

## WHITE PAPER

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# Red Hat Enterprise Linux in Use: Cost-Conscious Retailer Streamlines Linux Deployments

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## IDC OPINION

Linux has moved a long distance from that of a fringe technology in the 1990s to a mainstream position today as one of two operating systems expected to be fundamental building blocks for the next generation of computing on x86 servers. Additionally:

- ☒ IDC research demonstrates that a more consistent and standardized environment returns operational efficiency and better uptime. This result was clear in a recent IDC study that considered the cost benefits of standardizing on Red Hat Enterprise Linux (RHEL) rather than using a mixture of Linux distributions including nonpaid solutions. IDC's study found that an environment that has considerable variability in its deployed systems is inherently more expensive to maintain because of the "one-off" nature of the configuration of individual machines.
- ☒ Operating system standardization includes having a limited number of brands and using a limited number of variations of configurations for each brand across the datacenter. Standardization also mandates using a common support infrastructure including a consistent commercial support provider.
- ☒ The case study presented here typifies an organization that has made a broad commitment to Linux and has adopted best practices to optimize that environment. The retailer highlighted in this IDC White Paper has taken an important step toward building a tightly controlled standard Linux server operating system image that has a predefined, well-understood life cycle. Through a broad commitment to a single Linux distribution, and through the use of a minimal number of operating system variations, this company has been able to optimize its environment and optimize value received back.
- ☒ This standardization initiative will save the highlighted company money and resources in the near term (by eliminating older, support-intensive installations) as well as at the other end of the life cycle when servers can be queued up for decommissioning and replacement well before the vendor's support system runs its course. In a previous ROI study conducted by IDC, we found that organizations that highly standardized on a single commercially supported Linux distribution were able to lower operational costs significantly.
- ☒ Retailers have long faced cost-competitive environments, and the learnings that the highlighted worldwide retailer has found help make it more competitive within the retail market, but the lessons learned here are applicable to organizations in other industries.

## METHODOLOGY

This IDC White Paper summarizes two research efforts. The first is an in-depth interview conducted in April 2012 with a Red Hat Enterprise Linux customer.

This in-depth case study is one of four interviews that IDC conducted with large RHEL customers. The interviews typically took 40–45 minutes and covered a wide range of topics including the organization's server mix, the operational procedures used, the range of ages of the organization's RHEL installations, and more.

This customer interview helps bring to life a separate research effort (briefly summarized in the ROI Study Recap section of this White Paper) covering a formal return-on-investment (ROI) study conducted by IDC in April 2011, comparing shops that were highly standardized on a single, supported distribution of Linux (RHEL) with organizations that had considerable variation in their Linux installations.

In the ROI study, IDC identified, screened, and qualified multiple end-user organizations and used their experiences as a representative model of the effect of acquiring and deploying Linux. This research effort included organizations that are highly standardized on using RHEL and its associated subscription support on over 70% of their Linux servers and organizations that primarily use nonpaid Linux distributions on at least 70% of their Linux servers. In addition, IDC interviewed a number of organizations that had a more heterogeneous collection of Linux operating system solutions in place (categorized as mixed).

As part of the ROI study, IDC captured operational characteristics of customer environments; the size and nature of deployments; the mix of Linux operating systems in use; the frequency of system and end-user problems, system outages, and help desk calls; and the time spent by IT professionals to support end users within the organization who are accessing applications deployed on servers running Linux.

This information is used to create an ROI comparison between organizations that are using commercially supported Linux deployments relying on RHEL and an RHEL support subscription and organizations that are using primarily nonpaid Linux solutions. For more details on IDC's methodology, see *Understanding Linux Deployment Strategies: The Business Case for Standardizing on Red Hat Enterprise Linux* (IDC #227903, April 2011).

## CASE STUDY

### Study Snapshot

- ☒ **Industry:** Retail
- ☒ **Objectives:** Eliminate Unix usage, eliminate non-RHEL instances, and standardize on a small number of standardized RHEL images
- ☒ **Current status:** 33% of server instances are Windows; in the process of standardizing on RHEL

## **Cost-Conscious Retailer Streamlines Linux Deployments**

If there is one thing that the retail industry really understands, it is the necessity to achieve the best possible cost efficiency and never stop working to further reduce costs. So it comes as little surprise that the IT department at this well-known retail giant believes in standardization in the IT department. When it comes to its Linux servers, it's almost as if the IT department tore a page from the company's retail playbook.

### ***The Challenge***

This company had too many platforms in use, and IT costs needed to come down. The company made the strategic decision to consolidate on the x86 architecture using two key operating systems: Red Hat Enterprise Linux and Windows. The philosophy is to not only drive consistency through the near-exclusive use of RHEL as its preferred Linux distribution but minimize the number of configuration variables the RHEL installations might include.

The company is moving quickly with Linux. Today, the combined physical and virtual platform mix is 33% Linux and 63% Windows, with the balance made up of IBM AIX Unix. In terms of instance total, that is 4,500 Windows instances, 2,400 Linux Instances, and 300 Unix instances. That's a pretty good penetration for Linux, an operating system the company began using only seven years ago.

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The platform mix includes three major platforms — Windows, RHEL, and IBM AIX. However, there is a sprinkling of secondary Linux distributions mixed in, with about 150 instances of CentOS currently in use. According to the retailer's Linux head, who carries the title product specialist, Linux technical standard (LTS), the CentOS instances, which are used for DHCP, for DNS, and as a Web proxy server, will be replaced by new RHEL 6 installations within the next 12 months.

"With CentOS, we don't have a company backing us," says the product specialist. He adds, "Not sure I ever saw application software certified on CentOS. We have a policy of not using software that is not supported by a company." The expectation is that the remaining CentOS images will be replaced by RHEL within the next 12 months.

Having a robust application portfolio of ISV-certified applications along with a commercial support provider that can offer this company the worldwide 24 x 7 backing it needs makes the using Red Hat a practical and logical choice. The standardization initiative goes well beyond just eliminating CentOS, though.

The company is aggressive on its Windows virtualization, with about 70% of the Windows instances virtualized today. In contrast, the Linux virtualization rate is far lower — about 11% virtualized — today. According to the product specialist, the low virtualization ratio for Linux is directly related to the use of Linux as an onsite server that runs in stores and warehouses. Because the store infrastructure has not yet gone through a standardization process, it has been hard to increase the virtualization ratios. However, according to the product specialist, that will change dramatically in the near future.

The trajectory the company is on parallels others in the industry today, where the company's investment in Unix is contracting at a fairly steep rate and Linux is growing at a steep rate to offset the Unix decline. Five years ago, the company was a big AIX shop, but today AIX is the smallest platform — in terms of instances — for the company. However, the cost of Unix operating systems on the comparatively expensive hardware platform drove the company to standardize x86 servers.

Over the next three to five years, the anticipation is for a continued increase in both Linux and Windows and a continued reduction in the Unix servers being used. Organic growth is expected on both Linux and Windows, with the application requirements expected to drive the platform selection. However, if any existing applications might switch platforms, the impact could be dramatic. For instance, the movement of a single application from Windows to Linux, or from Linux to Windows, could move 1,000 virtual instances from one platform to the other.

The application portfolio used by this retailer includes WebLogic, database, and application software from Oracle; DB2 from IBM; and the requisite suite of industry-specific applications that a large retailer would use.

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## **Putting Technical Standards into Play**

The company's current Linux technical standard marries a specific version of RHEL with the company's life-cycle plan. There is a Linux technical standard tied to RHEL 5 and another standard tied to RHEL 6. The retailer's policy is for the life cycle of the Linux technical standard to exist for seven years, terminating about three years before the end of life for Red Hat's extended support phase.

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The company's use of an LTS combines the strong commercial support backing that Red Hat can provide with a manageable number of deployment configurations. "The main reason it is like that, is because of our very large installed base," the product specialist adds. "When we do the move from RHEL 5 to RHE6, we need to make sure we don't get to having 200 unsupported Linux distributions running," he says. Of course, having multiple LTSs in use implies there will still be diversity within the retailer's environment. Given the Red Hat product release cycles, there is a potential for up to three LTSs to be in use simultaneously. As the product specialist notes, "There are huge differences between supporting RHEL 4 and 5. We have to retain knowledge to maintain those different platforms. That costs money." In the case of RHEL 4, the retailer's support burden is centered on that product, which is part of the motivation to move applications forward to either LTS 2 (RHEL 5) or LTS 3 (RHEL 6).

The product specialist notes, "That is something we see clearly with RHEL 4. We have about 200 installations of RHEL 4, and that generates about 60% of all the incidents we have for Linux software."

### ***Virtualization Use***

The company is currently a confirmed VMware shop, but there are some evaluation activities going on with Hyper-V at the moment. The company reviews different hypervisors on a regular basis, including KVM.

The hypervisor review may well tie into another initiative the company is working on — to build a private cloud for internal use. That is a five-year goal. Today, the company has a two portals, one for Linux and one for Windows, where users can go to order and trigger an installation of Linux or Windows. But that portal lacks the functionality to customize already-deployed virtual machines.

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## Focus on Availability

Being a retailer, where system outages can translate fairly directly to lost revenue, the company has a focus on operational availability. The product specialist says he and other members of the Linux operations team are measured on availability. "Today we are at 99.98% for our Level 1 services," he says. "Making everything stable and available is the focus."

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One key dimension behind the drive to improve availability is the ability to limit the variability of the server implementations. Using a single distribution in RHEL, leveraging Red Hat's expertise, and applying the LTS on top of that allow the company to improve the uptime of its Linux servers. In fact, the Linux team recently crossed a milestone where the availability improved from 99.97% to the current 99.98%. "We will see next year if we can make 99.99%," says the product specialist."

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## Satisfaction with RHEL and Open Source

"In general, we are pretty happy with the product. A lot of software vendors support RHEL. [Red Hat has] a policy on API compatibility within minor releases, and that is important. Upgrading from 5.1 to 5.9 does not affect the compatibility of the software. That is something we are happy with," says the product specialist. "The fact that Red Hat is one of the leading contributors to most of the open source projects is important."

His advice to other companies is direct: "First, build a standard, and don't install Linux using CDs or DVDs. You don't have to get a large number of Linux installations before you have to pay out of your pockets to do that. Building a standard is not complicated. There are recipes for building a Linux standard on the Internet." He adds, "Make sure your [Linux] plan is in synch with lower-level building blocks like storage, virtualization, and server hardware so you don't get surprised if the server hardware you buy does not work on your standard."

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## Case Study Takeaways

### ☒ Best practices:

- Establishing a Linux technical standard
- Proactively moving older RHEL and non-RHEL images to RHEL to achieve a standardized Linux environment
- Achieving 99.98% uptime
- Leveraging Red Hat Technical Account Manager

☒ **Opportunities:**

- ☐ Removing remaining RHEL 4 instances since they cause the majority of support incidences
- ☐ Drive standardization out to store locations around the world

## **ROI STUDY RECAP**

In the ROI study that IDC conducted in April 2011, we compared organizations using a commercial Linux subscription from Red Hat to support the vast majority of their Linux servers with organizations that are using a mixed environment of both commercially supported and nonpaid Linux distributions and with organizations that are primarily using nonpaid Linux distributions aboard their servers.

IDC's ROI study found that organizations that have standardized on Red Hat Enterprise Linux typically recover up-front subscription costs through more efficient operations, higher ratios of servers and users per administrator, and a significantly lower annual downtime cost compared with organizations that maintain a Linux server infrastructure that is either mixed or primarily nonpaid.

Specific observations include:

- ☒ Organizations standardized on RHEL have more efficient IT staffs. Shops standardized on RHEL average 174 servers per administrator, while mixed shops average 115 servers per administrator and primarily nonpaid shops average only 97 servers per administrator.
- ☒ In terms of end users per administrator, shops standardized on RHEL average 422 users per administrator compared with 373 users per administrator in mixed shops and 358 users per administrator in primarily nonpaid shops. This efficiency, combined with lower downtime and fewer help desk issues, means that RHEL shops incur \$18,960 in annual IT labor costs per 100 users, while primarily nonpaid shops experience annual IT labor costs of \$37,099 per 100 users.
- ☒ Downtime was another differentiator. Shops standardized on RHEL average 0.4 hours per year per user, or about one-fifth the amount of downtime experienced by shops that are mixed and slightly less for shops using primarily nonpaid Linux distributions on their Linux servers.
- ☒ Hardware and management software savings were also noted. The combination of more end users per server and more standardized maintenance operations, together with a longer useful life cycle (i.e., less frequent replacement), resulted in lower hardware costs. Hardware savings, combined with less need for management software tools, means shops standardized on RHEL spend \$12,029 per year per 100 users, while mixed shops spend \$19,201 per year per 100 users and primarily nonpaid shops spend \$25,206 per year per 100 users.
- ☒ Our findings indicate that organizations that heavily use nonpaid Linux end up with higher total operational costs of \$62,305 per year per 100 users compared

with \$37,494 per year per 100 users for shops standardized on RHEL, with the up-front subscription cost for RHEL being recovered through lower operational costs in as little as seven months.

## **CONCLUSION**

The customer portrayed in this case study highlights both the value of building a company standard and the challenge of making it be a pervasive standard. IDC makes the following observations of this customer's environment:

- ☒ Retailers are, by nature, efficient and cost sensitive. While other industries may not have the same focus on cost control, the lessons learned and the processes used by retailers apply to other industries. In fact, an argument could be made that the cost-control pressure that retailers face makes IT professionals in retail into thought leaders for the larger industry.
- ☒ Having a Linux technical standard built on top of a strong commercial product offering is an innovative way to approach the need for a standardized build. Other organizations that don't have any form of a standardized build of their Linux environment would be well advised to consider adopting this concept.
- ☒ Widely distributed server infrastructure, in this case distributed worldwide, makes it challenging to implement standards and can serve as an impediment to rolling out modern solutions like virtualized servers.

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