

## WHITE PAPER

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### Linux Adoption in a Global Recession

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#### IDC OPINION

Economic downturns have a tendency to accelerate emerging technologies, boost the adoption of effective solutions, and punish solutions that are not cost competitive or that are out of synch with industry trends. IDC research finds that Linux users are clearly satisfied about their choice to deploy Linux, and during trying economic times, the potential for those same customers to ramp up their deployment of Linux is strong. Highlights of our research include:

- ☒ Given the severity of the current economic downturn and the potential for a lengthy and gradual recovery that will likely be measured in terms of years rather than months, Linux is in a desirable competitive position to emerge from this downturn as a stronger solution with a key position in the industry.
- ☒ A worldwide survey by IDC capturing data on usage plans for and satisfaction levels with Linux server operating systems finds that Linux customers are highly satisfied and are ready to deploy additional Linux instances as a direct action in response to budget concerns or budgetary reductions being imposed by corporate management. While budget concerns sweep across all geographies and business verticals, North American businesses are among the most pessimistic when it comes to increased IT spending or even spending at prior-year levels.
- ☒ Linux distributions are entering a new phase of maturity today, with a second generation of major releases based on the 2.6.x Linux kernel emerging from the industry's top vendors. These products feature more mature management tools, integrated virtualization, and virtualization-compatible use rights, and today they also boast a larger application portfolio and better interoperability with other mainstream corporate IT solutions.
- ☒ While Linux client operating systems have been the shining hope of opportunity for Linux for much of the past decade, Linux has failed to successfully capture a substantial share of traditional client deployments. However, the emergence of small portable form factors (commonly referred to as netbooks), the growing catalog of Web-based applications, the shift of growth opportunities away from mature markets to emerging geographies, OEMs increasingly preloading Linux on devices, and the continued antipiracy efforts by Microsoft help create a more favorable climate for Linux.
- ☒ Linux has enjoyed significant commercial success on server platforms, and today it is aptly categorized as the most widely available server operating system the industry has ever seen, with availability aboard every major architecture. Linux is also the operating system of choice for many cloud providers and ISVs delivering software appliances today.

## METHODOLOGY

For this research project, IDC surveyed 330 organizations in the following regions:

- ☒ Western Europe — 78
- ☒ Americas — 118
- ☒ Asia/Pacific — 134

The 330 respondents were segmented by the following industries:

- ☒ Manufacturing — 90
- ☒ Financial services — 80
- ☒ Retail — 80
- ☒ Government — 54
- ☒ Other — 26

Participating organizations had to have more than 100 employees; the survey was looking primarily for IT decision makers familiar with Linux usage and adoption plans. Among the survey participants, 55% had Linux server operating systems in use, 39% had Unix server operating systems in use, and 97% had Windows server operating systems in use. Typical respondents had titles such as CIO, VP IT, IT Director, IT Manager, IT Staff, and IT Consultant. Respondents were prescreened via demographics screeners and completed the survey online. Novell was not involved in recruiting, and respondents did not need to be Novell customers.

## IN THIS WHITE PAPER

This IDC White Paper presents the results of an IDC survey that measures the receptiveness to Linux and takes into consideration changing views driven by the disruptive economic environment that businesses face today.

## SITUATION OVERVIEW

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### **The Impact of the Economy on Linux**

Linux has been a commercially viable solution for much of the past decade and has battled its way into the number 2 position in the industry on the basis of units deployed on an annual basis. In the process, Linux has passed Unix server operating environments and today presents an alternative solution that has been adopted not only by Unix shops that are expanding their server mix or are migrating to the x86 architecture but also by Windows shops that have a need for the workloads that are supported by Linux.

Linux arguably became viable in a commercially supported format in the late 1990s and saw growing corporate adoption that started in that era; it has continued to ramp ever since. The timing of Linux's emergence as a mainstream solution was fortuitous,

as the product was able to ride the tail end of the year 2000 date change investments and parallel the dot-com boom.

The subsequent recession caused in part by the dot-com bust led to a retrenchment on the part of many organizations, and part of that retrenchment included a shift to favor more standardized architectures, including the x86 server platform, and x86-compatible operating systems such as Linux.

IDC has found that economic downturns lead to a reduction in spending, but not necessarily an equal-sized reduction in deployments. In fact, past recessions have helped to accelerate platform shifts that were in progress. During the 2001–2002 recession, the industry saw a shift away from RISC-based Unix servers and toward x86 server architectures. Linux was a beneficiary of that transition, and that downturn set the stage for the sustained growth of Linux server operating system deployments during much of the current decade.

The current economic crisis is likely to help nudge that adoption forward once again, given the low-cost nature of Linux and the accompanying availability of no-cost Linux solutions. We believe the current economic crisis will also have a net positive impact on the use of virtualization software, which will end up hosting more guest operating systems, including Linux server operating systems.

As was the case in the 2001–2002 time period, we believe that other related factors will also help impact the adoption and deployment of Linux through the course of this economic recovery. First, the increase in the availability of and the interest in ultra-low-cost servers places downward pressure on traditional operating environment solutions. This trend is not all positive for Linux server operating system vendors; in fact, it may lead to an affinity of nonpaid Linux solutions. On the client side of the market, growing low-cost, small form factor products such as notebooks are leading to new opportunities for Linux.

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## **The Economic Impact and IT Budgets**

The IDC survey found that the economic climate has had the largest negative effect on the budget for companies in the Americas and in the government and financial services sectors. Overall, 62% of respondents said that their budget has been cut or that they are moving more cautiously and investing only where needed.

From this survey, IDC has also found that the economic climate has a direct effect on how users are planning to deploy Linux on both the server and the client. As illustrated in Figure 1, IDC found that 53% of respondents are planning to increase adoption of Linux on the server and 48% are planning to increase adoption of Linux on the client as a direct result of the economic climate. While end-user projections can be overly optimistic, the direction and intent noted here are strong indicators that these users believe that Linux is a key part of their IT deployments moving forward.

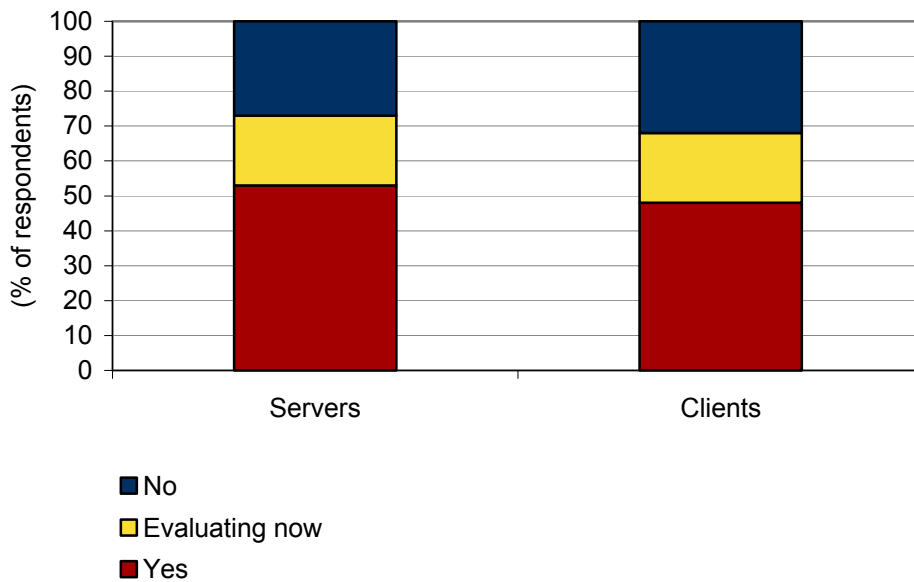
From a regional perspective, Asia/Pacific is the most bullish on increasing Linux adoption, as 73% of respondents said they would increase adoption of Linux deployments on the server and 70% said they would increase adoption of Linux on the client. In the Americas, 66% said they are evaluating or have already decided to

increase adoption of Linux on the desktop and 67% said they are evaluating or have already decided to increase adoption of Linux on the server. From a vertical perspective, retail is the most aggressive sector in terms of planning to increase adoption of Linux on the client (63%) and on the server (69%). Financial services and manufacturing are not far behind, but both of these verticals also have a higher percentage than retail of users evaluating now for both client and server.

**FIGURE 1**

Increasing Linux Adoption Due to Economic Climate

- Q. Do you plan to increase your adoption of Linux on servers in 2009 as a result of the economic climate and a focus on cost containment?
- Q. Do you plan to increase your adoption of Linux on clients in 2009 as a result of the economic climate and a focus on cost containment?



n = 330

Source: IDC's Linux Usage Survey, February 2009

The receptiveness of these current Linux users to deploy additional Linux, as illustrated in Figure 1, dovetails into the adoption trends IDC has seen over the past several years, where Linux server operating system growth has led the industry on the measure of both new subscriptions and revenue associated with those subscriptions. In parallel, IDC has seen a movement to increasingly favor the use of Linux as a platform to support more mission-critical workloads on all architectures where Linux is used, particularly aboard System z, HP Business Critical Server systems, and the modern 64-bit x86 server solutions.

## FUTURE OUTLOOK

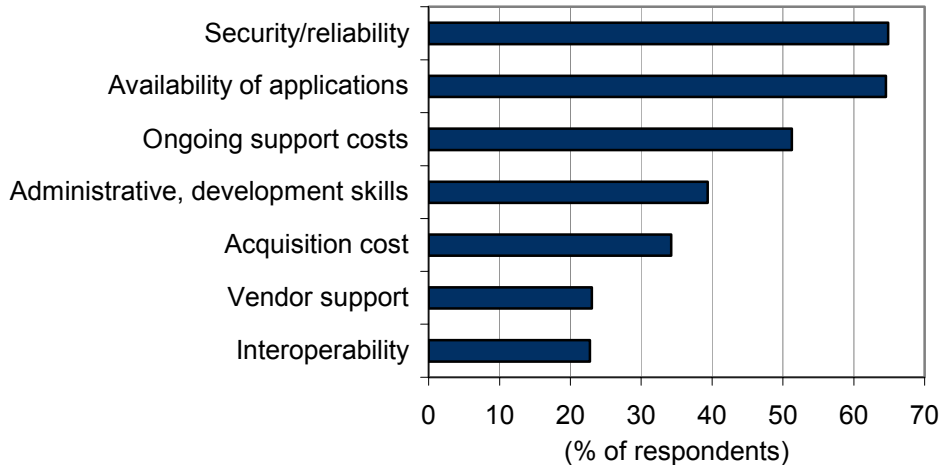
### Server Operating Environments

A business can choose a server operating system for a multitude of reasons. With this in mind, IDC asked 330 users worldwide what their top 3 considerations are for acquiring a new server operating environment. Overwhelmingly, as seen in Figure 2, users cited security/reliability, application availability, and ongoing support costs as their top priorities.

**FIGURE 2**

#### Top 3 Considerations with a New Server OS Selection

Q. What are your top 3 considerations when choosing a server operating system? (Select three.)



n = 330

Source: IDC's Linux Usage Survey, February 2009

Analyzing the results of this data by vertical, we find very little difference among the different sectors for the top 3 responses. However, what is interesting is that manufacturers seem to be most sensitive to acquisition costs. In fact, data shows this industry vertical cites up-front acquisition costs as the fourth most important consideration.

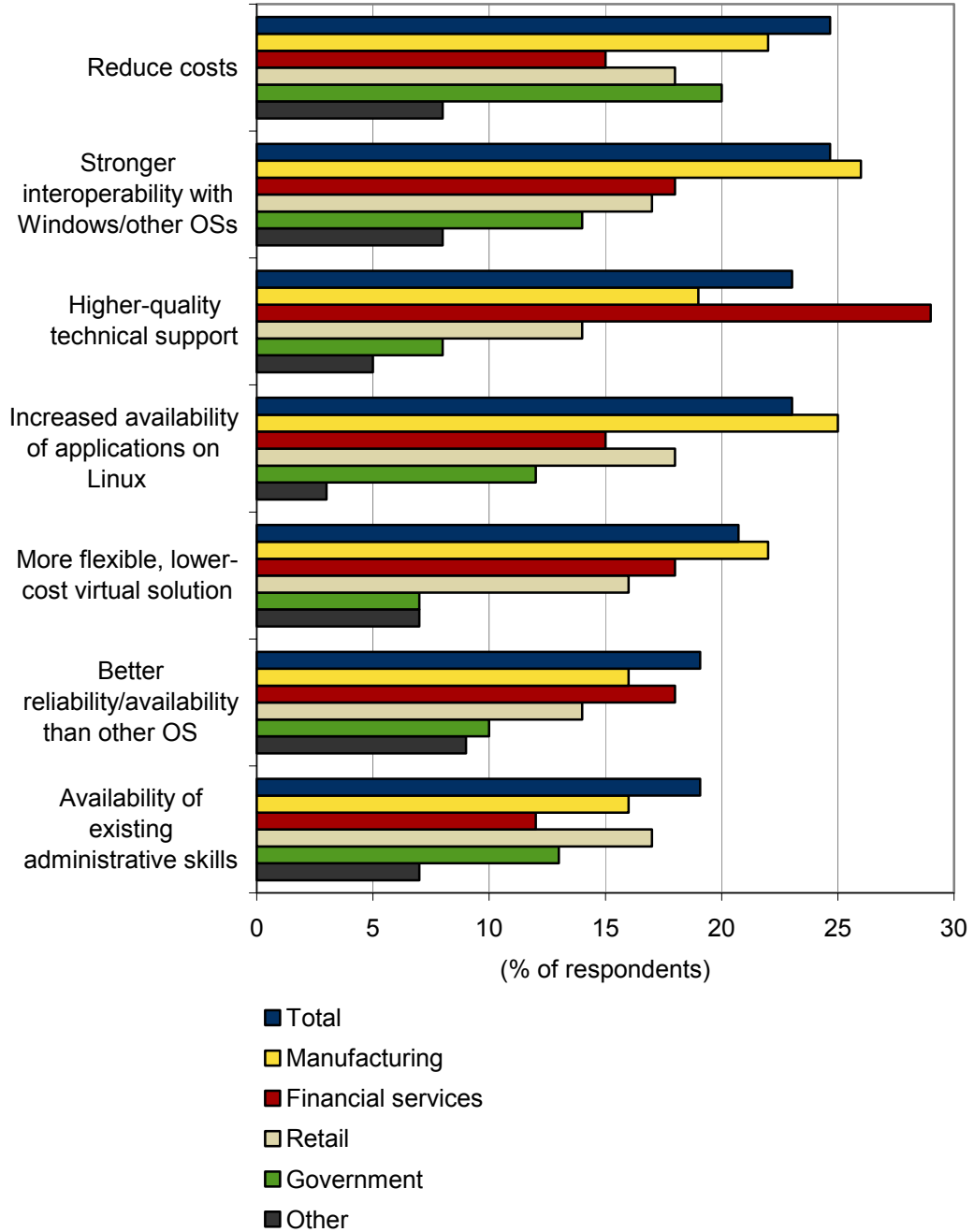
By contrast, retail and government sectors both cited the next most important consideration as in-house administration and development skills, showing their need to support infrastructure using on-staff resources. For financial services respondents, after the top 3 considerations, the response rate for the remaining choices was significantly lower, indicating that the value proposition of Linux is seen as primarily being about the right applications and the right long-term cost of ownership in a secure environment.

When survey participants were asked what factors would accelerate new deployments of Linux, they identified reducing costs and stronger interoperability with Windows or other operating systems as the top 2 reasons (see Figure 3). This finding is certainly not surprising given the turbulent economic times and the fact that most IT shops run multiple operating systems in their environment.

**FIGURE 3**

**Reasons to Accelerate Linux Deployments**

Q. Which of the following reasons would encourage you to consider new deployments or accelerate your deployments of Linux on servers? (Select up to three.)



n = 330

Source: IDC's Linux Usage Survey, February 2009

Overall, the retail industry showed the greatest potential for acceleration in Linux adoption; 61% of respondents in the retail sector said they strongly agree with the expectation for planning an increase on the desktop, and 59% of retailers described Linux as the preferred operating system of choice on the server. The government sector lagged.

In addition, survey participants confirmed that Linux is increasingly seen as a platform for key business applications. A total of 51% of survey participants gave an "important" or "very important" rating to the statement that Linux is increasingly being used for mission-critical workloads.

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## **Virtualization**

Virtualization has been one of the hottest, most talked-about trends in IT over the past several years. Adoption is ramping up in the industry; the current run rate of new x86 servers deployed with virtualization software increased to 14.8% of shipments as of the third quarter of 2008.

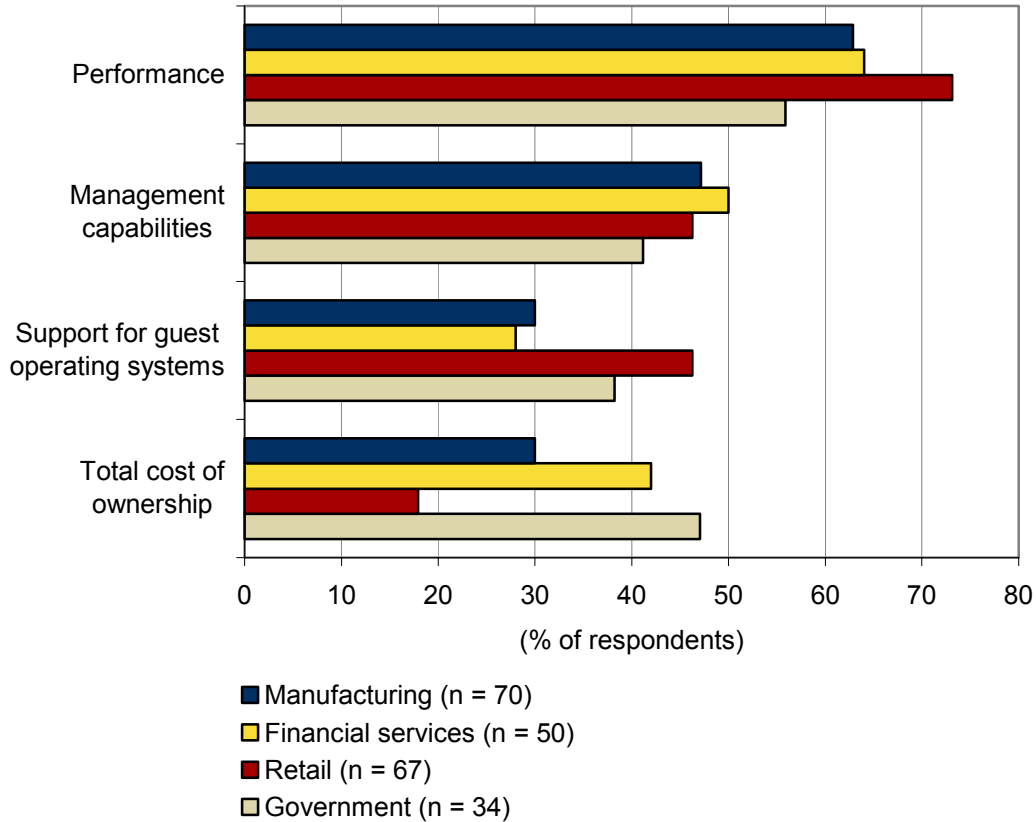
IDC believes that just as the 2001–2002 recession had a positive impact on Linux server operating system adoption, the current economic malaise also will have a direct positive impact on adoption of and deployment of virtualization software. Going forward, given the widespread availability of stable and well-performing Xen-based hypervisors incorporated into commercial Linux distributions, we expect that 2009 and 2010 will be important adoption and deployment years for hypervisors in Linux deployments.

Figure 4 shows the top 2 considerations cited by survey participants when evaluating hypervisor solutions.

**FIGURE 4**

**Top Considerations of Virtualization Software**

Q. *What are your top 2 considerations when choosing a virtualization software solution? (Choose two.)*



Source: IDC's Linux Usage Survey, February 2009

Nearly half of the survey participants stated that moving to virtualization is accelerating their adoption of Linux. Eighty-eight percent of respondents plan to evaluate, deploy, or increase their use of virtualization software within Linux operating systems over the next 12–24 months.

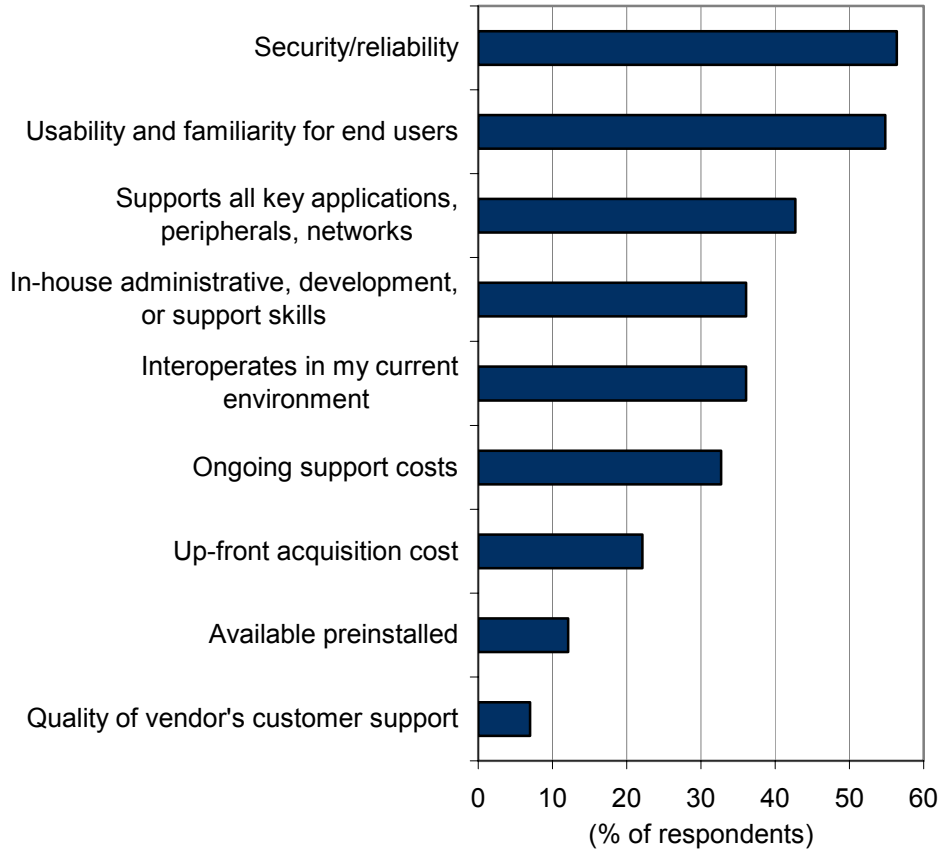
**Client Operating Environments**

The survey also captured information about the considerations around and adoption plans related to Linux client operating systems. Figure 5 illustrates the top 3 considerations that survey participants cited when choosing a client operating system (not specific to Linux). As shown in Figure 5, top factors are security/reliability, usability/familiarity, and application and peripheral support.

**FIGURE 5**

**Top 3 Considerations for a Client OS**

Q. *What are your top 3 considerations when choosing a client operating system? (Select three.)*



Source: IDC's Linux Usage Survey, February 2009

While security has never been widely perceived as a drawback for Linux, this operating system also historically has lacked the application or peripheral support that end users demand. This has led to Linux on the client not achieving the penetration that many of its proponents expected. This lack of installed base also has had the side effect of making the operating system less of a potential target for malware authors.

Overall, 50% of survey participants agreed with or strongly agreed with the statement that they plan to accelerate adoption of Linux on the desktop, especially for basic office functions, technical workstation users, and higher education/K-12.

In the past 12-18 months, IDC has observed several trends in the market that help make the deployment of a Linux client operating system more favorable to increased adoption, including:

- ☒ **Low-cost, simple functionality notebooks known as netbooks.** This form factor has driven down hardware costs, placing increased pressure on operating systems vendors to deliver low-cost solutions. This phenomenon plays well for Linux, since Linux client operating systems already are very competitively priced in the industry.
- ☒ **Increased consumption of Web-based applications.** As Web-based applications become increasingly viable and more broadly available, the need for a traditional complete desktop operating system becomes less critical in geographies where workers have access to reliable broadband service where needed.
- ☒ **Increased price sensitivity to desktops due to economic conditions.** The most direct impact of the economic downturn is that budgets are flat or smaller, making it more difficult to justify acquisition of new solutions that require significant up-front investments. This is partly why OEMs have increasingly offered Linux as a preload option in the past 12–18 months. However, IDC cautions customers not only to think about up-front acquisition costs but also to consider long-term operational costs (which are dependent upon the sophistication of management solutions in place).

## SUSE LINUX ENTERPRISE 11 FROM NOVELL

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### Features of SUSE Linux Enterprise 11

In March 2009, Novell released the newest version of its client and server Linux distribution, SUSE Linux Enterprise 11, which includes a long list of new features. Novell expects the product to address three key tenets:

- ☒ Mission-critical computing
- ☒ Interoperability
- ☒ Ubiquity

#### ***Mission-Critical Computing***

Over the past several years, the Linux platform has made significant headway in establishing itself as a major player for mission-critical workloads. With SUSE Linux Enterprise 11, Novell is focusing on extending the fit for its product to support mission-critical deployments. In the past year alone, Novell has tripled the number of certified applications on SUSE Linux Enterprise 9 and SUSE Linux Enterprise 10. For SUSE Linux Enterprise for System z, Novell is also providing new capabilities to facilitate higher performance and greater manageability.

Novell is introducing an enhanced high-availability stack along with a new support offering, the SUSE Linux Enterprise High Availability Extension. Additionally, Novell has increased the scalability, performance, and security of the product with this latest update. Furthermore, Novell is introducing a new long-term support option that addresses the extended life cycles that some enterprises require.

## ***Interoperability***

Novell continues to make SUSE Linux Enterprise more interoperable with other systems installed at customer sites, particularly Windows platforms. This is made more readily possible by Novell's technical collaboration agreement with Microsoft.

From a management standpoint, Novell has already announced a Linux Management Pack for Microsoft's management solution, System Center, and the ability to establish identity/directory federation between eDirectory and Active Directory. With the SUSE Linux Enterprise 11 release, Novell also introduced the SUSE Linux Enterprise Mono Extension, the first non-Windows runtime platform that can support many .NET applications without modification.

On the client side, SUSE Linux Enterprise Desktop will be the first Linux client operating environment to offer Silverlight support through an open source implementation called Moonlight and support for Microsoft multimedia formats such as WMA and WMV. Additionally, Novell has expanded the capabilities of OpenOffice.org Novell Edition with two-way interoperability of document formats with Microsoft Office.

## ***Ubiquity***

Novell is focused on increasing the widespread use of SUSE Linux Enterprise 11. One dimension of product innovation intended to help move toward that goal is work completed by the company to optimize performance in virtualized environments.

Accordingly, the company has had a strong focus to ensure that this new version delivers optimum performance aboard both physical and virtual environments. SUSE Linux Enterprise Server 11 will improve its capabilities as a virtualization host with an upgrade to Xen 3.3.1.

Reflecting Novell's focus on the appliance and cloud computing markets, the company is also releasing SUSE Linux Enterprise JeOS (Just enough Operating System), a minimal configuration of SUSE Linux Enterprise Server that is designed for software appliances. Novell offers complementary tools for appliance building and management, including a Web-based GUI tool for building, testing, and configuring appliances. It plans to complement these tools with additional management tools in the near future.

Unlike some competitors, Novell offers unlimited virtualization use rights for all of its SKUs for SUSE Linux Enterprise Server and does not force customers to purchase a premium SKU for virtualized environments.

Linux operating system deployments on client hardware have yet to see the penetration that many proponents have long expected. With the introduction of SUSE Linux Enterprise Desktop 11, Novell is attempting to remove some of the inhibitors that have held back Linux on the client side.

For example, Novell is accelerating its partnerships with OEMs to preload SUSE Linux Enterprise Desktop aboard desktops, notebooks, and other form factors, and in this release, Novell has also enhanced SUSE Linux Enterprise Desktop usability and

accessibility features. This set of updates contains upgrades to all included applications (e.g., Firefox, Novell Evolution), better driver/USB support, green IT innovations such as smart power management, and accessibility features for disabled users. Additionally, SUSE Linux Enterprise Desktop 11 will include Likewise Enterprise, which Novell claims will simplify and enhance user and group policy management in an Active Directory environment. This update also features PolicyKit, which increases security by providing fine-grained controls with user flexibility in mind.

## CHALLENGES/OPPORTUNITIES

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### Challenges

Linux is competing in a hostile marketplace against well-entrenched, well-respected competitors. Therefore, Linux must overcome the following challenges to be successful:

- ☒ **Windows as a competitor.** The Windows platform holds a majority position both on PCs and on x86 server hardware, and it is the single most pervasive competitor and largest threat to the long-term growth potential for Linux. For many customers, Linux is not seen as a viable alternative to existing installed Windows solutions.
- ☒ **Packaged application portfolio.** The portfolio of applications for Linux continues to improve, and today the number of business applications for Linux server operating environments is ramping steadily. However, Linux application portfolio choices continue to be considerably more limited than Windows or Unix application portfolio choices. On the client platform, many personal productivity applications exist today to replicate functionality found on the Windows client platform, but many business applications still are not available for client-side Linux.
- ☒ **Stickiness of custom applications.** Many customers, particularly those using Unix, typically have a substantial installed base of custom applications and will weigh the benefit of a migration to Linux against the risk of the migration, the cost of the migration, and the length of payback for the migration. Unless the payback can be justified in an acceptably short period of time, the argument to "stay the course" is hard to fight.
- ☒ **Competitive Linux distributions.** SUSE Linux Enterprise 11 is the second largest server-side Linux distribution on a worldwide basis. Novell faces continued competition from other distributions, including Red Hat. Nonpaid Linux represents a separate, but equally difficult challenge.
- ☒ **Other competitive solutions including Unix** on RISC and Solaris on x86, which remain viable as alternatives to Linux on several different architectures.

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## Opportunities

Linux has been widely seen as heir apparent to meaningful portions of the platform opportunity during current and future generations of industry deployments. Linux has substantial opportunities, including:

- ☒ **Linux as a Unix replacement.** Linux is widely deployed today, filling roles previously held by Unix servers. IDC believes that substantial opportunity remains for existing Unix installations to be replaced by new systems running either Linux or x86 Unix, an opportunity that Linux is well-positioned to win.
- ☒ **Nonpaid Linux.** The dynamics of the Linux market have always included an enormous component of nonpaid Linux as part of the overall ecosystem. This market segment is important because it constitutes a large pool of receptive customers that just need to be converted to a different distribution — customers that are unlikely to move off Linux to an alternative operating system solution.
- ☒ **Pervasiveness of Linux.** The porting of Linux to virtually every modern computer architecture makes Linux a standardization layer that offers both an attraction and a strong value proposition for customers. Linux has become the next-generation application platform for CISC and for some RISC architectures, bringing developer skills to platforms that no longer have strong developer communities.
- ☒ **Growth of business workloads on Linux.** The continued movement of business applications to the Linux platform points to a healthy future for Linux in commercial deployments.
- ☒ **Completeness of the SUSE Linux Enterprise portfolio.** Novell has invested in a full portfolio of products based on SUSE Linux Enterprise 11, including client, server, and software appliances.
- ☒ **Software appliances.** This relatively new form factor integrates a traditional software stack into a single composite package and includes integrated life-cycle management. Like a traditional hardware appliance, the software appliance provides the end user with only a single stream of patches for the entire entity, thus reducing time and money spent on integrating disparate patches from different vendors. Linux will be the operating system of choice due its flexible licensing, low costs, and modular architecture. Novell has an opportunity to be a leader in this emerging market with its SUSE Linux Appliance program.

## CONCLUSION

The economic downturn of 2009 will be a demarcation line that is likely to highlight an acceleration toward adoption of standardized architecture across the industry. The standardization layers will include standardized blade chassis, x86 servers, Linux, and virtualization software.

Survey data captured by IDC shows that current Linux users are deploying additional Linux instances as a proactive response to budgetary limitations. IDC research finds

that Linux users are clearly satisfied with their choice to deploy Linux, and during trying economic times, the potential for those same customers to ramp up their deployment of Linux is strong.

With next-generation Linux distributions such as SUSE Linux Enterprise 11 coming to market, maturing management tools, integrated virtualization, and virtualization-compatible use rights, customers have never had a better range of Linux-based solutions.

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