SIGNUS BLOG |HI TECH|ELECTRONIC

Somewhere up in the sky there are things that would crack our minds...

Esp8266 – Windows compilation tutorial for n00bs

ESP8266 is a new SOC(System On Chip) WiFi module from Espressif that works in similar way to modems, it's controlled by AT commands through serial port.
Well, it's actually more than that. You can write your own custom software that runs on this small, yet powerful device. It's like arduino that has more power, WiFi buil't in but only few pinouts(unless you use other versions which are pretty hard to run without proper soldering training)
There's esp8266 wiki that describes how to prepare build environment but its Linux only, so I decided to write small tutorial on how to do that on Windows.

1. Download cygwin installer and run it [Exe]

https://cygwin.com/install.html

Install it to c:\cygwin\
Select make when asked for which packages you want to install:
Add->Devel->Make

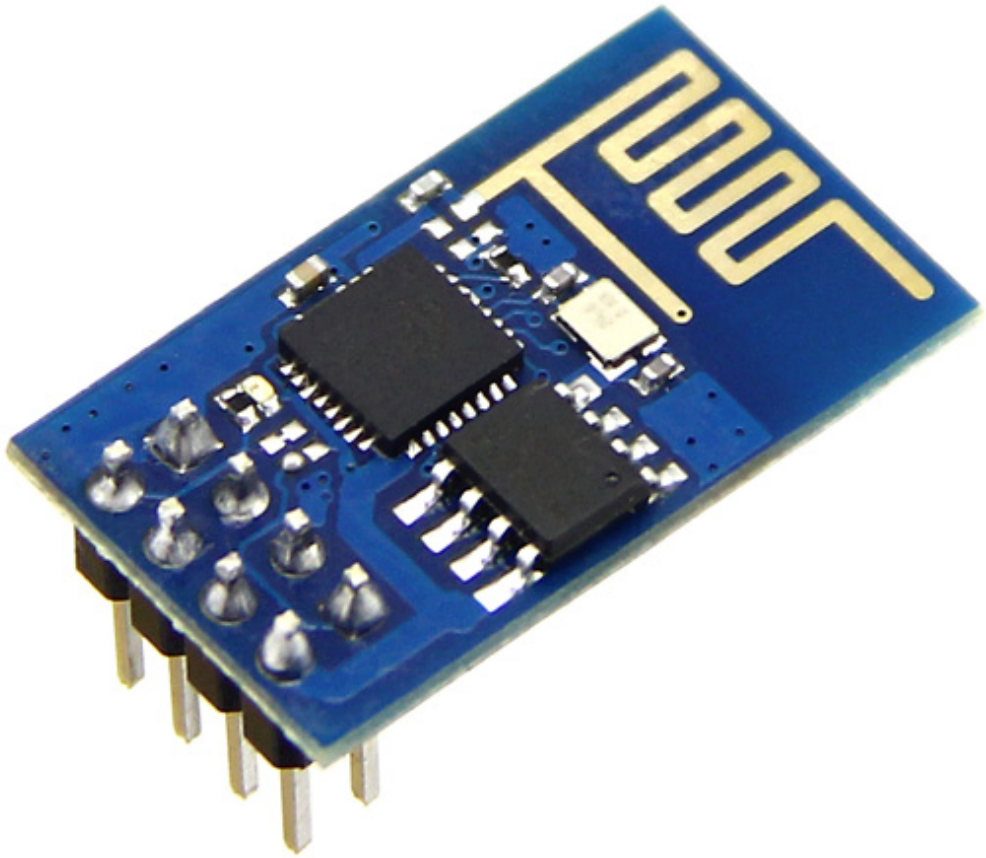
2. Install Python 2.7 from https://www.python.org/

3. Install git [Optional, would be easier to do further steps, add git.exe to your PATH.

4. Create folder for your esp development
Keep your 8266 stuff in one place, including toolchain, compiler and projects, create folder C:\Projects\esp8266

5. Download compiled toolchain

Google drive: https://drive.google.com/folderview?



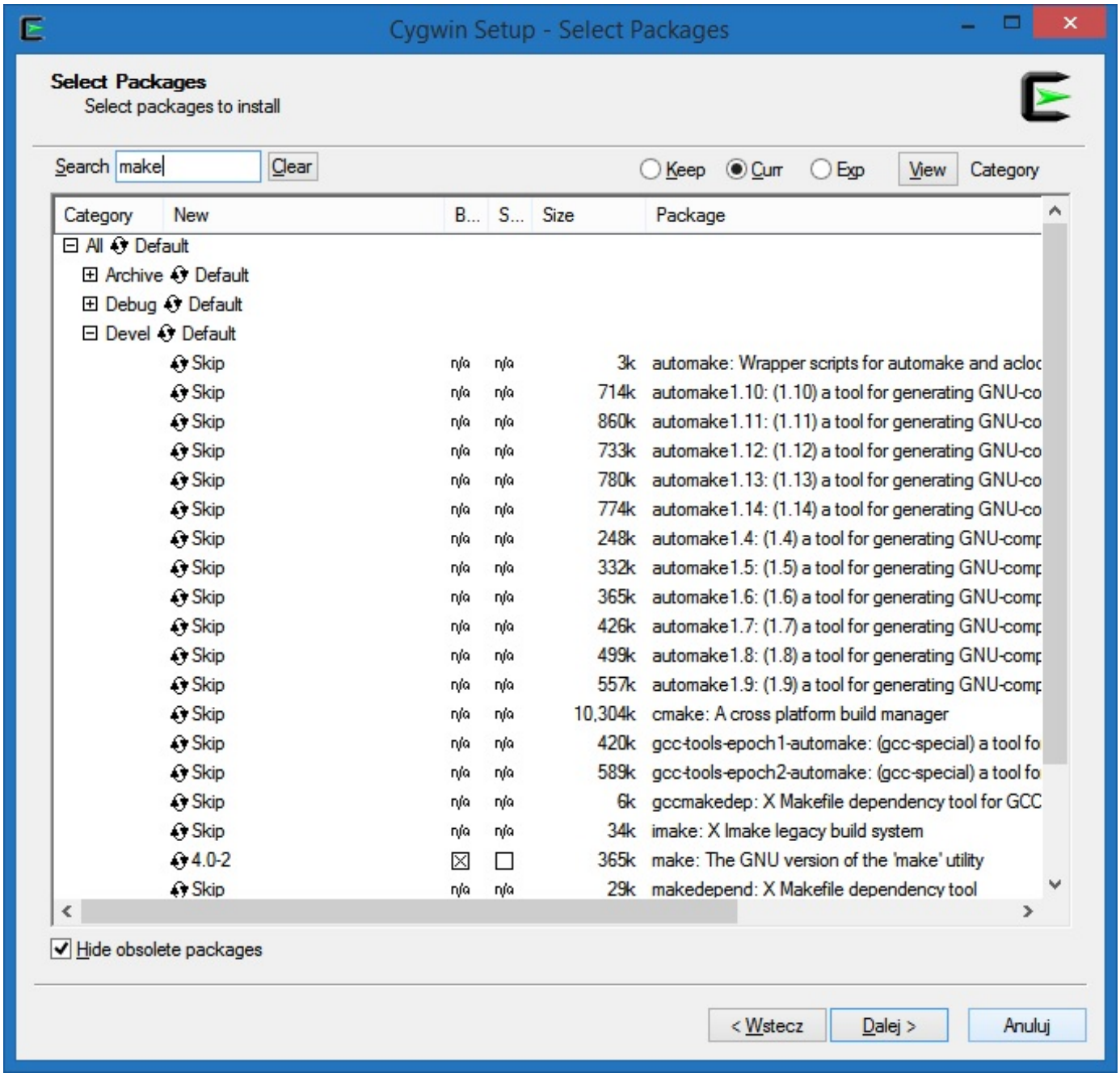
id=0BzWyTGWIwcYQendHbWlsNUZpX0E&usp=drive_web#list\
Downoad: xtensa-lx106-elf-141114.7z
Extract it to "C:\Projects\esp8266\xtensa-lx106-elf", you need to have 7zip handling software to unpack this file.

Its made by mobyfab from esp8266.com
These are apperently x64 binaries so no hope for you if you are using 32 bit machine.

6. Download SDK (esp_iot_sdk_v0.9.2_14_10_24.zip)
from official Espressif forum
and extract it to c:\esp8266\esp_iot_sdk_v0.9.2\

7. Download helper files from my repository https://github.com/toomasz/esp8266_stuff
and extract them to c:\Projects\esp8266\esp8266_stuff

8. Edit file C:\Projects\esp8266\esp8266_stuff\espmake.sh
and change variables so they reflect your buildsystem(you don't have to do it if you used same folders as mine):




```
TOOLCHAIN=c:/Projects/esp8266/tools/xtensa-lx106-elf/bin
SDK=c:/Projects/esp8266/Espressif/ESP8266_SDK
INCDIR='-Iinclude'
ESPTOOL=/bin/esptool
```

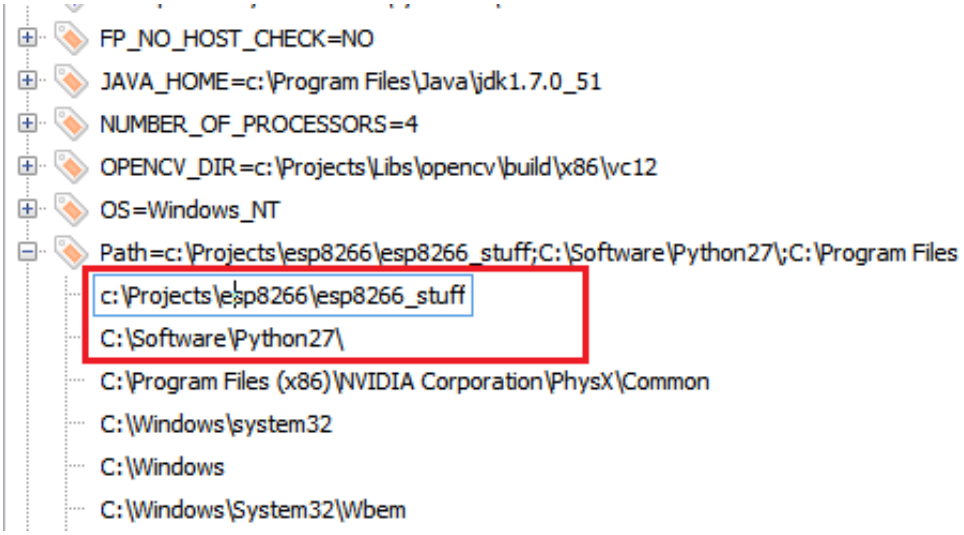
9. Download esptool.exe

https://github.com/metalheart/esp8266/raw/master/bin/esptool.exe

and put it into C:/Cygwin/bin

10. Add C:\Projects\esp8266\esp8266_stuff and python to your PATH variable

I recommend using some tool for editing PATH variable, for example rapid environment editor.



11. Download missing libwinpthread-1.dll that in neccesary to run compiler.

Download it from:

https://drive.google.com/file/d/0B-lM6D5uRWgBWnN1akVmOHZNSkU/view?usp=sharing
Sorry to exe link to my google account but I don't remember where I downloaded this one and it seems like the only libwinpthread-1.dll one that works, dll-files.com one doesn't work.

Put it to: c:\Projects\esp8266\esp8266_stuff\

12. Try to compile example project

Download AT Example from Espressif: AT Example
And put it to c:\Projects\esp8266\projects\at\

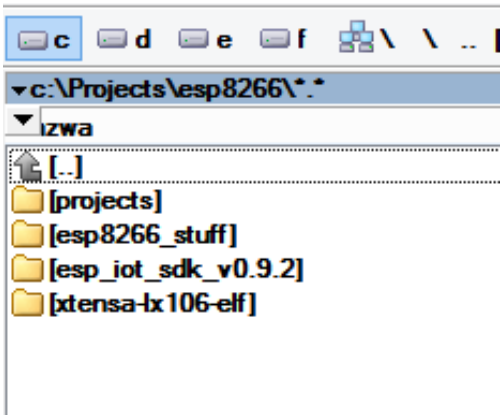
Replace 'retarded' Makefile with this one
https://gist.github.com/fpoussin/73e3bf45846bec1e5a08/download#
Now close all programs on your computer(as a precaution regarding PATH variable).
And edit new makefile, add upgrade upgrade_ssl to libs:

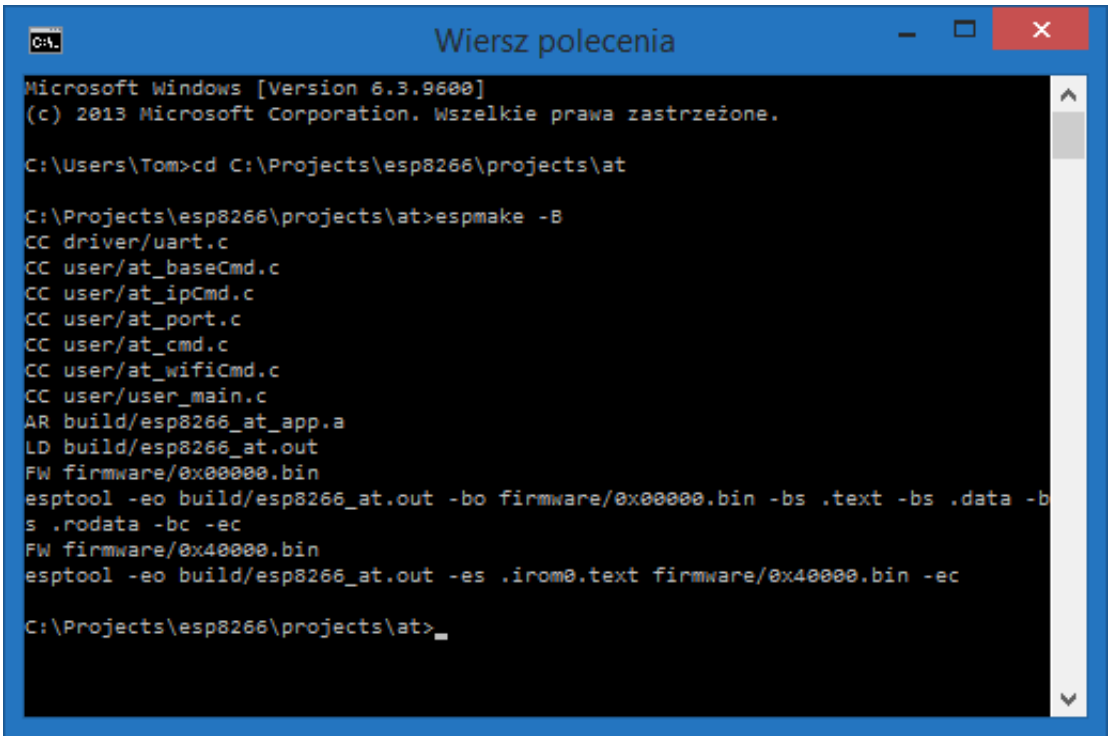
```
# libraries used in this project, mainly provided by the SDK
LIBS= c gcc hal phy net80211 lwip wpa main upgrade upgrade_ssl
```

If your esp8266 directory looks like below, try to compile sample project:

Run cmd, Cd to C:\Projects\esp8266\projects\at and run **espmake -B**
If you see the following, you are good to go

espmake.bat uses same arguments as make, so you can call for example make -B to rebuild.





This entry was posted in Electronics, esp8266, Programming on November 18, 2014 [http://signusx.com/esp8266-windows-compilation-tutorial/] .

30 thoughts on “Esp8266 – Windows compilation tutorial for n00bs”

sashacohen
November 19, 2014 at 10:42 pm

Aah yeah very nice in kazahstan our tutorial is only one step. But in US and A is 13! You are a n00b!!

Johan
November 26, 2014 at 8:17 pm

Tnx I'm trying now!

"8. Edit file C:\esp8266\esp8266\esp8266_stuff\espmake.sh "

This has to be: C:\Project\esp8266\esp8266_stuff\espmake.sh?

tom Post author
November 27, 2014 at 7:54 am

Yes, thats right!

Johan
November 27, 2014 at 12:44 pm

And 10 also?
" C:\esp8266\esp8266\esp8266_stuff" ?

Tnx for the Tut. Now I can compile also under windows :D.

Johan
November 27, 2014 at 12:49 pm

In the espmake.sh the xtensa is in

c:/Project/esp8266/tools/xtensa-lx106-elf/bin
So we have to put it there in the tool map right?
Also the SDK is in another map then?
SDK=c:/Projects/esp8266/Espressif/ESP8266_SDK

Tnx for the easy setup guide one more time :D.

tom Post author
November 27, 2014 at 3:39 pm

Thanks for pointing mistake, i fixed #10 too
TOOLCHAIN should be set to directory where xtensa toolchain resides, so you should find .exes like xtensa-lx106-elf-gcc there

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Johan
November 28, 2014 at 9:30 am

I made a simple .bat file to flash your project:
https://github.com/zoutepopcorn/esp8266-Websocket/blob/master/build.bat

place the bat in C:\Project\esp8266\projects\

You can now build like:
build at COM3

Johan
November 29, 2014 at 7:21 pm

Maybe you can tell about something flashing?

I'm having a FTDI programmer under windows
Installed pyserial-2.7: http://pyserial.sourceforge.net/pyserial.html

Using the mad inventor tool: https://github.com/themadinventor/esptool

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Pingback: Encender y apagar un led con el ESP8266 (sin necesidad de un microcontrolador) | The Inventor's House

John
December 14, 2014 at 2:38 am

do you have the At example working under 0.9.3? I have lots of compile errors with it. I noticed some of your git code has been updated to 0.9.3...

John
December 14, 2014 at 11:02 pm

I was able to figure it out w/ some other 0.9.3 examples

LIBS= c gcc hal phy net80211 lwip wpa main ssl pp upgrade

Loureiro
December 23, 2014 at 1:05 pm

Hello, thank you for the information.
I am getting the next error :

CC driver/uart.c
CC user/at_baseCmd.c
CC user/at_ipCmd.c

CC user/at_port.c
CC user/at_cmd.c
CC user/at_wifiCmd.c
CC user/user_main.c
AR build/esp8266_at_app.a
LD build/esp8266_at.out
D:\Projects\esp8266\xtensa-lx106-elf\bin\xtensa-lx106-elf-ld.exe: cannot open li
nker script file /home/wouters/GIT/willemwouters/ESP8266/sdk/esp_iot_sdk_v0.9.3/
ld/eagle.rom.addr.v6.ld: No such file or directory
Makefile:111: recipe for target 'build/esp8266_at.out' failed
make: *** [build/esp8266_at.out] Error 1

The tool is searching the file
/home/wouters/GIT/willemwouters/ESP8266/sdk/esp_iot_sdk_v0.9.3/ld/eagle.rom.addr.v6.ld

But I cannot find that path on the files.

Best regards
Loureiro

Chakrit
March 21, 2015 at 5:00 am

I change the SDK to version esp_iot_sdk_v0.9.2, It work.
And don't forget the edit the
C:\Projects\esp8266\esp8266_stuff\espmake.sh too,
SDK=c:/Projects/esp8266/esp_iot_sdk_v0.9.2

Note :I found the "readme.txt" in project "at"
Notice: AT demo v0.19 is based on SDK v0.9.2.

Mark P.
December 25, 2014 at 9:38 am

Hi Tom,

I followed your instructions and double checked them (both with Cygwin 32 & 64 bits). I get the following error. I am stumped and would greatly appreciate any help I can get to get this example compiled.

My experiments are on a 64bit intel machine as shown below.
PROCESSOR_IDENTIFIER=Intel64 Family 6 Model 60 Stepping 3, GenuineIntel

c:\Projects\esp8266\projects\at>espmake -B
/cygdrive/c/Projects/esp8266/esp8266_stuff/espmake.sh: line 2: $'\r': command not found
: No such file or directory6/esp8266_stuff/espmake.sh: line 5: cd:
/cygdrive/c/Projects/esp8266/projects/at
/cygdrive/c/Projects/esp8266/esp8266_stuff/espmake.sh: line 6: $'\r': command not found
/cygdrive/c/Projects/esp8266/esp8266_stuff/espmake.sh: line 14: $'\r': command not found
/cygdrive/c/Projects/esp8266/esp8266_stuff/espmake.sh: line 15: $'\r': command not found
'. Stop. No rule to make target '

c:\Projects\esp8266\projects\at>

Greatly appreciate your help.

Mark

ieis
January 5, 2015 at 7:31 pm

Hi!

I have a similar problem! (I attach the execution using make and espamake.

C:\projects\esp8266\projects\at>make -B
CC driver/uart.c
make: C:/Espressif/xtensa-lx106-elf/bin/xtensa-lx106-elf-gcc: Command not found
Makefile:132: recipe for target 'build/driver/uart.o' failed
make: *** [build/driver/uart.o] Error 127

C:\projects\esp8266\projects\at>espmake -B
/cygdrive/c/projects/esp8266/esp8266_stuff/espmake.sh: línea 2: cd: /cygdrive/c/
: No such file or directoryt
‘. Alto. No rule to make target ‘

C:\projects\esp8266\projects\at>

I appreciate your help.

Thanks!

tom Post author
January 7, 2015 at 11:44 pm

Have you installed cygwin? And set all variables in espmake.sh to your system?

MikeB
January 22, 2015 at 3:02 pm

Hi.

I got this error during compilation. Please advice.

C:\Projects\esp8266\projects\at>espmake -B
CC driver/uart.c
CC user/at_baseCmd.c
CC user/at_ipCmd.c
CC user/at_port.c
CC user/at_cmd.c
CC user/at_wifiCmd.c
CC user/user_main.c
AR build/esp8266_at_app.a
LD build/esp8266_at.out
c:/projects/esp8266/xtensa-lx106-elf/bin/../lib/gcc/xtensa-lx106-elf/4.8.2/../..

/../../xtensa-lx106-elf/bin/ld.exe: cannot find -lupgrade_ssl
collect2.exe: error: ld returned 1 exit status
Makefile:106: recipe for target 'build/esp8266_at.out' failed
make: *** [build/esp8266_at.out] Error 1

Thanks

Chris
February 1, 2015 at 5:22 am

Hi, thanks for creating the blog. I've been following along with the steps but I have been unsuccessful.

Step 6. C:\Projects\esp8266\esp_iot_sdk_v0.9.2 (the step 6 directions left out the Projects folder).

Step 8.
TOOLCHAIN=c:/Projects/esp8266/tools/xtensa-lx106-elf/bin
SDK=c:/Projects/esp8266/Espressif/ESP8266_SDK
INCDIR='-Iinclude'
ESPTOOL=/bin/esptool

The TOOLCHAIN references a folder called "tools"? Should it be:
TOOLCHAIN=C:\Projects\esp8266\xtensa-1×106-elf\bin

The SDK line references a folder called "Expressif" and "ESP8266_SDK". Where does this come from?

Step 12. references replacing the Makefile. Does the file gist73e3bf45846bec1e5a08-27524e602d795eba6fe515353febab6645c21f67.tar get renamed Makefile or does it stay that long filename.

Also, does it matter where the addition below goes inside the file?

# libraries used in this project, mainly provided by the SDK
LIBS= c gcc hal phy net80211 lwip wpa main upgrade upgrade_ssl

Thanks...

Chris
February 1, 2015 at 5:25 am

I should have mentioned what my folder looks like.

C:\Projects\esp8266\
esp_iot_sdk_v0.9.2
esp8266_stuff
projects
xtensa-lx106-elf

Pushkar
February 3, 2015 at 11:50 am

I'm getting error at the firmware build phase, please help :
esptool.exe is saved in C:\cygwin64\bin

C:\Projects\esp8266\projects\at>espmake -B
CC driver/uart.c
CC user/at_baseCmd.c
CC user/at_ipCmd.c
CC user/at_port.c
CC user/at_cmd.c
CC user/at_wifiCmd.c
CC user/user_main.c
AR build/esp8266_at_app.a
LD build/esp8266_at.out
FW firmware/0x00000.bin
esptool -eo build/esp8266_at.out -bo firmware/0x00000.bin -bs .text -bs .data -bs .rodata -bc -ec
Makefile:98: recipe for target 'firmware/0x00000.bin' failed
make: *** [firmware/0x00000.bin] Error 127

Pushkar

February 3, 2015 at 5:01 pm

EDIT: I got this working. There was an issue with the esptool.exe downloaded from path given above. I tried running this esptool.exe in Win XP compatibility mode, i deleted the msvcp110.dll from C:\Windows\sysWOW64\ and installing new one downloaded by dll-fixer tool, I tried reinstalling the Cygwin at C:\cygwin path instead of C:\cygwin64, I tried rebooting at every step given earlier, but nothing worked.
Finally i looked for the esptool source code, which i found here:
http://atelier-klippel.de/esptool-0.0.3b.tgz
fixed its Makefile to have TARGET_ARCH = WINDOWS and then compiled it on my machine (normal cmd prompt). Then I placed the generated esptool.exe which is a good 24KB file instead of original non-working 9KB and placed it in C:\cygwin\bin and BANG it worked in first go !!!! Phew ….. Spent almost 8 hours fixing this stupid issue, but fruitful Both the firmware files are now generated fine for the AT example.

Jose
March 11, 2015 at 9:37 pm

Hi Pushkar,
I think maybe I am having the same problem you posted.
Could you please post detailed instructions to recompile the esptool.exe? or maybe to upload somewere your new esptool.exe and post the link?
thanks,
Jose.

SebH
March 14, 2015 at 12:38 am

Thanks you very much Pushkar !

I had the same problem before !

cygwin64 is’nt the problem, recompiling the esptool did it !:)

Rajesh
March 25, 2015 at 9:01 pm

Hi Pushkar,
I am also facing the same error as you. I am compiling on Windows 7 64 bit. Could you please tell me the steps to compile esptool code.

Thanks

Rajesh
March 25, 2015 at 11:46 pm

I got it compiled. Thanks for the clue about esptool issue though.

Terra
March 8, 2015 at 1:39 am

Hello admin, i found this post on 24 spot in google’s
search results. I’m sure that your low rankings are caused by
hi bounce rate. This is very important ranking factor.
One of the biggest reason for high bounce rate is due to visitors hitting the back button. The higher your bounce rate the further down the search results your posts and pages will end up, so having reasonably low bounce rate is important for improving your rankings naturally.
There is very useful wp plugin which can help you. Just search in google for:
Seyiny’s Bounce Plugin

Jose
March 12, 2015 at 2:10 am

I did all the steps on this tutorial but have this error when try to compile the AT example using espmake -B from windows cmd "…cannot execute binary file…" looks like a linux error.
Someone could help me please?
thanks.

kefir135
March 14, 2015 at 1:13 pm

No succcess:

```
D:\ESP8266\Projects\at>
D:\ESP8266\Projects\at>espmake -B
CC driver/uart.c
CC user/at_baseCmd.c
CC user/at_ipCmd.c
CC user/at_port.c
CC user/at_cmd.c
CC user/at_wifiCmd.c
CC user/user_main.c
AR build/esp8266_at_app.a
LD build/esp8266_at.out
FW firmware/0x00000.bin
esptool -eo build/esp8266_at.out -bo firmware/0x00000.bin -bs .text -bs .data -b
s .rodata -bc -ec
Makefile:98: recipe for target 'firmware/0x00000.bin' failed
make: *** [firmware/0x00000.bin] Error 127

D:\ESP8266\Projects\at>
```

Any help please ?

Gabe
April 22, 2015 at 8:24 am

Worked great. I only needed to edit the version of IDK to v0.9.2. as indicated by Chakrit's comment above. Thanks for the great walkthrough, much appreciated!

Jeff_T
April 22, 2015 at 2:07 pm

Hi

I'm a noob att Python and esp8266. I know my way around C and Dos though not a unix guru.

I followed everything above very carefully – but got stuck at:

"And edit new makefile, add upgrade upgrade_ssl to libs:"

How do I edit a makefile as so far I thought it was a binary. And which makefile?

"# libraries used in this project, mainly provided by the SDK
LIBS= c gcc hal phy net80211 lwip wpa main upgrade upgrade_ssl

what do I do here – how do I add upgrade upgrade_ssl to libs? Where is libs?

Sorry for being so un-clued about what probably appears obvious.
