IDC
Analyze the Future

WHITE PAPER

The Opportunity for Linux in a New Economy

Sponsored by: The Linux Foundation

Al Gillen

April 2009

IDC OPINION

Economic disruption as seen in 2009 has two sides: the short-term carnage caused by nonlinear business growth and contraction and long-term trends initiated or accelerated by economic events, which will extend for years beyond the immediate recovery. IDC forecasts show Linux to be a long-term winner on the other side of the current downturn, as it is well-positioned to ride existing and new market trends:

- The economic disruptions impacting the market today are affecting all market segments, including the Linux ecosystem. However, IDC forecasts show that Linux will be impacted less severely and will recover more aggressively than any other platform. IDC forecasts for 2009 show Linux-related software revenue as one bright spot, with customer spending projected to increase by 21%. By comparison, the software market overall will increase only 2% during 2009.
- IDC projects that Linux-related software growth will lead the industry during the post-recession recovery period, with a 2008–2013 compound annual growth rate (CAGR) of 23.6%. Linux-related software spending is expected to grow from $12.3 billion in 2008 to $35.5 billion in 2013. By comparison, the overall market is projected to increase at a 5% 2008–2013 CAGR. The Unix and Windows platforms are projected to show a 2008–2013 CAGR of 1.8% and 6.6%, respectively. These growth rates are calculated based on larger base numbers, with Unix spending growing from $69 billion to $74 billion, while Windows spending grows from $149 billion to $206 billion.
- Linux is highly compatible with two of the hottest trends in the industry: virtualization and cloud computing. The recession of 2001–2002 helped usher in the era of Linux as a mainstream solution because Linux was the right solution at the right price point at that time. We believe that virtualization software use will be accelerated during the current recession, and that trend will likely draw more Linux into use as well, given the compatible use rights that Linux offers in a virtualized environment.
- Cloud computing, where Linux has already enjoyed significant success, will continue to evolve as a next-generation compute platform. While we don't believe that cloud adds heavily to the "spend" on Linux-related software, it is highly likely to increase the consumption of open source solutions.
- Traditional workload shifts within the Linux platform, including those from the use of Linux to support infrastructure-oriented workloads, continue to expand into commercially oriented workloads such as database, enterprise resource planning (ERP) software, and other general business processing.

Global Headquarters: 5 Speen Street Framingham, MA 01701 USA P.508.872.8200 F.508.935.4015 www.idc.com

IN THIS WHITE PAPER

This white paper presents IDC's perspectives on the changing opportunity for Linux server operating environment (SOE) deployments and the workloads that are supported by Linux. This document considers both workload data and the ecosystem that has grown up to support the opportunity for Linux deployments, including application software, application development and deployment software, and infrastructure software.

SITUATION OVERVIEW

Linux in an Economic Downturn

Economic downturns are not a new phenomena, nor are the recoveries that follow them, in which new competitors emerge and thrive and old-line vendors sometimes lose market share or cease to be competitive in the new world.

As the IT industry climbs out of an economic downturn, often IT will adopt new technologies to address new market opportunities or seek to reduce costs as a way of improving competitiveness. This transition often starts at the operating systems level and works its way through the software stack.

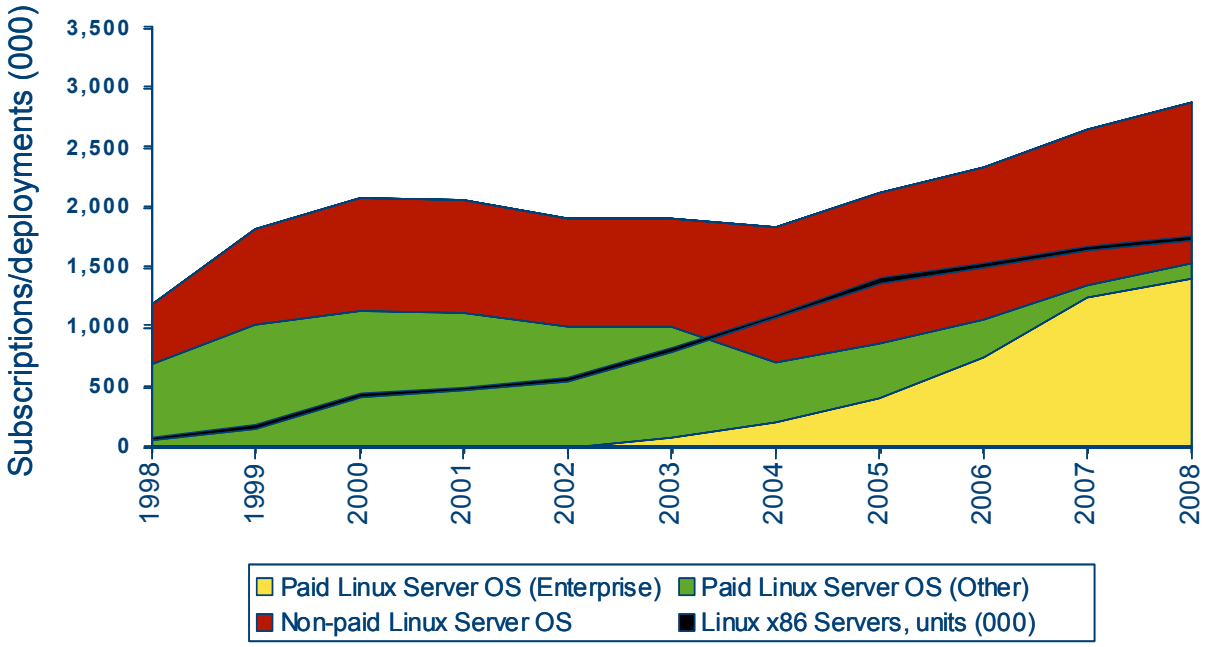
When the dot-com bust occurred and the 2001–2002 recession settled on the industry, customers entered a period of time in which making new capital expense (capex) investments became difficult or not possible and a renewed focus on operational expenses (opex) became the operational mandate.

At that time, Linux changed the playing field in several ways. Compared with Unix, Linux opened up broad access to attractive price points and multivendor hardware solutions, particularly in the growing x86 server market, while preserving a Unix-like configuration, management, and reliability experience. Most importantly, Linux was accessible to pilot or deploy in production at a variety of price points, ranging from free to an enterprise-ready subscription service that cost up to several thousand dollars per year per system.

As the industry climbed out of the recession in 2002, the launch of enterprise-grade commercial Linux distributions was accompanied by the growth of enterprise-grade Linux server (hardware) shipments, as shown in Figure 1. Once the software market completed a reset from the high-volume, low-cost Linux distributions popular in the early 2000s over to enterprise distributions, unit volume for operating systems began to accelerate as well.

FIGURE 1

Linux Server and Operating System Growth, 1998–2008



Source: IDC, 2009

Linux After the 2009 Recession

The current economic climate is forcing a retreat across the industry on spending for hardware, software, and services. How this spending pullback is distributed depends on the way platforms are being deployed by customers.

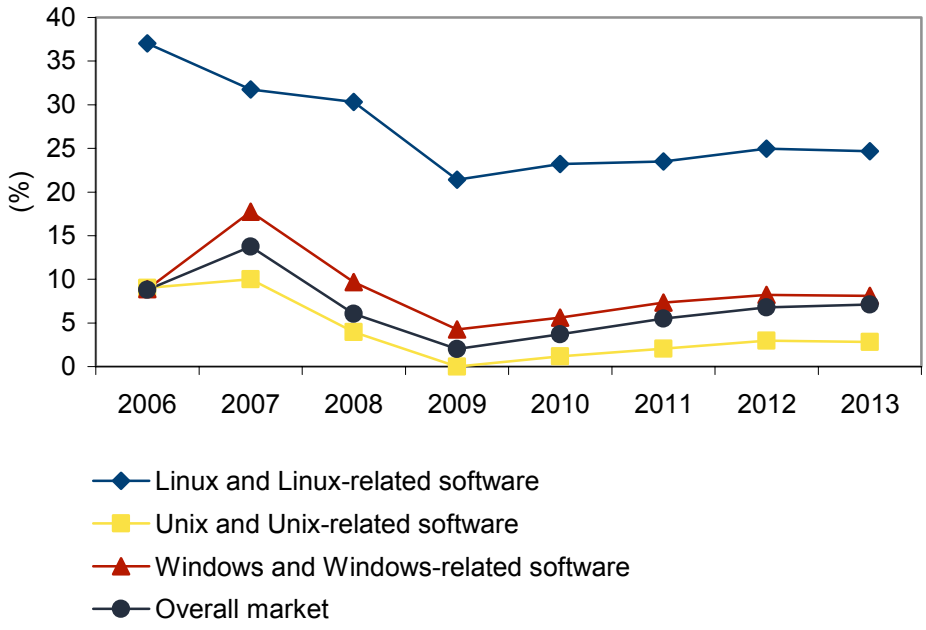
IDC research finds that Linux, like other operating systems, has experienced a reduction in growth of software spending. Figure 2 presents the worldwide growth rate projections according to IDC software forecast data. Not surprisingly, every operating system platform sees a significant reduction in growth during 2009, but the recovery starts in 2010.

IDC data indicates that Unix will experience the least robust post-recession recovery, while Windows will recover at moderate rates.

However, it is important to remember that the relative size of the markets must be considered as well. The Linux software market in 2008 generated $12.3 billion in spending, and that total is projected to nearly triple to $35.5 billion in 2013. By comparison, the Microsoft software ecosystem was $149 billion in 2008 — so even with a sub-10% growth rate through 2013, it will add $56 billion in spending.

FIGURE 2

Worldwide Software Revenue Year-over-Year Growth Rates, 2006–2013



Source: IDC, 2009

End-User Attitudes Toward Linux Deployment

In early 2009, IDC conducted a study that looked at Linux adoption trends, including the impact of the economic downturn, as part of a project sponsored by Novell Inc. (The related white paper — *Linux Adoption in a Global Recession* — is available on Novell's Web site.) The 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.

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 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 3, 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. This increase in deployment can be interpreted as either an increase of Linux overall or a shift toward Linux without necessarily including a net increase of operating system deployments.

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% on the server.

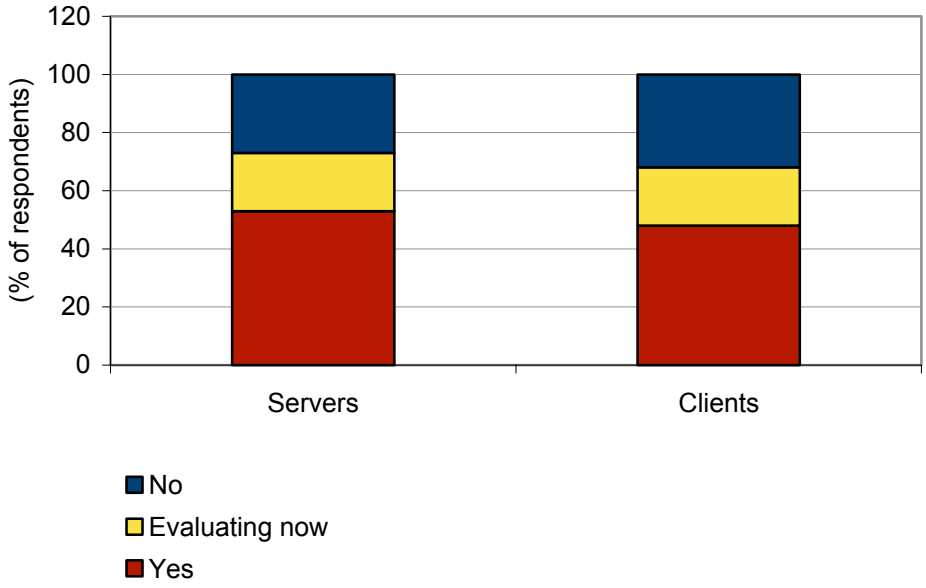
While end-user projections can be overly optimistic, the direction and intent noted in this document are strong indicators that these users believe that Linux is a key part of their IT deployments moving forward.

FIGURE 3

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

Total Ecosystem Growth

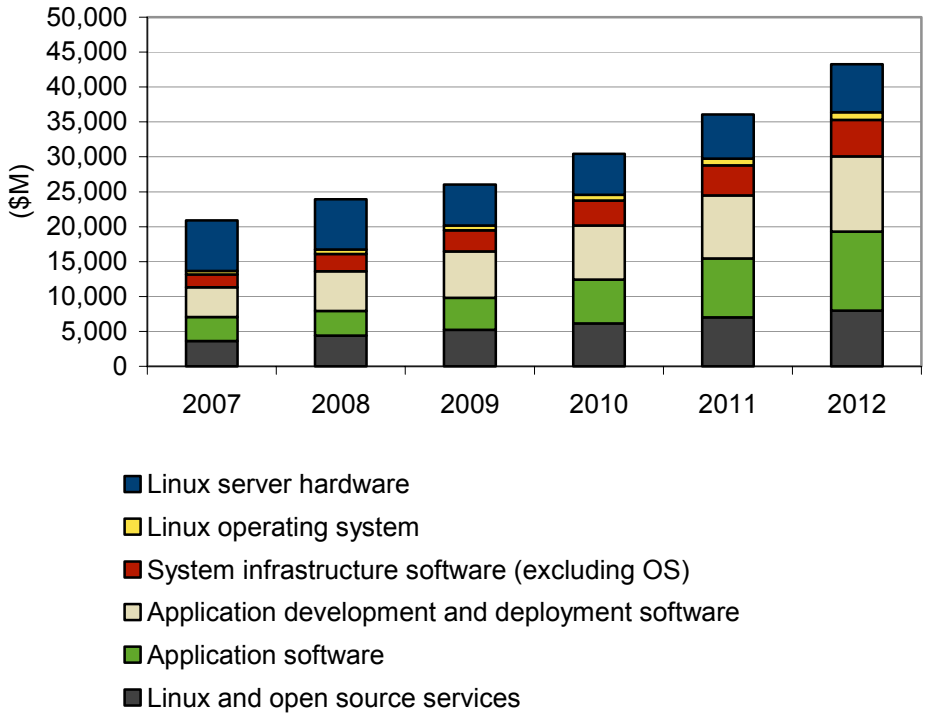
Not surprisingly, the growth trajectory for the overall Linux ecosystem saw some cooling in 2008 compared with IDC's original predictions, and when services and hardware spend is included with software spend, the overall Linux ecosystem market growth is projected by IDC to grow at 9% in 2009, well below IDC's pre-recession expectations.

As shown in Figure 4, the single largest reduction in revenue for the Linux ecosystem comes from a sharp reduction in spending on new server hardware, which is particularly evident in 2009. This reduction in hardware spending is driven by a combination of factors, including customers deferring purchases of new systems and increased use of virtualization software, which over the past several years has helped increase system utilization, at the cost of unit volume in the server market.

IDC projects a return to growth of the overall Linux ecosystem through 2012. Our updated forecast, which extends through 2012, projects continued growth, reaching $28 billion in software spend in 2012 and a total ecosystem spend of $43 billion by the end of 2012.

FIGURE 4

Worldwide Linux and Open Source Software Ecosystem Revenue, 2007–2012



Notes:
Server hardware revenue is adjusted for operating systems value.
Services revenue forecast was last updated in September 2008.

Source: IDC, 2009

Figure 4 includes the following elements:

- Linux hardware revenue, which includes factory revenue associated with the sales of servers that are sold where Linux is deployed as the primary operating system either at the factory or in the channel.
- Linux operating system revenue, which is primarily SOE–related revenue.
- System infrastructure software, which is defined by IDC to include systems management software, security software, storage software, as well as virtualization and clustering software.
- Application development and deployment software, which includes information and data management software (including RDBMS software), development tools, development life-cycle products, application deployment software (including application serving, transaction, and middleware software products), and data analysis software.
- Application software, which includes collaborative application software, content management software, ERP software, customer relationship management, supply chain management, manufacturing applications, and engineering applications.
- Services revenue associated with services and support delivered to Linux deployments. The suite of open source–related services offerings is virtually identical to services available in the industry for competitive SOEs and includes the following:
  - Systems integration
  - Software deployment and support
  - IS outsourcing
  - IT education and training
  - IT consulting

Virtualization and Cloud Computing

To fully appreciate the potential for expanded Linux usage in today's market, one must understand the parallels between the market dynamics today and the market dynamics from 2001.

During the prior recession, IT professionals were challenged with a need to continue to build out their companies' Web presence and to solve technical issues related to consolidations that they were continuing in the wake of the buildout that took place two years earlier. In many cases, the solution was to redeploy a decommissioned server, reprovision it with Linux, and bring the system back into service.

In today's environment, the components are slightly different, but the solution is much the same. In this case, the hardware pool includes virtual servers, made possible by Xen hypervisors incorporated in all major Linux distributions today, as well as third-party solutions such as VMware ESX, Citrix XenServer, and other products. These hypervisors make it possible to carve out additional virtual servers from existing hardware at no capital expense — since no-cost hypervisors are available from all the major industry vendors.

Linux operating systems are available in commercially supported and nonpaid, no-cost distributions, much the same as in 2001, albeit with commercial distributions at a higher price point than in 2001. However, the ability to "spin up" additional replica copies of the host operating system — which is included in the subscription agreement covering most commercial products — makes it possible to greatly expand the utilization of those Linux distributions (although in some cases, use rights offering unlimited virtualized replica copies may be associated with only premium subscription offerings).

IDC believes that customers using Linux today will continue to increase their deployments of virtualized instances of Linux operating systems aboard existing servers. The customer use data cited in Figure 3 suggests customers are receptive to expanding their use of Linux.

Cloud Computing

IDC's sees cloud providers as virtualizing a layer of the computing stack and presenting that as a service to the customer. The virtualization can occur at several layers, which would offer different services or different types of services, including:

- **Infrastructure clouds** offer infrastructure services such as CPU, networking, and storage, often presented as a virtual machine over the Web. Users install their own operating system and applications on top of this type of infrastructure cloud.
- **Platform clouds** are effectively an operating system hosted in a cloud form factor, providing an application development and runtime environment.
- **Application clouds** virtualize an entire application stack and what is today often described as SaaS. These services either may be consumed in their entirety as a solution or may deliver individual services, accessed through application programming interfaces (APIs), allowing those services to be aggregated into another application solution that may be hosted locally in a company's intranet, on a second cloud, or on the same cloud that is providing the application services.

IDC observes that Linux has emerged as a key component of many of today's available cloud infrastructures, providing both the base technology for cloud providers and an operating environment for customers that wish to access the Linux operating system and Linux services that are hosted in a cloud.

Linux has gained traction among cloud providers due to its low cost and customizability. Cloud providers are building cutting-edge, highly complex services and often require source code access and the ability to modify the base code to their highly specific needs.

Workload Shifts

Figure 5 shows results from IDC's ongoing Server Workload studies, which are modeled against Linux server hardware shipments. This view shows the primary workloads deployed on Linux servers between 2002 and 2012, with projections shown in two-year increments.

We can see that well-established workloads such as Web and IT infrastructure remain a relatively static portion of Linux deployments — capturing just over 50% of Linux server deployments, with a slight decline through the data shown.

By comparison, business and commercially oriented workloads, including business processing and decision support (which include ERP, CRM, and other common business management solutions), grew through the period, from 13% to 18.6%, an increase of over 5 percentage points. This growth is the result of slight shifts of workload share from established workloads, including IT infrastructure and Web infrastructure, and a reduction in the "other workloads" category.

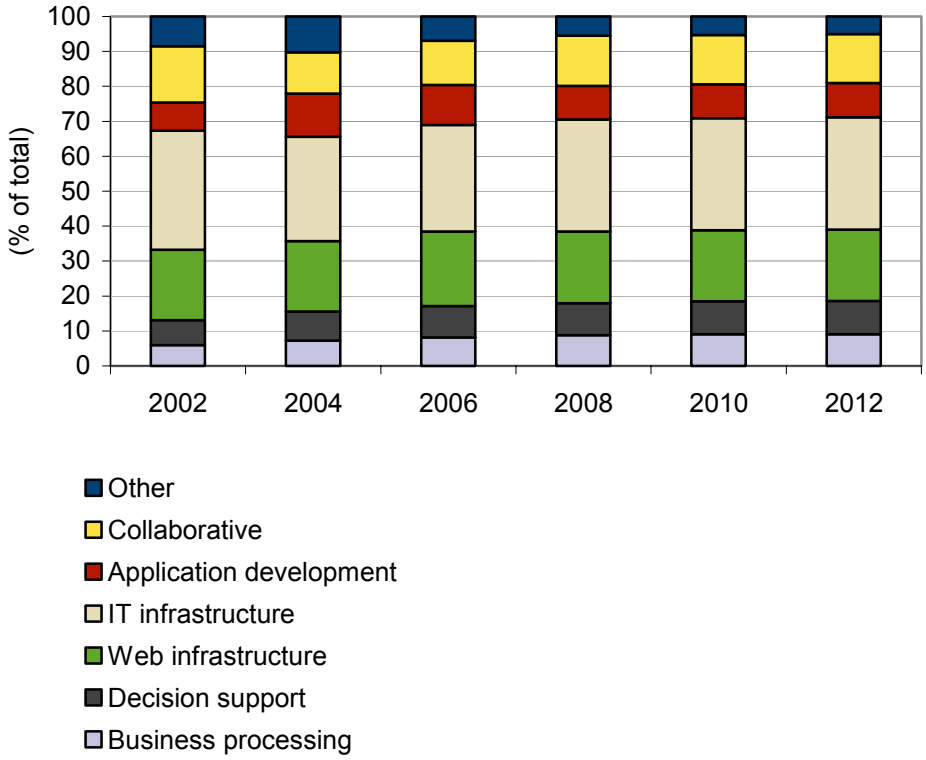
The growth of Linux as a platform for business-oriented workloads appears to be coming largely from the migration of existing Unix deployments in combination with organic growth of Linux deployments in these same workload areas.

Database workloads are not explicitly broken out from the other workload categories shown in Figure 5 because database workloads are an integral part of many other workload types. That is, virtually all business-oriented workloads have a database component, as do many Web infrastructure workloads and collaborative workloads.

It is important to note that a flat share of a given workload does not indicate a decreasing opportunity. As the overall size of the Linux opportunity increases, each segment grows in terms of the number of units placed into that workload as well. The segments where shares are growing are simply expanding at a faster rate than the segments where shares are stagnant or are in decline.

FIGURE 5

Worldwide Shifts in Linux Server Usage by Workload, 2002–2012



Source: IDC's Server Workloads Study, 2008

FUTURE OUTLOOK

IDC projects that Linux-related software growth will lead the industry, with a 2008–2013 CAGR of 23.6%. Linux-related software spending is expected to grow from $12.3 billion in 2008 to $35.5 billion in 2013.

By comparison, the overall market is projected to increase at a 5% 2008–2013 CAGR. The Unix and Windows platforms are projected to show a 2008–2013 CAGR of 1.8% and 6.6%, respectively. These growth rates are calculated based on larger base numbers, with Unix spending growing from $69 billion to $74 billion, while Windows spending grows from $149 billion to $206 billion.

CHALLENGES/OPPORTUNITIES

The continued growth of Linux SOE adoption and deployment is expected to be challenged by a number of factors, but it also has substantial opportunity to take advantage of customer receptiveness to deploy more mission-critical applications aboard the Linux operating system. IDC sees the following factors impacting the Linux SOE market going forward:

- **Challenge: Unix operating systems.** The market for Unix servers and server operating systems has been squeezed by competitors in recent years, and that platform is being hit particularly hard by the current economic downturn. Nevertheless, this remains a sizable market with a significant ecosystem surrounding it, leading to an installed base momentum that can be hard to break.

- **Opportunity: Unix operating systems.** The growth of the Linux ecosystem has evolved both by capturing net-new market revenue as the market grows and by siphoning off revenue previously spent on other operating systems. Given the natural synergy between Linux and Unix and the large installed base of Unix servers, IDC expects this platform to present a long-term source for future deployments of Linux alongside and as a replacement for retiring Unix installations, especially as next-generation high-performance and energy-efficient systems are embraced.

- **Challenge: the Windows market.** Windows presents a significant long-term challenge for Linux, since software revenue related primarily to Windows SOE deployments continues to account for over half of marketwide customer software spending. Windows will continue to enjoy the largest installed base of any major server operating system. When it comes to Unix migration opportunities, expect Microsoft to compete vigorously for opportunities in this space in the future. We don't see Windows being an attractive migration platform for installed Linux systems today.

- **Opportunity: the Windows market.** Microsoft has shifted its approach to both Linux and other open source technology and today is working both competitively and cooperatively with Linux solutions at a technology and development level. However, the company still takes a highly competitive marketing and sales approach to Linux. This approach improves the ability of Microsoft to sell into Linux-friendly or mixed-platform accounts. The company has yet to deliver any major software products aboard the Linux platform, and IDC does not expect to see any such activity in the near term. In particular, Unix shops that add Linux today will benefit from Microsoft's interoperability efforts. Given this improved synergy, customers that have a justification to use Linux alongside Windows will be more likely to deploy.

- **Opportunity: reduction in the use of discrete software stacks.** IDC sees a shift in the industry that is favoring the configuration of turnkey software stacks that incorporate operating system functionality along with middleware and other infrastructure software components, and potentially with application software as well. This packaging at times takes on a form factor that IDC describes as a "software appliance." If this form factor takes off with end-user adoption, it could consolidate revenue opportunities to those vendors with a strong software portfolio that can be married with a Linux operating system. This trend could result in higher-volume deployments of Linux, but it will reduce revenue opportunities for discrete products.

CONCLUSION

Customers need not look any further than their local newspapers or television to see the direct effect of the current economic disruption. However, in the IT industry, we believe there is a longer-term effect from recessions such as the one currently hovering over the industry, and that effect is to help the industry more quickly sort out the technology choices that may exist.

Looking forward, IDC sees Linux as a platform solution that we expect to thrive in the post-recession time period, especially given the compatibility of Linux with two of the industry's more exciting trends — virtualization and cloud computing.