ORACLE
Ksplice

Protecting Linux systems with Oracle Ksplice zero-downtime patching

Oracle Ksplice performs patching for the Linux operating system (OS) kernels, hypervisors, and critical user space libraries while the OS is running, on-premises or in the cloud. An Oracle Linux Premier Support subscription offers this advanced capability, making it possible to apply critical OS security patches immediately and without business disruptions associated with forced reboots.

Why patching matters

Most applications have a regular patch availability cycle, while the OS does not. For example, Oracle releases Critical Patch Updates as collections of security fixes for many Oracle products on a regular quarterly basis. Meanwhile, important security patches for Linux kernels are typically released as those issues are discovered and fixed. Patches for critical Linux user space libraries also are released frequently, but not on a fixed schedule.

Critical OS patches should be applied shortly after they are released to help ensure that systems have up-to-date OS protection and security compliance. However, this OS patching typically requires system downtime. Depending on operations, downtime can require weeks or months of advanced planning to coordinate with the application's patching schedule. With Oracle Ksplice, patching for applications and the OS can be aligned without sacrificing security, resulting in cost savings and improved operational efficiency.

Customers with an Oracle Linux Premier Support or an Oracle Cloud Infrastructure subscription can increase the security, reliability, and availability of their Oracle Linux and Ubuntu systems by applying critical security patches to Linux kernels, without rebooting, using Ksplice. Moreover, Ksplice for Oracle Linux provides zero-downtime patching for critical user space libraries and known exploit detection.

Key benefits

- Increase security with the ability to apply critical OS patches without reboots
- Reduce operational costs and increase operational efficiency by aligning OS and applications patching schedules
- Improve application availability and uptime by applying critical OS patches without interruptions
- Experience world-class enterprise support for Linux and virtualization environments
- Supports multiple Linux distributions

Supported OS and hardware

Oracle Ksplice supports Oracle Linux on the following hardware architectures

- 64-bit Intel/AMD (x86-64)
- 64-bit Arm (aarch64)

Visit Oracle Linux Hardware Compatibility List (HCL)

Ksplice also supports additional OSs on x86-64 platforms

- Oracle VM Server for x86
- Ubuntu

Why use Ksplice?

Oracle Ksplice allows system administrators to install critical OS security patches with increased security and compliance, reduced operational costs, improved availability, and greater flexibility and control.

- **Improve security and compliance**: Ksplice enables IT administrators to greatly improve their security compliance. Ksplice applies security patches for Linux kernels, hypervisors (KVM and Xen), and critical user space libraries (`glibc` and `openssl`) as soon as they become available, helping to ensure that the OSs remain secure and up-to-date. In addition, Oracle Ksplice has been designed to interoperate with commonly used vulnerability scanners. These security scanners can recognize and incorporate patches applied through Ksplice, which helps to ensure more accurate and comprehensive vulnerability reporting for better compliance.
- **Reduce operational costs**: Customers can significantly reduce the time allocated for planning and implementing critical OS security patches and aligning with application patching schedules. Applying Ksplice patches can be automated to further reduce the workload on IT staff, while maintaining optimal system performance and security.
- **Improve availability**: With Ksplice, supported OS security patches are installed without interrupting running applications or users of those applications. The status of systems can be easily checked before rolling out needed OS patches. Installing these OS patches requires no downtime, improving system availability. While other Linux live patching technology may require a reboot to revert live patches, Ksplice patches can be rolled back without downtime.
- **Stay ahead of potential security threats**: Ksplice's known exploit detection feature provides added peace of mind for administrators and IT teams. When Oracle Linux systems are patched with Ksplice, not only is the OS security vulnerability closed, but tripwires are laid down for selected vulnerabilities. Later, if an attacker attempts to exploit a patched vulnerability, Ksplice sends an alert to administrators, allowing them to stay ahead of potential security threats and quickly respond to attempts to exploit known vulnerabilities.
- **Improve support diagnostic capabilities**: When a Linux kernel is not performing normally, Ksplice patches can be temporarily applied to help with diagnostics, retrieving the necessary debugging and logging information from the kernel. Ksplice can deliver needed in-memory code fixes and then remove them, all without system disruptions.

How can I get Ksplice and how does it work?

Ksplice is available with an Oracle Linux Premier Support subscription, which includes access to the Unbreakable Linux Network (ULN). Subscribers can request an Oracle Ksplice access key through ULN.

Key features

Rollback capability. OS patches applied using Oracle Ksplice can also be reversed without rebooting.

No performance impact. Ksplice does not negatively affect performance. No daemon or system agent is required.

Web interface and API. View and manage the status of Ksplice on Linux systems from one place—a web interface or programmatically via a REST API.

Virtualization and container compatibility. Ksplice works well in virtualization and container environments.

User space patching. Ksplice supports patching for critical user space libraries such as `glibc` and `openssl` without rebooting.

Offline patches. Ksplice patches can be applied offline for systems not directly connected to the internet by using a local mirror.

Known exploit detection. Ksplice automatically sends an alert if an attacker attempts to exploit selected patched vulnerabilities.

Proxy support. Ksplice supports standard HTTP proxies to pass through firewalls.

Access policies. Ksplice offers access policies for individual systems or groups.

Email notifications. Administrators can choose to be notified when new Ksplice patches are available for their systems.

After installing the Ksplice client, customers can easily apply all important Linux kernel security patches. Ksplice loads a Linux kernel module that rewrites portions of the running kernel to apply the patches. No configuration changes or initial reboot are needed to install patches.

Ksplice patches keep a Linux kernel up-to-date while it is running; however, it is recommended that users continue to install the OS and kernel packages so that the system has the latest updates for all software. Because Oracle provides Ksplice patching against all production kernels of a supported Linux release, customers can reboot into any supported Linux kernel without fear of losing zero-downtime patching capability.

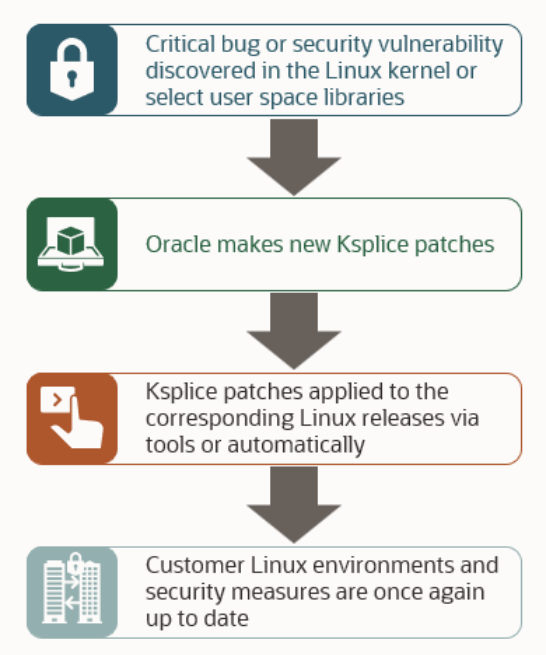

Figure 1: Lifecycle of Ksplice patches

An enhanced Ksplice client for Oracle Linux can be installed to patch in-memory pages of Ksplice-aware shared libraries such as `glibc` and `openssl`. A reboot is required after first upgrading to Ksplice-aware user space libraries. Then, Oracle Linux systems can use Ksplice-aware user space libraries without rebooting for future Ksplice patches.

Management tool integration

Oracle Linux Manager can be configured to act as a Ksplice mirror with repositories and associated software channels for the Oracle Linux releases to run the offline client, in order to meet customers' Linux lifecycle management and flexible deployment requirements.

Oracle Linux Support customers have the option of using Oracle OS Management Hub. It simplifies the management and monitoring of updates and patches for Oracle Linux systems through a centralized management console, which integrates with Ksplice zero-downtime patching.

Related products

- Oracle Linux
- Oracle VM
- Oracle Engineered Systems

Related services

- Oracle Linux Premier Support
- Oracle Autonomous Linux
- Oracle OS Management Hub
- Oracle Premier Support for Systems
- Oracle Cloud Infrastructure

Established track record

With over 2.5 million servers protected each month and over 100 million patches applied, Oracle Ksplice can be trusted to keep customers' mission-critical systems up to date.

Get started

To see which patches should be applied to the supported Linux systems, use the free online tool Oracle Ksplice inspector to help proactively identify vulnerabilities.

To get hands-on experience using Ksplice, read the tutorial, watch the videos, and learn Ksplice on an Oracle-provided free lab environment, or try Oracle Ksplice free for 30 days.

Please contact the Oracle team for more information about obtaining Oracle Linux Premier Support or Oracle Cloud Infrastructure subscriptions to help improve Linux security and compliance with Ksplice.

To learn more about Oracle Ksplice, visit ksplice.oracle.com and Ksplice User's Guide.

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