
GGSL installers explained

Technical Note Hqn092

December 2014



1 Introduction

This technical note details the various steps followed by the Global Graphics installers when installing the Harlequin MultiRIP and Harlequin Host Renderer products. It gives the specific commands used to add and remove supporting software as well as the RIPs themselves.

The following abbreviations are used:

HMR	Harlequin MultiRIP
HHR	Harlequin Host Renderer
HLS	Harlequin License Server
HLM	Harlequin License Manager
LDK	Sentinel License Development Kit from SafeNet Inc
USER_INSTALL_DIR	The directory chosen by the user into which the RIP will be installed
HLS_BINDIR	the “bin” directory containing an installed HLS.

The product versions covered here are: HMR v10.0 (or later) and HHR v 4.0 (or later).

The rest of this document describes the installations steps for Windows and Linux separately; note that only the HHR product is supported on Linux systems.

2 Windows

The installer imposes the following simple validation rules:

- The Windows 64-bit installer will not run on a Windows 32-bit system
- The user must have admin privileges when running the installer
- The installer will not install into “protected” locations, such as: Windows, Windows\System, Control Panel, Root directory of C: and Program Files.
- The installer will not overwrite an existing installed RIP product.

2.1 Sentinel SuperPro dongle driver (if required)

The Sentinel dongle driver must be installed when:

- the local machine will have a Sentinel SuperPro dongle attached, for example to enable the HLS, and
- the driver is not currently installed, or
- an old version of the driver is installed. That is, a version older than 7.5.7.

The version of the currently installed dongle driver, if any, is available in one of the following locations in the Windows registry:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Rainbow Technologies\Sentinel System
Driver:CurrentVersion
```

```
HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Rainbow Technologies\Sentinel System
Driver:CurrentVersion
```

Use the following command to install the Sentinel SuperPro dongle driver:

```
USER_INSTALL_DIR\dongle\Sentinel System Driver Installer 7.5.7.exe /s /v"/qb"
```

2.2 Microsoft Visual C runtime libraries

The RIP and associated products require the appropriate C runtime libraries, which can be installed by running the “redistributables” sub-installers that are freely available from Microsoft.

Note: The sub-installer version to use may vary with the HMR/HHR release.

For HMR 10.0rx or HHR 4.0rx, use sub-installers version **10.0.40219.01** available here:

x86—<http://www.microsoft.com/en-us/download/details.aspx?id=5555>

x64—<http://www.microsoft.com/en-us/download/details.aspx?id=14632>.

For HMR 10.1rx or HHR 4.1rx, use sub-installers version **12.0.21005.01** available here:

x86, x64—<http://www.microsoft.com/en-gb/download/details.aspx?id=40784>.

Use the following command(s) to install these C runtime libraries:

on Win32: `vcredist_x86.exe /q /norestart`

on Win64: `vcredist_x64.exe /q /norestart`
`vcredist_x86.exe /q /norestart`

2.3 Harlequin License Server / Manager

The HLS (and HLM) will need to be installed when:

- the RIP product is to be enabled using HLS security, and
- the HLS is not currently installed, or
- an old version of the HLS is installed. That is, a version older than 5.0
- the user selects to re-install the HLS irrespective of version.

The HLS is installed into a specific location, normally:

```
\Program Files\Common Files\Global Graphics Software
```

unless installing a 32-bit product onto a Windows 64-bit system, in which case the location is:

```
\Program Files(x86)\Common Files\Global Graphics Software
```

Check for an existing HLS by looking for the HLS_BINDIR directory, for example:

```
\Program Files\Common Files\Global Graphics Software\Harlequin License  
Server\bin
```

If this is not found on a Windows 64-bit system, look for directory:

```
\Program Files (x86)\Common Files\Global Graphics Software\Harlequin License  
Server\bin
```

If HLS_BINDIR is found, you can check if the HLS is currently installed with the command:

```
HLS_BINDIR\hqn_lsd.exe -stop
```

If an existing HLS is installed this command will generate a message (on stdout) which includes one of the following strings:

- is not running
- Stopping
- stopped

To get the version of an installed HLS, use the following commands

```
HLS_BINDIR\hqn_lsd.exe -start
HLS_BINDIR\hqn_lsa.exe -i
```

This will result in several lines of output to stdout, one of which will have the form:

```
server release: n.nrn ( where each 'n' is 1 or more digits )
```

The command to remove a currently installed HLS is:

```
HLS_BINDIR\hqn_lsd.exe -remove
```

After copying any new or replacement HLS or HLM files into:

```
\Program Files\Common Files\Global Graphics Software\
```

the set of commands to install a new HLS is:

```
HLS_BINDIR\hqn_lsd.exe -remove
```

Note: The `-remove` argument removes any existing “orphan” HLS service.

```
HLS_BINDIR\hqn_lsd.exe -install
HLS_BINDIR\hqn_lsd.exe -start
```

The HLS is installed as a Windows Service set to start whenever Windows is restarted.

2.4 LDK

The command to install or update the LDK is:

```
USER_INSTALL_DIR\ldk\haspdinst.exe -install -criticalmsg
```

The command to enable a user to register an LDK Product Key is:

```
USER_INSTALL_DIR\ldk\utils\ldktool.exe
```

The command to remove an installed LDK is:

```
USER_INSTALL_DIR\ldk\haspdinst.exe -r -purge -criticalmsg
```

Note: When selecting a different language you should finish the installation then run the LDK tool and set the language.

2.5 HMR / HHR

The installer must create one or two extra files when installing the RIP products.

```
USER_INSTALL_DIR\title.txt
```

Text file containing one line providing a relevant name string for the RIP. (For example, Harlequin MultiRIP, OEMname RIP.) This file is only used by the Migrate utility and hence is not created for HHR installations.

```
USER_INSTALL_DIR\SW\secprefs
```

Text file containing two lines indicating whether a RIP is enabled using the HLS or the LDK:

—first line is one word: `method`

—second line is either: `hls` or `ldk`

This file is not generated for RIPs enabled using other security mechanisms.

3 Linux

Note: The HMR is not supported on Linux systems, so this section refers to HHR installs only.

The installer imposes the following simple validation rules:

- the Linux 64-bit installer will not run on a Linux 32-bit system
- the user must have elevated privileges to install the HLS or LDK software
- the installer will not overwrite an existing installed RIP product.

3.1 Sentinel SuperPro dongle driver (if required)

The Sentinel SuperPro dongle driver must be installed when:

- the local machine will have a Sentinel dongle attached, for example to enable the HLS, and
- the driver is not currently installed, or
- an old version of the driver is installed. That is, a version older than 7.5.2.

The version of the currently installed dongle driver, if any, is available from the file:

```
/var/opt/sentinel_keys/shk_product.info
```

which will contain a line similar to:

```
sud=sntl-sud-n.n.n:nnn:/opt/safenet_sentinel/common_files:ins-sud=N
```

(where each “n” is 1 or more digits).

Use the following command to install the Sentinel SuperPro dongle driver:

```
USER_INSTALL_DIR/dongle/sud_install.sh nobanner
```

3.2 Harlequin License Server / Manager

The HLS (and HLM) must be installed when:

- the HHR is to be enabled using HLS security, and
- the HLS is not currently installed, or
- an old version of the HLS is installed. That is, a version older than 5.0
- the user selects to re-install the HLS irrespective of version.

There is no prescribed directory for the HLS on a Linux system, although there is a recommended default location: `/usr/local/bin/HLS`, so the user has to provide this information to the installer.

The `HLS_BINDIR` folder will then be `<user_dir>/Global Graphics Software/Harlequin License Server/bin`

For example;

```
/usr/local/bin/HLS/Global Graphics Software/Harlequin License Server/bin
```

The following commands give the version of an HLS that is already installed:

```
HLS_BINDIR/hls-rcd stop
HLS_BINDIR/hls-rcd start
HLS_BINDIR/hlsadm -i
```

This results in several lines of output to stdout, one which will have the form:

```
server release: n.nrn
```

(where each “n” is 1 or more digits).

The command to remove a currently installed HLS is simply:

```
HLS_BINDIR/hls-rcd stop
```

After copying any new/replacement HLS and HLM files into:

```
<user_dir>/Global Graphics Software/
```

The command to install a new HLS is:

```
HLS_BINDIR/hls-rcd start
```

Once started the HLS runs in the background as a Unix daemon.

To start the HLS whenever the computer is restarted, copy the script `HLS_BINDIR/hls-rcd` into the `/etc/init.d` directory and then add the following line to the `/etc/rc.local` file:

```
/etc/init.d/hls-rcd start
```

For more information on the scripts used to run the HLS, and the HLM, see [Appendix A](#) below.

3.3 LDK

The commands to install or update the LDK are:

```
rpm -U USER_INSTALL_DIR/ldk/aksusbd-2.2-1.i386.rpm
cp USER_INSTALL_DIR/ldk/hasplib_109670.so /var/hasplm/
```

Note: Make the sure the folder `/var/hasplm` already exists.

The command to enable a user to register an LDK Product Key is:

```
USER_INSTALL_DIR/ldk/utils/$ldktool
```


The command to remove an installed LDK is:

```
rpm -e USER_INSTALL_DIR/ldk/aksusbd-2.2-1.i386.rpm
```

Note: When selecting a different language you should finish the installation then run the LDK tool and set the language.

3.4 HHR

The installer must create one extra file when installing the HHR.

```
USER_INSTALL_DIR\SW\secprefs
```

Text file containing two lines indicating whether an HHR is enabled using the HLS or the LDK:

—first line is one word: `method`

—second line is either: `hls` or `ldk`

This file is not generated for RIPS enabled using other security mechanisms.

4 *USER_INSTALL_DIR* contents

This section describes the install directory contents for both HMR and HHR.

4.1 HMR

The HMR installation folder will always contain the following:

- RIP executable binary
- RIP GUI resource files for English and Japanese
- omniORB (CORBA support) and pthreads libraries
- Messages folder contains localization resource data
- SW folder.

It may also contain some or all of:

- Genlin tool and `genlin` folder
- Migrate tool and `migrate` folder

- `ldk` folder containing LDK security tools
- `sentinel` folder containing Sentinel dongle driver
- `Uninstall_xxx` folder containing Uninstaller and install log(s)
- `jre` folder containing Java runtime support needed to run Migrate and/or the Uninstaller.

The `sw` folder will include some or all of the following:

CRD Generator	<code>SW/Crdgen</code>
None plugin	<code>SW/Devices/testnone</code>
PDF Raster plugin	<code>SW/Devices/pdfraster</code>
Socket plugin	<code>SW/Inputs/socket</code>
Spool plugin	<code>SW/Inputs/spool</code>
TIFF plugin	<code>SW/Devices/tiff</code>
XPSptdev	<code>SW/Extensions/PSDevices/xpsptdev</code>

4.2 HHR

The HHR installation folder will always contain the following:

- `bin` folder containing the RIP executable, `corelib` and `pthread` libraries, build makefile
- `sw` folder.

It may also contain some or all of:

- `bin/omniORB` libraries if the RIP uses HLS or LDK security
- `bin.minrip` folder containing a sample minimal build of the RIP executable, build makefile
- `doc` folder containing API help file for developers using the SDK
- `dongle` folder containing Sentinel dongle driver
- `ldk` folder containing LDK security tools
- `lib` folder containing source code for the HHR SDK skin modules

- `Uninstall_xxx` folder containing Uninstaller and install log(s)
- `jre` folder containing Java runtime support for the Uninstaller (not required if the system already has Java 1.5+ support installed).

5 Running the installer automatically

The installer (and uninstaller) for both HMR and HHR can be run without any interactive user involvement by passing it a response file which sets some or all of the following variables.

<code>INSTALL_UI</code>	specify the installer's user interface when it runs
- values	<code>gui, silent</code>
<code>DEF_PRESET</code>	flag that we are using a preset responses file (required)
- values	<code>1</code>
<code>DEF_RIPNUM</code>	specify which RIP to install by giving its position in the list displayed by the installer (don't set this if an installer only contains one RIP)
- values	<code>1 .. n</code>
<code>DEF_RIPSEC</code>	specify which security model to use for the selected RIP (don't set this if the RIP only has one security option)
- values	<code>hls, ldk, le</code>
<code>DEF_INSTSEC</code>	if using HLS or LDK, should it be installed as well as the RIP
- values	<code>yes, no, only</code> (<code>yes</code> = both, <code>no</code> = RIP only, <code>only</code> = HLS/LDK only, no RIP)

DEF_LINKDIR	directory for shortcut/alias/softlink entries
- values	any valid directory specification
- not set	no shortcut/alias/softlink entries are created
DEF_HLSDIR	separate HLS directory (only if installing HHR on Linux)
- values	any valid directory specification
USER_INSTALL_DIR	directory into which to install (required).

Example of a response file:

```
DEF_PRESET=1
INSTALLER_UI=silent
DEF_RIPNUM=1
DEF_RIPSEC=hls
DEF_INSTSEC=yes
DEF_LINKDIR=c:\\test\\auto\\scuts
USER_INSTALL_DIR=c:\\test\\auto\\hmr_win64
```

Note: There should be no trailing spaces at the end of any lines in the properties file. When generating a properties file using a Windows command file, the simplest way to avoid adding such spaces is to use the following command layout:

```
>>properties_filename echo DEF_PRESET=1
```

Sample command to use a response file:

```
<directory>\install_hmr_win64.exe -f <any_directory>\<response_file_name>
```

Note: The above command returns immediately when running the installer/uninstaller in silent mode on Windows; to avoid this run the command from within a cmd script (or prefix with start/wait).

Appendix A Using dynamic libraries on Linux

The HLS and HLM tools both use the omniORB dynamic libraries supplied to provide CORBA support; as delivered these libraries are in sub-folders named:

```
i586_linux64_2.6_glibc2.5_gcc4.4
```

Note: The set of omniORB libraries for the HLM are not the same as those for the HLS (or HHR).

Note: By default the HLS and HLM both look for these libraries in `./<omniORB_subfolder>`, which means that they can only be run from within their install folder. To avoid this limitation the following Linux shell scripts are added to the HLS/HLM folders by the installer:

<code>hlsadm</code>	run the HLS admin tool used to get information about a running HLS.
<code>runhls</code>	run the HLS itself.
<code>licmgr</code>	run the HLM.

Each of these scripts has the same format:

```
#!/bin/sh
hlsdir="<instdir>/Global Graphics Software/Harlequin License Server/bin"
libdir="i586_linux64_2.6_glibc2.5_gcc4.4"
case "$LD_LIBRARY_PATH" in
*"$libdir"*) ;;
*/"*) export LD_LIBRARY_PATH="$LD_LIBRARY_PATH:$hlsdir/$libdir" ;;
*) export LD_LIBRARY_PATH="$hlsdir/$libdir" ;;
esac
if [ -f "$hlsdir"/<toolname> ]; then
exec "$hlsdir"/<toolname> $*
fi
```

These, in effect, set the environment variable `LD_LIBRARY_PATH` to include the location of the omniORB libraries before running the appropriate HLS/HLM tool. These scripts can be run from any location on the system.

Alternatively, the omniORB libraries supplied with the HLS—but not those with the HLM—could be moved to a “known” location, in which case these scripts would not be required and the HLS tools could be run directly. The procedure for doing this, which requires privileged access, is:

- copy the contents of the omniORB subfolder to `/usr/lib`

Note: The soft links must also be moved across.

- enter the command `/sbin/ldconfig`

Note: This approach implies that these specific omniORB libraries will be used by all relevant tools except where the `LD_LIBRARY_PATH` variable is set to indicate otherwise.

The sample HHR executable for Linux ('clrip') is built using one or more dynamic libraries:

corelib.so	the HHR core library, supplied in <code>USER_INSTALL_DIR/bin</code>
omniORB*.so	CORBA support libraries, supplied in <code>USER_INSTALL_DIR/bin/i586_...</code> (Present when using HLS or LDK security to enable the HHR.) (If present the omniORB libraries are the same as those supplied with the HLS.)

By default the HHR looks for these libraries in `../bin` and `./<omniORB_subfolder>` respectively (the former allows the clrip and minrip to use the same core library), hence the clrip may only be run from `USER_INSTALL_DIR/bin`. In a development and test environment where there may be several copies and/or versions of the HHR being used this avoids any confusion over sharing libraries, but some OEMs/users may find this too restrictive.

Alternate ways of lifting this restriction for the omniORB libraries (if present) are described above, and the approach of setting the `LD_LIBRARY_PATH` variable can also be used for the corelib library once clrip (and/or minrip) has been re-linked after making the following changes to the appropriate Makefile:

Line num	Change from:	Change to:
88	<code>CORELIB=\$(CORELIB_DIR)/corelib.so</code>	<code>CORELIB=corelib.so</code>
650	<code>\$(CORELIB)</code>	<code>\$(CORELIB_DIR)/\$(CORELIB)</code>
656	<code>\$(CORELIB)</code>	<code>-L\$(CORELIB_DIR) \$(CORELIB)</code>

Additional reading

For further information see the following documents:

- Harlequin License Server—for the Harlequin Host Renderer and Harlequin MultiRIP
- LDK Security for the Harlequin MultiRIP
- LDK Security for the Harlequin Host Renderer
- Harlequin Host Renderer SDK Developers Guide.

Document history

Change history		
v1.0	03.12.2014	New Document



Copyright and Trademarks

GGSL installers explained

Version 1.0: December 2014

Part number: Hqn092

Document issue: 104

Copyright © 2014 Global Graphics Software Ltd and its licensors. All Rights Reserved.

Global Graphics Software Ltd. Confidential Information.

Certificate of Computer Registration of Computer Software.

Registration No. 2006SR05517

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of Global Graphics Software Ltd.

The information in this publication is provided for information only and is subject to change without notice. This publication could contain technical inaccuracies, typographical errors and out-of-date information. Use of the information is therefore at your own risk. Global Graphics Software Ltd and its affiliates shall not be responsible or liable for any loss or damage that may arise from the use of any information in this publication.

The software described in this publication is furnished under license and may only be used or copied in accordance with the terms of that license. Global Graphics Software Ltd accepts no responsibility or liability for any special, punitive, incidental, indirect or consequential damages of any kind, or any damages whatsoever, including, without limitation, those resulting from loss of use, data or profits, whether or not Global Graphics Software has been advised of the possibility of such damages, and on any theory of liability, arising out of or in connection with the use of this software.

Protected by U.S. Patents 5,862,253; 6,343,145; 6,330,072; 6,483,524; 6,380,951; 6,755,498; 6,624,908; 6,809,839; 6,755,498; 6,624,908; 6,809,839; 6,996,284; 7,298,526; 7,359,530; 8,749,813; 8,823,982.

Other U.S. Patents Pending

Protected by European Patents 0 803 160; 0 772 934

Portions Type 1 font renderer contains licensed third party software

Portions copyright 1991 International Business Machines, Corp.,

Portions copyright 1991 Lexmark International, Inc.

Portions Adobe Glyph List. Copyright 1990-2007 Adobe Systems Incorporated.

Portions Adobe Cmaps. Copyright 1990-2009 Adobe Systems Incorporated

Portions TrueType® font renderer copyright 1997 Bitstream, Inc.

Portions developed using the Kakadu software. Copyright 2001 David Taubman, The University of New South Wales (Unisearch Ltd)

The ECI and FOGRA ICC color profiles supplied with this Harlequin RIP are distributed with the kind permission of the ECI (European Color Initiative) and FOGRA respectively, and of Heidelberger Druckmaschinen AG (HEIDELBERG).

The IFRA ICC profiles supplied with this Harlequin RIP are distributed with the kind permission of IFRA and of GretagMacbeth.

Harlequin and the Harlequin RIP are trademarks of Global Graphics Software Ltd, which may be registered in certain jurisdictions. Harlequin ColorPro, Harlequin Dispersed Screening (HDS), Harlequin Precision Screening (HPS), TrapPro, SetGold, SetGoldPro, Harlequin MultiRIP, Harlequin Host Renderer, Harlequin Parallel Pages and Harlequin VariData are all trademarks of Global Graphics Software Ltd. Other brand or product names are the registered trademarks or trademarks of their respective holders.

TrueType is a registered trademark of Apple Computer, Inc.

Microsoft, Win32, Windows, Windows NT, Windows Server, Windows Vista, Windows 7, Windows 8 and WinFX are either registered trademarks or trademarks of the Microsoft Corporation in the United States and/or other countries.

PANTONE® Colors displayed herein may not match PANTONE-identified standards. Consult current PANTONE Color Publications for accurate color. PANTONE® and other Pantone trademarks are the property of Pantone LLC. © Pantone LLC, 2014.

Fonts copyright (c) 2000-2004 Timo Lehtinen. All Rights Reserved. <http://www.timolehtinen.com/type/>.

International Cooperation for Integration of Processes in Prepress, Press and Postpress, CIP4, Job Definition Format, JDF and the CIP4 logo are trademarks of CIP4.

Adobe, Adobe Photoshop, Adobe Type Manager, Acrobat, Display PostScript, Adobe Illustrator, PostScript, Distiller and PostScript 3 are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries which may be registered in certain jurisdictions.

Portions include software licensed under the following terms:

OpenSSL - general purpose cryptography library

Copyright © 1998-2011 The OpenSSL Project. All rights reserved.

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

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

3. All advertising materials mentioning features or use of this software must display the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (<http://www.openssl.org/>)"

4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.

5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.

6. Redistributions of any form whatsoever must retain the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>)"

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

This product includes cryptographic software written by Eric Young (eyay@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).

Copyright © 1995-1998 Eric Young (eyay@cryptsoft.com)

All rights reserved.

This package is an SSL implementation written by Eric Young (eyay@cryptsoft.com). The implementation was written so as to conform with Netscapes SSL.

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

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

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

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

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

3. All advertising materials mentioning features or use of this software must display the following acknowledgement: "This product includes cryptographic software written by Eric Young (eyay@cryptsoft.com)" The word 'cryptographic' can be left out if the routines from the library being used are not cryptographic related(-).

4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement: "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

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

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

ICU - IBM library providing Unicode and Globalization support

Copyright © 1995-2003 International Business Machines Corporation and others All rights reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, provided that the above copyright notice(s) and this permission notice appear in all copies of the Software and that both the above copyright notice(s) and this permission notice appear in supporting documentation.

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 COPYRIGHT HOLDER OR HOLDERS INCLUDED IN THIS NOTICE BE LIABLE FOR ANY CLAIM, OR 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.

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.

Expat - XML parser library

Copyright © 1998, 1999, 2000 Thai Open Source Software Center Ltd and Clark Cooper

Copyright © 2001, 2002 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.

pthread-win32 - a POSIX threads library for Microsoft Windows

This file is Copyrighted

zlib - general purpose compression library

Copyright © 1995-2013 Jean-loup Gailly and Mark Adler

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

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

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

Copyright © 2005-2008, The Android Open Source Project

Licensed under the Apache License, Version 2.0 (the “License”); you may not use this file except in compliance with the License.

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an “AS IS” BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

Apache License

Version 2.0, January 2004

<http://www.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 counterclaim 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.

US Government Use

Harlequin MultiRIP software is a computer software program developed at private expense. If the Harlequin MultiRIP software is acquired under the terms of a proposal or agreement with the United States Govern-

ment or any contractor therefor, the software is subject to the following restricted rights notice: "This Software is commercial computer software provided with RESTRICTED RIGHTS. Use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013, FAR 52.227-17 Alternate III (g)(3), or subparagraphs (c)(1) and (2) of the Commercial Computer Software -- Restricted Rights at 48 CFR 52.227-19, as applicable, and their successor provisions. Contractor/Manufacturer is Global Graphics Software Incorporated, Waltham, MA 02451."