-----Bonjour-----320.10.80-----

Apache License

Version 2.0, January 2004

http:11www,apache.org/licenses/ (http:11www,apache.org/licenses/)

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions,

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License,

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has

been received by Licensor and subsequently incorporated within the Work

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.

3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counter claim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:

a. You must give any other recipients of the Work or Derivative Works a copy of this License; and

b. You must cause any modified files to carry prominent notices stating that You changed the files; and

c. You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and

d. If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

  You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions, Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor

regarding such Contributions.

6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.

7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License,

8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.

9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

-----gSOAP   2.7.6C-----

gSOAP Public License

Version 1.3a

The gSOAP public license is derived from the Mozilla Public License (MPL1.1). The sections that were deleted from the original MPL1.1 text are 1.0.1, 2.1.(c),(d), 2.2.(c),(d), 8.2.(b), 10, and 11. Section 3.8 was added. The modified sections are 2.1.(b), 2.2.(b), 3.2 (simplified), 3.5 (deleted the last sentence), and 3.6 (simplified).

1 DEFINITIONS.

1.0.1.

1.1. "Contributor" means each entity that creates or contributes to the creation of Modifications.

1.2. "Contributor Version" means the combination of the Original Code, prior Modifications used by a Contributor, and the Modifications made by that particular Contributor.

1.3. "Covered Code" means the Original Code, or Modifications or the combination of the Original Code, and Modifications, in each case including portions thereof.

1.4. "Electronic Distribution Mechanism" means a mechanism generally accepted in the software development community for the electronic transfer of data.

1.5. "Executable" means Covered Code in any form other than Source Code.

1.6. "Initial Developer" means the individual or entity identified as the Initial Developer in the Source Code notice required by Exhibit A.

1.7. "Larger Work" means a work which combines Covered Code or portions thereof with code not governed by the terms of this License.

1.8. "License" means this document.

1.8.1. "Licensable" means having the right to grant, to the maximum extent possible, whether at the time of the initial grant or subsequently acquired, any and all of the rights conveyed herein.

1.9. "Modifications" means any addition to or deletion from the substance or structure of either the Original Code or any previous Modifications. When Covered Code is released as a series of files, a Modification is:

A. Any addition to or deletion from the contents of a file containing Original Code or previous Modifications.

B. Any new file that contains any part of the Original Code, or previous Modifications.

1.10. "Original Code" means Source Code of computer software code which is described in the Source Code notice required by Exhibit A as Original Code, and which, at the time of its release under this License is not already Covered Code governed by this License.

1.10.1. "Patent Claims" means any patent claim(s), now owned or hereafter acquired, including without limitation, method, process, and apparatus claims, in any patent Licensable by grantor.

1.11. "Source Code" means the preferred form of the Covered Code for making modifications to it, including all modules it contains, plus any associated interface definition files, scripts used to control compilation and installation of an Executable, or source code differential comparisons against either the Original Code or another well known, available Covered Code of the Contributor's choice. The Source Code can be in a compressed or archival form, provided the appropriate decompression or de-archiving software is widely available for no charge.

1.12. "You" (or "Your") means an individual or a legal entity exercising rights under, and complying with all of the terms of, this License or a future version of this License issued under Section 6.1. For legal entities, "You" includes any entity which controls, is controlled by, or is under common control with You. For purposes of this definition, "control" means (a) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (b) ownership of more than fifty percent (50%) of the outstanding shares or beneficial ownership of such entity.

2 SOURCE CODE LICENSE.

2.1. The Initial Developer Grant.

The Initial Developer hereby grants You a world-wide, royalty-free, non-exclusive license, subject to third party intellectual property claims:

(a) under intellectual property rights (other than patent or trademark) Licensable by Initial Developer to use, reproduce, modify, display, perform, sublicense and distribute the Original Code (or portions thereof) with or without Modifications, and/or as part of a Larger Work; and

(b) under patents now or hereafter owned or controlled by Initial Developer, to make, have made, use and sell ("offer to sell and import") the Original Code, Modifications, or portions thereof, but solely to the extent

that any such patent is reasonably necessary to enable You to utilize, alone or in combination with other software, the Original Code, Modifications, or any combination or portions thereof.

(c)

(d)

2.2. Contributor Grant.

Subject to third party intellectual property claims, each Contributor hereby grants You a world-wide, royaltyfree, non-exclusive license

(a) under intellectual property rights (other than patent or trademark) Licensable by Contributor, to use, reproduce, modify, display, perform, sublicense and distribute the Modifications created by such Contributor (or portions thereof) either on an unmodified basis, with other Modifications, as Covered Code and/or as part of a Larger Work; and

(b) under patents now or hereafter owned or controlled by Contributor, to make, have made, use and sell ("offer to sell and import") the Contributor Version (or portions thereof), but solely to the extent that any such patent is reasonably necessary to enable You to utilize, alone or in combination with other software, the Contributor Version (or portions thereof).

(c)

(d)

3 DISTRIBUTION OBLIGATIONS.

3.1. Application of License.

The Modifications which You create or to which You contribute are governed by the terms of this License, including without limitation Section 2.2. The Source Code version of Covered Code may be distributed only under the terms of this License or a future version of this License released under Section 6.1, and You must include a copy of this License with every copy of the Source Code You distribute. You may not offer or impose any terms on any Source Code version that alters or restricts the applicable version of this License or the recipients' rights hereunder. However, You may include an additional document offering the additional rights described in Section 3.5.

3.2. Availability of Source Code.

Any Modification created by You will be provided to the Initial Developer in Source Code form and are subject to the terms of the License.

3.3. Description of Modifications.

You must cause all Covered Code to which You contribute to contain a file documenting the changes You made to create that Covered Code and the date of any change. You must include a prominent statement that the Modification is derived, directly or indirectly, from Original Code provided by the Initial Developer and including the name of the Initial Developer in (a) the Source Code, and (b) in any notice in an Executable version or related documentation in which You describe the origin or ownership of the Covered Code.

3.4. Intellectual Property Matters.

(a) Third Party Claims. If Contributor has knowledge that a license under a third party's intellectual property rights is required to exercise the rights granted by such Contributor under Sections 2.1 or 2.2, Contributor must include a text file with the Source Code distribution titled "LEGAL" which describes the claim and the party making the claim in sufficient detail that a recipient will know whom to contact. If Contributor

obtains such knowledge after the Modification is made available as described in Section 3.2, Contributor

shall promptly modify the LEGAL file in all copies Contributor makes available thereafter and shall take

other steps (such as notifying appropriate mailing lists or newsgroups) reasonably calculated to inform

those who received the Covered Code that new knowledge has been obtained.

(b) Contributor APIs. If Contributor's Modifications include an application programming interface and Contributor

has knowledge of patent licenses which are reasonably necessary to implement that API, Contributor

must also include this information in the LEGAL file.

(c) Representations. Contributor represents that, except as disclosed pursuant to Section 3.4(a) above, Contributor

believes that Contributor's Modifications are Contributor's original creation(s) and/or Contributor

has sufficient rights to grant the rights conveyed by this License.

3.5. Required Notices.

You must duplicate the notice in Exhibit A in each file of the Source Code. If it is not possible to put such

notice in a particular Source Code file due to its structure, then You must include such notice in a location

(such as a relevant directory) where a user would be likely to look for such a notice. If You created one or

more Modification(s) You may add your name as a Contributor to the notice described in Exhibit A. You must

also duplicate this License in any documentation for the Source Code where You describe recipients' rights or

ownership rights relating to Covered Code. You may choose to offer, and to charge a fee for, warranty, support,

indemnity or liability obligations to one or more recipients of Covered Code. However, You may do so only on

Your own behalf, and not on behalf of the Initial Developer or any Contributor.

3.6. Distribution of Executable Versions.

You may distribute Covered Code in Executable form only if the requirements of Section 3.1-3.5 have been

met for that Covered Code. You may distribute the Executable version of Covered Code or ownership rights

under a license of Your choice, which may contain terms different from this License, provided that You are

in compliance with the terms of this License and that the license for the Executable version does not attempt

to limit or alter the recipient's rights in the Source Code version from the rights set forth in this License. If

You distribute the Executable version under a different license You must make it absolutely clear that any terms

which differ from this License are offered by You alone, not by the Initial Developer or any Contributor. If you

distribute executable versions containing Covered Code as part of a product, you must reproduce the notice in

Exhibit B in the documentation and/or other materials provided with the product.

3.7. Larger Works.

You may create a Larger Work by combining Covered Code with other code not governed by the terms of this

License and distribute the LargerWork as a single product. In such a case, You must make sure the requirements

of this License are fulfilled for the Covered Code.

3.8. Restrictions.

You may not remove any product identification, copyright, proprietary notices or labels from gSOAP.

4 INABILITY TO COMPLY DUE TO STATUTE OR REGULATION.

If it is impossible for You to comply with any of the terms of this License with respect to some or all of the Covered

Code due to statute, judicial order, or regulation then You must: (a) comply with the terms of this License to the

maximum extent possible; and (b) describe the limitations and the code they affect. Such description must be included

in the LEGAL file described in Section 3.4 and must be included with all distributions of the Source Code. Except to

the extent prohibited by statute or regulation, such description must be sufficiently detailed for a recipient of ordinary skill to be able to understand it.

5 APPLICATION OF THIS LICENSE.

This License applies to code to which the Initial Developer has attached the notice in Exhibit A and to related Covered Code.

6 VERSIONS OF THE LICENSE.

6.1. New Versions.

Grantor may publish revised and/or new versions of the License from time to time. Each version will be given a distinguishing version number.

6.2. Effect of New Versions.

Once Covered Code has been published under a particular version of the License, You may always continue to use it under the terms of that version. You may also choose to use such Covered Code under the terms of any subsequent version of the License.

6.3. DerivativeWorks.

If You create or use a modified version of this License (which you may only do in order to apply it to code which is not already Covered Code governed by this License), You must (a) rename Your license so that the phrase ˝ gSOAP˝ or any confusingly similar phrase do not appear in your license (except to note that your license differs from this License) and (b) otherwise make it clear that Your version of the license contains terms which differ from the gSOAP Public License. (Filling in the name of the Initial Developer, Original Code or Contributor in the notice described in Exhibit A shall not of themselves be deemed to be modifications of this License.)

7 DISCLAIMER OF WARRANTY.

COVERED CODE IS PROVIDED UNDER THIS LICENSE ON AN "AS IS" BASIS, WITHOUT WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, WITHOUT LIMITATION, THE IMPLIEDWARRANTIES OF MERCHANTABILITY, OF FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS, AND ANY WARRANTY THAT MAY ARISE BY REASON OF TRADE USAGE, CUSTOM, OR COURSE OF DEALING. WITHOUT LIMITING THE FOREGOING, YOU ACKNOWLEDGE THAT THE SOFTWARE IS PROVIDED "AS IS" AND THAT THE AUTHORS DO NOTWARRANT THE SOFTWAREWILL RUN UNINTERRUPTED OR ERROR FREE. LIMITED LIABILITY THE ENTIRE RISK AS TO RESULTS AND PERFORMANCE OF THE SOFTWARE IS ASSUMED BY YOU. UNDER NO CIRCUMSTANCES WILL THE AUTHORS BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER, WHETHER BASED ON CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE, ARISING OUT OF OR IN ANY WAY RELATED TO THE SOFTWARE, EVEN IF THE AUTHORS HAVE BEEN ADVISED ON THE POSSIBILITY OF SUCH DAMAGE OR IF SUCH DAMAGE COULD HAVE BEEN REASONABLY FORESEEN, AND NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY EXCLUSIVE REMEDY PROVIDED. SUCH LIMITATION ON DAMAGES INCLUDES, BUT IS NOT LIMITED TO, DAMAGES FOR LOSS OF GOODWILL, LOST PROFITS, LOSS OF DATA OR SOFTWARE, WORK STOPPAGE, COMPUTER FAILURE OR MALFUNCTION OR IMPAIRMENT OF OTHER GOODS. IN NO EVENTWILL THE AUTHORS BE LIABLE FOR THE COSTS OF PROCUREMENT

OF SUBSTITUTE SOFTWARE OR SERVICES. YOU ACKNOWLEDGE THAT THIS SOFTWARE IS NOT DESIGNED FOR USE IN ON-LINE EQUIPMENT IN HAZARDOUS ENVIRONMENTS SUCH AS OPERATION OF NUCLEAR FACILITIES, AIRCRAFT NAVIGATION OR CONTROL, OR LIFE-CRITICAL APPLICATIONS. THE AUTHORS EXPRESSLY DISCLAIM ANY LIABILITY RESULTING FROM USE OF THE SOFTWARE IN ANY SUCH ON-LINE EQUIPMENT IN HAZARDOUS ENVIRONMENTS AND ACCEPTS NO LIABILITY IN RESPECT OF ANY ACTIONS OR CLAIMS BASED ON THE USE OF THE SOFTWARE IN ANY SUCH ONLINE EQUIPMENT IN HAZARDOUS ENVIRONMENTS BY YOU. FOR PURPOSES OF THIS PARAGRAPH, THE TERM "LIFE-CRITICAL APPLICATION" MEANS AN APPLICATION IN WHICH THE FUNCTIONING OR MALFUNCTIONING OF THE SOFTWARE MAY RESULT DIRECTLY OR INDIRECTLY IN PHYSICAL INJURY OR LOSS OF HUMAN LIFE. THIS DISCLAIMER OF WARRANTY CONSTITUTES AN ESSENTIAL PART OF THIS LICENSE. NO USE OF ANY COVERED CODE IS AUTHORIZED HEREUNDER EXCEPT UNDER THIS DISCLAIMER.

8 TERMINATION.

8.1. This License and the rights granted hereunder will terminate automatically if You fail to comply with terms herein and fail to cure such breach within 30 days of becoming aware of the breach. All sublicenses to the Covered Code which are properly granted shall survive any termination of this License. Provisions which, by their nature, must remain in effect beyond the termination of this License shall survive.

8.2.

8.3. If You assert a patent infringement claim against Participant alleging that such Participant's Contributor Version directly or indirectly infringes any patent where such claim is resolved (such as by license or settlement) prior to the initiation of patent infringement litigation, then the reasonable value of the licenses granted by such Participant under Sections 2.1 or 2.2 shall be taken into account in determining the amount or value of any payment or license.

8.4. In the event of termination under Sections 8.1 or 8.2 above, all end user license agreements (excluding distributors and resellers) which have been validly granted by You or any distributor hereunder prior to termination shall survive termination.

9 LIMITATION OF LIABILITY.

UNDER NO CIRCUMSTANCES AND UNDER NO LEGAL THEORY, WHETHER TORT (INCLUDING NEGLIGENCE), CONTRACT, OR OTHERWISE, SHALL YOU, THE INITIAL DEVELOPER, ANY OTHER CONTRIBUTOR, OR ANY DISTRIBUTOR OF COVERED CODE, OR ANY SUPPLIER OF ANY OF SUCH PARTIES, BE LIABLE TO ANY PERSON FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY CHARACTER INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF GOODWILL, WORK STOPPAGE, COMPUTER FAILURE OR MALFUNCTION, OR ANY AND ALL OTHER COMMERCIAL DAMAGES OR LOSSES, EVEN IF SUCH PARTY SHALL HAVE BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. THIS LIMITATION OF LIABILITY SHALL NOT APPLY TO LIABILITY FOR DEATH OR PERSONAL INJURY RESULTING FROM SUCH PARTY'S NEGLIGENCE TO THE EXTENT APPLICABLE LAW PROHIBITS SUCH LIMITATION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THIS EXCLUSION AND LIMITATION MAY NOT APPLY TO YOU.

10 U.S. GOVERNMENT END USERS.

11 MISCELLANEOUS.

12 RESPONSIBILITY FOR CLAIMS.

As between Initial Developer and the Contributors, each party is responsible for claims and damages arising, directly or indirectly, out of its utilization of rights under this License and You agree to work with Initial Developer and Contributors to distribute such responsibility on an equitable basis. Nothing herein is intended or shall be deemed to constitute any admission of liability.

EXHIBIT A.

  "The contents of this file are subject to the gSOAP Public License Version 1.3 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

http://genivia.com/Products/gsoap/license.pdf

More information on licensing options, support contracts, and consulting can be found at

http://genivia.com/Products/gsoap/contract.html

Software distributed under the License is distributed on an "AS IS" basis, WITHOUT WARRANTY OF ANY KIND, either express or implied. See the License for the specific language governing rights and limitations under the License.

The Original Code of the gSOAP Software is: stdsoap.h, stdsoap2.h, stdsoap.c, stdsoap2.c, stdsoap.cpp, stdsoap2.cpp, soapcpp2.h, soapcpp2.c, soapcpp2 lex.l, soapcpp2 yacc.y, error2.h, error2.c, symbol2.c, init2.c, soapdoc2.html, and soapdoc2.pdf, httpget.h, httpget.c, stl.h, stldeque.h, stllist.h, stlvector.h, stlset.h.

The Initial Developer of the Original Code is Robert A. van Engelen. Portions created by Robert A. van Engelen are Copyright (C) 2001–2004 Robert A. van Engelen, Genivia inc. All Rights Reserved.

Contributor(s):

  " ."

[Note: The text of this Exhibit A may differ slightly form the text of the notices in the Source Code files of the Original code. You should use the text of this Exhibit A rather than the text found in the Original Code Source Code for Your Modifications.]

EXHIBIT B.

  "Part of the software embedded in this product is gSOAP software.

Portions created by gSOAP are Copyright (C) 2001–2004 Robert A. van Engelen, Genivia, Inc. All Rights Reserved.

THE SOFTWARE IN THIS PRODUCT WAS IN PART PROVIDED BY GENIVIA INC 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 ANYWAY OUT OF THE USE OF THIS SOFTWARE, EVEN

IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE."

-----OpenSSL   1.0.1i-----

LICENSE ISSUES

==============

The OpenSSL toolkit stays under a dual license, i.e. both the conditions of
the OpenSSL License and the original SSLeay license apply to the toolkit.
See below for the actual license texts.

OpenSSL License

```
/* ====================================================================
 * Copyright (c) 1998-2016 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
```

* copied and put under another distribution licence

 * [including the GNU Public Licence.]

 */

-----Kerberos   1.11   MIT-----

The U.S. government prohibits export of encryption source code to certain countries and individuals, including, but not limited to, the countries of Cuba, Iran, North Korea, Sudan, Syria, and residents and nationals of those countries.

Documentation components of this software distribution are licensed under a Creative Commons Attribution-ShareAlike 3.0 Unported License. (http://creativecommons.org/licenses/by-sa/3.0/)

Individual source code files are copyright MIT, Cygnus Support, Novell, OpenVision Technologies, Oracle, Red Hat, Sun Microsystems, FundsXpress, and others.

Project Athena, Athena, Athena MUSE, Discuss, Hesiod, Kerberos, Moira, and Zephyr are trademarks of the Massachusetts Institute of Technology (MIT).   No commercial use of these trademarks may be made without prior written permission of MIT.

"Commercial use" means use of a name in a product or other for-profit manner.   It does NOT prevent a commercial firm from referring to the MIT trademarks in order to convey information (although in doing so, recognition of their trademark status should be given).

==

The following copyright and permission notice applies to the OpenVision Kerberos Administration system located in "kadmin/create", "kadmin/dbutil", "kadmin/passwd", "kadmin/server", "lib/kadm5", and portions of "lib/rpc":

   Copyright, OpenVision Technologies, Inc., 1993-1996, All Rights
   Reserved

   WARNING: Retrieving the OpenVision Kerberos Administration system
   source code, as described below, indicates your acceptance of the
   following terms.   If you do not agree to the following terms, do
   not retrieve the OpenVision Kerberos administration system.

   You may freely use and distribute the Source Code and Object Code

compiled from it, with or without modification, but this Source

Code is provided to you "AS IS" EXCLUSIVE OF ANY WARRANTY,

INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY OR

FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER WARRANTY, WHETHER

EXPRESS OR IMPLIED. IN NO EVENT WILL OPENVISION HAVE ANY LIABILITY

FOR ANY LOST PROFITS, LOSS OF DATA OR COSTS OF PROCUREMENT OF

SUBSTITUTE GOODS OR SERVICES, OR FOR ANY SPECIAL, INDIRECT, OR

CONSEQUENTIAL DAMAGES ARISING OUT OF THIS AGREEMENT, INCLUDING,

WITHOUT LIMITATION, THOSE RESULTING FROM THE USE OF THE SOURCE

CODE, OR THE FAILURE OF THE SOURCE CODE TO PERFORM, OR FOR ANY

OTHER REASON.

OpenVision retains all copyrights in the donated Source Code.

OpenVision also retains copyright to derivative works of the Source

Code, whether created by OpenVision or by a third party. The

OpenVision copyright notice must be preserved if derivative works

are made based on the donated Source Code.

OpenVision Technologies, Inc. has donated this Kerberos

Administration system to MIT for inclusion in the standard Kerberos

5 distribution. This donation underscores our commitment to

continuing Kerberos technology development and our gratitude for

the valuable work which has been performed by MIT and the Kerberos

community.

==

Portions contributed by Matt Crawford "crawdad@fnal.gov" were work

performed at Fermi National Accelerator Laboratory, which is

operated by Universities Research Association, Inc., under contract

DE-AC02-76CHO3000 with the U.S. Department of Energy.

==

Portions of "src/lib/crypto" have the following copyright:

Copyright (C) 1998 by the FundsXpress, INC.

All rights reserved.

Export of this software from the United States of America may

require a specific license from the United States Government.

It is the responsibility of any person or organization

contemplating export to obtain such a license before exporting.

WITHIN THAT CONSTRAINT, 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 FundsXpress. not be used in advertising or publicity

pertaining to distribution of the software without specific,

written prior permission.   FundsXpress makes no representations

about the suitability of this software for any purpose.   It is

provided "as is" without express or implied warranty.

THIS SOFTWARE IS PROVIDED "AS IS" AND WITHOUT ANY EXPRESS OR

IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED

WARRANTIES OF MERCHANTIBILITY AND FITNESS FOR A PARTICULAR PURPOSE.

==

The implementation of the AES encryption algorithm in

"src/lib/crypto/builtin/aes" has the following copyright:

Copyright (C) 2001, Dr Brian Gladman "brg@gladman.uk.net", Worcester, UK.

All rights reserved.

LICENSE TERMS

The free distribution and use of this software in both source and

binary form is allowed (with or without changes) provided that:

1. distributions of this source code include the above copyright

   notice, this list of conditions and the following disclaimer;

2. distributions in binary form include the above copyright notice,

   this list of conditions and the following disclaimer in the

   documentation and/or other associated materials;

3. the copyright holder's name is not used to endorse products
   built using this software without specific written permission.

DISCLAIMER

This software is provided 'as is' with no explcit or implied
warranties in respect of any properties, including, but not limited
to, correctness and fitness for purpose.

==

Portions contributed by Red Hat, including the pre-authentication
plug-in framework and the NSS crypto implementation, contain the
following copyright:

Copyright (C) 2006 Red Hat, Inc.
Portions copyright (C) 2006 Massachusetts Institute of Technology
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.

* Neither the name of Red Hat, Inc., 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 COPYRIGHT HOLDERS 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
COPYRIGHT OWNER 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 bundled verto source code is subject to the following license:

Copyright 2011 Red Hat, Inc.

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.

==

The implementations of GSSAPI mechglue in GSSAPI-SPNEGO in
"src/lib/gssapi", including the following files:

    lib/gssapi/generic/gssapi_err_generic.et

lib/gssapi/mechglue/g_accept_sec_context.c

lib/gssapi/mechglue/g_acquire_cred.c

lib/gssapi/mechglue/g_canon_name.c

lib/gssapi/mechglue/g_compare_name.c

lib/gssapi/mechglue/g_context_time.c

lib/gssapi/mechglue/g_delete_sec_context.c

lib/gssapi/mechglue/g_dsp_name.c

lib/gssapi/mechglue/g_dsp_status.c

lib/gssapi/mechglue/g_dup_name.c

lib/gssapi/mechglue/g_exp_sec_context.c

lib/gssapi/mechglue/g_export_name.c

lib/gssapi/mechglue/g_glue.c

lib/gssapi/mechglue/g_imp_name.c

lib/gssapi/mechglue/g_imp_sec_context.c

lib/gssapi/mechglue/g_init_sec_context.c

lib/gssapi/mechglue/g_initialize.c

lib/gssapi/mechglue/g_inquire_context.c

lib/gssapi/mechglue/g_inquire_cred.c

lib/gssapi/mechglue/g_inquire_names.c

lib/gssapi/mechglue/g_process_context.c

lib/gssapi/mechglue/g_rel_buffer.c

lib/gssapi/mechglue/g_rel_cred.c

lib/gssapi/mechglue/g_rel_name.c

lib/gssapi/mechglue/g_rel_oid_set.c

lib/gssapi/mechglue/g_seal.c

lib/gssapi/mechglue/g_sign.c

lib/gssapi/mechglue/g_store_cred.c

lib/gssapi/mechglue/g_unseal.c

lib/gssapi/mechglue/g_userok.c

lib/gssapi/mechglue/g_utils.c

lib/gssapi/mechglue/g_verify.c

lib/gssapi/mechglue/gssd_pname_to_uid.c

lib/gssapi/mechglue/mglueP.h

lib/gssapi/mechglue/oid_ops.c

lib/gssapi/spnego/gssapiP_spnego.h

lib/gssapi/spnego/spnego_mech.c

and the initial implementation of incremental propagation, including
the following new or changed files:

include/iprop_hdr.h

kadmin/server/ipropd_svc.c

lib/kdb/iprop.x

lib/kdb/kdb_convert.c

lib/kdb/kdb_log.c

lib/kdb/kdb_log.h

lib/krb5/error_tables/kdb5_err.et

slave/kpropd_rpc.c

slave/kproplog.c

are subject to the following license:

==

Kerberos V5 includes documentation and software developed at the
University of California at Berkeley, which includes this copyright
notice:

Permission is granted to use, copy, create derivative works and
redistribute this software and such derivative works for any
purpose, so long as the name of The University of Michigan is not
used in any advertising or publicity pertaining to the use of
distribution of this software without specific, written prior
authorization.   If the above copyright notice or any other
identification of the University of Michigan is included in any
copy of any portion of this software, then the disclaimer below
must also be included.

THIS SOFTWARE IS PROVIDED AS IS, WITHOUT REPRESENTATION FROM THE
UNIVERSITY OF MICHIGAN AS TO ITS FITNESS FOR ANY PURPOSE, AND
WITHOUT WARRANTY BY THE UNIVERSITY OF MICHIGAN OF ANY KIND, EITHER
EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE IMPLIED
WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
THE REGENTS OF THE UNIVERSITY OF MICHIGAN SHALL NOT BE LIABLE FOR
ANY DAMAGES, INCLUDING SPECIAL, INDIRECT, INCIDENTAL, OR
CONSEQUENTIAL DAMAGES, WITH RESPECT TO ANY CLAIM ARISING OUT OF OR
IN CONNECTION WITH THE USE OF THE SOFTWARE, EVEN IF IT HAS BEEN OR
IS HEREAFTER ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

==

The pkcs11.h file included in the PKINIT code has the following
license:

    Copyright 2006 g10 Code GmbH
    Copyright 2006 Andreas Jellinghaus

    This file is free software; as a special exception the author gives
    unlimited permission to copy and/or distribute it, with or without
    modifications, as long as this notice is preserved.

    This file is distributed in the hope that it will be useful, but
    WITHOUT ANY WARRANTY, to the extent permitted by law; without even
    the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
    PURPOSE.

==

Portions contributed by Apple Inc. are subject to the following

license:

Copyright 2004-2008 Apple Inc.   All Rights Reserved.

Export of this software from the United States of America may

require a specific license from the United States Government.

It is the responsibility of any person or organization

contemplating export to obtain such a license before exporting.

WITHIN THAT CONSTRAINT, 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 Apple Inc. not be used in advertising or publicity

pertaining to distribution of the software without specific,

written prior permission.   Apple Inc. makes no representations

about the suitability of this software for any purpose.   It is

provided "as is" without express or implied warranty.

THIS SOFTWARE IS PROVIDED "AS IS" AND WITHOUT ANY EXPRESS OR

IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED

WARRANTIES OF MERCHANTIBILITY AND FITNESS FOR A PARTICULAR PURPOSE.

===

The implementations of UTF-8 string handling in src/util/support and

src/lib/krb5/unicode are subject to the following copyright and

permission notice:

The OpenLDAP Public License

Version 2.8, 17 August 2003

Redistribution and use of this software and associated

documentation ("Software"), with or without modification, are

permitted provided that the following conditions are met:

1. Redistributions in source form must retain copyright statements

and notices,

==

Marked test programs in src/lib/krb5/krb have the following copyright:

==

Portions of the RPC implementation in src/lib/rpc and

src/include/gssrpc have the following copyright and permission notice:

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 as
   the first lines of this file unmodified.

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 NTT "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 NTT 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 2000 by Carnegie Mellon University

All Rights Reserved

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
Carnegie Mellon University not be used in advertising or publicity
pertaining to distribution of the software without specific,
written prior permission.

THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR
ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A
PARTICULAR PURPOSE.

==

Copyright (C) 1991, 1992, 1994 by Cygnus Support.

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. Cygnus Support makes no
representations about the suitability of this software for any
purpose.   It is provided "as is" without express or implied
warranty.

==

Copyright (C) 2006 Secure Endpoints Inc.

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.

==

Portions of the implementation of the Fortuna-like PRNG are subject to
the following notice:

WITHIN THAT CONSTRAINT, permission to copy, modify, and distribute

this software and its documentation in source and binary forms is

hereby granted, provided that any documentation or other materials

related to such distribution or use acknowledge that the software

was developed by the University of Southern California.

DISCLAIMER OF WARRANTY.   THIS SOFTWARE IS PROVIDED "AS IS".   The

University of Southern California MAKES NO REPRESENTATIONS OR

WARRANTIES, EXPRESS OR IMPLIED.   By way of example, but not

limitation, the University of Southern California MAKES NO

REPRESENTATIONS OR WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY

PARTICULAR PURPOSE. The University of Southern California shall not

be held liable for any liability nor for any direct, indirect, or

consequential damages with respect to any claim by the user or

distributor of the ksu software.

===

Copyright (C) 1995

The President and Fellows of Harvard University

This code is derived from software contributed to Harvard by Jeremy

Rassen.

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.

==

Copyright (C) 2008 by the Massachusetts Institute of Technology.
Copyright 1995 by Richard P. Basch.   All Rights Reserved.
Copyright 1995 by Lehman Brothers, Inc.   All Rights Reserved.

   Export of this software from the United States of America may
   require a specific license from the United States Government. It
   is the responsibility of any person or organization
   contemplating export to obtain such a license before exporting.

WITHIN THAT CONSTRAINT, 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 Richard P. Basch, Lehman Brothers and M.I.T. not be
used in advertising or publicity pertaining to distribution of the
software without specific, written prior permission.   Richard P.
Basch, Lehman Brothers and M.I.T. make no representations about the

suitability of this software for any purpose.   It is provided "as
is" without express or implied warranty.

===

The following notice applies to "src/lib/krb5/krb/strptime.c" and
"src/include/k5-queue.h".

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 following notice applies to Unicode library files in
"src/lib/krb5/unicode":

    Copyright 1997, 1998, 1999 Computing Research Labs,
    New Mexico State University

    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 COMPUTING RESEARCH LAB OR
    NEW MEXICO STATE UNIVERSITY 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.

==

The following notice applies to "src/util/support/strlcpy.c":

The following notice applies to SWIG-generated code in
"src/util/profile/profile_tcl.c":

==

The following notice applies to portiions of "src/lib/rpc" and
"src/include/gssrpc":

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.

==

Implementations of the MD4 algorithm are subject to the following notice:

==

Implementations of the MD5 algorithm are subject to the following notice:

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.

==

The following notice applies to
"src/lib/crypto/crypto_tests/t_mddriver.c":

Copyright (C) 1990-2, RSA Data Security, Inc. Created 1990. All
rights reserved.

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.

==

Portions of "src/lib/krb5" are subject to the following notice:

Copyright (C) 1994 CyberSAFE Corporation.
Copyright 1990,1991,2007,2008 by the Massachusetts Institute of Technology.

All Rights Reserved.

Export of this software from the United States of America may
require a specific license from the United States Government. It
is the responsibility of any person or organization
contemplating export to obtain such a license before exporting.

WITHIN THAT CONSTRAINT, 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.   Furthermore if you modify this software
you must label your software as modified software and not
distribute it in such a fashion that it might be confused with the
original M.I.T. software. Neither M.I.T., the Open Computing
Security Group, nor CyberSAFE Corporation make any representations
about the suitability of this software for any purpose.   It is
provided "as is" without express or implied warranty.

==

Portions contributed by PADL Software are subject to the following
license:

Copyright (c) 2011, PADL Software Pty Ltd. 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 PADL Software 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 PADL SOFTWARE 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 PADL SOFTWARE

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 bundled libev source code is subject to the following license:

   All files in libev are Copyright (C)2007,2008,2009 Marc Alexander

   Lehmann.

   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.

   THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS 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

COPYRIGHT OWNER 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.

Alternatively, the contents of this package may be used under the

terms of the GNU General Public License ("GPL") version 2 or any

later version, in which case the provisions of the GPL are

applicable instead of the above. If you wish to allow the use of

your version of this package only under the terms of the GPL and

not to allow others to use your version of this file under the BSD

license, indicate your decision by deleting the provisions above

and replace them with the notice and other provisions required by

the GPL in this and the other files of this package. If you do not

delete the provisions above, a recipient may use your version of

this file under either the BSD or the GPL.

-----OpenLDAP   2.4.33-----

The OpenLDAP Public License

   Version 2.8, 17 August 2003

Redistribution and use of this software and associated documentation

("Software"), with or without modification, are permitted provided

that the following conditions are met:

1. Redistributions in source form must retain copyright statements

   and notices,

2. Redistributions in binary form must reproduce applicable copyright

   statements and notices, this list of conditions, and the following

   disclaimer in the documentation and/or other materials provided

   with the distribution, and

3. Redistributions must contain a verbatim copy of this document.

The OpenLDAP Foundation may revise this license from time to time.
Each revision is distinguished by a version number.   You may use
this Software under terms of this license revision or under the
terms of any subsequent revision of the license.

A copy of this license is available in the file LICENSE in the top-level directory of the distribution or, alternatively, at <http://www.OpenLDAP.org/license.html>.

OpenLDAP is a registered trademark of the OpenLDAP Foundation.

Individual files and/or contributed packages may be copyright by other parties and/or subject to additional restrictions.

This work is derived from the University of Michigan LDAP v3.3 distribution.   Information concerning this software is available at <http://www.umich.edu/~dirsvcs/ldap/ldap.html>.

This work also contains materials derived from public sources.

Additional information about OpenLDAP can be obtained at <http://www.openldap.org/>.

Portions Copyright 1998-2012 Kurt D. Zeilenga.
Portions Copyright 1998-2006 Net Boolean Incorporated.
Portions Copyright 2001-2006 IBM Corporation.
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted only as authorized by the OpenLDAP Public License.

Portions Copyright 1999-2008 Howard Y.H. Chu.
Portions Copyright 1999-2008 Symas Corporation.
Portions Copyright 1998-2003 Hallvard B. Furuseth.
Portions Copyright 2007-2011 Gavin Henry.
Portions Copyright 2007-2011 Suretec Systems Ltd.
All rights reserved.

Redistribution and use in source and binary forms, with or without

modification, are permitted provided that this notice is preserved.
The names of the copyright holders may not be used to endorse or
promote products derived from this software without their specific
prior written permission.   This software is provided ``as is''
without express or implied warranty.

Portions Copyright (c) 1992-1996 Regents of the University of Michigan.
All rights reserved.

Redistribution and use in source and binary forms are permitted
provided that this notice is preserved and that due credit is given
to the University of Michigan at Ann Arbor.   The name of the
University may not be used to endorse or promote products derived
from this software without specific prior written permission.   This
software is provided ``as is'' without express or implied warranty.

-----libCurl   7.26.0-----

COPYRIGHT AND PERMISSION NOTICE

Copyright (c) 1996 - 2012, 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.

-----SASL 2.1.26-----

/* CMU libsasl

 * Tim Martin

 * Rob Earhart

 * Rob Siemborski

 */

/*

 * Copyright (c) 1998-2003 Carnegie Mellon University.   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 "Carnegie Mellon University" must not be used to

 *   endorse or promote products derived from this software without

 *   prior written permission. For permission or any other legal

 *   details, please contact

 *   Office of Technology Transfer

 *   Carnegie Mellon University

 *   5000 Forbes Avenue

 *   Pittsburgh, PA   15213-3890

 *   (412) 268-4387, fax: (412) 268-7395

 *   tech-transfer@andrew.cmu.edu

 *

 * 4. Redistributions of any form whatsoever must retain the following

 *   acknowledgment:

 *   "This product includes software developed by Computing Services

```
 *        at Carnegie Mellon University (http://www.cmu.edu/computing/)."
 *
 * CARNEGIE MELLON UNIVERSITY DISCLAIMS ALL WARRANTIES WITH REGARD TO
 * THIS SOFTWARE, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY
 * AND FITNESS, IN NO EVENT SHALL CARNEGIE MELLON UNIVERSITY BE LIABLE
 * FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES
 * WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN
 * AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING
 * OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.
 */
```

-----wpa_supplicant 2.0-----

WPA Supplicant
==============

This program is licensed under the BSD license (the one with
advertisement clause removed).

If you are submitting changes to the project, please see CONTRIBUTIONS
file for more instructions.

License
----

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(s) of the above-listed copyright holder(s) nor the

   names of its contributors may be used to endorse or promote products

   derived from this software without specific prior written permission.

Features

Supported WPA/IEEE 802.11i features:
- WPA-PSK ("WPA-Personal")
- WPA with EAP (e.g., with RADIUS authentication server) ("WPA-Enterprise")
  Following authentication methods are supported with an integrate IEEE 802.1X
  Supplicant:
  * EAP-TLS
  * EAP-PEAP/MSCHAPv2 (both PEAPv0 and PEAPv1)
  * EAP-PEAP/TLS (both PEAPv0 and PEAPv1)
  * EAP-PEAP/GTC (both PEAPv0 and PEAPv1)
  * EAP-PEAP/OTP (both PEAPv0 and PEAPv1)
  * EAP-PEAP/MD5-Challenge (both PEAPv0 and PEAPv1)
  * EAP-TTLS/EAP-MD5-Challenge
  * EAP-TTLS/EAP-GTC
  * EAP-TTLS/EAP-OTP
  * EAP-TTLS/EAP-MSCHAPv2

* EAP-TTLS/EAP-TLS

* EAP-TTLS/MSCHAPv2

* EAP-TTLS/MSCHAP

* EAP-TTLS/PAP

* EAP-TTLS/CHAP

* EAP-SIM

* EAP-AKA

* EAP-AKA'

* EAP-PSK

* EAP-PAX

* EAP-SAKE

* EAP-IKEv2

* EAP-GPSK

* EAP-pwd

* LEAP (note: requires special support from the driver for IEEE 802.11
    authentication)

(following methods are supported, but since they do not generate keying

  material, they cannot be used with WPA or IEEE 802.1X WEP keying)

* EAP-MD5-Challenge

* EAP-MSCHAPv2

* EAP-GTC

* EAP-OTP

- key management for CCMP, TKIP, WEP104, WEP40

- RSN/WPA2 (IEEE 802.11i)

* pre-authentication

* PMKSA caching

Supported TLS/crypto libraries:

- OpenSSL (default)

- GnuTLS

Internal TLS/crypto implementation (optional):

- can be used in place of an external TLS/crypto library

- TLSv1

- X.509 certificate processing

- PKCS #1

- ASN.1

- RSA

- bignum

- minimal size (ca. 50 kB binary, parts of which are already needed for WPA;

TLSv1/X.509/ASN.1/RSA/bignum parts are about 25 kB on x86)

Requirements

Current hardware/software requirements:
- Linux kernel 2.4.x or 2.6.x with Linux Wireless Extensions v15 or newer
- FreeBSD 6-CURRENT
- NetBSD-current
- Microsoft Windows with WinPcap (at least WinXP, may work with other versions)
- drivers:

Linux drivers that support cfg80211/nl80211. Even though there are
number of driver specific interface included in wpa_supplicant, please
note that Linux drivers are moving to use generic wireless configuration
interface driver_nl80211 (-Dnl80211 on wpa_supplicant command line)
should be the default option to start with before falling back to driver
specific interface.

Linux drivers that support WPA/WPA2 configuration with the generic
Linux wireless extensions (WE-18 or newer). Obsoleted by nl80211.

In theory, any driver that supports Linux wireless extensions can be
used with IEEE 802.1X (i.e., not WPA) when using ap_scan=0 option in
configuration file.

Wired Ethernet drivers (with ap_scan=0)

BSD net80211 layer (e.g., Atheros driver)
At the moment, this is for FreeBSD 6-CURRENT branch and NetBSD-current.

Windows NDIS
The current Windows port requires WinPcap (http://winpcap.polito.it/).
See README-Windows.txt for more information.

wpa_supplicant was designed to be portable for different drivers and
operating systems. Hopefully, support for more wlan cards and OSes will be
added in the future. See developer's documentation
(http://hostap.epitest.fi/wpa_supplicant/devel/) for more information about the
design of wpa_supplicant and porting to other drivers. One main goal

is to add full WPA/WPA2 support to Linux wireless extensions to allow
new drivers to be supported without having to implement new
driver-specific interface code in wpa_supplicant.

Optional libraries for layer2 packet processing:
- libpcap (tested with 0.7.2, most relatively recent versions assumed to work,
        this is likely to be available with most distributions,
        http://tcpdump.org/)
- libdnet (tested with v1.4, most versions assumed to work,
        http://libdnet.sourceforge.net/)

These libraries are _not_ used in the default Linux build. Instead,
internal Linux specific implementation is used. libpcap/libdnet are
more portable and they can be used by adding CONFIG_L2_PACKET=pcap into
.config. They may also be selected automatically for other operating
systems. In case of Windows builds, WinPcap is used by default
(CONFIG_L2_PACKET=winpcap).

Optional libraries for EAP-TLS, EAP-PEAP, and EAP-TTLS:
- OpenSSL (tested with 1.0.1 and 1.0.2 versions; assumed to
    work with most relatively recent versions; this is likely to be
    available with most distributions, http://www.openssl.org/)
- GnuTLS
- internal TLSv1 implementation

One of these libraries is needed when EAP-TLS, EAP-PEAP, EAP-TTLS, or
EAP-FAST support is enabled. WPA-PSK mode does not require this or EAPOL/EAP
implementation. A configuration file, .config, for compilation is
needed to enable IEEE 802.1X/EAPOL and EAP methods. Note that EAP-MD5,
EAP-GTC, EAP-OTP, and EAP-MSCHAPV2 cannot be used alone with WPA, so
they should only be enabled if testing the EAPOL/EAP state
machines. However, there can be used as inner authentication
algorithms with EAP-PEAP and EAP-TTLS.

See Building and installing section below for more detailed
information about the wpa_supplicant build time configuration.

WPA

The original security mechanism of IEEE 802.11 standard was not
designed to be strong and has proven to be insufficient for most
networks that require some kind of security. Task group I (Security)
of IEEE 802.11 working group (http://www.ieee802.org/11/) has worked
to address the flaws of the base standard and has in practice
completed its work in May 2004. The IEEE 802.11i amendment to the IEEE
802.11 standard was approved in June 2004 and published in July 2004.

Wi-Fi Alliance (http://www.wi-fi.org/) used a draft version of the
IEEE 802.11i work (draft 3.0) to define a subset of the security
enhancements that can be implemented with existing wlan hardware. This
is called Wi-Fi Protected Access<TM> (WPA). This has now become a
mandatory component of interoperability testing and certification done
by Wi-Fi Alliance. Wi-Fi provides information about WPA at its web
site (http://www.wi-fi.org/OpenSection/protected_access.asp).

IEEE 802.11 standard defined wired equivalent privacy (WEP) algorithm
for protecting wireless networks. WEP uses RC4 with 40-bit keys,
24-bit initialization vector (IV), and CRC32 to protect against packet
forgery. All these choices have proven to be insufficient: key space is
too small against current attacks, RC4 key scheduling is insufficient
(beginning of the pseudorandom stream should be skipped), IV space is
too small and IV reuse makes attacks easier, there is no replay
protection, and non-keyed authentication does not protect against bit
flipping packet data.

WPA is an intermediate solution for the security issues. It uses
Temporal Key Integrity Protocol (TKIP) to replace WEP. TKIP is a
compromise on strong security and possibility to use existing
hardware. It still uses RC4 for the encryption like WEP, but with
per-packet RC4 keys. In addition, it implements replay protection,
keyed packet authentication mechanism (Michael MIC).

Keys can be managed using two different mechanisms. WPA can either use
an external authentication server (e.g., RADIUS) and EAP just like
IEEE 802.1X is using or pre-shared keys without need for additional
servers. Wi-Fi calls these "WPA-Enterprise" and "WPA-Personal",

respectively. Both mechanisms will generate a master session key for
the Authenticator (AP) and Supplicant (client station).

WPA implements a new key handshake (4-Way Handshake and Group Key
Handshake) for generating and exchanging data encryption keys between
the Authenticator and Supplicant. This handshake is also used to
verify that both Authenticator and Supplicant know the master session
key. These handshakes are identical regardless of the selected key
management mechanism (only the method for generating master session
key changes).

IEEE 802.11i / WPA2

The design for parts of IEEE 802.11i that were not included in WPA has
finished (May 2004) and this amendment to IEEE 802.11 was approved in
June 2004. Wi-Fi Alliance is using the final IEEE 802.11i as a new
version of WPA called WPA2. This includes, e.g., support for more
robust encryption algorithm (CCMP: AES in Counter mode with CBC-MAC)
to replace TKIP and optimizations for handoff (reduced number of
messages in initial key handshake, pre-authentication, and PMKSA caching).

wpa_supplicant
----

wpa_supplicant is an implementation of the WPA Supplicant component,
i.e., the part that runs in the client stations. It implements WPA key
negotiation with a WPA Authenticator and EAP authentication with
Authentication Server. In addition, it controls the roaming and IEEE
802.11 authentication/association of the wlan driver.

wpa_supplicant is designed to be a "daemon" program that runs in the
background and acts as the backend component controlling the wireless
connection. wpa_supplicant supports separate frontend programs and an
example text-based frontend, wpa_cli, is included with wpa_supplicant.

Following steps are used when associating with an AP using WPA:

- wpa_supplicant requests the kernel driver to scan neighboring BSSes
- wpa_supplicant selects a BSS based on its configuration
- wpa_supplicant requests the kernel driver to associate with the chosen
  BSS
- If WPA-EAP: integrated IEEE 802.1X Supplicant completes EAP
  authentication with the authentication server (proxied by the
  Authenticator in the AP)
- If WPA-EAP: master key is received from the IEEE 802.1X Supplicant
- If WPA-PSK: wpa_supplicant uses PSK as the master session key
- wpa_supplicant completes WPA 4-Way Handshake and Group Key Handshake
  with the Authenticator (AP)
- wpa_supplicant configures encryption keys for unicast and broadcast
- normal data packets can be transmitted and received

Building and installing

In order to be able to build wpa_supplicant, you will first need to
select which parts of it will be included. This is done by creating a
build time configuration file, .config, in the wpa_supplicant root
directory. Configuration options are text lines using following
format: CONFIG_<option>=y. Lines starting with # are considered
comments and are ignored. See defconfig file for an example configuration
and a list of available options and additional notes.

The build time configuration can be used to select only the needed
features and limit the binary size and requirements for external
libraries. The main configuration parts are the selection of which
driver interfaces (e.g., nl80211, wext, ..) and which authentication
methods (e.g., EAP-TLS, EAP-PEAP, ..) are included.

Following build time configuration options are used to control IEEE
802.1X/EAPOL and EAP state machines and all EAP methods. Including
TLS, PEAP, or TTLS will require linking wpa_supplicant with OpenSSL
library for TLS implementation. Alternatively, GnuTLS or the internal
TLSv1 implementation can be used for TLS functionality.

CONFIG_IEEE8021X_EAPOL=y

CONFIG_EAP_MD5=y

CONFIG_EAP_MSCHAPV2=y

CONFIG_EAP_TLS=y

CONFIG_EAP_PEAP=y

CONFIG_EAP_TTLS=y

CONFIG_EAP_GTC=y

CONFIG_EAP_OTP=y

CONFIG_EAP_SIM=y

CONFIG_EAP_AKA=y

CONFIG_EAP_AKA_PRIME=y

CONFIG_EAP_PSK=y

CONFIG_EAP_SAKE=y

CONFIG_EAP_GPSK=y

CONFIG_EAP_PAX=y

CONFIG_EAP_LEAP=y

CONFIG_EAP_IKEV2=y

CONFIG_EAP_PWD=y

Following option can be used to include GSM SIM/USIM interface for GSM/UMTS
authentication algorithm (for EAP-SIM/EAP-AKA/EAP-AKA'). This requires pcsc-lite
(http://www.linuxnet.com/) for smart card access.

CONFIG_PCSC=y

Following options can be added to .config to select which driver
interfaces are included.

CONFIG_DRIVER_NL80211=y

CONFIG_DRIVER_WEXT=y

CONFIG_DRIVER_BSD=y

CONFIG_DRIVER_NDIS=y

Following example includes some more features and driver interfaces that
are included in the wpa_supplicant package:

CONFIG_DRIVER_NL80211=y

CONFIG_DRIVER_WEXT=y

CONFIG_DRIVER_BSD=y

```
CONFIG_DRIVER_NDIS=y
CONFIG_IEEE8021X_EAPOL=y
CONFIG_EAP_MD5=y
CONFIG_EAP_MSCHAPV2=y
CONFIG_EAP_TLS=y
CONFIG_EAP_PEAP=y
CONFIG_EAP_TTLS=y
CONFIG_EAP_GTC=y
CONFIG_EAP_OTP=y
CONFIG_EAP_SIM=y
CONFIG_EAP_AKA=y
CONFIG_EAP_PSK=y
CONFIG_EAP_SAKE=y
CONFIG_EAP_GPSK=y
CONFIG_EAP_PAX=y
CONFIG_EAP_LEAP=y
CONFIG_EAP_IKEV2=y
CONFIG_PCSC=y
```

EAP-PEAP and EAP-TTLS will automatically include configured EAP
methods (MD5, OTP, GTC, MSCHAPV2) for inner authentication selection.

After you have created a configuration file, you can build
wpa_supplicant and wpa_cli with 'make' command. You may then install
the binaries to a suitable system directory, e.g., /usr/local/bin.

Example commands:

```
# build wpa_supplicant and wpa_cli
make
# install binaries (this may need root privileges)
cp wpa_cli wpa_supplicant /usr/local/bin
```

You will need to make a configuration file, e.g.,
/etc/wpa_supplicant.conf, with network configuration for the networks
you are going to use. Configuration file section below includes
explanation fo the configuration file format and includes various
examples. Once the configuration is ready, you can test whether the

configuration work by first running wpa_supplicant with following
command to start it on foreground with debugging enabled:

wpa_supplicant -iwlan0 -c/etc/wpa_supplicant.conf -d

Assuming everything goes fine, you can start using following command
to start wpa_supplicant on background without debugging:

wpa_supplicant -iwlan0 -c/etc/wpa_supplicant.conf -B

Please note that if you included more than one driver interface in the
build time configuration (.config), you may need to specify which
interface to use by including -D<driver name> option on the command
line. See following section for more details on command line options
for wpa_supplicant.

Command line options
----

usage:
  wpa_supplicant [-BddfhKLqqtuvW] [-P<pid file>] [-g<global ctrl>] ¥
        [-G<group>] ¥
        -i<ifname> -c<config file> [-C<ctrl>] [-D<driver>] [-p<driver_param>] ¥
        [-b<br_ifname> [-MN -i<ifname> -c<conf> [-C<ctrl>] [-D<driver>] ¥
        [-p<driver_param>] [-b<br_ifname>] [-m<P2P Device config file>] ...

options:
  -b = optional bridge interface name
  -B = run daemon in the background
  -c = Configuration file
  -C = ctrl_interface parameter (only used if -c is not)
  -i = interface name
  -d = increase debugging verbosity (-dd even more)
  -D = driver name (can be multiple drivers: nl80211,wext)
  -f = Log output to default log location (normally /tmp)
  -g = global ctrl_interface
  -G = global ctrl_interface group
  -K = include keys (passwords, etc.) in debug output

-t = include timestamp in debug messages

-h = show this help text

-L = show license (BSD)

-p = driver parameters

-P = PID file

-q = decrease debugging verbosity (-qq even less)

-u = enable DBus control interface

-v = show version

-W = wait for a control interface monitor before starting

-M = start describing matching interface

-N = start describing new interface

-m = Configuration file for the P2P Device

drivers:

nl80211 = Linux nl80211/cfg80211

wext = Linux wireless extensions (generic)

wired = wpa_supplicant wired Ethernet driver

roboswitch = wpa_supplicant Broadcom switch driver

bsd = BSD 802.11 support (Atheros, etc.)

ndis = Windows NDIS driver

In most common cases, wpa_supplicant is started with

wpa_supplicant -B -c/etc/wpa_supplicant.conf -iwlan0

This makes the process fork into background.

The easiest way to debug problems, and to get debug log for bug
reports, is to start wpa_supplicant on foreground with debugging
enabled:

wpa_supplicant -c/etc/wpa_supplicant.conf -iwlan0 -d

If the specific driver wrapper is not known beforehand, it is possible
to specify multiple comma separated driver wrappers on the command
line. wpa_supplicant will use the first driver wrapper that is able to
initialize the interface.

wpa_supplicant -Dnl80211,wext -c/etc/wpa_supplicant.conf -iwlan0

wpa_supplicant can control multiple interfaces (radios) either by
running one process for each interface separately or by running just
one process and list of options at command line. Each interface is
separated with -N argument. As an example, following command would
start wpa_supplicant for two interfaces:

wpa_supplicant ¥
       -c wpa1.conf -i wlan0 -D nl80211 -N ¥
       -c wpa2.conf -i wlan1 -D wext

If the interfaces on which wpa_supplicant is to run are not known or do
not exist, wpa_supplicant can match an interface when it arrives. Each
matched interface is separated with -M argument and the -i argument now
allows for pattern matching.

As an example, the following command would start wpa_supplicant for a
specific wired interface called lan0, any interface starting with wlan
and lastly any other interface. Each match has its own configuration
file, and for the wired interface a specific driver has also been given.

wpa_supplicant ¥
       -M -c wpa_wired.conf -ilan0 -D wired ¥
       -M -c wpa1.conf -iwlan* ¥
       -M -c wpa2.conf

If the interface is added in a Linux bridge (e.g., br0), the bridge
interface needs to be configured to wpa_supplicant in addition to the
main interface:

wpa_supplicant -cw.conf -Dnl80211 -iwlan0 -bbr0

Configuration file
----

wpa_supplicant is configured using a text file that lists all accepted
networks and security policies, including pre-shared keys. See

example configuration file, wpa_supplicant.conf, for detailed
information about the configuration format and supported fields.

Changes to configuration file can be reloaded be sending SIGHUP signal
to wpa_supplicant ('killall -HUP wpa_supplicant'). Similarly,
reloading can be triggered with 'wpa_cli reconfigure' command.

Configuration file can include one or more network blocks, e.g., one
for each used SSID. wpa_supplicant will automatically select the best
network based on the order of network blocks in the configuration
file, network security level (WPA/WPA2 is preferred), and signal
strength.

Example configuration files for some common configurations:

1) WPA-Personal (PSK) as home network and WPA-Enterprise with EAP-TLS as work
    network

# allow frontend (e.g., wpa_cli) to be used by all users in 'wheel' group
ctrl_interface=/var/run/wpa_supplicant
ctrl_interface_group=wheel
#
# home network; allow all valid ciphers
network={
        ssid="home"
        scan_ssid=1
        key_mgmt=WPA-PSK
        psk="very secret passphrase"
}
#
# work network; use EAP-TLS with WPA; allow only CCMP and TKIP ciphers
network={
        ssid="work"
        scan_ssid=1
        key_mgmt=WPA-EAP
        pairwise=CCMP TKIP
        group=CCMP TKIP
        eap=TLS
        identity="user@example.com"
        ca_cert="/etc/cert/ca.pem"

```
        client_cert="/etc/cert/user.pem"
        private_key="/etc/cert/user.prv"
        private_key_passwd="password"
}
```

2) WPA-RADIUS/EAP-PEAP/MSCHAPv2 with RADIUS servers that use old peaplabel
   (e.g., Funk Odyssey and SBR, Meetinghouse Aegis, Interlink RAD-Series)

```
ctrl_interface=/var/run/wpa_supplicant
ctrl_interface_group=wheel
network={
        ssid="example"
        scan_ssid=1
        key_mgmt=WPA-EAP
        eap=PEAP
        identity="user@example.com"
        password="foobar"
        ca_cert="/etc/cert/ca.pem"
        phase1="peaplabel=0"
        phase2="auth=MSCHAPV2"
}
```

3) EAP-TTLS/EAP-MD5-Challenge configuration with anonymous identity for the
   unencrypted use. Real identity is sent only within an encrypted TLS tunnel.

```
ctrl_interface=/var/run/wpa_supplicant
ctrl_interface_group=wheel
network={
        ssid="example"
        scan_ssid=1
        key_mgmt=WPA-EAP
        eap=TTLS
        identity="user@example.com"
        anonymous_identity="anonymous@example.com"
        password="foobar"
        ca_cert="/etc/cert/ca.pem"
        phase2="auth=MD5"
}
```

4) IEEE 802.1X (i.e., no WPA) with dynamic WEP keys (require both unicast and
broadcast); use EAP-TLS for authentication

```
ctrl_interface=/var/run/wpa_supplicant
ctrl_interface_group=wheel
network={
        ssid="1x-test"
        scan_ssid=1
        key_mgmt=IEEE8021X
        eap=TLS
        identity="user@example.com"
        ca_cert="/etc/cert/ca.pem"
        client_cert="/etc/cert/user.pem"
        private_key="/etc/cert/user.prv"
        private_key_passwd="password"
        eapol_flags=3
}
```

5) Catch all example that allows more or less all configuration modes. The
configuration options are used based on what security policy is used in the
selected SSID. This is mostly for testing and is not recommended for normal
use.

```
ctrl_interface=/var/run/wpa_supplicant
ctrl_interface_group=wheel
network={
        ssid="example"
        scan_ssid=1
        key_mgmt=WPA-EAP WPA-PSK IEEE8021X NONE
        pairwise=CCMP TKIP
        group=CCMP TKIP WEP104 WEP40
        psk="very secret passphrase"
        eap=TTLS PEAP TLS
        identity="user@example.com"
        password="foobar"
        ca_cert="/etc/cert/ca.pem"
        client_cert="/etc/cert/user.pem"
```

```
            private_key="/etc/cert/user.prv"

            private_key_passwd="password"

            phase1="peaplabel=0"

            ca_cert2="/etc/cert/ca2.pem"

            client_cert2="/etc/cer/user.pem"

            private_key2="/etc/cer/user.prv"

            private_key2_passwd="password"

}
```

6) Authentication for wired Ethernet. This can be used with 'wired' or
   'roboswitch' interface (-Dwired or -Droboswitch on command line).

```
ctrl_interface=/var/run/wpa_supplicant
ctrl_interface_group=wheel
ap_scan=0
network={
        key_mgmt=IEEE8021X
        eap=MD5
        identity="user"
        password="password"
        eapol_flags=0
}
```

Certificates

Some EAP authentication methods require use of certificates. EAP-TLS
uses both server side and client certificates whereas EAP-PEAP and
EAP-TTLS only require the server side certificate. When client
certificate is used, a matching private key file has to also be
included in configuration. If the private key uses a passphrase, this
has to be configured in wpa_supplicant.conf ("private_key_passwd").

wpa_supplicant supports X.509 certificates in PEM and DER
formats. User certificate and private key can be included in the same
file.

If the user certificate and private key is received in PKCS#12/PFX format, they need to be converted to suitable PEM/DER format for wpa_supplicant. This can be done, e.g., with following commands:

```
# convert client certificate and private key to PEM format
openssl pkcs12 -in example.pfx -out user.pem -clcerts
# convert CA certificate (if included in PFX file) to PEM format
openssl pkcs12 -in example.pfx -out ca.pem -cacerts -nokeys
```

wpa_cli
----

wpa_cli is a text-based frontend program for interacting with wpa_supplicant. It is used to query current status, change configuration, trigger events, and request interactive user input.

wpa_cli can show the current authentication status, selected security mode, dot11 and dot1x MIBs, etc. In addition, it can configure some variables like EAPOL state machine parameters and trigger events like reassociation and IEEE 802.1X logoff/logon. wpa_cli provides a user interface to request authentication information, like username and password, if these are not included in the configuration. This can be used to implement, e.g., one-time-passwords or generic token card authentication where the authentication is based on a challenge-response that uses an external device for generating the response.

The control interface of wpa_supplicant can be configured to allow non-root user access (ctrl_interface_group in the configuration file). This makes it possible to run wpa_cli with a normal user account.

wpa_cli supports two modes: interactive and command line. Both modes share the same command set and the main difference is in interactive mode providing access to unsolicited messages (event messages, username/password requests).

Interactive mode is started when wpa_cli is executed without including

the command as a command line parameter. Commands are then entered on the wpa_cli prompt. In command line mode, the same commands are entered as command line arguments for wpa_cli.

Interactive authentication parameters request

When wpa_supplicant need authentication parameters, like username and password, which are not present in the configuration file, it sends a request message to all attached frontend programs, e.g., wpa_cli in interactive mode. wpa_cli shows these requests with "CTRL-REQ-<type>-<id>:<text>" prefix. <type> is IDENTITY, PASSWORD, or OTP (one-time-password). <id> is a unique identifier for the current network. <text> is description of the request. In case of OTP request, it includes the challenge from the authentication server.

The reply to these requests can be given with 'identity', 'password', and 'otp' commands. <id> needs to be copied from the the matching request. 'password' and 'otp' commands can be used regardless of whether the request was for PASSWORD or OTP. The main difference between these two commands is that values given with 'password' are remembered as long as wpa_supplicant is running whereas values given with 'otp' are used only once and then forgotten, i.e., wpa_supplicant will ask frontend for a new value for every use. This can be used to implement one-time-password lists and generic token card -based authentication.

Example request for password and a matching reply:

CTRL-REQ-PASSWORD-1:Password needed for SSID foobar
> password 1 mysecretpassword

Example request for generic token card challenge-response:

CTRL-REQ-OTP-2:Challenge 1235663 needed for SSID foobar
> otp 2 9876

wpa_cli commands

status = get current WPA/EAPOL/EAP status

mib = get MIB variables (dot1x, dot11)

help = show this usage help

interface [ifname] = show interfaces/select interface

level <debug level> = change debug level

license = show full wpa_cli license

logoff = IEEE 802.1X EAPOL state machine logoff

logon = IEEE 802.1X EAPOL state machine logon

set = set variables (shows list of variables when run without arguments)

pmksa = show PMKSA cache

reassociate = force reassociation

reconfigure = force wpa_supplicant to re-read its configuration file

preauthenticate <BSSID> = force preauthentication

identity <network id> <identity> = configure identity for an SSID

password <network id> <password> = configure password for an SSID

pin <network id> <pin> = configure pin for an SSID

otp <network id> <password> = configure one-time-password for an SSID

passphrase <network id> <passphrase> = configure private key passphrase
    for an SSID

bssid <network id> <BSSID> = set preferred BSSID for an SSID

list_networks = list configured networks

select_network <network id> = select a network (disable others)

enable_network <network id> = enable a network

disable_network <network id> = disable a network

add_network = add a network

remove_network <network id> = remove a network

set_network <network id> <variable> <value> = set network variables (shows
    list of variables when run without arguments)

get_network <network id> <variable> = get network variables

save_config = save the current configuration

disconnect = disconnect and wait for reassociate command before connecting

scan = request new BSS scan

scan_results = get latest scan results

get_capability <eap/pairwise/group/key_mgmt/proto/auth_alg> = get capabilies

terminate = terminate wpa_supplicant

quit = exit wpa_cli

wpa_cli command line options

wpa_cli [-p<path to ctrl sockets>] [-i<ifname>] [-hvB] [-a<action file>] ¥

      [-P<pid file>] [-g<global ctrl>]   [command..]

  -h = help (show this usage text)

  -v = shown version information

  -a = run in daemon mode executing the action file based on events from

      wpa_supplicant

  -B = run a daemon in the background

  default path: /var/run/wpa_supplicant

  default interface: first interface found in socket path

Using wpa_cli to run external program on connect/disconnect

----

wpa_cli can used to run external programs whenever wpa_supplicant

connects or disconnects from a network. This can be used, e.g., to

update network configuration and/or trigget DHCP client to update IP

addresses, etc.

One wpa_cli process in "action" mode needs to be started for each

interface. For example, the following command starts wpa_cli for the

default interface (-i can be used to select the interface in case of

more than one interface being used at the same time):

wpa_cli -a/sbin/wpa_action.sh -B

The action file (-a option, /sbin/wpa_action.sh in this example) will

be executed whenever wpa_supplicant completes authentication (connect

event) or detects disconnection). The action script will be called

with two command line arguments: interface name and event (CONNECTED

or DISCONNECTED). If the action script needs to get more information

about the current network, it can use 'wpa_cli status' to query

wpa_supplicant for more information.

Following example can be used as a simple template for an action

script:

#!/bin/sh

IFNAME=$1

```
CMD=$2

if [ "$CMD" = "CONNECTED" ]; then
    SSID=`wpa_cli -i$IFNAME status | grep ^ssid= | cut -f2- -d=`
    # configure network, signal DHCP client, etc.
fi

if [ "$CMD" = "DISCONNECTED" ]; then
    # remove network configuration, if needed
    SSID=
fi
```

Integrating with pcmcia-cs/cardmgr scripts
----

wpa_supplicant needs to be running when using a wireless network with
WPA. It can be started either from system startup scripts or from
pcmcia-cs/cardmgr scripts (when using PC Cards). WPA handshake must be
completed before data frames can be exchanged, so wpa_supplicant
should be started before DHCP client.

For example, following small changes to pcmcia-cs scripts can be used
to enable WPA support:

Add MODE="Managed" and WPA="y" to the network scheme in
/etc/pcmcia/wireless.opts.

Add the following block to the end of 'start' action handler in
/etc/pcmcia/wireless:

```
    if [ "$WPA" = "y" -a -x /usr/local/bin/wpa_supplicant ]; then
        /usr/local/bin/wpa_supplicant -B -c/etc/wpa_supplicant.conf ¥
                    -i$DEVICE
    fi
```

Add the following block to the end of 'stop' action handler (may need
to be separated from other actions) in /etc/pcmcia/wireless:

```
    if [ "$WPA" = "y" -a -x /usr/local/bin/wpa_supplicant ]; then
        killall wpa_supplicant
    fi
```

This will make cardmgr start wpa_supplicant when the card is plugged
in.

Dynamic interface add and operation without configuration files
----

wpa_supplicant can be started without any configuration files or
network interfaces. When used in this way, a global (i.e., per
wpa_supplicant process) control interface is used to add and remove
network interfaces. Each network interface can then be configured
through a per-network interface control interface. For example,
following commands show how to start wpa_supplicant without any
network interfaces and then add a network interface and configure a
network (SSID):

```
# Start wpa_supplicant in the background
wpa_supplicant -g/var/run/wpa_supplicant-global -B

# Add a new interface (wlan0, no configuration file, driver=nl80211, and
# enable control interface)
wpa_cli -g/var/run/wpa_supplicant-global interface_add wlan0 ¥
        "" nl80211 /var/run/wpa_supplicant

# Configure a network using the newly added network interface:
wpa_cli -iwlan0 add_network
wpa_cli -iwlan0 set_network 0 ssid '"test"'
wpa_cli -iwlan0 set_network 0 key_mgmt WPA-PSK
wpa_cli -iwlan0 set_network 0 psk '"12345678"'
wpa_cli -iwlan0 set_network 0 pairwise TKIP
wpa_cli -iwlan0 set_network 0 group TKIP
wpa_cli -iwlan0 set_network 0 proto WPA
wpa_cli -iwlan0 enable_network 0

# At this point, the new network interface should start trying to associate
```

with the WPA-PSK network using SSID test.

Remove network interface
wpa_cli -g/var/run/wpa_supplicant-global interface_remove wlan0

Privilege separation

To minimize the size of code that needs to be run with root privileges
(e.g., to control wireless interface operation), wpa_supplicant
supports optional privilege separation. If enabled, this separates the
privileged operations into a separate process (wpa_priv) while leaving
rest of the code (e.g., EAP authentication and WPA handshakes) into an
unprivileged process (wpa_supplicant) that can be run as non-root
user. Privilege separation restricts the effects of potential software
errors by containing the majority of the code in an unprivileged
process to avoid full system compromise.

Privilege separation is not enabled by default and it can be enabled
by adding CONFIG_PRIVSEP=y to the build configuration (.config). When
enabled, the privileged operations (driver wrapper and l2_packet) are
linked into a separate daemon program, wpa_priv. The unprivileged
program, wpa_supplicant, will be built with a special driver/l2_packet
wrappers that communicate with the privileged wpa_priv process to
perform the needed operations. wpa_priv can control what privileged
are allowed.

wpa_priv needs to be run with network admin privileges (usually, root
user). It opens a UNIX domain socket for each interface that is
included on the command line; any other interface will be off limits
for wpa_supplicant in this kind of configuration. After this,
wpa_supplicant can be run as a non-root user (e.g., all standard users
on a laptop or as a special non-privileged user account created just
for this purpose to limit access to user files even further).

Example configuration:
- create user group for users that are allowed to use wpa_supplicant
  ('wpapriv' in this example) and assign users that should be able to

use wpa_supplicant into that group

- create /var/run/wpa_priv directory for UNIX domain sockets and control

   user access by setting it accessible only for the wpapriv group:

   mkdir /var/run/wpa_priv

   chown root:wpapriv /var/run/wpa_priv

   chmod 0750 /var/run/wpa_priv

- start wpa_priv as root (e.g., from system startup scripts) with the

   enabled interfaces configured on the command line:

   wpa_priv -B -P /var/run/wpa_priv.pid nl80211:wlan0

- run wpa_supplicant as non-root with a user that is in wpapriv group:

   wpa_supplicant -i ath0 -c wpa_supplicant.conf

wpa_priv does not use the network interface before wpa_supplicant is

started, so it is fine to include network interfaces that are not

available at the time wpa_priv is started. As an alternative, wpa_priv

can be started when an interface is added (hotplug/udev/etc. scripts).

wpa_priv can control multiple interface with one process, but it is

also possible to run multiple wpa_priv processes at the same time, if

desired.

Linux capabilities instead of privileged process
----

wpa_supplicant performs operations that need special permissions, e.g.,

to control the network connection. Traditionally this has been achieved

by running wpa_supplicant as a privileged process with effective user id

0 (root). Linux capabilities can be used to provide restricted set of

capabilities to match the functions needed by wpa_supplicant. The

minimum set of capabilities needed for the operations is CAP_NET_ADMIN

and CAP_NET_RAW.

setcap(8) can be used to set file capabilities. For example:

sudo setcap cap_net_raw,cap_net_admin+ep wpa_supplicant

Please note that this would give anyone being able to run that

wpa_supplicant binary access to the additional capabilities. This can

further be limited by file owner/group and mode bits. For example:

```
sudo chown wpas wpa_supplicant
sudo chmod 0100 wpa_supplicant
```

This combination of setcap, chown, and chmod commands would allow wpas
user to execute wpa_supplicant with additional network admin/raw
capabilities.

Common way style of creating a control interface socket in
/var/run/wpa_supplicant could not be done by this user, but this
directory could be created before starting the wpa_supplicant and set to
suitable mode to allow wpa_supplicant to create sockets
there. Alternatively, other directory or abstract socket namespace could
be used for the control interface.

External requests for radio control

External programs can request wpa_supplicant to not start offchannel
operations during other tasks that may need exclusive control of the
radio. The RADIO_WORK control interface command can be used for this.

"RADIO_WORK add <name> [freq=<MHz>] [timeout=<seconds>]" command can be
used to reserve a slot for radio access. If freq is specified, other
radio work items on the same channel may be completed in
parallel. Otherwise, all other radio work items are blocked during
execution. Timeout is set to 10 seconds by default to avoid blocking
wpa_supplicant operations for excessive time. If a longer (or shorter)
safety timeout is needed, that can be specified with the optional
timeout parameter. This command returns an identifier for the radio work
item.

Once the radio work item has been started, "EXT-RADIO-WORK-START <id>"
event message is indicated that the external processing can start. Once
the operation has been completed, "RADIO_WORK done <id>" is used to
indicate that to wpa_supplicant. This allows other radio works to be
performed. If this command is forgotten (e.g., due to the external
program terminating), wpa_supplicant will time out the radio work item
and send "EXT-RADIO-WORK-TIMEOUT <id>" event to indicate that this has
happened. "RADIO_WORK done <id>" can also be used to cancel items that
```

have not yet been started.

For example, in wpa_cli interactive mode:

> radio_work add test
1
<3>EXT-RADIO-WORK-START 1
> radio_work show
ext:test@wlan0:0:1:2.487797
> radio_work done 1
OK
> radio_work show


> radio_work done 3
OK
> radio_work show
ext:test freq=2412 timeout=30@wlan0:2412:1:28.583483
<3>EXT-RADIO-WORK-TIMEOUT 2


> radio_work add test2 freq=2412 timeout=60
5
<3>EXT-RADIO-WORK-START 5
> radio_work add test3
6
> radio_work add test4
7
> radio_work show
ext:test2 freq=2412 timeout=60@wlan0:2412:1:9.751844
ext:test3@wlan0:0:0:5.071812
ext:test4@wlan0:0:0:3.143870
> radio_work done 6
OK
> radio_work show
ext:test2 freq=2412 timeout=60@wlan0:2412:1:16.287869
ext:test4@wlan0:0:0:9.679895
> radio_work done 5
OK
<3>EXT-RADIO-WORK-START 7

<3>EXT-RADIO-WORK-TIMEOUT 7

-----libstrophe        0.8.5-----

libstrophe XMPP client library
Copyright (C) 2005-2009 Collecta, Inc.

This program is dual licensed under the MIT and GPLv3 licenses.

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.

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.

<center>END OF TERMS AND CONDITIONS</center>

<center>How to Apply These Terms to Your New Programs</center>

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:

&lt;program&gt;    Copyright (C) &lt;year&gt;    &lt;name of author&gt;

    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

&lt;http://www.gnu.org/licenses/&gt;.

    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

&lt;http://www.gnu.org/philosophy/why-not-lgpl.html&gt;.

-----Jansson            2.4-----

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.

-----Expat 2.1.0-----

Copyright (c) 1998, 1999, 2000 Thai Open Source Software Center Ltd
and Clark Cooper
Copyright (c) 2001, 2002, 2003, 2004, 2005, 2006 Expat maintainers.

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.