WHITE PAPER

Red Hat Enterprise Linux in Use: Banking on Linux to Reduce Unix Costs

Sponsored by: Red Hat

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June 2012

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 finding was apparent in a recent IDC study that compared organizations that standardized on Red Hat Enterprise Linux (RHEL) with organizations that used a mixture of Linux distributions or a mix of RHEL and nonpaid Linux. IDC's research finds 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 large bank highlighted in this IDC White Paper is representative of the downward cost pressures that some industry sectors continue to face in the aftermath of the 2008–2009 downturn. Today, the bank's IT organization is focusing on replacing older, expensive Unix servers with virtualized x86 Linux instances. This transition has progressed quickly over the past few years, although the pace of that transition will moderate as the easy-to-move servers are migrated. The company intends to continue centralizing its Unix/Linux infrastructure around a RHEL standard because of the long support life cycle that RHEL offers and the cost reductions RHEL brings to the company's IT environment.

- This organization has a clear plan to shift the balance of its Linux/Unix server installed base to favor a far greater Linux presence. This comes in parallel with a virtualization initiative that will reduce the overall number of physical servers. The bank has adopted best practices to optimize its environment; the bank's single commercially supported Linux distribution will be heavily virtualized in the future, ensuring flexibility and low operational costs from its Linux infrastructure.
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: Banking

Objective: Migrate from Unix to Linux; standardize on RHEL

Current status: Unix/Linux mix at 40% Linux today, down from 95% Unix four years ago
Banking on Linux to Reduce Unix Costs

Financial services is among the more heavily regulated industries today, and that constant constraint combined with recent financial downturns means that the pressure is on many banks to reduce costs while improving — or at a minimum, maintaining — customer service levels. Such is the case for a large European bank that is focusing on replacing aging, expensive Unix servers with Red Hat Enterprise Linux on virtualized x86 servers.

The Challenge

Like many other companies in the banking world, this bank faces cost reduction pressures resulting from challenging economic conditions and the need to be competitive with other financial institutions in its core markets. Over time, the organization's IT infrastructure had become complex, with a multitude of servers and operating system versions in use, leading to unnecessarily high operational costs.

The head of Unix engineering, who is responsible for the Unix and Linux server infrastructure, is responsible for an environment that is currently split primarily between Solaris and RHEL. The Unix/Linux infrastructure accounts for about 30% of the company's total servers, with Windows accounting for close to 70% of the overall total. The company also has a handful of midrange and mainframe class servers in use.

The combined Unix/Linux environment today breaks down to about 60% Unix and 40% Linux. By comparison, four years ago, the mix included about 95% Unix systems, with Linux making up the 5% balance. The head of Unix engineering says that over the next three to five years, if the cost benefits persist with Linux, the organization will focus on reaching a 50:50 split between Unix and Linux.

The Unix environment is heavily dominated by Solaris, with only a handful of AIX servers in the mix. Likewise, the Linux environment is highly standardized, with nearly 100% of the Linux servers running RHEL. There remain only a few instances of SUSE Linux running on virtual machines, and a scattering of CentOS and Fedora, with the latter two used for proxy serving.

The company has been using the Solaris Container (Zones) technology for instance isolation on the Unix servers. The head of Unix engineering estimates that across the Unix servers, there are 8,000–10,000 Solaris Containers in use.

In contrast, the Linux environment has been largely unvirtualized up to this point, other than a few instances of SUSE Linux that are running on VMware (the Windows servers are virtualized on VMware as well).
a lowering of costs and an increase in reliability. However, the company found that Linux was better suited as a migration platform for its Unix servers, and Unix-to-Linux migration became its focus.

While the company had initially started with SUSE Linux, five years ago, it added RHEL as a second corporate selection. After gaining experience with RHEL, the company made a decision to switch to RHEL as its strategic platform. Today, the company has moved close to 100% of its Linux instances over to RHEL. The company is in the process of replacing the remaining competitive distributions with RHEL deployments as replacement cycles and application compatibility allow. The company cites the ability to support critical enterprise business applications through the long support life cycle that RHEL offers as a key reason for the RHEL standardization initiative.

The company considered adding but opted to not add Oracle Linux to its platform mix. Says the head of Unix engineering, "We don't want to use Oracle Linux because then we [would] have only one main vendor, Oracle, then we are no longer independent with our IT strategy."

Interestingly, the company now has plans to standardize on RHEL 6's integrated Kernel-based Virtual Machine (KVM) technology, which is identical to the functionality in Red Hat Enterprise Virtualization (RHEV). Moving forward, the goal is to ramp up to operating system instance densities on the Linux servers similar to the 4:1 to 5:1 ratio that Solaris experiences today, then continue to ramp until the Linux servers are 70–80% virtualized. As the adoption of KVM rolls out, the expectation is for the number of physical Linux servers to contract.

The company sees no role for public cloud in the near future, partly because of the regulatory requirements that the banking industry must adhere to.

**Emphasizing RHEL 6**

The bank has a mix of RHEL in use, ranging from aging RHEL 3 and RHEL 4 instances to the more current products RHEL 5 and RHEL 6. In an internal effort to consolidate its RHEL deployments to a smaller number of releases, the IT organization no longer will support requests from internal clients for any changes on RHEL 3 and RHEL 4 installations. "Our main focus is, as much as possible, to migrate applications to RHEL 6," says the head of Unix engineering.

**Management Solutions**

Like many Linux (and Unix) shops, this bank has a collection of tools for management, including many that are homegrown. "We use the same tools for RHEL and for our Solaris environment," notes the head of Unix engineering. The company does, however, use IBM Tivoli for performance management.
It's All About Reducing Cost

The big picture corporate initiative today at this European bank is about stripping costs out of business operations. The head of Unix engineering notes, "[Our] philosophy at the moment, the big picture, is cost reduction. But we must offer customers the same service levels as before."

Giving advice to his colleagues in the industry, the head of Unix engineering says that one of the gems that makes Red Hat special is the Red Hat Network. "From my view, the Red Hat Network, [and] the Red Hat Network Satellite, is really the technology highlight. If someone is using Red Hat, they should definitely use the Red Hat Network Satellite."

Case Study Takeaways

- **Best practices:**
  - Migrating older RHEL 3 and RHEL 4 instances to RHEL 6
  - Extending virtualization use to Red Hat using KVM
  - Strong user of Red Hat Network and Red Hat Network Satellite for systems management

- **Opportunities:**
  - Accelerate replacements of older RHEL images
  - Accelerate the use of virtualization for Linux

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

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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 provides a glimpse into the operational activities typical of a large organization. IDC makes the following observations of this customer's environment:

- This customer is working to standardize its environment on RHEL 6 but, like many other organizations, faces the prospect of driving forward older installations that continue to run well enough to have been left untouched to date. Bringing these older installs forward makes good sense since doing so not only leads to a more standardized operating system deployment but makes virtualizing and consolidating these workloads easier.

- This customer, like many others, continues to take a best-of-breed approach to its technology selections. In this case, best-of-breed includes a consideration for the technology solution as well as the acquisition and operational costs.

- This customer is unusual in the respect that it has chosen to retain Unix for its infrastructure workloads. In general, much of the industry migrates infrastructure workloads from Unix to Linux first and follows with increasingly important application workloads.
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