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The global economy is driving competition at an ever-increasing rate, forcing enterprises both small and large to work as cost-effectively and efficiently as possible. To reduce costs in the datacenter, many IT managers are moving to commodity x86-based servers to replace their legacy RISC servers, such as those based on Oracle SPARC processors. To help ensure reliable, efficient operation, more companies migrating from SPARC choose Red Hat® Enterprise Linux® than any other platform.

A decision to move to x86 and Red Hat Enterprise Linux is a sound one and is proven by the momentum of migrations, as well as reported benefits from enterprises that have completed migrations. Market share numbers also point to the increased adoption of Linux – server operating system use is trending toward Linux and Red Hat Enterprise Linux is the market share leader in enterprise server operating systems. In contrast, the Solaris operating system market share is declining. UNIX server shipments are declining and x86 servers now make up 96 percent of all server units shipped worldwide. This shift in market share has many implications and has already had an effect on the availability of applications and device drivers on various operating systems. Since Linux is license free and open source, an increasing number of ISVs develop their applications on Linux first and then perhaps port to other operating systems, including Solaris, but less frequently on Solaris on x86.

By migrating to Red Hat Enterprise Linux, you gain the flexibility to run the applications you require on the right platform, regardless of processor type, without sacrificing the RAS features of enterprise UNIX or replacing or retraining administrative staff. This paper discusses how this flexibility and similarity to Solaris make Red Hat Enterprise Linux an ideal choice for your migration projects.

WHY MIGRATE TO X86 AND RED HAT ENTERPRISE LINUX?

Typically, enterprises consider migrating hardware, operating system, or applications under a variety of circumstances. Hardware needs to be refreshed to increase application performance, or to help comply with corporate mandates to increase power and energy efficiency, or to reduce costly maintenance fees on legacy systems. With more powerful multi-core x86 servers, you might be consolidating the infrastructure to reduce carbon footprint and total cost of ownership (TCO) or as part of a corporate merger. You might be virtualizing the environment and require the ability to mix and match operating systems on shared servers in order to increase flexibility and lay the foundation for cloud computing.

Other issues that might cause you to consider migrating to x86 and Linux are:

- Vendor release schedules or support policies (end of standard or extended maintenance leading to increased fees)
- A desire or mandate to minimize the number of unique platforms, increase standardization to decrease costs, decrease complexity, or increase compliance
- A corporate requirement to increase choice of hardware, applications, peripherals, and other components
- A desire to move to commodity platforms without retraining or replacing IT staff
- A desire or mandate to adapt more quickly to change by adopting open source software

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1 IDC Platform Migration Multiclient Study, September 2010
For enterprises currently utilizing Oracle SPARC hardware and the Solaris operating system, there are a number of other reasons that might lead you to consider migrating to an alternative platform. Oracle’s integrated hardware and software offerings are attractive if you only run Oracle software products and are looking for a single point of purchase/support. However, they also leave you increasingly vulnerable to indiscriminate cost increases, limit your deployment options, and lock you into one vendor and their products and product roadmap. If you also use non-Oracle applications, you might be concerned by the possibility that relationships with other vendors, such as IBM, SAP, and SAS, that offer competing products to Oracle, might become strained and cause support issues in the long term.

In addition, Solaris 11 contains a number of significant changes, including a new installer that replaces JumpStart, new packaging, and a requirement to use the Zetabyte File System (ZFS) file system for root, which are likely to require a large migration effort. Some enterprises delayed the adoption of Solaris 10 given the amount of change and effort required to upgrade, and remain on previous versions of Solaris. Because the major changes in Solaris 11 focus on system management functionality, the impact to training and operational procedures could be substantial. Since a number of these new features are very similar to functionality in Linux, it makes sense to consider migrating to Linux, rather than Solaris 11.

**LINUX DELIVERS SUBSTANTIAL BENEFITS**

There are a number of substantial benefits that can be attained by migrating from Solaris to Red Hat Enterprise Linux, the two greatest of which are reducing TCO and increasing deployment options. According to Harvard Research Group, “Customers that have migrated from proprietary UNIX systems to Linux are satisfied with the outcome based on the reduction in TCO, increases in operational responsiveness and efficiency, and improved ROI for IT infrastructure capital expenditures. In addition, IT decision-makers are satisfied when migrating to the new Xeon 7500 series processor based IA platforms running Red Hat Enterprise Linux because of the improved features, functionality, and workload capabilities.”

**REDUCED TCO**

One of the key factors that drives Solaris users to look at alternative operating systems is licensing and support costs. With Red Hat Enterprise Linux, you pay only for subscriptions, not software licenses. Traditional software licenses lose value over time. But with the subscription model, you pay as you go, and the value returns to you over the lifetime of the subscription in the form of access to all of the shipping versions of the operating system, a steady stream of feature enhancements, proactive security updates, and additional hardware and software support. In addition, a subscription model helps reduce financial risk by offering predictable IT costs and access to the expertise of the leaders in Linux platform support and development.

Another area where you can garner savings by migrating to Red Hat Enterprise Linux is lower-cost administrators. Because Linux is freely available, it is taught as part of the standard computer science curriculum at many higher-learning institutions. As a result, there are many more Linux administrators in the market than UNIX administrators, and they therefore command a lower salary. In addition, elementary and secondary schools, as well as governments around the world, have deployed or are migrating to Linux on their desktops and server environments in order to reduce TCO. Compare this to the number of Solaris systems running in these environments and it’s easy to see where skilled administrators will be focused in the future.

Cox Enterprises recently migrated to Red Hat Enterprise Linux and experienced real savings. “Our analysis was correct as supporting the commodity hardware that Linux runs on is much more affordable than the support that we needed to maintain proprietary hardware. The savings in support, both internally and externally, associated with Red Hat Enterprise Linux is significant for us,” said Dean Abercrombie, Cox Enterprises’ UNIX and storage systems group manager.

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2 HRG Assessment Linux Migration 2010.
3 Median expected salary for UNIX administrator is $85,708 and $90,538 for Linux. http://www1.salary.com/Linux-Administrator-Salary.html
**INCREASED CHOICE**

In a world where the only constant these days seems to be change, it’s critical to have the choice to implement the most efficient and cost-effective solutions available, while still reducing complexity as much as possible. Because Red Hat Enterprise Linux runs on more platforms than any other operating system, you have unparalleled choice in hardware platform deployment options. Red Hat Enterprise Linux is broadly supported, including on the following major platforms:

- IBM System x, System z, Power, and BladeCenter
- HP ProLiant, Integrity (Red Hat Enterprise Linux 5), and BladeSystem
- Dell, Cisco, Fujitsu, Fujitsu Siemens, Hitachi, Intel, Lenovo, NEC, SGI, Tyan, Unisys, and others

In addition, applications that are certified to run on Red Hat Enterprise Linux will also run unmodified on a Red Hat supported hypervisor including Red Hat’s Kernel-based Virtual Machine (KVM), VMware, Microsoft Hyper-V, and IBM Lpars, further enhancing the flexibility of your environment.

To maximize your flexibility and portability, Red Hat provides several options for application isolation ranging from integrated virtualization technology, to cGroups, to SELinux sandboxes. Red Hat provides ABI/API compatibility from the physical server to the virtual guest, so all applications are supported in either baremetal or virtual installations. In addition, container technology will be available in a future version of Red Hat Enterprise Linux 6.

**OUTSTANDING FLEXIBILITY, SCALABILITY, AND RELIABILITY**

There is a historical perspective that x86 servers lacked the performance, availability, and scalability of larger proprietary platforms. This hindered the adoption of x86 servers for core enterprise applications. Today, many enterprises are migrating core enterprise applications from expensive proprietary platforms, such as SPARC, or older x86 servers to Red Hat Enterprise Linux on multi-core, standards-based x86 servers. For example, the new Intel Xeon Processor 7500 series is now available in systems that are designed for Linux and are scalable to 64 cores, 2 TB RAM, and 16 I/O slots. In this case, Red Hat works with hardware vendors and Intel to deliver complementary software support features to make hardware advances in scalability, flexibility, reliability, and power management available to users at an extremely competitive cost point.

Red Hat Enterprise Linux has proven performance on systems with over a hundred cores and many terabytes of memory, making it suitable for the largest enterprise application deployments. The scalability of Linux is proven in the fact that over 91 percent of the Top 500 supercomputer list run Linux, while UNIX is down to 3.8 percent. The reliability of the operating system is evident in the number of companies and organizations that rely on Red Hat Enterprise Linux to run their mission-critical applications, including Salesforce.com, NYSE Euronext, and the U.S. Department of Defense.

The latest major release from Red Hat, Red Hat Enterprise Linux 6, includes features that make it an exceptional operating system for core enterprise applications:

- Support for up to 4,096 CPUs and 64 TB of memory
- Automatic isolation of defective CPUs and memory
- Improved hardware awareness that allows the kernel to take better advantage of multi-core and NUMA architectures, and when possible, consolidate tasks to fewer CPU sockets to reduce power consumption
- Resource controls via cGroups that provide the ability to reduce resource contention, improve overall system performance, and help applications meet service level agreements (SLAs)
- Integrated hypervisor that allows applications to move from physical to virtualized environments independent of underlying hardware
COMMUNITY-BASED INNOVATION

Red Hat Enterprise Linux is designed with large datacenters and virtualization in mind. Red Hat’s world-class engineering organization works in collaboration with the open source community and Red Hat subscribers to create and test an innovative technology that provides unmatched availability, security, and scalability. A Red Hat subscription provides an enterprise-class application platform that evolves with your business and the fast-moving computing industry. It allows you to leverage the unique and leading position Red Hat has in the open source development community, as well as Red Hat’s strong industry relationships. Through these relationships, Red Hat combines industry and community innovation with its enterprise platform products, aligning customer and partner road maps. This means you can migrate to a manageable, reliable, flexible, and secure IT infrastructure that your business demands.

Red Hat is the leading commercial contributor to the Linux kernel, JBoss.org, and countless other open source projects. Because Red Hat is the world’s leading open source provider, your subscription allows you to leverage Red Hat’s involvement in other open source initiatives, as well as its relationships with the software and hardware vendors you rely upon.

Red Hat believes that communicating with other developers in the community provides an amazing starting point for the next generation of problems. One person or company doesn’t have to develop alone any longer – it’s likely someone else has started on the same problem or is at least minimally interested in refining the same ideas. Red Hat’s approach is to be open source first, not after – open source is viewed as a necessity to facilitate the worldwide collaboration needed to develop next-generation solutions.

When considering a change in platform, consider this: 25 percent of the changes to the Linux kernel in 2010 were contributed by Red Hat (12.4 percent), IBM (6.9 percent), and Intel (5.8 percent), making up a total of over 47,000 contributions. That’s an incredible amount of engineering, collaboration, and commitment towards innovation that can benefit everyone, not just one company.

Yes, there’s a lot to be said about long-term stability, which Red Hat provides for every release of the operating system, but the computing world is also changing faster than ever before and a Gartner report states that “CIOs must re-imagine IT to support growth and competitive advantage”4. Consumer-driven trends, such as mashups and social media are making their way into corporate use. Gartner is also advising CIOs to get involved now in adopting tablets in the enterprise5. And, more applications and data are moving to the cloud. As the number and variety of end-points grow, the demand on your servers, your flexibility, and your creativity increases exponentially. It’s becoming clear that to stay competitive, you need the ability to quickly change with the times and the only operating system and development community that is poised to support you in this effort is Linux.

THE STRONGEST FUTURE

Linux is 20 years old in the summer of 2011 and both Linux and Red Hat have a strong future ahead of them. As quoted in an article for InternetNews.com, Jim Zemlin, the Executive Director of the Linux Foundation said, “What makes Linux so great is that there are so many self-forming communities around Linux that use a single kernel to address so many different market segments.”6 Linux is the only operating system that is across the spectrum of servers, desktops, mobile devices, and embedded consumer devices, while still also maintaining a consistent kernel. This broad development community and stability enables an intersection of ideas that enhances the strength of the entire Linux ecosystem.

The market numbers show Linux adoption on the rise around the world and many ISVs as well as startups are developing on Linux. Because it is easily available, open source, and license-free, many of the latest technologies are available on Linux first, and most silicon is prototyped with support for Linux. In addition, Linux is a building block for across silicon platforms, including Intel x86, ARM, and MIPS7.

4 http://www.gartner.com/it/page.jsp?id=1526414
5 http://www.gartner.com/it/page.jsp?id=1462813
7 http://www.gartner.com/it/page.jsp?id=1526414
In addition, as cloud offerings mature, more companies will begin deploying private or hybrid clouds. A recent Gartner survey of CIOs revealed that a large number of CIOs in the survey expect to run a majority of IT in the cloud or on Software-as-a-Service (SaaS) technologies. Linux is at the forefront of cloud deployments and development, and is also the basis of Google Android and the operating system supporting Google’s cloud offering. Red Hat is also at the forefront of the cloud movement and has been working with Amazon EC2 (much longer than Solaris), IBM, Fujitsu, and others for quite some time to provide cost-effective, reliable cloud services.

No other operating system has ever had, or can boast, such a level of industry support and commitment. With support from nearly every major chip manufacturer, hardware vendor, and ISV, anyone of them could drop support or stop developing and Linux would still exist and be supported. This is simply not true for Solaris or any other brand of UNIX operating system.

**A More Personal Relationship**

Oracle’s business model is based on licenses, support, and maintenance agreements. Such traditional models only allow you to contact Oracle when something goes wrong. A Red Hat subscription, however, delivers high-quality software and maintenance along with information and support services that span the entire application infrastructure lifecycle. Red Hat encourages contact, but not just when there’s a problem. It is a truly collaborative and consultative relationship. When you engage in the Red Hat support process, you will often work with the people who write and test the software and oversee the open source development of the underlying technologies. You can also contact Red Hat to leverage the expertise of its people during all phases of planning, testing, migrating, maintaining, and upgrading your infrastructure.

**Long-Term, Worldwide Support**

One of the greatest benefits of Red Hat’s subscription-based support model is long-term, enterprise-class, worldwide support. Yes, the operating system is open source, and brings with it all of the benefits of open source collaboration and innovation, but it’s also backed by the support you need to run your business applications with that confidence that help is available when you need it. The subscription model lets Red Hat create a true relationship with you before there’s a problem. That means low-cost, high-value, reliable computing.

Each version of Red Hat Enterprise Linux is supported for up to 10 years, providing a stable platform for enterprise applications. New technology is delivered throughout the lifecycle when it is mature and thoroughly tested and includes support at no additional cost.

Subscriptions include ongoing service and support, which helps keep systems secure, reliable, and up-to-date. Subscriptions also include access to unique knowledge and technical expertise from Red Hat’s Global Support Services and engineering teams, as well as access to a global customer portal. The customer portal provides a single point of entry to access product knowledge such as document and video content, downloads, case management, security updates, subscription management, and proactive planning tools such as uses cases and solutions.

Red Hat must absolutely provide superior support to keep enterprises renewing their support contracts, and numerous service awards and an increasing number of subscriptions bear proof of Red Hat’s commitment to support excellence. Red Hat has been recognized for delivering customer value for seven consecutive years by the CIO Insight Vendor Value survey, an annual survey polling IT decision-makers at U.S.-based enterprises on how they perceive the value of their IT vendor’s product and service offerings. In addition, Red Hat is a top-three finalist in the HDI Team Excellence Awards.

“The top three finalists of HDI’s Team Excellence, in either Internal or External, demonstrate to our support industry peers that the teams have achieved high levels of excellence in the three categories of people, process and technology, making Red Hat a leading-edge company in the support industry,” said Sophie Klossner, executive director of Membership at HDI. “Because of the history of HDI’s Team Excellence award winners and the quality of teams they represent, Red Hat is joining an elite group of companies that share in the excellence they have developed through their support teams, generating through their entire organization.”

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8 HRG Assessment Linux Migration 2010.
SIMILARITY OF RED HAT ENTERPRISE LINUX TO SOLARIS

Red Hat Enterprise Linux shares a number of similarities to Solaris, making it easier to migrate your enterprise Solaris workloads to Linux. Red Hat Enterprise Linux is backed by long-term, worldwide support, includes tools that are very similar to tools used in Solaris, offers similar infrastructure tools, and is administered similarly to Solaris.

Since both the Red Hat Enterprise Linux and Solaris platforms use POSIX compliant APIs, porting time is, if necessary, greatly reduced. In addition, any open-source software used with or supported by the Solaris platform is generally available as part of or for Red Hat Enterprise Linux, which speeds the migration and training process.

HP and IBM also offer Solaris-to-Linux porting kits and assistance, which can reduce porting time by 10 times and the number of errors by 90 percent. For example, the IBM Migration Kit for the Solaris operating system to Linux is a free set of software tools and guides. The tools identify where code changes are required to run Solaris code, shell scripts, and make files on Red Hat Enterprise Linux to make it easier to make the necessary changes and test them on the Linux platform.

SIMILAR TOOLS

Many of the same tools used to manage Solaris are similar to tools in Red Hat Enterprise Linux. This similarity makes Red Hat Enterprise Linux a logical choice over a completely different operating system like Microsoft Windows Server because you can retain your current administrative staff and limit the amount of training needed.

<table>
<thead>
<tr>
<th>FUNCTIONALITY</th>
<th>RED HAT ENTERPRISE LINUX</th>
<th>SIMILAR TO SOLARIS FUNCTIONALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package Management</td>
<td>RPM Package Manager: Software bundled into installable RPM packages that help automate software management</td>
<td>Similar to SVR4 packages (pkgadd) used in Solaris. Can front-end with Yum, which is similar to OpenSolaris Image Packaging System (IPS)</td>
</tr>
<tr>
<td>Auto Installer</td>
<td>Kickstart</td>
<td>Similar to JumpStart</td>
</tr>
<tr>
<td>Logical Volume Manager</td>
<td>LVM, LVM2, LVM2 supports snapshot capability</td>
<td>Similar to Solaris Volume Manager</td>
</tr>
<tr>
<td>Software Updates</td>
<td>Software Updater</td>
<td>Similar to Solaris 10 update Manager</td>
</tr>
<tr>
<td>Software Update Management</td>
<td>Red Hat Network and Red Hat Network Satellite</td>
<td>Similar to Sun Connection/Oracle Enterprise xVM Ops Center for managing updates</td>
</tr>
<tr>
<td>Default GUI</td>
<td>GNOME</td>
<td>GNOME</td>
</tr>
<tr>
<td>Free Software Package Repository</td>
<td>EPL</td>
<td>Similar to Sun Freeware and OpenSolaris Contrib pkg repository</td>
</tr>
<tr>
<td>Init Scripts</td>
<td>System V-style init scripts for starting, stopping, checking standalone services, etc.</td>
<td>Similar to Solaris 9 and earlier (and Solaris 10 legacy services)</td>
</tr>
<tr>
<td>General Administration Tools</td>
<td>vmstat, top, iostat, netstat</td>
<td>vmstat, top, iostat, netstat</td>
</tr>
<tr>
<td>Military-Grade Security</td>
<td>SELinux (EAL) Common Criteria Certified</td>
<td>Similar to Trusted Solaris</td>
</tr>
</tbody>
</table>
All of Oracle’s major applications are supported on Red Hat Enterprise Linux, so you can move to Linux as a first step of the migration and then replace hardware as needed. The differences between platforms are usually relatively minor and require a low degree of migration effort. In addition, thousands of leading ISV applications are certified on Red Hat Enterprise Linux, providing the choices you need to mitigate vendor lock-in by replacing applications that are Solaris only.

Because Linux is managed similarly to Solaris, administrator skill sets can be quickly transferred to Linux from Solaris, making it an ideal companion or replacement for Solaris environments. There are a variety of resources to help with this transition, including:

- Red Hat Training (discussed later in this paper)
  www.redbooks.ibm.com/abstracts/sg247186.html
- IBM: Technical resources for Linux programmers and system administrators:  
  www.ibm.com/developerworks/linux/
- Linux Journal:  
  www.linuxjournal.com

### Software

<table>
<thead>
<tr>
<th><strong>FUNCTIONALITY</strong></th>
<th><strong>RED HAT ENTERPRISE LINUX</strong></th>
<th><strong>SIMILAR TO SOLARIS FUNCTIONALITY</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Native Multipathing</td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td>Dynamic Tracing</td>
<td>System Tap</td>
<td>Similar to DTrace</td>
</tr>
<tr>
<td>Resource Management</td>
<td>Resource Management</td>
<td>Similar to Resource Manager</td>
</tr>
<tr>
<td>High Availability</td>
<td>High Availability Add-On</td>
<td>Similar to Solaris Cluster</td>
</tr>
<tr>
<td>File Systems</td>
<td>ext2, ext3, ext4, ReiserFS, FAT, ISO 9660, UDF, NFS, support for encrypted file systems</td>
<td>Ext4 similar to ZFS, Ext4 scalable to unlimited sub directions, file system size of EB</td>
</tr>
<tr>
<td>Development Tools</td>
<td>Can recompile using GNU tools on SPARC then move to Linux. Likely to only run into API issues only when moving to Linux. (<a href="http://searchenterprise-priselinux.techtarget.com/tip/Solaris-to-Linux-porting-part-two">http://searchenterprise-priselinux.techtarget.com/tip/Solaris-to-Linux-porting-part-two</a>)</td>
<td>GNU tools</td>
</tr>
<tr>
<td>Networking</td>
<td>Both support IPV4 and IPV6</td>
<td></td>
</tr>
<tr>
<td>Integrated Firewall</td>
<td>Netfilter</td>
<td>Similar to IPfilter</td>
</tr>
<tr>
<td>Cluster File System</td>
<td>GFS2 (in Resilient Storage Add-On)</td>
<td>Similar to CFS in Solaris Cluster</td>
</tr>
</tbody>
</table>

### Skills

Red Hat Enterprise Linux – Migrate from Solaris with Confidence
MORE CHOICE — STRONG RELATIONSHIPS WITH HARDWARE AND SOFTWARE VENDORS

Red Hat maintains relationships with thousands of software and hardware vendors, as well as cooperative alliances with major hardware and enterprise software vendors. Through these relationships, Red Hat combines industry and community innovation with Red Hat enterprise platform products to deliver robust solutions your business can rely on, in one of the largest technology certification ecosystems in the world. This level of choice is unique to Linux — no other operating system is supported on more platforms — and Red Hat Enterprise Linux is the leader in Linux subscriptions.

HARDWARE VENDORS

Red Hat works closely with processor manufacturers and platform vendors to help ensure that the products from both parties leverage the technological advantages of the other. Red Hat has highly strategic partner alliances with the leading industry platform vendors. This level of partnership delivers the increased choice, performance, flexibility, reliability, power management, and cohesive support that is required by IT managers that must quickly respond to demands for rapid change and increased capacity.

Because Red Hat is strategically aligned with all of the major hardware vendors, you can take advantage of the latest multi-core processors deployed on the key platform offerings. Red Hat continually collaborates with hardware vendors specifically around reliability features, including fault isolation and control groups, to further increase the reliability of individual systems.

The sections below describe in more detail Red Hat’s relationship with a number of hardware vendors.

INTEL

Red Hat and Intel have been working closely for many years to offer high-performance, low-cost alternatives to proprietary IT solutions. For example, Red Hat and Intel collaborated during the development of Intel’s Nehalem processor so that when was processor was announced, Red Hat Enterprise Linux was fully supported. The virtualization capabilities provided in Red Hat Enterprise Linux were highly optimized to utilize the latest features of the Intel Virtualization hardware. Red Hat Enterprise Linux was also optimized to deliver the full benefits of Nehalem’s power management enhancements.

Intel and Red Hat have also worked extensively with the open source community to drive innovative virtualization solutions to the industry. By combining the advancements in Intel Virtualization Technology (which is supported by the native KVM hypervisor), Red Hat’s virtualization infrastructure, and open source community innovations, Red Hat Enterprise Linux running on Intel processor-based platforms offers a solution with outstanding performance, scalability, and agility.

“The combination of working together with hardware and software aspects had really allowed us to innovate in the open source community. Red Hat is a real, strong partner and a trusted adviser for us to work with to ensure that as we build our platforms, we deliver the most compelling platforms in the marketplace,” said Doug Fisher, VP and GM, System Software Division, Intel.

AMD

AMD and Red Hat have been working together for years to optimize the Red Hat Enterprise Linux operating system for AMD Opteron processors. The combined solution of Red Hat Enterprise Linux and AMD Opteron 6000 Series platforms provides all of the capabilities of high-end proprietary systems but with the cost savings and flexibility of an industry-standard architecture. The AMD Opteron 6000 Series platform features AMD-V 2.0 technology, which is designed to help simplify virtualization solutions, enabling near-native application performance. AMD-V was developed in collaboration with Red Hat, and Red Hat Enterprise Linux takes advantage of AMD-V 2.0’s advanced technology features.
IBM

Red Hat has maintained a strong partnership for more than 12 years that continues to bring cost-effective, stable, highly secure, reliable, and high-performing solutions to market. Red Hat Enterprise Linux is tuned to support the built-in performance, reliability, availability, and serviceability capabilities of IBM System z, System x, and IBM Power systems, giving you the choice to deploy your applications across IBM’s product portfolio utilizing a single operating system. Red Hat Enterprise Linux takes advantage of the functionality of multi-core chips from Intel and AMD, as well as IBM’s new eight-core POWER7 processors, to deliver optimal performance from each platform. In addition, IBM’s cloud environment is based on Red Hat technology and both companies deploy each other’s solutions in-house.

IBM’s commitment to Linux and Red Hat Enterprise Linux is very real. In fact, IBM contributes more changes to the Linux kernel than any other hardware vendor, outpacing Oracle’s contributions by more than three times.

“I think Red Hat Enterprise Linux 6 provides a very strong infrastructure for customers in all sorts of industries, and it will give them the security, if you will, to know that it has the capacity to handle whatever they throw at it,” said Bob Sutor, VP, Open Systems and Linux, IBM Software Group, IBM.

HP

For over 11 years, HP and Red Hat have partnered to provide powerful, integrated solutions that deliver the technical benefits of a robust UNIX-like operating system and the economic benefits of open source software with the confidence that comes from buying systems, software, and services from HP. As a result, HP offers more Red Hat-certified platforms than any other vendor and the combination of Red Hat Enterprise Linux and the versatile and powerful HP ProLiant and BladeSystem servers demonstrate outstanding performance across the industry’s most demanding and diverse workloads. Companies and organizations around the world see the value of the x86 and Linux as evidenced by the fact that more enterprises run Red Hat Enterprise Linux on HP ProLiant servers than any other server.

“HP and Red Hat have a greater than 10-year alliance. As time has progressed and our customer requirements are clear about stable and robust environments, Red Hat Enterprise Linux personifies all of that in all of Linux,” said Scott Farrand, VP, Industry Standard Servers and Software, HP.

CISCO

Red Hat and Cisco collaborate to deliver ground-breaking solutions that help enable businesses to deploy mission-critical applications in a virtualized, high-performance, supported datacenter environment. Together, the companies offer next-generation computing by integrating the Cisco Unified Computing System Virtual Interface Card with KVM. This combination creates a logical network infrastructure, including large-scale cloud deployments, which can help to provide full visibility, control, and consistency of the network for virtualization without sacrificing performance, thus enabling IT managers to achieve new levels of IT efficiency. The benefits of the Cisco Unified Computing System’s simplified architecture and Red Hat’s centralized virtualization management, IT managers can reduce both the cost and time to deploy business applications, resulting in lower TCO.

“Red Hat and Cisco continue to raise the bar for what’s possible for IT with innovative new architectures, technologies, and capabilities,” said Lew Tucker, VP and CTO, Cloud Computing, Cisco.

DELL

Dell and Red Hat work together to bring business-ready solutions to IT organizations. Recently, Dell partnered with Red Hat to deliver enhancements for Red Hat Enterprise Linux 6, where Dell engineers contributed to the kernel to ensure Red Hat Enterprise works on all Dell servers. The two companies worked together to make Dell systems easier to deploy and manage with the following: integrated device drivers, integrated Dell OpenManage, native PowerEdge, Red Hat Network Satellite hardware patch management, tight integration of storage, and intelligent power management.
“Red Hat Enterprise Linux 6 is an incredibly strategic platform for Dell. We don’t have a proprietary UNIX offering. Linux is our offering, Linux is our UNIX strategy, Red Hat is our strategic partner. We have a very strong relationship there that customers are seeing every day. Dell is fully committed to Linux. We have hundreds of Red Hat Certified Engineers on staff, focused on driving certification, innovations to the Linux kernel, and plowing that back into the community. We link our support organizations to make sure that customers receive the highest levels of support,” said Tim Mattox, VP Enterprise Product Management, Dell.

“Red Hat Enterprise Linux coupled with Dell PowerEdge servers enables customers to build, manage, and maintain an efficient datacenter while preserving flexibility and choice. The technology leadership delivered with Red Hat Enterprise Linux 6 on Dell platforms provides exceptional value over RISC alternatives.”

**FUJITSU**

Building on the companies’ long-term partnership, Red Hat Enterprise Linux is now available as a guest operating system on Fujitsu’s On-Demand Virtual System Service public cloud. Red Hat Enterprise Linux is an effective platform for running applications in the cloud with its broad base of developers and extensive ecosystem of certified applications that allow for flexibility, portability, and scalability. The combination of Red Hat Enterprise Linux and Fujitsu’s enterprise-ready On-Demand Virtual System Service offers a powerful infrastructure for the cloud with proven Red Hat technologies and enterprise-class support from Fujitsu, backed by Red Hat.

“With the availability of Red Hat Enterprise Linux on our service, our customers can access the leading distribution of enterprise Linux in the world. Through our collaboration with Red Hat, we are able to provide this highly demanded service to our customers,” said Chiseki Sagawa, president, Service Oriented Platform Strategy & Development Office at Fujitsu.

**SOFTWARE VENDORS**

Red Hat cultivates and maintains relationships with hundreds of software vendors, certifying their applications on Red Hat Enterprise Linux. Here are just a few examples of enterprise application vendors that Red Hat collaborates with around Red Hat Enterprise Linux.

**SAP**

The SAP and Red Hat global alliance brings together two industry leaders in a partnership that delivers extraordinary business value to businesses and organizations around the world. Red Hat and SAP have a decade-long technology and engineering collaboration program through the SAP Linux Lab, resulting in comprehensive product support for SAP business applications on Red Hat Enterprise Linux.

Red Hat’s partner engineering team works with SAP to ensure that SAP products are optimized and certified on Red Hat Enterprise Linux. Red Hat maintains a full-time engineering presence on-site at SAP to bolster the ongoing working relationship between the SAP Linux Lab and Red Hat product development.

This relationship has resulted in the addition of SAP-specific features for Red Hat Enterprise Linux – offered as Red Hat Enterprise Linux for SAP – including joint testing, problem resolution, ongoing performance work by Red Hat, and close cooperation between the partners around virtualization. One example of the SAP/Red Hat collaboration is the addition of a new framework to the Red Hat Enterprise Linux High Availability Add-On (included in Red Hat Enterprise Linux for SAP) to manage SAP’s requirements for starting a complex set of services in a specific order when performing high-availability clustering failover. Red Hat and SAP have also established a cooperative support agreement whereby customers are assured of receiving best-in-class support services for their SAP infrastructure running on Red Hat Enterprise Linux.
In addition, SAP has access to pre-release versions of Red Hat software, and Red Hat includes testing of SAP software against development versions of Red Hat Enterprise Linux in a nightly test suite provided by SAP. All of this joint engineering and collaboration helps to deliver solutions that reduce CAPEX and OPEX through lower hardware costs, better application performance, and reduced system administration overhead.

**SAS**

Red Hat was the first Linux operating system supported by SAS in 2002. Since then, both companies have leveraged synergies that ultimately work to your advantage. Subscription-based models from both companies help you respond to the pressure on your IT budget to do more with less, and offer world-class service and support. In addition, Red Hat is mentoring SAS engineering on performance tuning and Linux file systems to achieve optimal performance and I/O throughput from SAS solutions running Red Hat Enterprise Linux, resulting in excellent scalability in tests up to 64 cores on a single system. Red Hat also uses SAS solutions as a regression test application to validate new releases of Red Hat Enterprise Linux. The benefit of this joint collaboration is powerful and cost-effective analytics and business intelligence solutions for your business.

“Getting the best answer using the least resources with enough time to take action is really a constrained optimization problem – one which SAS and Red Hat understand. Optimizing the analytic compute effort, compute cost, and timeliness of results lets you do your best with what you have. The TCO and performance of SAS Analytics on Red Hat Enterprise Linux is a game changer that allows our customers to more effectively leverage the power of analytics within the confines of today’s shrinking IT budgets,” said Anne Milley, SAS Sr. Director, Analytic Strategy.

**THERE’S MORE**

“Some of the largest enterprise customers and service providers in the world are working together with BMC and with Red Hat’s solutions to help build their cloud infrastructures,” said Johnny Ola, VP Corporate Business Development, BMC Software.

“Red Hat has been a fantastic partner for CA Technologies. They share roadmaps with us, they share technology and vision with us, they share where the future is going with us, and that enables us to create a complete vision of how we should take the open source Linux environment in the future,” said Tim Brown, Chief Architect Security, Distinguished Engineer, and SVP, CA Technologies.

“Linux provides great technology at a great price and Red Hat specifically is the leading platform due to its scalability, advanced capabilities, as well as trusted support,” said Don Angspatt, VP Product Management, Storage and Availability Management Group, Symantec Corporation.
MIGRATION STEPS

Migrating from Solaris to Red Hat Enterprise Linux can be accomplished in five basic steps.

1. Examine the existing Solaris infrastructure and determine the equivalent capabilities in the Red Hat Enterprise Linux ecosystem. For example:
   - Compilers, programming interfaces, utilities
   - Apache, sendmail, GNOME, DNS, provisioning, etc.
   - This step takes approximately three to five weeks

2. Examine third-party infrastructure and business applications and determine the equivalent capabilities in the Red Hat Enterprise Linux ecosystem. Determine the difficulty of porting in-house applications. Determine application dependencies. For example:
   - Symantec (Veritas) NetBackup runs on Red Hat Enterprise Linux
   - Replace flash archive with Altriis Deployment Solution or similar
   - Veritas Cluster can be utilized or replaced by Red Hat Resilient Storage Add-On (includes high availability)
   - Vast majority of business applications are supported on Linux
   - 2-8 weeks

3. Measure organizational readiness and overall migration risk.
   - Looks at additional technical and business details such as server sizing, service level agreements (SLAs), server refresh cycles, skills gaps, training, IT processes and practices, IT governance, etc. to measure organizational readiness and overall migration risk.
   - 3-5 weeks

4. Develop a strategic Solaris to Red Hat Enterprise Linux migration plan, including a detailed roadmap (including hardware/virtualization, etc.) and cost estimate.
   - Produce a detailed migration roadmap, scope of activities needed, as well as a detailed migration cost estimate for the entire migration project.
   - 3-5 weeks

5. Implement the strategic migration plan and employ implementation support strategies.
   - Red Hat Consulting offers a wide variety of workshops, training, and service offerings designed to help customers implement their Strategic Migration Plan.
   - To be determined

Red Hat provides a Solaris-to-Red Hat Enterprise Linux Strategic Migration Planning Guide that details the recommended process for moving from Solaris to Red Hat Enterprise Linux. It includes planning steps to prepare for the migration. It also provides information on common implementation and training standards and best practices. If you need help with the migration, Red Hat and partners also offer migrations services and training.
MIGRATION SERVICES AND SKILLS TRAINING

Red Hat offers a number of services to help you migrate and help your administrators transition their skills to Linux. Red Hat also works with a number of partners to help you move from SPARC to the more cost-effective x86 platform.

RED HAT MIGRATION SERVICES

To guide IT staff through the migration process, Red Hat Consulting offers migration services to help plan and execute a migration to Red Hat Enterprise Linux. Red Hat consultants are field-tested Linux veterans who guide team members through migration planning and ensure successful new deployments of Red Hat Enterprise Linux. Red Hat consultants have decades of experience working with leading companies in the Financial Services, Healthcare, and Telecommunication industries, as well as with government agencies around the world.

Involving a consultant early provides valuable insight into migration best practices. This approach results in IT staff that is better equipped to migrate opportunistically, enable IT to:

• Maximize cost savings and efficiencies as the transition progresses
• Speed time to production
• Drive faster return on investment (ROI)

TRAINING

Free skills assessments are available on-line to determine skill levels and necessary course to familiarize your staff with the differences between Solaris and Red Hat Enterprise Linux. IT staff can then utilize virtual training, if desired, to greatly reduce cost and enable them to schedule instruction at their own pace. For example, The Red Hat Certified System Administrator (RHCSA) Fast Track course is available for Linux and UNIX administrators. In addition, Red Hat offers:

• On-site training and workshops provide fast knowledge transfer
• Red Hat Dedicated Enterprise Engineer (DEE): can see the project to its end, provide real-time guidance and recommendations, ensuring time lines and goals are met
• Red Hat consultants available to help deploy new systems and build IT staff confidence in new skills
• Red Hat Consulting Solution Table
• Infrastructure Consulting Services

IBM MIGRATION FACTORY

Together, Red Hat and IBM have migrated many top-name businesses to Red Hat Enterprise Linux on IBM-based platforms and the customers are very pleased with their migration decision. IBM offers the IBM Migration Factory to help move enterprises from Oracle/Sun to IBM and Linux. The program includes competitive server assessments, migration services, and other resources. IBM also offers trade-in credits for software and services when migrating from Oracle.

IBM has migrated 700 clients worldwide from Oracle to IBM systems. Based on their experience of migrating hundreds of clients, IBM developed software tools that automate and accelerate Sun migrations. The tools discover and identify Sun assets, provision new IBM platforms, and optimize workloads across hardware, software, and processes.
HP ENTERPRISE AND TECHNOLOGY SERVICES

HP offers a wide range of migration capabilities to help datacenter staff successfully move business and mission-critical applications and databases to Red Hat Enterprise Linux on the HP ProLiant servers. HP’s experienced Linux service professionals work with IT teams to design, develop, and continuously enhance a Red Hat Enterprise Linux solution in alignment with specific business objectives.

Red Hat Migration Services from HP help streamline the transition from RISC/UNIX to Linux, save time, and reduce costs. HP services encompass complete end-to-end delivery, from migration planning and execution to post-migration activities and detailed reporting and testing. HP also provides ongoing support services to help operate and continually improve the infrastructure.

The migration services provide expert project management and are organized into four steps:

- **Strategy** – Discover and analyze the current environment, plan target environment and migration strategy, and create the business case
- **Design** – Design an infrastructure to host the migrated workloads
- **Transition** – Pilot the migration, deploy the target environment, migrate data and workloads, and refine the solution
- **Operation** – Transition to production, proactive support, and education

MIGRATION SUCCESSES

Many large, known-name companies run their mission-critical applications/businesses on Red Hat Enterprise Linux. Here is a recent case study of a company that migrated from Solaris:

National City Corporation is part of PNC Financial Services Group, Inc., one of the nation’s largest financial services enterprises and the fifth largest U.S. bank by deposits.

- **Business challenge:** Re-engineering the data center infrastructure from costly proprietary RISC machines running Sun Solaris and other UNIX distributions to x86-based blade servers running Red Hat Enterprise Linux.
- **Reason for migration:** Cut costs and scale capacity to accommodate rapid growth of the business.
- **Solutions:** The new datacenter runs Red Hat Enterprise Linux on a combination of physical and virtual HP ProLiant servers. The HP ProLiant servers now support the bank’s most business-critical applications, from Oracle financial software to JBoss Enterprise Middleware-based applications, online transaction processing (OLTP) systems, and customer-facing loan application systems.
- **Benefits:** The price/performance of the Red Hat Enterprise Linux platform is exceptional. IT operating costs were reduced to two cents per transaction, with the potential to save millions over the life of the system. The datacenter was re-engineered without unscheduled business interruptions and now provides the ability to scale IT for business growth.

CONCLUSION

You’ve made the decision to migrate from SPARC to x86. Now is the time to make the decision to migrate your business-critical Solaris workloads to Red Hat Enterprise Linux. Enterprises have been migrating web server farms, web applications/portals, ERP systems, database applications, homegrown applications, and mission-critical applications to Red Hat Enterprise Linux for years.

Red Hat offers a sensible low-risk, high-value alternative to Solaris and it has been successfully replacing traditional UNIX workloads across the enterprise. Migrating to Red Hat Enterprise Linux can help reduce operating costs and offers hardware vendor neutrality and increased flexibility for businesses and organizations large and small across the world.

For more information see: www.redhat.com/migrate/Solaris_to_Linux.

RED HAT SALES AND INQUIRIES

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