

Oracle Linux 7

Release Notes for Oracle Linux 7.7



F20376-09
December 2024



Oracle Linux 7 Release Notes for Oracle Linux 7.7,
F20376-09

Copyright © 2022, 2024, Oracle and/or its affiliates.

Contents

Preface

Conventions	vi
Documentation Accessibility	vi
Access to Oracle Support for Accessibility	vi
Diversity and Inclusion	vii

1 System Requirements and Limitations

File System, Storage, and Address Space Limitations	1-1
---	-----

2 Shipped Kernels

3 New Features and Changes

Installation	3-1
Important Installation Information for Oracle Linux 7.7	3-1
Graphical Installation Program Enhancement	3-1
Developer and Compiler Tools	3-2
NVMe/FC Driver on QLogic Adapter	3-2
File Systems	3-2
BTRFS Deprecated in RHCK	3-2
Red Hat Compatible Kernel	3-2
Networking	3-3
Security	3-3
Infrastructure Services	3-4
Tuned Updates	3-4
Chrony Updates	3-4
Technology Preview	3-4
Compatibility	3-5

4 Fixed Issues

depmod errors during kmod-oracleasm package upgrade issue fixed	4-1
---	-----

5 Known Issues

Installation, Upgrade, and Boot Issues	5-1
Graphical installer allows users to edit kickstart settings	5-1
FCoE boot fails on HPE servers with HPE FlexFabric adapters	5-1
Installation on an iSCSI disk	5-2
Information about installation on an HPE 3PAR TPVV	5-2
Installation fails on Aura7 NVMe device	5-2
Upgrade fails if open files limit is too low and rpm-plugin-systemd-inhibit is installed	5-2
Incompatible libpmemobj++-devel package version in ol7_optional_latest repository causes dependency issue during an upgrade	5-3
32-bit RDMA packages are installed when upgrading a system that has rdma-core installed	5-3
microcode_ctl failed early load check for "intel-06-4f-01"	5-3
Package Conflicts	5-3
PackageKit.i686 and PackageKit.x86_64	5-4
Automatic Bug Reporting Tool	5-4
File Systems Issues	5-5
BTRFS: Version of btrfs-progs utility on Oracle Linux 7.7 ISO does not support zstd file compression property	5-5
XFS: No support for reflink feature in RHCK	5-5
XFS: No support for real-time devices in RHCK	5-5
Snapshots of KVM guests using UEFI fail and are unsupported	5-6
KVM guests with LSI MegaRAID SAS iSCSI controller limited to 7 virtual disks	5-6
grubby fatal error during kernel upgrade when /boot is on a BTRFS subvolume	5-6
Hebrew LaTeX fonts	5-7
InfiniBand Issues	5-7
Kdump might fail due to an incorrect InfiniBand Adapter M3 Firmware version	5-7
Disabling an InfiniBand CA port generates warnings	5-7
Database installation and operation fails if RemoveIPC=yes is configured for systemd	5-8
Uninstalling libpcap can result in the removal of a large number of libvirt packages	5-8
Unable to create Oracle Linux 7 LXC containers on NFS	5-8
Support for Oracle Linux 7 guests on Oracle VM and Xen	5-9
Hyper-V related services fail to start on Oracle Linux 7 guest with UEK R4 kernel under Windows Hyper-V Server	5-9
Network Issues	5-9
Geneve network driver support not available in UEK releases prior to UEK R5	5-9
NetworkManager fails to respond to IPv6 addresses on low priority networks with DHCP on UEK R4	5-9
Network connection icon reports incorrect state for interfaces	5-9

Power button defaults to ACPI Suspend	5-10
Unable to customize guest name during installation with Virtual Machine Manager	5-10

6 Installation and Availability

Upgrading from Oracle Linux 6	6-2
Oracle-Supported RDMA Packages	6-3
Upgrading a system with an existing UEK R5 installation	6-3
Upgrading a system with an existing UEK R4 installation to use UEK R5	6-3
Upgrading a system with an existing UEK R4 installation to continue to use UEK R4	6-4

7 Package Changes from the Upstream Release

Changes to Binary Packages	7-1
Added Binary Packages by Oracle	7-1
Modified Binary Packages	7-2
Modified Optional Binary Packages	7-14
New Binary Packages	7-14
Removed Binary Packages	7-15
Changes to Source Packages	7-16
Added Source Packages by Oracle	7-16
Modified Source Packages	7-17
Modified Optional Source Packages	7-25
New Source Packages	7-25
Removed Source Packages	7-26

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 7.7](#) provides a summary of the new features and known issues in Oracle Linux 7.7. 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.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
<code>monospace</code>	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

System Requirements and Limitations



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 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 that is required for installation is 1GB, a minimum of 5 GB is recommended.

File System, Storage, and Address Space Limitations

The following table describes the maximum file size and maximum file system size for the `btrfs`, `ext4`, and `xfs` file systems. File system limitations are affected by kernel versions and features, as well as the architecture of the system on which Oracle Linux is installed. The values that are depicted here are estimates based on the known variables that might affect the maximum theoretical value that can be achieved. The theoretical values might be higher than those depicted here, and the actual achievable values might be lower than the values shown, depending on the hardware and the kernel version that is used.

File System Type	Maximum File Size	Maximum File System Size
<code>btrfs</code>	8 EiB	8 EiB
<code>ext4</code>	16 TiB	1 EiB
<code>xfs</code>	8 EiB	8 EiB

The limits for the `ext4` file system that are described here are higher than recommended and might prove unstable. If you plan to work with systems on which you are intend to work towards using higher file system sizes or file sizes, it is recommended that you use either the BTRFS or XFS file system.

The maximum supported size for a bootable logical unit number (LUN) is 50 TB. GPT and UEFI support are required for LUNs that are larger than 2 TB.

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

2

Shipped Kernels



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 7.7 ships with the following kernel packages:

kernel-3.10.0-1062.el7

Red Hat Compatible Kernel (RHCK).

kernel-uek-4.14.35-1902.3.2.el7

Unbreakable Enterprise Kernel Release 5 (UEK R5), which is the default kernel.

The Oracle Linux release is tested as a bundle, as shipped on the installation media image. When installed from the installation media image, the minimum kernel version that is supported is the kernel that is included in the image. Downgrading kernel packages is not supported, unless recommended by Oracle Support.

Note that previous releases of UEK, such as UEK R4, are not included on the installation media image but can be installed from the Oracle Linux yum server or from the Unbreakable Linux Network (ULN).

The kernel source code for the shipped kernel is available after the initial release through a public git source code repository at <https://github.com/oracle/linux-uek>.

3

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.

The following features and changes are included in Oracle Linux 7.7.

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](#).

Installation

The following installation and upgrade features, bug fixes, and enhancements are included in this update.

Important Installation Information for Oracle Linux 7.7

Before installing Oracle Linux 7.7, review the following important information:

Important:

Any system that is installed by using any Oracle Linux 7.7 ISO that is subsequently registered with the Unbreakable Linux Network (ULN), is automatically subscribed to the `ol7_x86_64_latest` and `ol7_x86_64_UEKR5` channels and are configured to download the latest Unbreakable Enterprise Kernel Release 5 (UEK R5) release on the next system update. When you run `yum update` after registering with ULN initially, the system is upgraded to the Oracle Linux 7.7 release and the default kernel is automatically changed to UEK R5. If you prefer to continue to use an alternate kernel, such as UEK R4, you must manually change the subscriptions for the system in ULN before performing the system update.

Systems that are not registered with ULN retain any existing yum configuration and continue to use the kernel that is installed with Oracle Linux 7.7. If you are not registered with ULN and want to upgrade to use UEK R5, you must enable the `ol7_UEKR5` repository in your yum configuration.

Graphical Installation Program Enhancement

The Oracle Linux 7.7 graphical installation program has been enhanced to detect whether Simultaneous Multithreading (SMT) is enabled on a system. If the feature is enabled, a

message is displayed at the bottom of the Installation Summary screen. SMT enables the execution of multiple threads on a single physical CPU core, which can improve performance. Note that the use of SMT is only possible where the CPU is SMT-capable.

Kernel options for setting whether SMT should be used on a system are available. By default, the `mitigations=auto` kernel parameter is set. This parameter mitigates against CPU vulnerabilities, but also leaves SMT enabled, even if it is vulnerable. In the event that a vulnerability is detected, you can disable SMT by booting the system with the kernel option set to `mitigations=auto,nosmt`.

Developer and Compiler Tools

The following compiler and developer tool features and enhancements are included in this update.

- **gcc-libraries packages updated to version 8.3.1**

This version of the GNU Compiler Collection (GCC) introduces several bug fixes and enhancements over the previous GCC version.

- **linuxptp packages updated to version 2.0**

This version of the `linuxptp` compiler tool introduces several bug fixes and enhancements over the previous version.

- **Python version 3.6 available**

This update includes `python3` packages, which provide the Python 3.6 interpreter and the `pip` and `setuptools` tools. Note that previously these packages were only available as a part of software collections.

NVMe/FC Driver on QLogic Adapter

Oracle Linux 7.7 includes the NVMe/FC driver on the QLogic qla2xxx adapter.

File Systems

The following file systems features, bug fixes, and enhancements are included in this update.

BTRFS Deprecated in RHCK

Starting with Oracle Linux 7.4, BTRFS is deprecated in RHCK. Note that BTRFS is fully supported with UEK R4 and UEK R5.

Red Hat Compatible Kernel

The following changes are specific to the Red Hat Compatible Kernel (RHCK). For more information, refer to latest versions of the release notes for Oracle Linux Unbreakable Enterprise Kernel Release 5 in [Unbreakable Enterprise Kernel documentation](#).

- **IMA and EVM features available on all architectures**

In this update, the Integrity Measurement Architecture (IMA) and Extended Verification Module (EVM) features are available on all architectures. The IMA and EVM features are used to monitor files for accidental or malicious altering. In Oracle Linux 7.6, these features were only available on the AMD64 and Intel 64 architectures.

- **PMTU discovery and route redirection provided for VXLAN and GENEVE tunnels**

This enhancement adds Path MTU (PMTU) discovery and route redirection for Virtual Extensible LAN (VXLAN) and Generic Network Virtualization Encapsulation (GENEVE) tunnels. The kernel can now handle Internet Control Message Protocol (ICMP) error messages such as "Destination Unreachable" and "Redirect Message", as well as ICMPv6 error messages such as "Packet Too Big" and "Destination Unreachable" for VXLAN and GENEVE tunnels, which is done by adjusting the PMTU and modifying the forwarding information.

- **Spectre V2 mitigation default changed from IBRS to Retpoline on new Oracle Linux 7.7 installations**

On new Oracle Linux 7.7 installations, the default mitigation for the Spectre V2 vulnerability (CVE-2017-5715) for systems with the 6th Generation Intel Core Processors and close derivatives has changed from Indirect Branch Restricted Speculation (IBRS) to Retpoline. This implementation is a result of Intel's recommendations to align with the defaults that are used in the Linux community and also to restore lost performance. Note that using Retpoline in certain situations might not fully mitigate Spectre V2.

Networking

The following networking features, bug fixes, and enhancements are included in this update.

- **NetworkManager includes capability for VLAN filtering on bridge interfaces**

This enhancement enables you to configure virtual LAN (VLAN) filtering on bridge interfaces in the corresponding `NetworkManager` connection profiles, as well as define VLANs directly on bridge ports.

- **NetworkManager includes capability for configuring policy routing rules**

This enhancement enables you to configure rules as part of a connection profile, which means that `NetworkManager` now adds the rules when the profile is activated and removes the rules when the profile is deactivated. Previously, you would have to set up policy routing rules outside of `NetworkManager` by using the dispatcher script provided in the `NetworkManager-dispatcher-routing-rules` package.

Security

The following security features, bug fixes, and enhancements are included in this update.

- **Network Security Services (NSS) package updates**

This update introduces several NSS changes, including numerous bug fixes, security enhancements, and improvements over the previous NSS version.

Notably, the NSS code and Certificate Authority (CA) list now meets the recommendations that are published with the latest Mozilla Firefox Extended Support Release (ESR). The updated CA list improves compatibility with the certificates that are used in the Internet Public Key Infrastructure (PKI).

- **SCAP Security Guide enhancement to include Universal Base Image containers and images**

The security policies in the SCAP Security Guide been enhanced to include Universal Base Image (UBI) containers and UBI images, which also includes `ubi-minimal` images. This enhancement enables configuration compliance scanning of UBI containers and images by using the `atomic scan` command. UBI containers and images can now be scanned against any profile that is shipped in the SCAP Security Guide, with only those

rules that are relevant to the secure configuration of UBI being evaluated. Any rules that are inapplicable to UBI images and containers are automatically skipped.

- **scap-security-guide packages updated to version 0.1.43**

As of this update, the `scap-security-guide` packages are updated to version 0.1.43 in this update. This version of the `scap-security-guide` packages provides several bug fixes and enhancements over the previous version.

- **shadow-utils packages updated to version 4.6**

The `shadow-utils` packages have been updated to version 4.6 in this update. This version of the `shadow-utils` packages provides several bug fixes and enhancements over the previous version, including the new `newuidmap` and `newgidmap` commands for manipulating name space mapping for UID and GID.

- **tangd_port_t SELinux type added**

Oracle Linux 7.7 includes the `tangd_port_t` SELinux type. This SELinux type enables the `tangd` service to run as confined while in SELinux enforcing mode, which simplifies the configuration of a Tang server to enable listening on a user-defined port, while preserving the security level that SELinux provides when in enforcing mode.

Infrastructure Services

The following server and services features, bug fixes, and enhancements are included in this update.

Tuned Updates

As of this update, the `tuned` packages are updated to version 2.11. This version of Tuned provides several bug fixes and enhancements over the previous version, including the following: added support for the boot loader specification, an updated `virtual-host` profile, the addition of a range feature for CPU exclusion, and other important improvements.

Chrony Updates

As of this update, the `chrony` packages are updated to version 3.4. This version of Chrony provides several bug fixes and enhancements over the previous version, including the following: hardware time-standing improvements, extended polling interval ranges, the addition of the burst and filter options to NTP sources, and other important improvements.

Technology Preview

Features that are currently under technology preview when using UEK R5 are described in [Unbreakable Enterprise Kernel: Release Notes for Unbreakable Enterprise Kernel Release 5 Update 2 \(4.14.35-1902\)](#).

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

- **Systemd:** Importd features for container image imports and exports.
- **File Systems:**
 - Block and object storage layouts for parallel NFS (pNFS).
 - DAX (Direct Access) for direct persistent memory mapping from an application. This feature is under technical preview for the ext4 and XFS file systems.

- OverlayFS remains in technical preview.
- **Kernel:**
 - Heterogeneous memory management (HMM).
 - No-IOMMU mode virtual I/O feature.
- **Networking:**
 - Cisco VIC InfiniBand kernel driver, which provides similar functionality to RDMA on proprietary Cisco architectures.
 - Single-Root I/O virtualization (SR-IOV) in the `qlcnict` driver.
 - Cisco proprietary User Space Network Interface Controller in UCM servers provided in the `libusnic_verbs` driver.
 - Trusted Network Connect included.
- **Storage:**
 - Multi-queue I/O scheduling for SCSI (`scsi-mq`). This functionality is disabled by default.
 - Plug-in for the `libStorageMgmt` API used for storage array management. The `libStorageMgmt` API is now supported, but the plug-in is under technology preview.

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 continue to run unmodified on the Unbreakable Enterprise Kernel Release 5 (UEK R5) 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 R5 will remain unchanged in all subsequent updates to the initial release. UEK R5 contains changes to the kernel ABI relative to UEK R4 that require recompilation of third-party kernel modules on the system. Before installing UEK R5, verify its support status with your application vendor.

4

Fixed Issues



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 chapter describes issues that are fixed in Oracle Linux 7.7.

Note that additional issues that are specific to the kernel you are using might also be resolved. If you are using the default UEK R5U2 kernel, see [Unbreakable Enterprise Kernel: Release Notes for Unbreakable Enterprise Kernel Release 5 Update 2 \(4.14.35-1902\)](#). If you are using an alternate UEK release, refer to the appropriate release notes for the appropriate kernel version in [Unbreakable Enterprise Kernel documentation](#).

depmod errors during kmod-oracleasm package upgrade issue fixed

A bug that resulted in `depmod` errors when upgrading or reinstalling the `kmod-oracleasm` package has been fixed. This error appeared on systems that were running a previous version of the `kmod-oracleasm` package and only occurred if the packages were downgraded and then upgraded again.

(Bug ID 28864195)

5

Known Issues



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 chapter describes the known issues for Oracle Linux 7.7.

Note that additional issues that are specific to the kernel you are using might also be present. If you are using the default UEK R5U2 kernel, see [Unbreakable Enterprise Kernel: Release Notes for Unbreakable Enterprise Kernel Release 5 Update 2 \(4.14.35-1902\)](#). If you are using an alternate UEK release, refer to the release notes for the appropriate kernel version in [Unbreakable Enterprise Kernel documentation](#)

Installation, Upgrade, and Boot Issues

The following issues might be encountered during an Oracle Linux 7.7 installation.

Graphical installer allows users to edit kickstart settings

When performing a graphical installation, where some installation options are already set by using a kickstart configuration file, it is still possible to modify these settings by clicking the various fields during the installation to edit the predefined content. These types of edits during the installation process requires you to intentionally attempt to modify the setting, effectively enabling an interactive installation, where options that are set in the kickstart configuration are not secured by any policy.

Note that this type of change is not possible when performing a text installation. During a text installation, you can only modify fields that have not already been defined in the kickstart configuration file.

(Bug ID 28642357)

FCoE boot fails on HPE servers with HPE FlexFabric adapters

This issue is due to a known limitation that the `bnx2x` and `bnx2fc` drivers have with the Option Card Black Box - Active Health (OCBB) feature when input-output memory management unit (IOMMU) is enabled. The issue occurs because the network adapter firmware attempts to access a memory area that is not assigned network devices when bringing the interface up/down or when loading/unloading the driver. When this issue occurs, you must reboot the system.

As a workaround, you must specify `intel_iommu=off` in the kernel boot parameters.

(Bug ID 30102871)

Installation on an iSCSI disk

When installing on an iSCSI disk, you must add `rd.iscsi.ibft=1` to the boot command line and then 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`.

**Note:**

Any prior instruction to use the `ip=ibft` is no longer valid, as this option is now fully deprecated.

(Bug ID 22076589 and 30155659)

Information about installation on an HPE 3PAR TPVV

If you have not applied a Thin Persistence license to an HPE 3PAR storage array, the 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)

Installation fails on Aura7 NVMe device

Installation fails if the target device is an Aura7 NVMe add-in card with two block devices. Although the card has two independent NVMe controllers and devices, they are assigned identical WWIDs. The multipath device mapper maps the two block devices to the same WWID, resulting in a bogus multipath configuration that prevents installation.

The workaround for this issue is to disable multipath for the installation at boot time by using the installer boot argument `nopath`. After the installation completes, blocklist the NVMe block devices for the multipath configuration on the system by editing the `/etc/multipath.conf` file. Or, you can disable device mapper multipath altogether. See [Oracle Linux 7: Administrator's Guide](#) for more information about configuring multipath.

(Bug ID 27638939)

Upgrade fails if open files limit is too low and rpm-plugin-systemd-inhibit is installed

An upgrade from Oracle Linux 7.6 can fail if the log-in session open files limit is set too low and the system that is being upgraded includes multiple packages from many channels or repositories. This issue can be triggered if the `rpm-plugin-systemd-inhibit` package is installed and the session is configured for a maximum open file limit that is lower than 4096. The issue typically results in yum failing to update and error messages similar to the following:

```
Verifying : glib2-static-2.56.1-1.el7.i686
glib2-static-2.56.1-1.el7.i686 was supposed to be installed but is not!
```

To resolve this issue, set the open file limit to 4096 before running `yum update`:

```
sudo ulimit -n 4096
sudo yum update -y
```

(Bug ID 28720235)

Incompatible libpmemobj++-devel package version in ol7_optional_latest repository causes dependency issue during an upgrade

The version of the `libpmemobj++-devel` package that is provided in the `ol7_optional_latest` repository is not compatible with the version of the `libpmemobj-devel` package that is provided in Oracle Linux 7 Update 7. This incompatibility causes a package dependency issue during an upgrade from Oracle Linux 7.6 to Oracle Linux 7.7.

The workaround for this issue is to remove the `libpmemobj++-devel` package from the Oracle Linux 7.6 system prior to upgrading to Oracle Linux 7.7.

(Bug ID 30141105)

32-bit RDMA packages are installed when upgrading a system that has rdma-core installed

For upgrades prior to Oracle Linux 7.4, where the `rdma-core.noarch` package is installed, 32-bit versions of the packages and many dependencies are also installed, unnecessarily. This problem occurs because the original version of the package is obsoleted. Thus, during upgrade, the package is replaced with both the `rdma-core.i686` and `rdma-core.x86_64` versions of the package, along with those packages' dependencies.

To work around the issue, run the `yum update` command with the `--exclude=*.i686` option:

```
sudo yum update --exclude=*.i686
```

(Bug ID 28217831)

microcode_ctl failed early load check for "intel-06-4f-01"

During installation and while booting, an error similar to the following may appear in the system log:

```
dracut: microcode_ctl: kernel version "4.14.35-1818.3.3.el7uek.x86_64"
failed early load check for "intel-06-4f-01", skipping
```

The Intel `ucode 06-4f-01` file is incorrectly excluded from `initramfs` for boot-time microcode updates on some kernel versions. This affects certain Intel Xeon E5 v4 CPUs, one of the models formerly known as Broadwell. The Oracle Server X6-2 uses this CPU model. This message is harmless, provided that the BIOS is current for any system that is using this processor model, as the BIOS will perform the required update.

(Bug ID 28879995)

Package Conflicts

The following are known conflicts for packages that are distributed by Oracle for Oracle Linux 7.7 through ULN or the Oracle Linux yum server.

PackageKit.i686 and PackageKit.x86_64

The `PackageKit.i686` package in the `ol7_x86_64_optional_latest` ULN channel conflicts with the `PackageKit.x86_64` package in the `ol7_x86_64_u6_base` channel. Attempting to install both packages results in a transaction check error similar to the following:

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

You may only install one of these packages on the same system at the same time. To avoid this conflict, exclude the `PackageKit.i686` package in your `yum` configuration. For more information about how to exclude packages, see [Oracle Linux: Unbreakable Linux Network User's Guide for Oracle Linux 6 and Oracle Linux 7](#).

(Bug ID 24963661)

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.

File Systems Issues

The following are issues related to file systems.

BTRFS: Version of `btrfs-progs` utility on Oracle Linux 7.7 ISO does not support `zstd` file compression property

The version of the `btrfs-progs` that is provided on the Oracle Linux 7.7 ISO does not support the `zstd` file compression property. As a result, using the `mkfs.btrfs` utility to create and mount a `btrfs` file system fails if you specify the `zstd` file compression property, for example:

```
sudo mkfs.btrfs -f <device>
sudo mount <device> <mount point>
sudo touch <mount point>/file
sudo btrfs property set <mount point>/file compression "zstd"
sudo umount <mountpoint>
```

The following error occurs on the next attempt to open the file system by using the `btrfs.fsck` utility:

```
btrfs.fsck <device>
couldn't open because of unsupported option features (10)
ERROR: cannot open filesystem"
```

To correct this issue, update the version of the `btrfs-progs` utility on your system to version 4.15.1-1.el7, which is available in the `ol7_x86_64_UEKR5` channel on ULN and the `ol7_x86_64_UEKR5` repository on the Oracle Linux yum server.

(Bug ID 30178098)

XFS: No support for reflink feature in RHCK

If an XFS file system is created with support for the `reflink` feature with the UEK R5 kernel, you cannot mount the XFS file system with the RHCK kernel. It can only be mounted as a read-only file system.

(Bug ID 30119906)

XFS: No support for real-time devices in RHCK

If an XFS file system is created with support for `real-time` devices with the UEK R5 kernel, you cannot mount the XFS file system with the RHCK kernel.

(Bug ID 30115269)

Snapshots of KVM guests using UEFI fail and are unsupported

You cannot create snapshots of KVM guests if they use UEFI. In older versions of QEMU and libvirt, the tools might allow you to create the snapshot without an error or warning, but the snapshot could be corrupted. More recent versions of these tools prevent snapshot creation by producing an error similar to the following:

```
virsh # snapshot-create-as OL7-seboot
```

```
error: Operation not supported: internal snapshots of a VM with pflash based
firmware are not supported
```

(Bug ID 26826800)

KVM guests with LSI MegaRAID SAS ISCSI controller limited to 7 virtual disks

An Oracle Linux 7 KVM guest that is using the LSI MegaRAID SAS ISCSI controller is limited to 7 virtual disks. Although KVM guests can have up to 8 ISCSI virtual disks, the LSI MegaRAID SAS controller uses the first slot for the ISCSI Initiator, leaving just the 7 remaining slots for virtual disks.

The workaround for this issue is to use the `megasas` controller instead of the `lsi` controller when creating ISCSI virtual disks. For example, change `-device lsi` to `-device megasas`, as highlighted in the following examples:

```
sudo /usr/bin/qemu-system-x86_64 -machine accel=kvm -m 8192 -smp 8 \
-drive file=/path/OracleLinux-7.6-x86_64.qcow2,format=qcow2,if=none,id=disk \
-device ide-hd,bus=ide.0,unit=0,drive=disk,bootindex=0 -device lsi,id=lsi0 \
-drive file=/path/disk1.img,format=raw,if=none,id=drive_image1 \
-device scsi-hd,id=image1,drive=drive_image1,bus=lsi0.0 \
...

sudo /usr/bin/qemu-system-x86_64 -machine accel=kvm -m 8192 -smp 8 \
-drive file=/path/OracleLinux-7.6-x86_64.qcow2,format=qcow2,if=none,id=disk \
-device ide-hd,bus=ide.0,unit=0,drive=disk,bootindex=0 -device megasas,id=lsi0 \
-drive file=/path/disk1.img,format=raw,if=none,id=drive_image1 \
-device scsi-hd,id=image1,drive=drive_image1,bus=lsi0.0 \
...
```

(Bug 27681238)

grubby fatal error during kernel upgrade 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 7.7 and you upgrade the RHCK or UEK kernel, the following error is displayed:

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

After the kernel update, when the system is rebooted, it boots the old kernel.

The workaround for this problem is to use `grub2-mkconfig` to regenerate the `/etc/grub2/grub.cfg` file, or `/etc/grub2-efi.cfg` file on a UEFI booted system, immediately after the kernel has been installed or upgraded, for example:

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

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

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

From the listing, select the kernel entry that you want to run as the default kernel and set this entry as the default by using the following command:

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

where *menu entry title* is the title of the kernel entry that you identified in the listing.

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

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

(Bug ID 22750169)

Hebrew LaTeX fonts

Installing the `tex-fonts-hebrew` package fails unless you first install all of the `texlive*` packages.

(Bug ID 19059949)

InfiniBand Issues

The following are issues that you might encounter when using InfiniBand devices.

Kdump might fail due to an incorrect InfiniBand Adapter M3 Firmware version

Kdump might fail on Oracle Linux 7.6 if the Oracle Dual Port QDR InfiniBand Adapter M3 Firmware version 2.31.5350 is installed.

To prevent this issue from occurring, update the Oracle Dual Port QDR InfiniBand Adapter M3 Firmware version to at least 2.31.5350.

(Bug ID 26351183)

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)

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 use on laptop systems, 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 a database installation to fail or database services to crash.

By default, Oracle Linux 7.7 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 7.6, 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 the `systemctl reboot` command to reboot the system. (Bug ID 22224874)

Uninstalling libpcap can result in the removal of a large number of libvirt packages

The `libpcap` package is updated to enable functionality for upcoming technologies. If you install this package and then attempt to uninstall it, a large number of `libvirt` packages might also be uninstalled due to dependency relationships. The `libvirt` package has a dependency on the `libvirt-daemon-driver-nwfilter` package and this package has a dependency on `libpcap`. Removing `libpcap` removes the entire `libvirt` family of packages.

(Bug ID 28582266)

Unable to create Oracle Linux 7 LXC containers on NFS

The creation of Oracle Linux 7 containers fails when the `root` file system (`/container`) is hosted on an NFS share. This problem occurs because the `iputils` package in Oracle Linux 7 is built to use the Linux file extended attributes `[xattr(7)] security capabilities(7)`. Because the NFS protocol does not support these file capabilities, the `iputils` package might not be installed into an NFS files system. For example, when attempting to create an Oracle Linux 7 container, the installation fails while installing the `iputils` package, producing the following error:

```
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 container.

This issue occurs on both NFSv3 and NFSv4.

Note that Oracle Linux 6 containers are not affected. (Bug ID 25024258)

Support for 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 Release 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 Release 2. (Bug IDs 18712168, 18667813, 18266964)

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

If you are running UEK R4 or an earlier release on Oracle Linux 7, the `hypervkvpd` and `hypervvssd` services fail to start if the Hyper-V packages are at version `0-0.29.20160216git.el7` or later.

To avoid this issue, upgrade to UEK R4U5 or later.

(Bug ID 24745861)

Network Issues

The following issues are related to network features and configuration.

Geneve network driver support not available in UEK releases prior to UEK R5

The `ip` and `iproute` commands included with Oracle Linux 7.7 include support for Geneve-capable devices. The module for this driver is included with the RHCK but is not included in UEK R4. The commands to set, add or view Geneve devices are only functional when used with the RHCK or with UEK R5. (Bug ID 24652835) .

NetworkManager fails to respond to IPv6 addresses on low priority networks with DHCP on UEK R4

When running UEK R4 on Oracle Linux 7.7, NetworkManager fails to send a response to low priority networks with DHCP on UEK R4. Networks with higher priority (link-local, IPv6 `fe80::/64` routes) take priority over the lower priority networks. This behavior might result in the DHCPv6 server failing to send a response to a DHCP client on a lower priority network, even if the network has another output device. (Bug ID 27714775)

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 7.7 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)

Unable to customize guest name during installation with Virtual Machine Manager

During an installation with `virt-manager`, if you select a customized configuration and then edit the Name field to customize the virtual machine (VM) name, an error occurs when you attempt to apply the changes.



Note:

On the `x86_64` platform, this issue only occurs when UEFI firmware is selected for the guest; BIOS-based installations are unaffected.

The error that is displayed is similar to the following:

```
Error apply changes: 'NoneType' object has no attribute 'rfind'
```

```
Traceback (most recent call last):
```

```
File "/usr/share/virt-manager/virtManager/details.py", line 1887, in
config_apply
```

```
    ret = self.config_overview_apply()
```

```
File "/usr/share/virt-manager/virtManager/details.py", line 1979, in
config_overview_apply
```

```
    self.vm.rename_domain(self.widget("overview-name").get_text())
```

```
File "/usr/share/virt-manager/virtManager/domain.py", line 596, in
rename_domain
```

```
    new_nvram, old_nvram = self._copy_nvram_file(new_name)
```

```
File "/usr/share/virt-manager/virtManager/domain.py", line 571, in
_copy_nvram_file
```

```
    nvram_dir = os.path.dirname(old_nvram.path)
```

```
File "/usr/lib64/python2.7/posixpath.py", line 129, in dirname
    i = p.rfind('/') + 1
```

```
AttributeError: 'NoneType' object has no attribute 'rfind'
```

This issue is only encountered when attempting to customize the Name field. If you apply any other customizations prior to the installation, such as the Title or Description fields, the installation proceeds as expected. Note that you can edit the Name field after the installation completes, if desired.

(Bug ID 29954660)

6

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 7.7 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 7.7 by subscribing to the different channels on ULN or by enabling the required repositories within your yum configuration. To explore the channels that are available to you on ULN, log in to <https://uln.oracle.com/> and view the Channels option. To view the Oracle Linux yum repositories that are available for Oracle Linux 7, visit <https://yum.oracle.com/oracle-linux-7.html>.

Note:

The 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 an update on a system for which you have previously installed the Oracle-supported OFED packages, see [Upgrading a system with an existing UEK R4 installation to continue to use UEK R4](#) for instructions on how to update these packages during an upgrade.

UEK R5 is the default boot kernel for fresh installations of Oracle Linux 7.7. For more information, see [Unbreakable Enterprise Kernel: Release Notes for Unbreakable Enterprise Kernel Release 5 Update 2 \(4.14.35-1902\)](#).

For systems that are running UEK R3 or UEK R4 and are subscribed to the `o17_x86_64_UEKR3` or `o17_x86_64_UEKR4` channel on ULN, or the `o17_x86_64_UEKR3` or `o17_x86_64_UEKR4` repository on the Oracle Linux yum server, upgrade to the latest UEK release as follows:

1. Upgrade all of the packages on the system, including the 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
```

! Important:

Oracle Linux 7.7 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 7.7 under the following conditions:

- The system meets the minimum installation requirements for Oracle Linux 7 as described in [System Requirements and Limitations](#).
- 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 that is to be upgraded and is the default boot kernel.

Upgrading from UEK R2 is not supported. Note that the system is upgraded to use the UEK R5 release that is provided with Oracle Linux 7.7.

- 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 might fail or the resulting upgrade might not function as expected.

For general instructions on how to perform an upgrade, see [Oracle Linux 7: Installation Guide](#).

The following steps are specific to the update for this release:

1. Make sure 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` and `ol6_x86_64_addons` channels or `ol6_latest` and `ol6_addons` repositories to be updated.

2. Install the latest versions of the required upgrade packages:

```
yum install openscap redhat-upgrade-tool preupgrade-assistant \
preupgrade-assistant-el6toel7 preupgrade-assistant-el6toel7-data-0 \
preupgrade-assistant-tools preupgrade-assistant-ui
```

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

3. If the system is registered with ULN, delete the system from ULN and disable yum plugins.
4. Run the `preupg` command to perform an upgrade assessment:

```
sudo preupg
```

Examine the results in `/root/preupgrade/result.html` to make sure there are no items that have failed or need attention.

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

```
sudo redhat-upgrade-tool-cli --network=7.5 --instrepo=OL7_repo_url \
--debuglog=tmp/upgrade.log --cleanup-post
```

where `OL7_repo_url` is the URL of the repository where the Oracle Linux 7.7 ISO is hosted.

6. Reboot the system to start the upgrade process.

**Note:**

When upgrading from Oracle Linux 6 to Oracle Linux 7.7, the previous version of UEK R4 is removed from the system during the upgrade and the system is updated to use the UEK R5 release that is provided on the installation media image as the default boot kernel.

Oracle-Supported RDMA Packages

Oracle Linux 7.7 introduces UEK R5 as the default kernel. The Oracle-supported RDMA packages that are shipped with UEK R5 replace previous OFED packages and use an updated package and channel-naming scheme. Oracle recommends using UEK R5 with Oracle Linux 7.7. If you intend to install RDMA packages, see [Unbreakable Enterprise Kernel: Release Notes for Unbreakable Enterprise Kernel Release 5 Update 2 \(4.14.35-1902\)](#).

Upgrading a system with an existing UEK R5 installation

If you are upgrading your system from a release prior to Oracle Linux 7.7 and you are already using UEK R5 with the Oracle-supported RDMA packages, these packages are updated automatically as part of the upgrade process.

If your system is registered with ULN, ensure that it is subscribed to the `ol7_x86_64_UEKR5_RDMA`, `ol7_x86_64_UEKR5`, and `ol7_x86_64_latest` channels before the upgrade.

If your system uses the Oracle Linux yum server, ensure that the `ol7_UEKR5_RDMA`, `ol7_UEKR5`, and `ol7_latest` repositories are enabled before upgrading.

Upgrading a system with an existing UEK R4 installation to use UEK R5

If you are upgrading your system from a release prior to Oracle Linux 7.7 and you are using UEK R4 with the Oracle-supported OFED packages, it is recommended that you upgrade to UEK R5 and switch to the corresponding Oracle-supported UEK R5 RDMA packages before upgrading your system.

Note that if the system is newly registered on ULN, the `ol7_x86_64_UEKR5` and `ol7_x86_64_latest` channels are subscribed to by default. However, you will need to explicitly subscribe to the `ol7_x86_64_UEKR5_RDMA` channel.

If your system uses the Oracle Linux yum server, the `ol7_UEKR5`, and `ol7_latest` repositories are enabled by default, starting with Oracle Linux 7.6. However, ensure that the `ol7_UEKR5_RDMA` repository is enabled before upgrading.

Upgrading requires that you remove existing OFED packages prior to installing the compatible packages for UEK R5. For instructions, see [Unbreakable Enterprise Kernel: Release Notes for Unbreakable Enterprise Kernel Release 5 Update 2 \(4.14.35-1902\)](#).

Upgrading a system with an existing UEK R4 installation to continue to use UEK R4

If you are upgrading your system from a release prior to Oracle Linux 7.7 and you are using UEK R4 with the Oracle-supported OFED packages, *and* you intend to continue to use UEK R4, you must ensure that your system is subscribed to the correct channels or that the correct yum repositories are enabled before upgrading.

If you are using ULN, check that your system is registered before upgrading and then subscribe the system to the `ol7_x86_64_UEKR4_OFED` and `ol7_x86_64_UEKR4` channels.

NOT_SUPPORTED:

By default, the `ol7_x86_64_UEKR5` and `ol7_x86_64_latest` channels are enabled when you register an Oracle Linux 7.7 system with ULN. Note that if the `ol7_x86_64_UEKR5` channel is enabled, you must disable it to continue if you plan to continue to use UEK R4 with the Oracle-supported OFED packages.

If you are using the Oracle Linux yum server, check that the `ol7_UEKR4` and `ol7_UEKR4_OFED` repositories are enabled and make sure that the `ol7_UEKR5` and `ol7_UEKR5_RDMA` repositories are disabled.

Use the `yum update` command to upgrade to Oracle Linux 7.7 with the UEK R4 compatible OFED packages.

If you do not have any of the OFED packages installed, you can proceed to install the packages as described in the installation instructions that are provided in [Unbreakable Enterprise Kernel: Release Notes for Unbreakable Enterprise Kernel Release 4 Update 7 \(4.1.12-124\)](#).

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 binary and source packages from the upstream release.

Changes to Binary Packages

This section contains information about the removed, modified, and new **binary** packages in this release. For information about the **source** package changes, see [Changes to Source Packages](#).

Added Binary Packages by Oracle

The following binary packages have been added by Oracle:

- `dtrace-utils`
- `dtrace-utils-testsuite`
- `kernel-uek`
- `kernel-uek-debug`
- `kernel-uek-debug-devel`
- `kernel-uek-devel`
- `kernel-uek-doc`
- `libdtrace-ctf`
- `libdtrace-ctf-devel`
- `lxc`
- `lxc-devel`
- `lxc-libs`
- `ocfs2-tools`
- `ocfs2-tools-devel`
- `oracleasm-support`
- `oracle-database-preinstall-19c`

- `oraclelinux-release`
- `oracle-logos`
- `reflink`
- `yum-plugin-ulninfo`

Modified Binary Packages

The following binary packages from the upstream release have been modified:

- `abrt`
- `abrt-addon-ccpp`
- `abrt-addon-kerneloops`
- `abrt-addon-pstoreoops`
- `abrt-addon-python`
- `abrt-addon-vmcore`
- `abrt-addon-xorg`
- `abrt-cli`
- `abrt-console-notification`
- `abrt-dbus`
- `abrt-desktop`
- `abrt-gui`
- `abrt-gui-libs`
- `abrt-java-connector`
- `abrt-libs`
- `abrt-python`
- `abrt-tui`
- `akonadi`
- `akonadi-mysql`
- `anaconda`
- `anaconda-core`
- `anaconda-gui`
- `anaconda-tui`
- `anaconda-user-help`
- `anaconda-widgets`
- `apr-util`
- `apr-util-devel`
- `autofs`
- `basesystem`

- binutils
- binutils-devel
- blivet3-data
- bpftool
- btrfs-progs
- chrony
- cloud-init
- clufter-bin
- clufter-cli
- clufter-common
- clufter-lib-ccs
- clufter-lib-general
- clufter-lib-pcs
- cmirror
- cockpit
- cockpit-bridge
- cockpit-system
- cockpit-ws
- coreutils
- cpp
- cups-filters
- cups-filters-libs
- curl
- daxio
- dbus
- dbus-devel
- dbus-libs
- dbus-x11
- device-mapper
- device-mapper-event
- device-mapper-event-libs
- device-mapper-libs
- device-mapper-multipath
- device-mapper-multipath-libs
- dhclient
- dhcp

- dhcp-common
- dhcp-libs
- dracut
- dracut-config-generic
- dracut-config-rescue
- dracut-fips
- dracut-fips-aesni
- dracut-network
- efibootmgr
- firefox
- fuse
- fuse-devel
- fuse-libs
- fwupdate
- fwupdate-efi
- fwupdate-libs
- gcc
- gcc-c++
- gcc-gfortran
- gcc-gnat
- gcc-objc
- gcc-objc++
- gdb
- gdb-gdbserver
- glibc
- glibc-common
- glibc-devel
- glibc-headers
- glibc-utils
- gnome-system-log
- gperftools-libs
- grub2
- grub2-common
- grub2-efi-ia32
- grub2-efi-ia32-modules
- grub2-efi-x64

- grub2-efi-x64-modules
- grub2-pc
- grub2-pc-modules
- grub2-tools
- grub2-tools-extra
- grub2-tools-minimal
- grubby
- gstreamer
- gstreamer-tools
- httpd
- httpd-devel
- httpd-manual
- httpd-tools
- initial-setup
- initial-setup-gui
- initscripts
- ipa-client
- ipa-client-common
- ipa-common
- ipa-python-compat
- ipa-server
- ipa-server-common
- ipa-server-dns
- ipa-server-trust-ad
- iscsi-initiator-utils
- iscsi-initiator-utils-iscsiuio
- iwl1000-firmware
- iwl100-firmware
- iwl105-firmware
- iwl135-firmware
- iwl2000-firmware
- iwl2030-firmware
- iwl3160-firmware
- iwl3945-firmware
- iwl4965-firmware
- iwl5000-firmware

- iwl5150-firmware
- iwl6000-firmware
- iwl6000g2a-firmware
- iwl6000g2b-firmware
- iwl6050-firmware
- iwl7260-firmware
- iwl7265-firmware
- java-11-openjdk
- java-11-openjdk-devel
- java-11-openjdk-headless
- java-1.7.0-openjdk
- java-1.7.0-openjdk-devel
- java-1.7.0-openjdk-headless
- kabi-yum-plugins
- kdepimlibs
- kdepimlibs-akonadi
- kdepimlibs-devel
- kdepimlibs-kxmlrpcclient
- kde-settings
- kde-settings-ksplash
- kde-settings-plasma
- kde-settings-pulseaudio
- kernel
- kernel-abi-whitelists
- kernel-debug
- kernel-debug-devel
- kernel-devel
- kernel-doc
- kernel-headers
- kernel-tools
- kernel-tools-libs
- kexec-tools
- kmod
- kmod-kvdo
- kmod-libs
- kmod-oracleasm

- kpartx
- ksc
- ksh
- libatomic
- libatomic-static
- libcurl
- libcurl-devel
- libdbi-dbd-mysql
- libdbi-dbd-pgsql
- libdbi-drivers
- libgcc
- libgfortran
- libgnat
- libgnat-devel
- libgomp
- libgudev1
- libgudev1-devel
- libguestfs
- libguestfs-inspect-icons
- libguestfs-java
- libguestfs-tools
- libguestfs-tools-c
- libguestfs-xfs
- libitm
- libitm-devel
- libobjc
- libpmem
- libpmemblk
- libpmemlog
- libpmemobj
- libpmempool
- libquadmath
- libquadmath-devel
- libreport
- libreport-anaconda
- libreport-cli

- `libreport-filesystem`
- `libreport-gtk`
- `libreport-plugin-bugzilla`
- `libreport-plugin-mailx`
- `libreport-plugin-reportuploader`
- `libreport-plugin-ureport`
- `libreport-python`
- `libreport-rhel-anaconda-bugzilla`
- `libreport-web`
- `libreswan`
- `librpmem`
- `libssh2`
- `libstdc++`
- `libstdc++-devel`
- `libstdc++-docs`
- `libstoragemgmt`
- `libstoragemgmt-arccconf-plugin`
- `libstoragemgmt-hpsa-plugin`
- `libstoragemgmt-local-plugin`
- `libstoragemgmt-megaraid-plugin`
- `libstoragemgmt-netapp-plugin`
- `libstoragemgmt-nfs-plugin`
- `libstoragemgmt-nfs-plugin-clibs`
- `libstoragemgmt-nstor-plugin`
- `libstoragemgmt-python`
- `libstoragemgmt-python-clibs`
- `libstoragemgmt-smis-plugin`
- `libstoragemgmt-targetd-plugin`
- `libstoragemgmt-udev`
- `libvirt`
- `libvirt-bash-completion`
- `libvirt-client`
- `libvirt-daemon`
- `libvirt-daemon-config-network`
- `libvirt-daemon-config-nwfilter`
- `libvirt-daemon-driver-interface`

- libvirt-daemon-driver-lxc
- libvirt-daemon-driver-network
- libvirt-daemon-driver-nodedev
- libvirt-daemon-driver-nwfilter
- libvirt-daemon-driver-qemu
- libvirt-daemon-driver-secret
- libvirt-daemon-driver-storage
- libvirt-daemon-driver-storage-core
- libvirt-daemon-driver-storage-disk
- libvirt-daemon-driver-storage-gluster
- libvirt-daemon-driver-storage-iscsi
- libvirt-daemon-driver-storage-logical
- libvirt-daemon-driver-storage-mpath
- libvirt-daemon-driver-storage-rbd
- libvirt-daemon-driver-storage-scsi
- libvirt-daemon-kvm
- libvirt-devel
- libvirt-docs
- libvirt-libs
- libvmem
- libvmmalloc
- libxml2
- libxml2-devel
- libxml2-python
- libxslt
- libxslt-devel
- linux-firmware
- lorax
- lvm2
- lvm2-cluster
- lvm2-libs
- lvm2-python-boom
- lvm2-python-libs
- lz4
- mdadm
- microcode_ctl

- mkbootdisk
- mod_session
- mod_ssl
- mokutil
- mozjs52
- nfs-utils
- nscd
- nss-softokn
- nss-softokn-devel
- nss-softokn-freebl
- nss-softokn-freebl-devel
- ntp
- ntpdate
- opa-address-resolution
- opa-basic-tools
- opa-fastfabric
- opa-fm
- opa-libopamgt
- OpenIPMI
- OpenIPMI-libs
- OpenIPMI-modalias
- OpenIPMI-perl
- openscap
- openscap-containers
- openscap-python
- openscap-scanner
- openscap-utils
- openssl
- openssl-devel
- openssl-libs
- open-vm-tools
- open-vm-tools-desktop
- oscap-anaconda-addon
- osinfo-db
- os-prober
- PackageKit

- PackageKit-command-not-found
- PackageKit-glib
- PackageKit-gstreamer-plugin
- PackageKit-gtk3-module
- PackageKit-yum
- parted
- pcs
- pcs-snmp
- perf
- perl-DBD-MySQL
- perl-Sys-Guestfs
- perl-XML-Parser
- plymouth
- plymouth-core-libs
- plymouth-graphics-libs
- plymouth-plugin-label
- plymouth-plugin-two-step
- plymouth-scripts
- plymouth-system-theme
- plymouth-theme-charge
- pmempool
- policycoreutils
- policycoreutils-devel
- policycoreutils-gui
- policycoreutils-newrole
- policycoreutils-python
- policycoreutils-sandbox
- polkit
- polkit-devel
- polkit-docs
- ppp
- pykickstart
- python
- python2-blivet3
- python2-ipaclient
- python2-ipalib

- python2-ipaserver
- python3
- python3-libs
- python-blivet
- python-clufter
- python-configshell
- python-devel
- python-jwt
- python-libguestfs
- python-libs
- python-msrestazure
- python-perf
- python-rtslib
- python-s3transfer
- qt3
- qt3-devel
- qt3-MySQL
- qt3-ODBC
- qt3-PostgreSQL
- qt-settings
- rear
- redhat-bookmarks
- redhat-indexhtml
- redhat-lsb
- redhat-lsb-core
- redhat-lsb-cxx
- redhat-lsb-desktop
- redhat-lsb-languages
- redhat-lsb-printing
- redhat-lsb-submod-multimedia
- redhat-lsb-submod-security
- redhat-release-server
- redhat-rpm-config
- redhat-upgrade-dracut
- redhat-upgrade-dracut-plymouth
- redhat-upgrade-tool

- redland
- redland-virtuoso
- rhn-check
- rhn-client-tools
- rhnlib
- rhnsd
- rhn-setup
- rhn-setup-gnome
- rpmdevtools
- rpmemd
- scap-security-guide
- scap-security-guide-doc
- scap-workbench
- seabios-bin
- seavgabios-bin
- selinux-policy
- selinux-policy-devel
- selinux-policy-minimum
- selinux-policy-mls
- selinux-policy-targeted
- setroubleshoot
- setroubleshoot-plugins
- setroubleshoot-server
- shim-ia32
- shim-unsigned-ia32
- shim-unsigned-x64
- shim-x64
- sos
- sos-collector
- spice-streaming-agent
- system-config-date
- system-config-kickstart
- systemd
- systemd-devel
- systemd-libs
- systemd-python

- `systemd-sysv`
- `tog-pegasus`
- `tog-pegasus-libs`
- `unixODBC`
- `unixODBC-devel`
- `uom-lib`
- `virt-install`
- `virt-manager`
- `virt-manager-common`
- `virt-p2v-maker`
- `virt-v2v`
- `wireshark`
- `wireshark-gnome`
- `xfsprogs`
- `xsane-common`
- `xsane-gimp`
- `xulrunner`
- `yum`
- `yum-plugin-aliases`
- `yum-plugin-changelog`
- `yum-plugin-ovl`
- `yum-plugin-tmprepo`
- `yum-plugin-verify`
- `yum-plugin-versionlock`
- `yum-rhn-plugin`
- `yum-utils`

Modified Optional Binary Packages

The following optional binary packages have been modified:

- `thunderbird`

New Binary Packages

The following binary packages are new for Update 7, relative to Update 6 of Oracle Linux 7:

- `adobe-mappings-cmap`
- `adobe-mappings-pdf`
- `chrome-gnome-shell`

- `compat-exiv2-026`
- `geoipupdate`
- `geolite2`
- `libmaxminddb`
- `libpaper`
- `openjpeg2`
- `pmdk-convert`
- `po4a`
- `python3`
- `python3-setuptools`
- `python-blivet3`
- `python-pip`
- `python-rpm-generators`
- `python-rpm-macros`
- `python-wheel`
- `redfish-finder`
- `sassist`
- `ucx`
- `urw-base35-fonts`
- `xorriso`

Removed Binary Packages

The following binary packages from the upstream release have been removed:

- `insights-client`
- `kpatch`
- `python-rhsm`
- `redhat-access-gui`
- `redhat-access-plugin-ipa`
- `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-logos
- redhat-release-eula
- redhat-support-lib-python
- redhat-support-tool
- subscription-manager
- subscription-manager-migration-data
- virt-who

Changes to Source Packages

This section contains information about the removed, modified, and new **source** packages in this release. For information about the **binary** package changes, see [Changes to Binary Packages](#).

Added Source Packages by Oracle

The following source packages have been added by Oracle:

- compat-gcc-32
- dtrace-utils
- inotify-tools
- kernel-uek
- libdtrace-ctf
- lxc
- ocfs2-tools
- oracleasm-support

- oracle-database-preinstall-19c
- oraclelinux-release
- oracle-logos
- reflink
- uname26
- yum-plugin-ulninfo

Modified Source Packages

The following source packages from the upstream release have been modified:

- abrt
- abrt-java-connector
- akonadi
- anaconda
- anaconda-user-help
- apr-util
- autofs
- babel
- basesystem
- bcc
- binutils
- brltty
- btrfs-progs
- caribou
- ceph-common
- chrony
- cloud-init
- clufter
- cockpit
- coreutils
- cups-filters
- curl
- custodia
- dbus
- dbus-glib
- dbusmenu-qt
- dbus-python

- deltarpm
- device-mapper-multipath
- device-mapper-persistent-data
- dhcp
- dracut
- efibootmgr
- file
- firefox
- firewalld
- fuse
- fuseiso
- fwupdate
- gcc
- gcc-libraries
- gdb
- gdbm
- glibc
- gnome-system-log
- gperftools
- grub2
- grubby
- gstreamer
- gstreamer1
- gstreamer1-plugins-bad-free
- gstreamer1-plugins-base
- gstreamer1-plugins-good
- gstreamer1-plugins-ugly-free
- gstreamer-plugins-bad-free
- gstreamer-plugins-base
- gstreamer-plugins-good
- hawkey
- httpd
- initial-setup
- initscripts
- ipa
- iscsi-initiator-utils

- java-11-openjdk
- java-1.7.0-openjdk
- javapackages-tools
- kabi-yum-plugins
- kdepimlibs
- kde-settings
- kernel
- kernel-uek
- kexec-tools
- keycloak-httpd-client-install
- kmod
- kmod-kvdo
- ksc
- kscreen
- ksh
- libblockdev
- libbytesize
- libdbi-drivers
- libguestfs
- libguestfs-winsupport
- libpwquality
- libreport
- libreswan
- libssh2
- libstoragegmt
- libtdb
- libtevent
- libvirt
- libvirt-cim
- libvirt-glib
- libvirt-java
- libvirt-python
- libvirt-snmpp
- libxml2
- libxslt
- linux-firmware

- lorax
- lvm2
- lz4
- mdadm
- microcode_ctl
- mkbootdisk
- mozjs52
- nfs-utils
- nss-softoken
- ntp
- nvml
- opa-ff
- opa-fm
- OpenIPMI
- openscap
- openssl
- openssl098e
- open-vm-tools
- oracleasm
- oscap-anaconda-addon
- osinfo-db
- osinfo-db-tools
- os-prober
- PackageKit
- parted
- pcp
- pcs
- pcsc-lite
- pcsc-lite-ccid
- perftest
- perl-DBD-MySQL
- perl-XML-Parser
- plymouth
- policycoreutils
- polkit
- polkit-kde

- polkit-pkla-compat
- polkit-qt
- ppp
- pyatspi
- pygobject3
- pykickstart
- python
- python3
- python3-setuptools
- python-adal
- python-augeas
- python-azure-sdk
- python-backports
- python-backports-ssl_match_hostname
- python-beaker
- python-blivet
- python-blivet3
- python-boto3
- python-cffi
- python-chardet
- python-cherrypy
- python-configobj
- python-configshell
- python-coverage
- python-cpio
- python-cryptography
- python-cups
- python-dateutil
- python-decorator
- python-di
- python-dmidecode
- python-dns
- python-docs
- python-docutils
- python-enum34
- python-ethtool

- `python-futures`
- `python-gssapi`
- `python-gudev`
- `python-hwdata`
- `python-idna`
- `python-iniparse`
- `python-inotify`
- `python-ipaddr`
- `python-ipaddress`
- `python-IPy`
- `python-isodate`
- `python-jinja2`
- `python-jsonpatch`
- `python-jsonpointer`
- `python-jwcrypto`
- `python-jwt`
- `python-kdcproxy`
- `python-kerberos`
- `python-kitchen`
- `python-kmod`
- `python-krbV`
- `python-ldap`
- `python-linux-procfs`
- `python-lxml`
- `python-mako`
- `python-markupsafe`
- `python-matplotlib`
- `python-meh`
- `python-memcached`
- `python-msrest`
- `python-msrestazure`
- `python-netaddr`
- `python-netifaces`
- `python-nose`
- `python-nss`
- `python-ntplib`

- `python-oauthlib`
- `python-paramiko`
- `python-paste`
- `python-pillow`
- `python-pip`
- `python-ply`
- `python-prettytable`
- `python-psycopg2`
- `python-pyasnl`
- `python-pyblock`
- `python-pycparser`
- `python-pycurl`
- `python-pyudev`
- `python-qrcode`
- `python-reportlab`
- `python-requests`
- `python-requests-oauthlib`
- `python-rpm-generators`
- `python-rpm-macros`
- `python-rtslib`
- `python-s3transfer`
- `python-schedutils`
- `python-setproctitle`
- `python-setuptools`
- `python-six`
- `python-slip`
- `python-smbc`
- `python-sqlalchemy`
- `python-subprocess32`
- `python-suds`
- `python-tempita`
- `python-urlgrabber`
- `python-urllib3`
- `python-urwid`
- `python-virtualenv`
- `python-wheel`

- python-yubico
- qt3
- rear
- redhat-bookmarks
- redhat-indexhtml
- redhat-lsb
- redhat-release-server
- redhat-rpm-config
- redhat-upgrade-dracut
- redhat-upgrade-tool
- redland
- rhn-client-tools
- rhnlib
- rhnsd
- rpmdevtools
- scap-security-guide
- scap-workbench
- seabios
- selinux-policy
- setroubleshoot
- setroubleshoot-plugins
- shim
- shim-signed
- sos
- sos-collector
- spice-streaming-agent
- sssd
- system-config-date
- system-config-date-docs
- system-config-kickstart
- systemd
- tog-pegasus
- unixODBC
- uom-lib
- virt-manager
- volume_key

- wireshark
- xfsprogs
- xsane
- xulrunner
- yum
- yum-langpacks
- yum-metadata-parser
- yum-plugin-ulninfo
- yum-rhn-plugin
- yum-utils

Modified Optional Source Packages

The following optional source packages have been modified:

- gnu-efi
- jetty-artifact-remote-resources
- jetty-parent
- jetty-toolchain
- kmod-redhat-ixgbe
- libreoffice
- pesign
- publican
- sanlock
- thunderbird

New Source Packages

The following source packages are new for Update 7, relative to Update 6 of Oracle Linux 7:

- adobe-mappings-cmap
- adobe-mappings-pdf
- chrome-gnome-shell
- compat-exiv2-026
- geoipupdate
- geolite2
- libmaxminddb
- libpaper
- openjpeg2
- pmdk-convert

- python3
- python3-setuptools
- python-blivet3
- python-pip
- python-rpm-generators
- python-rpm-macros
- python-wheel
- redfish-finder
- sassist
- ucx
- urw-base35-fonts
- xorriso

Removed Source Packages

The following source packages from the upstream release have been removed:

- dtc
- insights-client
- kpatch
- libcxl
- libehca
- libica
- libocxl
- librtas
- libservicelog
- libvpd
- libzfcphbaapi
- lsvpd
- opal-prd
- openssl-ibmca
- paflib
- powerpc-utils
- powerpc-utils-python
- ppc64-diag
- ppc64-utils
- python-rhsm
- qclib

- `qemu-kvm-ma`
- `redhat-access-gui`
- `redhat-access-plugin-ipa`
- `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-logos`
- `redhat-release-eula`
- `redhat-support-lib-python`
- `redhat-support-tool`
- `s390utils`
- `servicelog`
- `SLOF`
- `subscription-manager`
- `subscription-manager-migration-data`
- `virt-who`
- `yaboot`