GNU Code Quality Project ?

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Background

- I maintain GnuTLS, GNU SASL, GNU Libidn, GNU Shishi, GNU GSS and several non-GNU projects

- I contribute to Gnulib, GNU InetUtils, GNU MailUtils and other projects

- Code quality efforts are to a large extent not very project-specific

  - Assuming "normal" projects, i.e., autoconf ./configure script and automake self-tests

Idea

Start a GNU-wide project to
facilitate code quality improvement
to interested projects

Essential services

- Build bot from version controlled source
  - Current solution is just a script
  - Could be more complex and require a number of installed developer packages on build machine
  - Use Nix?

Essential services

- Daily snapshot upload/download service
    - Currently SSH authenticated uploads of PGP signed sources (use anonymous ftp instead?)
    - Download via http://daily.josefsson.org/
- Build on different platforms for wider testing
    - Simpler: download daily snapshot, ./configure, make check, pipe output to email to PROJECT@autobuild.josefsson.org
- Web interface to view build status
    - http://autobuild.josefsson.org/

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http://daily.josefsson.org/

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Name	**Last modified**	**Size**	**Description**
README.html	08-May-2009 11:22	711	
gnulib/	11-Nov-2009 04:45	-	
gnupdf/	19-Sep-2009 07:15	-	
gnutls-2.4/	11-Nov-2009 04:45	-	
gnutls-2.6/	11-Nov-2009 04:45	-	
gnutls-2.8/	11-Nov-2009 04:45	-	
gnutls/	11-Nov-2009 04:45	-	
gsasl/	11-Nov-2009 04:45	-	
gss/	11-Nov-2009 04:45	-	
inetutils/	11-Nov-2009 04:45	-	
libgcrypt/	11-Nov-2009 04:45	-	
libgpg-error/	11-Nov-2009 04:45	-	
libidn/	11-Nov-2009 04:45	-	
libntlm/	11-Nov-2009 04:45	-	
libssh2/	11-Nov-2009 04:45	-	
libtasn1-1/	11-Nov-2009 04:45	-	
libtasn1/	11-Nov-2009 04:45	-	
robots.txt	18-Dec-2008 08:18	26	
shishi/	11-Nov-2009 04:45	-	

This server is sponsored by Simon Josefsson Datakonsult AB and contains daily snapshots for various projects.

The majority of snapshots were created by this script:

http://git.josefsson.org/cgi-bin/gitweb.cgi?p=tools.git;a=blob;f=scripts/daily-bootstrap-vc;hb=HEAD

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http://autobuild.josefsson.org/

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	Name	**Last modified**	**Size**	**Description**
	README.html	15-Apr-2009 08:19	3.1K	
	gnulib/	11-Nov-2009 04:00	-	
	gnupdf/	11-Nov-2009 04:00	-	
	gnutls/	11-Nov-2009 04:01	-	
	gsasl/	11-Nov-2009 04:02	-	
	guile/	11-Nov-2009 04:02	-	
	inetutils/	11-Nov-2009 04:02	-	
	libidn/	11-Nov-2009 04:02	-	
	libntlm/	11-Nov-2009 04:00	-	
	libssh2/	11-Nov-2009 04:02	-	
	robots.txt	15-Apr-2009 08:19	26	
	shishi/	11-Nov-2009 04:02	-	

This server contains build logs for projects that send their build logs via e-mail to [PROJECTNAME]@autobuild.josefsson.org.

For more information, see http://josefsson.org/autobuild/.

What are the requirements?

The system works best with projects that use Autoconf, and in particular those that run the AB_INIT macro in autobuild.m4 from Autobuild. The macro makes your configure script output strings such as:

```
configure: autobuild project... libtasn1
configure: autobuild revision... 0.3.8
configure: autobuild hostname... dopio
configure: autobuild timestamp... 20061202-123851
```

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Summary

Project	Build type	Revision	System	Build date	Results
GNU Libtasn1	i586-pc-mingw32msvc from i686-pc-linux-gnu	2.4	gaggia	20091111T084455Z	Success
	ia64-unknown-linux-gnu	2.4	Babe	20091110T080031Z	Success
	powerpc-apple-darwin8.11.0	2.4	espresso.lan	20091110T200021Z	Success
	x86_64-unknown-linux-gnu	2.4	gaggia	20091111T074945Z	Success
GnuTLS	x86_64-unknown-linux-gnu	2.4.4	gaggia	20091111-081902	Success
gnutls	unknown	latest	unknown	unknown	Failure
gnutls-2.6	unknown	2.6-latest	unknown	unknown	Failure
libgcrypt	unknown	latest	unknown	unknown	Failure
	x86_64-unknown-linux-gnu	0	unknown	unknown	Success
libgpg-error	unknown	latest	unknown	unknown	Failure
	x86_64-unknown-linux-gnu	1.8-svn225	gaggia	20091111-074603	Success
libtasn1	i586-pc-mingw32msvc from i686-pc-linux-gnu	1.8	gaggia	20091111T084529Z	Success
	ia64-unknown-linux-gnu	1.8	Babe	20091110T090014Z	Success
	x86_64-unknown-linux-gnu	1.8	gaggia	20091111T075052Z	Success

Project 'GNU Libtasn1'

Revisions (1): 2.4,

Hosttypes (4): i586-pc-mingw32msvc, ia64-unknown-linux-gnu, powerpc-apple-darwin8.11.0, x86_64-unknown-linux-gnu,

Build hosts (3): Babe, espresso.lan, gaggia,

Summary for GNU Libtasn1 2.4

System	Build host	Build date	Results
powerpc-apple-darwin8.11.0	espresso.lan	20091107T200019Z	Success
x86_64-unknown-linux-gnu	gaggia	20091107T201737Z	Success
powerpc-apple-darwin8.11.0	espresso.lan	20091108T200019Z	Success

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Other services

- Code coverage charts
  - Using GCOV/LCOV on 'make check'
  - Useful to identify what code needs more testing

LCOV - code coverage report

		Found	Hit	Coverage
Current view:	directory			
Test:	GNU SASL			
Test: GNU SASL	**Lines:**	10342	7416	**71.7 %**
Date: 2009-10-08	**Functions:**	532	441	**82.9 %**

Colors:
Line coverage:
0% to 15% | 15% to 50% | 50% to 100%

Function coverage:
0% to 75% | 75% to 90% | 90% to 100%

Directory	Line Coverage ⬍			Functions ⬍	
gl		49.0 %	556 / 1135	66.7 %	50 / 75
gltests		90.5 %	2413 / 2667	96.7 %	87 / 90
lib/anonymous		77.8 %	14 / 18	100.0 %	2 / 2
lib/cram-md5		78.3 %	72 / 92	100.0 %	6 / 6
lib/digest-md5		70.1 %	850 / 1213	90.0 %	36 / 40
lib/external		85.0 %	17 / 20	100.0 %	2 / 2
lib/gl		55.0 %	683 / 1242	78.3 %	47 / 60
lib/gltests		81.9 %	463 / 565	100.0 %	31 / 31
lib/gssapi		14.8 %	39 / 263	50.0 %	4 / 8
lib/login		83.3 %	80 / 96	100.0 %	6 / 6
lib/ntlm		76.7 %	46 / 60	100.0 %	3 / 3
lib/plain		81.7 %	67 / 82	100.0 %	2 / 2
lib/scram		71.6 %	479 / 669	85.2 %	23 / 27
lib/securid		82.8 %	106 / 128	100.0 %	4 / 4
lib/src		74.7 %	633 / 847	75.8 %	97 / 128
lib/tests		66.7 %	4 / 6	100.0 %	1 / 1
tests		72.2 %	894 / 1239	85.1 %	40 / 47

Generated by: LCOV version 1.7

Other services

- Cyclomatic code complexity charts to help find complex code

  - Useful to identify complex and thus likely buggy code

  - Rationale: most of GnuTLS's security bugs have been in functions which are at the top cyclo list

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http://www.gnu.org/software/gsasl/cyclo/cyclo-gsasl.html   Go

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GNU SASL Cyclomatic Complexity Report

Report generated at: **Fri Nov 06 16:20:09 CET 2009**

Resume

Total number of functions	**265**
Number of low risk functions	**223**
Number of moderate risk functions	**21**
Number of high risk functions	**19**
Number of untestable functions	**2**

Details for all functions

Used ranges:

Cyclomatic Complexity	Risk Evaluation
0 - 10	Simple module, without much risk
11 - 20	More complex module, moderate risk
21 - 50	Complex module, high risk
greater than 50	Untestable module, very high risk

Function Name	Cyclomatic Complexity	Number of Statements	Number of Lines	Source File
↓ _gsasl_kerberos_v5_server_step	59	214	381	lib/kerberos_v5/kerberos_v5.c
↓ _gsasl_kerberos_v5_server_step	59	214	381	lib/kerberos_v5/server.c
↓ _gsasl_kerberos_v5_client_step	44	153	277	lib/kerberos_v5/client.c
↓ _gsasl_kerberos_v5_client_step	44	153	277	lib/kerberos_v5/kerberos_v5.c
↓ _gsasl_scram_sha1_server_step	39	138	267	lib/scram/server.c
↓ digest_md5_print_response	38	86	146	lib/digest-md5/printer.c

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Other services

- Version controlled source statistics
  - StatCVS/GitStat
  - Helps visualize trends

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Development Statistics for gnus

Generated:
  2009-10-17 03:47
Report Period:
  1997-03-03 to 2009-10-16
Total Files:
  628
Total Lines of Code:
  271634
Developers:
  26

- **Developers**
- **Commit Logs**
- **Lines of Code**
- **File Statistics**
- **Directory Sizes**
- **Repo Heatmap**
- **LOC and Churn**
- **Cloud Commit**

Lines of Code

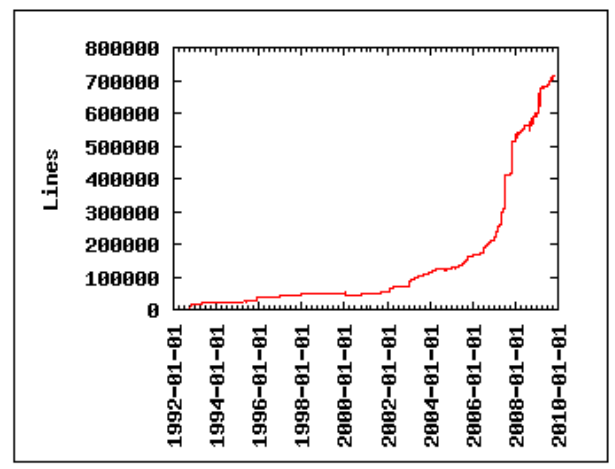Enter a web address to open, or a phrase to search for
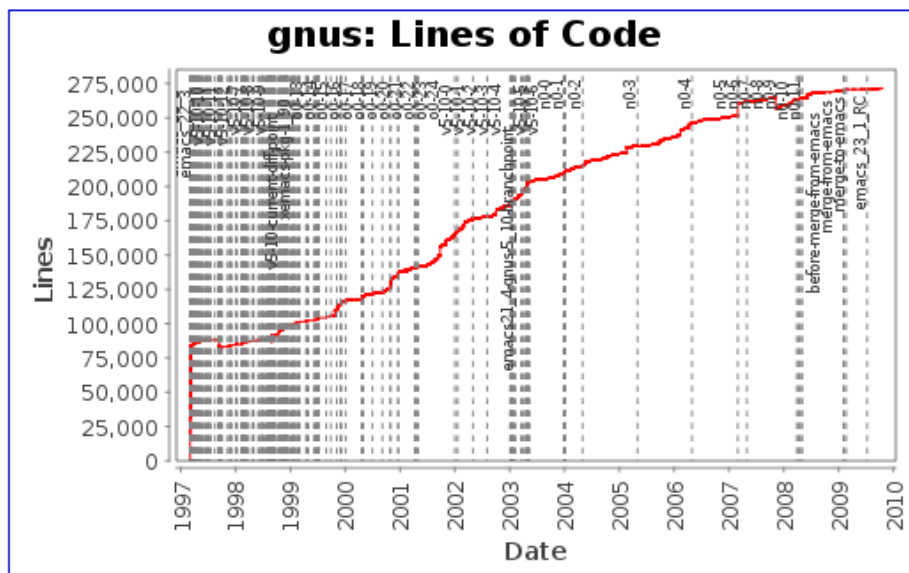
Lines

General   Activity   Authors   Files   Lines   Tags

Total lines:
714901

Lines of Code¶

Side effects

- More interaction and cooperation between GNU projects

- Improved understanding of maturity and stability of difference projects