# Oracle Linux 7
# Release Notes for Oracle Linux 7.3

E79987-14
November 2022

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Oracle Linux 7 Release Notes for Oracle Linux 7.3,

E79987-14

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# Preface

Oracle Linux 7: Release Notes for Oracle Linux 7.3 provides a summary of the new features and known issues in Update 3 for Oracle Linux 7. This document may be updated after it is released.

## Conventions

The following text conventions are used in this document:

| Convention | Meaning |
| --- | --- |
| **boldface** | Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary. |
| *italic* | 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/.

For information about the accessibility of the Oracle Help Center, see the Oracle Accessibility Conformance Report at https://www.oracle.com/corporate/accessibility/templates/t2-11535.html.

## 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

This section describes new features and changes in Update 3 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 and Limits

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 Oracle has not tested this configuration. 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 3 ships with the following kernel packages:

`kernel-3.10.0-514.el7`
Red Hat Compatible Kernel (RHCK).

`kernel-uek-4.1.12-61.1.18.el7uek`
Unbreakable Enterprise Kernel Release 4 update 2 (UEK R4u2), which is the default kernel.

Oracle Linux 7 Update 3 continues to support, but does not ship with, the latest Unbreakable Enterprise Kernel Release 3 updates. At the time of publication this is UEK R3u7.

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

# Support Tools

Oracle Linux 7 includes tools to assist with the resolution of runtime issues. This section describes new features and changes to these tools in this update.

## 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.

## makedumpfile Support for Large Memory Images

`makedumpfile` can now use `sadump` format for dumps of more than 16 TB of physical memory.

## Kpatch removed

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.

# 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

Note that the MySQL Community packages in this release update have been updated from MySQL Community 5.6 to MySQL Community 5.7.

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 5.7 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 5.7 packages nor MariaDB packages are installed. It is possible to install either the MySQL 5.7 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 5.7 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.

> **Note:**
>
> If you want to install MariaDB, you must deselect the MySQL repository. Otherwise, MySQL is installed even if you select only the MariaDB group. (Bug ID 22238684)

The MySQL Community 5.7, MySQL Community 5.6 and MySQL Community 5.5 packages are also available on the Unbreakable Linux Network (ULN) and Oracle Linux yum server.

(Bug ID 20069488)

# Spacewalk Client Registration

It is not necessary to install the Spacewalk client before registering an Oracle Linux 7 Update 3 system with a Spacewalk server. Instead, you can use the `rhnreg_ks` command, specifying the CA certificate file for the server, the server URL, and the activation key to be associated with the system.

To register a system as a client of a Spacewalk server:

1. Download the CA certificate file `RHN-ORG-TRUSTED-SSL-CERT` to the system.

   In a browser tab, navigate to `http://`*swksvr_FQDN*`/pub`, where *swksvr_FQDN* is the fully qualified domain name of the Spacewalk server, and download the CA certificate file `RHN-ORG-TRUSTED-SSL-CERT` to `/usr/share/rhn/`.

   Alternatively, you can use `wget` from the command line, for example:

   ```
   wget -q -O /usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT http://swksvr_FQDN/pub/RHN-ORG-
   TRUSTED-SSL-CERT
   ```

2. Register the system with Spacewalk using the `rhnreg_ks` command, using the `--sslCACert` option to specify the certificate.

   ```
   sudo rhnreg_ks --sslCACert=/usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT --
   serverUrl=https://swksvr_FQDN/XMLRPC --activationkey=activation_key
   ```

   Specify the Spacewalk server or proxy by its fully qualified domain name.

   If you need to re-register a Spacewalk client with a Spacewalk server, additionally specify the `--force` option.

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

To install the Spacewalk client software after registration, subscribe the server to a Spacewalk Client 2.2 software channel and use `yum` to install the packages:

```
sudo yum install rhn-client-tools rhn-check rhn-setup rhnsd m2crypto yum-rhn-
plugin
```

(Bug ID 20656368)

# UEFI Secure Boot Support

This update allows you to install and use 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. Oracle has updated the `kernel` and `grub2` packages to sign them with a valid Extended Validation (EV) certificate. The EV certificate has been compiled into the `shim` binary and has been signed by Microsoft. This feature is fully supported on Oracle Linux 7 update 3.

If you have previously enabled Secure Boot while it was available under technology preview, you must ensure that the `shim`, `grub2` and `kernel` packages are updated as an atomic operation if you intend to upgrade the system. If these packages are not all updated, the Secure Boot process may break and must be disabled until a full system upgrade is complete.

# Technology Preview

Features that are currently under technology preview when using UEK R4u2 are described in the release notes at Unbreakable Enterprise Kernel documentation

Features that are currently under technology preview when using UEK R3QU7 are described in the release notes at Unbreakable Enterprise Kernel documentation

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

- Systemd:
  - Importd features for container image imports and exports
- File Systems:
  - DAX (Direct Access) for direct persistent memory mapping from an application. This is under technical preview for the ext4 and XFS file systems.
  - Block and object storage layouts for parallel NFS (pNFS).
  - SCSI layout for parallel NFS (pNFS), including support for both client and server configurations.
  - OverlayFS remains in technical preview.
  - btrfs file system. Oracle supports btrfs with UEK R3 and UEK R4.
- Kernel:
  - Heterogeneous memory management (HMM).
  - Usernamespace (security features for isolating Linux containers from the host).
  - 10GbE RoCE Express for RDMA.
  - `ocrdma` and `libocrdma` packages for RDMA over RoCE.
  - No-IOMMU mode virtual I/O feature.
- Networking

- – Support for a Cisco proprietary User Space Network Interface Controller in UCM servers provided in the `libusnic_verbs` driver

- – Cisco VIC InfiniBand kernel driver that provides similar functionality to RDMA on proprietary Cisco architectures.

- – Trusted Network Connect.

- – Single-Root I/O virtualization (SR-IOV) in the `qlcnic` driver.

- – `nftables` and `libnftnl` network filtering and classification functionality

- Storage

  - – LVM2 support for RAID-level takeover (striped RAID4, linear RAID1 and mirror RAID1)

  - – Multi-queue I/O scheduling for SCSI (`scsi-mq`). This functionality is disabled by default.

  - – The plug-in for the libStorageMgmt API used for storage array management. The libStorageMgmt API is now fully supported, but the plugin is under technology preview.

  - – DIF/DIX for data integrity checking on SCSI devices other than certain, specified native HBA and storage hardware. Oracle supports DIF/DIX with UEK R3 and UEK R4.

# 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 4 (UEK R4) 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 R4 will remain unchanged in all subsequent updates to the initial release. UEK R4 contains changes to the kernel ABI relative to UEK R3 that require recompilation of third-party kernel modules on the system. Before installing UEK R4, verify its support status with your application vendor.

# 2
# Fixed Issues

This chapter describes the fixed issues for Oracle Linux 7 Update 3.

Note that additional issues specific to the kernel that you are using may also be resolved. If you are using the default UEK R4u2, please see Unbreakable Enterprise Kernel: Release Notes for Unbreakable Enterprise Kernel Release 4 Update 2 (4.1.12-61). If you are using an alternate UEK release or update, please refer to the appropriate release notes for this kernel version, available at Unbreakable Enterprise Kernel documentation.

## Upgrade issues fixed

Several issues relating to the upgrade process have been resolved to provide a more trouble-free upgrade process. (Bug IDs 18815298, 18767222, 18900135)

## Docker Engine and SELinux compatibility

An issue that previously caused the Docker Engine not to run on Oracle Linux 7 update 2 when SELinux was enabled has been resolved in this update. (Bug ID 22258930)

## Enabling and Disabling NFS

The issue that prevented enabling or disabling the NFS service by using the `systemctl` command with `nfs.service` has been resolved. (Bug ID 18437212)

## systemctl Service Actions Fixed For Some Services

Service actions, such as `configure`, that were previously not working for some services, such as for `o2cb` and `oracleasm`, are now fully functional via the `systemctl` command. (Bug IDs 18528039, 18527520)

# 3
# Known Issues

This chapter describes the known issues for Oracle Linux 7 Update 3.

Note that additional issues specific to the kernel that you are using may also be present. If you are using the default UEK R4u2, please see Unbreakable Enterprise Kernel: Release Notes for Unbreakable Enterprise Kernel Release 4 Update 2 (4.1.12-61). If you are using an alternate UEK release or update, please refer to the appropriate release notes for this kernel version, available at Unbreakable Enterprise Kernel documentation.

## 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)

## Installation on an iSCSI Disk

When installing on an iSCSI disk, add either `ip=ibft` or `rd.iscsi.ibft=1` to the boot command line and specify at least one MBR or GPT-formatted disk as an installation target. Otherwise, the installation fails with the error message `No valid boot loader target device found`. (Bug ID 22076589)

## Installation on an HP 3PAR TPVV

If you have not applied a Thin Persistence license to an HP 3PAR storage array, installation fails to create a file system on a thin provisioned virtual volume (TPVV). This license is required to support the low-level SCSI UNMAP command for storage reclamation. If you do not have a suitable license, the workaround is to use a fully provisioned virtual volume (FPVV) instead of a TPVV. (Bug ID 22140852)

## Oracle Linux 7 update 3 systems running UEK R3 are unable to boot if the `/root` partition is formatted using btrfs

Updates to the btrfs file system utilities that include new features, such as the skinny-metadata feature, are incompatible with UEK R3. If the `/root` partition is formatted using btrfs, a system running UEK R3 is unable to boot as it cannot mount the `/root` file system. The system is able to boot using UEK R4 or RHCK kernel types.

This problem is particularly important during installation, as it is possible to manually configure partitioning and the file systems from within the installer. When the file system is formatted within the installer, using btrfs, all of the newer features are enabled. If you select to downgrade the kernel to UEK R3 after installation, the system is unable to boot.

Systems that are already using btrfs with UEK R3 are unaffected when they are upgraded, as the file system would have been formatted with the new features disabled. (Bug ID 24840489)

# Upgrade Issues

The following sections describe issues that might be encountered when upgrading from Oracle Linux 6 (`_latest`) to Oracle Linux 7 Update 3.

## cgconfig and cgred Packages Must Be Restored Separately

The `libcgroup` package in Oracle Linux 7 does not include the `cgconfig` and `cgred` 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)

## 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)

# Package Conflicts

This section describes known package conflicts for packages distributed by Oracle for Oracle Linux 7 via ULN or Oracle Linux yum server.

## dovecot-devel.i686 and dovecot-devel.x86_64

The `dovecot-devel.i686` and `dovecot-devel.x86_64` packages in the `ol7_x86_64_optional_latest` ULN channel conflict. Attempting to install both packages results in a transaction check error:

```
Transaction check error:
  file /usr/include/dovecot/config.h conflicts between attempted installs of
dovecot-devel-1:2.2.10-7.el7.i686 and dovecot-devel-1:2.2.10-7.el7.x86_64
```

There are bitsize differences between the identified file. You may only install one of these packages on the same system at once. (Bug ID 25057633)

## ipa-server-dns.x86_64 and freeipa-server-dns

There is a conflict between the `ipa-server-dns.x86_64` package and the `freeipa-server-dns` package in the `ol7_x86_64_latest` ULN channel. The `.x86_64` version of the `ipa-server-dns` package has been superseded by a `.noarch` package for Oracle Linux 7 update 3.

To avoid the conflict you should exclude the `ipa-server-dns.*.x86_64` package in your Yum configuration. See Oracle Linux 7: Administrator's Guide for more information on how to exclude packages. (Bug ID 25054687)

## ipa-admintools.x86_64 and freeipa-admintools

There is a conflict between the `ipa-admintools.x86_64` package and the `freeipa-admintools` package in the `ol7_x86_64_latest` ULN channel. The `.x86_64` version of the `ipa-admintools` package has been superseded by a `.noarch` package for Oracle Linux 7 update 3.

To avoid the conflict you should exclude the `ipa-admintools.*.x86_64` package in your Yum configuration. See Oracle Linux 7: Administrator's Guide for more information on how to exclude packages. (Bug ID 25054687)

## rear.x86_64 and rear.noarch

The `.noarch` version of the `rear` package in the `ol7_x86_64_latest` ULN channel has been superseded by a `.x86_64` package for Oracle Linux 7 update 3.

To avoid the conflict you should exclude the `rear.*.noarch` package in your Yum configuration. See Oracle Linux 7: Administrator's Guide for more information on how to exclude packages. (Bug ID 25054687)

## PackageKit.i686 and PackageKit.x86_64

The `PackageKit.i686` package from the `ol7_x86_64_optional_latest` ULN channel conflicts with the `PackageKit.x86_64` package in the `ol7_x86_64_u3_base` channel. Attempting to install both packages results in a transaction check error:

```
Transaction check error:
  file /usr/lib/python2.7/site-packages/packagekit/__init__.pyc from install
of PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
  file /usr/lib/python2.7/site-packages/packagekit/__init__.pyo from install
of PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
  file /usr/lib/python2.7/site-packages/packagekit/backend.pyc from install
of PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
  file /usr/lib/python2.7/site-packages/packagekit/backend.pyo from install
of PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
  file /usr/lib/python2.7/site-packages/packagekit/enums.pyc from install of
PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
  file /usr/lib/python2.7/site-packages/packagekit/enums.pyo from install of
PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
  file /usr/lib/python2.7/site-packages/packagekit/filter.pyc from install of
PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
  file /usr/lib/python2.7/site-packages/packagekit/filter.pyo from install of
PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
  file /usr/lib/python2.7/site-packages/packagekit/misc.pyc from install of
PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
  file /usr/lib/python2.7/site-packages/packagekit/misc.pyo from install of
PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
  file /usr/lib/python2.7/site-packages/packagekit/package.pyc from install
of PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
  file /usr/lib/python2.7/site-packages/packagekit/package.pyo from install
of PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
  file /usr/lib/python2.7/site-packages/packagekit/progress.pyc from install
of PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
  file /usr/lib/python2.7/site-packages/packagekit/progress.pyo from install
of PackageKit-1.0.7-6.0.1.el7.i686 conflicts with file from package
PackageKit-1.0.7-6.0.1.el7.x86_64
```

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You may only install one of these packages on the same system at once. You should exclude the `PackageKit.i686` package in your Yum configuration. See Oracle Linux 7: Administrator's Guide for information on how to exclude packages. (Bug ID 24963661)

## sssd-common.i686 and sssd-common.x86_64

The `sssd-common.i686` package conflicts with the `sssd-common.x86_64` package in the `ol7_x86_64_optional_base` ULN channel. Attempting to install both packages results in a transaction check error:

```
Transaction check error:
  file /usr/share/systemtap/tapset/sssd.stp conflicts between attempted
installs of sssd-common-1.14.0-14.el7.i686 and
sssd-common-1.14.0-14.el7.x86_64
```

You may only install one of these packages on the same system at once. You should exclude the `sssd-common.i686` package in your Yum configuration. See Oracle Linux 7: Administrator's Guide for more information on how to exclude packages. (Bug ID 24963661)

# File System Related Bugs

The following are issues that related to file systems:

## xfs: Kernel panic in the multi-block buffer logging code

A bug exists in the multi-block buffer logging code, for XFS, that causes a kernel panic at log push time due to invalid regions being set in the buffer log format bitmap. (Bug ID 24400444)

## btrfs: Kernel warning after snapshot is created with incorrect qgroup

If qgroups are enabled, creating a snapshot that inherits from an invalid qgroup can cause the file system to crash and a warning to appear for the kernel in the system log. For example, the following operation causes the transaction to abort:

```
# btrfs subvolume snapshot -i 1/10 /mnt/scratch/ /mnt/scratch/snapshot
```

(Bug ID 24716895)

## btrfs: Unable to replay log after snapshot delete and parent directory fsync

If a snapshot is deleted and the parent directory is fsynced the log cannot be replayed during the next mount operation, preventing the file system from mounting. This is solvable by wiping the log trees using the btrfs-zero-log tool but is very inconvenient as it results in the loss of any data and metadata fsynced before the parent directory was fsynced. (Bug ID 24424719)

## btrfs: Empty symbolic link after fsync of parent directory

If a symbolic link is created and the parent directory is fsynced, a system crash or power outage results in an empty symbolic link when the file system is remounted. (Bug ID 23748445)

## btrfs: Incorrect directory entries after fsync log replay

If a directory or file is moved to a new parent directory and the file system logs the new parent but does not explicitly log the old parent, when the log is replayed entries for the moved directory of file can appear in both the old and new parent directories. (Bug ID 23748405)

## btrfs: File loss on log replay after renaming a file and fsync

If a file is renamed and fsynced and a system crash or power outage occurs, when the log is replayed, the file is deleted because the `last_unlink_trans` value is not captured in the log of the inode leaving the log without enough information to later replay the rename operation. (Bug ID 23725060)

## btrfs: qgroup Reserved space leaks

Several bugs surrounding the way in which quota groups (qgroups) reserve space result in leaks. This includes an issue where leaks are caused by rewriting to dirty ranges, resulting in a "pwrite64: Disk quota exceeded" error. (Bug ID 22483655)

## btrfs: Incorrect exclusive reference count after cloning file between subvolumes

The count for exclusive references is incorrect after cloning a file between two subvolumes. This issue is related to quota groups and the way in which some code is implemented. (Bug ID 22456419)

## btrfs: Kernel oops when unmounting during a quota rescan or disable

Operations that trigger a quota rescan or to disable the quota on a mounted file system cause a kernel oops message when attempting to unmount the file system. This can cause the system to hang. (Bug ID 22377928)

## btrfs: Kernel oops when removing shared extents using qgroup accounting

The removal of shared extents where quota group (qgroup) accounting is used can result in a kernel oops message. This relates to an issue where inaccurate results are obtained during a back reference walk due to missing records when adding delayed references. (Bug ID 21554517)

## ext4: System hang when processing corrupted orphaned inode list

If the orphaned inode list is corrupted the inode may be processed repeatedly resulting in a system hang. For example, if the orphaned inode list contains a reference to the bootloader inode, `ext4_iget()` returns a bad inode resulting in the processing loop that can hang the system. (Bug ID 24433290)

## xfs, ext4: IO error during DIO/AIO write results in disk content corruption

Disk content is corrupted when a Direct IO (DIO) or Asynchronous IO (AIO) write to an unwritten extent fails due to an IO error. (Bug ID 24393811)

## 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.

## Auto-completion 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 auto completion for all commands:

1.  Remove the `bash-completion` package:

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

2.  Run the `complete -r` command in the shell. To make this command persistent, you could put it in `$HOME/.bashrc`.

(Bug ID 19248362)

## 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.

(Bug ID 17616874)

## 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)

## grubby Fatal Error Upgrading Kernel When `/boot` Is On a btrfs Subvolume

If `/boot` is hosted on a btrfs subvolume, GRUB 2 is unable to correctly process the initramfs and vmlinuz pathnames. This problem occurs when you update or install a new kernel and `grubby` attempts to update the GRUB 2 configuration. In the case where you are running a fresh installation of Oracle Linux 7 update 3 and you upgrade the RHCK or UEK kernel, the following error is displayed:

```
grubby fatal error: unable to find a suitable template
```

When the system is rebooted, after the kernel update, the system boots to the old kernel.

Similarly, when upgrading from Oracle Linux 7 update 2 to Oracle Linux 7 update 3, if the `/boot` directory is hosted on a btrfs subvolume, the system boots to the old Oracle Linux 7 update 2 kernel after the upgrade is complete.

The workaround to this problem is to use `grub2-mkconfig` to recreate `/etc/grub2/grub.cfg` immediately after the kernel has been installed or upgraded. For example:

```
grub2-mkconfig -o /boot/grub2/grub.cfg
```

Obtain a listing of the kernel menu entries in the generated configuration:

```
grep -P "submenu|^menuentry" /boot/grub2/grub.cfg | cut -d "'" -f2
```

From the listing, select the kernel entry that you wish to run as the default kernel and set this entry as the default using the following command, substituting *menu entry title* with the title of the kernel entry that you identified in the listing:

```
grub2-set-default "menu entry title"
```

You can use the `grub2-editenv list` command to check that the `saved_entry` has been updated with the selected kernel menu title.

Reboot and use `uname -a` to check that the correct kernel is running when the system is rebooted.

(Bug ID 22750169)

## 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-ib`*N* 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/ib`*N*`/mode` is not supported for UEK R3. It is also not possible to change the mode of an InfiniBand interface while it is enabled if you are running UEK R3.

To change the IPoIB mode of an InfiniBand interface on a UEK R3 system:

1. Edit the `/etc/sysconfig/network-scripts/ifcfg-ib`*N* 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
```

> **Note:**
>
> This issue is resolved in UEK R4.

(Bug ID 17479833)

## Disabling an InfiniBand CA Port Generates Warnings

You might see the following warning messages if you use the `ibportstate disable` command to disable an InfiniBand CA or router 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)

## Intel QuickAssist Acceleration Technology

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

## Database Installation and Operation Fails if RemoveIPC=yes Is Configured for systemd

If `RemoveIPC=yes` is configured for `systemd`, interprocess communication (IPC) is terminated for a non-system user's processes when that user logs out. This setting, which is intended for laptops, can cause software problems on server systems. For example, if the user is a database software owner such as `oracle` for Oracle Database, this configuration can cause database installation to fail or database services to crash.

By default, Oracle Linux 7 Update 3 configures `RemoveIPC=no` in `/etc/systemd/logind.conf` to prevent systemd from terminating IPC. However, if you have touched this file before updating your system to Oracle Linux 7 Update 3, the update installs the new version of the file as `/etc/systemd/logind.conf.rpmnew` and does not set `RemoveIPC=no` in `/etc/systemd/logind.conf`. To avoid database crashes, set `RemoveIPC=no` in `/etc/systemd/logind.conf` and run `systemctl reboot` to reboot the system. (Bug ID 22224874)

## MariaDB Installation

If you want to install MariaDB, you must deselect the MySQL repository. Otherwise, MySQL is installed even if you select only the MariaDB group. (Bug ID 22238684)

# Oracle ASM Fails to Initialize with SELinux in Enforcing Mode

The `/etc/init.d/oracleasm` script fails if SELinux is in `Enforcing` mode. This interface is deprecated. Instead, use the global oracleasm userspace tool installed in `/usr/sbin/oracleasm` to run any oracleasm operations while SELinux is enabled.

(Bug ID 18513404)

# multipath Messages Relating to zram on UEK R3

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`.

Note that this issue is fixed for RHCK and UEK R4 u2 as `zram` support is compiled into separate kernel modules that can be loaded as needed. The warning messages reappear if the `zram` kernel module is loaded for either of these kernels.

(Bug ID 20300644)

# Unable to create Oracle Linux 7 LXC containers on NFS

The creation of Oracle Linux 7 containers fail when the root file system (`/container`) is hosted on an NFS share. RPM fails to set capabilities while attempting to install some packages. For instance, when attempting to create an Oracle Linux 7 update 2 container, the installation fails while installing the `iputils` package:

```
Error unpacking rpm package iputils-20121221-7.el7.x86_64
error: unpacking of archive failed on file /usr/bin/ping: cpio: cap_set_file
error: iputils-20121221-7.el7.x86_64: install failed
```

Similar issues are seen when attempting to install the `initscripts` and `systemd` packages while creating an Oracle Linux 7 update 1 container.

This issue occurs on both NFSv3 and NFSv4.

Oracle Linux 6 containers are unaffected.

(Bug ID 25024258)

# 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.

# Hyper-V related services fail to start on Oracle Linux 7 update 3 guest with UEK R4 kernel under Windows Hyper-V Server

For an Oracle Linux 7 update 3 guest with UEK R4 kernel running on Windows Hyper-V Server, the `hypervkvpd` and `hypervvssd` services fail to start if the Hyper-V packages are at version `0-0.29.20160216git.el7`.

The workaround is to downgrade the package version to `0-0.26.20150402git.el7` for the following packages:

- `hyperv-daemons`
- `hyperv-daemons-license`
- `hypervfcopyd`
- `hypervkvpd`
- `hypervvssd`

These userspace packages are available in both the `ol7_latest` yum repository and in the `ol7_x86_64_UEKR4` ULN channel.

Use the `yum` utility to downgrade the packages. For example:

1. Stop any running Hyper-V services:

   ```
   sudo systemctl stop hypervfcopyd.service
   sudo systemctl stop hypervkvpd.service
   sudo systemctl stop hypervvssd.service
   ```

2. Downgrade the packages:

   ```
   sudo yum downgrade hyperv*
   ```

3. Restart the Hyper-V services:

   ```
   sudo systemctl restart hypervfcopyd.service
   sudo systemctl restart hypervkvpd.service
   sudo systemctl restart hypervvssd.service
   ```

4. Modify your Yum configuration to exclude the Hyper-V packages from future updates. For example:

   ```
   echo "exclude = hyperv*" >> /etc/yum.conf
   ```

   Remember that you may want to remove this exclude at a later date when this issue is resolved.

(Bug ID 24745861)

# 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)

# 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)

# MACsec/IEEE 802.1AE network driver support not available in UEK

The `ip` and `iproute` commands included with Oracle Linux 7 Update 3 include support for MACsec network devices. The module for this driver is included with the RHCK but is not included in either UEK R3 or UEK R4. The commands to set or view MACsec features are only functional when used with the RHCK. (Bug ID 24614549).

# Geneve network driver support not available in UEK

The `ip` and `iproute` commands included with Oracle Linux 7 Update 3 include support for Geneve-capable devices. The module for this driver is included with the RHCK but is not included in either UEK R3 or UEK R4. The commands to set, add or view Geneve devices are only functional when used with the RHCK. (Bug ID 24652835) .

# Co-existing IPv4 and IPv6 VxLAN Workaround for UEK R4u2

Where VxLANs are configured for both IPv4 and IPv6 on the same host, there may be issues on UEK R4u2, due to the inability to bind the VxLAN tunnel on the same port and due to the way in which IPv6 sockets lists for IPv4 traffic as well. A patch has been applied in the RHCK, but the patch is not available in UEK R4u2.

To allow both versions of VxLAN to co-exist on the same system running Oracle Linux 7 update 3 when using UEK R4, enable the `bindv6only` system-wide socket option before bringing up the IPv6 VxLAN interface. You can disable the `bindv6only` system-wide socket option once the interface is online:

1. Enable the `bindv6only` system-wide socket option:

   ```
   sudo sysctl -w net.ipv6.bindv6only=1
   ```

2. Bring up the IPv6 interface, for example:

   ```
   sudo ip link set vlt2 up
   ```

3. Disable the `bindv6only` system-wide socket option once you are certain that the IPv6 interface is up:

   ```
   sudo sysctl -w net.ipv6.bindv6only=0
   ```

(Bug ID 24579830)

# 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 Manager is Unable to Add IPv6 Addresses to Interfaces on UEK R3

After upgrading from Oracle Linux 7 update 2 to Oracle Linux update 3, or when running UEK R3 on Oracle Linux 7 update 3, network interfaces configured for IPv6 may not be brought up by Network Manager and errors appear in the system log, similar to the following:

```
<error> platform-linux: do-add-ip6-address[2: fe80::210:e0ff:fe5f:920c]:
        failure 22 (Invalid argument)
<error> platform-linux: do-add-ip6-address[5: fd00:1:1:24::456]:
        failure 22 (Invalid argument)
```

It is possible to manually add the IPv6 address to the interface using the `ip addr add` command.

This issue is apparent regardless of whether IPv6 is configured statically, assigned dynamically via DHCP, or configured via Stateless Address Autoconfiguration (SLAAC).

The workaround for this issue is to disable Network Manager for interfaces where IPv6 must be configured for an interface. To disable Network Manager for an interface, edit the network script for the interface in `/etc/sysconfig/network-scripts/ifcfg-dev` and add the parameter `NM_CONTROLLED=no`. For example:

```
echo "NM_CONTROLLED=no" >> /etc/sysconfig/network-scripts/ifcfg-eno4
```

(Bug ID 24848072)

# 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)

# 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

You can download a full Oracle Linux 7 Update 3 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.

You can install additional software for Oracle Linux 7 by subscribing to the different channels on ULN or by enabling the required repositories within the Oracle Linux yum server configuration. To explore the channels that are available to you on ULN, login to https://uln.oracle.com/ and view the Channels option. To view the Oracle Linux yum server repositories available for Oracle Linux 7, visit https://yum.oracle.com/oracle-linux-7.html.

> **✎ 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.

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 3 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 3 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 R4 Update 2 is the default boot kernel for fresh installations of Oracle Linux 7 but the UEK R3 kernel remains available if you need to continue to use this. For more information, see Unbreakable Enterprise Kernel: Release Notes for Unbreakable Enterprise Kernel Release 4 Update 2 (4.1.12-61).

For systems that are running UEK R3 or UEK R4 and are subscribed to the `ol7_x86_64_UEKR3` or `ol7_x86_64_UEKR4` channel on ULN, or the `ol7_x86_64_UEKR3` or `ol7_x86_64_UEKR4` repository on Oracle Yum Server, 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
   ```

> **① Important:**
>
> Oracle Linux 7 Update 3 updates many major subsystems. To ensure that your updated systems function correctly, reboot them after updating.

# Upgrading from Oracle Linux 6

It is possible to upgrade an Oracle Linux 6 system to Oracle Linux 7 Update 3 under the following conditions:

- The system meets the minimum installation requirements for Oracle Linux 7 as described in System Requirements and Limits.

- The Oracle Linux 6 system has been completely updated from the `ol6_x86_64_latest` channel or `ol6_latest` repository.

- UEK R3 or UEK R4 has been installed on the system to be upgraded and is the default boot kernel. Upgrading from UEK R2 is not supported.

- No Oracle product stack is present on the system.

Upgrading is supported only for systems that are installed with the Minimal Install base environment. If additional packages are installed from an alternative repository or channel, upgrade may fail or the resulting upgrade may not function as expected.

General instructions on how to perform an upgrade are covered in Oracle Linux 7: Installation Guide. A summary of steps specific to the update for this release is provided below:

1. Make sure that your system is completely up to date by using the `yum update` command to update to the latest Oracle Linux 6 release. The system must be subscribed to the `ol6_x86_64_latest` channel or `ol6_latest` repository to be updated.

2. Install the required upgrade packages (specified version or later) :

   ```
   redhat-upgrade-tool-0.7.47-1.0.1.el6.noarch.rpm
   preupgrade-assistant-el6toel7-0.6.59-5.0.1.el6.noarch.rpm
   preupgrade-assistant-el6toel7-data-0.20161013-1.el6.noarch.rpm
   preupgrade-assistant-2.1.10-6.0.1.el6.noarch.rpm
   preupgrade-assistant-tools-2.1.10-6.0.1.el6.noarch.rpm
   preupgrade-assistant-ui-2.1.10-6.0.1.el6.noarch.rpm
   ```

   Obtain the latest versions of these packages from ULN (in the `ol6_x86_64_addons` channel), or from Oracle Linux yum server (in the `ol6_addons` repository).

3. Run the `preupg` command to perform and upgrade assessment:

   ```
   sudo preupg
   ```

   Examine the results in `/root/preupgrade/result.html` to make sure that there are not any items that have failed or need attention.

4. Run the `redhat-upgrade-tool-cli` command to perform the upgrade:

   ```
   sudo redhat-upgrade-tool-cli --network=7.3 --instrepo=OL7_repo_url \
   --debuglog=/tmp/upgrade.log --cleanup-post
   ```

> Replace *OL7_repo_url* with the URL of the repository where the Oracle Linux 7 update 2 packages are hosted.

**5.** Reboot the system to start the upgrade process.

# 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)

## Installation or Upgrade of Oracle-Supported OFED Packages for UEK R4

For instructions for installing or upgrading OFED packages with UEK R4 u2, see Unbreakable Enterprise Kernel: Release Notes for Unbreakable Enterprise Kernel Release 4 Update 2 (4.1.12-61). This is the default kernel.

## Installation or Upgrade of Oracle-Supported OFED Packages for UEK R3

The following sections describe different procedures for installing or upgrading OFED packages with UEK R3.

## Installing Oracle Linux 7 Update 3 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 3 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:

```
# yum install yum-plugin-priorities
```

4. To apply Oracle Linux 7 Update 3 to the system:

```
# 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:

```
# yum install ibutils
```

# Installing Oracle Linux 7 Update 3 from Oracle Linux Yum Server if the Oracle-Supported OFED Packages Are Already Installed

To install Update 3 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.

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

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

```
# 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:

```
# yum install yum-plugin-priorities
```

4. To apply Oracle Linux 7 Update 3 to the system:

```
# 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:

```
# 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:

   ```
   # 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:

   ```
   # 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.

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

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

   ```
   # 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:

    ```
    # 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:

    ```
    # 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:

    ```
    # 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:

    ```
    # 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):

    ```
    # 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:

    ```
    # 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.

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

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

   ```
   # 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:

   ```
   # 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:

   ```
   # 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):

   ```
   # 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:

   ```
   # yum install ibutils
   ```

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# 5

# Package Changes from the Upstream Release

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:

- `anaconda-user-help`
- `dtc`
- `kernel-aarch64`
- `kpatch`
- `libcxl`
- `libehca`
- `libica`
- `libreport-plugin-rhtsupport`
- `libreport-rhel`
- `librtas`
- `libservicelog`
- `libvpd`
- `libzfcphbaapi`
- `lsvpd`
- `opal-prd`
- `openssl-ibmca`
- `paflib`
- `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-insights`
- `redhat-access-plugin-ipa`
- `redhat-logos`
- `redhat-support-lib-python`
- `redhat-support-tool`
- `SLOF`
- `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
- akonadi
- anaconda
- apr-util
- autofs
- basesystem
- bash
- btrfs-progs
- clufter
- coreutils
- dbus
- dhcp
- dracut
- firefox
- fuse
- gperftools
- grub2
- grubby
- gstreamer
- hivex
- httpd
- initial-setup
- initscripts
- ipa
- iproute
- irqbalance
- iscsi-initiator-utils
- java-1.7.0-openjdk
- kabi-yum-plugins
- kde-settings
- kdepimlibs

- kexec-tools

- ksc

- libdbi-drivers

- libfprint

- libosinfo

- libreport

- libreport-rhel-anaconda-bugzilla

- libreswan

- libxml2

- libxslt

- lorax

- mkbootdisk

- mysql-connector-odbc

- nfs-utils

- nss

- nss-pam-ldapd

- ntp

- opa-ff

- opa-fm

- openscap

- open-vm-tools

- oracleasm

- os-prober

- PackageKit

- pcs

- perl-DBD-MySQL

- perl-XML-Parser

- plymouth

- policycoreutils

- postfix

- pykickstart

- python

- python-blivet

- qt3

- rear

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- `redhat-bookmarks`
- `redhat-indexhtml`
- `redhat-lsb`
- `redhat-release-server`
- `redhat-rpm-config`
- `redhat-upgrade-dracut`
- `redhat-upgrade-tool`
- `redland`
- `rhn-client-tools` (updated to support ULN)
- `rhnlib`
- `rhnsd`
- `rpmdevtools`
- `rsyslog`
- `scap-security-guide`
- `shim`
- `shim-signed`
- `selinux-policy`
- `setroubleshoot`
- `setroubleshoot-plugins`
- `sos`
- `system-config-date`
- `system-config-kickstart`
- `systemd`
- `tog-pegasus`
- `util-linux`
- `wireshark`
- `xfsprogs`
- `xsane`
- `xulrunner`
- `yum`
- `yum-rhn-plugin`

# New Packages

The following packages are new for Update 3 relative to Update 2 of Oracle Linux 7:

- `adwaita-qt`

- booth
- copy-jdk-configs
- cpuid
- crash-ptdump-command
- custodia
- hsakmt
- iwpmd
- ixpdimm_sw
- libcacard
- libi40iw
- libinvm-cim
- libinvm-cli
- libinvm-i18n
- libnftnl
- libpagemaker
- libvma
- memkind
- mod_auth_openidc
- ndctl
- nftables
- nvme-cli
- nvml
- pavucontrol
- pidgin-sipe
- python-gssapi
- python-idna
- python-ipaddress
- python-jwcrypto
- python-netifaces
- qt5-qt3d
- qt5-qtbase
- qt5-qtcanvas3d
- qt5-qtconnectivity
- qt5-qtdeclarative
- qt5-qtdoc

- `qt5-qtenginio`
- `qt5-qtgraphicaleffects`
- `qt5-qtimageformats`
- `qt5-qtlocation`
- `qt5-qtmultimedia`
- `qt5-qtquickcontrols`
- `qt5-qtscript`
- `qt5-qtsensors`
- `qt5-qtserialport`
- `qt5-qtsvg`
- `qt5-qttools`
- `qt5-qttranslations`
- `qt5-qtwebchannel`
- `qt5-qtwebsockets`
- `qt5-qtx11extras`
- `qt5-qtxmlpatterns`
- `spice-protocol`

# Modified Optional Packages

The following optional packages have been modified:

- `golang-github-gorilla-context`
- `golang-github-syndtr-gocapability`
- `libreoffice`
- `pesign`
- `publican`
- `sanlock`
- `jetty-artifact-remote-resources`
- `jetty-parent`
- `jetty-toolchain`
- `thunderbird`

# Packages Added by Oracle

The following packages have been added:

- `dtrace-modules`
- `inotify-tools`

- `kernel-uek`
- `libdtrace-ctf`
- `lxc`
- `mysql-connector`
- `ocfs2-tools`
- `oracleasm-support`
- `oraclelinux-release`
- `oracle-logos`
- `oracle-rdbms-server-11gR2-preinstall`
- `oracle-database-server-12cR2-preinstall`
- `reflink`
- `uname26`
- `yum-plugin-ulninfo`

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# Removed Modules

The following modules have been removed from UEK R4 for Oracle Linux 7 compared with UEK R4 for Oracle Linux 6:

- encrypted-keys
- usbserial
- xhci-pci
- xhci-hcd
- opencores-kbd
- max7359_keypad
- adp5588-keys
- mcs5000_ts
- rotary_encoder
- 3w-xxxx
- scsi_dh_rdac
- scsi_dh_emc
- scsi_dh_alua
- scsi_dh_hp_sw
- hid-magicmouse
- cpufreq_powersave
- cpufreq_conservative
- cciss
- rsxx
- dmi-sysfs
- kvaser_pci
- ems_pci
- sja1000_platform
- fealnx
- ns83820
- natsemi
- via-rhine
- via-velocity
- axnet_cs

- ne2k-pci
- 8390
- pcnet_cs
- forcedeth
- ath5k
- orinoco_pci
- wl12xx
- wlcore
- gpio-sch
- configfs
- autofs4
- af_alg
- seqiv
- pkcs7_message
- pkcs7_test_key
- algif_hash
- ctr
- algif_skcipher
- aes-x86_64
- can-gw