Oracle Linux 8

Release Notes for Oracle Linux 8.10

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Preface

Oracle Linux 8: Release Notes for Oracle Linux 8.10 provides information about the new features and known issues in the Oracle Linux 8.10 release. The information applies to both x86_64 and 64-bit Arm (aarch64) architectures. This document might be updated after first publication.

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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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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

About Oracle Linux 8

The current Oracle Linux 8 release contains new features and enhancements that improve performance in different areas including automation and management, security, and compliance, container management, and developer tools. These enhancements are especially designed to make the OS adaptable to different types of deployment such as on-premises installations, hybrid deployments that combine on-premises and cloud installations, and full cloud deployment.

> **Important:**
>
> Upgrading from an Oracle Linux Developer Preview release to its later official version isn't supported. If you're running the Developer Preview version, you must reinstall the official Oracle Linux release upon its general availability.

System Requirements and Limitations

To check whether a specific hardware can be used with the current Oracle Linux 8 release, see the Hardware Certification List at https://linux.oracle.com/hardware-certifications. Note that as hardware becomes available and validated, the hardware is added to the list.

Oracle Linux 8 for the aarch64 platform is primarily engineered for use with Ampere™ eMAG™-based EVK platform and the Marvell ThunderX2® processor. Other hardware might be supported and added to the Hardware Certification List in the future.

CPU, memory, disk, and file system limits for all Oracle Linux releases are described in Oracle Linux: Limits.

Available Architectures

The release is available on the following platforms:

- Intel® 64-bit (x86_64)
- AMD 64-bit (x86_64)
- Arm 64-bit (aarch64)

The Arm platform runs only with Unbreakable Enterprise Kernel Release (UEK).

Shipped Kernels

On the x86_64 platform, the current Oracle Linux 8 release ships with the following default kernel packages:

- `4.18.0-553` (Red Hat Compatible Kernel (RHCK))
- `5.15.0-206.153.7.1` (Unbreakable Enterprise Kernel Release 7 Update 2 (UEK R7U2))

For new installations, the UEK R7 is automatically enabled and installed. It also becomes the default kernel on first boot.

On the aarch64 platform, Oracle Linux ships with the UEK kernel only.

> **Important:**
>
> If you're upgrading from a previous Oracle Linux 8 version, the kernel isn't automatically upgraded to UEK R7. For more information on upgrading the kernel, see the release notes for the UEK release that you're upgrading to. For example, see the Installation and Availability section of Unbreakable Enterprise Kernel Release 7 Update 2: Release Notes (5.15.0-200).

The Oracle Linux release is tested as a bundle, as shipped on the installation media image. When installed from the installation media image, the kernel's version included in the image is the minimum version that's supported. Downgrading kernel packages is unsupported, unless recommended by Oracle Support.

About the Unbreakable Enterprise Kernel

The Unbreakable Enterprise Kernel (UEK) is a Linux kernel built by Oracle and supported through Oracle Linux support. UEK is tested on Arm (aarch64), Intel® x86, and AMD x86 (x86_64) platforms. Each release contains added features, bug fixes, and updated drivers to provide support for key functional requirements, improve performance, and optimize the kernel for use on Oracle products such as Oracle's Engineered Systems, Oracle Cloud Infrastructure, and large enterprise deployments for Oracle customers.

Typically, a UEK release contains changes to the kernel ABI relative to a previous UEK release. These changes require recompilation of third-party kernel modules on the system. To minimize impact on interoperability during releases, the Oracle Linux team works with third-party vendors regarding hardware and software that have dependencies on kernel modules. Thus, before installing the latest UEK release, verify its support status with the application vendor.

The kernel ABI for a UEK release remains unchanged in all later updates to the initial release.

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

For more information about UEK such as tutorials, notices, and release notes of different UEK versions, go to Unbreakable Enterprise Kernel documentation.

User Space Compatibility

Oracle Linux maintains user space compatibility with Red Hat Enterprise Linux (RHEL) that's independent of the kernel version that underlies the OS. Existing applications in user space continue to run unmodified on UEK R6 and UEK R7, with no required recertifications for RHEL certified applications.

Obtaining Installation Images

The following installation images for the current Oracle Linux 8 release are available:

- Full ISO of Oracle Linux for typical installations on premises.

- Boot ISO of Oracle Linux for network installations
- Boot ISO of the official UEK release for installing on hardware which is supported only on UEK
- Source DVDs

You can download these images from the following locations. Note that the images in these locations are for both the x86_64 and aarch64 platforms, unless indicated otherwise:

- Oracle Linux yum server at https://yum.oracle.com/oracle-linux-downloads.html
- Oracle Software Delivery Cloud at https://edelivery.oracle.com

To prepare a downloaded image for installing Oracle Linux, see Oracle Linux 8: Installing Oracle Linux.

For information about the available ISO images for the three most recent updates to the Oracle Linux releases, see https://yum.oracle.com/oracle-linux-isos.html.

For developers who use the Raspberry Pi hardware platform, Oracle provides an unsupported developer release image, which includes the required firmware to boot this platform. For more information about using the Raspberry Pi hardware platform, see Install Oracle Linux on a Raspberry Pi.

> **Note:**
>
> Aside from installation ISO images, you can also use Oracle Linux images to create compute instances on Oracle Cloud Infrastructure. For information about these images, see the release notes for the specific image that you're using on the *Oracle Cloud Infrastructure Documentation* page.
>
> To use Oracle Linux on Oracle Cloud Infrastructure, see https://docs.oracle.com/iaas/oracle-linux/home.htm.

Upgrading From Oracle Linux 7 to Oracle Linux 8

You can upgrade an Oracle Linux 7 system to the latest Oracle Linux 8 release by using the `leapp` utility. For step-by-step instructions and information about any known issues that might arise when upgrading the system, see Oracle Linux 8: Upgrading Systems With Leapp.

Installing Oracle-Supported RDMA Packages

Oracle Linux 8 releases earlier than Oracle Linux 8.7 ship with UEK R6 as the default kernel.

Starting with Oracle Linux 8.5, you also have the option of installing UEK R7. From Oracle Linux 8.7 onward, UEK R7 is the default kernel.

Oracle provides Remote Direct Memory Access (RDMA) packages for use with UEK R6 and UEK R7. The RDMA feature provides direct memory access between two systems that are connected by a network. RDMA improves high-throughput and low-latency networking in clusters.

To use RDMA features, you must first install the Oracle-supported RDMA packages. To do so, ensure that the system is subscribed to the appropriate channels on ULN or that you have enabled the appropriate repositories on the Oracle Linux yum server.

For more information about RDMA, including any known issues, see Unbreakable Enterprise Kernel documentation for the required kernel.

RDMA With UEK R6

If you're subscribed to ULN, enable the following channels:

- `ol8_x86_64_UEKR6`
- `ol8_x86_64_baseos_latest`
- `ol8_x86_64_appstream`
- `ol8_x86_64_UEKR6_RDMA`

Note that if the system is newly registered on ULN, then the system is already subscribed to the `ol8_x86_64_UEKR6`, `ol8_x86_64_baseos_latest`, and `ol8_x86_64_appstream` channels by default. However, you must explicitly subscribe to the `ol8_x86_64_UEKR6_RDMA` channel before installing RDMA packages.

If you're using the Oracle Linux yum server, enable the following repositories:

- `ol8_UEKR6`
- `ol8_baseos_latest`
- `ol8_appstream`
- `ol8_UEKR6_RDMA`

Note that if the system already uses the Oracle Linux yum server, the `ol8_UEKR6`, `ol8_baseos_latest`, and `ol8_appstream` repositories are enabled by default. However, you must explicitly enable the `ol8_UEKR6_RDMA` repository before installing RDMA packages.

RDMA With UEK R7

If you're subscribed to ULN, enable the following channels:

- `ol8_x86_64_UEKR7`
- `ol8_x86_64_baseos_latest`
- `ol8_x86_64_appstream`
- `ol8_x86_64_UEKR7_RDMA`

Note that if the system is newly registered on ULN, then the system is already subscribed to the `ol8_x86_64_UEKR6`, `ol8_x86_64_baseos_latest`, and `ol8_x86_64_appstream` channels by default. Disable `ol8_x86_64_UEKR6` and then explicitly subscribe to the `ol8_x86_64_UEKR7_RDMA` and `ol8_x86_64_UEKR7_RDMA` channels before installing RDMA packages.

If you're using the Oracle Linux yum server, enable the following repositories:

- `ol8_UEKR7`
- `ol8_baseos_latest`
- `ol8_appstream`
- `ol8_UEKR7_RDMA`

Note that if the system already uses the Oracle Linux yum server, the `ol8_UEKR6`, `ol8_baseos_latest`, and `ol8_appstream` repositories are enabled by default. Disable

`ol8_UEKR6` and then explicitly subscribe to the `ol8_UEKR7_RDMA` and `ol8_UEKR7_RDMA` repositories before installing RDMA packages.

2

New Features and Changes

This chapter describes the new features, major enhancements, bug fixes, and other changes that are included in this release of Oracle Linux 8.

Installation, Image Creation, and Boot

The following features, enhancements, and changes related to installation, image creation, and boot are introduced in this Oracle Linux 8 release.

DEP and NX Options During Pre-Boot

The Data Execution Prevention (DEP), No Execute (NX), or Execute Disable (XD) memory protection features, prevents code from running that is marked as non-executable. These features have been available in Oracle Linux at the operating system level but not as part of bootloaders. Oracle Linux now includes the DEP/NX function in the GRUB and shim boot loaders. This functionality might prevent some vulnerabilities during the pre-boot stage, such as a malicious EFI drivers that might run attacks without the DEP/NX protection.

New Trust Domain Run Time Measurement Capability in GRUB and Shim

With this release, the GRUB and `shim` boot loaders can handle Trust Domain (TD) measurement protocol.

For TD virtual machine guest environments, all components in the boot chain, such as `grub2` and `shim`, must log the event and measurement hash to the runtime measurement registers (RTMR).

TD guest runtime measurement in RTMR is the base for attestation applications. Applications on the TD guest rely on the TD measurement to provide evidence of the state of the system and to obtain confidential information, such as the key from the relaying party of the attestation service.

For more information about RTMR or TD, see the following Intel® documentation:

- Intel® Runtime Integrity Measurements and Attestation in a Trust Domain
- Intel® Trust Domain Extensions Documentation

Containers

The following features, enhancements, and changes related to containers are introduced in this Oracle Linux 8 release.

Podman `containers.conf` Modules

Podman can run with `containers.conf` modules files to load a predetermined set of configurations on-demand. When you specify a module file, you override the system and user configuration files.

You can created these files in the following directories:

- For rootless users, put the configuration file in the home directory of the user. For example,

  ```
  $HOME/.config/containers/containers.conf.modules
  ```

- For root users, put the configuration file in one of the following directories:

  ```
  /etc/containers/containers.conf.modules
  /usr/share/containers/containers.conf.modules
  ```

To load the modules on-demand, use the followign command:

```
podman --module <your_module_name>
```

In the previous command,

- `--module` specifies a module. You can use this option multiple times if required.
- `<your_module_name>` Is path to the module and the module name which is the name of the configuration file. The path can be an absolute path or a relative path. If the module path is absolute, then the module is loaded directly. If the module path is relative, then it resolves to the rootless or root user module directories mentioned previously.
- Modules contained in the `$HOME` directory override those in the `/etc/` and `/usr/share/` directories.

For more information, see man page for `containers.conf`.

Container Tools Packages Are Updated

The updated Container Tools RPM meta-package, which contain the Podman, Buildah, Skopeo, crun, and runc tools, are now available. Notable bug fixes and enhancements over the previous version include:

Notable changes in Podman v4.9:

- You can now use Podman to load the modules on-demand by using the `podman --module <your_module_name>` command and to override the system and user configuration files. Fore more information, see Podman `containers.conf` Modules.
- A new `podman farm` command with a set of the `create`, `set`, `remove`, and `update` subcommands has been added. With these commands, you can farm out builds to machines running podman for different architectures.
- A new `podman-compose` command has been added, which runs Compose workloads by using an external compose provider such as Docker compose.
- The `podman build` command now supports the `--layer-label` and `--cw` options.
- The `podman generate systemd` command is deprecated. Use Quadlet to run containers and pods under `systemd`.
- The `podman build` command now supports `Containerfiles` with the HereDoc syntax.
- The `podman kube play` command now supports a new `--publish-all` option. Use this option to expose all containerPorts on the host.

For more information about notable changes, see https://github.com/containers/podman/blob/main/RELEASE_NOTES.md#470%22.

SQLite Now Default Podman Database

The SQLite database backend for Podman, which provides better stability, performance, and consistency when working with container metadata, is now fully supported.

You can explicitly specify the database backend in the `containers.conf` file by using the `database_backend` option. Available values are:

- "" If an empty value is specified, the default value is `sqlite`. If you upgrade from a previous Oracle Linux version to Oracle Linux 8.10, and the empty value is specified, the default value is `boltdb` if BoltDB was already on the previous version of the system. This enables backward compatibility. If BoltDB was not already on the previous version of Oracle Linux, then `sqlite` is used.
- "sqlite" The database backend for Podman uses SQLite.
- "boltdb" The database backend for Podman uses BoltDB

Run the `podman system reset` command before switching to the SQLite database backend.

`Containerfile` Multi-Line Instructions

You can use the multi-line HereDoc instructions (Here Document notation) in the `Containerfile` file to simplify this file and reduce the number of image layers caused by performing multiple `RUN` directives.

For example, the original `Containerfile` can contain the following `RUN` directives:

```
RUN dnf update
RUN dnf -y install golang
RUN dnf -y install java
```

Instead of multiple RUN directives, you can use the HereDoc notation:

```
RUN <<EOF
dnf update
dnf -y install golang
dnf -y install java
EOF
```

Compilers and Development Tools

The following features, enhancements, and changes related to compilers and development tools are introduced in this Oracle Linux 8 release.

Clang Resource Directory Moved

The Clang resource directory, where Clang stores its internal headers and libraries, has been moved from `/usr/lib64/clang/17` to `/usr/lib/clang/17`.

Elfutils Updated to Version 0.190

The `elfutils` 0.190 update instroduces the following changes:

- `libelf`: This library now includes relative relocation (RELR).
- `libdw`: This library now functions with the `.debug_[ct]u_index` sections.
- `-Ds`, `--use-dynamic --symbol`: You can use these options with the `eu-readelf` tool to show symbols through the dynamic segment without using ELF sections.
- `eu-readelf`: This tool now shows `.gdb_index` version 9.
- `eu-scrlines`: This new tool generates a list of source files associated with a specified DWARF or ELF file.
- `debuginfod`: This server schema now compresses file name representations. You must reindex before you can use this feature.

`grafana-selinux` Package Added

A `grafana-selinux` package, which contains an SELinux policy for `grafana-server`, and which is installed by default with `grafana-server` is added to the release. This update ensures that the `grafana-server` runs as `grafana_t` SELinux type, rather than as an `unconfined_service_t` SELinux type.

Ant Updated to version 1.10.9

The ant:1.10 module stream has been updated to version 1.10.9. This latest version includes functionality for code signing, using a provider class and provider argument.

Note that the updated ant:1.10 module stream contains only the ant and ant-lib packages. Remaining packages related to Ant are distributed in the javapackages-tools module in the unsupported CodeReady Linux Builder (CRB) repository, which haven't been updated.

Packages from the updated ant:1.10 module stream cannot be used in parallel with packages from the javapackages-tools module. To use the complete set of Ant-related packages, you must uninstall the ant:1.10 module and disable it, enable the CRB repository, and install the javapackages-tools module.

`maven-openjdk21` Package Added

The `maven:3.8` module stream now includes the `maven-openjdk21` subpackage, which provides the Maven JDK binding for OpenJDK 21 and configures Maven to use the system OpenJDK 21.

`cmake` Updated to Version 3.26

The `cmake` package is updated to version 3.26. Notable changes include:

- Addition of the C17 and C18 language standards.
- `cmake` can query the `/etc/os-release` file to identify the OS.
- `cmake` can use CUDA 20 and `nvtx3` libraries.
- `cmake` can use the Python stable application binary interface.
- Perl 5 can be used in the Simplified Wrapper and Interface Generator (SWIG) tool.

Valgrind Updated to Version 3.22.0

Valgrind is updated to version 3.22.0. See https://valgrind.org/docs/manual/dist.news.html for more information.

LLVM Toolset Updated to Version 17.0.6

The LLVM Toolset package is updated to version 17.0.6. Notable changes include:

- opaque pointers migration: completed
- legacy pass manager in middle-end optimization deprecated.

Notable Clang changes include:

- C++20 coroutines now fully supported.
- Improved code generation for the std::move function and also in unoptimized builds.

See the LLVM and Clang upstream release notes for more information.

Rust Toolset Updated to Version 1.75.0

Rust Toolset is now at version 1.75.0. Notable changes include:

- Unlimitied Constant evaluation time
- Panic messages are now printed on their own lines without surrounding quotes, making them easier to read.
- Cargo registry authentication is enhanced so that authenticated registries require a credential provider.
- Improved expressiveness of the Rust language and trait system by stabilizing the `async fn` and `return_position_impl_trait_in_trait`

Go Toolset Updated to Version 1.21.0

GoToolset is now at version 1.21.0. Notable changes include:

- Added min, max, and clear built-ins.
- Added official support for profile guided optimization.
- Precisely defined package initialization order.
- Improved type inferencing.
- Improved backwards compatibility.

See the Go upstream release notes for more information.

GCC Toolset 13 is Updated

GCC Toolset 13 is a compiler toolset that provides recent versions of development tools. The toolset is available as an Application Stream in the form of a Software Collection in the `AppStream` repository.

The following tools and versions are available in the GCC Toolset 13:

- GCC 13.2.1

- GDB 12.1
- binutils 2.40
- dwz 0.14
- annobin 12.32

To install the toolset, type:

```
sudo dnf install gcc-toolset-13
```

To run a tool from GCC Toolset 13, type:

```
$ scl enable gcc-toolset-13 tool
```

To run a shell session where tool versions from GCC Toolset 13 override system versions of these tools, type:

```
scl enable gcc-toolset-13 bash
```

Dynamic Programming Languages, Web and Database Servers

The following features, enhancements, and changes related to programming languages, web servers, and database servers are introduced in this Oracle Linux 8 release.

Python Version 3.12 Availability

With this release of Oracle Linux 8.10, the newest release of Python 3.12 is available for use. Notable enhancements in Python 3.12 (compared to the 3.11) include :

- Syntax feature updates include a `type` statement and a type parameter syntax for generic classes and functions.
- Grammar feature updates include syntactic formalization of f-strings which can be integrated into the parser directly.
- The use of a unique per-interpreter Global Interpreter Lock (GIL). This feature enables Python programs to take full advantage of multiple CPU cores. Note that in this release this feature is only available through the C-API.
- Python data model updates include a way to the use a buffer protocol from Python code. Classes that implement the `__buffer__()` method are now usable as buffer types.
- Security improvements include the replacement of the built-in `hashlib` implementations of SHA1, SHA3, SHA2-384, SHA2-512, and MD5 with formally verified code from the HACL* project. These built-in implementations remain as fallbacks that are only used when OpenSSL does not provide them.
- Dictionary, list, and set comprehensions in `CPython` are now inlined. This enhancement increases the speed of a comprehension execution.
- `CPython` is available for use with the Linux `perf` profiler.
- Stack protection is provided by `CPython` on supported platforms.

Note that Python 3.12 series packages can be installed in parallel with Python 3.9 and Python 3.11 on the same system.

For example:

- To install packages from the `python3.12` stack, type:

```
# dnf install python3.12
# dnf install python3.12-pip
```

- To run the interpreter, type:

```
$ python3.12
$ python3.12 -m pip --help
```

For more information, see Oracle Linux 8: Installing and Managing Python.

> **Note:**
>
> The Python 3.12 series documentation is available in the `python3.12-docs` package.

For information about product support for Python language versions, see Oracle Linux: Product Life Cycle Information.

Python Improvements for Controlling Email Addresses Parsing

A fix relating to CVE-2023-27043, introduced the ability to enable stricter parsing of email addresses in Python 3 in the `getaddresses` and `parseaddr` functions from the `email.utils` module. However, this fix is not compatible with the old parsing behavior and so this improvement includes two methods to disable the new behavior in favor of the old behavior without having to implement the new code changes in existing code.

The first methods is a new `PYTHON_EMAIL_DISABLE_STRICT_ADDR_PARSING` environment variable that when set to `true`, enables the older parsing behavior as the default. For example:

```
export PYTHON_EMAIL_DISABLE_STRICT_ADDR_PARSING=true
```

You can do the same by creating the `/etc/python/email.cfg` configuration file with the following section:

```
[email_addr_parsing]
PYTHON_EMAIL_DISABLE_STRICT_ADDR_PARSING = true
```

> **Note:**
>
> If the new functions are implemented in the code, the functions can still enable the stricter behavior despite these settings.

Ruby Version 3.3 Availability

Ruby 3.3.0 is included in a new `ruby:3.3` module stream with the following notable enhancements:

- New `Prism` parser. Prism is a portable, error tolerant, and maintainable recursive descent parser for the Ruby language. `Prism` is an alternative parser to the `Ripper` script parser.
- Major performance improvements are available for Ruby just-in-time YJIT compiler.
- The `Regexp` matching algorithm was updated to reduce the impact of potential Regular Expression Denial of Service (ReDoS) vulnerabilities.
- The new pure-Ruby JIT compiler (RJIT) is available for use on x86-64 architecture Unix platforms. The RJIT compiler replaces the MJIT compiler.
- The new M:N thread scheduler is available for use.

Other notable changes:

- Use the `Lrama` LALR parser generator instead of `Bison`.
- Several deprecated methods and constants have been removed.
- The `Racc` gem has been promoted from a default gem to a bundled gem.

To enable and install the `ruby:3.3` module stream, type:

```
sudo dnf module enable ruby:3.3
```

```
sudo dnf module install ruby:3.3
```

If you want to upgrade from an earlier `ruby` module stream, see Oracle Linux: Managing Software on Oracle Linux.

For information about product support for Ruby modules, see Oracle Linux: Product Life Cycle Information.

`perl-DateTime-TimeZone` Module Updated to Version 2.62

The `perl-DateTime-TimeZone` module is updated to version 2.62. Notably, the `name()` method is changed to return the main time zone name rather than the alias value.

PHP Version 8.2 Availability

PHP 8.2 is included in the new `php:8.2` module stream with the following notable changes:

- Ability to mark a class with a readonly modifier.
- Ability to use null, false, and true as stand-alone types.
- A new `Random` extension named `random`. This extension helps to organizes and integrate existing PHP functionality related to random number generation.
- Ability to define constants in traits.

To install the `php:8.2` module stream, use the following command:

```
sudo dnf module install php:8.2
```

If you want to upgrade from the `php:8.1` stream within Oracle Linux, see Oracle Linux: Managing Software on Oracle Linux.

For information about the length of support for the `php` module streams, see the Oracle Linux: Product Life Cycle Information.

PostgreSQL Version 16 Availability

With Oracle Linux 8.10, PostgreSQL 16 is available for use as a `postgresql:16` module stream. PostgreSQL 16 contains many new features and enhancements over version 15.

Notable enhancements include:

- Improved performance for bulk-loading database operations.
- The `libpq` library handles connection-level load balancing. A new `load_balance_hosts = disable | random` option is available for use to control the order in which the client tries to connect to the available hosts and addresses.
- Ability to create custom configuration files and include them in the `pg_hba.conf` and `pg_ident.conf` files.
- Enhanced regular expression matching of user and database names in `pg_hba.conf`, and user names in `pg_ident.conf` files.

Other changes include:

- PostgreSQL is no longer distributed with the `postmaster` binary. Users who start the `postgresql` server by using the provided `systemd` unit file (the `systemctl start postgres` command) are not affected by this change. If you start the `postgresql` server directly through the `postmaster` binary, you must use the `postgres` binary instead.
- PostgreSQL no longer provides documentation in PDF format within the package. Use the PostgreSQL online documentation instead. Also, see Using PostgreSQL

To install the `postgresql:16` stream, use the following command:

```
sudo dnf module install postgresql:16
```

To upgrade from an earlier `postgresql` stream within Oracle Linux, follow the procedure described in Oracle Linux: Managing Software on Oracle Linux.

For information about the length of support for the `postgresql` module streams, see the Oracle Linux: Product Life Cycle Information.

NGINX Version 1.24 Availability

NGINX 1.24 web and proxy server is included in the new `nginx:1.24` module stream with the following notable changes:

New features and changes related to Transport Layer Security (TLS):

- Encryption keys are automatically rotated for TLS session tickets when using shared memory in the `ssl_session_cache` directive.
- Memory usage optimization improvements in configurations with Secure Sockets Layer (SSL) proxy.
- You can now use `ipv4=off` parameter to disable look up of IPv4 addresses while resolving IP addresses.

- New `$proxy_protocol_tlv_*` variables are available for use. You can use these variables to store the values of the Type-Length-Value (TLV) fields that appear in the PROXY v2 TLV protocol.
- New `byte range` functionality added to the `ngx_http_gzip_static_module`.

Other changes:

- Header lines now appear as linked lists in the internal API.
- NGINX can now combine arbitrary header lines with identical named header strings as they get passed to the FastCGI, SCGI, and uwsgi back ends in the `$r->header_in()` method of the `ngx_http_perl_module`, and during lookups of the `$http_...`, `$sent_http_...`, `$sent_trailer_...`, `$upstream_http_...`, and `$upstream_trailer_...` variables.
- A warning message appears if protocol parameters of a listening socket are redefined.
- NGINX closes connections with lingering if pipeline request was used by the client.
- The logging level for various SSL errors has been lowered from `Critical` to `Informational`.

To install the `nginx:1.24` stream, use:

```
sudo dnf module install nginx:1.24
```

To upgrade from the `nginx 1.22` stream within Oracle Linux, see Oracle Linux: Managing Software on Oracle Linux.

For information about the length of support for the `php` module streams, see the Oracle Linux: Product Life Cycle Information.

Git Updated to Version 2.43.0

Git version 2.43 is included in this release with the following notable enhancements.

- The `git check-attr` command has a new `--source` option you can use to read the `.gitattributes` file from the provided tree object instead of the current working directory.
- When Git receives an HTTP response that includes one or more `WWW-Authenticate` headers, the values for each `WW-Authenticate` header are then passed by Git to credential helpers.
- In the case of an empty commit, you can use the `git format-patch` command to write an output file containing a header of the commit instead of creating an empty file.
- You can use `git blame --contents=*<file>* *<revision>* -- *<path>*` command to examine the origins of lines starting at `*<file>*` through the history that leads to `*<revision>*`.
- The `git log --format` command was updated to accept the `%(decorate)` placeholder for further customization and to extend the capabilities provided by the `--decorate` option.

Git LFS Updated to Version 3.4.1

The Git Large File Storage (LFS) version 3.4.1 is included with the following notable changes:

- The `git lfs push` command now reads references and object IDs from standard input.

- Git LFS now handles alternative remotes without relying on Git.
- Git LFS now handles the `WWW-Authenticate` response-type header as a credential helper.

File Systems and Storage

The following features, enhancements, and changes related to file systems and storage are introduced in this Oracle Linux 8 release.

Samba Updated to Version 4.19.4

The `samba` packages are updated to 4.19.4. Notable changes include:

- The `smbget` utility is updated to use a common command line parser to handle command line options and provides better authentication handling. This change is significant and can break scripts that depend on `smbget` because the options interface has changed. Also, you can no longer use the `smbgetrc` configuration file. For more information about changes to `smbget`, run `smbget --help` or see the `smbget(1)` manual page.
- An update to the handling of `winbind` tracing, so that if `winbind debug traceid` is enabled in the `smb.conf` file, the `winbind` service logs the following fields:
  - `traceid`: shows records belonging to the same request.
  - `depth`: shows the request nesting level.
- Samba uses the GnuTLS cryptographic library functionality, to replace its own cryptography implementation.
- The `directory name cache size` option is removed.

Before updating Samba and before you start the service, ensure that you back up the database files because downgrading databases isn't supported. When the `smbd`, `nmbd`, or `winbind` services start, Samba automatically updates its `tdb` database files.

Use the `testparm` utility to verify the `/etc/samba/smb.conf` file after updating Samba.

Infrastructure Services

The following features, enhancements, and changes related to infrastructure services are introduced in this Oracle Linux 8 release.

`chrony` Updated to Version 4.5

The `chrony` packages are updated to version 4.5. Notable changes include:

- Added the AES-GCM-SIV cipher to shorten Network Time Security (NTS) cookies to avoid some length-specific blocking of Network Time Protocol (NTP).
- Improved automatic NTP source replacement for unreachable NTP sources.
- Logging of important changes made by command requests using the `chronyc` command.
- Periodic refreshes of NTP sources. The default refresh period is two weeks. You can disable refreshes by adding the `refresh 0` configuration entry in the `chrony.conf` file.
- Improved logging of source selection failures and falsetickers.
- Added the `hwtstimeout` directive to configure timeout for late hardware transmit timestamps.

- Added the `chronyd-restricted` service as an optional service for minimal client-only configurations so that the `chronyd` service can be started without `root` privileges.
- Fixed the `presend` option in `interleaved` mode.
- Fixed reloading of modified sources from the `sourcedir` directories.

`linuxptp` Updated to Version 4.2

`linuxptp` is an implementation of the Precision Time Protocol (PTP). The `linuxptp` package is updated to version 4.2 to include the following notable changes:

- Multiple domain capability in the `phc2sys` tool.
- Clock update and change notifications in the Precision Time Protocol (PTP) parent dataset.
- Addition of the PTP Power Profile (IEEE C37.238-2011 and IEEE C37.238-2017).

Kernel and System Libraries

The following notable features, enhancements, and changes apply to the Red Hat Compatible Kernel (RHCK) that's shipped with the current Oracle Linux 8 version.

Intel® SGX Available in RHCK

Intel® Software Guard Extensions (Intel® SGX) is an Intel® technology for protecting selected code and data from disclosure or modification.

Intel® SGX versions 1 and 2 are now available for use in Oracle Linux. Version 1 provides the Flexible Launch Control mechanism that enables SGX technology on platforms. Version 2 provides the Enclave Dynamic Memory Management (EDMM) functionality.

Notable functionality includes:

- Update of EPCM permissions on regular enclave pages that belong to an initialized enclave.
- Dynamically add regular enclave pages to an initialized enclave.
- Expand an initialized enclave to accommodate more threads.
- Remove regular pages and TCS pages from an initialized enclave.

IDXD Available in RHCK

The Intel® Data Streaming Accelerator Driver (IDXD) is an Intel® CPU integrated accelerator that shares a work queue with process address space ID (`pasid`) submission and shared virtual memory (SVM). From this release, IDXD is a supported feature in RHCK.

Security

The following features, enhancements, and changes related to security are introduced in this Oracle Linux 8 release.

SCAP Security Guide Updated to Version 0.1.72

Updates to the SCAP Security Guide include the following notable changes:

- Bash remediations are fixed to handle ISO9660 partitions in the fstab.
- The PCI DSS profile is aligned with the PCI DSS policy version 4.0.
- STIG profiles are aligned with the latest DISA STIG policies (V1R10).

OpenSSL Protects Against Bleichenbacher-Like Attacks

The OpenSSL TLS toolkit now includes API protections against Bleichenbacher-like attacks on the RSA PKCS #1 v1.5 decryption process. The RSA decryption now returns a randomly generated deterministic message instead of an error if it detects an error when checking padding during a PKCS #1 v1.5 decryption. The change provides general protection against vulnerabilities such as CVE-2020-25659 and CVE-2020-25657.

You can disable this protection by calling the `EVP_PKEY_CTX_ctrl_str(ctx, "rsa_pkcs1_implicit_rejection". "0")` function on the RSA decryption context, but this makes your system more vulnerable.

`librdkafka` Updated to 1.6.1

The Apache Kafka `librdkafka` implementation is updated 1.6.1. This is the first major feature release for Oracle Linux 8. The update includes important enhancements and bug fixes listed in the `CHANGELOG.md` in the `librdkafka` package.

Important changes includes modified configuration defaults and some deprecated configuration properties. The API (C and C++) and ABI © in this version are compatible with older versions of `librdkafka`, but some changes to the configuration properties may require changes to existing applications.

`libkcapi` Updated to Version 1.4.0

The `libkcapi` library is updated to version 1.4.0. Notable changes include:

- Added the `sm3sum` and `sm3hmac` tools.
- Added the `kcapi_md_sm3` and `kcapi_md_hmac_sm3` APIs.
- Added SM4 convenience functions.
- Added link-time optimization (LTO) and LTO regression testing
- Fixed support for AEAD encryption of an arbitrary size with `kcapi-enc`.

`stunnel` Updated to Version 5.71

The `stunnel` TLS/SSL tunneling service is updated to version 5.71.

Notable changes include:

- Integration with latest PostgreSQL clients.
- New `protocolHeader` service-level option to insert custom `connect` protocol negotiation headers for software impersonation.

- New `protocolHost` option to control the client SMTP protocol negotiation HELO/EHLO value.
- New client-side `protocol = ldap` availability.
- New `sessionResume` service-level option to control whether a session can be resumed.
- Extended option to request client certificates in server mode with `CApath` or `CAfile`.
- Improved file reading and logging performance.
- Added a configurable delay for the `retry` option.
- OCSP stapling is requested and verified when `verifyChain` is set in client mode.
- OCSP stapling is always available in server mode.
- Inconclusive OCSP verification breaks TLS negotiation. You can disable this by setting `OCSPrequire = no`.

OpenSSH Adds Authentication Delay Limits

OpenSSH artificially delays responses after login failure to prevent user enumeration attacks. An upper limit on artificial delays is applied when remote authentication takes too long, for example in privilege access management (PAM) processing.

`libkcapi` Can Target File Names in Hash-Sum Calculations

The `libkcapi` packages includes a new `-T` option that specifies target file names in hash-sum calculations. This option must be used with the `-c` option that specifies the HMAC files and overrides the target file names specified in the HMAC file. For example:

```
$ sha256hmac -c <hmac_file> -T <target_file>
```

`opencryptoki` Updated to Version 3.22.0

The `opencryptoki` package is updated to version 3.22.0. Notable changes include:

- The `AES-XTS` key type can be used with the `CPACF` protected keys.
- Certificate object management.
- A `no-login` option to create public sessions.
- Authentication as the Security Officer (SO).
- Capability to import and export the `Edwards` and `Montgomery` keys.
- Capability to import `RSA-PSS` keys and certificates.
- Validation that the keys AES-XTS are different when they're created or imported.

`audit` Updated to Version 3.1.2

The `audit` package is updated to version 3.1.2. Notable changes include:

- The `auparse` library now interprets unnamed and anonymous sockets.
- Added keyword, `this-hour`, to the `ausearch` and `aureport` command `start` and `end` options.

- Added user friendly keywords for signals to the `auditctl` command.
- The `auparse` command is hardened to better handle corrupt logs.
- The `ProtectControlGroups` option is disabled by default in the `auditd` service.
- Rule checking for the exclude filter is fixed.
- `OPENAT2` field interpretation is improved.
- The `audispd af_unix` plugin is moved to a standalone program.
- The Python binding is updated to disable setting Audit rules from the Python API to resolve an issue in the Simplified Wrapper and Interface Generator (SWIG).
- Added `io_uring` asynchronous I/O API capability.

`bcrypt` Local Users Password Hashing Algorithm

You can now enable the `bcrypt` password hashing algorithm for local users. To switch to the `bcrypt` hashing algorithm, you must first create a custom profile and then edit the profile to change the hashing algorithm:

1. Get the current profile and any enabled features:

   ```
   sudo authselect current
   ```

   Output might look similar to the following:

   ```
   Profile ID: minimal
   Enabled features:
   - with-faillock
   ```

2. Create a custom profile, *myprofile*, based on the current Profile ID, *minimal*:

   ```
   sudo authselect create-profile myprofile -b minimal
   ```

3. Enable any features that were enabled in the original profile, for example:

   ```
   sudo authselect enable-feature with-faillock
   ```

   You might need to run this command several times for each feature that was enabled before.

4. Edit the configuration files for the profile that you have created to change the algorithm used by `pam_unix.so`.

   For example, edit `/etc/authselect/custom/myprofile/system-auth` and `/etc/authselect/custom/myprofile/password-auth` files by changing the `pam_unix.so sha512` setting to `pam_unix.so blowfish`.

5. Apply the changes:

   ```
   # authselect apply-changes
   ```

6. Change the password for a user by using the `passwd` command.
7. In the `/etc/shadow` file, verify that the hashing algorithm is set to `$2b$`, indicating that the `bcrypt` password hashing algorithm is now used.

3
Technology Preview

For the Red Hat Compatible Kernel in the current Oracle Linux 8 release, the following features are under technology preview:

Infrastructure Services

The following features for infrastructure services are available as technology previews.

Socket API for TuneD

The socket API for TuneD maps one-to-one with the D-Bus API and provides an alternative communication method for cases where D-Bus isn't available. With the socket API, you can control the TuneD daemon to optimize the performance, and change the values of various tuning parameters. The socket API is disabled by default. You can enable it in the `tuned-main.conf` file.

Networking

The following networking features are available as technology previews.

Multi-Protocol Label Switching

Multi-protocol Label Switching (MPLS) is an in-kernel data-forwarding mechanism that routes the traffic flow across enterprise networks. In an MPLS network, the router that receives packets decides the further route of the packets, based on the labels that are attached to the packet. With the usage of labels, the MPLS network can handle packets with particular characteristics.

XDP Features

XDP programs can be loaded on architectures other than AMD and Intel® 64-bit. Note, however, that the `libxdp` library is available only for AMD and Intel® 64-bit platforms. Likewise, in this technology preview feature, you can offload XDP hardware.

Also, XDP includes the Address Family eXpress Data Path (`AF_XDP`) socket for high-performance packet processing. It grants efficient redirection of programmatically selected packets to user space applications for further processing.

`act_mpls` Module

The `act_mpls` module in the `kernel-modules-extra` rpm applies Multi-Protocol Label Switching (MPLS) actions with Traffic Control (TC) filters, for example, push and pop MPLS label stack entries with TC filters. The module also accepts the Label, Traffic Class, Bottom of Stack, and Time to Live fields to be set independently.

systemd-resolved Service

The systemd-resolved service provides name resolution to local applications. Its components include a caching and validating DNS stub resolver, a Link-Local Multicast Name Resolution (LLMNR), and Multicast DNS resolver and responder.

Kernel

The following kernel features are available as technology previews.

kexec Fast Reboot

The kexec fast reboot feature is available as a technology preview feature in Oracle Linux 8. This feature significantly speeds up the boot process by enabling the kernel to boot directly into the second kernel without first passing through the Basic Input/Output System (BIOS). To use this feature, load the kexec module first, then reboot the system.

SGX Available

Software Guard Extensions (SGX) from Intel® protects software code and data from disclosure and modification. The Linux kernel partially supports SGX v1 and SGX v1.5. Version 1 enables platofmrs by using the Flexible Launch Control mechanism to use the SGX technology.

Extended Berkeley Packet Filter (eBPF)

eBPF is an in-kernel virtual machine code is processed in the kernel space, in the restricted sandbox environment with access to a limited set of functions.

eBPF has a new system call bpf() for creating various types of maps and for loading programs that can be attached onto various points (sockets, tracepoints, packet reception) to receive and process data.

An eBPF component is AF_XDP, a socket for connecting the **eXpress Data Path (XDP)** path to user space for applications that prioritize packet processing performance.

Intel® Data Streaming Accelerator Driver

The driver is an Intel® CPU integrated accelerator and shares a work queue with process address space ID (pasid) submission and shared virtual memory (SVM).

accel-config Package

The accel-config package is available on Intel® EM64T and AMD64 architectures for managing data-streaming accelerator (DSA) subsystem in the Linux kernel. Also, it configures devices through sysfs (pseudo file system), saves and loads the configuration in the json format.

File Systems and Storage

The following features that are related to file systems and storage are available as technology preview.

DAX File System Available

In this release, the DAX file system is available as a Technology Preview for the ext4 and XFS file systems. DAX enables an application to directly map persistent memory into its address space. The system must have some form of persistent memory available to use DAX. Persistent memory can be in the form of one or more Non-Volatile Dual In-line Memory Modules (NVDIMMs). In addition, a file system that supports DAX must be created on the NVDIMMs; the file system must be mounted with the `dax` mount option. Then, an `mmap` of a file on the DAX mounted file system results in a direct mapping of storage into the application's address space.

NVMe/TCP Available

NVMe over Fabrics TCP host and the target drivers are included in RHCK as a technology preview in this release.

> **Note:**
>
> Support for NVMe/TCP is already available in Unbreakable Enterprise Kernel Release 6 and later.

High Availability and Clusters

The following features for high availability and clusters are available as technology previews.

Pacemaker Podman Bundles

Pacemaker container bundles now run on Podman, with the container bundle feature being available as a Technology Preview.

Heuristics in `corosync-qdevice`

Heuristics are a set of commands that run locally on startup, cluster membership change, successful connect to `corosync-qnetd`, and, optionally, on a periodic basis. When all commands finish successfully, heuristics have passed; otherwise, they have failed. The heuristics result is sent to `corosync-qnetd` where it's used in calculations to decide which partition is quorate.

Fence Agent

The `fence_heuristics_ping` agent is available with Pacemaker. The agent aims to open a class of experimental fence agents that do no actual fencing by themselves but instead exploit the behavior of fencing levels in a new way.

Through the agent, particularly by its issuing an `off` action, Pacemaker can be informed if fencing would succeed or not. The heuristics agent can prevent the agent that does the actual fecing from fencing a node under certain conditions.

Cloud Environment

The following features for the cloud environment are available as technology preview.

VM Deployment in Azure

With the updated RHCK, Oracle Linux confidential virtual machines (VMs) can be deployed on Microsoft Azure. Through the availability of Unified Kernel Images (UKIs), you can boot encrypted confidential VM images on that cloud environment. The UKI is available as a `kernel-uki-virt` package in Oracle Linux 9 repositories.

Note that the Oracle Linux UKI can only be used in a UEFI boot configuration.

This functionality isn't yet available for UEK.

4
Deprecated Features

This chapter lists features and functionalities that are deprecated in Oracle Linux 8. While these features might be currently included and operative in the release, support is not guaranteed in future major releases. Thus, they should not be used in new Oracle Linux 8 deployments.

Installation

The following installation related features and functionalities are deprecated in Oracle Linux 8.

Kickstart Commands

- `auth` or `authconfig`
- `device`
- `deviceprobe`
- `dmraid`
- `install`
- `lilo`
- `lilocheck`
- `mouse`
- `multipath`
- `bootloader --upgrade`
- `ignoredisk --interactive`

  Using the `--interactive` option causes a fatal installation error. You must remove this option from any kickstart files.
- `partition --active`
- `reboot --kexec`
- `autostep`

Even though specific options are listed as deprecated, the base command and the other options remain available and operative.

Software Management

The following features and functionalities related to software management are deprecated in Oracle Linux 8.

`rpmbuild --sign`

Using `rpmbuild --sign` can cause a fatal error in the system. Use the `rpmsign` command instead.

Shells and Command Lines

The following shell and command line components are deprecated in Oracle Linux 8.

OpenEXR

As a consequence of the OpenEXR deprecation, the `EXR` image format is no longer supported in the `imagecodex` module.

Dump Utility

With this removal of support for the `dump` utility, use other commands to back up file systems, for example, `tar`, `dd`, or `bacula`.

The `restore` component of the `dump` package remains supported and available as a separate `restore` package.

`hidepid=n` Mount Option

As a `mount` option, `hidepid=`*`n`* controls access to `/proc/[`*`pip`*`]`. The option is incompatible with the `systemd` infrastructure and might cause certain `systemd` services to generate SELinux AVC denial messages, which would inhibit completion of other operations.

ABRT Tool

The Automatic Bug Reporting Tool (ABRT) is used to detect and report application crashes. Instead of this tool, use the `systemd-coredump` tool for logging and storing core dumps that are generated when program crash.

`udev` Rename Device Helper Utility

The `udev` helper utility `/usr/lib/udev/rename_device` for renaming network interfaces is deprecated.

ReaR Crontab

The `/etc/cron.d/rear` crontab is deprecated in the `rear` package. The crontab utility monitors for any changes in the disk layout and runs `rear mkrescue` if changes are detected. If you require the `rear` functionality, configure the ReaR utility to run periodically.

SQLite in Bacula

Support is deprecated for SQLite as a database backend of the Bacula backup system. You should migrate to one of the backends that Bacula supports, such as PostgreSQL or MySQL.

`raw` Command

Use of the deprecated `/usr/bin/raw` command in future Oracle Linux releases might generate errors.

Security

The following security related features and functionalities are deprecated in Oracle Linux 8.

NSS SEED Ciphers

Support for TLS cipher suites that use a SEED cipher is deprecated in the Network Security Services (NSS) library from Mozilla. If your setup relies on SEED ciphers, you should enable support for other cipher suites in preparation for the complete removal of SEED ciphers from NSS.

TLS 1.0 and TLS 1.1

These two protocols are disabled in the `DEFAULT` system-wide cryptographic policy level. If you require these protocols, switch the policy to the `LEGACY` level as follows:

```
sudo update-crypto-policies --set LEGACY
```

Dsa

Authentication mechanisms that are based on the deprecated Digital Signature Algorithm (DSA) keys no longer work in the default configuration. OpenSSH clients do not accept DSA host keys even when the system-wide cryptographic policy level is set to `LEGACY`.

`fapolicyd.rules`

Policies for allowing and denying execution rules used to be specified in the `/etc/fapolicyd/fapolicyd.rules` file. This file is being replaced by files inside the `/etc/fapolicyd/rules.d` directory.

The `fagenrules` script now merges all component rule files in this directory to the `/etc/fapolicyd/compiled.rules` file. Rules in `/etc/fapolicyd/fapolicyd.trust` are still processed by the `fapolicyd` framework but only for ensuring backward compatibility.

SSL2 Client Hello

Secure Socket Layer 2's `Client Hello` message used to be supported by earlier versions of the Transport Layer Security (TLS) protocol. Being deprecated in the NSS library, this feature is now disabled by default.

If your application requires support for `Client Hello`, enable the feature by using the `SSL_ENABLE_V2_COMPATIBLE_HELLO` API.

Runtime Disabling of SELinux

Setting the `SELINUX=disabled` option in `/etc/selinux/config` to disable SELinux at runtime has deprecated support. If you use only this option to disable SELinux, then SELinux remains enabled but with no loaded policy.

To completely disable SELinux, add the `selinux=0` parameter to the kernel command line.

`ipa` SELinux Module

This module is no longer maintained and hence removed from the `selinux-policy` package. The functionality is now included in the `ipa-selinux` package.

TPM 1.2

The Trusted Platform Module (TPM) is updated to 2.0 with multiple improvements. However, the updated version is not backward compatible with earlier versions. Consequently, version 1.2 is deprecated.

`crypto-policies`

The introduction of scopes for `crypto-policies` directives in custom policies has resulted in the deprecation of the following derived properties of `crypto-policies`:

- `tls_cipher`
- `ssh_cipher`
- `ssh_group`
- `ike_protocol`
- `sha1_in_dnssec`

Use of the `protocol` property now requires a scope. For more information, see the `crypto-policies(7)` manual page.

Networking

The following network related features and functionalities are deprecated in Oracle Linux 8.

`PF_KEYv2` Kernel API

The `PF_KEYv2` kernel API, used for configuring IPSec, is deprecated in favor of the `netlink` API, which is actively maintained to provide important security features and updates.

Network Scripts

Network scripts are no longer available by default. New versions of `ifup` and `ifdown` scripts call the NetworkManager service through the `nmcli` tools. Therefore, to run these scripts in Oracle Linux 8, the NetworkManager service must be running.

Other commands in `/sbin/ifup-local`, `ifdown-pre-local`, and `ifdown-local` scripts are ignored. If you manually install the legacy `network-scripts` package and use the scripts, a warning is displayed about their deprecated state.

`dropwatch` Tool

Instead of the `dropwatch` tool, use the replacement `perf` command line tool in future Oracle Linux deployments, which provides the same functionality.

`xinetd` Service

The `xinetd` service is replaced by `systemd`.

`cgdcbxd` Package

The deprecated control group data center bridging exchange daemon (`cgdcbxd`) monitors data center bridging (DCB) netlink events and manages the `net_prio control` group subsystem. Support for this feature might be removed.

WEP Wi-Fi Connection

Instead of using this connection method, use the Wi-Fi Protected Access 3 (WPA3) or WPA2 connection methods.

`xt_u32` Module

The `xt_u32` module enables users to match arbitrary 32 bits in the packet header or payload for their `iptables`. Because this module is unsupported, migrate to the `nftables` packet filtering framework.

First, change the firewall to use `iptables` with native matches to incrementally replace individual rules. Then, use the `iptables-translate` command and accompanying utilities to migrate to `nftables`. If the `iptables` rules have no native match in `nftables`, use the raw payload matching feature of `nftables` instead.

For more information, see the *raw payload expression* section in the `nft(8)` manual page.

Kernel

The following kernel related features and functionalities are deprecated in Oracle Linux 8.

`rdma-rxe` Driver

Software Remote Direct Memory Access over Converged Ethernet (Soft-RoCE), or RXE, emulates RDMA. Because of instability issues, this driver is now deprecated.

Linux `firewire` Subsystems and Associated User Space Components

The `firewire` subsystem provides interfaces to use and maintain any resources on the IEEE 1394 bus. This subsystem is deprecated in the `kernel` package and likewise, associated user space components that are provided by the `libavc1394`, `libdc1394`, and `libram1394` packages.

`crash-ptdump-command` Package

The `crash-ptdump-command` package is a `ptdump` extension module for the crash utility. The package isn't maintained upstream and is deprecated in this Oracle Linux 8 release.

Bootloader

The following features and functionalities that are related to the bootloader are deprecated in Oracle Linux 8.

`kernelopts` Environment Variable

The `kernelopts` environment variable stores the defined kernel command line parameters for systems that use the GRUB2 bootloader. The variable was stored in the `/boot/grub2/grubenv` file for each kernel boot entry. The variable is deprecated and kernel command line parameters are stored in the Boot Loader Specification (BLS) snippet as a replacement.

File Systems and Storage

The following features and functionalities related to file systems and storage are deprecated in Oracle Linux 8.

`elevator` Kernel Command

The `elevator` kernel command line parameter sets the disk scheduler for all devices. If you require a different scheduler than what the kernel automatically selects, use `udev` rule or the TuneD service to configure the preferred scheduler.

NFSv3 Over UDP

The NFS server no longer opens or listens on a User Datagram Protocol (UDP) socket by default. Therefore, NFSv3 over UDP is disabled and no longer supported.

`peripety` Package

The `peripety` package is deprecated. The Peripety storage event notification daemon parses system storage logs into structured storage events to enable you investigate storage issues.

VDO Write Modes

- `sync`
- `async-unsafe`
- `auto`

In place of these modes, `async` is the recommended write mode to use.

VDO Manager

The VDO Manager is deprecated and is replaced by the LVM-VDO integration. To create VDO volumes, preferably use the `lvcreate` command instead.

You can use the `/usr/sbin/lvm_import_vdo` script in the `lvm2` package to convert existing volumes that were created with the VDO Manager. In this manner, these volumes can be managed through the LVM-VDO integration.

Cramfs Kernel Module

In place of the deprecated `cramfs` kernel module, use `squashfs`, which is the recommended replacement.

High Availability and Clusters

The following features and functionalities that related to high availability and clusters are deprecated in Oracle Linux 8.

`pcs` Commands Support for `clufter` Tool

The `clufter` tool is used for analyzing cluster configuration formats. The `pcs` commands that support the `clufter` tool are deprecated. Using these commands generate a warning about their deprecations. Sections that are related to these commands are removed from the `pcs` help display and the `pcs(8)` manual page.

Specifically, the following commands are deprecated:

- `pcs config import-cman`
- `pcs config export`

Dynamic programming languages, web, and database servers

The following dynamic programming languages, web, and database servers are deprecated in Oracle Linux 8.

`mod_php` Module

The `mod_php` module used to enable PHP on the Apache HTTP Server is available but is deprecated and not enabled in the default configuration. The module is no longer available in Oracle Linux 8. The module is deprecated in favor of the FastCGI Process Manager (`php-fpm`).

Compilers and Development Tools

The following compilers and development tools are deprecated in Oracle Linux 8.

`libdwarf` Library

In place of the deprecated `libdwarf` library, use the `elfutils` and `libdw` libraries for applications that need to process ELF/DWARF files.

As an alternative to the `libdwarf-tools dwarfdump` program, you can use the `binutils readelf` program or the `elfutils eu-readelf` program. Both programs can be used by passing the `--debug-dump` flag.

`gdb.i686` Packages

These packages were distributed in earlier Oracle Linux releases to support 32-bit versions of the GNU Debugger (GDB). With the removal of support for 32-bit hardware, these packages are no longer supported or available. The 64-bit version of GDB in `gdb.x86_64` packages can debug 32-bit applications.

Identity Management

The following identity management features are deprecated in Oracle Linux 8.

OpenSSH LDAP

The `openssh-ldap` subpackage is deprecated in favor of SSSD and the `sss_ssh_authorizedkeys` helper on Oracle Linux 8.

DES and 3DES

The Data Encryption Standard (DES) algorithm was deprecated and disabled by default in Oracle Linux 7. Single-DES (DES) and triple-DES (3DES) encryption types are removed in Oracle Linux 8.

SSSD `libwbclient`

The SSSD implementation of the `libwbclient` package is deprecated and has been removed.

Standalone `ctdb`

Standalone use of the `ctdb` clustered Samba service is deprecated. You can continue to use this service as a Pacemaker resource with the `ctdb` resource agent.

Samba NT4-style Domain Controllers

Use of Samba configured as either a Primary Domain Controller (PDC) or Backup Domain Controller (BDC) in an NT3-style domain is deprecated. Oracle doesn't support using Samba as an AD domain controller.

SMB1

The insecure Server Message Block version 1 (SMB1) protocol is deprecated. To improve security, SMB1 is disabled in the Samba server and client utilities.

Virtualization

The following virtualization related features and functionalities are deprecated in Oracle Linux 8.

`virsh iface-*` Commands

`virsh iface-*` commands such as `virsh iface-start`, `virsh iface-destroy`, and so on are deprecated. To configure and manage host network connections, use instead the NetworkManager tool and its related management applications, for example `nmcli`.

`virt-manager` Application Deprecated

The Virtual Machine Manager application (`virt-manager`) is deprecated in this release. To manage virtualization, use the Cockpit web console instead.

Virtual Machine Snapshots

Support for creating snapshots of VMs is limited only to those that don't use UEFI firmware. However, the operation might cause the QEMU monitor to become blocked and affects hypervisor operations.

As an alternative, use external snapshots.

Cirrus VGA Virtual GPU Type

The Cirrus VGA GPU device is deprecated and support for it might be removed in KVM virtual machines. In its place, use `stdvga`, `virtio-vga`, or `qxi` devices.

Signatures Using SHA-1

The use of SHA1-based signatures to perform SecureBoot image verification on UEFI (PE/COFF) executable files is deprecated. Instead, use signatures that are based on SHA-2 or later.

SPICE Remote Display Protocol

With the deprecation of the SPICE remote display protocol, the functionality of attaching smart card readers to virtual machines (VMs) will be provided by third party remote virtualization solutions.

Also, the deprecation of this protocol has the following consequences:

- For remote console access, use the VNC protocol.
- For advanced remote display functions, use third-party tools such as RDP, HP RGS, or Mechdyne TGX.

Live RDMA-Based Migration Deprecated

The functionality for migrating running virtual machines using Remote Direct Memory Access (RDMA) is deprecated.

Containers

The following features and functionalities that are related to containers are deprecated in Oracle Linux 8.

`container-tools` Modules

The `container-tools:1.0`, `container-tools:2.0`, and `container-tools:3.0` modules are deprecated and no longer support security updates.

Use newer supported stable module streams, such as `container-tools:4.0` instead.

CNI

The Container Network Interface (CNI) network stack is deprecated in favor of Netavark.

Container-Tools 4.0 Module Deprecated

With this release, the container-tools:4.0 module is deprecated and will no longer receive security updates. To continue to build and run Linux Containers on Oracle Linux, use the latest module stream container-tools:ol8.

For details on how to switch streams, see https://docs.oracle.com/en/operating-systems/oracle-linux/software-management/sfw-mgmt-InstallSoftwareonEnterpriseLinux.html#appstream-module-switch.

Podman varlink-based API v1.0

The Podman varlink-based API v1.0 has been removed. Use the Podman v2.0 v3.0 RESTful API instead.

Cockpit Web Console

The following Cockpit Web Console related features and functionalities are deprecated in Oracle Linux 8.

Incomplete Translations

Cockpit no longer supports a languages with translations available for less than 50 % of the Console's translatable strings. Browser requests for such language types reverts to English.

`remotectl`

The `remotectl` command has been deprecated. Use the `cockpit-certificate-ensure` command instead.

> **Note:**
>
> `cockpit-certificate-ensure` does not contain all the same features as `remotectl`. For example, bundled certificates and keychain files must be split out.

Deprecated Packages

The support status of deprecated packages remains unchanged within Oracle Linux 8. For more information about the length of support, see Oracle Linux: Product Life Cycle Information.

The following packages are deprecated in Oracle Linux 8:

- 389-ds-base-legacy-tools
- abrt
- abrt-addon-ccpp
- abrt-addon-kerneloops
- abrt-addon-pstoreoops
- abrt-addon-vmcore
- abrt-addon-xorg
- abrt-cli
- abrt-console-notification
- abrt-dbus
- abrt-desktop
- abrt-gui
- abrt-gui-libs
- abrt-libs
- abrt-tui
- adobe-source-sans-pro-fonts
- adwaita-qt
- alsa-plugins-pulseaudio
- amanda
- amanda-client
- amanda-libs
- amanda-server
- ant-contrib
- antlr3
- antlr32
- aopalliance
- apache-commons-collections
- apache-commons-compress
- apache-commons-exec
- apache-commons-jxpath
- apache-commons-parent
- apache-ivy

- apache-parent
- apache-resource-bundles
- apache-sshd
- apiguardian
- arpwatch
- aspnetcore-runtime-3.0
- aspnetcore-runtime-3.1
- aspnetcore-runtime-5.0
- aspnetcore-targeting-pack-3.0
- aspnetcore-targeting-pack-3.1
- aspnetcore-targeting-pack-5.0
- assertj-core
- authd
- auto
- autoconf213
- autogen
- autogen-libopts
- awscli
- base64coder
- bash-doc
- batik
- batik-css
- batik-util
- bea-stax
- bea-stax-api
- bind-export-devel
- bind-export-libs
- bind-libs-lite
- bind-pkcs11
- bind-pkcs11-devel
- bind-pkcs11-libs
- bind-pkcs11-utils
- bind-sdb
- bind-sdb
- bind-sdb-chroot
- bitmap-console-fonts
- bitmap-fixed-fonts
- bitmap-fonts-compat

- bitmap-lucida-typewriter-fonts
- bluez-hid2hci
- boost-jam
- boost-signals
- bouncycastle
- bpg-algeti-fonts
- bpg-chveulebrivi-fonts
- bpg-classic-fonts
- bpg-courier-fonts
- bpg-courier-s-fonts
- bpg-dedaena-block-fonts
- bpg-dejavu-sans-fonts
- bpg-elite-fonts
- bpg-excelsior-caps-fonts
- bpg-excelsior-condenced-fonts
- bpg-excelsior-fonts
- bpg-fonts-common
- bpg-glaho-fonts
- bpg-gorda-fonts
- bpg-ingiri-fonts
- bpg-irubaqidze-fonts
- bpg-mikhail-stephan-fonts
- bpg-mrgvlovani-caps-fonts
- bpg-mrgvlovani-fonts
- bpg-nateli-caps-fonts
- bpg-nateli-condenced-fonts
- bpg-nateli-fonts
- bpg-nino-medium-cond-fonts
- bpg-nino-medium-fonts
- bpg-sans-fonts
- bpg-sans-medium-fonts
- bpg-sans-modern-fonts
- bpg-sans-regular-fonts
- bpg-serif-fonts
- bpg-serif-modern-fonts
- bpg-ucnobi-fonts
- brlapi-java
- bsh

- buildnumber-maven-plugin
- byaccj
- cal10n
- cbi-plugins
- cdparanoia
- cdparanoia-devel
- cdparanoia-libs
- cdrdao
- cmirror
- codehaus-parent
- codemodel
- compat-exiv2-026
- compat-guile18
- compat-hwloc1
- compat-libpthread-nonshared
- compat-libtiff3
- compat-openssl10
- compat-sap-c++-11
- compat-sap-c++-10
- compat-sap-c++-9
- createrepo_c-devel
- ctags
- ctags-etags
- culmus-keteryg-fonts
- culmus-shofar-fonts
- custodia
- cyrus-imapd-vzic
- dbus-c++
- dbus-c++-devel
- dbus-c++-glib
- dbxtool
- dejavu-fonts-common
- dhcp-libs
- directory-maven-plugin
- directory-maven-plugin-javadoc
- dirsplit
- dleyna-connector-dbus
- dleyna-core

- dleyna-renderer
- dleyna-server
- dnssec-trigger
- dnssec-trigger-panel
- dotnet
- dotnet-apphost-pack-3.0
- dotnet-apphost-pack-3.1
- dotnet-apphost-pack-5.0
- dotnet-host-fxr-2.1
- dotnet-host-fxr-2.1
- dotnet-hostfxr-3.0
- dotnet-hostfxr-3.1
- dotnet-hostfxr-5.0
- dotnet-runtime-2.1
- dotnet-runtime-3.0
- dotnet-runtime-3.1
- dotnet-runtime-5.0
- dotnet-sdk-2.1
- dotnet-sdk-2.1.5xx
- dotnet-sdk-3.0
- dotnet-sdk-3.1
- dotnet-sdk-5.0
- dotnet-targeting-pack-3.0
- dotnet-targeting-pack-3.1
- dotnet-targeting-pack-5.0
- dotnet-templates-3.0
- dotnet-templates-3.1
- dotnet-templates-5.0
- dotnet5.0-build-reference-packages
- dptfxtract
- drpm
- drpm-devel
- dump
- dvd+rw-tools
- dyninst-static
- eclipse-ecf
- eclipse-ecf-core
- eclipse-ecf-runtime

- eclipse-emf
- eclipse-emf-core
- eclipse-emf-runtime
- eclipse-emf-xsd
- eclipse-equinox-osgi
- eclipse-jdt
- eclipse-license
- eclipse-p2-discovery
- eclipse-pde
- eclipse-platform
- eclipse-swt
- ed25519-java
- ee4j-parent
- elfutils-devel-static
- elfutils-libelf-devel-static
- emacs-terminal
- emoji-picker
- enca
- enca-devel
- environment-modules-compat
- evince-browser-plugin
- exec-maven-plugin
- farstream02
- felix-gogo-command
- felix-gogo-runtime
- felix-gogo-shell
- felix-scr
- felix-osgi-compendium
- felix-osgi-core
- felix-osgi-foundation
- felix-parent
- file-roller
- fipscheck
- fipscheck-devel
- fipscheck-lib
- firewire
- fonts-tweak-tool
- forge-parent

- freeradius-mysql
- freeradius-perl
- freeradius-postgresql
- freeradius-rest
- freeradius-sqlite
- freeradius-unixODBC
- fuse-sshfs
- fusesource-pom
- future
- gamin
- gamin-devel
- gavl
- gcc-toolset-9
- gcc-toolset-9-annobin
- gcc-toolset-9-build
- gcc-toolset-9-perftools
- gcc-toolset-9-runtime
- gcc-toolset-9-toolchain
- gcc-toolset-10
- gcc-toolset-10-annobin
- gcc-toolset-10-binutils
- gcc-toolset-10-binutils-devel
- gcc-toolset-10-build
- gcc-toolset-10-dwz
- gcc-toolset-10-dyninst
- gcc-toolset-10-dyninst-devel
- gcc-toolset-10-elfutils
- gcc-toolset-10-elfutils-debuginfod-client
- gcc-toolset-10-elfutils-debuginfod-client-devel
- gcc-toolset-10-elfutils-devel
- gcc-toolset-10-elfutils-libelf
- gcc-toolset-10-elfutils-libelf-devel
- gcc-toolset-10-elfutils-libs
- gcc-toolset-10-gcc
- gcc-toolset-10-gcc-c++
- gcc-toolset-10-gcc-gdb-plugin
- gcc-toolset-10-gcc-gfortran
- gcc-toolset-10-gdb

- gcc-toolset-10-gdb-doc
- gcc-toolset-10-gdb-gdbserver
- gcc-toolset-10-libasan-devel
- gcc-toolset-10-libatomic-devel
- gcc-toolset-10-libitm-devel
- gcc-toolset-10-liblsan-devel
- gcc-toolset-10-libquadmath-devel
- gcc-toolset-10-libstdc++-devel
- gcc-toolset-10-libstdc++-docs
- gcc-toolset-10-libtsan-devel
- gcc-toolset-10-libubsan-devel
- gcc-toolset-10-ltrace
- gcc-toolset-10-make
- gcc-toolset-10-make-devel
- gcc-toolset-10-perftools
- gcc-toolset-10-runtime
- gcc-toolset-10-strace
- gcc-toolset-10-systemtap
- gcc-toolset-10-systemtap-client
- gcc-toolset-10-systemtap-devel
- gcc-toolset-10-systemtap-initscript
- gcc-toolset-10-systemtap-runtime
- gcc-toolset-10-systemtap-sdt-devel
- gcc-toolset-10-systemtap-server
- gcc-toolset-10-toolchain
- gcc-toolset-10-valgrind
- gcc-toolset-10-valgrind-devel
- gcc-toolset-11-make-devel
- gcc-toolset-12-annobin-annocheck
- gcc-toolset-12-annobin-docs
- gcc-toolset-12-annobin-plugin-gcc
- gcc-toolset-12-binutils
- gcc-toolset-12-binutils-devel
- gcc-toolset-12-binutils-gold
- GConf2
- GConf2-devel
- gegl
- genisoimage

- genwqe-tools
- genwqe-vpd
- genwqe-zlib
- genwqe-zlib-devel
- geoipupdate
- geronimo-annotation
- geronimo-jms
- geronimo-jpa
- geronimo-parent-poms
- gfbgraph
- gflags
- gflags-devel
- glassfish-annotation-api
- glassfish-el
- glassfish-fastinfoset
- glassfish-jaxb-core
- glassfish-jaxb-txw2
- glassfish-jsp
- glassfish-jsp-api
- glassfish-legal
- glassfish-master-pom
- glassfish-servlet-api
- glew-devel
- glib2-fam
- glog
- glog-devel
- gmock
- gmock-devel
- gnome-abrt
- gnome-boxes
- gnome-menus-devel
- gnome-online-miners
- gnome-shell-extension-disable-screenshield
- gnome-shell-extension-horizontal-workspaces
- gnome-shell-extension-no-hot-corner
- gnome-shell-extension-window-grouper
- gnome-themes-standard
- gnu-free-fonts-common

- gnu-free-mono-fonts
- gnu-free-sans-fonts
- gnu-free-serif-fonts
- gnupg2-smime
- gnuplot
- gnuplot-common
- gobject-introspection-devel
- google-droid-kufi-fonts
- google-gson
- google-noto-kufi-arabic-fonts
- google-noto-naskh-arabic-fonts
- google-noto-naskh-arabic-ui-fonts
- google-noto-nastaliq-urdu-fonts
- google-noto-sans-balinese-fonts
- google-noto-sans-bamum-fonts
- google-noto-sans-batak-fonts
- google-noto-sans-buginese-fonts
- google-noto-sans-buhid-fonts
- google-noto-sans-canadian-aboriginal-fonts
- google-noto-sans-cham-fonts
- google-noto-sans-cuneiform-fonts
- google-noto-sans-cypriot-fonts
- google-noto-sans-gothic-fonts
- google-noto-sans-gurmukhi-ui-fonts
- google-noto-sans-hanunoo-fonts
- google-noto-sans-inscriptional-pahlavi-fonts
- google-noto-sans-inscriptional-parthian-fonts
- google-noto-sans-javanese-fonts
- google-noto-sans-lepcha-fonts
- google-noto-sans-limbu-fonts
- google-noto-sans-linear-b-fonts
- google-noto-sans-lisu-fonts
- google-noto-sans-mandaic-fonts
- google-noto-sans-meetei-mayek-fonts
- google-noto-sans-mongolian-fonts
- google-noto-sans-myanmar-fonts
- google-noto-sans-myanmar-ui-fonts
- google-noto-sans-new-tai-lue-fonts

- google-noto-sans-ogham-fonts
- google-noto-sans-ol-chiki-fonts
- google-noto-sans-old-italic-fonts
- google-noto-sans-old-persian-fonts
- google-noto-sans-oriya-fonts
- google-noto-sans-oriya-ui-fonts
- google-noto-sans-phags-pa-fonts
- google-noto-sans-rejang-fonts
- google-noto-sans-runic-fonts
- google-noto-sans-samaritan-fonts
- google-noto-sans-saurashtra-fonts
- google-noto-sans-sundanese-fonts
- google-noto-sans-syloti-nagri-fonts
- google-noto-sans-syriac-eastern-fonts
- google-noto-sans-syriac-estrangela-fonts
- google-noto-sans-syriac-western-fonts
- google-noto-sans-tagalog-fonts
- google-noto-sans-tagbanwa-fonts
- google-noto-sans-tai-le-fonts
- google-noto-sans-tai-tham-fonts
- google-noto-sans-tai-viet-fonts
- google-noto-sans-tibetan-fonts
- google-noto-sans-tifinagh-fonts
- google-noto-sans-ui-fonts
- google-noto-sans-yi-fonts
- google-noto-serif-bengali-fonts
- google-noto-serif-devanagari-fonts
- google-noto-serif-gujarati-fonts
- google-noto-serif-kannada-fonts
- google-noto-serif-malayalam-fonts
- google-noto-serif-tamil-fonts
- google-noto-serif-telugu-fonts
- gphoto2
- graphviz-ruby
- gsl-devel
- gssntlmssp
- gtest
- gtest-devel

- gtkmm24
- gtkmm24-devel
- gtkmm24-docs
- gtksourceview3
- gtksourceview3-devel
- gtkspell
- gtkspell-devel
- gtkspell3
- guile
- gutenprint-gimp
- gutenprint-libs-ui
- gvfs-afc
- gvfs-afp
- gvfs-archive
- hamcrest-core
- hawtjni
- hawtjni
- hawtjni-runtime
- HdrHistogram
- HdrHistogram-javadoc
- highlight-gui
- hivex-devel
- hostname
- hplip-gui
- hspell
- httpcomponents-project
- hwloc-plugins
- hyphen-fo
- hyphen-grc
- hyphen-hsb
- hyphen-ia
- hyphen-is
- hyphen-ku
- hyphen-mi
- hyphen-mn
- hyphen-sa
- hyphen-tk
- ibus-sayura

- icedax
- icu4j
- idm-console-framework
- inkscape
- inkscape-docs
- inkscape-view
- iptables
- ipython
- isl
- isl-devel
- isorelax
- istack-commons-runtime
- istack-commons-tools
- iwl3945-firmware
- iwl4965-firmware
- iwl6000-firmware
- jacoco
- jaf
- jaf-javadoc
- jakarta-oro
- janino
- jansi-native
- jarjar
- java-1.8.0-ibm
- java-1.8.0-ibm-demo
- java-1.8.0-ibm-devel
- java-1.8.0-ibm-headless
- java-1.8.0-ibm-jdbc
- java-1.8.0-ibm-plugin
- java-1.8.0-ibm-src
- java-1.8.0-ibm-webstart
- java-1.8.0-openjdk-accessibility
- java-1.8.0-openjdk-accessibility-slowdebug
- java_cup
- java-atk-wrapper
- javacc
- javacc-maven-plugin
- javaewah

- javaparser
- javapoet
- javassist
- javassist-javadoc
- jaxen
- jboss-annotations-1.2-api
- jboss-interceptors-1.2-api
- jboss-logmanager
- jboss-parent
- jctools
- jdepend
- jdependency
- jdom
- jdom2
- jetty
- jetty-continuation
- jetty-http
- jetty-io
- jetty-security
- jetty-server
- jetty-servlet
- jetty-util
- jffi
- jflex
- jgit
- jline
- jmc
- jnr-netdb
- jolokia-jvm-agent
- js-uglify
- jsch
- json_simple
- jss-javadoc
- jtidy
- junit5
- jvnet-parent
- jzlib
- kernel-cross-headers

- khmeros-fonts-common
- ksc
- kurdit-unikurd-web-fonts
- kyotocabinet-libs
- langtable-data
- ldapjdk-javadoc
- lensfun
- lensfun-devel
- lftp-scripts
- libaec
- libaec-devel
- libappindicator-gtk3
- libappindicator-gtk3-devel
- libatomic-static
- libavc1394
- libblocksruntime
- libcacard
- libcacard-devel
- libcgroup
- libcgroup-pam
- libcgroup-tools
- libchamplain
- libchamplain-devel
- libchamplain-gtk
- libcroco
- libcroco-devel
- libcxl
- libcxl-devel
- libdap
- libdap-devel
- libdazzle-devel
- libdbusmenu
- libdbusmenu-devel
- libdbusmenu-doc
- libdbusmenu-gtk3
- libdbusmenu-gtk3-devel
- libdc1394
- libdnet

- libdnet-devel
- libdv
- libdwarf
- libdwarf-devel
- libdwarf-static
- libdwarf-tools
- libeasyfc
- libeasyfc-gobject
- libepubgen-devel
- libertas-sd8686-firmware
- libertas-usb8388-firmware
- libertas-usb8388-olpc-firmware
- libgdither
- libGLEW
- libgovirt
- libguestfs-benchmarking
- libguestfs-devel
- libguestfs-gfs2
- libguestfs-gobject
- libguestfs-gobject-devel
- libguestfs-java
- libguestfs-java-devel
- libguestfs-javadoc
- libguestfs-man-pages-ja
- libguestfs-man-pages-uk
- libguestfs-tools
- libguestfs-tools-c
- libhugetlbfs
- libhugetlbfs-devel
- libhugetlbfs-utils
- libicu-doc
- libIDL
- libIDL-devel
- libidn
- libiec61883
- libindicator-gtk3
- libindicator-gtk3-devel
- libiscsi-devel

- libjose-devel
- libkkc
- libkkc-common
- libkkc-data
- libldb-devel
- liblogging
- libluksmeta-devel
- libmalaga
- libmcpp
- libmemcached
- libmemcached-libs
- libmetalink
- libmodulemd1
- libmongocrypt
- libmtp-devel
- libmusicbrainz5
- libmusicbrainz5-devel
- libnbd-devel
- libnice
- libnice-gstreamer1
- liboauth
- liboauth-devel
- libpfm-static
- libpng12
- libpsm2-compat
- libpurple
- libpurple-devel
- libraw1394
- libreport-plugin-mailx
- libreport-plugin-rhtsupport
- libreport-plugin-ureport
- libreport-rhel
- libreport-rhel-bugzilla
- librpmem
- librpmem-debug
- librpmem-devel
- libsass
- libsass-devel

- libselinux-python
- libsqlite3x
- libtalloc-devel
- libtar
- libtdb-devel
- libtevent-devel
- libtpms-devel
- libunwind
- libusal
- libvarlink
- libverto-libevent
- libvirt-admin
- libvirt-bash-completion
- libvirt-daemon-driver-storage-gluster
- libvirt-daemon-driver-storage-iscsi-direct
- libvirt-devel
- libvirt-docs
- libvirt-gconfig
- libvirt-gobject
- libvirt-lock-sanlock
- libvirt-wireshark
- libvmem
- libvmem-debug
- libvmem-devel
- libvmmalloc
- libvmmalloc-debug
- libvmmalloc-devel
- libvncserver
- libwinpr-devel
- libwmf
- libwmf-devel
- libwmf-lite
- libXNVCtrl
- libyami
- log4j12
- log4j12-javadoc
- lohit-malayalam-fonts
- lohit-nepali-fonts

- lorax-composer
- lua-guestfs
- lucene
- lucene-analysis
- lucene-analyzers-smartcn
- lucene-queries
- lucene-queryparser
- lucene-sandbox
- lz4-java
- lz4-java-javadoc
- mailman
- mailx
- make-devel
- malaga
- malaga-suomi-voikko
- marisa
- maven-antrun-plugin
- maven-assembly-plugin
- maven-clean-plugin
- maven-dependency-analyzer
- maven-dependency-plugin
- maven-doxia
- maven-doxia-sitetools
- maven-install-plugin
- maven-invoker
- maven-invoker-plugin
- maven-parent
- maven-plugins-pom
- maven-reporting-api
- maven-reporting-impl
- maven-resolver-api
- maven-resolver-connector-basic
- maven-resolver-impl
- maven-resolver-spi
- maven-resolver-transport-wagon
- maven-resolver-util
- maven-scm
- maven-script-interpreter

- maven-shade-plugin
- maven-shared
- maven-verifier
- maven-wagon-file
- maven-wagon-http
- maven-wagon-http-shared
- maven-wagon-provider-api
- maven2
- meanwhile
- mercurial
- mercurial-hgk
- metis
- metis-devel
- mingw32-bzip2
- mingw32-bzip2-static
- mingw32-cairo
- mingw32-expat
- mingw32-fontconfig
- mingw32-freetype
- mingw32-freetype-static
- mingw32-gstreamer1
- mingw32-harfbuzz
- mingw32-harfbuzz-static
- mingw32-icu
- mingw32-libjpeg-turbo
- mingw32-libjpeg-turbo-static
- mingw32-libpng
- mingw32-libpng-static
- mingw32-libtiff
- mingw32-libtiff-static
- mingw32-openssl
- mingw32-readline
- mingw32-sqlite
- mingw32-sqlite-static
- mingw64-adwaita-icon-theme
- mingw64-bzip2
- mingw64-bzip2-static
- mingw64-cairo

- mingw64-expat
- mingw64-fontconfig
- mingw64-freetype
- mingw64-freetype-static
- mingw64-gstreamer1
- mingw64-harfbuzz
- mingw64-harfbuzz-static
- mingw64-icu
- mingw64-libjpeg-turbo
- mingw64-libjpeg-turbo-static
- mingw64-libpng
- mingw64-libpng-static
- mingw64-libtiff
- mingw64-libtiff-static
- mingw64-nettle
- mingw64-openssl
- mingw64-readline
- mingw64-sqlite
- mingw64-sqlite-static
- modello
- mojo-parent
- mongo-c-driver
- mousetweaks
- mozjs52
- mozjs52-devel
- mozjs60
- mozjs60-devel
- mozvoikko
- msv-javadoc
- msv-manual
- munge-maven-plugin
- mythes-lb
- mythes-mi
- mythes-ne
- nafees-web-naskh-fonts
- nbd
- nbdkit-devel
- nbdkit-example-plugins

- nbdkit-gzip-plugin
- nbdkit-plugin-python-common
- nbdkit-plugin-vddk
- ncompress
- ncurses-compat-libs
- net-tools
- netcf
- netcf-devel
- netcf-libs
- network-scripts
- network-scripts-ppp
- nkf
- nodejs-devel
- nodejs-packaging
- nss_nis
- nss-pam-ldapd
- objectweb-asm
- objectweb-asm-javadoc
- objectweb-pom
- ocaml-bisect-ppx
- ocaml-camlp4
- ocaml-camlp4-devel
- ocaml-lwt
- ocaml-mmap
- ocaml-ocplib-endian
- ocaml-ounit
- ocaml-result
- ocaml-seq
- opencryptoki-tpmtok
- opencv-contrib
- opencv-core
- opencv-devel
- openhpi
- openhpi-libs
- OpenIPMI-perl
- openssh-cavs
- openssh-ldap
- openssl-ibmpkcs11

- opentest4j
- os-maven-plugin
- overpass-mono-fonts
- pakchois
- pandoc
- paps-libs
- paranamer
- paratype-pt-sans-caption-fonts
- parfait
- parfait-examples
- parfait-javadoc
- pcp-parfait-agent
- pcp-pmda-rpm
- pcp-pmda-vmware
- pcsc-lite-doc
- peripety
- perl-B-Debug
- perl-B-Lint
- perl-Class-Factory-Util
- perl-Class-ISA
- perl-DateTime-Format-HTTP
- perl-DateTime-Format-Mail
- perl-File-CheckTree
- perl-homedir
- perl-libxml-perl
- perl-Locale-Codes
- perl-Mozilla-LDAP
- perl-NKF
- perl-Object-HashBase-tools
- perl-Package-DeprecationManager
- perl-Pod-LaTeX
- perl-Pod-Plainer
- perl-prefork
- perl-String-CRC32
- perl-SUPER
- perl-Sys-Virt
- perl-tests
- perl-YAML-Syck

- phodav
- php-recode
- php-xmlrpc
- pidgin
- pidgin-devel
- pidgin-sipe
- pinentry-emacs
- pinentry-gtk
- pipewire0.2-devel
- pipewire0.2-libs
- platform-python-coverage
- plexus-ant-factory
- plexus-bsh-factory
- plexus-cli
- plexus-component-api
- plexus-component-factories-pom
- plexus-components-pom
- plexus-i18n
- plexus-interactivity
- plexus-pom
- plexus-velocity
- plymouth-plugin-throbgress
- pmreorder
- postgresql-test-rpm-macros
- powermock
- prometheus-jmx-exporter
- prometheus-jmx-exporter-openjdk11
- ptscotch-mpich
- ptscotch-mpich-devel
- ptscotch-mpich-devel-parmetis
- ptscotch-openmpi
- ptscotch-openmpi-devel
- purple-sipe
- pygobject2-doc
- pygtk2
- pygtk2-codegen
- pygtk2-devel
- pygtk2-doc

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- python-nss-doc
- python-podman-api
- python-psycopg2-doc
- python-pymongo-doc
- python-redis
- python-schedutils
- python-slip
- python-sqlalchemy-doc
- python-varlink
- python-virtualenv-doc
- python2-backports
- python2-backports-ssl_match_hostname
- python2-bson
- python2-coverage
- python2-docs
- python2-docs-info
- python2-funcsigs
- python2-ipaddress
- python2-mock
- python2-nose
- python2-numpy-doc
- python2-psycopg2-debug
- python2-psycopg2-tests
- python2-pymongo
- python2-pymongo-gridfs
- python2-pytest-mock
- python2-sqlalchemy
- python2-tools
- python2-virtualenv
- python3-bson
- python3-click
- python3-coverage
- python3-cpio
- python3-custodia
- python3-docs
- python3-flask
- python3-gevent

- python3-gobject-base
- python3-hivex
- python3-html5lib
- python3-hypothesis
- python3-ipatests
- python3-itsdangerous
- python3-jwt
- python3-libguestfs
- python3-mock
- python3-networkx-core
- python3-nose
- python3-nss
- python3-openipmi
- python3-pillow
- python3-ptyprocess
- python3-pydbus
- python3-pymongo
- python3-pymongo-gridfs
- python3-pyOpenSSL
- python3-pytoml
- python3-reportlab
- python3-schedutils
- python3-scons
- python3-semantic_version
- python3-slip
- python3-slip-dbus
- python3-sqlalchemy
- python3-syspurpose
- python3-virtualenv
- python3-webencodings
- python3-werkzeug
- python38-asn1crypto
- python38-numpy-doc
- python38-psycopg2-doc
- python38-psycopg2-tests
- python39-numpy-doc
- python39-psycopg2-doc
- python39-psycopg2-tests

- qemu-kvm-block-gluster
- qemu-kvm-block-iscsi
- qemu-kvm-block-ssh
- qemu-kvm-hw-usbredir
- qemu-kvm-device-display-virtio-gpu-gl
- qemu-kvm-device-display-virtio-gpu-pci-gl
- qemu-kvm-device-display-virtio-vga-gl
- qemu-kvm-tests
- qpdf
- qpdf-doc
- qperf
- qpid-proton
- qrencode
- qrencode-devel
- qrencode-libs
- qt5-qtcanvas3d
- qt5-qtcanvas3d-examples
- rarian
- rarian-compat
- re2c
- recode
- 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-lsb-supplemental
- redhat-lsb-trialuse
- redhat-menus
- redhat-support-lib-python
- redhat-support-tool
- reflections
- regexp
- relaxngDatatype
- resteasy-javadoc

- rhsm-gtk
- rpm-plugin-prioreset
- rpmemd
- rsyslog-udpspoof
- ruby-hivex
- ruby-libguestfs
- rubygem-abrt
- rubygem-abrt-doc
- rubygem-bson
- rubygem-bson-doc
- rubygem-bundler-doc
- rubygem-mongo
- rubygem-mongo-doc
- rubygem-net-telnet
- rubygem-xmlrpc
- s390utils-cmsfs
- samba-pidl
- samba-test
- samba-test-libs
- samyak-devanagari-fonts
- samyak-fonts-common
- samyak-gujarati-fonts
- samyak-malayalam-fonts
- samyak-odia-fonts
- samyak-tamil-fonts
- sane-frontends
- sanlk-reset
- sat4j
- scala
- scotch
- scotch-devel
- SDL_sound
- selinux-policy-minimum
- sendmail
- sgabios
- sgabios-bin
- shim-ia32
- shrinkwrap

- sil-padauk-book-fonts
- sisu-inject
- sisu-mojos
- sisu-plexus
- skkdic
- SLOF
- smc-anjalioldlipi-fonts
- smc-dyuthi-fonts
- smc-fonts-common
- smc-kalyani-fonts
- smc-raghumalayalam-fonts
- smc-suruma-fonts
- softhsm-devel
- sonatype-oss-parent
- sonatype-plugins-parent
- sos-collector
- sparsehash-devel
- spax
- spec-version-maven-plugin
- spice
- spice-client-win-x64
- spice-client-win-x86
- spice-glib
- spice-glib-devel
- spice-gtk
- spice-gtk-tools
- spice-gtk3
- spice-gtk3-devel
- spice-gtk3-vala
- spice-parent
- spice-protocol
- spice-qxl-wddm-dod
- spice-server
- spice-server-devel
- spice-qxl-xddm
- spice-server
- spice-streaming-agent
- spice-vdagent-win-x64

- spice-vdagent-win-x86
- sssd-libwbclient
- star
- stax-ex
- stax2-api
- stringtemplate
- stringtemplate4
- subscription-manager-initial-setup-addon
- subscription-manager-migration
- subscription-manager-migration-data
- subversion-javahl
- SuperLU
- SuperLU-devel
- supermin-devel
- swig
- swig-doc
- swig-gdb
- swtpm-devel
- swtpm-tools-pkcs11
- system-storage-manager
- systemd-tests
- tcl-brlapi
- testng
- thai-scalable-laksaman-fonts
- tibetan-machine-uni-fonts
- timedatex
- torque-libs
- tpm-quote-tools
- tpm-tools
- tpm-tools-pkcs11
- treelayout
- trousers
- trousers-lib
- tuned-profiles-compat
- tuned-profiles-nfv-host-bin
- tuned-utils-systemtap
- tycho
- uglify-js

- unbound-devel
- univocity-output-tester
- univocity-parsers
- usbguard-notifier
- usbredir-devel
- utf8cpp
- uthash
- velocity
- vinagre
- vino
- virt-dib
- virt-p2v-maker
- vm-dump-metrics-devel
- voikko-tools
- vorbis-tools
- weld-parent
- wodim
- woodstox-core
- wqy-microhei-fonts
- wqy-unibit-fonts
- xdelta
- xmlgraphics-commons
- xmlstreambuffer
- xinetd
- xorg-x11-apps
- xorg-x11-drv-qxl
- xorg-x11-server-Xspice
- xpp3
- xsane-gimp
- xsom
- xz-java
- xz-java-javadoc
- yajl-devel
- yp-tools
- ypbind
- ypserv
- zsh-html

Deprecated and Untested Devices

The following sections identify the deprecated and untested hardware devices as of this release:

- Deprecated Devices
- Untested Devices

Deprecated Devices

This section describes hardware devices (such as adapter and drivers) that have been deprecated as of this release. Note that these deprecated devices continue to be available for use through the entire lifecycle of Oracle Linux 8, but are unlikely to be available for use in future major Oracle Linux releases.

> **Note:**
>
> In the following table, the PCI device IDs appear in the format of vendor:device:subvendor:subdevice. In cases when a device ID isn't listed, all devices associated with the corresponding driver have been deprecated. To identify hardware PCI IDs on the system, use the `lspci -nn` command

Table 4-1 Deprecated Devices and Drivers

Device ID	Driver	Device Details
	hns_roce	
	ebtables	
	arp_tables	
	ip_tables	
	ip6_tables	
	ip6_set	
	ip_set	
	nft_compat	
	usnic_verbs	
	vmw_pvrdma	
	hfi1	
	bnx2	QLogic BCM5706/5708/5709/5716 Driver
	hpsa	Hewlett-Packard Company: Smart Array Controllers
0x10df:0x0724	lpfc	Emulex Corporation: OneConnect FCoE Initiator (Skyhawk)
0x10df:0xe200	lpfc	Emulex Corporation: LPe15000/LPe16000 Series 8Gb/16Gb Fibre Channel Adapter

Table 4-1 (Cont.) Deprecated Devices and Drivers

Device ID	Driver	Device Details
0x10df:0xf011	lpfc	Emulex Corporation: Saturn: LightPulse Fibre Channel Host Adapter
0x10df:0xf015	lpfc	Emulex Corporation: Saturn: LightPulse Fibre Channel Host Adapter
0x10df:0xf100	lpfc	Emulex Corporation: LPe12000 Series 8Gb Fibre Channel Adapter
0x10df:0xfc40	lpfc	Emulex Corporation: Saturn-X: LightPulse Fibre Channel Host Adapter
0x10df:0xe220	be2net	Emulex Corporation: OneConnect NIC (Lancer)
0x1000:0x005b	megaraid_sas	Broadcom / LSI: MegaRAID SAS 2208 [Thunderbolt]
0x1000:0x006E	mpt3sas	Broadcom / LSI: SAS2308 PCI-Express Fusion-MPT SAS-2
0x1000:0x0080	mpt3sas	Broadcom / LSI: SAS2208 PCI-Express Fusion-MPT SAS-2
0x1000:0x0081	mpt3sas	Broadcom / LSI: SAS2208 PCI-Express Fusion-MPT SAS-2
0x1000:0x0082	mpt3sas	Broadcom / LSI: SAS2208 PCI-Express Fusion-MPT SAS-2
0x1000:0x0083	mpt3sas	Broadcom / LSI: SAS2208 PCI-Express Fusion-MPT SAS-2
0x1000:0x0084	mpt3sas	Broadcom / LSI: SAS2208 PCI-Express Fusion-MPT SAS-2
0x1000:0x0085	mpt3sas	Broadcom / LSI: SAS2208 PCI-Express Fusion-MPT SAS-2
0x1000:0x0086	mpt3sas	Broadcom / LSI: SAS2208 PCI-Express Fusion-MPT SAS-2
0x1000:0x0087	mpt3sas	Broadcom / LSI: SAS2208 PCI-Express Fusion-MPT SAS-2
	myri10ge	Myricom 10G driver (10GbE)
	netxen_nic	QLogic/NetXen (1/10) GbE Intelligent Ethernet Driver
0x1077:0x2031	qla2xxx	QLogic Corp.: ISP8324-based 16Gb Fibre Channel to PCI Express Adapter
0x1077:0x2532	qla2xxx	QLogic Corp.: ISP2532-based 8Gb Fibre Channel to PCI Express HBA
0x1077:0x8031	qla2xxx	QLogic Corp.: 8300 Series 10GbE Converged Network Adapter (FCoE)
	qla3xxx	QLogic ISP3XXX Network Driver v2.03.00-k5

Table 4-1 (Cont.) Deprecated Devices and Drivers

Device ID	Driver	Device Details
0x1924:0x0803	sfc	Solarflare Communications: SFC9020 10G Ethernet Controller
0x1924:0x0813	sfc	Solarflare Communications: SFL9021 10GBASE-T Ethernet Controller
	Soft-RoCE (rdma_rxe)	
	HNS-RoCE	HNS GE/10GE/25GE/50GE/ 100GE RDMA Network Controller
	liquidio	Cavium LiquidIO Intelligent Server Adapter Driver
	liquidio_vf	Cavium LiquidIO Intelligent Server Adapter Virtual Function Driver

Untested Devices

This section describes hardware devices (such as adapter and drivers) that are available for use but are no longer being tested or updated as of this release. Note that these devices should no longer be used in production, and are likely to be disabled for use in the next major Oracle Linux 8 release.

> **Note:**
>
> In the following table, the PCI device IDs appear in the format of vendor:device:subvendor:subdevice. In cases when a device ID isn't listed, all devices associated with the corresponding driver have been deprecated. To identify hardware PCI IDs on the system, use the `lspci -nn` command

Table 4-2 Untested Devices and Drivers

Device ID	Driver	Device Details
	dl2k	
	dlci	
	dnet	
	hdlc_fr	
	rdma_rxe	
	nicvf	
	nicpf	
	siw	
	e1000	Intel® PRO/1000 Network Driver
	mptbase	Fusion MPT SAS Host driver
	mptsas	Fusion MPT SAS Host driver

Table 4-2 (Cont.) Untested Devices and Drivers

Device ID	Driver	Device Details
	mptscsih	Fusion MPT SAS Host driver
	mptspi	Fusion MPT SAS Host driver
0x1000:0x0071	megaraid_sas	Broadcom / LSI: MR SAS HBA 2004
0x1000:0x0073	megaraid_sas	Broadcom / LSI: MegaRAID SAS 2008 [Falcon]
0x1000:0x0079	megaraid_sas	Broadcom / LSI: MegaRAID SAS 2108 [Liberator]
	nvmet_tcp	NVMe/TCP target driver
	nvmet-fc	NVMe/Fabrics FC target driver

5
Known Issues

This chapter lists known issues in the current Oracle Linux 8 release. The list covers issues that might affect both x86 and aarch64 platforms. In the list, additional issues that are specific only to aarch64 platforms are labeled `aarch64 only:`.

The following guides provide additional information about known issues that related to specific Oracle Linux components:

- Podman container management tool: Oracle Linux: Podman User's Guide
- System and Oracle Cloud Infrastructure instance upgrade using Leapp: Oracle Linux 8: Upgrading Systems With Leapp

Installation and Upgrade Issues

The following are known installation and upgrade issues for Oracle Linux 8.6.

Messages Referring to `tmpfiles.d` Files Appear During Upgrade

During an upgrade from Oracle Linux 8.5 to Oracle Linux 8.6, and with the appropriate Oracle Linux 8 repositories enabled, the `dnf upgrade` command displays messages similar to the following:

```
Running scriptlet: systemd-239-44.0.1.el8.x86_64
4550/4550
[/usr/lib/tmpfiles.d/dnssec-trigger.conf:1] Line references path below legacy
directory /var/run/, updating /var/run/dnssec-trigger → /run/dnssec-trigger;
please update the tmpfiles.d/ drop-in file accordingly.
[/usr/lib/tmpfiles.d/krb5-krb5kdc.conf:1] Line references path below legacy
directory /var/run/, updating /var/run/krb5kdc → /run/krb5kdc; please update
the tmpfiles.d/ drop-in file accordingly.
[/usr/lib/tmpfiles.d/nss-pam-ldapd.conf:2] Line references path below legacy
directory /var/run/, updating /var/run/nslcd → /run/nslcd; please update the
tmpfiles.d/ drop-in file accordingly.
[/usr/lib/tmpfiles.d/pesign.conf:1] Line references path below legacy
directory /var/run/, updating /var/run/pesign → /run/pesign; please update
the tmpfiles.d/ drop-in file accordingly.
[/usr/lib/tmpfiles.d/portreserve.conf:1] Line references path below legacy
directory /var/run/, updating /var/run/portreserve → /run/portreserve; please
update the tmpfiles.d/ drop-in file accordingly.
.
.
.
```

These messages can be safely ignored, as the upgrade or package installation completes successfully.

As an alternative workaround, update the configuration by following the instructions in the message. Change the legacy `var/run/`<...> directory path to `/run/`<...>.

(Bug ID 32852433)

Installer Automatically Enables Ethernet Over USB Network Interface During a PXE Installation

During a Preboot Execution Environment (PXE) installation of Oracle Linux 8, the installer automatically enables the Ethernet over USB network interface with the `bootproto=dhcp` and `ONBOOT=yes` parameters. These default settings causes the `NetworkManager` service to fail to start.

To prevent this issue from occurring, or to resolve the issue if you have already encountered it, use one of the following workarounds:

- Prior to installation, disable the `ONBOOT` parameter for the Ethernet over USB network interface in the kickstart file, as follows:

  ```
  network --bootproto=dhcp --device=enp0s20f0u8u3c2 --onboot=off --ipv6=auto
  ```

- During installation, on the Network & Host Name screen, do not select the **Connect automatically with priority** check box to connect automatically on every reboot for the Ethernet over USB network interface.
- If you have already encountered this issue, then after the installation, change the network configuration setting for the Ethernet over USB network interface to `ONBOOT=no`. Then reboot the system.

(Bug ID 31888490)

Interactive Text-Based Installation Wizard Unable to Complete When An Alternate Language Is Selected

If you selected an alternate language while using the text-based installer to install the OS, you cannot proceed with the installation. The installation is blocked with [!] flags for **Software Selection** and **Installation Destination** regardless of what you have set for these two options.

However, this issue does not occur if you are performing an installation by using the default English language selection or by using the graphical installation program.

(Bug IDs 30535416, 29648703)

Graphical Installation Program Fails to Produce Error When an Unacceptable Kdump Value Is Entered

A minor upstream usability error affects the graphical installation program during the configuration of Kdump.

If you specify an unacceptable value when manually configuring the Kdump memory reservation, you can click `Done` to return to the Installation Summary screen. The installer does not generate a warning or error message. Instead, the installer automatically resets the value either to the last known acceptable value or the default value, which enables the installation to succeed. However, because this corrected setting is not displayed on the screen, you might not become aware that your specified value was ignored.

This issue does not occur with the text-based installer, which correctly returns an error if you enter an unacceptable value and prevents you from continuing.

(Bug IDs 31133351, 31182708)

Graphical Installation Program Does Not Display the Reserved Memory That's Manually Set For Kdump

A minor usability error affects the graphical installation program during the configuration of Kdump. If you manually change the default memory size that is reserved for Kdump, the new setting is not displayed when the screen is refreshed. Instead, only the values for the total system memory and usable system memory are displayed. Consequently, the limits for the parameter "Memory to be reserved (Mb)" become unknown for future Kdump configuration.

> **Note:**
>
> The default setting `auto` for Kdump memory reservation is adequate as the kernel determines what size to use when it boots

(Bug IDs 31133287 and 31182699)

Scriptlet-Related Error for `microcode_ctl` Might Be Displayed During Upgrade

A scriplet-related error message might be displayed during an upgrade of an Oracle Linux 8 release to its next version. When you run the `dnf update` command, an output similar to the following might appear:

```
  Running scriptlet: tuned-2.13.0-6.0.2.el8.noarch
             1089/1089
  Running scriptlet: microcode_ctl-4:20191115-4.el8.x86_64
             1089/1089
realpath: weak-updates/kmod-kvdo/vdo/kvdo.ko: No such file or directory
realpath: weak-updates/kmod-kvdo/uds/uds.ko: No such file or directory
dracut: installkernel failed in module kernel-modules-extra
warning: %posttrans(microcode_ctl-4:20191115-4.el8.x86_64) scriptlet failed,
exit status 1

Error in POSTTRANS scriptlet in rpm package microcode_ctl
  Running scriptlet: libgcc-8.3.1-4.5.0.7.el8.x86_64
             1089/1089
  Running scriptlet: glibc-common-2.28-101.0.1.el8.x86_64
             1089/1089
  Running scriptlet: info-6.5-6.el8.x86_64
             1089/1089
```

This error message is displayed if you use the Server with GUI environment to install Oracle Linux 8 and then you reboot the server by using RHCK. This installation method installs the kernel dependent, `kmod-kvdo` package or module, which is a different version in the previous Oracle Linux 8 release.

However, you can safely ignore the message because the `kmod-kvdo` package is successfully installed during the upgrade process.

> **Note:**
>
> This error does not occur if you install the Minimal Install base environment or if you boot the server with UEK R6 or UEK R7.

(Bug ID 31292199)

`rhnreg_ks` Register Command Might Fail If `python3-rhn-virtualization-host` Package Is Installed

Beginning with Oracle Linux 8.1, using the `rhnreg_ks` command to register a system with the Unbreakable Linux Network (ULN)might fail if the `python3-rhn-virtualization-hosts` package is installed on the system. This issue has been observed when the `libvirtd` service is not running.

To work around this issue, ensure that the `libvirtd` packages are installed on your system and that the service is enabled and running prior to issuing the `rhnreg_ks` command.

(Bug ID 30366521)

Package Conflict Between `usbguard-1.0.0-2.el8.i686` And `usbguard-1.0.0-8.el8.x86_64` on Oracle Linux 8 Upgrades

Beginning with Oracle Linux 8.5, when you upgrade Oracle Linux 8 with both the `ol8_baseos_latest` and `ol8_appstream` yum repositories enabled, a conflict between the `usbguard-1.0.0-2.el8.i686` and `usbguard-1.0.0-8.el8.x86_64` packages occurs.

The following error is produced:

```
Problem: package usbguard-1.0.0-8.el8.x86_64 conflicts with usbguard
provided by usbguard-1.0.0-2.el8.i686
  - cannot install the best candidate for the job
  - problem with installed package usbguard-1.0.0-2.el8.i686
(try to add '--allowerasing' to command line to replace conflicting packages
or '--skip-broken' to skip uninstallable packages or '--nobest' to use not
only best candidate packages)
```

This conflict occurs because in Oracle Linux 8.6 and later releases, the `usbguard-1.0.0-2.el8.i686` and the `usbguard-1.0.0-8.el8.x86_64` packages conflict with each other and could no longer be installed together, unlike in previous Oracle Linux 8 releases.

To work around this issue, remove the `usbguard-1.0.0-2.el8.i686` package from your Oracle Linux 8 system prior to upgrading to the current release.

(Bug ID 34097708)

Presence of `beignet` Package Could Result in Dependency Issue During An Upgrade

While upgrading a system to the current Oracle Linux 8 release, you might encounter a dependency issue if the `beignet` package exists on the system to be upgraded.

This issue exists specifically in cases where you upgrade systems running Oracle Linux 8.2 or earlier releases to the current Oracle Linux version. In these earlier releases, the `beginet` package requires earlier versions of the `clang-libs` package.

However, the `beignet` package is currently not available for Oracle Linux 8.4 and later Oracle Linux 8 releases. Therefore, the issue does not exist for these cases.

To work around this issue, remove the `beignet` package from the system prior to upgrading to the current Oracle Linux 8 release.

(Bug ID 31213935)

ULN registration wizard not displayed on first boot after an installation

On new installations of Oracle Linux 8, the ULN registration wizard that presents the options to register with ULN and to use Oracle Ksplice isn't displayed on first boot.

As an alternative, you can register with ULN after the installation completes. For instructions, see https://linux.oracle.com/.

(Bug ID 29933974)

Graphics controller requirements for an installation on an Oracle VM VirtualBox guest

To successfully install Oracle Linux 8 on an Oracle VM VirtualBox guest, where the graphical installation program is used and the default `Server with GUI` environment is selected, you must set the guest to use the VMSVGA graphics controller and configure the guest with at least 64MB of memory. Otherwise, the graphical display is unable to start correctly.

Beginning with Oracle VM VirtualBox 6.0, the VMSVGA graphics controller is the default controller for guests running Linux operating systems. This issue is more likely to appear if install Oracle Linux 8 on an existing guest that was created on an earlier Oracle VM VirtualBox release. To configure Oracle Linux 8 guests, Oracle recommends that you use Oracle VM VirtualBox 6.0 or later.

(Bug ID 30004543)

`aarch64` Only: Installer Displays Error: 'Failed to set new efi boot target' on Systems With a Multipath-Enabled NVMe Controller

The Oracle Linux 8.7 installer displays the following error on aarch64 systems that have a multipath-enabled NVMe controller:

```
Failed to set new efi boot target . This is most likely a kernel or firmware
bug.
```

To work around this issue, disable native multipath support for the installation at boot time by adding the `nvme_core.multipath=N` command-line argument on the target system.

(Bug IDs 34233800, 34215333, 31758304)

Mellanox NIC interface name subject to change after upgrading from RHCK or UEK R6 to UEK R7

During a kernel upgrade of x86_64 systems from RHCK or UEK R6 to UEK R7, the `mlx5_core` device name is subject to change, from `ens2f0` (RHCK or UEK R6) to `ens2f0np0` (UEK R7).

You might encounter this issue if you selected Server With GUI as the installation profile and under the following circumstances:

- When upgrading an Oracle Linux 8 system that's running RHCK or UEKR6 to UEK R7.
- When upgrading an Oracle Linux 8 system that's running RHCK or UEK R6 to Oracle Linux 9, which ships with UEK R7 by default.
- When upgrading an Oracle Linux 8 system that's already running UEK R7 to Oracle Linux 9.

> **Note:**
>
> In the case where an Oracle Linux 8 system is already running UEK R7, if you previously configured the system to use backward-compatible device names (`ens2f0`), you might need to apply the workaround that follows to the GRUB configuration after the upgrade to Oracle Linux 9 has completed.

Note that fresh installations of UEK R7 on Oracle Linux 8 and Oracle Linux 9 use the default naming convention for UEK R7 (`enp2s0f0np0`) by default.

To retain backward-compatible (RHCK) device names for the `mlx5_core` driver-based network interface card (NIC), perform the following workaround after upgrading to UEK R7, prior to rebooting the system. We recommended that you back up the existing `grub.cfg` file before making this change.

1. Edit the `/etc/default/grub` file and append the end of the line in the `GRUB_CMDLINE_LINUX=` module as follows:

   ```
   GRUB_CMDLINE_LINUX="console=xxxx mlx5_core.expose_pf_phys_port_name=0"
   ```

2. After editing the file, locate the `grub.cfg` file on the system, then run the command to update GRUB configuration, as appropriate:
   - On BIOS-based systems, the `grub.cfg` output/target file is typically located at `/boot/grub2/grub.cfg` and you would run the following command:

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

- On UEFI-based systems, the `grub.cfg` output/target file could be located at `/etc/grub2-efi.cfg` or `/boot/efi/EFI/redhat/grub.cfg`. Depending on the location of the file, you would run one of the following commands:

```
sudo grub2-mkconfig -o /etc/grub2-efi.cfg
```

```
sudo grub2-mkconfig -o /boot/efi/EFI/redhat/grub.cfg
```

3. Reboot the system for the changes to take effect.

(Bug IDs 34103369, 34145887, 35270018)

Removing `container-selinux` Package Might Also Remove The `selinux-policy-targeted` Package

If you remove the `container-selinux` package from the system after installing the current Oracle Linux 8 release, the `selinux-policy-targeted` package might also be removed.

When this problem occurs, you might also see an error message about being unable to load SELinux policy.

To avoid this issue, use the following syntax with the `dnf remove` command:

```
sudo dnf remove container-selinux --setopt=exclude=selinux-policy-targeted
```

(Bug ID 32860334)

Running `dnf update glusterfs-*` Command Fails to Upgrade Previously Installed Packages

If `glusterfs-*.i686` packages exist on an Oracle Linux 8 system which you then upgrade to the next update version, running the `dnf update glusterfs*` command later fails to upgrade GlusterFS packages.

As a workaround, first remove the `glusterfs-*.i686` packages from the system, and then run the `dnf update glusterfs*` command.

(Bug ID 30279840)

Updating `libss` Package Might Fail if `libss-devel` Package Is Installed

The `libss` package might fail to update if the `libss-devel` package is installed on the system.

This issue persists if UEK R6 is enabled. However, after updating the kernel and enabling UEK R7, the issue is no longer encountered.

However, this issue is fixed in UEK R7. Therefore, to work around this issue, enable the UEK R7 yum repository or ULN channel, and then install UEK R7. Reboot the system after the installation.

(Bug ID 32005190)

ACPI Error Messages Displayed on Dell EMC PowerEdge Server During Boot

During a system boot of an Intel-based Dell EMC PowerEdge Server, error messages similar to the following might be displayed if the Dell Active Power Controller (DAPC) setting is enabled in the BIOS:

```
kernel: ACPI Error: No handler for Region [SYSI] (0000000061df8ef3) [IPMI]
(20190816/evregion-132)
kernel: ACPI Error: Region IPMI (ID=7) has no handler (20190816/exfldio-265)
kernel: ACPI Error: Aborting method \_SB.PMI0._GHL due to previous error
(AE_NOT_EXIST) (20190816/psparse-531)
kernel: ACPI Error: Aborting method \_SB.PMI0._PMC due to previous error
(AE_NOT_EXIST) (20190816/psparse-531)
kernel: ACPI Error: AE_NOT_EXIST, Evaluating _PMC (20190816/power_meter-743)
```

To work around this issue, disable the `apci_power_meter` kernel module as follows:

```
echo "blacklist acpi_power_meter" >> /etc/modprobe.d/hwmon.conf
```

After disabling the `apci_power_meter` kernel module, reboot the system for the change to take effect.

For environments that do not require the DAPC feature, as an alternative workaround, you can disable the DAPC BIOS setting.

(Bug ID 32105233)

Oracle Linux 8 doesn't recognize SAS controllers on older Oracle Sun hardware

The Oracle Linux 8 installer does not recognize some Serial Attached SCSI (SAS) controllers that are found in older Oracle Sun server models. If you attempt to install Oracle Linux 8 on these server models, the installer does not recognize the local disk and the installation fails. Examples of these server models include, but are not limited to, the following: Oracle Sun Fire X4170 M2 Server, Oracle Sun Fire X4170 M3 Server, Oracle Sun OVCA X3-2 Server, and the Oracle Sun X4-2 Server.

The following SAS controllers are removed from the `mpt2sas` driver in RHCK:

- SAS2004, PCI ID 0x1000:0x0070
- SAS2008, PCI ID 0x1000:0x0072
- SAS2108_1, PCI ID 0x1000:0x0074
- SAS2108_2, PCI ID 0x1000:0x0076
- SAS2108_3, PCI ID 0x1000:0x0077
- SAS2116_1, PCI ID 0x1000:0x0064
- SAS2116_2, PCI ID 0x1000:0x0065
- SSS6200, PCI ID 0x1000:0x007E

The following SAS controllers are removed from the `megaraid_sas` driver in RHCK:

- Dell PERC5, PCI ID 0x1028:0x15
- SAS1078R, PCI ID 0x1000:0x60
- SAS1078DE, PCI ID 0x1000:0x7C
- SAS1064R, PCI ID 0x1000:0x411
- VERDE_ZCR, PCI ID 0x1000:0x413
- SAS1078GEN2, PCI ID 0x1000:0x78
- SAS0079GEN2, PCI ID 0x1000:0x79
- SAS0073SKINNY, PCI ID 0x1000:0x73
- SAS0071SKINNY, PCI ID 0x1000:0x71

The workaround for this issue to use the Unbreakable Enterprise Kernel Release 6 (UEK R6) boot ISO, and then run UEK R6 with Oracle Linux 8, as these controllers are supported in the Unbreakable Enterprise Kernel release.

(Bug ID 29120478)

File System Issues

The following are known file systems issues that have been encountered in this release of Oracle Linux 8.

BTRFS File System Not Supported on RHCK

The Btrfs file system is removed from RHCK in Oracle Linux 8, which means you cannot create or mount this file system when using this kernel. Also, any Btrfs user space packages that are provided are not supported with RHCK.

Support for the Btrfs file system is enabled in UEK R7 and UEK R6. Starting with Oracle Linux 8.3, during an installation, you have the option to create a Btrfs root file system, as well as select Btrfs as the file system type when formatting devices.

For further details about these changes, see the following documentation:

- For information about creating a Btrfs root file system during an installation, see Oracle Linux 8: Installing Oracle Linux.
- For information about managing the Btrfs file system, see Oracle Linux 8: Managing Local File Systems.
- For the latest information about other enhancements that have been made to Btrfs in UEK R6, see Unbreakable Enterprise Kernel Release 6 Update 3: Release Notes (5.4.17-2136).

  For information about UEK R7, see Unbreakable Enterprise Kernel Release 7: Release Notes (5.15.0-0.30).

OCFS2 File System Not Supported on RHCK

The OCFS2 file system is removed from RHCK in Oracle Linux 8, which means you cannot create or mount this file system when using this kernel. Also, OCFS2 user space packages that are provided are not supported with RHCK.

Note that support for OCFS2 file systems is enabled in UEK R7 and UEK R6. For the latest information and other enhancements that have been made to OCFS2 in UEK R6, see Unbreakable Enterprise Kernel Release 6 Update 3: Release Notes (5.4.17-2136). See also Unbreakable Enterprise Kernel Release 7: Release Notes (5.15.0-0.30).

`ext4`: Frequent or repeated system shutdowns can cause file system corruption

If a system that is using the `ext4` file system is repeatedly or frequently shut down, the file system might become corrupted. This issue is difficult to replicate and is therefore considered to be a corner-case issue. The issue exists in the upstream code and proposed patches are currently under review.

(Bug ID 27547113)

Systems With Btrfs Fail to Boot in FIPS Mode

When booted in FIPS mode, a system using Btrfs fails with the following message:

```
FATAL: FIPS integrity test failed
Refusing to continue
```

Bug ID 36028061

Kernel Issues

The following are known kernel issues that have been encountered in this release of Oracle Linux 8.

KVM guests boot with "amd64_edac_mod: Unknown symbol" errors on AMD 64-Bit platforms

The following errors might be displayed repeatedly when KVM guests are booting on 64-bit AMD hosts:

```
[   12.474069] amd64_edac_mod: Unknown symbol amd_register_ecc_decoder (err
[ 120)
[   12.474083] amd64_edac_mod: Unknown symbol amd_report_gart_errors (err 0)
[   12.852250] amd64_edac_mod: Unknown symbol amd_unregister_ecc_decoder (err
0)
[   12.852297] amd64_edac_mod: Unknown symbol amd_register_ecc_decoder (err 0)
.
.
.
```

These errors occur because the module code for the kernel erroneously returns `-EEXIST` for modules that failed to load and are in the process of being removed from the module list. The `amd64_edac_mod` module will not be loaded in a VM. These errors can be ignored, as they do not impact functionality in any way.

This issue occurs on Oracle Linux 8 hosts that are running RHCK *only* and is not encountered on UEK R6 hosts.

(Bug ID 29853602)

Output of `modinfo` command doesn't show `retpoline` support

A bug in the Oracle Linux 8 code causes Retropline support to not be displayed in the output of the `modinfo -F retpoline` command, even though the `CONFIG_RETPOLINE` flag is set to `Y`, for example:

```
sudo modinfo -F retpoline
/usr/lib/modules/4.18.0-80.el8.x86_64/kernel/sound/usb/usx2y/snd-usb-us122l.ko
.xz
```

The `CONFIG_RETPOLINE=Y` flag is still required to add and display Retpoline support. If the parameter is enabled, the kernel builds with a retpoline capable compiler.

To confirm that the `CONFIG_RETPOLINE` flag is enabled, search for the parameter in the kernel's `config-`*`kernel`* configuration file, for example:

```
cat /boot/config-5.4.17-2011.7.4.el8uek.x86_64 | grep RETPOLINE.


CONFIG_RETPOLINE=y
```

(Bug ID 29894295)

Kdump Might Fail on Some AMD Hardware

Kdump might fail on some AMD hardware that is running the current Oracle Linux release. Impacted hardware includes the AMD EPYC CPU servers.

To work around this issue, modify the `/etc/sysconfig/kdump` configuration file and remove the `iommu=off` command-line option from the `KDUMP_COMMANDLINE_APPEND` variable. Restart the `kdump` service for the changes to take effect.

(Bug ID 31274238, 34312626)

Limitations of the LVM `dm-writecache` Caching Method

The new LVM `dm-writecache` caching method has certain limitations that don't exist with the `dm-cache` method, including the following:

- Can't attach or detach `dm-writecache` when a logical volume is active.
- Can't take a snapshot of a logical volume when the logical volume is using `dm-writecache`.
- Must use a `dm-writecache` block size that matches the existing file system block size when attaching `dm-writecache` to an inactive logical volume.
- Can't resize a logical volume when `dm-writecache` is attached to the volume.
- Can't use `pvmove` commands on devices that are used with `dm-writecache`.
- Can't use logical volumes with `dm-writecache` when using thin pools or the virtual data optimizer (VDO).

For more information about the `dm-writecache` caching method, see the File Systems and Storage features section of Oracle Linux 8: Release Notes for Oracle Linux 8.2. See also the `lvmcache(7)` manual page.

Error: "mcelog service does not support this processor"

An error indicating that the `mcelog` service doesn't support the processor can appear in the system log on systems with AMD processors, such as some Oracle Server hardware. The message might be displayed as follows:

```
mcelog: ERROR: AMD Processor family
23: mcelog does not support this processor.  Please use the edac_mce_amd
module instead.
```

The `mcelog` daemon is a service that is used on x86_64 platforms to log and handle hardware error messaging. However, on AMD systems, the `edac_mce_amd` kernel module handles machine exception logging. AMD systems do not require the `mcelog` daemon. Therefore, the `mcelog` error on these systems can be disregarded.

(Bug ID 29501190)

Power Button Defaults to ACPI Suspend Mode

By default, the Oracle Linux 8 graphical user interface (GUI) console mode treats the hardware power button as the equivalent of the ACPI "Sleep" button, which puts the system into low-power sleep mode. This behavior is specific to the GNOME desktop environment.

In previous Oracle Linux releases, the hardware power button initiated a system shutdown. To ensure that Oracle Linux 8 behaves the same way, do the following:

1. Create a file named `/etc/dconf/db/local.d/01-shutdown-button-action` with following content:

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

2. Create a file named `/etc/dconf/db/local.d/locks/01-power` with the following content:

   ```
   /org/gnome/settings-daemon/plugins/power/power-button-action
   ```

3. Run the following command:

   ```
   sudo dconf update
   ```

4. Log out of the desktop environment and then log back in for the new settings to take effect.

(Bug ID 25597898)

Certain SEV Guest Configurations Might Cause Hypervisor CPU Soft-Lockup Warnings

On older generation AMD systems that are based on the AMD Rome processors, such as E2 and E3 systems, a guest with more than 350GB memory that's configured to use Secure Encrypted Virtualization (SEV) memory encryption can trigger a CPU soft-lockup warning on the hypervisor host during guest boot or shutdown operations.

The time that's needed to flush the pinned memory that's being encrypted is proportional to the amount of guest memory. However, with larger amounts of memory in excess of 350GB, the time on the CPU to flush the memory becomes excessive, which consequently triggers a warning. After the memory is flushed, the hypervisor resumes normal operations.

Newer systems that are based on the AMD Milan processor, such as E4 systems, have hardware support that can minimize the time required for flushing the memory. Therefore, the CPU soft-hang issue isn't encountered.

As a workaround, if a SEV enabled guest with more then 350GB of memory is required, create the guest on a system that's based on the AMD Milan processor. If you are using systems with the AMD Rome processor, limit the guest memory to less than 350GB if the guest is configured with SEV memory encryption.

(Bug ID 34050377)

(aarch64) Some GUI Elements Aren't Displayed During Installation and Boot Using VGA Output

During installations on the Arm platform, the Oracle Linux installer does not display some GUI elements, such as the progress update screen, on VGA output. Output is displayed on the serial console, instead.

Additionally, if you install Oracle Linux with GUI on an encrypted disk, for example, by choosing Server with GUI during the installation stage, and VGA is enabled, the password prompt doesn't appear on the VGA output at system boot, and consequently, the boot process can not be completed. The prompt appears only on a serial console, and therefore, you would need to switch to a serial console to provide the password there.

This issue is specific to systems on the Arm platform only and occurs regardless of whether you are using secure boot or non secure boot. Further, the issue applies to Oracle Linux 8 or Oracle Linux 9 systems that use UEKR6 or UEKR7. The issue occurs wherever Plymouth graphical elements are loaded in the GUI.

To resolve these GUI issues and to cause these elements to display on VGA output without using a serial console, add `plymouth.ignore-serial-consoles` to the kernel command line in the GRUB configuration. For instructions, see the *Managing Kernels and System Boot* chapter in Oracle Linux 8: Managing Core System Configuration.

(Bug ID 35034465 and 35270637)

Virtual Function MAC Address Differences With Host After VF Migration

On some VF hardware, after a VF migration, the MAC address of the VF might be different from the MAC address of the destination host, unless you preset the destination host's address on the VF guest before starting the migration. When migration is completed, the guest and host MAC addresses match without requiring a guest reboot.

As an alternative to presetting the address, reboot the guest after migration to synchronize the guest VF's MAC address with that of the destination host.

(Bug ID 35508407)

6 Package Changes From the Upstream Release

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 for BaseOS by Oracle

The following binary packages have been added to BaseOS by Oracle:

- `bcache-tools`
- `btrfs-progs`
- `dtrace`
- `iwlax2xx-firmware`
- `kernel-uek`
- `kernel-uek-core`
- `kernel-uek-debug`
- `kernel-uek-debug-core`
- `kernel-uek-debug-devel`
- `kernel-uek-debug-modules`
- `kernel-uek-debug-modules-extra`
- `kernel-uek-devel`
- `kernel-uek-doc`
- `kernel-uek-modules`
- `kernel-uek-modules-extra`
- `linux-firmware-core`
- `NetworkManager-config-connectivity-oracle`
- `ocfs2-tools`
- `oracle-backgrounds`
- `oracle-indexhtml`
- `oraclelinux-release`

- oraclelinux-release-el8
- oracle-logos
- oracle-logos-httpd
- oracle-logos-ipa

Added Binary Packages for AppStream by Oracle:

The following binary packages have been added to AppStream by Oracle:

- dtrace-devel
- dtrace-testsuite
- libblockdev-btrfs
- oracle-database-preinstall-21c
- python3-dnf-plugin-ulninfo

Added Binary Packages for CodeReady Linux Builder by Oracle

The following binary packages have been added to CodeReady Linux Builder by Oracle:

- qemu-kvm-tests
- shim-unsigned-ia32

Modified BaseOS Binary Packages

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

- autofs
- binutils
- biosdevname
- boom-boot
- boom-boot-conf
- boom-boot-grub2
- chkconfig
- chrony
- cockpit
- cockpit-bridge
- cockpit-doc
- cockpit-system
- cockpit-ws
- coreutils
- coreutils-common
- coreutils-single

- dbus
- dbus-common
- dbus-daemon
- dbus-libs
- dbus-tools
- dbxtool
- device-mapper
- device-mapper-event
- device-mapper-event-libs
- device-mapper-libs
- dnf
- dnf-automatic
- dnf-data
- dnf-plugins-core
- dracut
- dracut-caps
- dracut-config-generic
- dracut-config-rescue
- dracut-live
- dracut-network
- dracut-squash
- dracut-tools
- efibootmgr
- efi-filesystem
- expat
- expat-devel
- firewalld
- firewalld-filesystem
- fuse
- fuse3
- fuse3-devel
- fuse3-libs
- fuse-common
- fuse-devel
- fuse-libs
- fwupd

- fwupdate
- fwupdate-efi
- fwupdate-libs
- glibc
- glibc-all-langpacks
- glibc-common
- glibc-devel
- glibc-doc
- glibc-gconv-extra
- glibc-headers
- glibc-langpack-aa
- glibc-langpack-af
- glibc-langpack-agr
- glibc-langpack-ak
- glibc-langpack-am
- glibc-langpack-an
- glibc-langpack-anp
- glibc-langpack-ar
- glibc-langpack-as
- glibc-langpack-ast
- glibc-langpack-ayc
- glibc-langpack-az
- glibc-langpack-be
- glibc-langpack-bem
- glibc-langpack-ber
- glibc-langpack-bg
- glibc-langpack-bhb
- glibc-langpack-bho
- glibc-langpack-bi
- glibc-langpack-bn
- glibc-langpack-bo
- glibc-langpack-br
- glibc-langpack-brx
- glibc-langpack-bs
- glibc-langpack-byn
- glibc-langpack-ca

- glibc-langpack-ce
- glibc-langpack-chr
- glibc-langpack-cmn
- glibc-langpack-crh
- glibc-langpack-cs
- glibc-langpack-csb
- glibc-langpack-cv
- glibc-langpack-cy
- glibc-langpack-da
- glibc-langpack-de
- glibc-langpack-doi
- glibc-langpack-dsb
- glibc-langpack-dv
- glibc-langpack-dz
- glibc-langpack-el
- glibc-langpack-en
- glibc-langpack-eo
- glibc-langpack-es
- glibc-langpack-et
- glibc-langpack-eu
- glibc-langpack-fa
- glibc-langpack-ff
- glibc-langpack-fi
- glibc-langpack-fil
- glibc-langpack-fo
- glibc-langpack-fr
- glibc-langpack-fur
- glibc-langpack-fy
- glibc-langpack-ga
- glibc-langpack-gd
- glibc-langpack-gez
- glibc-langpack-gl
- glibc-langpack-gu
- glibc-langpack-gv
- glibc-langpack-ha
- glibc-langpack-hak

- glibc-langpack-he
- glibc-langpack-hi
- glibc-langpack-hif
- glibc-langpack-hne
- glibc-langpack-hr
- glibc-langpack-hsb
- glibc-langpack-ht
- glibc-langpack-hu
- glibc-langpack-hy
- glibc-langpack-ia
- glibc-langpack-id
- glibc-langpack-ig
- glibc-langpack-ik
- glibc-langpack-is
- glibc-langpack-it
- glibc-langpack-iu
- glibc-langpack-ja
- glibc-langpack-ka
- glibc-langpack-kab
- glibc-langpack-kk
- glibc-langpack-kl
- glibc-langpack-km
- glibc-langpack-kn
- glibc-langpack-ko
- glibc-langpack-kok
- glibc-langpack-ks
- glibc-langpack-ku
- glibc-langpack-kw
- glibc-langpack-ky
- glibc-langpack-lb
- glibc-langpack-lg
- glibc-langpack-li
- glibc-langpack-lij
- glibc-langpack-ln
- glibc-langpack-lo
- glibc-langpack-lt

- glibc-langpack-lv
- glibc-langpack-lzh
- glibc-langpack-mag
- glibc-langpack-mai
- glibc-langpack-mfe
- glibc-langpack-mg
- glibc-langpack-mhr
- glibc-langpack-mi
- glibc-langpack-miq
- glibc-langpack-mjw
- glibc-langpack-mk
- glibc-langpack-ml
- glibc-langpack-mn
- glibc-langpack-mni
- glibc-langpack-mr
- glibc-langpack-ms
- glibc-langpack-mt
- glibc-langpack-my
- glibc-langpack-nan
- glibc-langpack-nb
- glibc-langpack-nds
- glibc-langpack-ne
- glibc-langpack-nhn
- glibc-langpack-niu
- glibc-langpack-nl
- glibc-langpack-nn
- glibc-langpack-nr
- glibc-langpack-nso
- glibc-langpack-oc
- glibc-langpack-om
- glibc-langpack-or
- glibc-langpack-os
- glibc-langpack-pa
- glibc-langpack-pap
- glibc-langpack-pl
- glibc-langpack-ps

- glibc-langpack-pt
- glibc-langpack-quz
- glibc-langpack-raj
- glibc-langpack-ro
- glibc-langpack-ru
- glibc-langpack-rw
- glibc-langpack-sa
- glibc-langpack-sah
- glibc-langpack-sat
- glibc-langpack-sc
- glibc-langpack-sd
- glibc-langpack-se
- glibc-langpack-sgs
- glibc-langpack-shn
- glibc-langpack-shs
- glibc-langpack-si
- glibc-langpack-sid
- glibc-langpack-sk
- glibc-langpack-sl
- glibc-langpack-sm
- glibc-langpack-so
- glibc-langpack-sq
- glibc-langpack-sr
- glibc-langpack-ss
- glibc-langpack-st
- glibc-langpack-sv
- glibc-langpack-sw
- glibc-langpack-szl
- glibc-langpack-ta
- glibc-langpack-tcy
- glibc-langpack-te
- glibc-langpack-tg
- glibc-langpack-th
- glibc-langpack-the
- glibc-langpack-ti
- glibc-langpack-tig

- glibc-langpack-tk
- glibc-langpack-tl
- glibc-langpack-tn
- glibc-langpack-to
- glibc-langpack-tpi
- glibc-langpack-tr
- glibc-langpack-ts
- glibc-langpack-tt
- glibc-langpack-ug
- glibc-langpack-uk
- glibc-langpack-unm
- glibc-langpack-ur
- glibc-langpack-uz
- glibc-langpack-ve
- glibc-langpack-vi
- glibc-langpack-wa
- glibc-langpack-wae
- glibc-langpack-wal
- glibc-langpack-wo
- glibc-langpack-xh
- glibc-langpack-yi
- glibc-langpack-yo
- glibc-langpack-yue
- glibc-langpack-yuw
- glibc-langpack-zh
- glibc-langpack-zu
- glibc-locale-source
- glibc-minimal-langpack
- grub2-common
- grub2-efi-aa64-modules
- grub2-efi-ia32
- grub2-efi-ia32-cdboot
- grub2-efi-ia32-modules
- grub2-efi-x64
- grub2-efi-x64-cdboot
- grub2-efi-x64-modules

- grub2-pc
- grub2-pc-modules
- grub2-tools
- grub2-tools-efi
- grub2-tools-extra
- grub2-tools-minimal
- grubby
- initscripts
- iptables
- iptables-arptables
- iptables-devel
- iptables-ebtables
- iptables-libs
- iptables-services
- iptables-utils
- 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
- iwlax2xx-firmware
- kexec-tools
- kmod

- kmod-kvdo
- kmod-libs
- kmod-redhat-oracleasm
- krb5-devel
- krb5-libs
- krb5-pkinit
- krb5-server
- krb5-server-ldap
- krb5-workstation
- ksc
- libasan
- libatomic
- libatomic-static
- libblkid
- libblkid-devel
- libdb
- libdb-utils
- libdnf
- libertas-sd8686-firmware
- libertas-sd8787-firmware
- libertas-usb8388-firmware
- libertas-usb8388-olpc-firmware
- libfdisk
- libfdisk-devel
- libgcc
- libgfortran
- libgomp
- libgomp-offload-nvptx
- libipa_hbac
- libitm
- libkadm5
- libkcapi
- libkcapi-hmaccalc
- liblsan
- libmount
- libnfsidmap

- libnsl
- libquadmath
- libreport-filesystem
- libsmartcols
- libsmartcols-devel
- libsss_autofs
- libsss_certmap
- libsss_idmap
- libsss_nss_idmap
- libsss_simpleifp
- libsss_sudo
- libstdc++
- libtsan
- libubsan
- libuuid
- libuuid-devel
- libxslt
- libzstd
- libzstd-devel
- linux-firmware
- linux-firmware-core
- lvm2
- lvm2-dbusd
- lvm2-libs
- lvm2-lockd
- mcelog
- mdadm
- microcode_ctl
- mokutil
- mozjs52
- mozjs60
- netconsole-service
- net-snmp-libs
- NetworkManager
- NetworkManager-adsl
- NetworkManager-bluetooth

- NetworkManager-config-connectivity-oracle
- NetworkManager-config-server
- NetworkManager-dispatcher-routing-rules
- NetworkManager-initscripts-updown
- NetworkManager-libnm
- NetworkManager-ovs
- NetworkManager-ppp
- NetworkManager-team
- NetworkManager-tui
- NetworkManager-wifi
- NetworkManager-wwan
- network-scripts
- nfs-utils
- nscd
- nss_db
- ntsysv
- nvme-cli
- nvmetcli
- opa-address-resolution
- opa-basic-tools
- opa-fastfabric
- opa-fm
- opa-libopamgt
- OpenIPMI
- OpenIPMI-lanserv
- OpenIPMI-libs
- OpenIPMI-perl
- openssh
- openssh-cavs
- openssh-clients
- openssh-keycat
- openssh-ldap
- openssh-server
- os-prober
- pam_ssh_agent_auth
- parted

- platform-python
- policycoreutils
- policycoreutils-dbus
- policycoreutils-devel
- policycoreutils-newrole
- policycoreutils-python-utils
- policycoreutils-restorecond
- polkit
- polkit-devel
- polkit-docs
- polkit-libs
- procps-ng
- procps-ng-i18n
- python3-boom
- python3-configshell
- python3-cryptography
- python3-dnf
- python3-dnf-plugin-post-transaction-actions
- python3-dnf-plugins-core
- python3-dnf-plugin-versionlock
- python3-firewall
- python3-hawkey
- python3-iscsi-initiator-utils
- python3-libdnf
- python3-libipa_hbac
- python3-libs
- python3-libsss_nss_idmap
- python3-openipmi
- python3-policycoreutils
- python3-rpm
- python3-rtslib
- python3-sss
- python3-sssdconfig
- python3-sss-murmur
- python3-test
- rasdaemon

- readonly-root
- redhat-release
- rpm
- rpm-apidocs
- rpm-build-libs
- rpm-cron
- rpm-devel
- rpm-libs
- rpm-plugin-ima
- rpm-plugin-prioreset
- rpm-plugin-selinux
- rpm-plugin-syslog
- rpm-plugin-systemd-inhibit
- rpm-sign
- sanlock-lib
- selinux-policy
- selinux-policy-devel
- selinux-policy-doc
- selinux-policy-minimum
- selinux-policy-mls
- selinux-policy-sandbox
- selinux-policy-targeted
- shim-ia32
- shim-x64
- sos
- sos-audit
- sqlite
- sqlite-devel
- sqlite-doc
- sqlite-libs
- sssd
- sssd-ad
- sssd-client
- sssd-common
- sssd-common-pac
- sssd-dbus

- sssd-ipa
- sssd-kcm
- sssd-krb5
- sssd-krb5-common
- sssd-ldap
- sssd-nfs-idmap
- sssd-polkit-rules
- sssd-proxy
- sssd-tools
- sssd-winbind-idmap
- systemd
- systemd-container
- systemd-devel
- systemd-journal-remote
- systemd-libs
- systemd-pam
- systemd-tests
- systemd-udev
- target-restore
- trace-cmd
- tuned
- tuned-profiles-atomic
- tuned-profiles-compat
- tuned-profiles-cpu-partitioning
- tuned-profiles-mssql
- tuned-profiles-oracle
- unzip
- util-linux
- util-linux-user
- uuidd
- vim-minimal
- yum
- yum-utils

Modified Binary Packages for CodeReady Linux Builder by Oracle

The following binary packages to CodeReady Linux Builder by Oracle have been modified:

- anaconda-widgets-devel
- cups-filters-devel
- dconf-devel
- device-mapper-devel
- device-mapper-event-devel
- dotnet-sdk-3.1-source-built-artifacts
- dotnet-sdk-5.0-source-built-artifacts
- dotnet-sdk-6.0-source-built-artifacts
- dotnet-sdk-7.0-source-built-artifacts
- dotnet-sdk-8.0-source-built-artifacts
- fwupd-devel
- galera
- gcc-plugin-devel
- gcc-toolset-10-gcc-plugin-devel
- glibc-benchtests
- glibc-nss-devel
- glibc-static
- gstreamer1-plugins-bad-free
- guile-devel
- iscsi-initiator-utils-devel
- java-11-openjdk-demo-fastdebug
- java-11-openjdk-demo-slowdebug
- java-11-openjdk-devel-fastdebug
- java-11-openjdk-devel-slowdebug
- java-11-openjdk-fastdebug
- java-11-openjdk-headless-fastdebug
- java-11-openjdk-headless-slowdebug
- java-11-openjdk-jmods-fastdebug
- java-11-openjdk-jmods-slowdebug
- java-11-openjdk-slowdebug
- java-11-openjdk-src-fastdebug
- java-11-openjdk-src-slowdebug
- java-11-openjdk-static-libs-fastdebug
- java-11-openjdk-static-libs-slowdebug
- java-17-openjdk-demo-fastdebug
- java-17-openjdk-demo-slowdebug

- java-17-openjdk-devel-fastdebug
- java-17-openjdk-devel-slowdebug
- java-17-openjdk-fastdebug
- java-17-openjdk-headless-fastdebug
- java-17-openjdk-headless-slowdebug
- java-17-openjdk-jmods-fastdebug
- java-17-openjdk-jmods-slowdebug
- java-17-openjdk-slowdebug
- java-17-openjdk-src-fastdebug
- java-17-openjdk-src-slowdebug
- java-17-openjdk-static-libs-fastdebug
- java-17-openjdk-static-libs-slowdebug
- java-1.8.0-openjdk-accessibility-fastdebug
- java-1.8.0-openjdk-accessibility-slowdebug
- java-1.8.0-openjdk-demo-fastdebug
- java-1.8.0-openjdk-demo-slowdebug
- java-1.8.0-openjdk-devel-fastdebug
- java-1.8.0-openjdk-devel-slowdebug
- java-1.8.0-openjdk-fastdebug
- java-1.8.0-openjdk-headless-fastdebug
- java-1.8.0-openjdk-headless-slowdebug
- java-1.8.0-openjdk-slowdebug
- java-1.8.0-openjdk-src-fastdebug
- java-1.8.0-openjdk-src-slowdebug
- java-21-openjdk-demo-fastdebug
- java-21-openjdk-demo-slowdebug
- java-21-openjdk-devel-fastdebug
- java-21-openjdk-devel-slowdebug
- java-21-openjdk-fastdebug
- java-21-openjdk-headless-fastdebug
- java-21-openjdk-headless-slowdebug
- java-21-openjdk-jmods-fastdebug
- java-21-openjdk-jmods-slowdebug
- java-21-openjdk-slowdebug
- java-21-openjdk-src-fastdebug
- java-21-openjdk-src-slowdebug

- java-21-openjdk-static-libs-fastdebug
- java-21-openjdk-static-libs-slowdebug
- Judy
- Judy-devel
- kmod-devel
- libblockdev-crypto-devel
- libblockdev-devel
- libblockdev-fs-devel
- libblockdev-loop-devel
- libblockdev-lvm-devel
- libblockdev-mdraid-devel
- libblockdev-part-devel
- libblockdev-swap-devel
- libblockdev-utils-devel
- libblockdev-vdo-devel
- libcephfs2
- libcephfs-devel
- libdb-cxx
- libdb-cxx-devel
- libdb-devel-doc
- libdb-sql
- libdb-sql-devel
- libdnf-devel
- libnfsidmap-devel
- librados-devel
- libradosstriper1
- libradosstriper-devel
- librbd-devel
- libreoffice-sdk
- libreoffice-sdk-doc
- libsss_nss_idmap-devel
- libstdc++-static
- libvirt
- libvirt-client
- libvirt-daemon
- libvirt-daemon-config-network

- libvirt-daemon-config-nwfilter
- libvirt-daemon-driver-interface
- libvirt-daemon-driver-network
- libvirt-daemon-driver-nodedev
- libvirt-daemon-driver-nwfilter
- libvirt-daemon-driver-secret
- libvirt-daemon-driver-storage
- libvirt-daemon-driver-storage-core
- libvirt-daemon-driver-storage-disk
- libvirt-daemon-driver-storage-iscsi
- libvirt-daemon-driver-storage-iscsi-direct
- libvirt-daemon-driver-storage-logical
- libvirt-daemon-driver-storage-mpath
- libvirt-daemon-driver-storage-scsi
- libvirt-devel
- libvirt-docs
- libvirt-libs
- libvirt-nss
- libvirt-wireshark
- lvm2-devel
- mariadb
- mariadb-backup
- mariadb-common
- mariadb-devel
- mariadb-embedded
- mariadb-embedded-devel
- mariadb-errmsg
- mariadb-gssapi-server
- mariadb-oqgraph-engine
- mariadb-server
- mariadb-server-galera
- mariadb-server-utils
- mariadb-test
- mozjs52-devel
- mozjs60-devel
- NetworkManager-libnm-devel

- nmstate-devel
- nss_hesiod
- ocaml-libguestfs
- ocaml-libguestfs-devel
- OpenIPMI-devel
- openscap-engine-sce-devel
- PackageKit
- PackageKit-glib-devel
- parted-devel
- procps-ng-devel
- python3.11
- python3.11-debug
- python3.11-idle
- python3.11-test
- python3.11-tkinter
- sanlock-devel
- sblim-cmpi-devel
- sendmail-milter-devel
- tog-pegasus-devel

Modified AppStream Binary Packages

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

- aardvark-dns
- abrt
- abrt-addon-ccpp
- abrt-addon-coredump-helper
- abrt-addon-kerneloops
- abrt-addon-pstoreoops
- abrt-addon-vmcore
- abrt-addon-xorg
- abrt-cli
- abrt-cli-ng
- abrt-console-notification
- abrt-dbus
- abrt-desktop
- abrt-gui

- abrt-gui-libs
- abrt-java-connector
- abrt-libs
- abrt-plugin-machine-id
- abrt-plugin-sosreport
- abrt-tui
- adwaita-gtk2-theme
- anaconda
- anaconda-core
- anaconda-dracut
- anaconda-gui
- anaconda-install-env-deps
- anaconda-tui
- anaconda-user-help
- anaconda-widgets
- ansible-pcp
- aspnetcore-runtime-3.0
- aspnetcore-runtime-3.1
- aspnetcore-runtime-5.0
- aspnetcore-runtime-6.0
- aspnetcore-runtime-7.0
- aspnetcore-runtime-8.0
- aspnetcore-targeting-pack-3.0
- aspnetcore-targeting-pack-3.1
- aspnetcore-targeting-pack-5.0
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- xsane
- xsane-common
- xsane-gimp
- zstd

Removed BaseOS Binary Packages

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

- dnf-plugin-subscription-manager
- grub2-ppc64le-modules
- kpatch
- kpatch-dnf
- NetworkManager-config-connectivity-redhat

- python3-cloud-what
- python3-subscription-manager-rhsm
- python3-syspurpose
- redhat-indexhtml
- redhat-logos
- redhat-logos-httpd
- redhat-release-eula
- rhsm-icons
- subscription-manager
- subscription-manager-cockpit
- subscription-manager-plugin-ostree
- subscription-manager-rhsm-certificates

Removed AppStream Binary Packages

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

- ansible-collection-microsoft-sql
- ansible-collection-redhat-rhel_mgmt
- coreos-installer
- coreos-installer-bootinfra
- coreos-installer-dracut
- insights-client
- libreport-plugin-rhtsupport
- libreport-rhel
- libreport-rhel-anaconda-bugzilla
- libreport-rhel-bugzilla
- redhat-backgrounds
- redhat-cloud-client-configuration
- redhat-logos-ipa
- redhat-support-lib-python
- redhat-support-tool
- rhc
- rhc-worker-playbook
- rhsm-gtk
- rt-tests
- spice-client-win-x64
- spice-client-win-x86

- spice-qxl-wddm-dod
- spice-vdagent-win-x64
- spice-vdagent-win-x86
- subscription-manager-initial-setup-addon
- subscription-manager-migration
- subscription-manager-migration-data
- toolbox
- toolbox-tests
- virtio-win
- virt-who

Removed CodeReady Linux Builder Binary Packages

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

- asio
- Cython
- Cython-debugsource
- galera-debuginfo
- galera-debugsource
- hivex-debuginfo
- hivex-debugsource
- Judy-debuginfo
- Judy-debugsource
- libiscsi-debuginfo
- libiscsi-debugsource
- libiscsi-utils-debuginfo
- libnbd-debuginfo
- libnbd-debugsource
- libserf-debuginfo
- libserf-debugsource
- libvirt-client-debuginfo
- libvirt-daemon-debuginfo
- libvirt-daemon-driver-interface-debuginfo
- libvirt-daemon-driver-network-debuginfo
- libvirt-daemon-driver-nodedev-debuginfo
- libvirt-daemon-driver-nwfilter-debuginfo

- libvirt-daemon-driver-secret-debuginfo
- libvirt-daemon-driver-storage-core-debuginfo
- libvirt-daemon-driver-storage-disk-debuginfo
- libvirt-daemon-driver-storage-iscsi-debuginfo
- libvirt-daemon-driver-storage-iscsi-direct-debuginfo
- libvirt-daemon-driver-storage-logical-debuginfo
- libvirt-daemon-driver-storage-mpath-debuginfo
- libvirt-daemon-driver-storage-scsi-debuginfo
- libvirt-dbus-debuginfo
- libvirt-dbus-debugsource
- libvirt-debuginfo
- libvirt-debugsource
- libvirt-libs-debuginfo
- libvirt-nss-debuginfo
- libvirt-python-debugsource
- libvirt-wireshark-debuginfo
- mariadb-backup-debuginfo
- mariadb-debuginfo
- mariadb-debugsource
- mariadb-embedded-debuginfo
- mariadb-gssapi-server-debuginfo
- mariadb-oqgraph-engine-debuginfo
- mariadb-server-debuginfo
- mariadb-server-utils-debuginfo
- mariadb-test-debuginfo
- mod_dav_svn-debuginfo
- nbdfuse-debuginfo
- netcf-debuginfo
- netcf-debugsource
- netcf-libs-debuginfo
- ocaml-hivex-debuginfo
- ocaml-libguestfs-debuginfo
- ocaml-libnbd-debuginfo
- perl-hivex-debuginfo
- perl-Sys-Virt-debuginfo
- perl-Sys-Virt-debugsource

- pybind11
- pytest
- python39-Cython-debuginfo
- python3-hivex-debuginfo
- python3-libnbd-debuginfo
- python3-libvirt-debuginfo
- python3x-pyparsing
- python-atomicwrites
- python-attrs
- python-iniconfig
- python-more-itertools
- python-packaging
- python-pluggy
- python-py
- python-wcwidth
- ruby-hivex-debuginfo
- SLOF
- subversion-debuginfo
- subversion-debugsource
- subversion-devel-debuginfo
- subversion-gnome-debuginfo
- subversion-libs-debuginfo
- subversion-perl-debuginfo
- subversion-ruby-debuginfo
- subversion-tools-debuginfo
- utf8proc-debuginfo
- utf8proc-debugsource

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 for BaseOS by Oracle

The following source packages have been added to the BaseOS by Oracle:

- bcache-tools
- btrfs-progs

- dtrace
- kernel-uek
- ocfs2-tools
- oracle-indexhtml
- oraclelinux-release
- oraclelinux-release-el8
- oracle-logos

Added Source Packages for AppStream by Oracle

The following source packages have been added to AppStream by Oracle:

- dtrace
- oracle-database-preinstall-21c
- python3-dnf-plugin-ulninfo

Modified BaseOS Source Packages

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

- autofs
- binutils
- biosdevname
- boom-boot
- chkconfig
- chrony
- cockpit
- coreutils
- dbus
- dbxtool
- dnf
- dnf-plugins-core
- dracut
- efibootmgr
- efi-rpm-macros
- expat
- firewalld
- fuse
- fwupd
- fwupdate

- gcc
- glibc
- grub2
- grubby
- initscripts
- iptables
- iscsi-initiator-utils
- kexec-tools
- kmod
- kmod-kvdo
- kmod-redhat-oracleasm
- krb5
- ksc
- libdb
- libdnf
- libkcapi
- libreport
- libxslt
- linux-firmware
- lvm2
- mcelog
- mdadm
- microcode_ctl
- mokutil
- mozjs52
- mozjs60
- net-snmp
- NetworkManager
- nfs-utils
- nvme-cli
- nvmetcli
- opa-ff
- opa-fm
- OpenIPMI
- openssh
- os-prober

- parted
- policycoreutils
- polkit
- procps-ng
- python3
- python-configshell
- python-cryptography
- python-rtslib
- rasdaemon
- redhat-release
- rpm
- sanlock
- selinux-policy
- shim
- sos
- sqlite
- sssd
- systemd
- trace-cmd
- tuned
- unzip
- util-linux
- vim
- zstd

Modified AppStream Source Packages

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

- abrt
- abrt-java-connector
- anaconda
- anaconda-user-help
- ansible-pcp
- authd
- binutils
- buildah
- ceph

- clang
- cloud-init
- cockpit-appstream
- cockpit-composer
- cockpit-session-recording
- compat-libgfortran-48
- containernetworking-plugins
- containers-common
- cups-filters
- dbus
- dconf
- delve
- dnf-plugins-core
- dnf-plugin-spacewalk
- dotnet3.0
- dotnet3.1
- dotnet5.0
- dotnet6.0
- dotnet7.0
- dotnet8.0
- eclipse
- eclipse-ecf
- eclipse-emf
- efi-rpm-macros
- fapolicyd
- firefox
- firewalld
- frr
- gcc
- gcc-toolset-10-gcc
- gcc-toolset-11-binutils
- gcc-toolset-11-gcc
- gcc-toolset-11-gdb
- gcc-toolset-12-gdb
- gdb
- glibc

- gnome-boxes
- gnome-session
- gnome-themes-standard
- gstreamer1-plugins-bad-free
- gstreamer1-plugins-base
- guile
- httpd
- icedtea-web
- initial-setup
- ipa
- java-11-openjdk
- java-17-openjdk
- java-1.8.0-openjdk
- java-21-openjdk
- Judy
- ksh
- leapp
- leapp-repository
- libblockdev
- libdb
- libguestfs
- libreoffice
- libreport
- libreswan
- libvirt
- libxslt
- llvm
- lorax
- lorax-templates-rhel
- mecab-ipadic
- net-snmp
- NetworkManager
- nginx
- nmstate
- nodejs
- openchange

- openscap
- openssh
- open-vm-tools
- osinfo-db
- pacemaker
- PackageKit
- pcp
- perl-XML-Parser
- pesign
- pki-core
- plymouth
- podman
- policycoreutils
- postgresql
- pykickstart
- python2
- python3
- python3.11
- python-blivet
- python-cryptography
- rear
- redfish-finder
- redhat-lsb
- redhat-rpm-config
- rhel-system-roles
- rhncfg
- rhn-client-tools
- rhn-custom-info
- rhnlib
- rhnpush
- rhnsd
- rhn-virtualization
- rpm
- rpmdevtools
- rpmlint
- runc

- sanlock
- sblim-cmpi-devel
- scap-security-guide
- scap-workbench
- sendmail
- setroubleshoot
- setroubleshoot-plugins
- skopeo
- sos-collector
- spacewalk-backend
- spacewalk-oscap
- spacewalk-remote-utils
- spacewalk-usix
- spice-streaming-agent
- sqlite
- sssd
- sysstat
- systemtap
- thunderbird
- tog-pegasus
- trace-cmd
- tuned
- util-linux
- vim
- virt-manager
- virt-p2v
- WALinuxAgent
- wget
- xdg-desktop-portal
- xsane
- zstd

Modified Source Packages for CodeReady Linux Builder by Oracle

The following binary packages to CodeReady Linux Builder by Oracle have been modified:

- anaconda
- ceph

- cups-filters
- dconf
- dotnet3.1
- dotnet5.0
- dotnet6.0
- dotnet7.0
- dotnet8.0
- fwupd
- galera
- gcc
- gcc-toolset-10-gcc
- glibc
- gstreamer1-plugins-bad-free
- guile
- iscsi-initiator-utils
- java-11-openjdk
- java-17-openjdk
- java-1.8.0-openjdk
- java-21-openjdk
- Judy
- kmod
- libblockdev
- libdb
- libdnf
- libguestfs
- libreoffice
- libvirt
- lvm2
- mariadb
- mozjs52
- mozjs60
- NetworkManager
- nfs-utils
- nmstate
- OpenIPMI
- openscap

- PackageKit
- parted
- procps-ng
- python3.11
- sanlock
- sblim-cmpi-devel
- sendmail
- sssd
- tog-pegasus

Removed BaseOS Source Packages

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

- kpatch
- libica
- redhat-indexhtml
- redhat-logos
- subscription-manager

Removed AppStream Source Packages

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

- ansible-collection-microsoft-sql
- ansible-collection-redhat-rhel_mgmt
- coreos-installer
- insights-client
- libica
- redhat-cloud-client-configuration
- redhat-logos
- redhat-support-lib-python
- redhat-support-tool
- rhc
- rhc-worker-playbook
- rt-tests
- spice-client-win
- spice-qxl-wddm-dod
- spice-vdagent-win
- subscription-manager

- subscription-manager-migration-data
- toolbox
- virtio-win
- virt-who