

**Oracle® Communications Session
Border Controller**

Release Notes

Release S-CX6.4.0

Formerly Net-Net Session Director

October 2013

Copyright ©2013, 2012, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

Table of Contents

Table of Contents	iii
About this Guide	7
Overview	7
Supported Platforms	7
Related Documentation	7
.....	8
Revision History	8
Net-Net OS S-CX6.4.0 Release Notes	9
Introduction	9
Hardware Platform Support.....	9
Included Releases	9
S-CX6.4.0 Upgrade Prerequisites	9
S-CX6.4.0 New Features.....	9
SIP Features	9
SIP Replaces Header Support.....	9
SIP Timers: Discreet Configuration	10
RFC 4028 Session Timers	10
H.323 Features	10
Video Conferencing Support for Polycom Terminals.....	10
H.235 Encryption.....	10
IWF Features	10
SIP-H.323 Interworking with Dynamic Payload Types.....	10
Flow Control Mapping for Interworking Function (IWF) Video	11
Application Layer Gateway Services	11
DNS ALG Message Throttling	11
Session Routing and Load Balancing Features.....	11
IPv6 ENUM Server Support	11
Security Features	11
Trusted to Untrusted Transition Trap	11

SRTP IPv4/IPv6 Internetworking.....	12
SRTP/Linksys Interoperability	12
IMS Features	12
LIR/LIA Lookup to Home Subscriber Server from I-BCF.....	12
IPSec IMS-AKA	12
IR.92 Compliance via SIP 380 Response.....	13
Provisioning of SIP Signaling Flow Information	13
RCS Features.....	13
Message Session Relay Protocol	13
Accounting Features.....	13
Enhanced Stop CDR Reporting for Exceeded Ingress Session Constraints.....	13
Management Features	14
Message Rate Statistics.....	14
External Policy Servers Features	14
Subscriber Information AVP	14
Optimization of AAR Messages.....	14
CLF/Diameter e2 Error Handling	14
SNMP Features.....	15
Persistent Indexing of SNMP Tables.....	15
Additional Features.....	15
IP Identification (ID) Field	15
ETC Monitoring.....	15
Admin Security Features	15
Management Changes Summary	15
ACLI Command Changes	16
ACLI Configuration Changes	16
Added ACLI Parameters	16
SNMP Changes	18
Accounting VSA Changes	22
Known Issues	23
HMR Limitation	23
Message Rate Statistics.....	23
Notices and Third Party Licenses	25
Acme Packet Notices	25
Third Party Licenses.....	26
ARES Library.....	26
ASN1 Object Dumping Code	26
bitstring.h	26
Boost Library.....	27
Dropbear	27

CURL Library.....	28
GNU Common C++ Library	29
GNU Regular Expression Library.....	29
PCAP Library.....	29
IPSecKey	29
libeditline Library	30
libtar Library	30
libtelnet Library.....	31
libusb Library.....	31
LUA	31
OpenSSL Library.....	31
Perl-Compatible Regular Expressions (PCRE)	37
popt Command Line Option Parsing Library.....	37
Remote Authentication Dial In User Service (RADIUS)	37
Redblack Source Code	38
sdparam SCSI Disk Utility	38
Smart Pointer.....	38
Strong Random Number Generator	39
TCP/IP Stack (for ATCP)	39
VxWorks-2-Linux Library.....	40
xntp Time Synchronization Library.....	40
zlib Data Compression Library	41
zoneinfo	41
busybox	41
dmidecode	41
dosfstools	41
e2fsprogs	41
grub.....	41
irqbalance.....	41
Linux Kernel	41
kexec-tools	42
parted	42
procps.....	42
sg3_utils	42
usbutil.....	42
wireshark	42
APPENDIX A - GNU LESSER GENERAL PUBLIC LICENSE.....	45
APPENDIX B - GNU General Public License, version 2 (GPL-2.0).....	53
APPENDIX C - GNU General Public License, version 3 (GPL-3.0)	58

About this Guide

Overview

The *Oracle Communications Session Border Controller Release Notes* provides the following information when applicable:

- An overview of the new features available
- An overview of the management enhancements
- An overview of the accounting enhancements
- A summary of changes to the Packet Command Line Interface (ACLI)
- A summary of known issues and fixed defects
- Documentation updates

If any of these sections does not appear in the document, then there were no changes to summarize in that category for that specific release.

Supported Platforms

Release Version S-CX6.4.0 is supported on the Acme Packet 4500 and Acme Packet 3800 series platforms.

Related Documentation

The following table lists the members that comprise the documentation set for this release:

Document Name	Document Description
Acme Packet 4500 System Hardware Installation Guide	Contains information about the components and installation of the Acme Packet 4500 system.
Acme Packet 3800 Hardware Installation Guide	Contains information about the components and installation of the Acme Packet 3800 system.
Release Notes	Contains information about the current documentation set release, including new features and management changes.
ACLI Configuration Guide	Contains information about the administration and software configuration SBC.
ACLI Reference Guide	Contains explanations of how to use the ACLI, as an alphabetical listings and descriptions of all ACLI commands and configuration parameters.

Document Name	Document Description
Maintenance and Troubleshooting Guide	Contains information about Net-Net SBC logs, performance announcements, system management, inventory management, upgrades, working with configurations, and managing backups and archives.
MIB Reference Guide	Contains information about Management Information Base (MIBs), Enterprise MIBs, general trap information, including specific details about standard traps and enterprise traps, Simple Network Management Protocol (SNMP) GET query information (including standard and enterprise SNMP GET query names, object identifier names and numbers, and descriptions), examples of scalar and table objects.
Accounting Guide	Contains information about the SBC's accounting support, including details about RADIUS accounting.
HDR Resource Guide	Contains information about the SBC's Historical Data Recording (HDR) feature. This guide includes HDR configuration and system-wide statistical information.
Administrative Security Essentials	Contains information about the SBC's support for its Administrative Security license.

Revision History

This section contains a revision history for this document.

Date	Revision Number	Description
October 19, 2012	Revision 1.0	• Initial Release
May 13, 2013	Revision 1.01	• Adds more detail to HMR limitation section

Net-Net OS S-CX6.4.0 Release Notes

Introduction

The *Net-Net OS S-CX6.4.0 Release Notes* provide the following information about Net-Net Session Director:

- An overview of the new features available
- A summary of changes to the Acme Packet Command Line Interface (ACLI)
- A summary of known issues

Hardware Platform Support

As of Release S-CX6.4.0, the Net-Net Session Director no longer supports the Net-Net 4250 Hardware platform.

Included Releases

S-CX6.4.0 includes all features in S-CX6.3.0m1. These features are noted in the First availability note within the feature overviews in the following section.

S-CX6.4.0 Upgrade Prerequisites

Verify that your Net-Net system has been upgraded to the bootloader dated June 21, 2011 or later. You can use the **show version boot** ACLI command for this query.

```
ACMEPACKET# show version boot

Bootloader Info
-----
Stage 1 Date: 06/21/2011 09:01:15
Stage 2 Date: 06/21/2011 ff:ff:ff
[...]
```

Refer to the [Known Issues \(23\)](#) section for any caveats involving software upgrades.

S-CX6.4.0 New Features

This section describes the new features available in Net-Net Session Director.

Note: System session capacity and performance are subject to variations between various use cases (e.g. call models) and major software releases

SIP Features

SIP Replaces Header Support

The Net-Net SBC supports the Replaces: header in SIP messages according to RFC 3891. The header, included within SIP INVITE messages, provides a mechanism to replace an existing early or established dialog with a different dialog which can be

used for services such as call parking, attended call transfer and various conferencing features.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, SIP Signaling Chapter

SIP Timers: Discreet Configuration

Creates availability of a global, default transaction timeout value (expressed in seconds) used exclusively for initial INVITE transactions.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, SIP Signaling Chapter

RFC 4028 Session Timers

The Net-Net SBC supports RFC 4028 Session Timers. In this role, the Net-Net SBC acts as a B2BUA between two endpoints and then enforces the timer values on each call leg independently.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, SIP Signaling Chapter

H.323 Features

Video Conferencing Support for Polycom Terminals

In previous versions the Acme Packet Net-Net SBC when installed in a video conferencing environment composed of Polycom H323 terminals and a Polycom MCU (Multipoint Conferencing Unit) failed to relay certain H.239/H.245 resulting in service degradation. Version S-CX6.4.0 addresses this problem and ensures that these message types are now correctly implemented.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, H.323 Signaling Chapter

H.235 Encryption

Following the ITU-T H.235 encryption standard, the Net-Net SBC allows media (audio, video, and data) that has already been encrypted by endpoints to pass through it, thereby supporting video-conferencing applications where media confidentiality is key.

First availability: S-CX6.3.0m1

Feature Description Location: ACLI Configuration Guide, H.323 Signaling Chapter

IWF Features

SIP-H.323 Interworking with Dynamic Payload Types

The SIP and H.323 Protocols use RTP for transferring real-time audio/video data. The interworking function (IWF) provides a means of converting translation and signaling protocols and session descriptions between SIP and H.323. However, SIP and H.323 provide different mechanisms when exchanging payload types for media during IWF calls. Therefore, the International Telecommunications Union (ITU) modified the ITU H.245 recommendations in H.245 v16 to include a new "Dynamic Payload Type Replacement" capability that resolves this payload type conflict. This new capability provides a way for an H.323 endpoint to specify the payload type of

a media stream for which the endpoint is willing to receive through the OLC-acknowledgment (OLC-ACK) message in an audio/video call flow.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, IWF Services Chapter

Flow Control Mapping for Interworking Function (IWF) Video

The Net-Net SBC supports the SIP counter part of the H.245 FlowControlCommand using the SIP signaling path with the INFO method. The Net-Net SD sends the SIP INFO message with "change_bitrate" rate parameter that has the value 100* maxBitRate from the corresponding H.245 FlowControlCommand message.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, IWF Services Chapter

Application Layer Gateway Services

DNS ALG Message Throttling

You can limit DNS ALG-bound throughput by using the dns-alg-constraints configuration element. Message throttling is performed on request messages, and since DNS-ALG is transaction stateful, the responses are automatically throttled. Once a dns-alg-constraints element is configured, it can be referenced by a DNS configuration object. This allows users to create constraint profiles and apply them to multiple DNS configuration objects.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, Application Layer Gateway Services Chapter

Session Routing and Load Balancing Features

IPv6 ENUM Server Support

The Net-Net SBC supports IPv6 ENUM configurations in IPv6 realms. The **enum-servers** parameter in the enum-config configuration parameter can be configured IPv6 addresses in addition to IPv4 addresses. When IPv6 Addresses are used, the realm configured in the realm-id parameter must be an IPv6 realm.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, Session Routing and Load Balancing Chapter

Security Features

Trusted to Untrusted Transition Trap

When endpoints transition to an *untrusted* DDoS state, prior to being denied service, an SNMP trap can be configured to be sent.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, Security Chapter

SRTP IPv4/IPv6 Internetworking

SRTP operations are enhanced internetwork IPv4 and IPv6 media while using SDES as the key exchange protocol. Previous versions supported SRTP IPv4/IPv6 internetworking using the MIKEY key exchange protocol.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, Security Chapter

SRTP/Linksys Interoperability

The Net-Net SBC enhances enterprise operations by providing the capability to inter-operate and establish secure calls between itself and Linksys Analog Telephone Adapters (ATA) and IP phones.

In contrast to current SRTP implementations, which are standards-based in conformance with RFC 3711, *The Secure Real-time Transport Protocol (SRTP)*, Linksys interoperability requires support for a proprietary protocol. The proprietary protocol is similar, but not identical to RFC 3711, and uses a non-standard certificate exchange to perform mutual authentication, and then to transfer cryptographic keying material.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, Security Chapter

IMS Features**LIR/LIA Lookup to Home Subscriber Server from I-BCF**

The Net-Net SBC, acting as an I-BCF, can perform a Location Information Lookup (LIR) to a Home Subscriber Server (HSS) to find the S-CSCF where to forward a request message. LIR/LIA messages are part of the Diameter Cx interface, which is used to communicate with HSS.

In an IMS environment, a user registers with S-CSCF and that S-CSCF assigns itself with an HSS as the serving registrar for that user. When a call needs to be routed to the user, an I-BCF performs a location information lookup to the HSS to determine the S-CSCF for that user and route the request toward that S-CSCF.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, IMS Chapter

IPSec IMS-AKA

Compliance with the VoLTE specification (GSMA PRD IR.92) requires cluster member support for IPsec IMS-AKA (IP Multimedia Services Authentication and Key Agreement) as defined in 3GPP TS 24.299, *IP Multimedia Call Control Protocol Based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP): Stage 3*, and TS 33.203, *3G Security: Access Security for IP-based Services*.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, IMS Chapter

IR.92 Compliance via SIP 380 Response

This feature furthers the Net-Net SBC's compliance with GSMA's Voice over LTE specification (IR.92) to redirect VoLTE originated emergency calls to a circuit switched network.

When the Net-Net SBC receives an emergency call, which it can not complete, it returns a 380 (Alternative Service) response to the sender.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, IMS Chapter

Provisioning of SIP Signaling Flow Information

This feature supports of Provisioning of SIP Signalling Flow Information as described in 3GPP TS 29.213 section B1b [1], and the procedures specified in TS 29.214 section 4.4.5a.

The feature applies to the scenario when the Net-Net SBC (A-SBC / P-CSCF) uses its external policy server functionality and connects to a PCRF via Rx interface in bandwidth-management mode.

This feature deals with the information that the Net-Net SBC includes in an AAR message it sends to the PCRF when an endpoint registers, re-registers, and de-registers.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, IMS Chapter

RCS Features**Message Session Relay Protocol**

The Acme Packet Session Director supports Message Relay Protocol (MSRP) sessions initiated by Session Description Protocol (SDP) messages exchanged via the Session Initiation Protocol (SIP) offer/answer model. MSRP usage with SDP and SIP is described in Section 8 of RFC 4975, *The Message Relay Protocol*. The Session Director functions as a Back-to-Back User Agent (B2BUA) for MSRP sessions, terminating incoming MSRP, proxying for the MSRP session originator, initiating outgoing MSRP to the endpoint peer, and providing Network Address Translation (NAT) services.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, RCS Services Chapter

Accounting Features**Enhanced Stop CDR Reporting for Exceeded Ingress Session Constraints**

This feature enables consistent generation of RADIUS Stop records on both ingress and egress paths for RADIUS Stop records when calls are rejected for exceeding configured session ingress or egress constraints. On the egress path, prior releases rejected such calls with a 503 (Service Unavailable) response and the generation of a RADIUS STOP record. On the ingress path, however, while calls were rejected with a 503 response, RADIUS Stop records were not generated.

First availability: S-CX6.4.0

Feature Description Location: Accounting Guide, Configuring RADIUS Chapter

Management Features

Message Rate Statistics

The Net-Net SBC provides message rate statistics for SIP, DNS, and ENUM traffic. These statistics are available at the ACLI and via HDR.

First availability: S-CX6.4.0

Feature Description Location: Maintenance and Troubleshooting Guide, Performance Management Chapter (ACLI output)

Feature Description Location: HDR Resource Guide, HDR Groups and Group Statistics Chapter (HDR output)

External Policy Servers Features

Subscriber Information AVP

Certain policy servers rely on having the user's URI information available as means to identify the endpoint/subscriber. In addition to conveying the L3 IP address of a user, the Net-Net SBC supports RFC 4006: The Subscription-Id AVP. It identifies the end user's subscription and is used in 3GPP Rx reference point. This feature can be enabled regardless of the selected application mode of the external policy server.

You can enable the Net-Net SBC to include the Subscription-ID-Type based on the received message's request line's Request URI, or you can set the Subscription ID type on a per-realm basis.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, External Policy Servers Chapter

Optimization of AAR Messages

When the SBC acts as a P-CSCF, the Diameter Rx interface updates bandwidth and addressing changes during a session. Many transactions between the P-CSCF and a PCRF server trigger a new SDP offer, and an AA-Request (AAR) is sent to update bearer parameters. However, many transactions between the P-CSCF and PCRF do not require updates. In these instances, it is not necessary for the P-CSCF to initiate an AAR. This feature allows you to optimize the AAR for media updates during the dialog setup for Diameter Rx.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, External Policy Servers Chapter

CLF/Diameter e2 Error Handling

When the Net-Net SBC receives an error, as defined in RFC 3588, in a UDA message from a CLF, it replies to the UA with a 503 Service Unavailable message. There are exceptions for certain values embedded in either the Result-Code AVP or Experimental Result-Code AVP.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, External Policy Servers Chapter

Maintenance and Troubleshooting Guide, Performance Management Chapter

SNMP Features

Persistent Indexing of SNMP Tables

Certain Acme Packet proprietary MIB tables support persistent indexing across reboots. The purpose is to maintain the value of that object so that after a reboot or configuration reload, the value that identifies an object remains the same.

First availability: S-CX6.4.0

Feature Description Location: MIB Reference Guide, Acme Packet MIBs

Additional Features

IP Identification (ID) Field

The Net-Net SBC can populate the IP ID field with an incrementing value. Every non-fragmented packet sent will have its ID increased by one from the previous packet sent. Enabling the ID field can help distinguish a retransmitted non-fragmented application layer packet from a packet retransmitted by the network layer in monitoring or lab situations.

First availability: S-CX6.4.0

Feature Description Location: ACLI Configuration Guide, System Configuration Chapter

ETC Monitoring

The Net-Net SBC can monitor an Enhanced Traffic Control (ETC) NIU card's data cores' average load and memory usage. Any excessive load is reported as an alarm, independently for CPU load and memory usage. When data core or memory usage rises above a set threshold, an alarm is enabled and a trap is sent. No new calls are accepted by the system until the alarm is cleared.

First availability: S-CX6.4.0

Feature Description Location: Maintenance and Troubleshooting Guide, Fault Management Chapter

Admin Security Features

A new *Admin Security* APC license is now available which works in conjunction with a previously installed *Admin Security* license to enhance password strength requirements in certain high security environments. Enhanced password strength requirements depend on the presence of both the *Admin Security* license and the *Admin Security* ACP license.

First availability: S-CX6.4.0

Feature Description Location: Maintenance and Troubleshooting Guide, System Management Chapter

Management Changes Summary

This section summarizes the projected ACLI, SNMP, and RADIUS accounting management changes for Net-Net OS Release S-CX6.4.0. Changes appearing in this document have been added since the availability of Net-Net S-CX6.3.0.

ACLI Command Changes

This section summarizes the ACLI command changes that appear in Net-Net OS Release S-CX6.4.0.

Availability	Change	Description
nnSCX630f1	<code>security srtp check-mi ni -cert</code> <code>security srtp display-mi ni -cert</code> <code>security srtp update-mi ni -cert</code>	Adding commands for Linksys/SRTP SIPURA certificate manipulation.
	<code>show enum rate</code> <code>show dnsalg rate</code> <code>show sipd rate</code>	Adds rate statistics
	<code>show msrp stats</code>	Adds command to display MSRP statistics

ACLI Configuration Changes

This section summarizes the ACLI command changes that first appear in Net-Net OS Version S-CX6.4.0.

Added ACLI Parameters

Availability	Change	Description
nnSCX640	<code>system > media-manager > media-manager-config > trap-on-demote-to-untrusted</code>	Enables trusted to untrusted trap to be sent from the Net-Net SBC
	<code>system > security > media-security > sipura-profile</code> • <code>name</code> • <code>crypto-list</code> • <code>certificate-file-name</code>	Adds a new subconfiguration element to support Linksys/SRTP Interoperability
	<code>system > security > security-config</code> • <code>local-cert-exp-trap-int</code> • <code>local-cert-exp-warn-period</code>	Adds new parameters to enable security certificate presence and expiration traps
	<code>session-router > sip-profile</code> • <code>replaces-dialog</code>	Adds new parameter to enable RFC 3891/Replaces: header support
	<code>session-router > sip-config</code> • <code>extra-method-stats</code> • <code>extra-enum-stats</code>	Adds new parameters to enable ENUM and SIP method rate statistic collection
	<code>media-manager > dns-config</code> • <code>extra-dnsalg-stats</code>	Adds new parameter to enable DNS message rate statistic collection
	<code>session-router > home-subscriber-server</code> • <code>name</code> • <code>state</code> • <code>address</code> • <code>port</code> • <code>watchdog-ka-timer</code> • <code>add-lookup-parameter</code>	Adds new configuration element and parameters to support HSS functionality.

media-manager > dnsalg-constraints	<ul style="list-style-type: none"> • name • state • max-burst-rate • max-inbound-burst-rate • max-outbound-burst-rate • burst-rate-window • max-sustain-rate • max-inbound-sustain-rate • max-outbound-sustain-rate • sustain-rate-window • max-latency • time-to-resume 	Adds new configuration element and parameters to support DNS ALG message throttling
media-manager > dns-config	<ul style="list-style-type: none"> • constraint-name 	Adds new parameter to dns-config to apply DNS ALG message throttling profile
session-router>sip-config>initial-inv-trans-expire		Adds parameter that sets a default transaction timeout value (in seconds) used exclusively for initial INVITE transactions on this SIP interface.
session-router > realm-config		Adds parameter to set a Subscription ID type sent in an AAR message to an External Policy Server in this realm
subscription-id-type		
session-router > sip-interface		Adds parameter to fill the reason tag of the <ims-3gpp> element in a 380 response for a failed-to-route emergency call for IR.92 compliance
send-380-response		
media-manager>ext-policy-server>optimize-aar		Adds parameter that reduces the number of AAR messages sent to the PCRF during a session.
media-manager>ext-policy-server>provision-signaling-flow		Adds parameter that enables the Net Net SBC to send AAR messages to a PCRF on endpoint registrations.
session-router > session-timer-profile	<ul style="list-style-type: none"> • name • session-expires • min-se • force-reinvite • request-refresher • response-refresher 	Adds new configuration element and parameters to support RFC 4028 Session Timers
session-timer-profile		
session-router > sip-interface	<ul style="list-style-type: none"> • session-timer-profile 	Adds parameter to apply a configured session timer profile to this sip interface
media-manager > msrp-config	<ul style="list-style-type: none"> • state • uri-translation • session-inactivity-timer 	Adds new configuration element and parameters to support MSRP
media-manager > msrp-delayed-bye-timer		Adds new parameter to support MSRP
msrp-delayed-bye-timer		

media-manager > tcp-media-profile	Adds new configuration element and parameters to support MSRP
media-manager > tcp-media-profile > tcp-media-profile-entry	Adds new sub-configuration element and parameters to support MSRP
<ul style="list-style-type: none"> • media-type • transport-protocol • listen-port • preferred-setup-role • tls-profile • require-fingerprint 	
media-manager > realm-config	Adds parameter to support MSRP
<ul style="list-style-type: none"> • tcp-media-profile 	
security > password-policy	Adds parameter that specifies the maximum lifetime in days.
<ul style="list-style-type: none"> • expiry-interval 	
security > password-policy	Adds parameter that specifies the minimum password lifetime.
<ul style="list-style-type: none"> • password-change-interval 	
security > password-policy	Adds parameter that specifies the number of days prior to expiration that users begin to receive password expiration notifications.
<ul style="list-style-type: none"> • expiry-notify-period 	
security > password-policy	Adds parameter that specifies the time after a password expiration, the user has until forced to change password.
<ul style="list-style-type: none"> • grace-period 	
security > password-policy	Adds parameter that specifies the number of logins after a password expiration, the user has until forced to change password.
<ul style="list-style-type: none"> • grace-logins 	
security > password-policy	Adds parameter that specifies the number of previously used passwords retained in encrypted format in the password history cache.
<ul style="list-style-type: none"> • password-history-count 	
security > password-policy	Adds parameter that enables the enhanced password strength requirements provided by the new Admin Security ACP license.
<ul style="list-style-type: none"> • password-policy-strength 	

SNMP Changes

This section summarizes the SNMP/MIB changes that appear in Net-Net OS Release S-CX6.4.0 GA.

Availability	Changes	MIB Details	Description
S-CX6.4.0		Hosted Security Certificate Expiration	
Capability group in ap-agentcapability.mib	apSecurityCertificateCap	Includes:	Acme Packet agent capability
		<ul style="list-style-type: none"> • apSecurityCertObjectsGroup • apSecurityCertNotificationsGroup 	
		(apSecurityMibCapabilities 7)	

Availability	Changes	MIB Details	Description
	Object group in ap-security.mib	apSecurityCertObjectsGroup Objects: <ul style="list-style-type: none"> • apSecurityCertificateRecordName • apSecurityCertificateCertSubject • apSecurityCertificateCertStart • apSecurityCertificateCertExpire • apSecurityCertificateCertIssuer • apSecurityCertificateCertIsCA (apSecurityGroups 4)	Objects to identify the security certificate installed locally on the Net-Net SBC and its expiration time.
	Notifications group in ap-security.mib	apSecurityCertNotificationsGroup <ul style="list-style-type: none"> • apSecurityCertExpiredNotification • apSecurityCertExpireSoonNotification (apSecurityNotificationsGroups 7)	Traps generated when a security certificate is due to or has expired.
S-CX6.4.0	DNS ALG Message Throttling		
	Capability group in ap-agentcapability.mib	apDNSALGStatsGroupCap Includes: <ul style="list-style-type: none"> • apDnsAlgServerStatusGroup • apDnsAlgStatsGroup (apDNSALGMibCapabilities 1)	Acme Packet agent capability
	Object group in ap-dnsalg.mib	apDnsAlgServerStatusGroup Objects: <ul style="list-style-type: none"> • apDNSALGConfigIndex • apDNSALGServerIndex • apDNSALGConfigName • apDNSALGServerRealm • apDNSALGDomainSuffix • apDNSALGServerIpAddress • apDNSALGServerStatus (apDNSALGObjectGroups 1)	Objects to identify the DNS server and status.
	Object group in ap-dnsalg.mib	apDnsAlgStatsGroup Objects: <ul style="list-style-type: none"> • apDnsAlgClientRealmIndex • apDnsAlgClientRealmName • apDnsAlgCurrentQueries • apDnsAlgTotalQueries • apDnsAlgCurrentSuccess • apDnsAlgTotalSuccess • apDnsAlgCurrentNotFound • apDnsAlgTotalNotFound • apDnsAlgCurrentTimeOut • apDnsAlgTotalTimeOut • apDnsAlgCurrentBadStatus • apDnsAlgTotalBadStatus • apDnsAlgCurrentOtherFailures • apDnsAlgTotalOtherFailures • apDnsAlgAvgLatency • apDnsAlgMaxLatency • apDnsAlgMaxBurstRate (apDNSALGObjectGroups 2)	Objects to identify the constraint policy statistics for the given DNS server.
	Capability group in ap-agentcapability.mib	apDNSALGNotifGroupCap Includes: <ul style="list-style-type: none"> • apDNSALGNotifGroupCap (apDNSALGMibCapabilities 2)	Acme Packet agent capability

Availability	Changes	MIB Details	Description
	Object group in ap-dnsalg.mib	apDNSALGNotifGroupCap <ul style="list-style-type: none"> • apDnsAlgStatusChangeTrap • apDnsAlgStatusChangeClearTrap • apDnsAlgConstraintStateChangeTrap • apDnsAlgConstraintStateChangeClearTrap • apDnsAlgSvrConstraintStateChangeTrap • apDnsAlgSvrConstraintStateChangeClearTrap (apDNSALGNotificationGroups 1)	Traps sent when the reachability status of a DNS server changes, or the constraint status of a DNS object changes.
S-CX6.4.0	IPv6 Support for ENUM Servers		
	Capability group in ap-agentcapability.mib	apAppsENUMStatusGroupCap Includes: <ul style="list-style-type: none"> • apAppsENUMServerStatusGroup (apAppsMibCapabilities 1)	Acme Packet agent capability
	Object group in ap-apps.mib	apAppsENUMServerStatusGroup <ul style="list-style-type: none"> • apAppsENUMConfigName, • apAppsENUMServerInetAddressType, • apAppsENUMServerInetAddress, • apAppsENUMServerStatus (apAppsObjectGroups 1)	Objects added to support and identify IPv6 ENUM servers.
	Capability group in ap-agentcapability.mib	apAppsENUMSrvNotifGroupCap Includes: <ul style="list-style-type: none"> • apAppsEnumServerNotificationsGroup (apAppsMibCapabilities 3)	Acme Packet agent capability
	Notifications group in ap-security.mib	apAppsEnumServerNotificationsGroup: <ul style="list-style-type: none"> • apAppsENUMServerStatusChangeTrap (apAppsNotificationGroups 1)	Trap generated if the status of an IPv6 ENUM server changes.
S-CX6.4.0	DNS Server Status		
	Capability group in ap-agentcapability.mib	apAppsDNSStatusGroupCap Includes: <ul style="list-style-type: none"> • apAppsDnsServerStatusGroup (apAppsMibCapabilities 2)	Acme Packet agent capability
	Object group in ap-apps.mib	apAppsDnsServerStatusGroup: <ul style="list-style-type: none"> • apAppsDnsInterfaceName, • apAppsDnsServerInetAddressType, • apAppsDnsServerInetAddress, • apAppsDnsServerStatus (apAppsObjectGroups 2)	Group of objects to identify the status of a DNS server used by a SIP daemon.
	Capability group in ap-agentcapability.mib	apAppsDNSSrvNotifGroupCap Includes: <ul style="list-style-type: none"> • apAppsDnsServerNotificationsGroup (apAppsMibCapabilities 4)	Acme Packet agent capability
	Object group in ap-smgmt.mib	apAppsDnsServerNotificationsGroup: <ul style="list-style-type: none"> • apAppsDnsServerStatusChangeTrap (apAppsNotificationGroups 2)	Trap generated when the status of a DNS server used by a SIP daemon changes.
S-CX6.4.0	DIAMETER Management		

Availability	Changes	MIB Details	Description
Capability group in ap-agentcapability.mib	apDiamMibCap	Includes: <ul style="list-style-type: none">• apDiamACCTObjectsGroup• apDiamACCTNotificationsGroup• apDiamClfErrorStatsGroup• apDiamACCTResultObjectsGroup• apDiamACCTResultNotificationsGroup (apDiamMibCapabilities 1)	Acme Packet agent capability
Object group in ap-diameter.mib	apDiamACCTObjectsGroup	Objects: <ul style="list-style-type: none">• apDiamAcctSrvrHostName• apDiamAcctSrvrIPPort• apDiamAcctSrvrOriginRealm• apDiamAcctSrvrOriginHost• apDiamAcctSrvrOriginTransportType (apDiamNotificationGroups 1)	Object group accessible only to traps for Diameter Server information.
Object group in ap-diameter.mib	apDiamACCTNotificationsGroup	Objects: <ul style="list-style-type: none">• apDiameterAcctSrvrUpTrap• apDiamAcctSrvrDownTrap• apAcctMsgQueueFullTrap• apAcctMsgQueueFullClearTrap (apDiamNotificationGroups 2)	Notification group for Diameter server events.
Trap in ap-diameter.mib	apDiameterAcctSrvrUpTrap	Includes: <ul style="list-style-type: none">• apDiamAcctSrvrHostName• apDiamAcctSrvrIPPort• apDiamAcctSrvrOriginRealm• apDiamAcctSrvrOriginHost• apDiamAcctSrvrOriginTransportType (apDiamNotifications 1)	Trap generated when the Diameter Accounting server becomes available
Trap in ap-diameter.mib	apDiamAcctSrvrDownTrap	Includes: <ul style="list-style-type: none">• apDiamAcctSrvrHostName• apDiamAcctSrvrIPPort• apDiamAcctSrvrOriginRealm• apDiamAcctSrvrOriginHost• apDiamAcctSrvrOriginTransportType (apDiamNotifications 2)	Trap generated when the Diameter Accounting server goes down.
Trap in ap-diameter.mib	apAcctMsgQueueFullTrap	Includes: <ul style="list-style-type: none">• apAcctMsgQueueAvailCurrent• apAcctMsgQueueMinorThreshold• apAcctMsgQueueMajorThreshold• apAcctMsgQueueCriticalThreshold (apDiamNotifications 3)	Trap generated when the accounting message queue is full and all accounting servers are down.
Trap in ap-diameter.mib	apAcctMsgQueueFullClearTrap	Includes: <ul style="list-style-type: none">• apAcctMsgQueueAvailCurrent• apAcctMsgQueueMinorThreshold• apAcctMsgQueueMajorThreshold• apAcctMsgQueueCriticalThreshold (apDiamNotifications 4)	Trap generated when the accounting message queue has fallen below the apAcctMsgQueueMinorThreshold, and all accounting servers are up.

Availability	Changes	MIB Details	Description
	Object group in ap-diameter.mib	<p>apDiamClfErrorStatsGroup</p> <p>Includes:</p> <ul style="list-style-type: none"> • apDiamClfExtPolSrvName • apDiamClfErrorsRecent • apDiamClfErrorsTotal • apDiamClfErrorsPerMax <p>(apDiamObjectGroups 1)</p>	Object group for CLF statistics of external policy server errors.
	Object group in ap-diameter.mib	<p>apDiamACCTRResultObjectsGroup</p> <p>Includes:</p> <ul style="list-style-type: none"> • apDiameterResultCode <p>(apDiamNotificationGroups 3)</p>	Object group accessible only to traps for Result-Code (268) AVP value.
	Notification group in ap-diameter.mib	<p>apDiamACCTRResultNotificationsGroup</p> <p>Includes:</p> <ul style="list-style-type: none"> • apDiameterSrvrErrorResultTrap • apDiameterSrvrSuccessResultTrap <p>(apDiamNotificationGroups 4)</p>	Notification group for Diameter server result events.
	Trap in ap-diameter.mib	<p>apDiameterSrvrErrorResultTrap</p> <p>Includes:</p> <ul style="list-style-type: none"> • apDiamAcctSrvrHostName • apDiamAcctSrvrIPPort • apDiamAcctSrvrOriginRealm • apDiamAcctSrvrOriginHost • apDiamAcctSrvrOriginTransportType <p>(apDiamNotifications 5)</p>	Generated when the Diameter Server returns 3xxx (Protocol Errors), 4xxx (Transient Failures), or 5xxx (Permanent Failure) Result-Code AVP (268).
	Trap in ap-diameter.mib	<p>apDiameterSrvrSuccessResultTrap</p> <p>Includes:</p> <ul style="list-style-type: none"> • apDiamAcctSrvrHostName • apDiamAcctSrvrIPPort • apDiamAcctSrvrOriginRealm • apDiamAcctSrvrOriginHost • apDiamAcctSrvrOriginTransportType <p>(apDiamNotifications 6)</p>	After an error result, generated when the Diameter Server returns a 2xxx (Success) Result-Code AVP (268).
S-CX6.4.0	DIAMETER Management		
	Capabilty group in ap-agentcapability.mib	<p>apSmgmtDOSNotifyTrustedtoUntrustedCap:</p> <p>apSysMgmtInetAddrDOStoUntrustedNotificationsGroup</p> <p>(apSmgmtMibCapabilities 51)</p>	Acme Packet Agent Capability
	Trap in ap-sysmgmt.mib	<p>apSysMgmtInetAddrDOStoUntrustedNotificationsGroup:</p> <p>apSysMgmtInetAddrTrustedToUntrustedDOSTrap</p> <p>(apSystemManagementNotificationsGroups 38)</p>	Generated when an IP is placed on a untrusted list from trusted list. The trap provides the IP address that has been demoted, the realm-id of that IP (if available), the URI portion of the SIP From header of the message that caused the demotion.

Accounting VSA Changes

There are no VSA changes for Net-Net OS Release S-CX6.4.0.

Known Issues

HMR Limitation

The following parameters may not be configured with a name longer than 24 characters:

```
sip-manipulation > name
header-rules > name
header-rules > element-rules > name
mime-rules > name
mime-rules > mime-header-rules > name
mime-isup-rules > name
mime-isup-rules > mime-header-rules > name
mime-isup-rules > isup-param-rules > name
sip-manipulation > mime-sdp-rules > name
sip-manipulation > mime-sdp-rules > mime-header-rules > name
sip-manipulation > mime-sdp-rules > sdp-session-rules > name
sip-manipulation > mime-sdp-rules > sdp-session-rules > sdp-line-rules
> name
sip-manipulation > mime-sdp-rules > sdp-media-rules > name
sip-manipulation > mime-sdp-rules > sdp-media-rules > sdp-line-rules >
name
```

Existing SIP manipulations whose **name** parameter is greater than 24 characters will continue to function. You may modify any other parameter within any subelement of the existing **sip-manipulation**, **header-rules**, **mime-rules**, and **mime-isup-rules** and the configuration will save and retain its functionality. You cannot save these existing configuration elements if you modify the name or ***-rules** parameters and it remains longer than 24 characters.

This limitation also applies for **realm-config > realm-id** parameter and wherever it is referenced.

Message Rate Statistics

The **Msg Sent** and **Req Sent** fields are not populated in the in the display of the **show enum rate** and **show enum rate <config-name>** commands' output.

Notices and Third Party Licenses

Acme Packet Notices

Legal Notices: Copyright (c) 2000-2012 Acme Packet, Inc. All rights reserved. Information in this document is subject to change without notice. Acme Packet, Inc. assumes no responsibility for any errors that may appear in this document.

MAIL ORDER OFFER FOR OPEN SOURCE CODE

To obtain a copy of the source code for the open-source software programs packaged with this product, send \$20 USD (to cover the costs of duplication and shipping) to the address below, or email opensource@acmepacket.com for further information:

Open source CD requests

c/o Office of the CTO

Acme Packet Inc.

100 Crosby Drive

Bedford, MA 01730

United States

Acknowledgements: Portions of this software may utilize the following copyrighted material. Use and distribution of the Acme Packet Net-Net OS SD product is subject to acceptance of multiple software license agreements, as listed below. This distribution consists of an aggregation of multiple separate binary programs each operating independently, which when used together, provide the complete product functionality. Each program is categorized into one of three classes based on its software license: i) Proprietary, ii) Dual license, iii) Open source

TRADEMARK RECOGNITION Acme Packet is a registered trademark and Session Aware Networking, Net-Net and related marks are trademarks of Acme Packet, Inc. Linux is a registered trademark of Linus Torvalds, licensed by the LinuxMark Institute. All other brand names are trademarks, registered trademarks or service marks of their respective companies or organizations.

CLASS I - Proprietary software This is Commercial software used and distributed under proprietary license, the software IS NOT redistributable by the end user, per the terms of the associated proprietary license agreement. For each component in this category, depending on the specific license requirements no source code or object code is provided and strict proprietary end-user license terms apply. This software is subject to closed-source proprietary license terms and restrictions, from the following vendors: Acme Packet Inc Net-Net OS SD These items are closed-source, proprietary unpublished works, and contain no free software. Use, Modification, Duplication and Redistribution rights are restricted, refer to the license text.

CLASS II - Dual-licensed software This is copyrighted software issued under dual proprietary and open source license. For software components with dual licenses, the software IS redistributable when used in an open-source program, but IS NOT redistributable when used in a proprietary program. Therefore, depending on the

specific usage it may be subject to either a closed-source proprietary license or to open source free software license terms, as follows:

Third Party Licenses

ARES Library

Copyright 1998 by the Massachusetts Institute of Technology.

Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation, and that the name of M.I.T. not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission. M.I.T. makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.

ASN1 Object Dumping Code

ASN.1 object dumping code, copyright Peter Gutmann Based on ASN.1 dump program by David Kemp, with contributions from various people including Matthew Hamrick, Bruno Couillard, Hallvard Furuseth, Geoff Thorpe, David Boyce, John Hughes, Hans-Olof Hermansson, Tor Rustad, Kjetil Barvik, James Sweeny, Chris Ridd, David Lemley, John Tobey, James Manger and several other people whose names I've misplaced.

You can use this code in whatever way you want, as long as you don't try to claim you wrote it.

bitstring.h

Copyright (c) 1989, 1993 The Regents of the University of California. All rights reserved.

This code is derived from software contributed to Berkeley by Paul Vixie.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. 3. All advertising materials mentioning features or use of this software must display the following acknowledgement: This product includes software developed by the University of California, Berkeley and its contributors. 4. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL

DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Boost Library

Boost Software License - Version 1.0 - August 17th, 2003

Permission is hereby granted, free of charge, to any person or organization obtaining a copy of the software and accompanying documentation covered by this license (the "Software") to use, reproduce, display, distribute, execute, and transmit the Software, and to prepare derivative works of the Software, and to permit third-parties to whom the Software is furnished to do so, all subject to the following:

The copyright notices in the Software and this entire statement, including the above license grant, this restriction and the following disclaimer, must be included in all copies of the Software, in whole or in part, and all derivative works of the Software, unless such copies or derivative works are solely in the form of machine-executable object code generated by a source language processor.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT. IN NO EVENT SHALL THE COPYRIGHT HOLDERS OR ANYONE DISTRIBUTING THE SOFTWARE BE LIABLE FOR ANY DAMAGES OR OTHER LIABILITY, WHETHER IN CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Dropbear

Dropbear contains a number of components from different sources, hence there are a few licenses and authors involved. All licenses are fairly non-restrictive.

The majority of code is written by Matt Johnston, under the license below.

Portions of the client-mode work are (c) 2004 Mihnea Stoenescu, under the same license:

Copyright (c) 2002-2008 Matt Johnston Portions copyright (c) 2004 Mihnea Stoenescu All rights reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT

HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

=====

LibTomCrypt and LibTomMath are written by Tom St Denis, and are Public Domain.

=====

sshpty.c is taken from OpenSSH 3.5p1, Copyright (c) 1995 Tuuva Ylonen <tylo@cs.hut.fi>, Espoo, Finland All rights reserved "As far as I am concerned, the code I have written for this software can be used freely for any purpose. Any derived versions of this software must be clearly marked as such, and if the derived work is incompatible with the protocol description in the RFC file, it must be called by a name other than "ssh" or "Secure Shell". "

=====

loginrec.c loginrec.h atomicio.h atomicio.c and strlcat() (included in util.c) are from OpenSSH 3.6.1p2, and are licensed under the 2 point BSD license.

loginrec is written primarily by Andre Lucas, atomicio.c by Theo de Raadt.

strlcat() is (c) Todd C. Miller

=====

Import code in keyimport.c is modified from PuTTY's import.c, licensed as follows:

PuTTY is copyright 1997-2003 Simon Tatham.

Portions copyright Robert de Bath, Joris van Rantwijk, Delian Delchev, Andreas Schultz, Jeroen Massar, Wez Furlong, Nicolas Barry, Justin Bradford, and CORE SDI S.A.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

CURL Library

COPYRIGHT AND PERMISSION NOTICE

Copyright (c) 1996 - 2011, Daniel Stenberg, <daniel@haxx.se>.

All rights reserved.

Permission to use, copy, modify, and distribute this software for any purpose with or without fee is hereby granted, provided that the above copyright notice and this permission notice appear in all copies.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF THIRD PARTY RIGHTS. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Except as contained in this notice, the name of a copyright holder shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization of the copyright holder.

GNU Common C++ Library

Copyright (C) 1999-2000 Open Source Telecom Corporation

GNU General Public License with following exception: If you link the Common C++ library with other files to produce an executable, this does not by itself cause the resulting executable to be covered by the GNU General Public License. Your use of that executable is in no way restricted on account of linking the Common C++ library code into it.

GNU Regular Expression Library

Copyright (C) 1993-1999, 2000, 2001 Free Software Foundation, Inc.

LGPL 2.1 - See APPENDIX A

PCAP Library

License: BSD

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The names of the authors may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED ``AS IS'' AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IPSecKey

Copyright And Configuration Management -----

PassThruEx Support Utilities - ptutils.cpp

Companion Sample Code for the Article

"Extending the Microsoft PassThru NDIS Intermediate Driver"

Copyright (c) 2003 Printing Communications Associates, Inc. (PCAUSA)
<http://www.pcausa.com>

The right to use this code in your own derivative works is granted so long as 1.) your own derivative works include significant modifications of your own, 2.) you retain the above copyright notices and this paragraph in its entirety within sources derived from this code. This product includes software developed by PCAUSA. The name of PCAUSA may not be used to endorse or promote products derived from this software without specific prior written permission. THIS SOFTWARE IS PROVIDED "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

libeditline Library

Copyright (c) 1992, 1993 The Regents of the University of California. All rights reserved. This code is derived from software contributed to Berkeley by Christos Zoulas of Cornell University. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. 3. All advertising materials mentioning features or use of this software must display the following acknowledgement: This product includes software developed by the University of California, Berkeley and its contributors. 4. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission. THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

libtar Library

Copyright (c) 1998-2003 University of Illinois Board of Trustees Copyright (c) 1998-2003 Mark D. Roth All rights reserved.

Developed by: Campus Information Technologies and Educational Services,
University of Illinois at Urbana-Champaign

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal with the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and

to permit persons to whom the Software is furnished to do so, subject to the following conditions:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimers.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimers in the documentation and/or other materials provided with the distribution.
- * Neither the names of Campus Information Technologies and Educational Services, University of Illinois at Urbana-Champaign, nor the names of its contributors may be used to endorse or promote products derived from this Software without specific prior written permission.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE CONTRIBUTORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS WITH THE SOFTWARE.

libtelnet Library

libtelnet is released to the public domain:

The author or authors of this code dedicate any and all copyright interest in this code to the public domain. We make this dedication for the benefit of the public at large and to the detriment of our heirs and successors. We intend this dedication to be an overt act of relinquishment in perpetuity of all present and future rights to this code under copyright law.

-- Sean Middleditch sean@sourcemud.org

libusb Library

LGPL 2.1 - See APPENDIX A

LUA

Copyright (C) 1994-2008 Lua.org, PUC-Rio. All rights reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions: The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

OpenSSL Library

Copyright (c) 1998-2002 The OpenSSL Project. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (<http://www.openssl.org/>)"
4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.
5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.
6. Redistributions of any form whatsoever must retain the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>)"

THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT ``AS IS'' AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com) All rights reserved.

This package is written by Eric Young (eay@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com)

This library is free for commercial and non-commercial use as long as the following conditions are aheared to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, Ihash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com).

Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed. If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used. This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. 3. All advertising materials mentioning features or use of this software must display the following acknowledgement: "This product includes cryptographic software written by

Eric Young (eay@cryptsoft.com)" The word 'cryptographic' can be left out if the routines from the library being used are not cryptographic related :-). 4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement: "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The licence and distribution terms for any publically available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution licence [including the GNU Public Licence.]

Copyright (c) 2004, Richard Levitte <richard@levitte.org> All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.

Portions of the attached software ("Contribution") are developed by SUN MICROSYSTEMS, INC., and are contributed to the OpenSSL project.

The Contribution is licensed pursuant to the Eric Young open source license provided above.

The binary polynomial arithmetic software is originally written by Sheueling Chang Shantz and Douglas Stebila of Sun Microsystems Laboratories.

Copyright 2006 NTT (Nippon Telegraph and Telephone Corporation) . ALL RIGHTS RESERVED.

Intellectual Property information for Camellia:
<http://info.isl.ntt.co.jp/crypt/eng/info/chiteki.html>

News Release for Announcement of Camellia open source:
<http://www.ntt.co.jp/news/news06e/0604/060413a.html>

The Camellia Code included herein is developed by NTT (Nippon Telegraph and Telephone Corporation), and is contributed to the OpenSSL project.

The Camellia Code is licensed pursuant to the OpenSSL open source license provided below.

Copyright 2006 NTT (Nippon Telegraph and Telephone Corporation) . ALL RIGHTS RESERVED.

Intellectual Property information for Camellia:
<http://info.isl.ntt.co.jp/crypt/eng/info/chiteki.html>

News Release for Announcement of Camellia open source:
<http://www.ntt.co.jp/news/news06e/0604/060413a.html>

The Camellia Code included herein is developed by NTT (Nippon Telegraph and Telephone Corporation), and is contributed to the OpenSSL project.

The Camellia Code is licensed pursuant to the OpenSSL open source license provided below.

Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.

The Elliptic Curve Public-Key Crypto Library (ECC Code) included herein is developed by SUN MICROSYSTEMS, INC., and is contributed to the OpenSSL project.

The ECC Code is licensed pursuant to the OpenSSL open source license

The software is originally written by Sheueling Chang Shantz and Douglas Stebila of Sun Microsystems Laboratories.

Copyright (c) 2002 Bob Beck <beck@openbsd.org> Copyright (c) 2002 Theo de Raadt Copyright (c) 2002 Markus Friedl All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF

THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Copyright (c) 2005 Hewlett-Packard Development Company, L.P.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE. */

Contributed to the OpenSSL Project 2004 by Richard Levitte (richard@levitte.org)

Copyright (c) 2004 Kungliga Tekniska Högskolan (Royal Institute of Technology, Stockholm, Sweden). All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the Institute nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE INSTITUTE AND CONTRIBUTORS ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE INSTITUTE OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

ModExp / RSA (with/without KM) plugin API

This file is Copyright 1998-2000 nCipher Corporation Limited.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the copyright notice, this list of conditions, and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions, and the following disclaimer, in the documentation and/or other materials provided with the distribution

IN NO EVENT SHALL NCIPHER CORPORATION LIMITED ('NCIPHER') AND/OR ANY OTHER AUTHORS OR DISTRIBUTORS OF THIS FILE BE LIABLE for any damages arising directly or indirectly from this file, its use or this licence. Without prejudice to the generality of the foregoing: all liability shall be excluded for direct, indirect, special, incidental, consequential or other damages or any loss of profits, business, revenue goodwill or anticipated savings; liability shall be excluded even if nCipher or anyone else has been advised of the possibility of damage. In any event, if the exclusion of liability is not effective, the liability of nCipher or any author or distributor shall be limited to the lesser of the price paid and 1,000 pounds sterling. This licence only fails to exclude or limit liability for death or personal injury arising out of negligence, and only to the extent that such an exclusion or limitation is not effective.

NCIPHER AND THE AUTHORS AND DISTRIBUTORS SPECIFICALLY DISCLAIM ALL AND ANY WARRANTIES (WHETHER EXPRESS OR IMPLIED), including, but not limited to, any implied warranties of merchantability, fitness for a particular purpose, satisfactory quality, and/or non-infringement of any third party rights.

US Government use: This software and documentation is Commercial Computer Software and Computer Software Documentation, as defined in sub-paragraphs (a)(1) and (a)(5) of DFAR 252.227-7014, "Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation." Use, duplication or disclosure by the Government is subject to the terms and conditions specified here.

By using or distributing this file you will be accepting these terms and conditions, including the limitation of liability and lack of warranty. If you do not wish to accept these terms and conditions, DO NOT USE THE FILE.

The actual dynamically loadable plugin, and the library files for static linking, which are also provided in some distributions, are not covered by the licence described above. You should have received a separate licence with terms and conditions for these library files; if you received the library files without a licence, please contact nCipher.

Copyright 2005 Nokia. All rights reserved.

The portions of the attached software ("Contribution") is developed by Nokia Corporation and is licensed pursuant to the OpenSSL open source license.

The Contribution, originally written by Mika Kousa and Pasi Eronen of Nokia Corporation, consists of the "PSK" (Pre-Shared Key) ciphersuites support (see RFC 4279) to OpenSSL.

No patent licenses or other rights except those expressly stated in the OpenSSL open source license shall be deemed granted or received expressly, by implication, estoppel, or otherwise.

No assurances are provided by Nokia that the Contribution does not infringe the patent or other intellectual property rights of any third party or that the license provides you with all the necessary rights to make use of the Contribution.

THE SOFTWARE IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND. IN ADDITION TO THE DISCLAIMERS INCLUDED IN THE LICENSE, NOKIA SPECIFICALLY DISCLAIMS ANY LIABILITY FOR CLAIMS BROUGHT BY YOU OR ANY OTHER ENTITY BASED ON INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OR OTHERWISE.

Perl-Compatible Regular Expressions (PCRE)

Copyright (c) 1997-2010 University of Cambridge

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. Neither the name of the University of Cambridge nor the names of its contributors may be used to endorse or promote products derived from his software without specific prior written permission.

popt Command Line Option Parsing Library

Copyright (c) 1998 Red Hat Software

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE X CONSORTIUM BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Except as contained in this notice, the name of the X Consortium shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization from the X Consortium.

Remote Authentication Dial In User Service (RADIUS)

Copyright 1992-1999 Lucent Technologies Inc. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. All advertising materials mentioning features or use of this software must display the following acknowledgement: This product includes software developed by Lucent Technologies and its contributors. Neither the name of the copyright holder nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

Redblack Source Code

Redblack balanced tree algorithm Copyright (C) Damian Ivereigh 2000
LGPL 2.1 - See APPENDIX A

sdparam SCSI Disk Utility

Copyright (c) 2005-2009 Douglas Gilbert. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. 3. The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Smart Pointer

Copyright (c) 2000 Vovida Networks, Inc. All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. 3. The names "VOCAL", "Vovida Open Communication Application Library", and "Vovida Open Communication Application Library (VOCAL)" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact vocal@vovida.org. 4. Products derived from this software may not be called "VOCAL", nor may "VOCAL" appear in their name, without prior written permission of Vovida Networks, Inc. THIS SOFTWARE IS PROVIDED "AS

IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT ARE DISCLAIMED. IN NO EVENT SHALL VOVIDA NETWORKS, INC. OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT DAMAGES IN EXCESS OF ,000, NOR FOR ANY INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Strong Random Number Generator

Copyright 2001-2004 Wind River Systems, Inc. Copyright Theodore Ts'o, 1994, 1995. All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, and the entire permission notice in its entirety, including the disclaimer of warranties. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. 3. The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission. ALTERNATIVELY, this product may be distributed under the terms of the GNU Public License, in which case the provisions of the GPL are required INSTEAD OF the above restrictions. (This clause is necessary due to a potential bad interaction between the GPL and the restrictions contained in a BSD-style copyright.) THIS SOFTWARE IS PROVIDED "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

TCP/IP Stack (for ATCP)

Copyright 1984-1996 Wind River Systems, Inc. Copyright (c) 1982, 1986, 1993 The Regents of the University of California. All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. 3. All advertising materials mentioning features or use of this software must display the following acknowledgement: This product includes software developed by the University of California, Berkeley and its contributors. 4. Neither the name of the University nor the names of its contributors

may be used to endorse or promote products derived from this software without specific prior written permission.

VxWorks-2-Linux Library

LGPL 2.1 - See APPENDIX A

xntp Time Synchronization Library

(c)Copyright TaiJin, 1988. All Rights Reserved. Hewlett-Packard Laboratories. Permission is hereby granted for unlimited modification, use, and distribution. This software is made available with no warranty of any kind, express or implied. This copyright notice must remain intact in all versions of this software. The author would appreciate it if any bug fixes and enhancements were to be sent back to him for incorporation into future versions of this software. Please send changes to tai@iag.hp.com or ken@sdd.hp.com.

Copyright (C) 1992, 1996 by Rainer Pruy Friedrich-Alexander Universität Erlangen-Nürnberg, Germany

This code may be modified and used freely provided the credits remain intact.

Copyright (C) 1990, RSA Data Security, Inc. All rights reserved. License to copy and use this software is granted provided that it is identified as the "RSA Data Security, Inc. MD5 Message-Digest Algorithm" in all material mentioning or referencing this software or this function.

License is also granted to make and use derivative works provided that such works are identified as "derived from the RSA Data Security, Inc. MD5 Message-Digest Algorithm" in all material mentioning or referencing the derived work.

RSA Data Security, Inc. makes no representations concerning either the merchantability of this software or the suitability of this software for any particular purpose. It is provided "as is" without express or implied warranty of any kind. These notices must be retained in any copies of any part of this documentation and/or software.

Copyright (C) 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996 by Frank Kardel Friedrich-Alexander Universität Erlangen-Nürnberg, Germany

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.

(c)Copyright TaiJin, 1988. All Rights Reserved. Hewlett-Packard Laboratories. Permission is hereby granted for unlimited modification, use, and distribution. This software is made available with no warranty of any kind, express or implied. This copyright notice must remain intact in all versions of this software. The author would appreciate it if any bug fixes and enhancements were to be sent back to him for incorporation into future versions of this software. Please send changes to tai@iag.hp.com or ken@sdd.hp.com.

Random number generator is: Copyright 1988 by Rayan S. Zachariassen, all rights reserved. (Used in xntp by permission of the author.)

zlib Data Compression Library

version 1.2.5, April 19th, 2010

Copyright (C) 1995-2010 Jean-loup Gailly and Mark Adler

This software is provided 'as-is', without any express or implied warranty. In no event will the authors be held liable for any damages arising from the use of this software.

Permission is granted to anyone to use this software for any purpose, including commercial applications, and to alter it and redistribute it freely, subject to the following restrictions:

1. The origin of this software must not be misrepresented; you must not claim that you wrote the original software. If you use this software in a product, an acknowledgment in the product documentation would be appreciated but is not required.
2. Altered source versions must be plainly marked as such, and must not be misrepresented as being the original software.
3. This notice may not be removed or altered from any source distribution.

Jean-loup Gailly Mark Adler jloup@gzip.org madler@alumni.caltech.edu

zoneinfo

Public Domain

CLASS III - Open-source licensed software

This is Third-party software, used and distributed under an open-source license. For software components open-source licenses, the software IS redistributable by the end user, subject to the terms of the associated open-source license agreement. For each component in this category, depending on the specific license requirements either the source code or the object code will be found on the Net-Net OS platform distribution media, as required by the license agreement.

busybox

GPL 2.0 - See APPENDIX B

dmidecode

GPL 2.0 - See APPENDIX B

dosfstools

GPL 3.0 - See APPENDIX C

e2fsprogs

Utilities: GPL 2.0 - See APPENDIX B Libraries: LGPL 2.1 - See APPENDIX A

grub

GPL 2.0 - See APPENDIX B

irqbalance

GPL 2.0 - See APPENDIX B

Linux Kernel

GPL 2.0 - See APPENDIX B NOTE! This copyright does *not* cover user programs that use kernel services by normal system calls - this is merely considered normal use of the kernel, and does *not* fall under the heading of "derived work". Also

note that the GPL below is copyrighted by the Free Software Foundation, but the instance of code that it refers to (the Linux kernel) is copyrighted by me and others who actually wrote it.

Also note that the only valid version of the GPL as far as the kernel is concerned is this particular version of the license (ie v2, not v2.2 or v3.x or whatever), unless explicitly otherwise stated.

kexec-tools	GPL 2.0 - See APPENDIX B
parted	GPL 3.0 - See APPENDIX C
procps	GPL 2.0 - See APPENDIX B
sg3_utils	<p>GPL 2.0 - See APPENDIX B Upstream Authors: Douglas Gilbert <dgilbert at interlog dot com>, Bruce Allen <ballen at gravity dot phys dot uwm dot edu>, Peter Allworth <linsol at zeta dot org dot au>, James Bottomley <jejb at parisc-linux dot org>, Lars Marowsky-Bree <lmb at suse dot de>, Kurt Garloff <garloff at suse dot de>, Grant Grundler <grundler at parisc-linux dot org>, Christophe Varoqui <christophe dot varoqui at free dot fr>, Michael Weller <eowmob at exp-math dot uni-essen dot de>, Eric Youngdale <eric at andante dot org></p> <p>Copyright: This software is copyright(c) 1994-2009 by the authors</p> <p>You are free to distribute this software under the terms of the GNU General Public License. On Debian systems, the complete text of the GNU General Public License can be found in /usr/share/common-licenses/GPL file.</p> <p>Many parts of this package are covered by a (Free-) BSD license. These include central error processing code (sg_lib.[hc] and sg_lib_data.[hc]), common command code (sg_cmds_basic.[hc], sg_cmds_mmc.[hc] and sg_cmds_extra.[hc]) and later utilities. They are Copyright: Douglas Gilbert. The author's intention is that the (Free-) BSD licensed code can be used freely by others. On Debian systems, the complete text of the BSD License can be found in `/usr/share/common-licenses/BSD'.</p> <p>Doug Gilbert 4th January 2009</p>
usbutil	GPL 2.0 - See APPENDIX B
wireshark	<p>GPL 2.0 - See APPENDIX B Wireshark is distributed under the GNU GPLv2. There are no restrictions on its use. There are restrictions on its distribution in source or binary form.</p> <p>Most parts of Wireshark are covered by a "GPL version 2 or later" license. Some files are covered by different licenses that are compatible with the GPLv2.</p>

As a notable exception the pidl utility at tools/pidl is covered by a "GPL version 3 or later" license. Note that only the tool itself is covered by this license, not the source code generated by it. The pidl authors do not consider generated code a derived work of pidl.

Parts of Wireshark can be built and distributed as libraries. These parts are still covered by the GPL, and NOT by the Lesser General Public License or any other license.

If you integrate all or part of Wireshark into your own application, then that application must be released under a license compatible with the GPL.

Other license: Parts of this software are licensed as follows

Copyright (c) 1988, 1992, 1993 The Regents of the University of California. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. 3. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Copyright (c) 2003 Markus Friedl. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER

CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Copyright (c) 2003 Endace Technology Ltd, Hamilton, New Zealand. All rights reserved.

This software and documentation has been developed by Endace Technology Ltd. along with the DAG PCI network capture cards. For further information please visit <http://www.endace.com/>.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The name of Endace Technology Ltd may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY ENDACE TECHNOLOGY LTD ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL ENDACE TECHNOLOGY LTD BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Copyright (C) 1995, 1996, 1997, and 1998 WIDE Project. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. 3. Neither the name of the project nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE PROJECT AND CONTRIBUTORS ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE PROJECT OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF

LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Copyright (c) 1997, 1999 Hellmuth Michaelis. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

APPENDIX A - GNU LESSER GENERAL PUBLIC LICENSE

GNU LESSER GENERAL PUBLIC LICENSE Version 2.1, February 1999

Copyright (C) 1991, 1999 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.

GNU LESSER GENERAL PUBLIC LICENSE TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

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.

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.

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.

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.

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 Sections 1 and 2 above provided that you 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.

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.

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.

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 Sections 1 and 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.

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.

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.

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.

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.

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.

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.

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.

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

5. 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.

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!

APPENDIX B - GNU General Public License, version 2 (GPL-2.0)

The GNU General Public License (GPL-2.0) Version 2, June 1991 Copyright (C) 1989, 1991 Free Software Foundation, Inc. 59 Temple Place, Suite 330, Boston, MA 02111-1307 USA

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

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

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.

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.

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.

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 Sections 1 and 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.

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.

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.

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.

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.

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.

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.

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

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.

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., 59 Temple Place, Suite 330, Boston, MA 02111-1307 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.

APPENDIX C - GNU General Public License, version 3 (GPL-3.0)

GNU GENERAL PUBLIC LICENSE Version 3, 29 June 2007

Copyright (C) 2007 Free Software Foundation, Inc. <<http://fsf.org/>>

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

Preamble The GNU General Public License is a free, copyleft license for software and other kinds of works.

The licenses for most software and other practical works are designed to take away your freedom to share and change the works. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change all versions of a program--to make sure it remains free software for all its users. We, the Free Software Foundation, use the GNU General Public License for most of our software; it applies also to any other work released this way by its authors. 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 them 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 prevent others from denying you these rights or asking you to surrender the rights. Therefore, you have certain responsibilities if you distribute copies of the software, or if you modify it: responsibilities to respect the freedom of others.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must pass on to the recipients the same freedoms that you received. 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.

Developers that use the GNU GPL protect your rights with two steps: (1) assert copyright on the software, and (2) offer you this License giving you legal permission to copy, distribute and/or modify it.

For the developers' and authors' protection, the GPL clearly explains that there is no warranty for this free software. For both users' and authors' sake, the GPL requires that modified versions be marked as changed, so that their problems will not be attributed erroneously to authors of previous versions.

Some devices are designed to deny users access to install or run modified versions of the software inside them, although the manufacturer can do so. This is fundamentally incompatible with the aim of protecting users' freedom to change the software. The systematic pattern of such abuse occurs in the area of products for individuals to use, which is precisely where it is most unacceptable. Therefore, we have designed this version of the GPL to prohibit the practice for those products. If such problems arise substantially in other domains, we stand ready to extend this provision to those domains in future versions of the GPL, as needed to protect the freedom of users.

Finally, every program is threatened constantly by software patents. States should not allow patents to restrict development and use of software on general-purpose computers, but in those that do, we wish to avoid the special danger that patents applied to a free program could make it effectively proprietary. To prevent this, the GPL assures that patents cannot be used to render the program non-free.

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

TERMS AND CONDITIONS 0. Definitions. "This License" refers to version 3 of the GNU General Public License.

"Copyright" also means copyright-like laws that apply to other kinds of works, such as semiconductor masks.

"The Program" refers to any copyrightable work licensed under this License. Each licensee is addressed as "you". "Licensees" and "recipients" may be individuals or organizations.

To "modify" a work means to copy from or adapt all or part of the work in a fashion requiring copyright permission, other than the making of an exact copy. The resulting work is called a "modified version" of the earlier work or a work "based on" the earlier work.

A "covered work" means either the unmodified Program or a work based on the Program.

To "propagate" a work means to do anything with it that, without permission, would make you directly or secondarily liable for infringement under applicable copyright law, except executing it on a computer or modifying a private copy. Propagation includes copying, distribution (with or without modification), making available to the public, and in some countries other activities as well.

To "convey" a work means any kind of propagation that enables other parties to make or receive copies. Mere interaction with a user through a computer network, with no transfer of a copy, is not conveying.

An interactive user interface displays "Appropriate Legal Notices" to the extent that it includes a convenient and prominently visible feature that (1) displays an appropriate copyright notice, and (2) tells the user that there is no warranty for the work (except to the extent that warranties are provided), that licensees may convey the work under this License, and how to view a copy of this License. If the interface presents a list of user commands or options, such as a menu, a prominent item in the list meets this criterion.

1. Source Code. The "source code" for a work means the preferred form of the work for making modifications to it. "Object code" means any non-source form of a work.

A "Standard Interface" means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The "System Libraries" of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major Component, and (b) serves only to enable use of the work with that Major Component, or to implement a Standard Interface for which an implementation is available to the public in source code form. A "Major Component", in this context, means a major essential component (kernel, window system, and so on) of the specific operating system (if any) on which the executable work runs, or a compiler used to produce the work, or an object code interpreter used to run it.

The "Corresponding Source" for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work's System Libraries, or general-purpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

The Corresponding Source need not include anything that users can regenerate automatically from other parts of the Corresponding Source.

The Corresponding Source for a work in source code form is that same work.

2. Basic Permissions. All rights granted under this License are granted for the term of copyright on the Program, and are irrevocable provided the stated conditions are met. This License explicitly affirms your unlimited permission to run the unmodified Program. The output from running a covered work is covered by this License only if the output, given its content, constitutes a covered work. This License acknowledges your rights of fair use or other equivalent, as provided by copyright law.

You may make, run and propagate covered works that you do not convey, without conditions so long as your license otherwise remains in force. You may convey covered works to others for the sole purpose of having them make modifications exclusively for you, or provide you with facilities for running those works, provided that you comply with the terms of this License in conveying all material for which you do not control copyright. Those thus making or running the covered works for you must do so exclusively on your behalf, under your direction and control, on terms that prohibit them from making any copies of your copyrighted material outside their relationship with you.

Conveying under any other circumstances is permitted solely under the conditions stated below. Sublicensing is not allowed; section 10 makes it unnecessary.

3. Protecting Users' Legal Rights From Anti-Circumvention Law. No covered work shall be deemed part of an effective technological measure under any applicable law fulfilling obligations under article 11 of the WIPO copyright treaty adopted on 20

December 1996, or similar laws prohibiting or restricting circumvention of such measures.

When you convey a covered work, you waive any legal power to forbid circumvention of technological measures to the extent such circumvention is effected by exercising rights under this License with respect to the covered work, and you disclaim any intention to limit operation or modification of the work as a means of enforcing, against the work's users, your or third parties' legal rights to forbid circumvention of technological measures.

4. Conveying Verbatim Copies. You may convey 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; keep intact all notices stating that this License and any non-permissive terms added in accord with section 7 apply to the code; keep intact all notices of the absence of any warranty; and give all recipients a copy of this License along with the Program.

You may charge any price or no price for each copy that you convey, and you may offer support or warranty protection for a fee.

5. Conveying Modified Source Versions. You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:

a) The work must carry prominent notices stating that you modified it, and giving a relevant date. b) The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to "keep intact all notices". c) You must license the entire work, as a whole, under this License to anyone who comes into possession of a copy. This License will therefore apply, along with any applicable section 7 additional terms, to the whole of the work, and all its parts, regardless of how they are packaged. This License gives no permission to license the work in any other way, but it does not invalidate such permission if you have separately received it. d) If the work has interactive user interfaces, each must display Appropriate Legal Notices; however, if the Program has interactive interfaces that do not display Appropriate Legal Notices, your work need not make them do so. A compilation of a covered work with other separate and independent works, which are not by their nature extensions of the covered work, and which are not combined with it such as to form a larger program, in or on a volume of a storage or distribution medium, is called an "aggregate" if the compilation and its resulting copyright are not used to limit the access or legal rights of the compilation's users beyond what the individual works permit. Inclusion of a covered work in an aggregate does not cause this License to apply to the other parts of the aggregate.

6. Conveying Non-Source Forms. You may convey a covered work in object code form under the terms of sections 4 and 5, provided that you also convey the machine-readable Corresponding Source under the terms of this License, in one of these ways:

a) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by the Corresponding Source fixed on a durable physical medium customarily used for software interchange. b) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source

for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge. c) Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b. d) Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements. e) Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d. A separable portion of the object code, whose source code is excluded from the Corresponding Source as a System Library, need not be included in conveying the object code work.

A "User Product" is either (1) a "consumer product", which means any tangible personal property which is normally used for personal, family, or household purposes, or (2) anything designed or sold for incorporation into a dwelling. In determining whether a product is a consumer product, doubtful cases shall be resolved in favor of coverage. For a particular product received by a particular user, "normally used" refers to a typical or common use of that class of product, regardless of the status of the particular user or of the way in which the particular user actually uses, or expects or is expected to use, the product. A product is a consumer product regardless of whether the product has substantial commercial, industrial or non-consumer uses, unless such uses represent the only significant mode of use of the product.

"Installation Information" for a User Product means any methods, procedures, authorization keys, or other information required to install and execute modified versions of a covered work in that User Product from a modified version of its Corresponding Source. The information must suffice to ensure that the continued functioning of the modified object code is in no case prevented or interfered with solely because modification has been made.

If you convey an object code work under this section in, or with, or specifically for use in, a User Product, and the conveying occurs as part of a transaction in which the right of possession and use of the User Product is transferred to the recipient in perpetuity or for a fixed term (regardless of how the transaction is characterized), the Corresponding Source conveyed under this section must be accompanied by the Installation Information. But this requirement does not apply if neither you nor any third party retains the ability to install modified object code on the User Product (for example, the work has been installed in ROM).

The requirement to provide Installation Information does not include a requirement to continue to provide support service, warranty, or updates for a work that has been modified or installed by the recipient, or for the User Product in which it has been modified or installed. Access to a network may be denied when the modification

itself materially and adversely affects the operation of the network or violates the rules and protocols for communication across the network.

Corresponding Source conveyed, and Installation Information provided, in accord with this section must be in a format that is publicly documented (and with an implementation available to the public in source code form), and must require no special password or key for unpacking, reading or copying.

7. Additional Terms. "Additional permissions" are terms that supplement the terms of this License by making exceptions from one or more of its conditions. Additional permissions that are applicable to the entire Program shall be treated as though they were included in this License, to the extent that they are valid under applicable law. If additional permissions apply only to part of the Program, that part may be used separately under those permissions, but the entire Program remains governed by this License without regard to the additional permissions.

When you convey a copy of a covered work, you may at your option remove any additional permissions from that copy, or from any part of it. (Additional permissions may be written to require their own removal in certain cases when you modify the work.) You may place additional permissions on material, added by you to a covered work, for which you have or can give appropriate copyright permission.

Notwithstanding any other provision of this License, for material you add to a covered work, you may (if authorized by the copyright holders of that material) supplement the terms of this License with terms:

a) Disclaiming warranty or limiting liability differently from the terms of sections 15 and 16 of this License; or b) Requiring preservation of specified reasonable legal notices or author attributions in that material or in the Appropriate Legal Notices displayed by works containing it; or c) Prohibiting misrepresentation of the origin of that material, or requiring that modified versions of such material be marked in reasonable ways as different from the original version; or d) Limiting the use for publicity purposes of names of licensors or authors of the material; or e) Declining to grant rights under trademark law for use of some trade names, trademarks, or service marks; or f) Requiring indemnification of licensors and authors of that material by anyone who conveys the material (or modified versions of it) with contractual assumptions of liability to the recipient, for any liability that these contractual assumptions directly impose on those licensors and authors. All other non-permissive additional terms are considered "further restrictions" within the meaning of section 10. If the Program as you received it, or any part of it, contains a notice stating that it is governed by this License along with a term that is a further restriction, you may remove that term. If a license document contains a further restriction but permits relicensing or conveying under this License, you may add to a covered work material governed by the terms of that license document, provided that the further restriction does not survive such relicensing or conveying.

If you add terms to a covered work in accord with this section, you must place, in the relevant source files, a statement of the additional terms that apply to those files, or a notice indicating where to find the applicable terms.

Additional terms, permissive or non-permissive, may be stated in the form of a separately written license, or stated as exceptions; the above requirements apply either way.

8. Termination. You may not propagate or modify a covered work except as expressly provided under this License. Any attempt otherwise to propagate or modify it is void, and will automatically terminate your rights under this License (including any patent licenses granted under the third paragraph of section 11).

However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation.

Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you of the violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that copyright holder, and you cure the violation prior to 30 days after your receipt of the notice.

Termination of your rights under this section does not terminate the licenses of parties who have received copies or rights from you under this License. If your rights have been terminated and not permanently reinstated, you do not qualify to receive new licenses for the same material under section 10.

9. Acceptance Not Required for Having Copies. You are not required to accept this License in order to receive or run a copy of the Program. Ancillary propagation of a covered work occurring solely as a consequence of using peer-to-peer transmission to receive a copy likewise does not require acceptance. However, nothing other than this License grants you permission to propagate or modify any covered work. These actions infringe copyright if you do not accept this License. Therefore, by modifying or propagating a covered work, you indicate your acceptance of this License to do so.

10. Automatic Licensing of Downstream Recipients. Each time you convey a covered work, the recipient automatically receives a license from the original licensors, to run, modify and propagate that work, subject to this License. You are not responsible for enforcing compliance by third parties with this License.

An "entity transaction" is a transaction transferring control of an organization, or substantially all assets of one, or subdividing an organization, or merging organizations. If propagation of a covered work results from an entity transaction, each party to that transaction who receives a copy of the work also receives whatever licenses to the work the party's predecessor in interest had or could give under the previous paragraph, plus a right to possession of the Corresponding Source of the work from the predecessor in interest, if the predecessor has it or can get it with reasonable efforts.

You may not impose any further restrictions on the exercise of the rights granted or affirmed under this License. For example, you may not impose a license fee, royalty, or other charge for exercise of rights granted under this License, and you may not initiate litigation (including a cross-claim or counterclaim in a lawsuit) alleging that any patent claim is infringed by making, using, selling, offering for sale, or importing the Program or any portion of it.

11. Patents. A "contributor" is a copyright holder who authorizes use under this License of the Program or a work on which the Program is based. The work thus licensed is called the contributor's "contributor version".

A contributor's "essential patent claims" are all patent claims owned or controlled by the contributor, whether already acquired or hereafter acquired, that would be infringed by some manner, permitted by this License, of making, using, or selling its contributor version, but do not include claims that would be infringed only as a consequence of further modification of the contributor version. For purposes of this definition, "control" includes the right to grant patent sublicenses in a manner consistent with the requirements of this License.

Each contributor grants you a non-exclusive, worldwide, royalty-free patent license under the contributor's essential patent claims, to make, use, sell, offer for sale, import and otherwise run, modify and propagate the contents of its contributor version.

In the following three paragraphs, a "patent license" is any express agreement or commitment, however denominated, not to enforce a patent (such as an express permission to practice a patent or covenant not to sue for patent infringement). To "grant" such a patent license to a party means to make such an agreement or commitment not to enforce a patent against the party.

If you convey a covered work, knowingly relying on a patent license, and the Corresponding Source of the work is not available for anyone to copy, free of charge and under the terms of this License, through a publicly available network server or other readily accessible means, then you must either (1) cause the Corresponding Source to be so available, or (2) arrange to deprive yourself of the benefit of the patent license for this particular work, or (3) arrange, in a manner consistent with the requirements of this License, to extend the patent license to downstream recipients. "Knowingly relying" means you have actual knowledge that, but for the patent license, your conveying the covered work in a country, or your recipient's use of the covered work in a country, would infringe one or more identifiable patents in that country that you have reason to believe are valid.

If, pursuant to or in connection with a single transaction or arrangement, you convey, or propagate by procuring conveyance of, a covered work, and grant a patent license to some of the parties receiving the covered work authorizing them to use, propagate, modify or convey a specific copy of the covered work, then the patent license you grant is automatically extended to all recipients of the covered work and works based on it.

A patent license is "discriminatory" if it does not include within the scope of its coverage, prohibits the exercise of, or is conditioned on the non-exercise of one or more of the rights that are specifically granted under this License. You may not convey a covered work if you are a party to an arrangement with a third party that is in the business of distributing software, under which you make payment to the third party based on the extent of your activity of conveying the work, and under which the third party grants, to any of the parties who would receive the covered work from you, a discriminatory patent license (a) in connection with copies of the covered work conveyed by you (or copies made from those copies), or (b) primarily for and in connection with specific products or compilations that contain the covered work, unless you entered into that arrangement, or that patent license was granted, prior to 28 March 2007.

Nothing in this License shall be construed as excluding or limiting any implied license or other defenses to infringement that may otherwise be available to you under applicable patent law.

12. No Surrender of Others' Freedom. If 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 convey a covered work so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not convey it at all. For example, if you agree to terms that obligate you to collect a royalty for further conveying from those to whom you convey the Program, the only way you could satisfy both those terms and this License would be to refrain entirely from conveying the Program.

13. Use with the GNU Affero General Public License. Notwithstanding any other provision of this License, you have permission to link or combine any covered work with a work licensed under version 3 of the GNU Affero General Public License into a single combined work, and to convey the resulting work. The terms of this License will continue to apply to the part which is the covered work, but the special requirements of the GNU Affero General Public License, section 13, concerning interaction through a network will apply to the combination as such.

14. Revised Versions of this License. The Free Software Foundation may publish revised and/or new versions of the GNU 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 that a certain numbered version of the GNU General Public License "or any later version" applies to it, you have the option of following the terms and conditions either of that numbered version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of the GNU General Public License, you may choose any version ever published by the Free Software Foundation.

If the Program specifies that a proxy can decide which future versions of the GNU General Public License can be used, that proxy's public statement of acceptance of a version permanently authorizes you to choose that version for the Program.

Later license versions may give you additional or different permissions. However, no additional obligations are imposed on any author or copyright holder as a result of your choosing to follow a later version.

15. Disclaimer of Warranty. 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.

16. Limitation of Liability. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MODIFIES AND/OR CONVEYS 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.

17. Interpretation of Sections 15 and 16. If the disclaimer of warranty and limitation of liability provided above cannot be given local legal effect according to their terms, reviewing courts shall apply local law that most closely approximates an absolute waiver of all civil liability in connection with the Program, unless a warranty or assumption of liability accompanies a copy of the Program in return for a fee.

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 state 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 3 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, see <<http://www.gnu.org/licenses/>>. Also add information on how to contact you by electronic and paper mail.

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

<program> Copyright (C) <year> <name of author>

This program 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, your program's commands might be different; for a GUI interface, you would use an "about box".

You should also get your employer (if you work as a programmer) or school, if any, to sign a "copyright disclaimer" for the program, if necessary. For more information on this, and how to apply and follow the GNU GPL, see <<http://www.gnu.org/licenses/>>.

The GNU 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 Lesser General Public License instead of this License. But first, please read <<http://www.gnu.org/philosophy/why-not-lgpl.html>>.

