

# SUSE® Linux Enterprise Real Time

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Many of today's largest high-profile organizations—including financial institutions, manufacturers, government agencies and others—rely on time-dependent applications and processes, which must execute accurately and predictably all the time, every time. This is why organizations are turning to SUSE® Linux Enterprise Real Time, to monitor their physical, edge, IoT, or virtual environments. SUSE Linux Enterprise Real Time includes SUSE Linux Enterprise Server and ensures proper and timely execution of applications and processes.

## Product overview

Whether you are monitoring an IoT sensor on an industrial device or have an edge system that must act instantly on external inputs, SUSE Linux Enterprise Real Time will ensure proper and timely execution of applications and processes.

Additional benefits include:

### Precision timing

The product inherits the advantages of the latest SUSE Linux Enterprise Server platform, as well as delivers enhancements to the real-time scheduler and more fine-grained locking mechanisms, improving performance and scalability.

### Predictability

The product includes support for per device interrupt threads, enabling tuning at the device level. In addition, new hardware latency detectors and reporting capabilities increase visibility, helping customers reduce latency and optimize performance across their entire real-time stack – hardware and software.

### Pricing

Subscriptions are available for 1 or 3 years with standard or priority support, as a standalone product offering that includes SUSE Linux Enterprise Server, and shares the same kernel tree. Since this

is no longer just an extension, a single subscription is now required rather than two subscriptions.

## Key features

### Low latency

Running your time-sensitive, mission-critical applications on SUSE Linux Enterprise Real Time reduces latency and gives you the time advantage you need to make profits or cut losses ahead of your competitors. A fully preemptible real-time kernel allows you to specify which processes take priority over previously uninterruptible operating system processes, such as spinlocks and hardware and software interrupts. With these innovative capabilities, you can execute your time-critical operations ahead of all others without any delay.

### Deterministic execution

Get greater predictability. Ensure critical business processes complete in time, every time, and deliver high quality of service, even under heavy system loads. By shielding key system resources for high-priority processes, you can ensure greater predictability for time-sensitive applications.

### Low jitter

The low jitter, built upon the highly deterministic technology of a SUSE Linux Enterprise Real Time system, helps to

keep applications synchronized with the real world. This helps services that need ongoing and repeated calculation.

### Priority inheritance

Priority inheritance refers to the ability of a lower priority process to assume a higher priority when there is a higher priority process that requires the lower priority process to finish before it can accomplish its task. SUSE Linux Enterprise Real Time solves priority inversion problems for mission-critical processes.

### Threaded interrupts

Processes running in interrupt mode in a general-purpose operating system are not preemptible. With SUSE Linux Enterprise Real Time, these interrupts have been encapsulated by kernel threads, which are interruptible, and, in turn allow the hard and soft interrupts to be preempted by user-defined higher priority processes.

### LTTng tracing tool

LTTng, a highly efficient tracing tool for Linux, helps to track down performance issues and debug problems involving multiple concurrent processes and threads.

### High resolution timer

Process accounting precision and ac-

curacy are improved by replacing a low-resolution POSIX timer with a timer working at speeds of a few microseconds. The amount of time the system spends processing interrupts, system calls, kernel daemons and user applications is now accounted for at nanosecond resolution.

### OFED/InfiniBand

SUSE Linux Enterprise Real Time includes kernel modules that support OpenFabrics Enterprise Distribution (OFED), the open source RDMA software stack available from the OpenFabrics Alliance, enabling the implementation of unified high-speed interconnects based on InfiniBand and 10-Gigabit Ethernet.

### Precision Time Protocol

To act as one unit, distributed systems need time accuracy not only within a server but across all servers. The Precision Time Protocol (PTP) synchronizes servers via the high-speed network, up to sub-microsecond accuracy.

### Adaptive locking

The adaptive locking algorithm allows a system to be put to sleep or suspended and release resources that are being held for higher priority processes to be executed. Adaptive locks reduce operating system context switching times, dramatically improving the performance of throughputsensitive workloads.

## CPU shielding and assignment

With SUSE Linux Enterprise Real Time, users have full control over the assignment of processes and threads to CPUs. Processes with real-time requirements can be assigned to run exclusively on dedicated CPUs or cores. CPUs executing real-time tasks can be completely shielded from any other processes that have not been explicitly assigned to them. This ensures that resources are always available for high-priority processes and minimally affected by increased system loads, ensuring greater reliability and predictability.

## Virtualization

SUSE Linux Enterprise Real Time supports open source KVM and Xen virtualization, as well as VMware and Microsoft Hyper-V. Real time and standard virtual machines (VMs) are supported on the same physical server. This feature also delivers higher density of real-time systems in VMs on a single server. Learn more at [suse.com/products/realtime/](https://www.suse.com/products/realtime/)

## System requirements

### Supported platforms

- x86\_64

For more information, please visit: [www.suse.com/products/realtime](https://www.suse.com/products/realtime)

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