tech notes of yet another programmer

Saturday, June 13, 2015

building libffi on windows by visual studio

problem

It's not trivial task - build libffi by visual studio.

tools & versions

What do you need to build libffi on windows:

- Visual Studio (2013 in my case)
- Cygwin 32-bits (I don't know why but cygwin64 doesn't work)

problem solving in a short for x64

0. Download and unpack (I'm using FAR manager for unpacking) libffi sources.
1. Run "VS2013 x64 Native Tools Command Prompt"
2. Open in it Cygwin.bat, for example:
   c:\cygwin\Cygwin.bat
3. Go to directory with sources, for example:
   cd d:/tmp/libraries/libffi-3.2.1
4. Make directory for building and go to it, for example:
   mkdir build-x64
   cd ./build-x64
5. Then you need to configure, and here you need decide which runtime do you want - dynamic (/MD) or static (/MT)
   dynamic (/MD): ../configure CC="../msvcc.sh -m64" CXX="../msvcc.sh -m64" LD=link CPP="cl -nologo -EP" —build=x86_64-unknown-cygwin
   static release (/MT): ../configure CC="../msvcc.sh -DUSE_STATIC_RTL -m64" CXX="../msvcc.sh -DUSE_STATIC_RTL -m64" LD=link CPP="cl -nologo -EP" —build=x86_64-unknown-cygwin
   static debug (/MTd): ../configure CC="../msvcc.sh -DUSE_STATIC_RTL -DUSE_DEBUG_RTL -m64" CXX="../msvcc.sh -DUSE_STATIC_RTL -DUSE_DEBUG_RTL -m64" LD=link CPP="cl -nologo -EP" —build=x86_64-unknown-cygwin
6. Then in ./include/ffitarget.h will be symlink (visual studio don't understand symlinks) - and this symlink has some strange access rights, so, for example in FAR manager (not in this cygwin console) do the next:
     - delete './include/ffitarget.h'
     - copy '../src/x86/ffitarget.h' to './include/ffitarget.h'
7. And in this ffitarget.h file you need to comment define '#define FFI_TARGET_HAS_COMPLEX_TYPE'
8. Using any text editor - in 'libffi-3.2.1\src\x86\win64.S' replace 'jmp SHORT' to 'jmp' under labels:
     'ret_uint16$:'
     'ret_sint16$:'
9. make
10. In subdirectory ./.libs you will get files.

problem solving in a short for x86

0. Download and unpack (I'm using FAR manager for unpacking) libffi sources.
1. Run "VS2013 x86 Native Tools Command Prompt"
2. Open in it Cygwin.bat, for example:
   c:\cygwin\Cygwin.bat

Labels

- windows
- building
- visualstudio
- memo
- openssl
- c++
- perl
- zlib
- automation
- blowfish
- cfb
- cmd
- libxml++
- libzip
- linux
- mysql
- proxy-libintl
- python
- redis
- redis3m
- yara
- 7z
- autostart
- boost
- forensic
- glib
- glibmm
- gnuwin32
- iconv
- ida
- javascript
- libffi
- libiconv
- libxml2
- mc
- mcrypt
- mingw
- msys
- mui
- nginx
- openpgp
- pcre
- pdfium
- reversing
- sfx
- sigc++
- ssh
- telnet
- tinyxpath
- tricks
- uac
- v8
- vbscript

3. Go to directory with sources, for example:
   cd d:/tmp/libraries/libffi-3.2.1
4. Make directory for building and go to it, for example:
   mkdir build-x86
   cd ./build-x86
5. Then you need to configure, and here you need decide which runtime do you want - dynamic (/MD) or static (/MT)
   dynamic: .../configure CC="../msvcc.sh" CXX="../msvcc.sh" LD=link CPP="cl -nologo -EP" —build=i686-unknown-cygwin
   static: ../configure CC="../msvcc.sh -DUSE_STATIC_RTL" CXX="../msvcc.sh -DUSE_STATIC_RTL" LD=link CPP="cl -nologo -EP" —build=i686-unknown-cygwin
6. Then in ./include/ffitarget.h will be symlink, and visual studio don't understand symlinks - so, replace it by real file.   cp ../src/x86/ffitarget.h ./include
7. And in this ffitarget.h file you need to comment define '#define FFI_TARGET_HAS_COMPLEX_TYPE'
8. make
9. In subdirectory ./.libs you will get files.

useful sources and links

0. 'README' file in sources gives you couple advices, but it's not enough
1. This guy also gives good advices - [link], I've backuped it [here]

possible errors (for googling people)

1) if you open cygwin64\Cygwin.bat instead of cygwin\Cygwin.bat
   ——
   checking how to run the C++ preprocessor... /lib/cpp
   configure: error: in `/cygdrive/d/tmp/libraries/libffi-3.2.1/build-x64':
   configure: error: C++ preprocessor "/lib/cpp" fails sanity check
   See `config.log' for more details
   ——
   what to do - use 32-bits cygwin

2) if you set —build=i686... instead of --build=x86_64..., when you want x64 binaries
   ——
   ml -nologo -safeseh -c ./win32.asm
   ../msvcc.sh: line 241: ml: command not found
   Makefile:1338: ошибка выполнения рецепта для цели <src/x86/win32.lo>
   make[2]: *** [src/x86/win32.lo] Ошибка 1
   make[2]: выход из каталога </cygdrive/d/tmp/libraries/libffi-3.2.1/build-x64>
   Makefile:1596: ошибка выполнения рецепта для цели <all-recursive>
   make[1]: *** [all-recursive] Ошибка 1
   make[1]: выход из каталога </cygdrive/d/tmp/libraries/libffi-3.2.1/build-x64>
   Makefile:730: ошибка выполнения рецепта для цели <all>
   make: *** [all] Ошибка 2
   ——
   what to do - use --build=i686-unknown-cygwin

3) if you forgot replace symlink by real file
   ——
   include\ffitarget.h(1) : error C2059: syntax error : '!'
   C:\Program Files (x86)\Microsoft Visual Studio 12.0\VC\INCLUDE\crtdefs.h(642) : error C2081: 'uintptr_t' : name in formal parameter list illegal
   C:\Program Files (x86)\Microsoft Visual Studio 12.0\VC\INCLUDE\stddef.h(71) : error C2143: syntax error : missing '{' before '__cdecl'
   include\ffi.h(223) : error C2016: C requires that a struct or union has at least one member
   include\ffi.h(223) : error C2061: syntax error : identifier 'ffi_abi'
   include\ffi.h(232) : error C2059: syntax error : '}'
   include\ffi.h(240) : error C2143: syntax error : missing ')' before '*'
   include\ffi.h(240) : error C2143: syntax error : missing '{' before '*'
   include\ffi.h(241) : error C2146: syntax error : missing ';' before identifier 'abi'
   include\ffi.h(242) : error C2059: syntax error : 'type'
   include\ffi.h(246) : error C2059: syntax error : ')'
   include\ffi.h(263) : error C2016: C requires that a struct or union has at least one member
   include\ffi.h(263) : error C2061: syntax error : identifier 'ffi_sarg'
   include\ffi.h(264) : error C2061: syntax error : identifier 'uint'
   include\ffi.h(264) : error C2059: syntax error : ';'
   include\ffi.h(268) : error C2059: syntax error : '}'
   include\ffi.h(281) : error C2061: syntax error : identifier 'ffi_java_raw'
   include\ffi.h(281) : error C2059: syntax error : ';'
   include\ffi.h(285) : error C2143: syntax error : missing ')' before '*'
   include\ffi.h(285) : error C2143: syntax error : missing '{' before '*'
   include\ffi.h(286) : error C2059: syntax error : 'type'

- winapi

```
include\ffi.h(290) : error C2143: syntax error : missing ')' before '*'
include\ffi.h(290) : error C2143: syntax error : missing '{' before '*'
include\ffi.h(290) : error C2059: syntax error : 'type'
include\ffi.h(290) : error C2059: syntax error : ')'
include\ffi.h(291) : error C2143: syntax error : missing ')' before '*'
include\ffi.h(291) : error C2143: syntax error : missing '{' before '*'
include\ffi.h(291) : error C2143: syntax error : missing ';' before '*'
include\ffi.h(291) : error C2059: syntax error : 'type'
include\ffi.h(291) : error C2059: syntax error : ')'
include\ffi.h(292) : error C2143: syntax error : missing ')' before '*'
include\ffi.h(292) : error C2143: syntax error : missing '{' before '*'
include\ffi.h(292) : error C2059: syntax error : ')'
include\ffi.h(298) : error C2143: syntax error : missing ')' before '*'
include\ffi.h(298) : error C2143: syntax error : missing '{' before '*'
include\ffi.h(299) : error C2059: syntax error : 'type'
include\ffi.h(303) : error C2143: syntax error : missing ')' before '*'
include\ffi.h(303) : error C2143: syntax error : missing '{' before '*'
include\ffi.h(303) : error C2059: syntax error : 'type'
include\ffi.h(303) : error C2059: syntax error : ')'
include\ffi.h(304) : error C2143: syntax error : missing ')' before '*'
include\ffi.h(304) : error C2143: syntax error : missing '{' before '*'
include\ffi.h(304) : error C2143: syntax error : missing ';' before '*'
include\ffi.h(304) : error C2059: syntax error : 'type'
include\ffi.h(304) : error C2059: syntax error : ')'
include\ffi.h(305) : error C2143: syntax error : missing ')' before '*'
include\ffi.h(305) : error C2143: syntax error : missing '{' before '*'
include\ffi.h(305) : error C2059: syntax error : ')'
include\ffi.h(433) : error C2143: syntax error : missing ')' before '*'
include\ffi.h(433) : error C2143: syntax error : missing '{' before '*'
include\ffi.h(434) : error C2146: syntax error : missing ';' before identifier 'abi'
include\ffi.h(435) : error C2059: syntax error : 'type'
include\ffi.h(437) : error C2059: syntax error : ')'
include\ffi.h(439) : error C2143: syntax error : missing ')' before '*'
include\ffi.h(439) : error C2143: syntax error : missing '{' before '*'
include\ffi.h(440) : error C2146: syntax error : missing ';' before identifier 'abi'
include\ffi.h(441) : error C2059: syntax error : 'type'
include\ffi.h(444) : error C2059: syntax error : ')'
include\ffi.h(446) : error C2143: syntax error : missing ')' before '*'
include\ffi.h(446) : error C2143: syntax error : missing '{' before '*'
include\ffi.h(447) : error C2059: syntax error : 'type'
../include\ffi_common.h(81) : error C2143: syntax error : missing ')' before '*'
../include\ffi_common.h(81) : error C2143: syntax error : missing '{' before '*'
../include\ffi_common.h(81) : error C2059: syntax error : ')'
../include\ffi_common.h(82) : error C2143: syntax error : missing ')' before '*'
../include\ffi_common.h(82) : error C2143: syntax error : missing '{' before '*'
../include\ffi_common.h(83) : error C2059: syntax error : 'type'
../include\ffi_common.h(83) : error C2059: syntax error : ')'
../include\ffi_common.h(88) : error C2016: C requires that a struct or union has at least one
member
../include\ffi_common.h(88) : error C2061: syntax error : identifier 'ffi_cif'
../include\ffi_common.h(91) : error C2059: syntax error : '}'
C:\Program Files (x86)\Microsoft Visual Studio 12.0\VC\INCLUDE\stdlib.h(235) : error C2081:
'uintptr_t' : name in formal parameter list illegal
../src/prep_cif.c(107) : error C2143: syntax error : missing ')' before '*'
../src/prep_cif.c(107) : error C2143: syntax error : missing '{' before '*'
../src/prep_cif.c(107) : error C2146: syntax error : missing ';' before identifier 'abi'
../src/prep_cif.c(108) : error C2059: syntax error : 'type'
../src/prep_cif.c(111) : error C2059: syntax error : ')'
../src/prep_cif.c(226) : error C2143: syntax error : missing ')' before '*'
../src/prep_cif.c(226) : error C2143: syntax error : missing '{' before '*'
../src/prep_cif.c(226) : error C2146: syntax error : missing ';' before identifier 'abi'
../src/prep_cif.c(226) : error C2059: syntax error : 'type'
../src/prep_cif.c(227) : error C2059: syntax error : ')'
../src/prep_cif.c(232) : error C2143: syntax error : missing ')' before '*'
../src/prep_cif.c(232) : error C2143: syntax error : missing '{' before '*'
../src/prep_cif.c(233) : error C2146: syntax error : missing ';' before identifier 'abi'
../src/prep_cif.c(234) : error C2059: syntax error : 'type'
../src/prep_cif.c(237) : error C2059: syntax error : ')'
libtool: compile: mv -f "prep_cif.obj" "src/.libs/prep_cif.obj"
mv: cannot stat 'prep_cif.obj': No such file or directory
Makefile:1362: ошибка выполнения рецепта для цели <src/prep_cif.lo>
make[2]: *** [src/prep_cif.lo] Ошибка 1
make[2]: выход из каталога </cygdrive/d/tmp/libraries/libffi-3.2.1/build-x64>
Makefile:1596: ошибка выполнения рецепта для цели <all-recursive>
make[1]: *** [all-recursive] Ошибка 1
make[1]: выход из каталога </cygdrive/d/tmp/libraries/libffi-3.2.1/build-x64>
```

```
Makefile:730: ошибка выполнения рецепта для цели <all>
make: *** [all] Ошибка 2
————————————————————————————————————————
```

what to do - replace symlink by real file.

4) if you forgot to comment FFI_TARGET_HAS_COMPLEX_TYPE

——

```
../src/types.c(101) : error C2061: syntax error : identifier '_Complex'
../src/types.c(101) : error C2059: syntax error : '}'
../src/types.c(101) : error C2065: '_Complex' : undeclared identifier
../src/types.c(101) : error C2143: syntax error : missing ')' before 'type'
../src/types.c(101) : error C2059: syntax error : ')'
../src/types.c(102) : fatal error C1903: unable to recover from previous error(s); stopping
compilation
libtool: compile: mv -f "types.obj" "src/.libs/types.obj"
mv: cannot stat 'types.obj': No such file or directory
Makefile:1362: ошибка выполнения рецепта для цели <src/types.lo>
make[2]: *** [src/types.lo] Ошибка 1
make[2]: выход из каталога </cygdrive/d/tmp/libraries/libffi-3.2.1/build-x64>
Makefile:1596: ошибка выполнения рецепта для цели <all-recursive>
make[1]: *** [all-recursive] Ошибка 1
make[1]: выход из каталога </cygdrive/d/tmp/libraries/libffi-3.2.1/build-x64>
Makefile:730: ошибка выполнения рецепта для цели <all>
make: *** [all] Ошибка 2
————————————————————————————————————————
```

what to do - comment FFI_TARGET_HAS_COMPLEX_TYPE

5) if you forgot to replace replace two 'jmp short' to 'jmp'

——

```
ml64 -nologo  -c  ./win64.asm
 Assembling: ./win64.asm
./win64.asm(1029) : error A2075:jump destination too far : by 20 byte(s)
./win64.asm(1038) : error A2075:jump destination too far : by 1 byte(s)
Makefile:1338: ошибка выполнения рецепта для цели <src/x86/win64.lo>
make[2]: *** [src/x86/win64.lo] Ошибка 1
make[2]: выход из каталога </cygdrive/d/tmp/libraries/libffi-3.2.1/build-x64>
Makefile:1596: ошибка выполнения рецепта для цели <all-recursive>
make[1]: *** [all-recursive] Ошибка 1
make[1]: выход из каталога </cygdrive/d/tmp/libraries/libffi-3.2.1/build-x64>
Makefile:730: ошибка выполнения рецепта для цели <all>
make: *** [all] Ошибка 2
————————————————————————————————————————
```

what to do - replace two 'jmp short' to 'jmp'

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Posted by HostageBrain at 9:47 AM

Labels: building, libffi, visualstudio, windows

6 comments:

Unknown January 28, 2017 at 3:44 AM

Hi I'm in the process of building libffi under Windows using MSVC 2015 following your indications (really, thanks for sharing your tips, very helpful!).

Unfortunately I cannot get rid of the problem specified at point 1). I still get the C++ preprocessor failure:
checking how to run the C++ preprocessor... /lib/cpp
configure: error: in `/cygdrive/c/Users/alex/Documents/libffi-3.2.1/build-x86':
configure: error: C++ preprocessor "/lib/cpp" fails sanity check
See `config.log' for more details

I'm pretty sure I'm NOT using cygwin64, since I don't even have that target version installed. Anyway, from process manager I can clearily see the bash.exe (32 bit version) running.

Do you have any tip to help me solve this issue?
Thanks in advance,
Alex

Reply

▼ Replies

Unknown May 29, 2017 at 5:35 PM

"C++ preprocessor failure" means it can't find the path to cl.exe, to make it know you must do something like: export PATH=$PATH:'C:\ path to cl.exe here' before 'configure' command.

ex0dus June 12, 2017 at 2:42 PM

This comment has been removed by the author.

Unknown July 29, 2018 at 7:24 AM

This happens because the command line for configure specifies what to use for the C preprocessor (CPP=...) but does not specify what to use for the C++ preprocessor. The variable is supposed to be CXX and can be the same as CPP, i.e. CXX="cl -nologo -EP", which is a way to run the MS compiler as a preprocessor (the -EP flag, that is; -nologo is just a sliencer).

Unknown July 30, 2018 at 2:54 AM

Sorry, the wrong variable name for C++ preprocessor: it must be CXXCPP="cl -nologo -EP"

Reply

gina ulfa August 19, 2017 at 12:32 AM

nice post
Penyebab Penyakit Miom

Reply

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