

# Installation of Google Protocol Buffers 3.0.0

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**Version:** 0.1

In this document we propose an installation procedure for the Google Protocol Buffer C++ library, version 3.0.0, on top of Xubuntu 16.04 LTS (Xenial Xerus) for a system (64-bits). Google Protocol Buffer Java support is also installed.

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## Links

- <https://github.com/google/protobuf>
- <https://developers.google.com/protocol-buffers/>
- <https://developers.google.com/protocol-buffers/docs/cpptutorial>
- <https://developers.google.com/protocol-buffers/docs/downloads>
- <http://blog.codeclimate.com/blog/2014/06/05/choose-protocol-buffers/>

## Download

```
$ cd /opt/sw/
$ mkdir GoogleProtocolBuffer
$ wget \
  https://github.com/google/protobuf/releases/download/v3.0.0/protobuf-cpp-3.0.0.tar.gz
$ tar xvzf protobuf-cpp-3.0.0.tar.gz
$ wget \
  https://github.com/google/protobuf/releases/download/v3.0.0/protobuf-java-3.0.0.tar.gz
$ tar xvzf protobuf-java-3.0.0.tar.gz
```

## Installation

Installation instructions: <https://github.com/google/protobuf/blob/master/src/README.md>

```
$ export PROTOBUF_BASE_DIR=/opt/sw/GoogleProtocolBuffers
$ mkdir -p ${PROTOBUF_BASE_DIR}
$ cd ${PROTOBUF_BASE_DIR}
$ sudo apt-get install autoconf automake libtool curl make g++ unzip
$ brewsh
```

```
$ export PROTOBUF_INSTALL_DIR=${PROTOBUF_BASE_DIR}/install-3.0.0
$ cd ${PROTOBUF_BASE_DIR}/protobuf-3.0.0/
$ ./autogen.sh
$ ./configure --help
$ ./configure --prefix=${PROTOBUF_INSTALL_DIR}
$ make -j4
$ make check
$ make install
...
```

---

Libraries have been installed in:

```
/opt/sw/GoogleProtocolBuffers/install-3.0.0/lib
```

If you ever happen to want to link against installed libraries in a given directory, `LIBDIR`, you must either use `libtool`, and specify the full pathname of the library, or use the `'-LLIBDIR'` flag during linking and do at least one of the following:

- add `LIBDIR` to the `'LD_LIBRARY_PATH'` environment variable during execution
- add `LIBDIR` to the `'LD_RUN_PATH'` environment variable during linking
- use the `'-Wl,-rpath -Wl,LIBDIR'` linker flag
- have your system administrator add `LIBDIR` to `'/etc/ld.so.conf'`

See any operating system documentation about shared libraries **for** more information, such as the `ld(1)` and `ld.so(8)` manual pages.

## Java

### Install Maven

Java support is provided through the Maven utility:

```
$ sudo apt-get install default-jdk default-jdk-doc maven
```

See also <http://maven.apache.org/guides/mini/guide-proxies.html> to use Maven behind a proxy (use your own `~/.m2/settings.xml` file).

Example of `~/.m2/settings.xml` file to support a proxy (with authentication):

```
<?xml version="1.0" encoding="UTF-8"?>
<settings>
  <proxies>
    <proxy>
      <id>lpccaen-proxy</id>
      <active>true</active>
      <protocol>http</protocol>
      <host>caeproxy.in2p3.fr</host>
      <port>3128</port>
      <username>LOGIN</username>
      <password>PASSWORD</password>
      <nonProxyHosts>www.google.com|*.example.com</nonProxyHosts>
    </proxy>
  </proxies>
</settings>
```

### Build/install Protobuf Java

```
$ export PATH="${PROTOBUF_INSTALL_DIR}/bin:${PATH}"
$ protoc --version
libprotoc 3.0.0
$ mvn -v
Apache Maven 3.3.9
Maven home: /usr/share/maven
```

```

Java version: 1.8.0_91, vendor: Oracle Corporation
Java home: /usr/lib/jvm/java-8-openjdk-amd64/jre
Default locale: fr_FR, platform encoding: UTF-8
OS name: "linux", version: "4.4.0-34-generic", arch: "amd64", family: "unix"
$ cd ${PROTOBUF_BASE_DIR}/protobuf-3.0.0/java
$ mvn test
$ mvn install
$ mvn package
$ find . -name "protobuf-*.jar"
./core/target/protobuf-java-3.0.0-beta-3.jar
./util/target/protobuf-java-util-3.0.0-beta-3.jar
$ mkdir -p ${PROTOBUF_INSTALL_DIR}/lib/java
$ cp ./core/target/protobuf-java-3.0.0.jar ${PROTOBUF_INSTALL_DIR}/lib/java
$ cp ./util/target/protobuf-java-util-3.0.0.jar ${PROTOBUF_INSTALL_DIR}/lib/java

```

## Check Protobuf installation

```

$ LANG=C tree -L 1 ${PROTOBUF_INSTALL_DIR}
/opt/sw/GoogleProtocolBuffers/install-3.0.0
|-- bin
|-- include
'-- lib

$ LANG=C tree -L 2 ${PROTOBUF_INSTALL_DIR}/lib
/opt/sw/GoogleProtocolBuffers/install-3.0.0/lib/
|-- java
|   |-- protobuf-java-3.0.0.jar
|   '-- protobuf-java-util-3.0.0.jar
|-- libprotobuf-lite.a
|-- libprotobuf-lite.la
|-- libprotobuf-lite.so -> libprotobuf-lite.so.10.0.0
|-- libprotobuf-lite.so.10 -> libprotobuf-lite.so.10.0.0
|-- libprotobuf-lite.so.10.0.0
|-- libprotobuf.a
|-- libprotobuf.la
|-- libprotobuf.so -> libprotobuf.so.10.0.0
|-- libprotobuf.so.10 -> libprotobuf.so.10.0.0
|-- libprotobuf.so.10.0.0
|-- libprotoc.a
|-- libprotoc.la
|-- libprotoc.so -> libprotoc.so.10.0.0
|-- libprotoc.so.10 -> libprotoc.so.10.0.0
|-- libprotoc.so.10.0.0
'-- pkgconfig
    |-- protobuf-lite.pc
    '-- protobuf.pc

```

## Setup Protobuf

In your `.bashrc` script, add:

```

export PROTOBUF_BASE_DIR=/opt/sw/GoogleProtocolBuffers
function do_protobuf_300_setup()
{
    if [ -n "${PROTOBUF_INSTALL_DIR}" ]; then
        echo "WARNING: Google Protocol Buffers is already setup !" >&2
        return 1
    fi
    export PROTOBUF_INSTALL_DIR="${PROTOBUF_BASE_DIR}/install-3.0.0"
    export PATH="${PROTOBUF_INSTALL_DIR}/bin:$PATH"
    echo "NOTICE: Google Protocol Buffers is now setup." >&2
}

```

```
    return 0;
}
export -f do_protobuf_300_setup

# Special aliases:
alias protobuf_setup="do_protobuf_300_setup"
```

To setup the protobuf libraries and tools from a terminal, run :

```
$ protobuf_setup
```

Check the protoc compiler:

```
$ which protoc
/opt/sw/GoogleProtocolBuffers/install-3.0.0/bin/protoc
```