Oracle® Linux

Software Collection Library for Oracle Linux 6 and Oracle Linux 7
Abstract

*Oracle® Linux: Software Collection Library for Oracle Linux 6 and Oracle Linux 7* describes the Software Collection Library release 3.6 that is available from Oracle. It describes the differences from the upstream version and includes information about installing and configuring software collections. A statement of supported features is also included.
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Preface

Oracle® Linux: Software Collection Library for Oracle Linux 6 and Oracle Linux 7 provides details of the Software Collection Library release 3.6 that is available from Oracle for Oracle Linux 6 and Oracle Linux 7.

Audience

This document is written for developers who want to use software collections with Oracle Linux 6 or Oracle Linux 7. It is assumed that readers have a general understanding of the Linux operating system.

Related Documents

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

https://docs.oracle.com/en/operating-systems/linux.html

Conventions

The following text conventions are used in this document:

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

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Chapter 1 Release Notes

1.1 About the Software Collection Library for Oracle Linux

Note

The Software Collection Library is currently available for Oracle Linux 6 (x86_64) and Oracle Linux 7 (x86_64) and is supported for customers with Oracle Linux Premier Support.

Oracle Linux 8 provides similar components in the form of Application Streams. See Oracle® Linux 8: Managing Software on Oracle Linux.

The Software Collection Library enables you install and use several different versions of the same software at the same time on a system. Software collections are primarily intended for development environments, which often require more recent versions of software components such as Perl, PHP, or Python to gain access to the latest features, but which need to avoid the risk of disrupting other processes on the system that rely on different versions of these components. You use the Software Collection Library scl utility to run the developer tools from the software collections that you have installed under the /opt/rh directory hierarchy. The scl utility isolates the effects of running these tools from other versions of the same software utilities that you have installed.

The Software Collection Library version 3.6 replaces the previous release of the Software Collection Library. This version includes all of the software collections that were available in the previous release, along with some package updates, and also includes additional software collections that were not available in previous releases.

1.1.1 Additions and Updates for Oracle Linux 7

The Software Collection Library that is available for Oracle Linux 7 may differ in content to the same Software Collection Library that is available for Oracle Linux 6. This section describes changes that apply to the software collections that are available for Oracle Linux 7.

New in the 3.6 release in Oracle Linux 7

The following collections are new in the 3.6 release of the Software Collection Library:

- devtoolset-10
- rh-git227
- rh-nodejs14

Updated in the 3.6 release for Oracle Linux 7

The following collections were available in the previous release of the Software Collection Library, but have been updated in the 3.6 release:

- httpd24
- rh-haproxy18
- rh-php73
- rh-ruby25
Additions and Updates for Oracle Linux 6

The updates listed here are current at the time of release. Packages in each collection may be updated with patches throughout the life cycle of the Software Collection Library release. Patches might include security and bug fixes. It is important that you regularly update any software collections that you install.

1.1.2 Additions and Updates for Oracle Linux 6

The Software Collection Library that is available for Oracle Linux 6 may differ in content to the same Software Collection Library that is available for Oracle Linux 7. The following information applies to the software collections that are available for Oracle Linux 6.

Note

In the 3.6 release of the Software Collection Library, no collections were added or updated for Oracle Linux 6.

This information is current as of the time of release. However, note that packages in each collection may be updated with patches throughout the life cycle of the Software Collection Library release. Also, patches may include security and bug fixes. It is important that you regularly update any software collections that you install.

1.2 Differences From the Upstream Release

There are some minor differences between the Oracle versions of the software collections and the upstream release.

The following changes are included:

• Addition of Oracle Linux GPG keys.
• Removal of the MariaDB, MongoDB, MySQL, PostgreSQL, and Thermostat software collections.
• Removal of the rhscl-dockerfiles package.
• Branding changes.

1.3 Available Software Collections

The following software collections are available in the Oracle Linux 6 and Oracle Linux 7 SoftwareCollections channels on the Unbreakable Linux Network (ULN) or the Oracle Linux 6 and Oracle Linux 7 software_collections repositories on the Oracle Linux yum server. If a collection is only available for either Oracle Linux 6 or Oracle Linux 7, it is indicated as such.

devassist09

DevAssistant 0.9.3 assists in the creation and configuration of the development environment for projects that use the C, C++, Java, and Python programming languages. DevAssistant has a modular architecture that enables it to be modified to work with many languages, frameworks, and tools.

For more information, see https://devassistant.github.io.

devtoolset-3

The Developer Toolset consists of development, debugging, and performance monitoring tools, including the latest versions of the GNU compiler collection, GNU debugger, and the Eclipse development platform.
Available Software Collections


**devtoolset-4**

The Developer Toolset consists of development, debugging, and performance monitoring tools, including the latest versions of the GNU compiler collection, GNU debugger, and the Eclipse development platform.


**devtoolset-6**

The Developer Toolset includes development, debugging, and performance monitoring tools, which include the latest versions of the GNU compiler collection and GNU debugger. Note that the Eclipse development platform is no longer available as part of this collection, but you can install the `rh-eclipse46` collection separately.

The following upgraded components are included in the Developer Toolset version 6.1:

- GCC updated to version 6.3.1.
- `elfutils` updated to version 0.168.
- GDB updated to version 7.12.1.

A bug fix update has also been made available for `ltrace`.

For more information, see https://gcc.gnu.org/ and http://www.gnu.org/software/gdb/.

**devtoolset-7**

The Developer Toolset includes development, debugging, and performance monitoring tools, which include the latest versions of the GNU compiler collection and GNU debugger.

The following upgraded components are included in the Developer Toolset version 7.0:

- GCC updated to version 7.3.1.
- `binutils` updated to version 2.28.
- `elfutils` updated to version 0.170.
- make updated to version 4.2.1.
- GDB updated to version 8.0.1.
- `strace` updated to version 4.17.
- SystemTap updated to version 3.1.
- Valgrind updated to version 3.13.0.
- OProfile updated to version 1.2.0.
- Dyninst updated to version 9.3.2.
devtoolset-8

The Developer Toolset includes development, debugging, and performance monitoring tools, which include the latest versions of the GNU compiler collection and GNU debugger.

The following upgraded components are included in the Developer Toolset version 8.1:

• GCC updated to version 8.2.1.
• GDB updated to version 8.2.
• binutils updated to version 2.30.
• elfutils updated to version 0.176.
• strace updated to version 4.24.
• SystemTap updated to version 3.3.
• Valgrind updated to version 3.14.0.
• OProfile updated to version 1.3.0.

For more information, see https://gcc.gnu.org/ and http://www.gnu.org/software/gdb/.
Available Software Collections

**devtoolset-9**

**Oracle Linux 7 Only**

The Developer Toolset includes development, debugging, and performance monitoring tools, which include the latest versions of the GNU compiler collection and GNU debugger.

The following upgraded components are included in the Developer Toolset version 9.1:

- **GCC** updated to version 9.3.1
- **GDB** updated to version 8.3.
- **make** updated to version 4.2.1.
- **binutils** updated to version 2.32.
- **strace** updated to version 5.1.
- **ltrace** updated to version 0.7.91.
- **SystemTap** updated to version 4.1.
- **Valgrind** updated to version 3.15.0.
- **Dyninst** updated to version 10.1.0.

Available Software Collections

**devtoolset-10**

**Oracle Linux 7 Only**

The Developer Toolset includes development, debugging, and performance monitoring tools, which include the latest versions of the GNU compiler collection and GNU debugger.

The following upgraded components are included in the Developer Toolset version 10.0:

- **GCC** updated to version 10.2.1.
- **binutils** updated to version 2.35.
- **dwz** updated to version 0.12
- **elfutils** updated to version 0.180
- **GDB** updated to version 9.2.
- **memstomp** updated to version 0.1.5.
- **OProfile** updated to version 1.4.0.
- **strace** updated to version 5.7.
- **SystemTap** updated to version 4.3.
- **Valgrind** updated to version 3.16.1.
- **annobin** updated to version 9.23.


**git19**

Git 1.9.4 is built on a decentralized architecture and provides a distributed revision-control system that emphasizes high performance and data integrity, as well as support for non-linear, distributed workflows.

For more information, see [https://git-scm.com/](https://git-scm.com/).

**httpd24**

The Apache HTTP Server implements event-based processing for enhanced performance, FastCGI, an improved SSL module, and the **mod_auth_kerb** module.

The **httpd24** software collection provides version 2.4.34 of the software. This release includes a number of bug and security fixes and enhancements from the previous version, as well as improvements for SSL/TLS and support for version 2 of the Automatic Certificate Management Environment (ACME) certificate issuance and management protocol.

For more information, see [http://httpd.apache.org/docs/2.4/](http://httpd.apache.org/docs/2.4/).

**maven30**

Maven 3.0.5 is a tool for managing builds, documentation, and reporting for Java projects.

For more information, see [http://maven.apache.org/](http://maven.apache.org/).
<table>
<thead>
<tr>
<th>Software Collection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>nginx16</td>
<td>Nginx 1.6.2 is a combined web and proxy server that is designed to provide enhanced concurrency and performance without placing excessive demands on memory. New features include SSL verification enhancements, improved logging options, thread pooling, and hash load balancing. For more information, see <a href="http://nginx.org/">http://nginx.org/</a>.</td>
</tr>
<tr>
<td>nodejs010</td>
<td>Node.js 0.10 is a programming platform that includes npm to share and reuse code. This software collection requires the V8 JavaScript engine that is implemented by v8314. For more information, see <a href="https://nodejs.org/en/">https://nodejs.org/en/</a>.</td>
</tr>
<tr>
<td>perl516</td>
<td>Perl 5.16.3 provides better performance, new debugging features, enhanced Unicode support, improved interoperability with MySQL and PostgreSQL, and the mod_perl and perl-DateTime modules for use with httpd24. For more information, see <a href="https://www.perl.org/">https://www.perl.org/</a> and <a href="https://perldoc.perl.org/">https://perldoc.perl.org/</a>.</td>
</tr>
<tr>
<td>php54</td>
<td>PHP 5.4.16 provides PEAR 1.9.4, various language and interface improvements, and the APC, memcache, and Zend OPcache extensions. For more information, see <a href="https://www.php.net/">https://www.php.net/</a>.</td>
</tr>
<tr>
<td>php55</td>
<td>PHP 5.5.21 has enhanced language features for better exception handling, generators, and Zend OPcache, and also includes the memcache and mongodb extensions. For more information, see <a href="https://www.php.net/">https://www.php.net/</a>.</td>
</tr>
<tr>
<td>python27</td>
<td>Python 2.7.18 includes a number of additional utilities, a new ordered dictionary type, faster I/O, and better forward compatibility with Python 3. Also included are the Python 2.7.8 interpreter, web-programming extension libraries and mod_wsgi for use with httpd24, PostgreSQL connectors, and the numpy and scipy modules for scientific applications. In this release, the python27-python-pymongo package has been updated to version 3.2.1. Note that this version is not fully compatible with the previously shipped version 2.5.2. For more information, see <a href="https://www.python.org/">https://www.python.org/</a>.</td>
</tr>
<tr>
<td>python33</td>
<td>Python 3.3.2 includes the Python 3.3.2 interpreter, web-programming extension libraries, and mod_wsgi for use with httpd24, MySQL, and PostgreSQL connectors. Also included are the numpy and scipy modules for scientific applications. For more information, see <a href="https://www.python.org/">https://www.python.org/</a>.</td>
</tr>
</tbody>
</table>
**Available Software Collections**

**rh-eclipse46**

**Oracle Linux 7 Only**

The **rh-eclipse46** software collection is an integrated development environment. Previous releases of Eclipse were available as part of the Developer Toolset collections. This release provides an independent software collection that is dependent on the **rh-java-common** collection.

In this release, the **rh-eclipse46** collection is version 4.6.3, which is based on the Eclipse Foundation’s Neon release train.

This version of the collection provides several bug fixes and the following new plugins:

- The **m2e** plugin provides support for developing maven-based projects.
- The **TestNG** plugin provides support for writing and executing tests by using the **TestNG** framework.

Most other plugins have received incremental updates to fix upstream bugs.

For more information, see [https://www.eclipse.org/](https://www.eclipse.org/).

**rh-git29**

The Git 2.9.3 revision control system is used to track changes in files and coordinate work among multiple contributors in a distributed environment.

For more information, see [https://git-scm.com/](https://git-scm.com/).

**rh-git218**

The Git 2.18.4 revision control system is used to track changes in files and coordinate work among multiple contributors in a distributed environment. This collection includes bug fixes and new features that improve on the **rh-git29** software collection. This version includes the Large File Storage (LFS) extension.

For more information, see [https://git-scm.com/](https://git-scm.com/).

**rh-git227**

The Git 2.27.0 release of Git is a distributed revision control system with a decentralized architecture. This version introduces numerous enhancements including the following:

- `git checkout` command is split into `git switch` and `git restore`.
- Behavior of the `git rebase` command has changed.
- Git Large File Storage (LFS) is updated to version 2.11.0.

For more information, see [https://git-scm.com/](https://git-scm.com/).

**rh-haproxy18**

**Oracle Linux 7 Only**

The HAProxy 1.8.24 proxy software provides a mechanism that can proxy Transmission Control Protocol (TCP) requests and perform a variety of related functions, such as content-based switching, server
Available Software Collections

load balancing, TCP traffic regulation and monitoring, and HTTP compression.

For more information, see http://cbonte.github.io/haproxy-dconv/.

rh-java-common

The rh-java-common software collection provides common Java libraries and tools that are used by other software collections. It is usually installed as a dependency for these collections.

In this release, the rh-java-common collection has been updated and extended to comply with the changes that are in the dependent components.

rh-maven33

Apache Maven 3.3.9 is a tool that you use to build and manage Java projects. The software provides a single interface to a uniform build system that eases Java development and aids comprehension of any Java-based project.

Note that this version of the rh-maven33 software collection also includes several bug fixes.

For more information, see https://maven.apache.org/docs/3.3.9/release-notes.html.

rh-maven35

Oracle Linux 7 Only

Apache Maven 3.5.0 is a tool that you use to build and manage Java projects. The software provides a single interface to a uniform build system that eases Java development and aids comprehension of any Java-based project.

This version of the rh-maven35 software collection includes several bug fixes and enhancements, including console color output and several other improvements.

For more information, see https://maven.apache.org/docs/3.5.0/release-notes.html.

rh-maven36

Oracle Linux 7 Only

Apache Maven 3.6.1 is a tool that you use to build and manage Java projects. The software provides a single interface to a uniform build system that eases Java development and aids comprehension of any Java-based project.

This version of the rh-maven36 software collection also includes several bug fixes and performance enhancements.

For more information, see https://maven.apache.org/docs/3.6.1/release-notes.html.

rh-nginx18

Nginx 1.8.1 is a combined web and proxy server that is designed to provide enhanced concurrency and performance without placing excessive demands on memory. New features include SSL verification
Available Software Collections

enhancements, improved logging options, thread pooling, and hash load balancing.

For more information, see http://nginx.org/.

rh-nginx110

Nginx 1.10.2 provides a number of new features, including dynamic module support, HTTP/2 support, and numerous performance improvements.

The rh-nginx110 collection does not support integration with Phusion Passenger. If you require nginx with Passenger support, continue using rh-nginx18, which provides nginx version 1.8.

The rh-nginx110 software collection has optional support for Perl, in conjunction with the rh-perl524 software collection. To configure Perl handlers and call Perl functions from SSI scripts, you must install the rh-nginx110-nginx-mod-http-perl package.

For more information, see http://nginx.org/.

rh-nginx112

Oracle Linux 7 Only

Nginx 1.12.1 provides a number of new features, including IP Transparency, TCP/UDP load balancing, enhanced caching and support for multiple SSL certificates of different types. Many other enhancements and new features are available in this release. Refer to the upstream documentation for more information.

Note that the rh-nginx110 collection does not support integration with Phusion Passenger. If you require nginx with Passenger support, continue using rh-nginx18, which provides nginx version 1.8.

The rh-nginx110 software collection has optional support for Perl, in conjunction with the rh-perl524 software collection. To configure Perl handlers and call Perl functions from SSI scripts, you must install the rh-nginx110-nginx-mod-http-perl package.

For more information, see http://nginx.org/.

rh-nginx114

Oracle Linux 7 Only

Nginx 1.14.0 provides a number of new features, including a new mirror module, a gRPC proxy module, HTTP/2 server push functionality, and improvements to vim syntax-highlighting scripts.

For more information, see http://nginx.org/.

rh-nginx116

Oracle Linux 7 Only

Nginx 1.16.1 provides a number of new features, including improved TLS certificate handling, an additional load-balancing algorithm, and improvements to UDP proxying.

For more information, see http://nginx.org/.
<table>
<thead>
<tr>
<th>Available Software Collections</th>
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<tbody>
<tr>
<td><strong>rh-nodejs4</strong> Node.js 4.4.2 is a JavaScript programming platform that includes npm to share and reuse code. This software collection requires the V8 JavaScript engine that is implemented by v8314. For more information, see <a href="https://nodejs.org/en/">https://nodejs.org/en/</a>.</td>
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</table>
| **rh-nodejs6** Node.js 6.91 is a JavaScript programming platform that includes npm 3.10.9. This version also includes the following new features and bug fixes:  
  - Multiple API enhancements.  
  - Performance and security improvements.  
  - Support for the ECMAScript 2015 language specification.  
For more information, see [https://nodejs.org/en/](https://nodejs.org/en/). |
| **rh-nodejs8** Oracle Linux 7 Only Node.js 8.6.0 is a JavaScript programming platform that includes npm to share and reuse code. This release introduces the new async_hooks module and experimental support for N-API, as well as full support for HTTP/2.  
This software collection uses the V8 JavaScript engine version 6.0, which is included in this collection. This release removes the dependency on v8314, which was required in previous Node.js collections.  
For more information, see [https://nodejs.org/en/](https://nodejs.org/en/). |
| **rh-nodejs10** Oracle Linux 7 Only Node.js 10.21.1 is a JavaScript programming platform that includes npm to share and reuse code. This release introduces full support for N-API, stability improvements, and security enhancements.  
This software collection uses the V8 JavaScript engine version 6.6, which is included in this collection.  
For more information, see [https://nodejs.org/en/](https://nodejs.org/en/). |
| **rh-nodejs12** Oracle Linux 7 Only Node.js 12.19.1 is a JavaScript programming platform that includes npm to share and reuse code. This release introduces support for ECMAScript 2015 (ES6) modules, improved support for native modules, and performance improvements.  
This software collection uses the V8 JavaScript engine version 7.6, which is included in this collection.  
For more information, see [https://nodejs.org/en/](https://nodejs.org/en/). |
rh-nodejs14

**Oracle Linux 7 Only**

Node.js 14.15.0 is a release of Node.js with V8 version 8.3, a new experimental WebAssembly System Interface (WASI), and a new experimental Async Local Storage API.

For more information, see https://nodejs.org/en/.

rh-passenger40

Phusion Passenger 4.0.50 is a fast and robust and lightweight web application server that is designed to be used in conjunction with applications that are written in Python or Ruby. This software collection is typically used in conjunction with several other software collections, including the various Python, Ruby or Ruby on Rails collections, and a web server like Nginx or the Apache HTTP Server.

For more information, see https://www.phusionpassenger.com/.

rh-perl520

Perl 5.20, includes additional scripts and utilities, as well as the database connectors for MySQL and PostgreSQL. Other included components are the DateTime module and the mod_perl Apache module that is supported by the httpd24 collection.

For more information, see https://www.perl.org/.

rh-perl524

Perl 5.24, includes additional scripts and utilities, as well as the database connectors for MySQL and PostgreSQL. Other included components are the DateTime module and the mod_perl Apache module that is supported by the httpd24 collection.

For more information, see https://www.perl.org/.

rh-perl526

**Oracle Linux 7 Only**

Perl 5.26.3, includes some security improvements, bug fixes, and enhancements. Enhancements include changes to remove the current directory from the @INC module search path, deprecation of the do statement, stricter regular expression patterning, and support for Unicode 9.0.

The rh-perl526-perl package installs core modules, along with the interpreter, which is provided in the rh-perl526-perl-interpreter package. Note that this is a change in behavior from previous releases, where core modules were not included in the base perl package.

For more information, see https://www.perl.org/.

rh-php56

PHP 5.6.25, including PEAR 1.9.5, enhanced language features for constant expressions, variadic functions, argument unpacking and interactive debugging. The memcache, mongodb and XDebug extensions are also included.

For more information, see https://www.php.net/.

rh-php70

PHP 7.0.10, including PEAR 1.10, enhanced language features and performance improvements.

For more information, see https://www.php.net/.
Available Software Collections

<table>
<thead>
<tr>
<th>Software Collection</th>
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<tbody>
<tr>
<td>rh-php71</td>
<td>PHP 7.1.8, including PEAR 1.10.4 and the APCu extension version 5.1.8. This release includes many bug fixes and performance improvements. For more information, see <a href="https://www.php.net/">https://www.php.net/</a>.</td>
</tr>
<tr>
<td>rh-php72</td>
<td>PHP 7.2.10, including PEAR 1.10.5 and the APCu extension version 5.1.12. This version includes many bug fixes and performance improvements, including the following: object-to-array and array-to-object casts for numeric keys, a new <code>object</code> typehint, and a change to <code>HashContext</code> from a resource to an object. For more information, see <a href="https://www.php.net/">https://www.php.net/</a>.</td>
</tr>
</tbody>
</table>
| rh-php73            | PHP 7.3.20 includes many notable changes, updates, and performance enhancements over PHP 7.2, including some deprecations and backward incompatibility changes. Other notable changes include the following:  
  • Several new and upgraded extensions.  
  • Improvements to multibyte string handling.  
  • Improvements to FastCGI Process Manager (FPM) logging.  
  • Support for LDAP controls. For more information about this PHP release, see [https://www.php.net/](https://www.php.net/).  


<table>
<thead>
<tr>
<th>Software Collection</th>
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<tbody>
<tr>
<td>rh-python34</td>
<td>Python 3.4 includes the Python 3.4.2 interpreter, web-programming extension libraries and <code>mod_wsgi</code> for use with <code>httpd24</code>, MySQL, and PostgreSQL connectors, as well as the <code>numpy</code> and <code>scipy</code> modules for scientific applications. For more information, see <a href="https://www.python.org/">https://www.python.org/</a>.</td>
</tr>
<tr>
<td>rh-python35</td>
<td>Python 3.5.1 includes the Python 3.5.1 interpreter, web-programming extension libraries and <code>mod_wsgi</code> for use with <code>httpd24</code>, MySQL, and PostgreSQL connectors, as well as the <code>numpy</code> and <code>scipy</code> modules for scientific applications. For more information, see <a href="https://www.python.org/">https://www.python.org/</a>.</td>
</tr>
<tr>
<td>rh-python36</td>
<td>Python 3.6.3 includes the Python 3.6.3 interpreter, web-programming extension libraries and <code>mod_wsgi</code> for use with <code>httpd24</code>, MySQL, and PostgreSQL connectors, as well as the <code>numpy</code> and <code>scipy</code> modules for scientific applications. This version includes a variety of new features and enhancements. Several syntax features have been</td>
</tr>
</tbody>
</table>
added, including formatted string literals and asynchronous generators and comprehensions. The secrets module has been added to the standard library. Also, dictionaries have been reimplemented to use significantly less memory to enhance performance. Also notable is support for DTrace and SystemTap probes.

For more information, see https://www.python.org/.

**rh-python38**

Python 3.8.6 introduces new Python modules, such as contextvars, dataclasses, and importlib.resources, as well as new language features, and improved performance. Also included are web-programming extension libraries and mod_wsgi for use with httpd24, as well as PostgreSQL connectors and the numpy and scipy modules for scientific applications. For a complete list of the new features and enhancements in this version, see https://docs.python.org/3/whatsnew/3.8.html.

**rh-redis32**

Redis 3.2.4 is an open source, in-memory data structure store that is commonly used as a database and cache, as well as a message broker.

For more information, see https://redis.io.

**rh-ror41**

Ruby on Rails 4.1.5 is a recent version of the web application framework that is written in the Ruby language.

This release includes numerous new features, including the following:

- Spring application pre-loader.
- Action Pack.
- Action Mailer.
- Security fixes for earlier versions of the software.

For more information, see https://rubyonrails.org/.

**rh-ror42**

Ruby on Rails 4.2, is a recent version of the web application framework that is written in the Ruby language. This version includes the following new features: Active Job, improvements such as support for asynchronous mails, performance enhancements such as the Adequate Record feature, and a default Web Console that is included with each new application.

For more information, see https://rubyonrails.org/.

**rh-ror50**

Ruby on Rails 5.0.1 provides a number of bug fixes and the following new features:

- Action Cable framework for handling WebSockets in Rails.
- API mode to assist in creating a Rails application for an API server more easily.
- Exclusive use of the rails CLI over Rake.
- Addition of ActionRecord attributes.
Available Software Collections

Note that you can now override *ActiveRecord* attributes, if needed.

For further details, see the [upstream release notes](https://rubyonrails.org/).

The `rh-ror50` software collection is supported with the `rh-ruby24` and `rh-nodejs6` collections.

For more information, see [https://rubyonrails.org/](https://rubyonrails.org/).

---

**rh-ruby22**

Ruby 2.2.2 is a stable release of Ruby 2.2. This release is backward compatible with Ruby 2.0.0, and Ruby 1.9.3 at a source level.

For more information, see [https://www.ruby-lang.org/](https://www.ruby-lang.org/).

---

**rh-ruby23**

Ruby 2.3.1 is a stable release of Ruby 2.3 and includes many new features, including a frozen string literal pragma, a safe navigation or lonely operator, improved debugging, and many performance enhancements. This release is backward compatible with Ruby 2.2.2, Ruby 2.0.0, and Ruby 1.9.3 at a source level.

For more information, see [https://www.ruby-lang.org/](https://www.ruby-lang.org/).

---

**rh-ruby24**

Ruby 2.4.0 introduces performance improvements, including the following:

- Improved hash table performance.
- New `binding#irb` method starts a read–eval–print loop (REPL) session, which enables easier debugging and introspection of variables during runtime.
- Improved debugging of threads and better deadlock detection.
- Fixnum and Bignum classes are integrated into the Integer class.
- Support for Unicode case mappings.
- Support for the OpenSSL 1.1.0 library.

Ruby 2.4 is backward compatible with Ruby 2.3.1, Ruby 2.2.2, Ruby 2.0.0, and Ruby 1.9.3. The `rh-ruby23` and `rh-ruby22` software collections are also still supported.

For more information, see [https://www.ruby-lang.org/](https://www.ruby-lang.org/).
### rh-ruby25

**Oracle Linux 7 Only**

Ruby 2.5.5 introduces performance improvements, as well as new features and changes, including the following:

- Simplified block usage with the `rescue, else, and ensure` keywords.
- New `yield_self` method.
- Support for branch coverage and method coverage measurement.
- New `Hash#slice` and `Hash#transform_keys` methods.

Ruby 2.5 is backward compatible with Ruby 2.4, Ruby 2.3.1, Ruby 2.2.2, Ruby 2.0.0, and Ruby 1.9.3. The `rh-ruby23` and `rh-ruby22` software collections are also still supported.

For more information, see [https://www.ruby-lang.org/](https://www.ruby-lang.org/).

### rh-ruby26

**Oracle Linux 7 Only**

Ruby 2.6.2 introduces performance improvements, new features and changes, including the following:

- Endless ranges.
- `Binding#source_location` method.
- `$SAFE` process global state.

Ruby 2.6 is backward compatible with Ruby 2.5, Ruby 2.4, Ruby 2.3.1, Ruby 2.2.2, Ruby 2.0.0, and Ruby 1.9.3. The `rh-ruby23` and `rh-ruby22` software collections are also still supported.

For more information, see [https://www.ruby-lang.org/](https://www.ruby-lang.org/).

### rh-ruby27

**Oracle Linux 7 Only**

Ruby 2.7.1 introduces performance improvements, new features and changes, including the following:

- Pattern Matching.
- REPL improvement.
- Compaction GC.
- Separation of positional and keyword arguments.
- Several security fixes and bug fixes.

Available Software Collections

**rh-scala**

**Oracle Linux 7 Only**

The new Scala 2.10.6 software collection is a general-purpose programming language that is designed to express common programming patterns in a concise and type-safe way. Scala 2.10.6 integrates both object-oriented and functional languages features and is fully interoperable with Java.

For more information, see [https://docs.scala-lang.org/](https://docs.scala-lang.org/).

**rh-varnish4**

Varnish Cache 4.0.3 is an efficient reverse proxy for HTTP. Files and content are cached in memory to reduce response time and network bandwidth consumption. The Varnish Cache can improve web application performance significantly.

For more information, see [https://varnish-cache.org/](https://varnish-cache.org/).

**rh-varnish5**

**Oracle Linux 7 Only**

Varnish Cache 5.2.1 is an efficient reverse proxy for HTTP. This release provides bug fixes and enhancements over the previous version, including experimental HTTP/2 support, the shard director, and improvements to configuration through Varnish Configuration Language files and labels.

For more information, see [https://varnish-cache.org/](https://varnish-cache.org/).

**rh-varnish6**

**Oracle Linux 7 Only**

Varnish Cache 6.0.6 includes many security patches, bug fixes, and enhancements.

For more information, see [https://varnish-cache.org/docs/6.0/index.html](https://varnish-cache.org/docs/6.0/index.html).

**ror40**

Ruby on Rails 4.0.2 provides additional features and improvements, including support for live-streaming over persistent connections and can be used with ruby200. This software collection requires the V8 JavaScript engine that is implemented by v8314.

For more information, see [https://rubyonrails.org/](https://rubyonrails.org/).

**ruby193**

Ruby 1.9.3 includes Ruby on Rails 3.2.8 and provides enhanced Unicode support, improved threading, quicker loading, the mod_passenger module for use with httpd24, and a large collection of Ruby gems.

For more information, see [https://www.ruby-lang.org/](https://www.ruby-lang.org/).

**ruby200**

Ruby 2.0.0 provides improved performance and reliability, and includes additional features and enhanced debugging, and retains backward compatibility with Ruby 1.9.3 at the source level.

For more information, see [https://www.ruby-lang.org/](https://www.ruby-lang.org/).

**source-to-image**

**Oracle Linux 7 Only**

The source-to-image software collection, which provides a tool for building artifacts from source and injecting them into docker images, is
1.4 Installing the Software Collection Library Utility From ULN

The `scl-utils` package, which provides the Software Collection Library `scl` utility, is available in the Oracle Linux 6 and Oracle Linux 7 `latest` channels.

The software collection packages are available in the Oracle Linux 6 and Oracle Linux 7 `SoftwareCollections` channels.

To use a software collection on an Oracle Linux 6 or Oracle Linux 7 system, you must first install the `scl` utility on that system.

To install `scl` on a system:

1. Log in to the ULN at `linux.oracle.com` and then subscribe the system to the appropriate `latest` and `SoftwareCollections` channels:
   - For Oracle Linux 6, subscribe the system to the `ol6_x86_64_latest` and `ol6_x86_64_SoftwareCollections` channels.
   - For Oracle Linux 7, subscribe the system to the `ol7_x86_64_latest`, `ol7_x86_64_optional_latest` and `ol7_x86_64_SoftwareCollections` channels.

2. Install the `scl-utils` package.

   ```bash
   # yum install scl-utils
   ```

   You can now install and use software collection packages on the system. See Section 1.6, “Installing a Software Collection From the Oracle Linux Yum Server” and Section 1.8, “Using the Software Collection Version of a Command”.

Note

Alternatively, you can obtain the `scl-utils` and software collection packages from the Oracle Linux yum server. See Section 1.5, “Installing the Software Collection Library Utility From the Oracle Linux Yum Server”.

1.5 Installing the Software Collection Library Utility From the Oracle Linux Yum Server

The `scl-utils` package, which provides the Software Collection Library `scl` utility, is available in the Oracle Linux 6 and Oracle Linux 7 `latest` repositories on the Oracle Linux yum server.

The software collection packages are available in the following Oracle Linux 6 and Oracle Linux 7 `software_collections` repositories:

- `https://yum.oracle.com/repo/OracleLinux/OL6/SoftwareCollections/x86_64/` (Oracle Linux 6)
Installing a Software Collection From the Oracle Linux Yum Server

- https://yum.oracle.com/repo/OracleLinux/OL7/SoftwareCollections/x86_64/ (Oracle Linux 7)

To use a software collection on an Oracle Linux 6 or Oracle Linux 7 system, you must first install the `scl` utility on that system.

To install `scl` on a system:

1. Ensure that your system is up to date and that you have transitioned to use the modular yum repository configuration by installing the `oraclelinux-release-el7` package and running the `/usr/bin/ol_yum_configure.sh` script. For example, on Oracle Linux 7, do the following:

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

2. Enable the `software_collections` repository, for example:

```
# yum-config-manager --enable software_collections
```

If you are using Oracle Linux 7, ensure that the `ol7_latest` and `ol7_optional_latest` repositories are also enabled:

```
# yum-config-manager --enable ol7_latest ol7_optional_latest
```

If you are using Oracle Linux 6, ensure that the `ol6_latest` repository is also enabled:

```
# yum-config-manager --enable ol6_latest
```

3. Install the `scl-utils` package.

```
# yum install scl-utils
```

You can now install and use software collection packages on the system. See Section 1.6, “Installing a Software Collection From the Oracle Linux Yum Server” and Section 1.8, “Using the Software Collection Version of a Command”.

### 1.6 Installing a Software Collection From the Oracle Linux Yum Server

After you set up the system to access the `software_collections` repository on the Oracle Linux yum server or the `SoftwareCollections` channel on ULN, you can use the `yum` command to install a software collection on the system as follows:

```
# yum install sw_col
```

Replace `sw_col` with the name of the software collection that you want to install.

A software collection can have a number of optional packages that you can also choose to install if required. To list these packages, use the following command:

```
# yum list available sw_col-\*
```

To list the installed software collections, use the `scl --list` command.

To list the packages that a software collection contains, use the `scl --list sw_col` command.

To display a list of all of the available packages within the Software Collection Library, restrict your `yum` query as follows:

```
# yum --disablerepo="*" --enablerepo="*_SoftwareCollections" list available
```
1.7 Updating or Removing a Software Collection

You can update or remove a software collection in the same way as you would update or remove any ordinary package, for example:

```
# yum update sw_col
# yum remove sw_col
```

1.8 Using the Software Collection Version of a Command

To enable and use the version of a command that a software collection contains, use the `scl` utility with the `enable` action:

```
# scl enable sw_col -- command args
```

By default, the specified command from the software collection runs in a `bash` environment. If required, you can specify a different shell environment.

If you want to enable several software collections so that you can run several utilities together, specify `bash` to provide the environment from which you can access the utilities, for example:

```
# scl enable sw_col1 sw_col2 -- bash
```

Note

The `X_SCLS` environment variable contains a list of the currently enabled software collections in the shell.

You can specify the commands that you want to run in a software collection environment and pipe these to the `scl` command:

```
# cat cmd_file | scl enable sw_col
```

You could also create an executable wrapper script to run an `scl` command, for example:

```
#!/bin/bash
scl enable php55 -- php $@
```

As of version 3.0, the `scl` utility can be called directly from the shebang (`#!/`) line of a script, with the `enable` action provided. This feature change enables you to call an interpreter from within a collection directly from your scripts, for example:

```
#!/usr/bin/scl enable rh-python36 -- python
import platform
import sys
import os
print(os.system('python -V'))
print(platform.python_version())
print(sys.version)
```

For more information, see the `scl(1)` manual page.

1.9 Using Services That Are Provided by Software Collections

Some of the software collections install service scripts in `/etc/rc.d/init.d` that include the software collection name in the name of the service script, for example `httpd24-httpd`. As for any system
service, you can enable, disable, and control a software collection service by using `chkconfig` and `service` if you are running Oracle Linux 6 or by running the `systemctl` command if you are running Oracle Linux 7.

### 1.10 Accessing Software Collection-Specific Manual Pages

A software collection is packaged with a manual page that describes its content. Use the following command to display the manual page for a software collection:

```
$ scl enable sw_col -- man sw_col
```

### 1.11 Known Software Collection Issues

The following are known issues in this release.

#### 1.11.1 Package Dependency Issues When Upgrading From an Earlier Software Collection Version

In the case where a certain Software Collection version is already installed on Oracle Linux 7, and the system is upgraded to a later Software Collection version, some dependency issues may result if the following packages are installed:

- `devtoolset-3-liblsan-devel`
- `devtoolset-3-libtsan-devel`

Typically, the error appears as follows:

```
--> Finished Dependency Resolution
Error: Package: devtoolset-3-liblsan-devel-4.9.1-10.el7.x86_64 (@ol7_x86_64_SoftwareCollections) Requires: liblsan = 4.9.1-10.el7
Removing: liblsan-4.9.1-10.el7.x86_64 (@ol7_x86_64_SoftwareCollections12)
liblsan = 4.9.1-10.el7
Updated By: liblsan-6.2.1-3.1.el7.x86_64 (SCL23)
liblsan = 6.2.1-3.1.el7
Available: liblsan-5.2.1-2.2.el7.x86_64 (ol7_x86_64_SoftwareCollections)
libsan = 5.2.1-2.2.el7
Available: liblsan-5.3.1-6.1.el7.x86_64 (ol7_x86_64_SoftwareCollections)
libsan = 5.3.1-6.1.el7
Error: Package: devtoolset-3-libtsan-devel-4.9.1-10.el7.x86_64 (@ol7_x86_64_SoftwareCollections) Requires: libtsan = 4.9.1-10.el7
Removing: libtsan-4.9.1-10.el7.x86_64 (@ol7_x86_64_SoftwareCollections12)
libtsan = 4.9.1-10.el7
Updated By: libtsan-6.2.1-3.1.el7.x86_64 (SCL23)
libtsan = 6.2.1-3.1.el7
Available: libtsan-4.8.2-16.el7.x86_64 (ol7_x86_64_SoftwareCollections)
libtsan = 4.8.2-16.el7
Available: libtsan-4.8.2-16.2.el7.0.x86_64 (ol7_x86_64_SoftwareCollections)
libtsan = 4.8.2-16.2.el7.0
Available: libtsan-4.8.3-9.el7.x86_64 (ol7_x86_64_SoftwareCollections)
libtsan = 4.8.3-9.el7
libtsan = 4.8.2-16.el7
Available: libtsan-4.8.5-4.el7.x86_64 (ol7_x86_64_SoftwareCollections)
libtsan = 4.8.5-4.el7
libtsan = 4.8.2-16.el7
Available: libtsan-4.8.5-11.el7.x86_64 (ol7_x86_64_SoftwareCollections)
libtsan = 4.8.5-11.el7
libtsan = 4.8.2-16.el7
Available: libtsan-5.2.1-2.2.el7.x86_64 (ol7_x86_64_SoftwareCollections)
libtsan = 5.2.1-2.2.el7
Available: libtsan-5.3.1-6.1.el7.x86_64 (ol7_x86_64_SoftwareCollections)
libtsan = 5.3.1-6.1.el7
```
The workaround is to uninstall and remove the listed rpm packages before running the `yum update` or `yum install` command. You should also exclude these packages from a `yum update` or `yum install`, by editing the `/etc/yum.conf` file and updating the `exclude` option. Or, you can use the `--exclude` flag when running the `yum` command.

(Bug ID 24376931)

### 1.11.2 libasan-static Package Dependency

When installing the `devtoolset-3-libasan-devel-4.9.1-10.el7` package, which requires the `libasan-4.9.1-10.el7` package, there is a potential dependency issue if the `libasan-static-4.8.3-9.el7` package is already present on the system. An error such as the following is reported:

```
 Finished Dependency Resolution
Error: Multilib version problems found. This often means that the root cause is something else and multilib version checking is just pointing out that there is a problem. Eq.:

1. You have an upgrade for libasan which is missing some dependency that another package requires. Yum is trying to solve this by installing an older version of libasan of the different architecture. If you exclude the bad architecture yum will tell you what the root cause is (which package requires what). You can try redoing the upgrade with `--exclude libasan.otherarch` ... this should give you an error message showing the root cause of the problem.

2. You have multiple architectures of libasan installed, but yum can only see an upgrade for one of those architectures. If you don't want/need both architectures anymore then you can remove the one with the missing update and everything will work.

3. You have duplicate versions of libasan installed already. You can use "yum check" to get yum show these errors.

...you can also use `--setopt=protected_multilib=false` to remove this checking, however this is almost never the correct thing to do as something else is very likely to go wrong (often causing much more problems).

Protected multilib versions: libasan-4.9.1-10.el7.x86_64 != libasan-4.8.5-11.el7.i686
```

The workaround is to remove the `libasan-static` package before installing the `devtoolset-3-libasan-devel` package.

(Bug ID 21896256)

### 1.11.3 Software Collection and Package Version Conflicts

You cannot install multiple versions of software collections on a system due to package conflicts within matching software collections. The following software collections are known to conflict:

- `devtoolset-3` and `devtoolset-4`
- `rh-nginx18`, `rh-nginx110` and `nginx16`
- `rh-nodejs4`, `rh-nodejs6` and `nodejs010`
Dependency Issue When Upgrading Software Collection Version

- `perl516`, `rh-perl520`, `rh-perl523` and `rh-perl524`
- `php54`, `php55`, `rh-php56` and `rh-php70`
- `python27`, `python33`, `rh-python34` and `rh-python35`
- `rh-ror42`, `rh-ror50` and `ror40`
- `ruby193`, `ruby200`, `rh-ruby22`, `rh-ruby23` and `rh-ruby24`

In most cases, the conflict may result from particular package conflicts within each software collection. Typically, the conflict occurs because it is only possible to install one set of macro files for the packages, which means that the `scldevel` packages for each collection tend to conflict. For instance, the `rh-php56-scldevel` and `php54-scldevel` packages within the `php54` and `rh-php56` software collections are known to conflict. Note that this behavior is expected. As such, do not attempt to install multiple versions of a software collections package on the same system.

In some cases, other conflicts may occur. For instance, the `devtoolset-3-tycho` and `devtoolset-4-tycho` packages conflict. This conflict occurs due to binary mismatches within the packages. As previously stated, do not attempt to install multiple versions of a software collections package on the same system.

(Bug IDs 20090086, 23311408, 24286085, 24376992, 25115835, 25164232, 25424807, 25562645, 25562669, 25562714, 25562760, 26540817)

**1.11.4 rh-php56-build Dependency Issue When Upgrading Software Collection Version**

A package dependency conflict results when attempting to upgrade the `rh-php56` collection from an earlier Software Collection version to later Software Collection version. Typically, the following output is displayed during the upgrade:

```
--> Finished Dependency Resolution
Error: Package: rh-php56-build-2.0-6.el7.x86_64
    Requires: rh-php56-runtime(x86-64) = 2.0-6.el7
    Removing: rh-php56-runtime-2.0-6.el7.x86_64
(ol7_x86_64_SoftwareCollections)
    Updated By: rh-php56-runtime-2.3-1.el7.x86_64
(ol7_x86_64_SoftwareCollections)
    rh-php56-runtime(x86-64) = 2.3-1.el7
```

The workaround for this issue is to uninstall and remove the `rh-php56-build-2.0-6.el7.x86_64` rpm package before running the `yum update` or `yum install` command, for example:

```
# yum remove rh-php56-build-2.0-6
```

You should also exclude these packages from the `yum update` or `yum install` command by editing the `/etc/yum.conf` file and updating the `exclude` option. Or, you can use the `-e exclude` flag when running the `yum` command.

(Bug ID 25424699)

**1.11.5 source-to-image Dependency on Docker**

The `source-to-image` package has a dependency on `docker`, but it is not in the `ol7_latest` channel. If the system where `source-to-image` is to be installed is not subscribed to the `ol7_addons` channel, the installation fails due to a missing dependency.
Note that the system must be subscribed to the `ol7_addons` channel to install `source-to-image`.

1.11.6 rh-ror41 Dependency on v8314

The `rh-ror41` collection has a dependency on the `v8314` collection. The `therubyracer` gem, which compresses and provides a runtime for Javascript, uses the V8 Javascript engine that is made available in the `v8314` software collection.

To enable this collection and make it available to `rh-ror41`, run the command:

```
# scl enable v8314
```

(Bug ID 25683450)
Appendix A Software Collection Libraries for Oracle Linux 7 (aarch64)

Oracle only provides the latest versions and additions to the Software Collection library for the Arm (aarch64) platform and these are only supported for the latest update level of Oracle Linux 7. A subset of the complete Software Collection Library (as available for the x86_64 platform) is available for the 64-bit Arm (aarch64) platform.

The following collections are currently available for Oracle Linux 7 (aarch64):

- devtoolset-6
- devtoolset-7
- devtoolset-8
- devtoolset-9
- httpd24
- oracle-armtoolset-1
- oracle-armtoolset-8
- python27
- rh-git29
- rh-git218
- rh-maven35
- rh-nginx112
- rh-nginx114
- rh-nginx116
- rh-nodejs6
- rh-nodejs8
- rh-nodejs10
- rh-nodejs12
- rh-perl526
- rh-php70
- rh-php71
- rh-php72
- rh-php73
- rh-python36
The Oracle Linux 7 (aarch64) release of the Software Collection Library also includes a toolchain that provides a solid developer toolset to build code for 64-bit Arm platforms and compile modules against the provided kernel. The toolset includes version 7.3 of the gcc compiler that is used to build the aarch64 version of Unbreakable Enterprise Kernel Release 5 and Unbreakable Enterprise Kernel Release 6.

Developer tools are released as a software collection, which can be found in the /addons/Oscl directory repository on the provided ISO for each Oracle Linux 7 (aarch64) release, which are also available in the software_collections repository on the Oracle Linux yum server or the SoftwareCollections channel on ULN. You can install the oracle-armtoolset-1 software collection by using the yum command:

```bash
# yum install scl-utils oracle-armtoolset-1
```

After installing the oracle-armtoolset-1 software collection, you can enable it as follows:

```bash
# scl enable oracle-armtoolset-1 bash
```

The oracle-armtoolset-1 software collection is released as an addition to the Software Collection Library for Oracle Linux and is only available on the 64-bit Arm (aarch64) platform.

**Note**

The oracle-armtoolset-1 software collection is required if you need to build kernel modules from source.