

syslog-ng Premium Edition 7.0.10

Release Notes

August 2018

These release notes provide information about the syslog-ng Premium Edition release.

About this release

Welcome to syslog-ng Premium Edition (syslog-ng PE) version 7 and thank you for choosing our product. This document describes the new features and most important changes since the latest release of syslog-ng PE. The main aim of this paper is to aid system administrators in planning the migration to the new version of syslog-ng PE. The following sections describe the news and highlights of syslog-ng PE 7.

Starting with version 7, syslog-ng Premium Edition is released as a rolling release. For details, see the [Version policy](#).

Supported platforms

The syslog-ng Premium Edition application is officially supported on the following platforms. Note that the following table is for general reference only, and is not always accurate about the supported platforms and options available for specific platforms. The latest version of this table is available at <https://syslog-ng.com/log-management-software/supported-platforms>. Unless explicitly noted otherwise, the subsequent releases of the platform (for example, Windows Server 2008 R2 and its service packs in case of Windows Server 2008) are also supported.

Table 1: Platforms supported by syslog-ng Premium Edition

	x86	x86_64	SPARC	SPARC64	PowerPC	IA64
AIX 7.1	-	-	-	-	✓	-
CentOS 5	✓	✓	-	-	-	-
CentOS 6	✓	✓	-	-	-	-
CentOS 7	-	✓	-	-	-	-
Debian 7 (wheezy)	-	✓	-	-	-	-
Debian 8 (jessie)	-	✓	-	-	-	-
FreeBSD 10	-	✓	-	-	-	-
HP-UX 11i v3	-	-	-	-	-	✓
Oracle Linux 6	-	✓	-	-	-	-
Oracle Linux 7	-	✓	-	-	-	-
openSUSE 11	✓	✓	-	-	-	-
Red Hat EL 6	-	✓	-	-	-	-
Red Hat EL 7	-	✓	-	-	-	-
SLES 12	-	✓	-	-	-	-
Solaris 10	-	✓	✓	✓	-	-
Solaris 11	-	✓	-	✓	-	-
Ubuntu 12.04 LTS (Precise Pangolin)	-	✓	-	-	-	-
Ubuntu 14.04 LTS (Trusty Tahr)	-	✓	-	-	-	-
Ubuntu 16.04 LTS (Xenial Xerus)	-	✓	-	-	-	-
Windows Server 2008	✓	✓	-	-	-	-
Windows Server 2012	-	✓	-	-	-	-
Windows Vista	✓	✓	-	-	-	-
Windows 7	✓	✓	-	-	-	-
Windows 8	✓	✓	-	-	-	-
Windows 10	✓	✓	-	-	-	-

⚠ CAUTION:

Certain sources and destinations are not supported on every platform (particularly, the `sql()` destination, and the `hdfs()` destination). For details, see the description of the specific source and destination.

⚠ CAUTION:

If you are planning to use Python in syslog-ng PE (for example [Python parser](#) or [Python template function](#)) on RHEL 6 platform, then you have to manually install Python 2.7. If the Python version on the machine is not 2.7, you will receive a similar error message during startup:

```
[2017-07-27T13:42:03.606679] Reading shared object for a candidate module;
path='/opt/syslog-ng/lib/syslog-ng', fname='mod-python.so', module='mod-python'
[2017-07-27T13:42:03.606994] Error opening plugin module; module='mod-python',
error='libpython2.7.so.1.0: cannot open shared object file: No such file or
directory'
```

For details about the syslog-ng Agent for Windows application, see the [syslog-ng Agent for Windows documentation](#). For an agent-less solution, see [the list of supported platforms](#).

For using syslog-ng PE on other platforms (for example, AIX, FreeBSD, HP-UX, Solaris, Microsoft Windows), see [the list of supported platforms](#).

New features in syslog-ng PE 7.0.10

Send logs using the Advanced Log Transport Protocol (ALTP)

Using the new Advanced Log Transfer Protocol (ALTP), you can send (and receive) log messages in a reliable way over the TCP transport layer. ALTP is a proprietary transport protocol that prevents message loss during connection breaks. The transport is used between syslog-ng PE hosts (for example, a client and a server, or a client-relay-server), and interoperates with the flow-control and reliable disk-buffer mechanisms of syslog-ng PE, thus providing the best way to prevent message loss.

ALTP is the successor of the Reliable Log Transport Protocol (RLTP) introduced in version 6 LTS. Starting with version 7.0.9, the syslog-ng PE application can receive messages sent using RLTP from hosts that are running version 6 of syslog-ng PE or the syslog-ng Agent for Windows application. Starting with version 7.0.10, syslog-ng PE can now also send messages using ALTP to hosts that are running version 6 or at least version 7.0.9 of syslog-ng PE or the syslog-ng Agent for Windows application. For details, see [Administration Guide](#).

An additional change regarding the Advanced Log Transfer Protocol is that the global `flush-lines()` option does not affect the batch size of ALTP anymore. Instead, a new ALTP has been introduced, called `batch-size()`. For details, see ["ALTP options" in the Administration Guide](#).

Enhancements

- The `failover()` option allows you to specify what happens after syslog-ng PE fails over to a secondary server. Additionally, the `failover-servers()` option has been deprecated and removed from the document. For more information about the

`failover()` option, see [Administration Guide](#).

- You can now refer to any additional parameters at the end of the argument in a block by adding three dots to it (...). It tells syslog-ng PE that this macro accepts `__VARARGS__`, therefore any name-value pair can be passed without validation. For details, see [Administration Guide](#).
- You can now make parameters mandatory in block definitions by defining them with empty brackets (). For details, see [Administration Guide](#).

Highlights of 7.0.9

Receive logs using the Advanced Log Transport Protocol (ALTP)

With the new Advanced Log Transport Protocol (ALTP) you can receive log messages in a reliable way over the TCP transport layer. ALTP is a proprietary transport protocol that prevents message loss during connection breaks. The transport is used between syslog-ng PE hosts (for example, a client and a server, or a client-relay-server), and interoperates with the flow-control and reliable disk-buffer mechanisms of syslog-ng PE, thus providing the best way to prevent message loss.

ALTP is the successor of the Reliable Log Transport Protocol (RLTP) introduced in version 6 LTS. Starting with version 7.0.9, the syslog-ng PE application can receive messages sent using RLTP from hosts that are running version 6 of syslog-ng PE or the syslog-ng Agent for Windows application. For details, see [Administration Guide](#).

Easily receive and parse messages from remote hosts

The `default-network-drivers()` source is a special source that uses multiple source drivers to receive and parse several different types of syslog messages from the network. For details, see "[default-network-drivers\(\) source options](#)" in the [Administration Guide](#).

Transfer log messages and their key-value pairs between syslog-ng nodes

The [Enterprise-wide message model or EWMM](#) allows you to deliver structured messages from the initial receiving syslog-ng component right up to the central log server, through any number of hops. It does not matter if you parse the messages on the client, on a relay, or on the central server, their structured results will be available where you store the messages. Optionally, you can also forward the original raw message as the first syslog-ng component in your infrastructure has received it, which is important if you want to forward a message for example to a SIEM system. To make use of the enterprise-wide message model, you have to use the [syslog-ng\(\) destination on the sender side](#), and the [default-network-drivers\(\) source on the receiver side](#).

Clearer configuration using `if`, `else`, `elif` conditions

You can use `if {}`, `elif {}`, and `else {}` blocks to configure conditional expressions. For details, see [Administration Guide](#).

Message parsing

syslog-ng PE version 7.0.9 includes parsers for the [sudo](#) and [iptables](#) applications.

Compliance and integration

You can now store and forward the incoming messages exactly as received using the `store-raw-message` source flag and the `RAWMSG` macro. These are especially useful if you are forwarding the messages to a SIEM, or if you have to preserve the original message for legal reasons. For details, see [Administration Guide](#).

Enhancements

- The `ignore-tns-ora()` option has been added to the document. For details, see ["Using the sql\(\) driver with an Oracle database" in the Administration Guide](#).

Highlights of 7.0.8

Client-side failover

The `failover-servers()` option of the `network()` and `syslog()` destinations is now available in syslog-ng PE version 7.

For more information, see [Administration Guide](#).

New log path flag: drop-unmatched

A new log path flag, `drop-unmatched`, has been added. The new flag causes messages to be dropped along a log path when they do not match a filter or are discarded by a parser. For details, see [Administration Guide](#).

Support for Elasticsearch's Shield security discontinued

Elasticsearch deleted the Shield `.jar` files required for syslog-ng PE to work with Shield so support for Shield has been removed.

Support for POSIX regular expressions discontinued

Support for POSIX regular expressions has been removed. All "posix" regular expressions are automatically switched to "pcre". In case you have POSIX regular expressions configured, ensure that your regexps work with PCRE, and also specify `type("pcre")` explicitly.

Highlights of 7.0.7

Logstore destination

The `logstore()` destination that was available only in syslog-ng PE version 6 is now available in version 7.0.7, allowing you to store messages in encrypted files.

For more information, see [Administration Guide](#).

Password-protected private keys

Starting with syslog-ng PE version 7.0.7, you can use password-protected private keys in the `network()` and `syslog()` source and destination drivers.

For more information, see [Administration Guide](#).

Highlights of 7.0.6

Windows Event Collector for syslog-ng PE

The Windows Event Collector (WEC) acts as a log collector and forwarder tool for the Microsoft Windows platform. It collects the log messages of Windows-based hosts over HTTPS (using TLS encryption and mutual authentication), and forwards them to a syslog-ng PE server. In Windows terminology, this tool allows you to define source-initiated subscriptions, and have them forwarded to a syslog-ng PE server.

Unlike the [syslog-ng Agent for Windows](#), the Windows Event Collector is a standalone tool that does not require installing on the Windows-based host itself. This can be an advantage when your organization's policies restrict or do not allow the installation of third-party tools. The Windows Event Collector sits between your Windows hosts and your syslog-ng Premium Edition server, accepting log messages from the remote Windows side with WinRM and feeding them to syslog-ng Premium Edition 7.0.

For more information, see:

- [Windows Event Collector Administration Guide](#)
- [Administration Guide](#)

Support for unsetting a group of fields

In addition to unsetting a macro or a field of a message, you can now explicitly unset a group of fields too, using the `groupunset()` rewrite rule.

For more information, see "[Unsetting message fields](#)" in the [Administration Guide](#).

Highlights of 7.0.5

XML parser

A new parser, the XML parser has been added, which processes input in XML format, and then adds the parsed data to the message object. Use this parser to interoperate with applications that produce XML-encoded log messages.

The XML parser allows you to extract information from XML logs, and use this information in your logging pipeline, for example, in filters, and also to further process the extracted data using syslog-ng or other tools. In addition, parsing XML logs helps you normalize your log messages, and convert them to a common format.

For details, see "[Options of XML parsers](#)" in the [Administration Guide](#).

Cisco parser

A new parser, the Cisco parser has been added, which is capable of parsing the log messages of various Cisco devices. The messages of these devices often do not completely comply with the syslog RFCs, making them difficult to parse. The `cisco-parser()` of syslog-ng PE solves this problem, and can separate these log messages to name-value pairs, extracting also the Cisco-specific values.

For more information, see [Administration Guide](#).

New `systemd-journal()` source option

A new `systemd-journal()` source option, `read-old-records()`, has been added. Previously, syslog-ng PE started reading records from the journald system service right from the very beginning of the journal. This was often a lengthy process. The new option lets you specify whether you want to read only new records from the journal or all records, starting from the beginning of the journal.

For more information, see [Administration Guide](#).

Configurable JVM options for Java destinations

You can now fine-tune your Java Virtual Machine (JVM) options when configuring Elasticsearch, Hadoop Distributed File System (HDFS), and Apache Kafka destinations. Previously, settings of the Java Virtual Machine could not be overridden from the syslog-ng PE configuration file, resulting sometimes in suboptimal memory utilization. The new `jvm-options()` allows you to configure these Java settings from syslog-ng PE as a global option.

For details, see:

- [Administration Guide](#)
- [Administration Guide](#)
- [Administration Guide](#)
- [Administration Guide](#)

Changes in HDFS destination options

The following changes have been introduced with regards to HDFS files:

- *New option `hdfs-append-enabled()`*: A new option has been added, which enables syslog-ng PE to append new data to the end of an already existing HDFS file. This means that, when setting this parameter to `true`, there is no need anymore to open a new file once a file has been closed.

For further details, see [Administration Guide](#).

- *Support for macros in file names and file paths*: `hdfs-file()` now supports the usage of macros, meaning that syslog-ng PE can create files on HDFS dynamically, using macros in the file (or directory) name.

For further details, see [Administration Guide](#).

New TLS options

The following new TLS options have been added:

- `dhparam-file()`: Allows you to specify a file that contains the Diffie-Hellman parameters for key exchanges, generated by the `openssl dhparam` utility.

For further information, see [Administration Guide](#).

- `ecdh-curve-list()`: Allows you to specify the curves permitted when using Elliptic Curve Cryptography (ECC).

For further information, see [Administration Guide](#).

Oracle Linux 6 platform now supported in syslog-ng PE

The Oracle Linux 6 platform is now supported in syslog-ng PE.

For a complete list of supported platforms, see [Administration Guide](#).

Highlights of 7.0.4

RHEL6 support

Red Hat Enterprise Linux 6 platform is now supported. For details, see [Administration Guide](#).

New osquery source

The `osquery` application allows you to ask questions about your machine using an SQL-like language. For example, you can query running processes, logged in users, installed packages and syslog messages as well. You can make queries on demand, and also schedule them to run regularly.

The `osquery()` source of syslog-ng PE allows you read the results of periodical osquery queries and automatically parse the messages. For details, see [Administration Guide](#).

New HTTP destination

The syslog-ng PE application can directly post log messages to web services using the HTTP protocol, without having to use Java.

HTTPS connection, as well as password- and certificate-based authentication is supported. For details, see [Administration Guide](#).

Look up GeoIP2 data from IP addresses

The syslog-ng PE application can lookup IP addresses from an offline GeoIP2 database, and make the retrieved data available in name-value pairs. Depending on the database used, you can access country code, longitude, and latitude information, and many more in addition to what you could access with `geoip()`. For details, see .

You can use the `geoip2` template function to format messages to contain GeoIP data. For details, see .

The `geoip()` parser is deprecated.

The `geoip()` parser is now deprecated. Use the `geoip2` parser instead.

Highlights of 7.0.3

Reading Net-SNMP traps

Using the `snmptrap()` source, you can read and parse the SNMP traps of the [Net-SNMP's snmptrapd](#) application. syslog-ng PE can read these traps from a log file, and extract their content into name-value pairs, making it easy to forward them as a structured log message (for example, in JSON format). For details, see [Administration Guide](#).

Monitor syslog-ng PE more effectively

syslog-ng PE version 7.0.3 also includes new metrics. For details, see "[Metrics and counters of syslog-ng PE](#)" in the [Administration Guide](#).

Also note the following changes compared earlier syslog-ng PE versions:

- The stored counter was renamed to `queued`.
- The output of the `syslog-ng-ctl query` command was changed from `<counter-name>: <counter-value>` to `<counter-name>=<counter-value>`

Ported from the syslog-ng PE 6 LTS product line

- The functionality of wildcard file sources are available in syslog-ng PE 7.0.3 as a separate source driver. For details, see [Administration Guide](#).

Other changes

- The default value of the `log-msg-size()` option has been increased to 64k. That way syslog-ng PE will not truncate long log messages, which are getting increasingly common.
- The `syslog-debun` utility now supports IBM AIX.
- The `hdfs()` destination now supports Kerberos authentication. For details, see [Administration Guide](#).
- The new `basename()` and `dirname()` template functions allow you to easily separate the path and filenames. For details, see [Administration Guide](#).

Highlights of 7.0.2

Python support: message parsers and template functions

The Python Log Parser allows you to write your own parser in Python. Practically, that way you can process the log message (or parts of the log message) any way you need. For example, you can import external Python modules to process the messages, query databases to enrich the messages with additional data, and many other things. For details, see [Administration Guide](#).

You can write your own template function in Python. You can define a Python block in your syslog-ng PE configuration file, and define one or more Python functions in it. You can use these functions as template functions. For details, see [Administration Guide](#).

Monitor syslog-ng PE more effectively

The new `monitoring()` source allows you to granularly select which statistics of syslog-ng PE you want to monitor. In addition, the statistics are available as structured name-value pairs, so you can format the output similarly to other log messages. That way, you can easily convert the statistics and metrics, for example, into JSON or WELF format, and send the results into your monitoring database. For details, see [Administration Guide](#).

syslog-ng PE version 7.0.2 also includes the `monitoring-welf()` source, which is a preconfigured `monitoring()` source that generates statistics messages in WELF format. Starting with version 7.0., syslog-ng PE uses this driver for new installations to generate statistics (earlier versions use the `internal()` source for this purpose).

Ported from the syslog-ng PE 6 LTS product line

- The functionality of `syslog-ng-query` application is available in syslog-ng PE 7.0.2, as part of the `syslog-ng-ctl` utility. For details, see [Administration Guide](#).

Highlights of 7.0

Enriching data

You can use an external database file to append custom name-value pairs to incoming logs, thus extending, enriching, and complementing the data found in the log message. For example, you can create a database (or export it from an existing tool) that contains a list of hostnames or IP addresses, and the department of your organization that the host belongs to, the role of the host (mailserver, webserver, and so on), or similar contextual information. For details, see [Administration Guide](#).

You can correlate and aggregate information from log messages using a few simple filters that are similar to SQL GROUPBY statements. You do not even have to configure a pattern database. Also, when correlating messages containing numerical information, you can use numerical template functions that work on numerical values of a correlation context. For details, see [Administration Guide](#) and [Administration Guide](#).

Improved configuration flexibility

You can define configuration objects inline, where they are actually used, without having to define them in a separate object. This is useful if you need an object only once, for example, a filter or a rewrite rule, because it makes the configuration much easier to read. Every object can be defined inline: sources, destinations, filters, parsers, rewrite rules, and so on. For details, see [Administration Guide](#).

From now on, every configuration object is a log expression. Every configuration object is essentially a configuration block, and can include multiple objects. To reference the block, only the top-level object must be referenced. That way you can use embedded log statements, junctions and in-line object definitions within source, destination, filter, rewrite and parser definitions. For example, a source can include a rewrite rule to modify the messages received by the source, and that combination can be used as a simple source in a log statement. This feature allows you to preprocess the log messages very close to the source itself. For details, see [Administration Guide](#).

To make the configuration more readable, and to help avoid misconfiguration, you can use human-readable units when setting configuration options, for example, `log-fifo-size(2Mb)`. For details, see [Administration Guide](#).

Other changes

- The default value of `log-msg-size()` is 8192 instead of 65536. Increase it if needed.
- The `skip-cluster-health-check()` option is available for the `elasticsearch2()` destination. For details, see [Administration Guide](#).
- The `qdisk-dir` option of `syslog-ng` PE is not available as a command-line option, use the `dir()` option of `disk-buffer()` in the configuration of the destination instead.
- Several features and platforms that are available in `syslog-ng` Premium Edition 6 LTS are not yet available in `syslog-ng` PE 7. For details, see [Features available only in syslog-ng PE 6 LTS](#).

Deprecated features

The following is a list of features that are no longer supported starting with syslog-ng PE 7.0.10.

- The `failover-servers()` option has been deprecated. You can now use the `failover()` option to specify what happens after syslog-ng PE fails over to a secondary server.

Resolved issues

The following is a list of issues addressed in this release.

Table 2: General resolved issues

Resolved Issue	Issue ID
Messages from journald are not included in center statistics The center counter of the statistics framework did not count the messages arriving from the journal source. This issue has been fixed.	SYSLOGDEV-4343
Minor fixes in SELinux installer script This fix solves a few minor bugs in the SELinux installer script.	SYSLOGDEV-4345
syslog-ng crash when trying to open a corrupt logstore In certain cases, when an attempt was made to open a corrupt logstore, syslog-ng crashed and a core dump was generated. This issue has been fixed.	SYSLOGDEV-4350
Logstore file owner not set correctly When syslog-ng was running with only user privileges but with CAP_CHOWN capability enabled, the owner of the logstore file was not set correctly. This issue has been fixed.	SYSLOGDEV-4361
JVM not unloaded at syslog-ng reload Using Java-based destinations, when syslog-ng was reloaded, the Java Virtual Machine (JVM) was not exited so extra java processes remained. From now on, during a reload, the old java process will remain and it will be used after the reload.	SYSLOGDEV-4368
Support for cap_syslog capability The capability library (libcap) shipped with syslog-ng PE was outdated and it did not support the cap_syslog capability. From now on, it is supported.	SYSLOGDEV-4381

Features available only in syslog-ng PE 6 LTS

Several features that are available in syslog-ng Premium Edition 6 LTS are not yet available in syslog-ng PE 7. In case you need to use these features, use syslog-ng PE 6 LTS, or contact support; for advice. The features missing from syslog-ng PE 7 will become gradually available again in future releases of syslog-ng PE.

- The SNMP destination (`snmp()`).
- The SQL source (`sql()`).
- The `persist-tool` application.
- The `allow-compress()`, `ca-dir-layout()`, and `cert-subject()` options related to TLS transport.
- The syslog-ng PE 7 application is currently supported only on Linux platforms. For a detailed list, see [Administration Guide](#).
- The `spoof-interface()` options of the `network()` and `syslog()` destinations.
- The `read-old-records()` and `use-syslogng-pid()` options of the `file()` source.
- The `replace()`, `cut()`, and `format-snare()` template-functions.
- FIPS-compliant packages are not available.

Platforms not supported in syslog-ng PE 7

- AIX
- FreeBSD
- HP-UX
- Oracle Linux 5, 6
- openSUSE
- Solaris
- Windows

For a complete list of supported platforms, see [Administration Guide](#).

Product licensing

To enable a trial license

1. Apply for a trial license at the [syslog-ng website](#)
2. Download the license and the installation package for your platform, then follow the installation instructions in the Administration Guide.

To enable a purchased commercial license

1. Download the license and the installation package for your platform, then follow the installation instructions in the Administration Guide.

Upgrade and installation instructions

To install or upgrade syslog-ng Premium Edition, follow the instructions in the syslog-ng Premium Edition Administration Guide.

More resources

Additional information is available from the following:

- [Online product documentation](#)

About us

One Identity solutions eliminate the complexities and time-consuming processes often required to govern identities, manage privileged accounts and control access. Our solutions enhance business agility while addressing your IAM challenges with on-premises, cloud and hybrid environments.

Contacting us

For sales or other inquiries, visit <https://www.oneidentity.com/company/contact-us.aspx> or call +1-800-306-9329.

Technical support resources

Technical support is available to One Identity customers with a valid maintenance contract and customers who have trial versions. You can access the Support Portal at <https://support.oneidentity.com/>.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

- Submit and manage a Service Request
- View Knowledge Base articles
- Sign up for product notifications
- Download software and technical documentation
- View how-to-videos at www.YouTube.com/OneIdentity
- Engage in community discussions
- Chat with support engineers online
- View services to assist you with your product

Third-party contributions

This appendix includes the open source licenses and attributions applicable to syslog-ng Premium Edition.

GNU General Public License

Version 2, June 1991

1989, 1991 Free Software Foundation, Inc.

Free Software Foundation, Inc. 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Version 2, June 1991

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software - to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Library General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps:

1. copyright the software, and
2. offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

Section 0

This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you".

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

Section 1

You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

Section 2

You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of [Section 1](#) above, provided that you also meet all of these conditions:

- a. You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.
- b. You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.
- c. If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user

how to view a copy of this License. (Exception: If the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

Section 3

You may copy and distribute the Program (or a work based on it, under [Section 2](#) in object code or executable form under the terms of [Section 1](#) and [Section 2](#) above provided that you also do one of the following:

- a. Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,
- b. Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,
- c. Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

Section 4

You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

Section 5

You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

Section 6

Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

Section 7

If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

Section 8

If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

Section 9

The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

Section 10

If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY Section 11

BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

Section 12

IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER

PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

<one line to give the program's name and a brief idea of what it does.> Copyright (C) <year> <name of author>

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA

Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

Gnomovision version 69, Copyright (C) year name of author Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type "show w". This is free software, and you are welcome to redistribute it under certain conditions; type "show c" for details.

The hypothetical commands "show w" and "show c" should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than "show w" and "show c" ; they could even be mouse-clicks or menu items-- whatever suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the program "Gnomovision" (which makes passes at compilers) written by James Hacker.

<signature of Ty Coon>, 1 April 1989 Ty Coon, President of Vice

This General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the GNU Library General Public License instead of this License.

GNU Lesser General Public License

Version 2.1, February 1999

Copyright (C) 1991, 1999 Free Software Foundation, Inc.

Free Software Foundation, Inc. 51 Franklin Street, Fifth Floor Boston, MA 02110-1301 USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some specially designated software packages--typically libraries--of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below.

When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method:

1. we copyright the library, and
2. we offer you this license, which gives you legal permission to copy, distribute and/or modify the library.

To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

We call this license the Lesser General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

Section 0

This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".)

"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

Section 1

You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

Section 2

You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of [Section 1](#) above, provided that you also meet all of these conditions:

- a. The modified work must itself be a software library.
- b. You must cause the files modified to carry prominent notices stating that you

changed the files and the date of any change.

- c. You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.
- d. If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, [Subsection 2d](#) requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

Section 3

You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

Section 4

You may copy and distribute the Library (or a portion or derivative of it, under [Section 2](#)) in object code or executable form under the terms of [Section 1](#) and [Section 2](#) above provided that you accompany it with the complete corresponding machine-readable source code,

which must be distributed under the terms of [Section 1](#) and [Section 2](#) above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

Section 5

A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. [Section 6](#) states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under [Section 6](#).)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of [Section 6](#). Any executables containing that work also fall under [Section 6](#), whether or not they are linked directly with the Library itself.

Section 6

As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

- a. Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be

distributed under [Section 1](#) and [Section 2](#) above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

- b. Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.
- c. Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in [Subsection 6a](#), above, for a charge no more than the cost of performing this distribution.
- d. If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.
- e. Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

Section 7

You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

- a. Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.
- b. Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

Section 8

You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

Section 9

You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.

Section 10

Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this License.

Section 11

If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty-free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

Section 12

If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

Section 13

The Free Software Foundation may publish revised and/or new versions of the Lesser General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.

Section 14

If you wish to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY Section 15

BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

NO WARRANTY Section 16

IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO

LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Libraries

If you develop a new library, and you want it to be of the greatest possible use to the public, we recommend making it free software that everyone can redistribute and change. You can do so by permitting redistribution under these terms (or, alternatively, under the terms of the ordinary General Public License).

To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

<one line to give the library's name and a brief idea of what it does.> Copyright (C)
<year> <name of author>

This library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.

This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.

You should have received a copy of the GNU Lesser General Public License along with this library; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA

Also add information on how to contact you by electronic and paper mail.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the library, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the library `Frob' (a library for tweaking knobs) written by James Random Hacker.

<signature of Ty Coon>, 1 April 1990 Ty Coon, President of Vice

That's all there is to it!

License attributions

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<https://www.openssl.org/>). This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)

Copyright 2018 One Identity LLC.

ALL RIGHTS RESERVED.

This guide contains proprietary information protected by copyright. The software described in this guide is furnished under a software license or nondisclosure agreement. This software may be used or copied only in accordance with the terms of the applicable agreement. No part of this guide may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording for any purpose other than the purchaser's personal use without the written permission of One Identity LLC .

The information in this document is provided in connection with One Identity products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of One Identity LLC products. EXCEPT AS SET FORTH IN THE TERMS AND CONDITIONS AS SPECIFIED IN THE LICENSE AGREEMENT FOR THIS PRODUCT, ONE IDENTITY ASSUMES NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL ONE IDENTITY BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF ONE IDENTITY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. One Identity makes no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. One Identity does not make any commitment to update the information contained in this document.

If you have any questions regarding your potential use of this material, contact:

One Identity LLC.
Attn: LEGAL Dept
4 Polaris Way
Aliso Viejo, CA 92656

Refer to our Web site (<http://www.OneIdentity.com>) for regional and international office information.




Patents

One Identity is proud of our advanced technology. Patents and pending patents may apply to this product. For the most current information about applicable patents for this product, please visit our website at <http://www.OneIdentity.com/legal/patents.aspx>.

Trademarks

One Identity and the One Identity logo are trademarks and registered trademarks of One Identity LLC. in the U.S.A. and other countries. For a complete list of One Identity trademarks, please visit our website at www.OneIdentity.com/legal. All other trademarks are the property of their respective owners.

Legend

-  **WARNING: A WARNING icon indicates a potential for property damage, personal injury, or death.**
-  **CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.**
-  **IMPORTANT, NOTE, TIP, MOBILE, or VIDEO: An information icon indicates supporting information.**