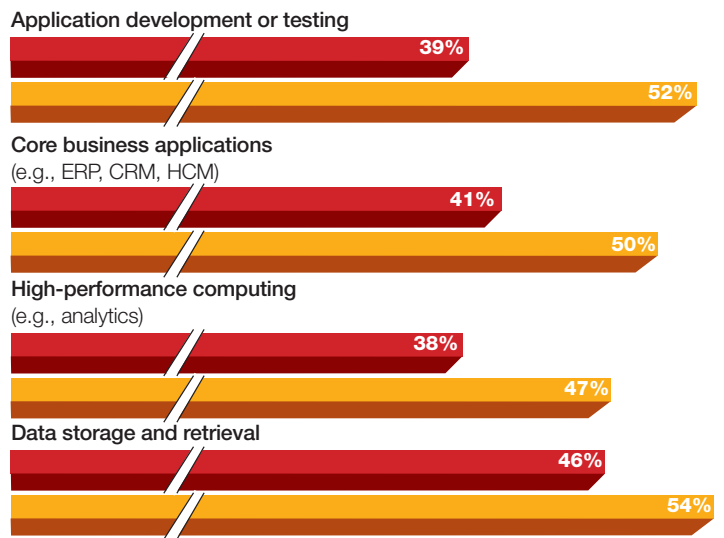


FIGURE 4 Base: Survey of 303 executives at midsize and large enterprise organizations worldwide Source: Computerworld Strategic Marketing Services, February-March 2014 Cloud Survey

The Asia-Pacific region is the most enthusiastic about using the private cloud for development and testing, with 62 percent of respondents planning such deployments in two years, compared to an average of 52 percent overall. India reports the highest percentage of application development in the cloud today, ranging between 55 percent and 60 percent for both public and private clouds.

#### NEEDED FOR PUBLIC AND PRIVATE PAAS: TRADITIONAL DATACENTER CAPABILITIES

With its Web-based promise of infinitely expandable, “pay as you go” service, the cloud is often portrayed as revolutionary technology. But many survey respondents want the same capabilities from cloud as from their existing in-house datacenters.

For example, complete isolation from other tenants ranks highest in importance to 83 percent of respondents when asked about a public cloud PaaS infrastructure (see Figure 5, “Top Cloud Requirements in Public and Private PaaS,” on page 9). Such isolation is most important (at 90 percent) to larger companies (\$10 billion or more in sales) compared to an average of 83 percent for all respondents. This would be expected, given the demanding workloads in enterprises and their greater sensitivity to compliance and security issues. The requirement for isolation again helps explain the greater popularity of private clouds versus public clouds among respondents.

Also ranking among the top three requirements in a public PaaS environment are service-level guarantees and access control in the form of integrated identity management. This level of importance is likely a reflection of the “hybrid” cloud strategies many organizations follow as they move some applications to public and private



## CLOUD COMPUTING

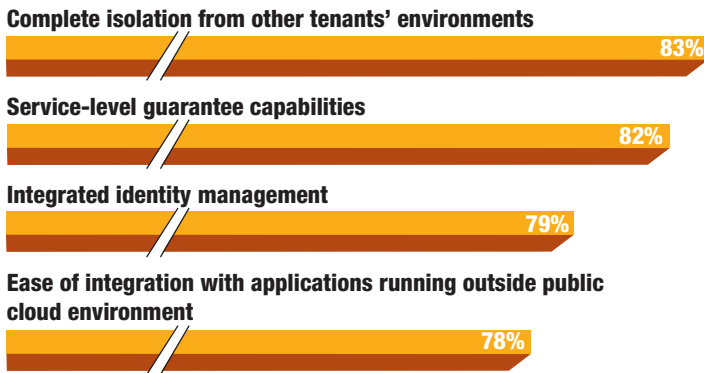
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### Top Cloud Requirements in Public and Private PaaS

#### Public Cloud PaaS

Considering your platform as a service usage, please rate the importance of each of the following capabilities to your IT organization in a public cloud PaaS environment.

(% responding either “very important” or “somewhat important”)



#### Private Cloud PaaS

Considering your current or planned private cloud usage, how important are/would be the following capabilities to your company when choosing a private cloud application environment based on the PaaS model?

(% responding either “very important” or “somewhat important”)

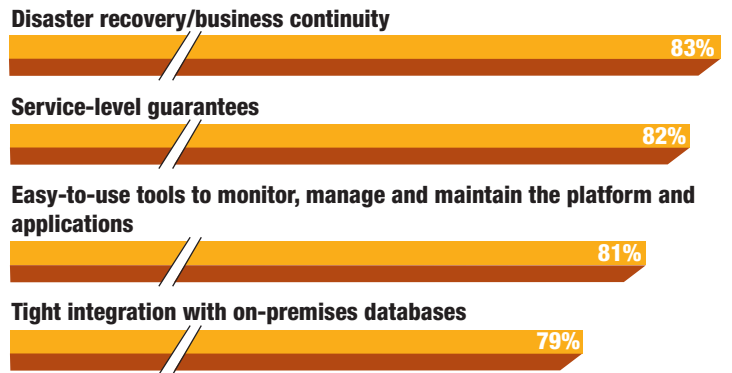


FIGURE 5 Base: Survey of 303 executives at midsize and large enterprise organizations worldwide Source: Computerworld Strategic Marketing Services, February-March 2014 Cloud Survey

clouds, while keeping their most sensitive (or difficult to move) software in legacy datacenters.

Despite the growing popularity of cloud, most respondents using or planning to use private cloud PaaS infrastructure (79 percent) want integration with applications still housed in the datacenter. Ranking close behind, at 78 percent in terms of importance, is elasticity—the ability of the cloud to scale up or down quickly, so that resource availability is kept in sync with demand.

Data caching—storing frequently used data close to applications running in the cloud—is also important to respondents as a way to meet application performance and availability requirements while reducing costs in their private cloud PaaS infrastructures.

The most frequently cited benefit of data caching (81 percent of respondents) is to enable highly available, real-time access to data by reducing the latency caused when data is not stored in the same

cloud as an application. This was followed very closely by eliminating the need to move data in and out of the cloud (80 percent of respondents), which reduces not only latency but network costs.

#### SOLVING THE INTEROPERABILITY PUZZLE

Achieving unified, standards-based interoperability among public and private clouds—as well as traditional datacenters—is important for 80 percent of survey respondents (see Figure 6, “Wanted: Standards, Integration and Application Portability,” on page 10). This includes the ability to use the same standards and code base to deploy applications on either public or private clouds without the cost and delay of rewriting or retesting those applications.

Respondents place great importance on the integration of business processes and data, ranking it nearly equal to standards-based interoperability. This is notable because, once achieved, business process and data integration enables business users to get the same flexibility, scalability and reduced cost benefits from the cloud that IT managers enjoy in today's increasingly hybrid environments.

## CLOUD COMPUTING

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### Wanted: Standards, Integration and Application Portability

Considering current or planned usage, please rate the importance of the following interoperability capabilities as you deploy applications and data across public and private clouds. (% responding either “very important” or “somewhat important”)

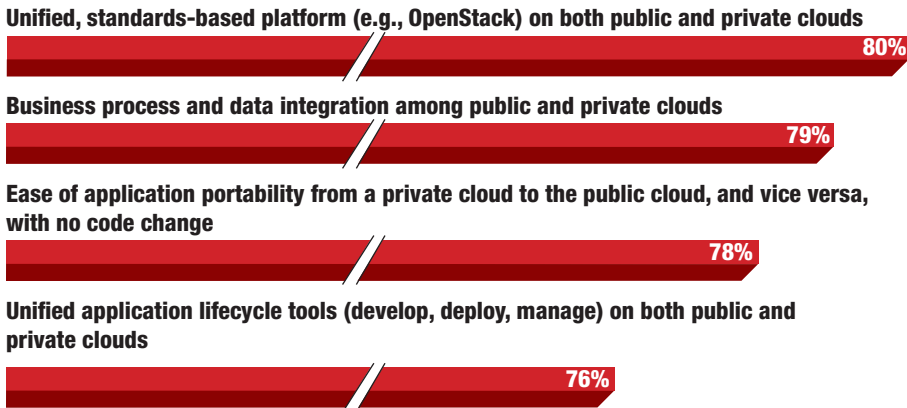


FIGURE 6 Base: Survey of 303 executives at midsize and large enterprise organizations worldwide  
Source: Computerworld Strategic Marketing Services, February-March 2014 Cloud Survey

Another common interoperability objective, being able to easily migrate data and applications between public and private clouds, is important for a sizable majority (78 percent) of respondents. This is no surprise, given the concerns that many enterprises have about relying on cloud providers for essential business services. If a cloud provider cuts off service because it goes bankrupt or believes a customer hasn't paid their bill or has broken the law, “you should have something that allows you to manage and deploy your software on another cloud provider,” says consultant Munz, adding that many of today's management tools require the writing of scripts that add to the cost and delay of such rehosting.

### CONCERNS AND CONSIDERATIONS FOR MIGRATING EXISTING APPLICATIONS TO CLOUD

With all the enthusiasm around public and private clouds, respondents are fully aware of areas of caution about migrating both applications and data to the cloud.

The most important, cited by 78 percent for private cloud users and 76 percent for public cloud users, is migrating high-performance applications—or those with stringent security requirements—to either type of cloud. Nearly three-quarters of respondents also say they lack confidence that even a private cloud can support mission-critical applications (see Figure 7, “Factors Influencing Decision to Migrate Existing Applications to Cloud,” on page 11). Many respondents say that the inability to easily migrate existing application data would greatly influence any decision to move to a private cloud.

When asked about the public cloud, respondents' major concerns include legal or regulatory requirements (67 percent), security and isolation from other customers (66 percent) and vendor viability (61 percent). Other areas of unease involve issues such as vendor lock-in, integration costs and delays, and lack of reliable usage metrics.

IT consultant Kaplan, for one, believes these concerns will diminish over time. “Public cloud services have proven to be sufficiently secure and scalable, as well as economical,” he says. “The fact is, though, that there are a number of instances where the private cloud alternative is viewed as preferable because organizations want to set their own standards for security, performance, reliability and control.”

He argues that the difference between public and private clouds is less than it often seems—and that the quality of skills and processes a customer brings to their IT management is more important than their choice of public vs. private cloud.

Because either option “can provide you a sufficient amount of control,” Kaplan says, “the next question then becomes, can the service provider live up to their commitments, and can you, as a customer, properly manage those resources to get the control and other attributes you're looking for?”

## CLOUD COMPUTING

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### Factors Influencing Decision to Migrate Existing Applications to Cloud

#### Public Cloud

Considering your current or planned public cloud usage, please rate the level of influence that each of the following factors would have in decisions to migrate your existing applications to a public cloud platform. (% responding either “very important” or “somewhat important”)

**Unwilling to undertake the risks of migrating applications with very high performance, availability and security requirements**

76%

**Lack of ability to easily migrate existing application data**

75%

**Not enough confidence that cloud can support mission-critical applications**

74%

**Lack of existing tools to easily deploy existing applications in the cloud**

73%

#### Private Cloud

Considering your current or planned private cloud usage, please rate the level of influence that each of the following factors would have in decisions to migrate your existing applications to a private cloud platform. (% responding either “very important” or “somewhat important”)

**Unwilling to undertake the risks of migrating applications with very high performance, availability and security requirements**

78%

**Lack of ability to easily migrate existing application data**

77%

**Not enough confidence that cloud can support mission-critical applications**

76%

**Lack of existing tools to easily deploy existing applications in the cloud**

73%

FIGURE 7 Base: Survey of 303 executives at midsize and large enterprise organizations worldwide Source: Computerworld Strategic Marketing Services, February-March 2014 Cloud Survey

### TO THE CLOUD, WITH CAUTION

As the survey results show, IT managers understand the differences among the multiple types of cloud and they target different applications and workloads to each. But as they look to the future, the survey confirms these managers will be relying on standards-based platforms such as commercial Java and looking for better cross-cloud management, integration with internal and external databases, and support for traditional datacenter disciplines such as performance guarantees, predictable scalability, out-of-the-box integration and lifecycle management.

As these capabilities continue to evolve, enterprises will increasingly be able to create “hybrid” clouds that can include any type of cloud, as well as traditional internal datacenters. Organizations could then, ideally, move applications and data to any flavor of cloud that offers the best price, performance and security at any given time.

That would deliver the ideal world survey respondents want: The agility and cost savings of the cloud, without sacrificing the performance, reliability or security that well-run datacenters have come to symbolize. ■

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**ORACLE PLATFORM AS A SERVICE (PaaS)** enables enterprise IT and independent software developers to rapidly build and deploy scalable enterprise applications in the cloud. Built on the industry's #1 application server and database, Oracle PaaS delivers a complete portfolio of standards-based platform services that helps IT operations reduce complexity and overhead. It also helps developers increase productivity and accelerate the pace of innovation. Oracle PaaS enables businesses to develop and deploy applications faster and easier than with traditional application platforms. These services include the Oracle Database Cloud, Oracle Java Cloud, Oracle Developer Cloud, Oracle Business Intelligence Cloud, Oracle Documents Cloud, Oracle Mobile Cloud and Oracle Integration Cloud.

**Built on the industry's #1 application server and database, Oracle PaaS delivers a complete portfolio of standards-based platform services that helps IT operations reduce complexity and overhead. It also helps developers increase productivity and accelerate the pace of innovation.**

Gain unparalleled control and flexibility with the interoperability between Oracle's Public and Private PaaS offerings. The same enterprise-grade platform that drives Oracle PaaS in a public cloud can also be used by businesses to build their own private PaaS. Oracle's private PaaS solution delivers best-in-class performance, scalability and reliability with full control and visibility to an on-premises solution. The solution includes the Oracle Database, Oracle WebLogic Server, Oracle Enterprise Manager, Oracle Business Intelligence, Oracle WebCenter, Oracle BPM and Oracle Service Bus. Because these solutions are all based on industry standards, including Java, SQL, HTML5 and the Web, businesses can migrate applications transparently between a public cloud and on-premises with zero code changes.

Maximize productivity with instant access to cloud environments that support Java applications, complete with database access, integration with upper stack products, development and management tools, integrated security and more. Oracle WebLogic Server, the industry's #1 platform to develop and deploy cloud applications, is the primary technology powering Oracle Java Cloud Service. Providing the robustness and power of WebLogic in the public cloud, Oracle Java Cloud Service enables businesses to reap all the benefits of PaaS, including subscription-based, self-service access to reliable, scalable and elastic cloud environments. What's more, businesses can move their applications seamlessly between Oracle Public PaaS and Oracle Private PaaS.

Realize the full benefits of private cloud PaaS with the #1 market-leading Oracle Database. Oracle Database simplifies database consolidation with an innovative multitenant architecture, making it easy to standardize database services in the cloud. In addition, Oracle Database increases flexibility and availability with robust capabilities like Oracle Real Application Clusters. Oracle Database Cloud Service, as offered in Oracle's public cloud services portfolio, provides flexibility and the ability to choose between a dedicated database instance with full administrative control and a dedicated schema with a complete development and deployment platform managed by Oracle. Oracle Database Cloud Service enables businesses to reap all the benefits of the cloud, including subscription-based, self-service access to reliable, scalable and elastic cloud environments.

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For more information about Oracle's PaaS offerings, visit: [www.oracle.com/cloud/paas.html](http://www.oracle.com/cloud/paas.html)

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