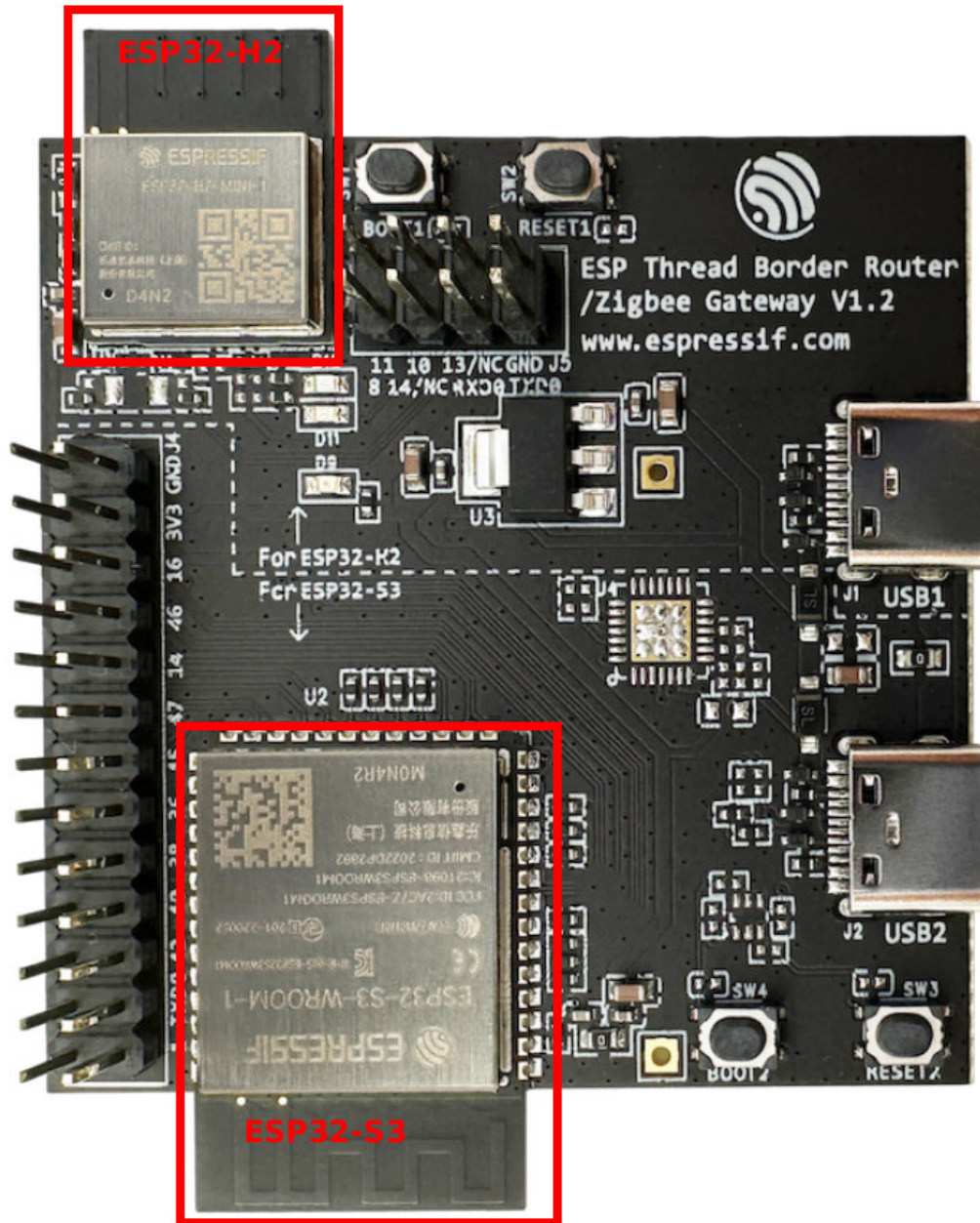


# How to setup and work with OpenThread Border Router

[https://docs.espressif.com/projects/esp-thread-br/en/latest/dev-guide/build\\_and\\_run.html](https://docs.espressif.com/projects/esp-thread-br/en/latest/dev-guide/build_and_run.html)

<https://openthread.io/guides/border-router/espressif-esp32>

<https://openthread.io/codelabs/esp-openthread-hardware>

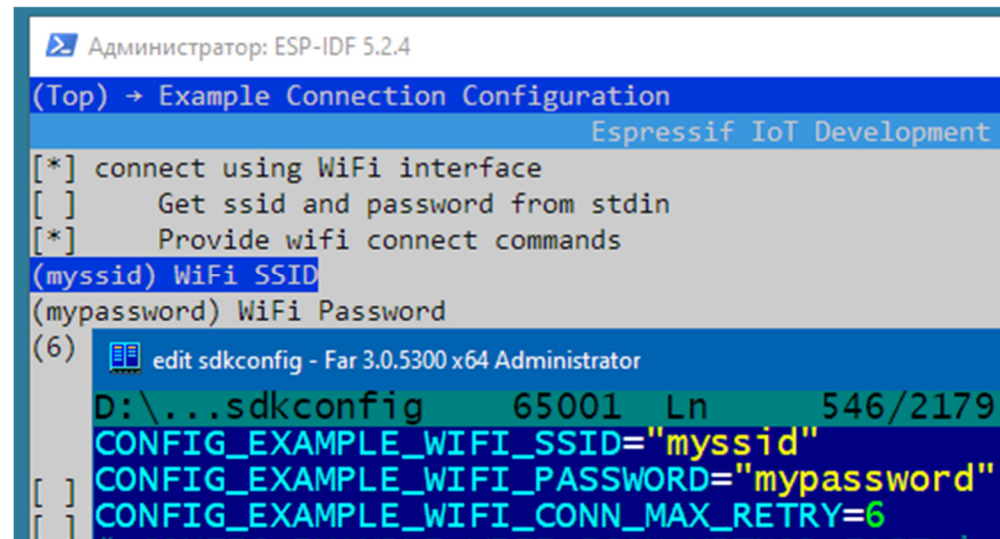


Note: Only the USB2 port on the ESP Thread Border Router Board needs to be connected to the host.

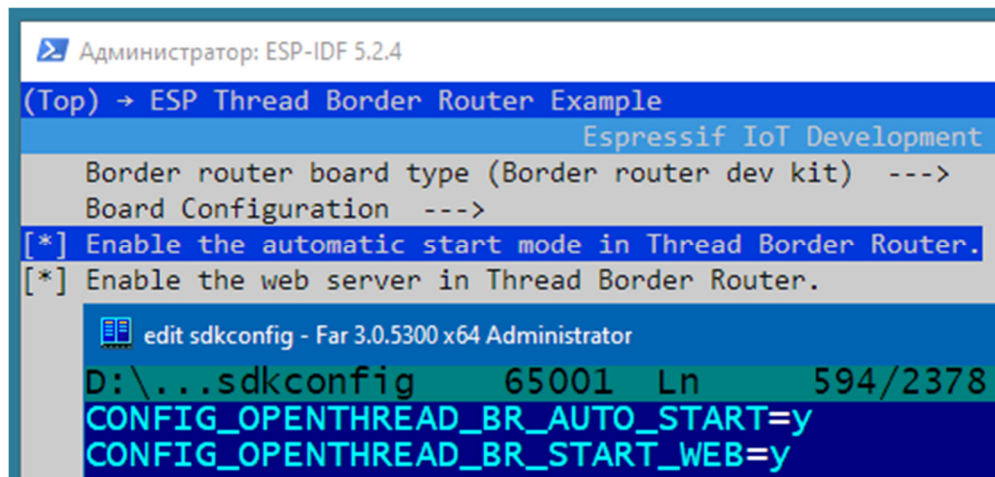
```
~~~
D:
cd /Espressif/esp-idf
./export.bat
cd ..
git clone --recursive https://github.com/espressif/esp-thread-br.git
~~~
```

Build the esp-idf/examples/openthread/ot\_rcp example. The firmware doesn't need to be explicitly flashed to a device. It will be included in the Border Router firmware and flashed to the ESP32-H2 chip upon first boot (or the RCP firmware changed).

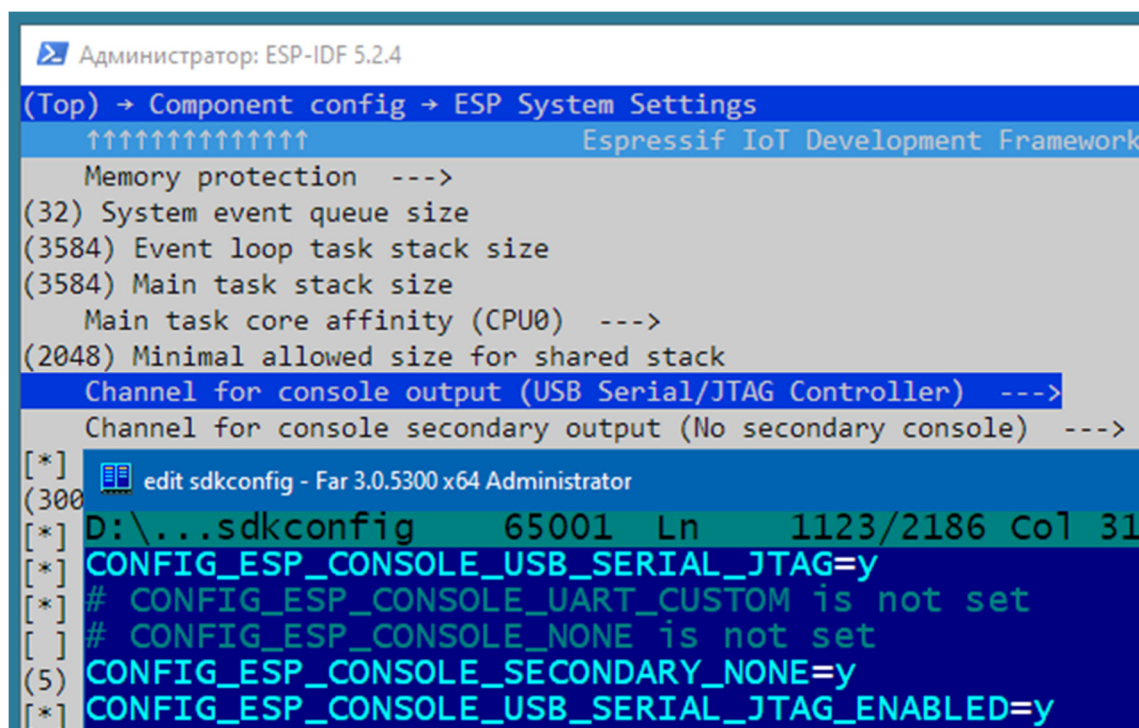
```
~~~
cd /Espressif/esp-idf/examples/openthread/ot_rcp
idf.py set-target esp32h2
idf.py build
cd /Espressif/esp-thread-br/examples/basic_thread_border_router
idf.py set-target esp32s3
idf.py menuconfig
~~~
```



esp\_otbr\_menuconfig\_01.png



esp\_otbr\_menuconfig\_02.png



esp\_otbr\_menuconfig\_03.png

```
(Top) → Component config → OpenThread → OpenThread → Thread Core Features
Espressif IoT Development Framework Con

Thread Operational Dataset --->
Thread device type (Full Thread Device) --->
Thread Trel Radio Link --->
Thread 15.4 Radio Link --->
[*] Enable Border Router
-*- Enable Commissioner
    Commissioner Configurations --->
-*- Enable Joiner
[*] edit sdkconfig - Far 3.0.5300 x64 Administrator
[*] D:\...\sdkconfig 65001 Ln 1812/2186 Col 19
[ ] # CONFIG_OPENTHREAD_RADIO_NATIVE is not set
[ ] CONFIG_OPENTHREAD_RADIO_SPINEL_UART=y
[ ] # CONFIG_OPENTHREAD_RADIO_SPINEL_SPI is not set
[ ] # CONFIG_OPENTHREAD_RADIO_154_NONE is not set
[ ] # end of Thread 15.4 Radio Link
[ ]
[*] CONFIG_OPENTHREAD_BORDER_ROUTER=y
[*] CONFIG_OPENTHREAD_COMMISSIONER=y
[ ] #
[ ] # Commissioner Configurations
[ ] #
[ ] CONFIG_OPENTHREAD_COMM_MAX_JOINER_ENTRIES=2
[ ] # end of Commissioner Configurations
[Spa]
[0]
[F] CONFIG_OPENTHREAD_JOINER=y
```



Администратор: ESP-IDF 5.2.4

(Top) → Component config → OpenThread → OpenThread → Thread Core Features → Thread Operational Dataset

Espressif IoT Development Framework Configuration

(OpenThread-ESP) OpenThread network name

(fd00:db8:a0:0::/64) OpenThread mesh local prefix, format <address>/<plen>

(15) OpenThread network channel

(0x1234) OpenThread network pan id

(dead00beef00cafe) OpenThread extended pan id

(00112233445566778899aabbccddeeff) OpenThread network key

(104810e2315100afd6bc9215a6bfac53) OpenThread pre-shared commissioner key

edit sdkconfig - Far 3.0.5300 x64 Administrator

D:\...\sdkconfig 65001 Ln 1790/2186 Col 22 Ch 22 73

CONFIG\_OPENTHREAD\_NETWORK\_NAME="OpenThread-ESP"

CONFIG\_OPENTHREAD\_MESH\_LOCAL\_PREFIX="fd00:db8:a0:0::/64"

CONFIG\_OPENTHREAD\_NETWORK\_CHANNEL=15

CONFIG\_OPENTHREAD\_NETWORK\_PANID=0x1234

CONFIG\_OPENTHREAD\_NETWORK\_EXTPANID="dead00beef00cafe"

CONFIG\_OPENTHREAD\_NETWORK\_MASTERKEY="00112233445566778899aabbccddeeff"

CONFIG\_OPENTHREAD\_NETWORK\_PSKC="104810e2315100afd6bc9215a6bfac53"

esp\_otbr\_menuconfig\_05.png

~~~

idf.py -p COM3 build flash monitor

~~~

Now we can form a Thread network using the OpenThread command line on ESP Thread Border Router Board (BR Commissioner):

~~~

dataset init new

~~~

Done

~~~

dataset

~~~

Active Timestamp: 1

Channel: 21

Channel Mask: 0x07fff800

Ext PAN ID: 151975d11bea97b5

Mesh Local Prefix: fd6a:b54b:d6a3:b05a::/64

Network Key: 731ab6a60a64a0a0b14b259b86b2be01

Network Name: OpenThread-1444

PAN ID: 0x1444  
PSKc: 54e7f18d2575014da94db09df29c5df0  
Security Policy: 672 onrc 0  
Done

Commit this dataset as the active one:

~~~  
dataset commit active  
~~~  
Done

Bring up the IPv6 interface:

~~~  
ifconfig up  
~~~  
I (59329) OPENTHREAD: Platform UDP bound to port 49153  
Done  
I (59329) OT\_STATE: netif up

Start Thread protocol operation:

~~~  
thread start  
~~~  
I(61709) OPENTHREAD:[N] Mle-----: Role disabled -> detached  
Done  
I(62469) OPENTHREAD:[N] Mle-----: Attach attempt 1, AnyPartition reattaching with Active Dataset  
I(69079) OPENTHREAD:[N] RouterTable---: Allocate router id 11  
I(69079) OPENTHREAD:[N] Mle-----: RLOC16 fffe -> 2c00  
I(69089) OPENTHREAD:[N] Mle-----: Role detached -> leader  
I(69089) OPENTHREAD:[N] Mle-----: Partition ID 0x28b518c6  
I (69099) OPENTHREAD: Platform UDP bound to port 49154

After a moment, check the device state. It should be the Leader.

~~~  
state  
~~~  
leader  
Done