

## Red Hat Enterprise Linux versus Solaris 10

Description of the key new features of Solaris 10 and how RHEL stacks up

**Overview:** release. Next to each feature is a quick synopsis of the equivalent features in the current Red Hat Enterprise Linux product as well as our future development plans in those areas

Solaris 10 Feature	RHEL Status	Feature Description	Equivalent RHEL Feature
Solaris Containers	Under development	<p>Solaris Containers is Sun's newest virtualization technology.</p> <p>Designed to increase utilization of hardware resources and boost server-to-administrator ratio. Sun claims Solaris 10 can create up to 8000 software partitions, each with its own IP address, memory space, file area, host name, and root password per single instance of the OS. This would allow customers to run multiple independent workloads on one machine.</p>	<p>Sun's approach to virtualization is to place different applications into compartments or zones within a single OS image. They are advocating an approach to increase utilization primarily from the application level upward. The rest of the marketplace, both leading IT vendors and major customers, believes that more isolation is required, extending down through the OS and to the hardware.</p> <p>Sun's solution is not the only solution and it may not be the preferred solution in the long term.</p> <p>Sun claims that a zones approach saves customers effort with patch management because there is only one OS image. However, this benefit is a two-edged sword. Any upgrade or patch to the underlying OS that is needed for one application will have to be re-qualified for all other applications running on the box.</p> <p>It is also likely a strong technical solution for virtualization must be closely integrated with the advanced I/O capabilities of next generation chip architectures.</p> <p>In addition to the work being done by the leading chip and system vendors, open source developers and Red Hat are actively working on virtualization solutions that will give customers much greater flexibility to deploy their applications and evolve their infrastructure over time. Ultimately, Red Hat is working to create virtualization solutions that provide customers the choice to select the technology that is right for them</p>
DTrace	Red Hat Enterprise Linux provides an extensive set of tools for application development, monitoring, debugging, and profiling. Additionally, Red Hat is working with IBM, Intel, and the open source community to deliver a powerful new tracing and profiling capability called SystemTap that will provide the next generation of functionality for these capabilities.	<p>"Dynamic tracing" software is diagnostic software that lets programmers pinpoint bottlenecks.</p> <p>DTrace could be used to speed up the debugging process in development and help tune system performance.</p> <p>The key advantage is it takes out the need for recompiling the kernel and rebooting the machine to collect troubleshooting data.</p> <p>Sun claims that performance degradation due to DTrace is minimal (less than 1 percent).</p>	<p>Red Hat's current suite of development and debugging tools (including oprofile, gdb, valgrind, and eclipse) provide an open and flexible development, debugging, and tuning environment.</p> <p>Customer feedback has indicated that DTrace allows quick turnaround for targeted debugging activities when used by suitably qualified personnel. This value was quickly recognized by the open source community, so Red Hat, in combination with IBM and Intel, launched a project called SystemTap (System Tracing and Profiling) to provide equivalent capabilities. The goal of the project is to provide a simple, integrated tool based on existing open source technologies (e.g. Kprobes) to further simplify analysis of application-level problems on Linux. SystemTap is already in public Beta and is scheduled for delivery before the end of 2005.</p>
Predictive Self Healing	Not matched, but may not be an issue	<p>Predictive Self Healing delivers automatic online error detection and automatic system recovery.</p> <p>It apparently removes failing components from the system before they actually fail, and automatically restarts failed applications and services.</p> <p>The server can detect recurring problems with a memory bank and automatically switch to another without halting operations or losing data.</p>	<p>Monitoring is a part of the RHN roadmap and Cluster Suite can be used to provide automatic application restart in the event of a failure.</p> <p>Removing components before they fail usually comes down to memory and disks, and not much more. With today's highly reliable memory and disk systems these features are not as important as they were a few years ago.</p> <p>While these features not apples-to-apples matched in RHEL, the value to the customer is equal with either solution.</p>
Solaris ZFS	Matched	<p>Uses a 128-bit addressing scheme to accommodate the growth into the exabyte size range that data sets will need (next 10 years).</p> <p>ZFS makes administration of multiple storage volumes easier and automatically checks data for errors during reads/writes.</p>	<p>LVM2 accomplishes this in RHEL 4</p> <p>Before exabytes we have to span petabytes, so we have a few orders of magnitude to go before this becomes a problem.</p> <p>The 2.6 kernel theoretically allows 64-bit disk addressing, which is good for approx 8 exabytes using current designs. In practice there are buffer cache limits (on x86) that prevent a full exabyte implementation today, but these will certainly be handled well before real-world customers run into problems.</p>
Cryptographic Infrastructure	Matched	Provides cryptographic services to users and applications.	RHEL 3 and 4 provide kernel-level cryptography and cryptoAPI. This provides the same cryptographic functionality.
Secure by Default	Matched	Solaris' out-of-the-box installation is designed with security in mind.	<p>RHEL 3 is "secure by default". RHEL 4 will be even more secure through the addition of SELinux, Exec Shield, NX technology support, and PIE.</p> <p>Sun is far behind on this; Red Hat adopted a "secure-by-default" stance long before Red Hat Enterprise Linux. Our move to SELinux as well as our focus on removing possible exploit openings put us in a leadership position. Unlike Trusted Solaris, SELinux will be a part of the core OS and made available at no additional cost to all users. The security capabilities it provides far exceed those of the standard Solaris operating system.</p>
Process Rights Management	Matched	Fine-grained security access control supplanting the "all or nothing" traditional UNIX root model.	RHEL 4 will provide a greater level of security through the integration of SELinux technology. SELinux takes a much broader approach than Solaris 10, assigning more fine-grained rights and privileges across users and files. In addition, it is part of a broader, NSA driven initiative, to tighten Linux security as a whole.
IP Filter	Matched	Provides network address translation and firewall services.	RHEL 3 and 4 already have this functionality with IPTables.
Single Source OS	Matched	Solaris 10 is a single source OS, optimized to run multiple applications on multiple platforms.	All RHEL 3 and RHEL 4 architecture versions are built from same source tree for a greater variety of architectures than Solaris. Red Hat currently supports versions for x86, EM64T, AMD64, and Power architectures.
Project Janus	Matched	Allows customers to run Linux binary applications unchanged on the Solaris OS.	<p>RHEL 3 and 4 run these applications natively.</p> <p>Essentially Sun has announced that it will support the RHEL3 user API set so that Solaris customers can use RHEL-certified applications. A more interesting side effect is that it is likely to encourage ISVs to port to RHEL, on the basis that they can kill two birds with one stone.</p>