



Introduction to Asterisk Development

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How to obtain, build and work with Asterisk
from the Subversion repositories

How to obtain, build and work with Asterisk from the Subversion repositories

- Source modules and branches
- Operating system platforms
- Required and optional tools
- Required and optional libraries



Subversion repositories

- All Asterisk and related projects managed via Subversion 1.4 repositories
- Public (read-only) repository at <http://svn.digium.com>
- Master (read-write) repository at <https://origsvn.digium.com>
- Repositories viewable via web browser at <http://svn.digium.com/view>
- All commits are logged to mailing lists on lists.digium.com (svn-commits, asterisk-commits, etc.)
- Repositories are managed by Digium development staff, but dozens of community developers have commit access



Source modules and branches

Asterisk

<http://svn.digium.com/svn/asterisk>

- trunk
- branches/1.6.0, 1.6.1, etc.
- branches/1.4
- branches/1.2
- team/<developer>/...
- tags/...



Source modules and branches

Asterisk-Addons

<http://svn.digium.com/svn/asterisk-addons>

- trunk
- branches/1.6.0, 1.6.1, etc.
- branches/1.4
- branches/1.2
- team/<developer>/...
- tags/...



Source modules and branches

DAHDI Linux kernel modules

<http://svn.digium.com/svn/DAHDI/linux>

- trunk
- team/<developer>/...
- tags/...



Source modules and branches

DAHDI Userspace tools

<http://svn.digium.com/svn/DAHDI/tools>

- trunk
- team/<developer>/...
- tags/...



Source modules and branches

Libpri (ISDN protocol stack)

<http://svn.digium.com/svn/libpri>

- branches/1.4
- branches/1.2
- team/<developer>/...
- tags/...



Source modules and branches

Libss7 (SS7 protocol stack)

<http://svn.digium.com/svn/libss7>

- trunk
- team/<developer>/...
- tags/...



Obtaining and updating code via Subversion

```
$ svn co http://svn.digium.com/svn/asterisk/trunk asterisk-trunk
```

```
$ svn co http://svn.digium.com/svn/libpri/branches/1.4 libpri-1.4
```

```
....
```

```
$ cd asterisk-trunk
```

```
$ ./configure && make && make install
```

```
...
```

```
$ make update
```



Operating system platforms

- GNU/Linux (primary development): various flavors including Fedora, Debian/Ubuntu, RHEL/CentOS
- FreeBSD 5.x and 6.x
- Solaris/OpenSolaris
- Mac OS X (Darwin)
- Windows (via Cygwin, Asterisk 1.6.x only)



Required tools

- GNU C/C++ compilers, v3.x or higher, v4.x recommended
- GNU binary utilities (assembler and linker)
- GNU make, v3.80 or higher



Optional tools

- doxygen and graphviz
- ccache
- GNU debugger (gdb)
- valgrind
- ctags and/or etags
- autoconf and automake
- bison and flex (only for AEL and expression parser)
- wget/fetch



Required libraries (Asterisk 1.6)

- OpenSSL (res_crypto)
- zlib (pbx_dundi)
- termcap (editline, can come from termcap, tinfo, curses or ncurses)



Optional libraries (Asterisk 1.6)

- alsa (chan_alsa)
- execinfo (backtrace support)
- cap (POSIX capabilities)
- curl (func_curl, res_config_curl)
- DAHDI (chan_dahdi, codec_dahdi)
- ffmpeg (console_video)
- gsm (codec_gsm, version included with Asterisk)
- gmime (res_http_post)
- iconv (func_iconv)
- iksemel (res_jabber, chan_gtalk, chan_jingle)



Optional libraries (Asterisk 1.6)

- imap (UW IMAP Toolkit, app_voicemail IMAP support)
- isdn (ISDN4Linux, chan_phone)
- jack (app_jack)
- ldap (OpenLDAP, res_config_ldap)
- Lua (pbx_lua)
- misdn (mISDNuser, chan_misdn)
- nbs (chan_nbs)
- netsnmp (res_snmp)
- odbc (unixODBC, res_odbc, cdr_odbc, func_odbc, res_config_odbc, cdr_adaptive_odbc)
- ogg (format_ogg_vorbis)



Optional libraries (Asterisk 1.6)

- osptk (OSP Toolkit, app_osplookup)
- oss (chan_oss)
- postgres (PostgreSQL, cdr_pgsql, res_config_pgsql)
- portaudio (chan_console)
- libpri (chan_dahdi)
- resample (codec_resample)
- spandsp (app_fax)
- libss7 (chan_dahdi)
- pwlip (chan_h323)
- h323 (OpenH.323, chan_h323)



Optional libraries (Asterisk 1.6)

- radius (radiusclient, cdr_radius)
- sdl (chan_oss)
- sdl_image (chan_oss)
- speex (codec_speex)
- sqlite (cdr_sqlite, res_config_sqlite)
- sqlite3 (cdr_sqlite3_custom)
- ssl (OpenSSL, TLS support in various modules)
- tds (FreeTDS, cdr_tds)
- usb (libusb, chan_usbradio)
- vorbis (format_ogg_vorbis)



Optional libraries (Asterisk 1.6)

- vpb (Voicetronix API, chan_vpb)
- x11 (chan_oss)





Asterisk Contributions and Licensing

Contributions and Licensing

- Patch creation and support
- Maintaining out-of-tree patches
- Licensing
- Patch submission
- Contributor License Agreement



Patch Creation

- always run 'make update'
- use 'svn diff'
- **read** the patch before posting it
- watch for new/removed files



Out-Of-Tree Patches

- You may choose to maintain your changes outside of the Digium-maintained Asterisk tree, which allows you to distribute them under any GPLv2-compatible license you wish to use
- Warning: keeping an out-of-tree patch up to date with the trunk branch can be hard work, but tools can help
- Users of your patch may have limited support options



Licensing

- Asterisk projects are dual-licensed
 - they are distributed under the version 2 GNU General Public License
 - they are also distributed by Digium under commercial licenses that do not require source code distribution
- Contributions **must** be licensed to Digium
- All code contributed to the tree **must** be original code, or **must** include a license agreement from the original author, or **must** be licensed in a way that does not restrict Digium's distribution of the code in any way
- Changes contributed to Asterisk **cannot** be subject to any encumbrances, such as patents, exclusivity agreements or non-competition agreements



Licensing of your changes/patches

- If you make changes to Asterisk, you are **not** required to distribute the source code for them (unless you distribute binaries containing the changed code, as the GPLv2 mandates)
- Likewise, you are **not** required to contribute your changes to the Asterisk source tree, although we would prefer that you do so
- If your changes are accepted into Asterisk, they will be maintained and kept current with the rest of the Asterisk source by the community and/or Digium's developers



Asterisk GPLv2 is Permanent

- Contrary to occasional discussions on the Internet, the Asterisk source code, since it has been released under the GPLv2, will **always** be available under the GPLv2.
- Anyone can distribute the Asterisk source code as they wish, although if they distribute a modified version Digium may require them to not use the 'Asterisk' name for it, since 'Asterisk' is a registered trademark owned by Digium.



Patch submission

- All code contributions **must** be posted on Digium's issue tracker for consideration
- Patches posted on mailing lists, web sites, etc. will not be reviewed or considered for merging by development team, for licensing reasons
- Patches posted on issue tracker are tied to user who posted them and license agreement



Contributor License Agreement

- On <http://bugs.digium.com>
- Required before any code contributions will be visible to any other user of issue tracker
- Simple, one-page form
- This form retains all copyrights by the original owner, and grants Digium an irrevocable and royalty-free license to use the code in any form.
- The owner of the code can continue to distribute the code as they wish, under any license they choose to use, as long as it does not conflict with the license granted to Digium (i.e. they cannot grant an exclusive license to the code to any other party).

