Oracle® Linux 7

Release Notes for Oracle Linux 7.2

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Preface

Oracle® Linux 7: Release Notes for Oracle Linux 7.2 provides a summary of the new features and known issues in Update 2 for Oracle Linux 7. This document may be updated after it is released.

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Audience

This document is intended for users and administrators of Oracle Linux 7. It describes potential issues and the corresponding workarounds you may encounter while using Oracle Linux 7. Oracle recommends that you read this document before installing Oracle Linux 7. It is assumed that readers have a general understanding of the Linux operating system.

Related Documents

The latest version of this document and other documentation for this product are available at:

Oracle® Linux 7 Documentation

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.

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industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is an ongoing, long-term process.

Chapter 1 New Features and Changes

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This section describes new features and changes in Update 2 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*.

1.1 System Requirements

You can install Oracle Linux 7 on x86-64 systems with up to 2048 logical CPUs and 64 TB of memory. The theoretical upper limit is 5120 logical CPUs and 64 TB of memory, but 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.

1.2 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.

1.3 Shipped Kernels

Oracle Linux 7 Update 2 includes the following kernels:

`kernel-3.10.0-327.el7`   Red Hat Compatible Kernel (RHCK).

`kernel-uek-3.8.13-98.7.1.el7uek`	Unbreakable Enterprise Kernel Release 3 (UEK R3), which is the default kernel.

1.4 makedumpfile Support for Large Memory Images

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

1.5 Kdump Configuration During Installation

It is now possible to configure Kdump during non-graphical installation. For limitations on using the `crashkernel=auto` setting, see Section 3.4, "Crash Kernel auto Setting".

1.6 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*

1.7 MySQL Community and MariaDB Packages

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

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

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

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

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

> **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.

1.8 Spacewalk Client Registration

It is not necessary to install the Spacewalk client before registering an Oracle Linux 7 Update 2 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.

   ```
   # 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:

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

1.9 Technology Preview

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

- **Ceph**

  Ceph presents a uniform view of object and block storage from a cluster of multiple physical and logical commodity-hardware storage devices. Ceph can provide fault tolerance and enhance I/O performance by replicating and striping data across the storage devices in a Storage Cluster. Ceph's monitoring and self-repair features minimize administration overhead. You can configure a Storage Cluster on non-identical hardware from different manufacturers.

  Ceph for Oracle Linux is based on the Ceph Community Firefly release (v0.80). It includes the Object Store, Block Device, Storage Cluster, and Object Gateway components of Ceph. The Ceph file system (CephFS) component is also included but it is neither a technical preview feature nor is it supported.

  For more information, see *Oracle® Linux 7 Documentation*.

- **DRBD (Distributed Replicated Block Device)**

A shared-nothing, synchronously replicated block device (*RAID1 over network*), designed to serve as a building block for high availability (HA) clusters. It requires a cluster manager (for example, pacemaker) for automatic failover.

- **SCAP Workbench and the OSCAP Anaconda add-on**

  The OpenSCAP add-on to the Installer allows you to select a Security Content Automation Protocol (SCAP) policy by using either the graphical interface or a Kickstart `%addon org_fedora_oscap` section. At the end of the installation process, the compliance scanning utility (`oscap`) scans the system and saves the results to `/root/openscap_data`. The installation supports a number of standard security profiles that are provided by the `openscap-scanner` package. Alternatively, you can choose to use profiles from an accessible FTP or web server. Unless you specify the OpenSCAP add-on, the Installer neither applies a security policy nor performs any compliance scan during the installation process.

- **Transcendent memory**

  Transcendent Memory (*tmem*) provides a new approach for improving the utilization of physical memory in a virtualized environment by claiming underutilized memory in a system and making it available where it is most needed. From the perspective of an operating system, tmem is fast pseudo-RAM of indeterminate and varying size that is useful primarily when real RAM is in short supply. To learn more about this technology and its use cases, see the Transcendent Memory project page at https://oss.oracle.com/projects/tmem/.

- **UEFI Secure Boot**

  This update 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.

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

- Active Directory and LDAP `sudo` providers.

- Block and object storage layouts for parallel NFS (pNFS).

- Block device caching by LVM, which allows small, fast devices to act as caches for large, slow devices.

- btrfs file system. Oracle supports btrfs with UEK R3.

- Crash kernel can be configured to boot with more than a single CPU.

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

- LSI Syncro CS feature in the `megaraid_sas` driver to support High-Availability Direct-Attached storage (HA-DAS) adapters.

- LVM API.

- More than 32 PCI slots can be configured with PCI Bridge in QEMU.

- OpenLMI Software Provider.

- PCI Express Bus, AHCI Bus, and USB 3.0 host adapter emulation are provided for KVM guests.

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

- Storage array management, which includes a command-line interface and the libStorageMgmt API.

- The `dm-era` device-mapper target records changes made to blocks over a specified time period.

- Trusted Network Connect.

- `virtio-blk-data-plane` in Quick EMUlator (QEMU) improves block I/O performance.

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

1.10 Compatibility

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

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

1.11 Unsupported Emulex Devices

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

- LP10000 (VID:10DF, DID:FA00)

- LP10000S (VID:10DF, DID:FC00)

- LP101 (VID:10DF, DID:F0A1)

- LP1050 (VID:10DF, DID:F0A5)

- LP11000S (VID:10DF, DID:FC10)

- LP11000-S (VID:10DF, DID:FD11)

- LP111 (VID:10DF, DID:F0D1)

- LP6000 (VID:10DF, DID:1AE5)

- LP7000 (VID:10DF, DID:F700)

- LP8000 (VID:10DF, DID:F800)

- LP9002 (VID:10DF, DID:F900)

- LP952 (VID:10DF, DID:F095)

- LP9802 (VID:10DF, DID:F980)

- LP982 (VID:10DF, DID:F098)

- LPe1000 (VID:10DF, DID:F0F5)

- LPe1000-SP (VID:10DF, DID:F0F5)

- LPe1002-SP (VID:10DF, DID:F0F7)

- LPe11000S (VID:10DF, DID:FC20)

- LPx1000 (VID:10DF, DID:FB00)

Chapter 2 Fixed Issues

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This chapter describes the fixed issues for Oracle Linux 7 Update 2.

2.1 Kernel Panic if All Inodes Are Used

A kernel panic no longer occurs with UEK R3 quarterly update 7 or later (kernel version 3.8.13-118 or later) if all the inodes for an XFS file system are used. (Bug ID 19695297)

2.2 Network Teaming

Network teaming is supported with UEK R3 if you update the system with UEK R3 Quarterly Update 7 or later. (Bug ID 19151770)

Chapter 3 Known Issues

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This chapter describes the known issues for Oracle Linux 7 Update 2.

3.1 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.

3.2 Autocompletion of Commands in the bash Shell

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

1. Remove the `bash-completion` package:

    ```
    # 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)

3.3 Ceph Block Devices

Mounting and formatting Ceph block devices is available as a technical preview with UEK R3. See the *Oracle Linux: Ceph Release Notes* at *Oracle® Linux 7 Documentation*. (Bug ID 20304006)

3.4 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.

3.5 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 2 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 2, 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)

3.6 Docker Fails to Start if SELinux Is Enabled

Docker 1.8.3 can fail to start if SELinux is enabled. A workaround is to disable SELinux. To fix the issue without disabling SELinux, upgrade to `docker-engine-1.8.3-1.0.2`, which automatically pulls in `docker-engine-selinux-1.8.3-1.0.2` as a dependency. (Bug ID 22258930)

3.7 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)

3.8 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)

3.9 Hebrew LaTeX Fonts

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

3.10 InfiniBand Issues

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

3.10.1 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:

```
# systemctl stop NetworkManager
```

3. Start the RDMA service:

```
# systemctl start rdma
```

4. Bring up the interface:

```
# ifup ibN
```

(Bug ID 19150870)

3.10.2 Changing the IPoIB mode of an InfiniBand Interface

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

To change the IPoIB mode of an InfiniBand interface:

1. Edit the `/etc/sysconfig/network-scripts/ifcfg-ibN` configuration file, where N is the number of the interface:

   • To configure connected mode, specify `CONNECTED_MODE=yes` in the file.

   • To configure datagram mode, either specify `CONNECTED_MODE=no` in the file or do not specify this setting at all (datagram mode is enabled by default).

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

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

```
# ifdown ibN
# ifup ibN
```

(Bug ID 17479833)

3.10.3 Disabling a Switch Port Generates Warnings

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

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

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

3.11 Installation Issues

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

3.11.1 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.

3.11.2 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)

3.11.3 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)

3.11.4 Installation on an Oracle Server X5-2 System with iSCSI Storage

When installing on an Oracle Server X5-2 system with iSCSI storage, the RHCK puts the 10 Gigabit PCI Express network interface in low-power mode. Following the warm installation reboot, networking is broken, and the UEFI BIOS cannot access the boot loader on the iSCSI target. The workaround is to completely power off the system and then power it on again instead of letting it perform a warm reboot. (Bug ID 22262810)

3.11.5 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)

3.12 Intel QuickAssist Acceleration Technology

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

3.13 iSCSI Boot Firmware Table Incorrectly Initialized under UEK R3 on Oracle Server X5-2 Systems

For an Oracle Server X5-2 system booted using UEK R3 from iSCSI storage, the iSCSI Boot Firmware Table is not initialized with the iSCSI initiator IP address that has been configured in the UEFI BIOS. (Bug ID 22265721)

3.14 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)

3.15 multipath Messages Relating to zram

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

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

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

(Bug ID 20300644)

3.16 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)

3.17 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)

3.18 NFS Issues

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

3.18.1 Using NFS v4 with an lxc-oracle Container Fails

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

3.18.2 Enabling and Disabling NFS

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

```
# systemctl enable nfs-server
```

(Bug ID 18437212)

3.19 Oracle ASM Fails to Initialize with SELinux in Enforcing Mode

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

```
# semodule -d oracleasm
# semodule -l | grep oracleasm
oracleasm      1.0.0   Disabled
```

(Bug ID 18513404)

3.20 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.

3.21 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)

3.22 systemctl Does Not Support Some Service Actions

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

3.23 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)

3.24 Update Fails Unless i686 Kerberos Packages Are Removed

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

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

(Bug ID 20671170)

3.25 Upgrade Issues

The following sections describe issues that might be encountered when upgrading from Oracle Linux 6 (`_latest`) to Oracle Linux 7 Update 2.

3.25.1 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)

3.25.2 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)

3.25.3 Rebooting Fails if preupg Is Not Run

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

3.25.4 Red Hat Compatible Kernel Is Not Removed

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

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

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

3.25.6 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)

3.26 xfs_copy Fails for Sector Size Larger than 512 Bytes

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

3.27 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:

```
# dconf update
```

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

Chapter 4 Installation and Availability

Table of Contents

You can download a full Oracle Linux 7 Update 2 installation media image from the Oracle Software Delivery Cloud at https://edelivery.oracle.com/linux. You can also obtain the latest Oracle Linux 7 packages from the Unbreakable Linux Network (ULN) and the Oracle Linux yum server.

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

ULN Channel	Oracle Linux yum server Repository	Description
ol7_x86_64_latest	ol7_latest	Latest packages for Oracle Linux 7.
ol7_x86_64_u0_base	ol7_u0_base	Base packages for the initial release (Update 0) of Oracle Linux 7.
ol7_x86_64_u0_patch		Patches for the initial-release packages of Oracle Linux 7.
ol7_x86_64_uN_base	ol7_uN_base	Base packages for Update N of Oracle Linux 7.
ol7_x86_64_uN_patch		Patches for Update N of Oracle Linux 7.
ol7_x86_64_addons	ol7_addons	GPL-licensed packages for Oracle Linux 7 that have not been sourced from upstream.
ol7_x86_64_Dtrace_userspace		DTrace user-space packages for Oracle Linux 7 with UEK R3.
ol7_x86_64_UEKR4_DTrace_userspace		DTrace user-space packages for Oracle Linux 7 with UEK R4.
ol7_x86_64_Ksplice		Ksplice packages for Oracle Linux 7.
ol7_x86_64_MySQL55	ol7_MySQL55	MySQL Community Edition 5.5 packages for Oracle Linux 7.
ol7_x86_64_MySQL56	ol7_MySQL56	MySQL Community Edition 5.6 packages for Oracle Linux 7.

ULN Channel	Oracle Linux yum server Repository	Description
`ol7_x86_64_optional_latest`	`ol7_optional_latest`	Latest optional packages (including most `*-devel` packages) for Oracle Linux 7 that have been sourced from upstream.
`ol7_x86_64_oracle`		Oracle software packages for Oracle Linux 7.
`ol7_x86_64_UEKR3`	`ol7_UEKR3`	Latest Unbreakable Enterprise Kernel Release 3 (UEK R3) packages for Oracle Linux 7.
`ol7_x86_64_UEKR4`	`ol7_UEKR4`	Latest Unbreakable Enterprise Kernel Release 4 (UEK R4) packages for Oracle Linux 7.
`ol7_x86_64_UEKR3_OFED20`		OpenFabrics Enterprise Distribution (OFED) packages for UEK R3 on Oracle Linux 7. See Section 4.2, "Installing or Upgrading the Oracle-Supported OFED Packages".
`ol7_x86_64_UEKR4_OFED`		OpenFabrics Enterprise Distribution (OFED) packages for UEK R4 on Oracle Linux 7. See *Unbreakable Enterprise Kernel Documentation*.
`ol7_x86_64_VirtualBox`		Oracle VM VirtualBox packages for Oracle Linux 7.

Note

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

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

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

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

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

- Section 4.2.1, "Installing Oracle Linux 7 Update 2 from ULN if the Oracle-Supported OFED Packages Are Already Installed" for instructions on how to install the update from ULN.

- Section 4.2.2, "Installing Oracle Linux 7 Update 2 from Oracle Linux Yum Server if the Oracle-Supported OFED Packages Are Already Installed" for instructions on how to install the update from Oracle Linux yum server.

UEK R3 is the default boot kernel for fresh installations of Oracle Linux 7 but the UEK R4 kernel is now also available. For more information, see *Unbreakable Enterprise Kernel Documentation*.

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.

```
# 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.

```
# systemctl reboot
```

⚠️ **Important**

Oracle Linux 7 Update 2 updates many major subsystems. To ensure that your updated systems function correctly, reboot them after updating.

4.1 Upgrading from Oracle Linux 6

It is possible to upgrade an Oracle Linux 6 system to Oracle Linux 7 Update 2 under the following conditions:

• The system meets the minimum installation requirements for Oracle Linux 7 as described in Section 1.1, "System Requirements".

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

• UEK R3 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.

The following table shows the changes that are applied to any kernels that are configured on the system being upgraded.

Kernel on Original System	Kernel on Upgraded System
RHCK (2.6.32)	RHCK (3.10.0) for Oracle Linux 7 is installed. RHCK (2.6.32) is removed.
UEK R3 (3.8.13)	UEK R3 (3.8.13) for Oracle Linux 7 is installed and made the default boot kernel. The previous version of UEK R3 is removed.

For instructions on how to perform an upgrade, see *Oracle® Linux 7: Installation Guide*.

4.2 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.

For instructions for installing or upgrading OFED packages with UEK R4, see *Unbreakable Enterprise Kernel Documentation*.

4.2.1 Installing Oracle Linux 7 Update 2 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 2 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 2 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
   ```

4.2.2 Installing Oracle Linux 7 Update 2 from Oracle Linux Yum Server if the Oracle-Supported OFED Packages Are Already Installed

To install Update 2 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_optional_latest`, `ol7_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 2 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
```

4.2.3 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
```

4.2.4 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_optional_latest`, `ol7_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
```

4.2.5 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
```

4.2.6 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_optional_latest`, `ol7_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
```

Appendix A Package Changes from the Upstream Release

Table of Contents

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

A.1 Removed Packages

The following packages from the upstream release have been removed:

- anaconda-user-help

- kernel-aarch64

- kpatch

- libehca

- libica

- libreport-plugin-rhtsupport

- libreport-rhel

- librtas

- libservicelog

- libvpd

- libzfcphbaapi

- lsvpd

- openssl-ibmca

- powerpc-utils

- powerpc-utils-python

- ppc64-diag

- ppc64-utils

- publican-redhat

- python-rhsm

- Red_Hat_Enterprise_Linux-Release_Notes-7-as-IN

- Red_Hat_Enterprise_Linux-Release_Notes-7-bn-IN

- Red_Hat_Enterprise_Linux-Release_Notes-7-de-DE

- Red_Hat_Enterprise_Linux-Release_Notes-7-en-US

- Red_Hat_Enterprise_Linux-Release_Notes-7-es-ES

- Red_Hat_Enterprise_Linux-Release_Notes-7-fr-FR

- Red_Hat_Enterprise_Linux-Release_Notes-7-gu-IN

- Red_Hat_Enterprise_Linux-Release_Notes-7-hi-IN

- Red_Hat_Enterprise_Linux-Release_Notes-7-it-IT

- Red_Hat_Enterprise_Linux-Release_Notes-7-ja-JP

- Red_Hat_Enterprise_Linux-Release_Notes-7-kn-IN

- Red_Hat_Enterprise_Linux-Release_Notes-7-ko-KR

- Red_Hat_Enterprise_Linux-Release_Notes-7-ml-IN

- Red_Hat_Enterprise_Linux-Release_Notes-7-mr-IN

- Red_Hat_Enterprise_Linux-Release_Notes-7-or-IN

- Red_Hat_Enterprise_Linux-Release_Notes-7-pa-IN

- Red_Hat_Enterprise_Linux-Release_Notes-7-pt-BR

- Red_Hat_Enterprise_Linux-Release_Notes-7-ru-RU

- Red_Hat_Enterprise_Linux-Release_Notes-7-ta-IN

- Red_Hat_Enterprise_Linux-Release_Notes-7-te-IN

- Red_Hat_Enterprise_Linux-Release_Notes-7-zh-CN

- Red_Hat_Enterprise_Linux-Release_Notes-7-zh-TW

- redhat-access-gui

- redhat-access-plugin-ipa

- redhat-logos

- redhat-support-lib-python

- redhat-support-tool

- s390utils

- servicelog

- subscription-manager

- subscription-manager-migration-data

- virt-who

- yaboot

A.2 Modified Packages

The following packages from the upstream release have been modified:

- abrt

- abrt-java-connector

- anaconda

- autofs

- basesystem

- btrfs-progs

- clufter

- coreutils

- curl

- dbus

- dhcp

- dracut

- firefox

- fuse

- glibc

- glusterfs

- gperftools

- grub2

- grubby

- gstreamer

- httpd

- initial-setup

- initscripts

- ipa

- irqbalance

- iscsi-initiator-utils

- `java-1.7.0-openjdk`

- `kabi-yum-plugins`

- `kde-settings`

- `kexec-tools`

- `libguestfs`

- `libnl3`

- `libosinfo`

- `libreoffice`

- `libreport`

- `libreport-rhel-anaconda-bugzilla`

- `libreswan`

- `libvirt`

- `libxml2`

- `libxslt`

- `lorax`

- `mariadb`

- `mkbootdisk`

- `NetworkManager`

- `nss`

- `opa-ff`

- `openscap`

- `open-vm-tools`

- `oracleasm`

- `os-prober`

- `PackageKit`

- `pcs`

- `plymouth`

- `policycoreutils`

- `python-blivet`

- `redhat-bookmarks`

- redhat-indexhtml

- redhat-lsb

- redhat-release-server

- redhat-rpm-config

- redhat-upgrade-dracut

- redhat-upgrade-tool

- rhn-client-tools (updated to support ULN)

- rhnsd

- rpmdevtools

- rsyslog

- scap-security-guide

- selinux-policy

- setroubleshoot

- setroubleshoot-plugins

- sos

- system-config-date

- system-config-kickstart

- systemd

- systemtap

- tog-pegasus

- wireshark

- xfsprogs

- xsane

- xulrunner

- yum

- yum-rhn-plugin

- yum-utils

A.3 New Packages

The following packages are new for Update 2 relative to Update 1 of Oracle Linux 7:

- adwaita-icon-theme

- appstream-data

- clufter

- compat-cogl114

- compat-colord10

- compat-glew

- compat-gnome-bluetooth38

- compat-gnome-desktop38

- compat-libgdata013

- compat-libgweather3

- compat-libxcb

- compat-PackageKit08

- compat-poppler022

- compat-upower09

- conntrack-tools

- criu

- dleyna-connector-dbus

- dleyna-core

- dleyna-server

- fabtests

- gcc-libraries

- geoclue2

- geocode-glib

- glm

- gnome-online-miners

- gnome-software

- gom

- gperftools

- hawkey

- ipsilon

- libappstream-glib

- libepoxy
- libevdev
- libfabric
- libguestfs-winsupport
- libhfi1
- libhif
- libmediaart
- libmspack
- libnetfilter_cthelper
- libnetfilter_cttimeout
- libpsm2
- librepo
- librevenge
- libsolv
- libtimezonemap
- libunwind
- libvdpau
- libxshmfence
- mod_auth_gssapi
- mozjs24
- opa-ff opa-fm
- protobuf
- protobuf-c
- python-cffi
- python-cherrypy
- python-cryptography
- python-enum34
- python-jsonpointer
- python-kdcproxy
- python-ntplib

- python-ply

- python-pycparser

- python-smbc

- python-sqlalchemy

- rear

- vte291

A.4 Modified Optional Packages

The following optional packages have been modified:

- golang

- pesign

- publican

- PyOpenGL

- sanlock

- jetty-artifact-remote-resources

- jetty-parent

- jetty-toolchain

- thunderbird

A.5 Packages Added by Oracle

The following packages have been added:

- btrfs-progs

- dtrace-modules

- inotify-tools

- kernel-uek

- libdtrace-ctf

- lxc

- ocfs2-tools

- oracleasm

- oracleasm-support

- oraclelinux-release

- oracle-logos

- `oracle-rdbms-server-11gR2-preinstall`

- `oracle-rdbms-server-12cR1-preinstall`

- `reflink`

- `uname26`

- `yum-plugin-ulninfo`

Appendix B Removed Modules

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

- 3c574_cs
- 3c589_cs
- 3c59x
- 3w-xxxx
- 8390
- acenic
- aic7xxx
- aic94xx
- amd8111e
- at76c50x-usb
- atmel
- atmel_cs
- atmel_pci
- axnet_cs
- b43
- b43legacy
- can
- can-bcm
- can-dev
- can-raw
- cassini
- c_can
- c_can_platform
- cciss
- cdc-phonet
- cxgb
- dl2k

- e100
- ems_pci
- ems_usb
- esd_usb2
- fealnx
- fmvj18x_cs
- forcedeth
- ips
- ipw2100
- ipw2200
- ixgb
- kvaser_pci
- libertas
- libertas-sd8686-firmware
- libertas-sd8787-firmware
- libertas-usb8388-firmware
- libertas_cs
- libertas_sdio
- libertas_tf
- libertas_tf_usb
- libipw
- mac80211_hwsim
- megaraid_mbox
- mptfc
- mptlan
- myri10ge
- natsemi
- ne2k-pci
- niu
- nmclan_cs

- ns83820
- p54common
- p54pci
- p54usb
- pch_can
- pcnet32
- pcnet_cs
- plx_pci
- r6040
- rt2400pci
- rt2500pci
- rt2500usb
- rtl8180
- s2io
- sc92031
- sis190
- sis900
- sja1000
- sja1000_platform
- slcan
- smc91c92_cs
- softing
- softing_cs
- starfire
- sundance
- sungem
- sungem_phy
- sunhme
- sym53c8xx
- tehuti

- tlan
- typhoon
- usb8xxx
- vcan
- via-rhine
- via-velocity
- vxge
- xirc2ps_cs
- zd1211rw