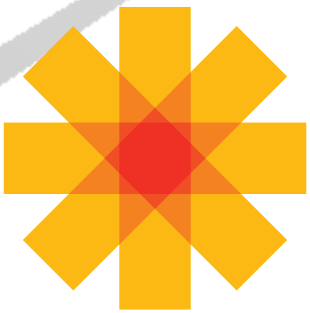
OpenDaylight
Installation Guide

master (October 2, 2014)



OPEN
DAYLIGHT

OpenDaylight Installation Guide

Opendaylight Community

master (2014-10-02)

This guide describes how to download and install OpenDaylight Helium.

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OpenDaylight Release Notes

Key Features

A list of the key functionality provided in OpenDaylight Helium can be found in the table in the section below.

Target Environment

Note

If you are using Oracle, JDK version 1.7.0_45 or later is required.

For Execution

The OpenDaylight controller source files are completely portable and only require a Java 7-compliant JVM to run.

For Development

Although the OpenDaylight controller is developed as a normal Java project, it makes heavy use of the Xtend language in some places. While development is possible with bare tools, we recommend you use Eclipse with the Xtend plugin.

Known Issues and Limitation

Other than as noted in project-specific release notes, there are two known limitations.

1. The Karaf distribution of OpenDaylight requires internet access when run for the first time.

2. There are scales beyond which the controller has been unreliable when collecting flow statistics from OpenFlow switches. In tests, theses issues became apparent when managing 10s of thousands of OpenFlow switches, however this may vary depending on deployment and use cases. Flow programming has been unaffected in our tests.

Full Bug List

All of the known issues for the OpenDaylight controller are listed here.

Project-specific Release Notes

Project-specific release notes can be found on the OpenDaylight wiki. This table provides links to them by project.

Project	Release Notes URL
AAA	https://wiki.opendaylight.org/view/AAA:Helium_Release_Notes

Project	Release Notes URL
BGPCEP	https://wiki.opendaylight.org/view/BGP_LS_PCEP:Helium_Release_Notes
DLUX	https://wiki.opendaylight.org/view/OpenDaylight_dlux:Release_Notes_Helium
Group Based Policy	https://wiki.opendaylight.org/view/Group_Policy:Helium-Release-Notes
L2 Switch	https://wiki.opendaylight.org/view/L2_Switch:Helium:Release_Notes
LISP Flow Mapping	https://wiki.opendaylight.org/view/OpenDaylight_Lisp_Flow_Mapping:_Helium_Release_Notes
OpenFlow Plugin	https://wiki.opendaylight.org/view/OpenDaylight_OpenFlow_Plugin:Helium_Release_Notes
OpenFlow Protocol Library	https://wiki.opendaylight.org/view/Openflow_Protocol_Library:Release_Notes
OVSDB	https://wiki.opendaylight.org/view/OVSDB_Integration:Helium_Release_Notes
PackCable PCMM	https://wiki.opendaylight.org/view/PacketCablePCMM:ReleaseNotes
Plugin2OC	https://wiki.opendaylight.org/view/Southbound_Plugin_to_the_OpenContrail_Platform:Helium_Release_Notes
SNBI	https://wiki.opendaylight.org/view/SecureNetworkBootstrapping:HeliumReleaseNotes
SDNi	https://wiki.opendaylight.org/view/ODL-SDNi_App:Helium_Release_Notes
SNBI	https://wiki.opendaylight.org/view/SecureNetworkBootstrapping:HeliumReleaseNotes
SNMP4SDN	https://wiki.opendaylight.org/view/SNMP4SDN:Helium_Release_Note
SFC	https://wiki.opendaylight.org/view/Service_Function_Chaining:Helium_Release_Notes
TCPMD5	https://wiki.opendaylight.org/view/TCPMD5:Helium_Release_Notes
TTP	https://wiki.opendaylight.org/view/Table_Type_Patterns:Helium_Release_Notes
VTN	https://wiki.opendaylight.org/view/OpenDaylight_Virtual_Tenant_Network_(VTN):Helium_Release_Notes
Yang Tools	https://wiki.opendaylight.org/view/YANG_Tools:Helium:Release_Notes

1. Getting and Installing OpenDaylight Helium

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Downloading the Karaf Distribution

The default distribution can be found on the OpenDaylight Software Download page here: http://www.opendaylight.org/software/downloads

This distribution comes with no features enabled by default, but all features are able to be installed and run.

Caution

Not all features can be run at the same time without negative consequences.

Running the Karaf distribution

1. Unzip the zip file
2. cd into the directory
3. run ./bin/karaf

For example:

```
$ ls distribution-karaf-0.2.0-Helium.zip
distribution-karaf-0.2.0-Helium.zip
$ unzip distribution-karaf-0.2.0-Helium.zip
Archive:  distribution-karaf-0.2.0-Helium.zip
   creating: distribution-karaf-0.2.0-Helium/
   creating: distribution-karaf-0.2.0-Helium/configuration/
   creating: distribution-karaf-0.2.0-Helium/data/
   creating: distribution-karaf-0.2.0-Helium/data/tmp/
   creating: distribution-karaf-0.2.0-Helium/deploy/
   creating: distribution-karaf-0.2.0-Helium/etc/
   creating: distribution-karaf-0.2.0-Helium/externalapps/
...
  inflating: distribution-karaf-0.2.0-Helium/bin/start.bat
  inflating: distribution-karaf-0.2.0-Helium/bin/status.bat
  inflating: distribution-karaf-0.2.0-Helium/bin/stop.bat
$ cd distribution-karaf-0.2.0-Helium
$ ./bin/karaf

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            \/|__|        \/     \/        \/     \/\/           /_____/      \/
```

```
Hit '<tab>' for a list of available commands
and '[cmd] --help' for help on a specific command.
Hit '<ctrl-d>' or type 'system:shutdown' or 'logout' to shutdown OpenDaylight.

opendaylight-user@root>
```

Installing Components

The following table describes a list of components in OpenDaylight Helium and the relevant Karaf feature to install in order to enable that component. To install a feature use the `feature:install` Karaf command, for example:

```
feature:install <feature-name>
```

Multiple features can be installed in the same command:

```
feature:install <feature1-name> <feature2-name> ... <featureN-name>
```

Table 1.1. Helium Components

Component Name	Component Description	Karaf feature name	Compatibility
BGPCEP	Enables support for BGP LS PCEP	odl-bgpcep-all	all
Defense4All	Enable DDoS detection and protection	n/a, see Defense4All	all
Group Based Policy	Enable Endpoint Registry and Policy Repository REST APIs and associated functionality for the Group Based Policy Proof of Concept demonstration	odl-groupbasedpolicy-ofoverlay	self+all
L2 Switch	Provides L2 (Ethernet) forwarding across connected OppenFlow switches and support for host tracking	odl-l2switch-switch-ui	self+all
LISP Flow Mapping	Enable LISP control plane services including the mapping system services REST API and LISP protocol SB plugin	odl-lispflowmapping-all	all
MD-SAL Clustering	Provides support for operating a cluster of OpenDaylight instances	odl-mdsal-clustering	special
Netconf over SSH	Provide support to manage Netconf-enabled devices over SSH	odl-netconf-connector-ssh	all
OpenFlow Flow Programming	Enables discovery and control of OpenFlow switches and the topology between them	odl-openflowplugin-flow-services-ui	all
OpenFlow Table Type Patterns	Allows OpenFlow Table Type Patterns to be manually associated with network elements	odl-ttp-all	all
OVS Management	Enable OVS management using OVSDB plugin and its associated OVSDB northbound APIs	odl-ovsdb-all	all
OVSDB OpenStack Neutron	OpenStack Network Virtualization using OpenDaylight's OVSDB support	odl-ovsdb-openstack	all
Packetcable PCMM	Enable flow-based dynamic QoS management of CMTS using in the DOCSIS infrastructure	odl-packetcable-all	all
Plugin to OpenContrail	Provides OpenStack Neutron support via OpenContrail	odl-plugin2oc	self+all
RESTCONF API Support	Enables REST API access to the MD-SAL including the data store	odl-restconf	all
SDN Interface	Provides support for interaction and sharing of state between (non-clustered) OpenDaylight instances	odl-sdninterfaceapp-all	all
Secure Networking Bootstrap	Define a SNBI domain and associated white lists of devices to be accommodated to the domain	odl-snbi-all	all
Service Flow Chaining (SFC)	Enables support for applying chains of network services to certain traffic	odl-sfc-all	all

Component Name	Component Description	Karaf feature name	Compatibility
SFC over LISP	Supports implementing SFC using LISP	odl-sfclisp	all
SFC over L2	Supports implementing SFC using Layer 2 forwarding	odl-sfcofl2	all
SFC over VXLAN	Supports implementing SFC using VXLAN via OVSDB	odl-ovsdb-ovssfc	self+all
SNMP4SDN	Enables monitoring and control of network elements via SNMP	odl-snmp4sdn-all	all
VTN Manager	Enables Virtual Tenant Network support including support for OpenStack Neutron	odl-vtn-manager-all	self+all

In the table a compatibility value of "all" means that it can be run with any other features. A value of "self+all" indicates that the feature can be installed with anything with a value of "all", but not any other features with a value of "self+all".

Installing the DLUX Web Interface

The OpenDaylight Web Interface, DLUX, draws information from the OpenFlow Flow Programming and L2 Switch components to display information about the topology of the network, flow statistics, host locations and the like. It will automatically be installed when you install either of these components.

Installing support for REST APIs

Most components that offer REST APIs will automatically load the RESTCONF API Support component, but if for whatever reason they seem to be missing, you can activate this support by installing the `odl-restconf` feature.

Installing MD-SAL Clustering

The MD-SAL clustering feature is noted to have "special" compatibility. It **must** be installed first, before any other features. That is, the first command run at the Karaf CLI should be:

```
feature:install odl-mdsal-clustering
```

Listing Available and Installed Karaf Features

Note, that this is not an exhaustive list of Karaf features, however you can find a full list by running the following command at the Karaf CLI:

```
feature:list
```

To just list the installed Karaf features, run the command:

```
feature:list -i
```

Project-Specific Installation Instructions

The Defense4All and Yang Tools projects provide project-specific installation instructions here. Other projects can either be installed by simply installing the appropriate Karaf feature(s) or, in some cases, further instructions can be found in the User Guide or Developer Guide.

Further Information

Further information can be found in the User Guide and Developer Guide, which should be available in the same location as this guide.

2. Defense4All

For information on how to install Defense4All please see this page on the OpenDaylight here: https://wiki.opendaylight.org/view/Defense4All:Installation_Guide

3. Yang Tools

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Installation Overview

Yang tools is a infrastructure project aiming to develop necessary tooling and libraries providing support for NETCONF and YANG for Java (JVM-language based) projects and applications. Yang tools is used for application such as Model Driven SAL for Controller (which uses YANG as the modeling language) and Netconf or OFConfig plugins.

Installing the Project

To configure your project and generate source code from YANG edit your projects **pom.xml** and add Opendaylight SNAPSHOT repository for snapshot releases (currently only snapshots are available).

Adding Plugin Repositories

Plugin Repository

To add following plugin repositories for plugin use:

```
<pluginRepositories>
    <pluginRepository>
       <id>opendaylight-release</id>
       <name>opendaylight-release</name>
       <url>http://nexus.opendaylight.org/content/repositories/
opendaylight.release/</url>
        </pluginRepository>
    <pluginRepository>
       <id>opendaylight-snapshot</id>
       <name>opendaylight-snapshot</name>
       <url>http://nexus.opendaylight.org/content/repositories/
opendaylight.snapshot/</url>
    </pluginRepository>
</pluginRepositories>
```

Dependency Repository

To add repositories for required dependencies use:

```
<repositories>
    <repository>
       <id>opendaylight-release</id>
       <name>opendaylight-release</name>
```

```
       <url>http://nexus.opendaylight.org/content/repositories/
opendaylight.release/</url>
    </repository>
    <repository>
       <id>opendaylight-snapshot</id>
       <name>opendaylight-snapshot</name>
       <url>http://nexus.opendaylight.org/content/repositories/
opendaylight.snapshot/</url>
    </repository>
</repositories>
```

Using Plugin

To add yang-maven-plugin to build section of your pom.xml use:

```
<build>
    <plugins>
        <plugin>
            <groupId>org.opendaylight.yangtools</groupId>
            <artifactId>yang-maven-plugin</artifactId>
            <version>0.6.1-SNAPSHOT</version>
            <!-- configuration -->
        </plugin>
    </plugins>
</build>
```