

# Oracle Linux 7

## Release Notes for Oracle Linux 7.1



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# Preface

## Warning

Oracle Linux 7 is now in Extended Support. See [Oracle Linux Extended Support](#) and [Oracle Open Source Support Policies](#) for more information.

Migrate applications and data to Oracle Linux 8 or Oracle Linux 9 as soon as possible.

[Oracle Linux 7: Release Notes for Oracle Linux 7.1](#) provides a summary of the new features and known issues in Update 1 for Oracle Linux 7.

## Conventions

The following text conventions are used in this document:

Convention	Meaning
<b>boldface</b>	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

## Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <https://www.oracle.com/corporate/accessibility/>.

## Access to Oracle Support for Accessibility

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit <https://www.oracle.com/corporate/accessibility/learning-support.html#support-tab>.

## Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to

build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

# 1

## New Features and Changes

### **Warning**

Oracle Linux 7 is now in Extended Support. See [Oracle Linux Extended Support](#) and [Oracle Open Source Support Policies](#) for more information.

Migrate applications and data to Oracle Linux 8 or Oracle Linux 9 as soon as possible.

This section describes new features and changes in Update 1 for Oracle Linux 7.

For details of the new features and changes in the initial release of Oracle Linux 7, see [Oracle Linux 7: Release Notes for Oracle Linux 7](#)

## System Requirements

You can install Oracle Linux 7 on x86-64 systems with up to 2048 logical CPUs and 64 TB of memory. The theoretical upper limit is 5120 logical CPUs and 64 TB of memory, but this configuration isn't supported. A minimum of 2 logical CPUs and 1 GB of memory per logical CPU is recommended. Although the minimum disk space required for installation is 1GB, a minimum of 5 GB is recommended.

## File System, Storage, and Address Space Limitations

The following table lists the maximum file size and maximum file system size for the btrfs, ext4, and XFS file systems.

File System Type	Maximum File Size	Maximum File System Size
btrfs	50 TB	50 TB
ext4	50 TB	50 TB
XFS	16 TB	500 TB

The maximum supported size for a bootable LUN is 50 TB. GPT and UEFI support are required for LUNs larger than 2 TB.

The maximum size of the address space that is available to each process is 128 TB.

## Shipped Kernels

Oracle Linux 7 Update 1 includes the following kernels:

**kernel-3.10.0-229.el7**  
Red Hat Compatible Kernel (RHCK).

`kernel-uek-3.8.13-55.1.6.el7uek`

Unbreakable Enterprise Kernel Release 3 (UEK R3), which is the default kernel.

## Kdump Configuration During Installation

It is now possible to configure Kdump during non-graphical installation. For limitations on using the `crashkernel=auto` setting, see [Crash Kernel auto Setting](#).

## Load Balancing and High Availability

Oracle Linux 7 includes the Keepalived and HAProxy technologies for balancing access to network services while maintaining continuous access to those services.

Keepalived uses the IP Virtual Server (IPVS) kernel module to provide transport layer (Layer 4) load balancing, redirecting requests for network-based services to individual members of a server cluster. IPVS monitors the status of each server and uses the Virtual Router Redundancy Protocol (VRRP) to implement high availability.

HAProxy is an application layer (Layer 7) load balancing and high availability solution that you can use to implement a reverse proxy for HTTP and TCP-based Internet services.

For more information, see [Oracle Linux 7: Administrator's Guide](#)

## MySQL Community and MariaDB Packages

In the initial release of Oracle Linux 7, the MySQL Community 5.6 packages were provided on the Oracle Linux 7 full installation DVD image but were not installable using the Anaconda installer or kickstart. The ISO image for this update to Oracle Linux 7 provides support for installing either MySQL 5.6 or MariaDB by using either the Anaconda installer or kickstart.

It is not possible to install MySQL and MariaDB on the same system as package conflicts exist. Installing the MySQL packages replaces any conflicting MariaDB packages.

By default, neither MySQL 5.6 packages nor MariaDB packages are installed. It is possible to install either the MySQL 5.6 package group or the MariaDB package group on a system by using the graphical installer or kickstart, but not both package groups.

To install the MySQL 5.6 packages using kickstart, specify the `@mysql` package group in the `%packages` section. If you also specify `@mariadb`, it is ignored.

To install the MariaDB packages using kickstart, specify `@mariadb` but not `@mysql` in the `%packages` section.

Both the MySQL Community 5.6 and the MySQL Community 5.5 packages are also available on the Unbreakable Linux Network (ULN) and Oracle Linux yum server.

## Spacewalk Client Registration

It is not necessary to install the Spacewalk client before registering an Oracle Linux 7 Update 1 system with a Spacewalk server. Instead, you can use the `rhndreg_ks` command, specifying the server URL, a user name that is authorized to register the system, the user's password in plain text, and the activation key to be associated with the system:

```
sudo rhndreg_ks --serverUrl=http://spacewalk_server/XMLRPC --username=user \  
--password=passwd --activationkey=activation_key
```

Oracle recommends installing the full Spacewalk client after registration to support all of the features provided by Spacewalk, which include provisioning and auditing.

## UPEK Fingerprint Readers

Support has been added for the UPEK fingerprint readers found on Lenovo T400 and other laptops as well as some external USB fingerprint readers.

## Technology Preview

The following features are still under development, but are made available for testing and evaluation purposes with UEK R3:

- **DRBD (Distributed Replicated Block Device)**  
A shared-nothing, synchronously replicated block device (*RAID1 over network*), designed to serve as a building block for high availability (HA) clusters. It requires a cluster manager (for example, pacemaker) for automatic failover.
- **Transcendent memory**  
Transcendent Memory (*tmem*) provides a new approach for improving the utilization of physical memory in a virtualized environment by claiming underutilized memory in a system and making it available where it is most needed. From the perspective of an operating system, tmem is fast pseudo-RAM of indeterminate and varying size that is useful primarily when real RAM is in short supply. To learn more about this technology and its use cases, see the Transcendent Memory project page at <https://oss.oracle.com/projects/tmem/>.
- **UEFI Secure Boot**  
This update provides support for installing and using Oracle Linux 7 on systems that have enabled UEFI Secure Boot. A system in Secure Boot mode will load only boot loaders and kernels that have been signed by Oracle.

For the RHCK, the following features are currently under technology preview:

- Active Directory and LDAP `sudo` providers.
- Block and object storage layouts for parallel NFS (pNFS).
- Block device caching by LVM, which allows small, fast devices to act as caches for large, slow devices.
- btrfs file system. Oracle supports btrfs with UEK R3.
- Crash kernel can be configured to boot with more than a single CPU.
- DIF/DIX for data integrity checking on SCSI devices.
- LSI Syncro CS feature in the `megaraid_sas` driver to support High-Availability Direct-Attached storage (HA-DAS) adapters.
- LVM API.
- More than 32 PCI slots can be configured with PCI Bridge in QEMU.
- OpenLMI Software Provider.
- PCI Express Bus, AHCI Bus, and USB 3.0 host adapter emulation are provided for KVM guests.

- SCAP Workbench and the OSCAP Anaconda add-on.
- Single-Root I/O virtualization (SR-IOV) in the `qlcnict` driver.
- Storage array management, which includes a command-line interface and the `libStorageMgmt` API.
- The `dm-era` device-mapper target records changes made to blocks over a specified time period.
- Trusted Network Connect.
- `virtio-blk-data-plane` in Quick EMUlator (QEMU) improves block I/O performance.

### Note

The upstream Kpatch RPM has been removed from Oracle Linux. Customers who wish to patch their running kernel with zero downtime should evaluate Oracle's Ksplice technology, which is included at no additional cost with Oracle Linux Premier support.

## Compatibility

Oracle Linux maintains user-space compatibility with Red Hat Enterprise Linux, which is independent of the kernel version that underlies the operating system. Existing applications in user space will continue to run unmodified on the Unbreakable Enterprise Kernel Release 3 (UEK R3) and no re-certifications are needed for RHEL certified applications.

To minimize impact on interoperability during releases, the Oracle Linux team works closely with third-party vendors whose hardware and software have dependencies on kernel modules. The kernel ABI for UEK R3 will remain unchanged in all subsequent updates to the initial release. UEK R3 contains changes to the kernel ABI relative to UEK R2 that require recompilation of third-party kernel modules on the system. Before installing UEK R3, verify its support status with your application vendor.

## Unsupported Emulex Devices

The following Emulex LightPulse HBA devices are being desupported by Emulex and are not supported for use with Oracle Linux 7:

- LP10000 (VID:10DF, DID:FA00)
- LP10000S (VID:10DF, DID:FC00)
- LP101 (VID:10DF, DID:F0A1)
- LP1050 (VID:10DF, DID:F0A5)
- LP11000S (VID:10DF, DID:FC10)
- LP11000-S (VID:10DF, DID:FD11)
- LP111 (VID:10DF, DID:F0D1)
- LP6000 (VID:10DF, DID:1AE5)
- LP7000 (VID:10DF, DID:F700)
- LP8000 (VID:10DF, DID:F800)
- LP9002 (VID:10DF, DID:F900)

- LP952 (VID:10DF, DID:F095)
- LP9802 (VID:10DF, DID:F980)
- LP982 (VID:10DF, DID:F098)
- LPe1000 (VID:10DF, DID:F0F5)
- LPe1000-SP (VID:10DF, DID:F0F5)
- LPe1002-SP (VID:10DF, DID:F0F7)
- LPe11000S (VID:10DF, DID:FC20)
- LPx1000 (VID:10DF, DID:FB00)

# 2

## Fixed Issues

### **Warning**

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Migrate applications and data to Oracle Linux 8 or Oracle Linux 9 as soon as possible.

This chapter describes the fixed issues for Oracle Linux 7 Update 1.

### avahi-daemon Failure to Start with UEK R3

With the version of UEK R3 provided in this update the `avahi-daemon` starts without requiring the `disallow-other-stacks` entry in `/etc/avahi/avahi-daemon.conf` to be commented out. (Bug ID 18459758)

### btrfs-convert Failure

The `btrfs-convert` command no longer fails when invoked to convert an `ext2`, `ext3`, or `ext4` file system to `btrfs`. (Bug ID 18534417)

### Error Messages on Restarting the RDMA Service

When the `rds_ib_srq` parameter for the `rds_rdma` module is enabled and the module is in use, restarting the `rdma` service no longer generates error messages that are visible in `dmesg` or `/var/log/messages`. (Bug ID 19010606)

### Installation Failure for `ext3` / and `/boot`

Rebooting following installation no longer fails if you format both `/` and `/boot` as `ext3` file systems. (Bug ID 19171480)

### Installation Failure if a `btrfs` Partition Exists

Installation of Oracle Linux 7 could fail if `btrfs` partitions were already present from a previous installation. The Anaconda installer has been amended to correct this issue. (Bug ID 20113551)

### Keyboard Input During Installation Under Hyper-V

Keyboard input is now accepted during installation of a generation 2 virtual machine under Hyper-V. (Bug ID 19843591)

## LDAP Authentication Failure for Large UID

An LDAP user account with a UID greater than 2147483647 ( $2^{31}-1$ ) failed PAM authentication. This update provides a version of the `nss-pam-ldap` module that supports UID and GID values of up to 4294967295 ( $2^{32}-1$ ) for LDAP accounts. (Bug ID 19487091)

## lxc-snapshot

The `lxc-snapshot` command failed if the `/containersnaps` directory did not exist. As `btrfs` snapshots must exist as subvolumes of the parent `/container`, the workaround was to create `/containersnaps` as a symbolic link to the directory `/container/snapshots`. It is recommended that you install `lxc-1.0.7-2.0.3` rather than use the workaround. This package uses an upstream fix instead of the workaround so you should remove the `/containersnaps` directory or symbolic link if it exists.

## SELinux Warnings from sosreport

The `sosreport -o selinux -a` command no longer reports SELinux warnings for files that do not belong to RPMs. (Bug ID 18913115)

## XFS File Attributes Leading to Panic or Reboot

Attempting to add many attributes to a file in an XFS file system under UEK R3 no longer results in a kernel panic or a system reboot. (Bug ID 18504299)

# 3

## Known Issues

### **Warning**

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Migrate applications and data to Oracle Linux 8 or Oracle Linux 9 as soon as possible.

This chapter describes the known issues for Oracle Linux 7 Update 1.

## Updating Oracle Linux Fails if the kernel-uek Package Cannot Be Updated

By default, the installation of Oracle Linux includes the `dtrace-modules` package for UEK R3. This package requires a specific `kernel-uek` version. However, a `yum update` fails if it cannot update the `kernel-uek` package when the `installonly_limit` of three updates is reached as the `dtrace-modules` package does not allow the existing `kernel-uek` packages to be removed. `yum` displays an error message similar to the following example:

```
--> Finished Dependency Resolution
Error: Package: kernel-uek-debug-3.8.13-55.1.1.el6uek.x86_64 (public_ol6_UEKR3_latest)
       Requires: kernel-firmware = 3.8.13-55.1.1.el6uek
```

The workaround is to remove any existing `dtrace-modules` packages before updating the `kernel-uek` package, for example:

```
for package in `rpm -qa | grep dtrace-modules`; do sudo yum remove -y $package; done
```

When you have removed all `dtrace-modules` packages, you can update Oracle Linux, including the UEK R3 kernel. If you want to use DTrace with UEK R3, reinstall the `dtrace-modules` package for the current kernel:

```
sudo yum install dtrace-modules-`uname -r`
```

(Bug ID 21669543)

## Automatic Bug Reporting Tool

The automated reporting daemons and features provided by the Red Hat Automatic Bug Reporting Tool (ABRT) are not supported with Oracle Linux

ABRT packages and associated files, such as `libreport`, are included in the distribution to satisfy package dependencies and can be used to generate local bug reports but the features to automatically upload these reports are not supported. For technical assistance, contact Oracle Support by using the My Oracle Support portal or by telephone.

## Autocompletion of Commands in the bash Shell

Pressing the Tab key to complete commands automatically in the `bash` shell works for some commands such as `ls` but not for other commands such as `export`. You can use the following workaround to enable autocompletion for all commands:

1. Remove the `bash-completion` package:

```
sudo yum remove bash-completion
```

2. Run the `complete -r` command in the shell. For example, you could put this command in `$HOME/.bashrc`.

(Bug ID 19248362)

## Ceph Block Devices

The UEK R3 does not support the mounting and formatting of Ceph block devices. (Bug ID 20304006)

## Crash Kernel auto Setting

If you enable the `crashkernel=auto` kernel parameter for UEK R3 to simplify Kdump configuration, both `dmesg` output and `/proc/cmdline` show `crashkernel=NNNM@0M`. This is the expected behavior for the implementation, where `@0M` implies the `auto` setting. The `crashkernel=auto` parameter is not supported for Xen.

## firewalld Does Not Currently Support IPv6 NAT Under UEK R3

The following error message indicates that IPv6 NAT is not currently supported by `firewalld` with UEK R3.

```
ERROR: ipv6 table 'nat' does not exist (or not enough permission to check)
```

(Bug ID 18504545)

## grubby Sets Incorrect Saved Entry

If `grubby` is used to remove a kernel menu entry from the GRUB 2 configuration, the value of the default entry in `/etc/grub2/grub.cfg` is incorrect. The workaround is to set the value of `GRUB_DEFAULT` in `/etc/default/grub` to the correct entry and use `grub2-mkconfig` to recreate `/etc/grub2/grub.cfg`, or use `yum` or `rpm` to remove the kernel packages. (Bug ID 19192278)

## Hebrew LaTeX Fonts

Installing the `tex-fonts-hebrew` package fails unless you first install all `texlive*` packages. (Bug ID 19059949)

## InfiniBand Issues

The following sections describe issues that might be encountered when using InfiniBand devices.

### Configuring Internet Protocol over InfiniBand (IPoIB)

To configure Internet Protocol over InfiniBand (IPoIB):

1. Edit the `/etc/sysconfig/network-scripts/ifcfg-ibN` configuration file, where *N* is the number of the interface. The following example shows the configuration for the interface `ib0`:

```
DEVICE=ib0
TYPE=InfiniBand
ONBOOT=yes
DHCP_HOSTNAME="myhost.mydom.com"
BOOTPROTO=static
IPADDR=192.168.100.1
NETMASK=255.255.255.0
IPV4_FAILURE_FATAL=yes
IPV6INIT=no
CONNECTED_MODE=no
NAME=ib0
```

2. Stop the NetworkManager service:

```
sudo systemctl stop NetworkManager
```

3. Start the RDMA service:

```
sudo systemctl start rdma
```

4. Bring up the interface:

```
sudo ifup ibN
```

(Bug ID 19150870)

### Changing the IPoIB mode of an InfiniBand Interface

The IPoIB driver supports the use of either connected mode or datagram mode with an interface, where datagram mode is the default mode. Changing the mode of an InfiniBand interface by echoing either `connected` or `datagram` to `/sys/class/net/ibN/mode` is not supported. It is also not possible to change the mode of an InfiniBand interface while it is enabled.

To change the IPoIB mode of an InfiniBand interface:

1. Edit the `/etc/sysconfig/network-scripts/ifcfg-ibN` configuration file, where *N* is the number of the interface:
  - To configure connected mode, specify `CONNECTED_MODE=yes` in the file.
  - To configure datagram mode, either specify `CONNECTED_MODE=no` in the file or do not specify this setting at all (datagram mode is enabled by default).

**Note**

Before saving your changes, make sure that you have not specified more than one setting for `CONNECTED_MODE` in the file.

2. To enable the specified mode on the interface, use the following commands to take down the interface and bring it back up:

```
sudo ifdown ibN
sudo ifup ibN
```

(Bug ID 17479833)

## Disabling a Switch Port Generates Warnings

You might see the following warning messages if you use the `ibportstate disable` command to disable a switch port:

```
ibwarn: [2696] _do_madrpc: recv failed: Connection timed out
ibwarn: [2696] mad_rpc: _do_madrpc failed; dport (Lid 38)
ibportstate: iberror: failed: smp set portinfo failed
```

You can safely ignore these warnings. (Bug ID 16248314)

## Installation Issues

The following sections describe issues that might be encountered during installation.

### Configuring Encryption and `/boot` During Installation

During installation, if you select **Encrypt my data** on the Installation Destination screen and then perform manual partitioning, the **Encrypt** check box is not shown as selected on the Manual Partitioning screen. This check box refers to encryption that you can configure on a file system type that supports encryption or on an LVM logical volume that contains the file system. If you click **Modify**, the **Encrypt** check box on the Configure Volume screen is shown as selected for the volume, meaning that the encryption will be applied at the level of the underlying block device.

For LVM, selecting **Encrypt my data** encrypts the LVM physical volume and all the logical volumes that it contains. If you do not select **Encrypt my data**, you can encrypt the logical volume by selecting the **Encrypt** check box on the Manual Partitioning screen or encrypt the physical volume by selecting the **Encrypt** check box on the Configure Volume screen.

For btrfs, encryption can only be applied to the block device that contains the file system, including its subvolumes. For example, enabling encryption for the `/home` subvolume of a btrfs root file system implicitly enables encryption for the root file system itself. You can only select the **Encrypt** check box on the Configure Volume screen. As btrfs does not support encryption at the file-system level, you cannot select the **Encrypt** check box on the Manual Partitioning screen for a btrfs file system.

Do not select the **Encrypt** check box or a **BTRFS**, **LVM**, or **LVM Thin Provisioning** device type for `/boot`. The `/boot` file system must be configured on a standard partition and should be of type `ext4` or `XFS`.

When entering a password in the Disk Encryption Passphrase dialog, press `Tab` to move between the entry fields. You cannot use the mouse to select the fields.

## Network Installation

Attempting to perform a network installation without configuring a network interface to use DHCP to obtain its IP settings or with static IP settings results in the error `Error in Installation Source`.

For example, if you use a feature such as a remote console or Lights-out management to access a boot ISO, the network configuration of the embedded server manager might not be available when you select the installation location. The workaround is to use the graphical installer to configure the network settings manually before configuring the installation location. (Bug ID 19047736)

## Intel QuickAssist Acceleration Technology

The UEK R3 does not support the QAT driver that allows cryptographic capabilities to be offloaded to QuickAssist hardware.

## multipath Messages Relating to zram

Running the `multipath -ll` command under UEK R3 produces messages such as the following:

```
zram0: No fc_host device for 'host'  
zram0: No fc_host device for 'host'  
zram0: No fc_remote_port device for 'rport--1:-1-0'
```

You can ignore these message as there is no effect on multipath functionality. You can prevent the messages from occurring by blocklisting the `zram` device in `/etc/multipath.conf`.

(Bug ID 20300644)

## net\_prio Control Group

The Network Priority cgroup subsystem (`net_prio`) is not currently supported for use with UEK R3. Attempting to use the module with UEK R3 results in error messages such as the following:

```
modprobe: FATAL: Module netprio_cgroup not found  
mount: special device cgroup does not exist.
```

(Bug ID 18966564)

## Network Connection Icon Reports Incorrect State for Interfaces

The network connection icon might report an active network interface as being disconnected. This behavior is seen for the `root` user but not for other users. Command-line utilities such as `ip link` and `ifconfig` report the correct state. (Bug ID 19060089)

## Network Teaming

Network teaming is not currently supported for use with UEK R3. The workaround is to use bonding instead. (Bug ID 19151770)

## NFS Issues

The following sections describe issues that might be encountered when using NFS.

### Using NFS v4 with an lxc-oracle Container Fails

Attempting to create an `lxc-oracle` container on a remote file system mounted using NFS v4 fails. In addition, attempting to mount a remote file system using NFS v4 from within an `lxc-oracle` container also fails. The workaround is to use NFS v3 instead. (Bug ID 16316266)

### Enabling and Disabling NFS

You cannot enable or disable the NFS service by using the `systemctl` command with `nfs.service`. Specify `nfs-server.service` instead, for example:

```
sudo systemctl enable nfs-server
```

(Bug ID 18437212)

### Oracle ASM Fails to Initialize with SELinux in Enforcing Mode

The `oracleasm` script fails if SELinux is in `Enforcing` mode. The suggested workaround is to disable the SELinux policy module for Oracle ASM before running `oracleasm`:

```
sudo semodule -d oracleasm  
sudo semodule -l | grep oracleasm
```

```
oracleasm      1.0.0   Disabled
```

(Bug ID 18513404)

### Oracle Linux 7 Guests on Oracle VM and Xen

Oracle Linux 7 guests are supported for both hardware virtualization (HVM) and hardware virtualization with paravirtual drivers (PVHVM) on Oracle VM 3. Oracle Linux 7 guests in a paravirtualized domain (PVM) on Oracle VM or other Xen-based hypervisors are not supported.

Oracle Linux 7 guests of any type are not supported on Oracle VM 2.

### Per-CPU Allocation Fails when Loading `kvm_intel` Module with UEK R3

Per-CPU allocation fails when the `kvm_intel` module is loaded with UEK R3. Messages such as the following are logged:

```
kvm_intel: Could not allocate 48 bytes percpu data  
PERCPU: limit reached, disable warning
```

There is no current workaround for UEK R3. (Bug ID 18459498)

## systemctl Does Not Support Some Service Actions

The `systemctl` command supports the `disable`, `enable`, `restart`, `start`, `status`, and `stop` actions for services such as `o2cb` and `oracleasm`. To perform actions such as `configure`, invoke the `/etc/init.d` script for the service directly. (Bug IDs 18527520 and 18528039)

## systemd Fails to Load the autofs4 and ipv6 Modules with UEK R3

At boot time, `systemd` fails to load the `autofs4` and `ipv6` modules and errors such as the following are logged:

```
systemd[1]: Failed to insert module 'autofs4'  
systemd[1]: Failed to insert module 'ipv6'
```

There is no current workaround for UEK R3. (Bug ID 18470449)

## Update Fails Unless i686 Kerberos Packages Are Removed

Updating Oracle Linux 7 fails if you have installed the `i686` versions of the `krb5-server` and `krb5-server-ldap` packages on a system. Remove these packages before updating the system, for example:

```
sudo yum remove krb5-server.i686 krb5-server-ldap.i686
```

(Bug ID 20671170)

## Upgrade Issues

The following sections describe issues that might be encountered when upgrading from Oracle Linux 6 (`_latest`) to Oracle Linux 7 Update 1.

### cgconfig and cgroup Packages Must Be Restored Separately

The `libcgroup` package in Oracle Linux 7 does not include the `cgconfig` and `cgroup` control group services. To restore these services on an upgraded system, install the `libcgroup-tools` package. (Bug ID 19177606)

### Postupgrade Fails if Web Proxy Is Required

The `postupgrade` scripts fail if a proxy is required to access Oracle Linux yum server. (Bug ID 19169163)

### Rebooting Fails if preupg Is Not Run

If you do not run the `preupgrade` assistant utility `preupg`, an upgraded system hangs while rebooting with the message `starting wait for plymouth boot screen to quit`. (Bug ID 18815298)

## Red Hat Compatible Kernel Is Not Removed

The old RHCK is not removed during the upgrade. (Bug ID 18767222)

## Upgrade Tool Does Not Exit if UEK R3 Is Not Installed

The `redhat-upgrade-tool-cli` utility does not exit if UEK R3 is not installed. (Bug ID 18900135)

## Using an Old Version of yum Causes Dependency Errors

The `redhat-upgrade-tool-cli` utility requires that you install version 3.2.29-43.0.1 or later of the `yum` package on the Oracle Linux 6 system that you want to upgrade. If you use an earlier version of the `yum` package, the upgrade tool fails with dependency errors. (Bug ID 18648783)

## XFS Issues

The following sections describe issues that might be encountered with the XFS file system under UEK R3.

### Kernel Panic if All Inodes Are Used

A kernel panic can occur with UEK R3 if all the inodes for an XFS file system are used. (Bug ID 19695297)

### xfs\_copy Fails for Sector Size Larger than 512 Bytes

`xfs_copy` fails to copy a file system under UEK R3 if the device sector size is greater than 512 bytes. (Bug ID 19267663)

## Power Button Defaults to ACPI Suspend

By default, Oracle Linux 7 in graphical (GUI) console mode treats the hardware power button as equivalent to the ACPI "Sleep" button, which puts the system into low-power sleep mode. This behavior is specific to Gnome desktop environment.

In previous Oracle Linux versions, the hardware power button initiated a system shutdown. To make Oracle Linux 7 do the same, create a file named `/etc/dconf/db/local.d/01-shutdown-button` with the following content:

```
[org/gnome/settings-daemon/plugins/power]
button-power='shutdown'
```

Then run the following command:

```
sudo dconf update
```

You must log out of the desktop environment and log back in for the new setting to take effect. (Bug ID 25597898)

# 4

## Installation and Availability

### **Warning**

Oracle Linux 7 is now in Extended Support. See [Oracle Linux Extended Support](#) and [Oracle Open Source Support Policies](#) for more information.

Migrate applications and data to Oracle Linux 8 or Oracle Linux 9 as soon as possible.

You can download a full Oracle Linux 7 Update 1 installation media image from the Oracle Software Delivery Cloud at <https://edelivery.oracle.com/linux>. You can also obtain the latest Oracle Linux 7 packages from the Unbreakable Linux Network (ULN) and the Oracle Linux yum server.

The following table lists some of the channels and repositories that are available on ULN and Oracle Linux yum server for Oracle Linux 7.

ULN Channel	Oracle Linux yum server Repository	Description
o17_x86_64_latest	o17_latest	Latest packages for Oracle Linux 7.
o17_x86_64_u0_base	o17_u0_base	Base packages for the initial release (Update 0) of Oracle Linux 7.
o17_x86_64_u0_patch		Patches for the initial-release packages of Oracle Linux 7.
o17_x86_64_uN_base	o17_uN_base	Base packages for Update <i>N</i> of Oracle Linux 7.
o17_x86_64_uN_patch		Patches for Update <i>N</i> of Oracle Linux 7.
o17_x86_64_addons	o17_addons	GPL-licensed packages for Oracle Linux 7 that have not been sourced from upstream.
o17_x86_64_Dtrace_userspace		DTrace user-space packages for Oracle Linux 7.
o17_x86_64_Ksplice		Ksplice packages for Oracle Linux 7.
o17_x86_64_MySQL55	o17_MySQL55	MySQL Community Edition 5.5 packages for Oracle Linux 7.
o17_x86_64_MySQL56	o17_MySQL56	MySQL Community Edition 5.6 packages for Oracle Linux 7.
o17_x86_64_optional_latest	o17_optional_latest	Latest optional packages (including most *-devel packages) for Oracle Linux 7 that have been sourced from upstream.

ULN Channel	Oracle Linux yum server Repository	Description
o17_x86_64_oracle		Oracle software packages for Oracle Linux 7.
o17_x86_64_UEKR3	o17_UEKR3	Latest Unbreakable Enterprise Kernel Release 3 (UEK R3) packages for Oracle Linux 7.
o17_x86_64_UEKR3_OFED20		OpenFabrics Enterprise Distribution (OFED) 2.0 packages for UEK R3 on Oracle Linux 7. See <a href="#">Installing or Upgrading the Oracle-Supported OFED Packages</a> .
o17_x86_64_VirtualBox		Oracle VM VirtualBox packages for Oracle Linux 7.

**Note**

Oracle Linux yum server does not provide equivalent repositories for some channels that are available on ULN. These channels provide non-open source packages.

The kernel source code is available after the initial release via a public git source code repository at <https://oss.oracle.com/git/?p=linux-uek3-3.8.git>.

If installed, remove the i686 versions of the `krb5-server` and `krb5-server-ldap` packages before updating the system, for example:

```
sudo yum remove krb5-server.i686 krb5-server-ldap.i686
```

If you are installing the update on a system on which you have previously installed the Oracle-supported OFED packages, see the following sections for instructions on how to update these packages during the upgrade:

- [Installing Oracle Linux 7 Update 1 from ULN if the Oracle-Supported OFED Packages Are Already Installed](#) for instructions on how to install the update from ULN.
- [Installing Oracle Linux 7 Update 1 from Oracle Linux Yum Server if the Oracle-Supported OFED Packages Are Already Installed](#) for instructions on how to install the update from Oracle Linux yum server.

UEK R3 is the default boot kernel for fresh installations of Oracle Linux 7. For systems that are running UEK R3 and are subscribed to the `o17_x86_64_UEKR3` channel on ULN, or the `o17_x86_64_UEKR3` repository on Oracle Linux yum server, you upgrade to the latest UEK release as follows:

1. Upgrade all packages on the system, including kernel packages.

```
sudo yum update
```

By default, the boot manager automatically enables the most recent kernel version so you do not need to change your GRUB configuration.

2. Reboot the system.

```
sudo systemctl reboot
```

# Installing or Upgrading the Oracle-Supported OFED Packages

The following sections describe how to install or upgrade the OFED packages provided by Oracle, including how to replace the default OFED packages from Red Hat that are present on a system that you have upgraded to Oracle Linux 7 or that you have installed from the Oracle Linux 7 full installation DVD image, the `ol7_x86_64_latest` channel on ULN, or the `ol7_latest` repository on Oracle Linux yum server. (Bug ID 19177152)

## Installing Oracle Linux 7 Update 1 from ULN if the Oracle-Supported OFED Packages Are Already Installed

### Note

This procedure assumes that you have registered the system with ULN. See [Oracle Linux: Unbreakable Linux Network User's Guide for Oracle Linux 6 and Oracle Linux 7](#).

To install Update 1 from ULN on an Oracle Linux 7 system on which the Oracle-supported OFED packages are already present:

1. Subscribe the system to the `ol7_x86_64_optional_latest`, `ol7_x86_64_UEKR3_OFED20`, `ol7_x86_64_UEKR3`, and `ol7_x86_64_latest` channels on ULN. (By default, the `ol7_x86_64_UEKR3` and `ol7_x86_64_latest` channels are enabled when you register an Oracle Linux 7 system with ULN.)
2. Edit `/etc/yum/pluginconf.d/rhnplugin.conf` and add the following lines to the end of the file:

```
[ol7_x86_64_UEKR3_OFED20]
priority=20
```

3. Install the `yum-plugin-priorities` package from the `ol7_x86_64_optional_latest` channel:

```
sudo yum install yum-plugin-priorities
```

4. To apply Oracle Linux 7 Update 1 to the system:

```
sudo yum update
```

Any Oracle-supported OFED packages that were already present are updated from the `ol7_x86_64_UEKR3_OFED20` channel.

5. Install Oracle-supported OFED packages such as `ibutils`, `libibcm`, `librdmacm-devel`, `librdmacm-utils`, `librdmacm`, `opensm`, `opensm-libs`, and `srptools` from the `ol7_x86_64_UEKR3_OFED20` channel as required, for example:

```
sudo yum install ibutils
```

## Installing Oracle Linux 7 Update 1 from Oracle Linux Yum Server if the Oracle-Supported OFED Packages Are Already Installed

To install Update 1 from Oracle Linux yum server on an Oracle Linux 7 system on which the Oracle-supported OFED packages are already present:

1. If you updated the server from Oracle Linux 6 or the initial release of Oracle Linux 7, ensure that your system is up to date and that you have transitioned to use the modular yum repository configuration by installing the `oraclelinux-release-el7` package and running the `/usr/bin/ol_yum_configure.sh` script.

```
sudo yum install oraclelinux-release-el7
sudo /usr/bin/ol_yum_configure.sh
```

2. Enable the `ol7_optional_latest`, `ol7_latest`, `ol7_UEKR3` and `ol7_UEKR3_OFED20` repositories.

```
sudo yum-config-manager --enable ol7_latest ol7_UEKR3 ol7_optional_latest
ol7_UEKR3_OFED20
```

3. Install the `yum-plugin-priorities` package from the `ol7_optional_latest` repository:

```
sudo yum install yum-plugin-priorities
```

4. To apply Oracle Linux 7 Update 1 to the system:

```
sudo yum update
```

Any Oracle-supported OFED packages that were already present are updated from the `ol7_UEKR3_OFED20` repository.

5. Install Oracle-supported OFED packages such as `ibutils`, `libibcm`, `librdmacm-devel`, `librdmacm-utils`, `librdmacm`, `opensm`, `opensm-libs`, and `srptools` from the `ol7_UEKR3_OFED20` repository as required, for example:

```
sudo yum install ibutils
```

## Installing the Oracle-Supported OFED Packages from ULN if the Default OFED Packages Are Not Already Installed

### Note

This procedure assumes that you have registered the system with ULN. See [Oracle Linux: Unbreakable Linux Network User's Guide for Oracle Linux 6 and Oracle Linux 7](#).

To install the Oracle-supported OFED packages from ULN on a minimally installed Oracle Linux 7 system on which the default OFED packages have not been installed:

1. Subscribe the system to the `ol7_x86_64_optional_latest`, `ol7_x86_64_UEKR3_OFED20`, `ol7_x86_64_UEKR3`, and `ol7_x86_64_latest` channels on ULN. (By default, the `ol7_x86_64_UEKR3` and `ol7_x86_64_latest` channels are enabled when you register an Oracle Linux 7 system with ULN.)

2. Edit `/etc/yum/pluginconf.d/rhnplugin.conf` and add the following lines to the end of the file:

```
[ol7_x86_64_UEKR3_OFED20]
priority=20
```

3. Install the `yum-plugin-priorities` package from the `ol7_x86_64_optional_latest` channel:

```
sudo yum install yum-plugin-priorities
```

4. Install Oracle-supported OFED packages such as `ibutils`, `libibcm`, `librdmacm-devel`, `librdmacm-utils`, `librdmacm`, `opensm`, `opensm-libs`, and `srptools` from the `ol7_x86_64_UEKR3_OFED20` channel as required, for example:

```
sudo yum install ibutils
```

## Installing the Oracle-Supported OFED Packages from Oracle Linux Yum Server if the Default OFED Packages Are Not Already Installed

To install the Oracle-supported OFED packages from Oracle Linux yum server on a minimally installed Oracle Linux 7 system on which the default OFED packages have not been installed:

1. If you updated the server from Oracle Linux 6 or the initial release of Oracle Linux 7, ensure that your system is up to date and that you have transitioned to use the modular yum repository configuration by installing the `oraclelinux-release-el7` package and running the `/usr/bin/ol_yum_configure.sh` script.

```
sudo yum install oraclelinux-release-el7
sudo /usr/bin/ol_yum_configure.sh
```

2. Enable the `ol7_optional_latest`, `ol7_latest`, `ol7_UEKR3` and `ol7_UEKR3_OFED20` repositories.

```
sudo yum-config-manager --enable ol7_latest ol7_UEKR3 ol7_optional_latest
ol7_UEKR3_OFED20
```

3. Install the `yum-plugin-priorities` package from the `ol7_optional_latest` repository:

```
sudo yum install yum-plugin-priorities
```

4. Install Oracle-supported OFED packages such as `ibutils`, `libibcm`, `librdmacm-devel`, `librdmacm-utils`, `librdmacm`, `opensm`, `opensm-libs`, and `srptools` from the `ol7_UEKR3_OFED20` repository as required, for example:

```
sudo yum install ibutils
```

## Installing the Oracle-Supported OFED Packages from ULN if the Default OFED Packages Are Already Present

### Note

This procedure assumes that you have registered the system with ULN. See [Oracle Linux: Unbreakable Linux Network User's Guide for Oracle Linux 6 and Oracle Linux 7](#).

To install the Oracle-supported OFED packages from ULN if the default OFED packages have already been installed on an Oracle Linux 7 system:

1. Subscribe the system to the `ol7_x86_64_optional_latest`, `ol7_x86_64_UEKR3_OFED20`, `ol7_x86_64_UEKR3`, and `ol7_x86_64_latest` channels on ULN. (By default, the `ol7_x86_64_UEKR3` and `ol7_x86_64_latest` channels are enabled when you register an Oracle Linux 7 system with ULN.)
2. Edit `/etc/yum/pluginconf.d/rhnplugin.conf` and add the following lines to the end of the file:

```
[ol7_x86_64_UEKR3_OFED20]
priority=20
```

3. Install the `yum-plugin-priorities` package from the `ol7_x86_64_optional_latest` channel:

```
sudo yum install yum-plugin-priorities
```

4. Downgrade any default OFED packages other than `ibutils`, `libibcm`, `librdmacm`, `librdmacm-devel`, `librdmacm-utils`, `opensm`, `opensm-libs`, and `srptools` that are already present on the system, for example:

```
sudo yum downgrade rdma
```

These packages are replaced with the Oracle-supported OFED packages from the `ol7_x86_64_UEKR3_OFED20` channel.

5. Remove the default `ibutils-libs` package (if present):

```
sudo yum remove ibutils-libs
```

6. Install Oracle-supported OFED packages such as `ibutils`, `libibcm`, `librdmacm-devel`, `librdmacm-utils`, `librdmacm`, `opensm`, `opensm-libs`, and `srptools` from the `ol7_x86_64_UEKR3_OFED20` channel as required, for example:

```
sudo yum install ibutils
```

## Installing the Oracle-Supported OFED packages from Oracle Linux Yum Server if the Default OFED Packages Are Already Present

To install the Oracle-supported OFED packages from Oracle Linux yum server if the default OFED packages have already been installed on an Oracle Linux 7 system:

1. If you updated the server from Oracle Linux 6 or the initial release of Oracle Linux 7, ensure that your system is up to date and that you have transitioned to use the modular yum repository configuration by installing the `oraclelinux-release-el7` package and running the `/usr/bin/ol_yum_configure.sh` script.

```
sudo yum install oraclelinux-release-el7
sudo /usr/bin/ol_yum_configure.sh
```

2. Enable the `ol7_optional_latest`, `ol7_latest`, `ol7_UEKR3` and `ol7_UEKR3_OFED20` repositories.

```
sudo yum-config-manager --enable ol7_latest ol7_UEKR3 ol7_optional_latest
ol7_UEKR3_OFED20
```

3. Install the `yum-plugin-priorities` package from the `ol7_optional_latest` repository:

```
sudo yum install yum-plugin-priorities
```

4. Downgrade any default OFED packages other than `ibutils`, `libibcm`, `librdmacm`, `librdmacm-devel`, `librdmacm-utils`, `opensm`, `opensm-libs`, and `srptools` that are already present on the system, for example:

```
sudo yum downgrade rdma
```

These packages are replaced with the Oracle-supported OFED packages from the `ol7_UEKR3_OFED20` repository.

5. Remove the default `ibutils-libs` package (if present):

```
sudo yum remove ibutils-libs
```

6. Install Oracle-supported OFED packages such as `ibutils`, `libibcm`, `librdmacm-devel`, `librdmacm-utils`, `librdmacm`, `opensm`, `opensm-libs`, and `srptools` from the `ol7_UEKR3_OFED20` repository as required, for example:

```
sudo yum install ibutils
```

# 5

## Package Changes from the Upstream Release

### **Warning**

Oracle Linux 7 is now in Extended Support. See [Oracle Linux Extended Support](#) and [Oracle Open Source Support Policies](#) for more information.

Migrate applications and data to Oracle Linux 8 or Oracle Linux 9 as soon as possible.

The following sections list the changes to source packages from the upstream release.

### Removed Packages

The following packages from the upstream release have been removed:

- kpatch
- libehca
- libica
- libreport-plugin-rhtsupport
- libreport-rhel
- librtas
- libservicelog
- libvpd
- libzfcphbaapi
- lsvpd
- openssl-ibmca
- powerpc-utils
- powerpc-utils-python
- ppc64-diag
- ppc64-utils
- publican-redhat
- python-rhsm
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-as-IN
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-bn-IN
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-de-DE
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-en-US
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-es-ES

- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-fr-FR
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-gu-IN
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-hi-IN
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-it-IT
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-ja-JP
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-kn-IN
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-ko-KR
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-ml-IN
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-mr-IN
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-or-IN
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-pa-IN
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-pt-BR
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-ru-RU
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-ta-IN
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-te-IN
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-zh-CN
- Red\_Hat\_Enterprise\_Linux-Release\_Notes-7-zh-TW
- redhat-access-gui
- redhat-access-plugin-ipa
- redhat-logos
- redhat-support-lib-python
- redhat-support-tool
- s390utils
- servicelog
- subscription-manager
- subscription-manager-migration-data
- virt-who
- yaboot

## Modified Packages

The following packages from the upstream release have been modified:

- abrt
- abrt-java-connector
- anaconda
- autofs
- basesystem
- coreutils

- dbus
- dhcp
- dracut
- firefox
- fuse
- gdm
- glibc
- glusterfs
- grub2
- grubby
- gstreamer
- httpd
- initial-setup
- initscripts
- ipa
- irqbalance
- iscsi-initiator-utils
- java-1.7.0-openjdk
- kabi-yum-plugins
- kde-settings
- kexec-tools
- libnl3
- libosinfo
- libreoffice
- libreport
- libreport-rhel-anaconda-bugzilla
- libreswan
- libvirt
- libxml2
- libxslt
- lorax
- mkbootdisk
- nss
- os-prober
- PackageKit
- pcs
- plymouth

- policycoreutils
- python-blivet
- redhat-bookmarks
- redhat-indexhtml
- redhat-lsb
- redhat-release-server
- redhat-rpm-config
- redhat-upgrade-dracut
- redhat-upgrade-tool
- rhn-client-tools (updated to support ULN)
- rhnsd
- rpmdevtools
- rsyslog
- scap-security-guide
- selinux-policy
- setroubleshoot
- setroubleshoot-plugins
- sos
- system-config-date
- system-config-kickstart
- systemd
- systemtap
- tog-pegasus
- wireshark
- xfsprogs
- xsane
- xulrunner
- yum
- yum-rhn-plugin
- yum-utils

## New Packages

The following packages are new for Update 1 relative to the initial release of Oracle Linux 7:

- anaconda-core
- anaconda-gui
- anaconda-tui
- augeas

- c-ares-devel
- ceph-common
- compat-opensm-lib
- convmv
- cups-client
- efivar-libs
- fence-agents-ilo-ssh
- fontawesome-fonts
- hypervfcopyd
- initial-setup-gui
- java-1.8.0-openjdk
- java-1.8.0-openjdk-devel
- java-1.8.0-openjdk-headless
- jboss-annotations-1.1-api
- kbd-legacy
- kernel-doc
- lasso
- libabw
- libetonyek
- libfreehand
- libguestfs-xf
- libnetfilter\_queue
- libocrdma
- librados2
- librbd1
- libselinux-ruby
- libusnic\_verbs
- lshw
- mod\_auth\_mellon
- mod\_authnz\_pam
- mod\_intercept\_form\_submit
- mod\_lookup\_identity
- mysql-community-bench
- mysql-community-client
- mysql-community-common
- mysql-community-devel
- mysql-community-embedded

- `mysql-community-embedded-devel`
- `mysql-community-libs`
- `mysql-community-server`
- `mysql-community-test`
- `nettle-devel`
- `opendnssec`
- `open-sans-fonts`
- `openscap-scanner`
- `python-libguestfs`
- `python-meh-gui`
- `python-qr-code-core`
- `python-rados`
- `python-rbd`
- `python-yubico`
- `pyusb`
- `samba-winbind-clients`
- `scap-security-guide`
- `softhsm`
- `sssd-krb5-common`
- `supermin5`
- `tagsoup`
- `xmlsec1`
- `xmlsec1-openssl`

## Modified Optional Packages

The following optional packages have been modified:

- `pesign`
- `publican`
- `PyOpenGL`
- `sanlock`
- `jetty-artifact-remote-resources`
- `jetty-parent`
- `jetty-toolchain`
- `thunderbird`

## Packages Added by Oracle

The following packages have been added:

- `btrfs-progs`
- `dtrace-modules`
- `kernel-uek`
- `libdtrace-ctf`
- `lxc`
- `ocfs2-tools`
- `oracleasm`
- `oracleasm-support`
- `oraclelinux-release`
- `oracle-logos`
- `oracle-rdbms-server-11gR2-preinstall`
- `oracle-rdbms-server-12cR1-preinstall`
- `reflink`
- `uname26`

# 6

## Removed Modules

 **Warning**

Oracle Linux 7 is now in Extended Support. See [Oracle Linux Extended Support](#) and [Oracle Open Source Support Policies](#) for more information.

Migrate applications and data to Oracle Linux 8 or Oracle Linux 9 as soon as possible.

The following modules have been removed from UEK R3 for Oracle Linux 7 compared with UEK R3 for Oracle Linux 6:

- 3c574\_cs
- 3c589\_cs
- 3c59x
- 3w-xxxx
- 8390
- acenic
- aic7xxx
- aic94xx
- amd8111e
- at76c50x-usb
- atmel
- atmel\_cs
- atmel\_pci
- axnet\_cs
- b43
- b43legacy
- can
- can-bcm
- can-dev
- can-raw
- cassini
- c\_can
- c\_can\_platform
- cciss

- cdc-phonet
- cxgb
- dl2k
- e100
- ems\_pci
- ems\_usb
- esd\_usb2
- fealnx
- fmvj18x\_cs
- forcedeth
- ips
- ipw2100
- ipw2200
- ixgb
- kvaser\_pci
- libertas
- libertas-sd8686-firmware
- libertas-sd8787-firmware
- libertas-usb8388-firmware
- libertas\_cs
- libertas\_sdio
- libertas\_tf
- libertas\_tf\_usb
- libipw
- mac80211\_hwsim
- megaraid\_mbox
- mptfc
- mptlan
- myril0ge
- natsemi
- ne2k-pci
- niu
- nmclan\_cs
- ns83820
- p54common
- p54pci
- p54usb

- pch\_can
- pcnet32
- pcnet\_cs
- plx\_pci
- r6040
- rt2400pci
- rt2500pci
- rt2500usb
- rtl8180
- s2io
- sc92031
- sis190
- sis900
- sja1000
- sja1000\_platform
- slcan
- smc91c92\_cs
- softing
- softing\_cs
- starfire
- sundance
- sungem
- sungem\_phy
- sunhme
- sym53c8xx
- tehuti
- tlan
- typhoon
- usb8xxx
- vcan
- via-rhine
- via-velocity
- vxge
- xirc2ps\_cs
- zd1211rw