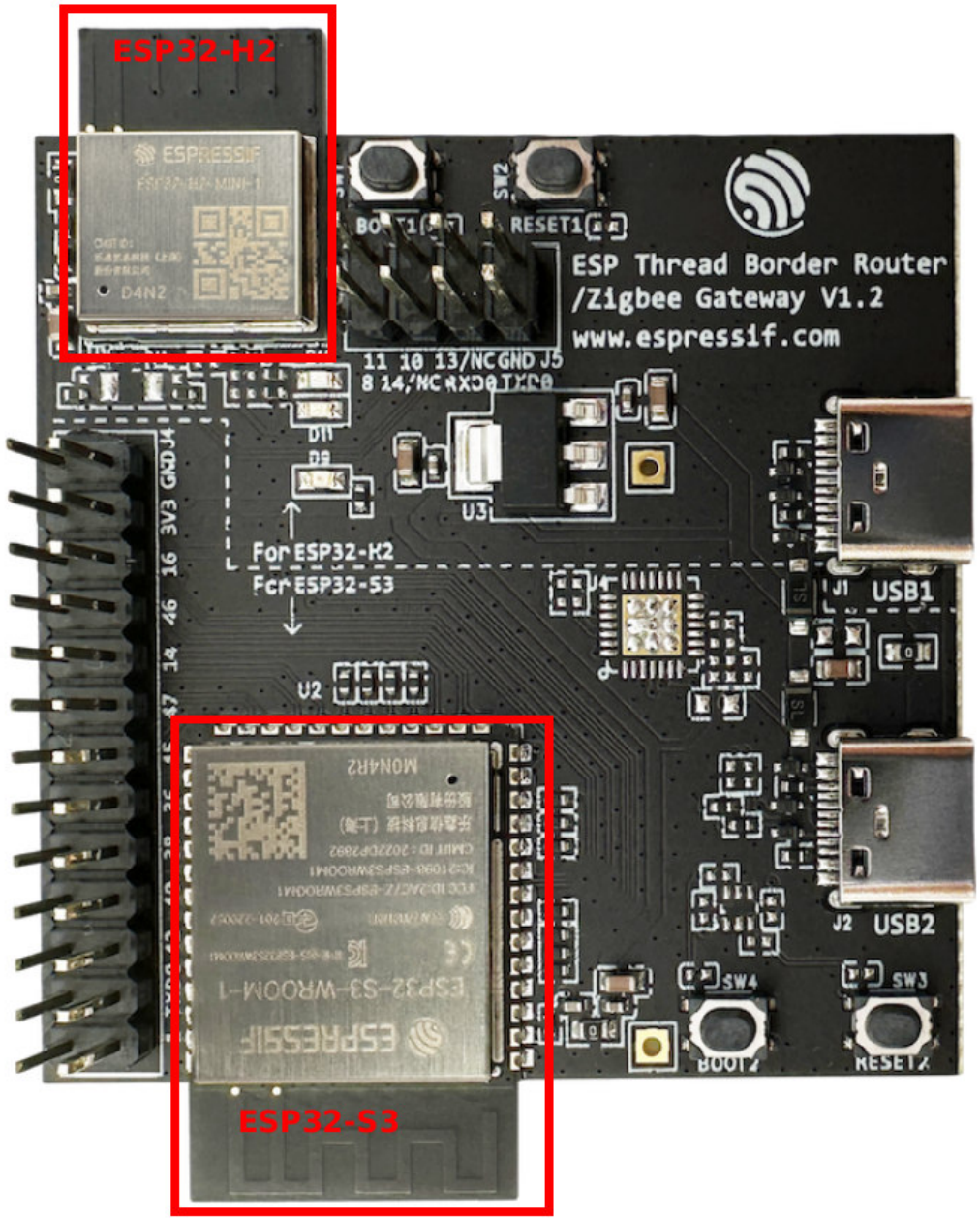
How to setup and work with OpenThread Border Router

https://docs.espressif.com/projects/esp-thread-br/en/latest/dev-guide/build_and_run.html
https://openthread.io/guides/border-router/espressif-esp32
https://openthread.io/codelabs/esp-openthread-hardware



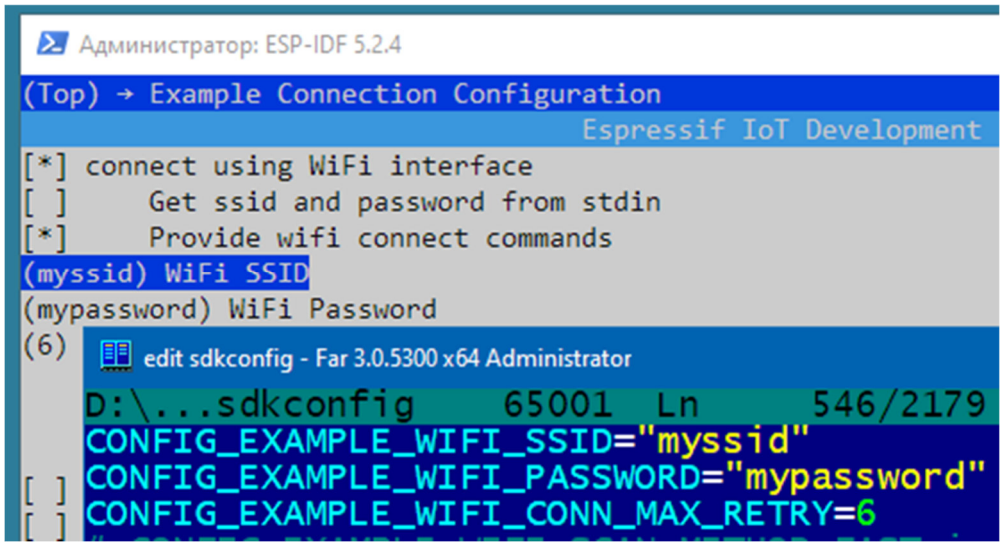
esp-thread-border-router-board.png

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

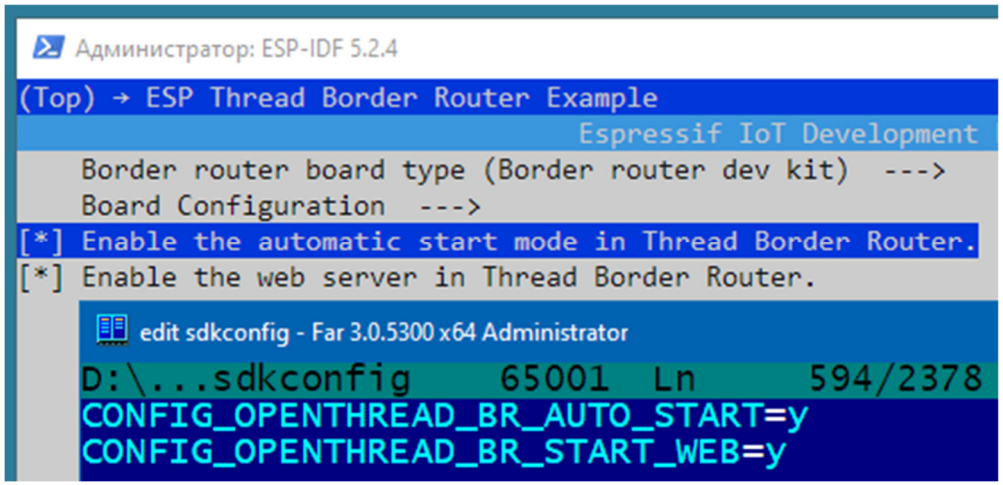
~~~
```
D:
cd /Espressif/esp-idf
./export.bat
cd ..
git clone --recursive https://github.com/espressif/esp-thread-br.git
```
~~~

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).

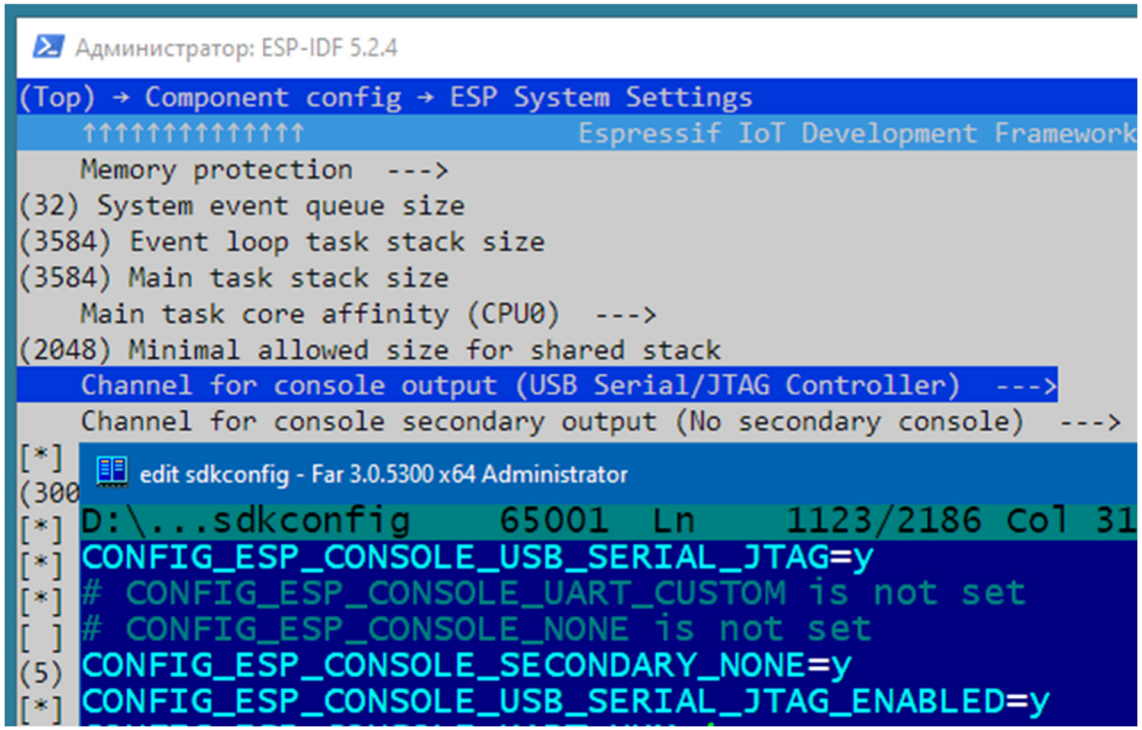
~~~
```
cd /Espressif/esp-idf/examples/openthread/ot_rcp
idf.py set-target esp32h2
idf.py build
cd /Espressif/esp-thread-br\examples\basic_thread_border_router
idf.py set-target esp32s3
idf.py menuconfig
```
~~~



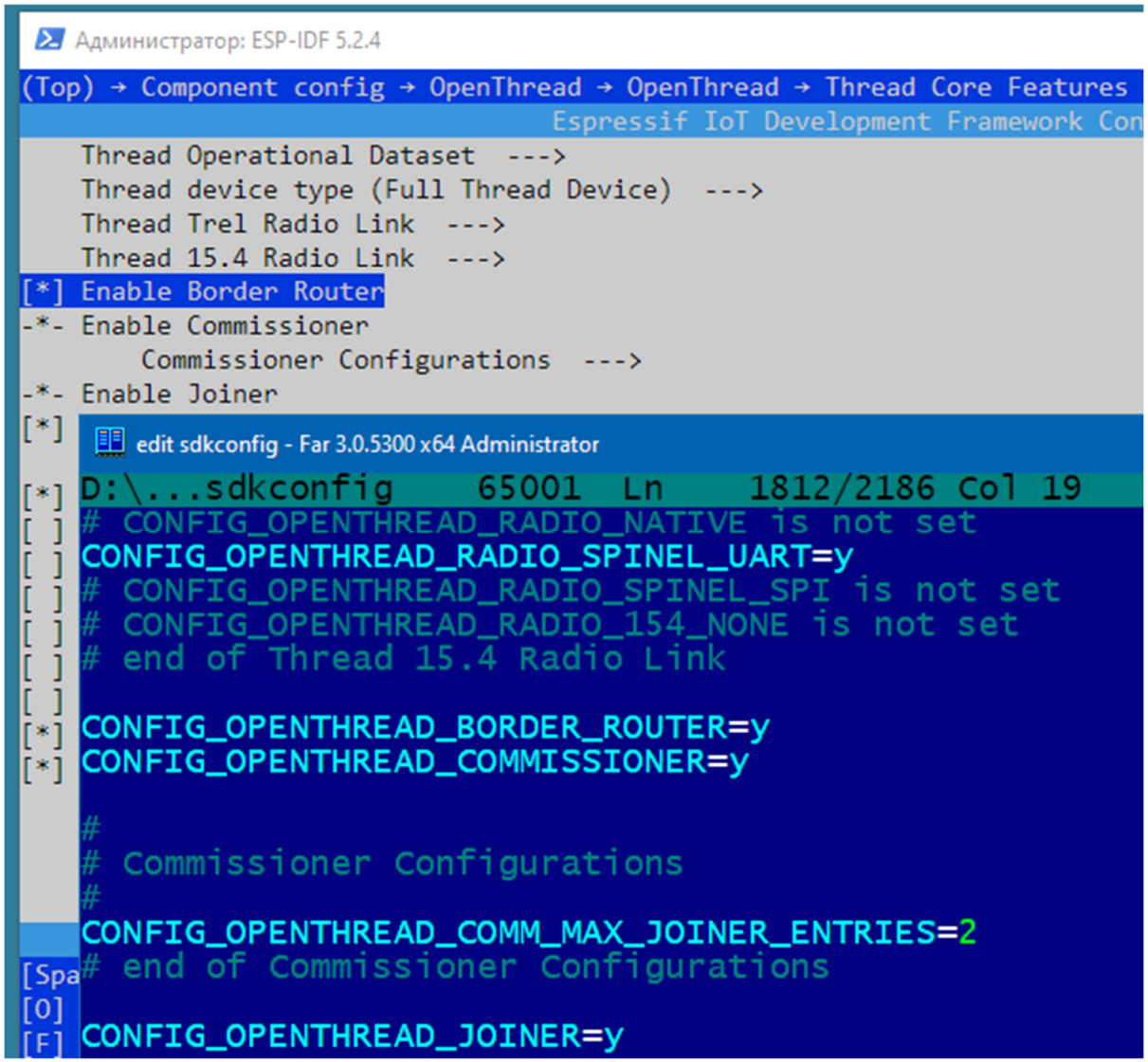
esp_otbr_menuconfig_01.png



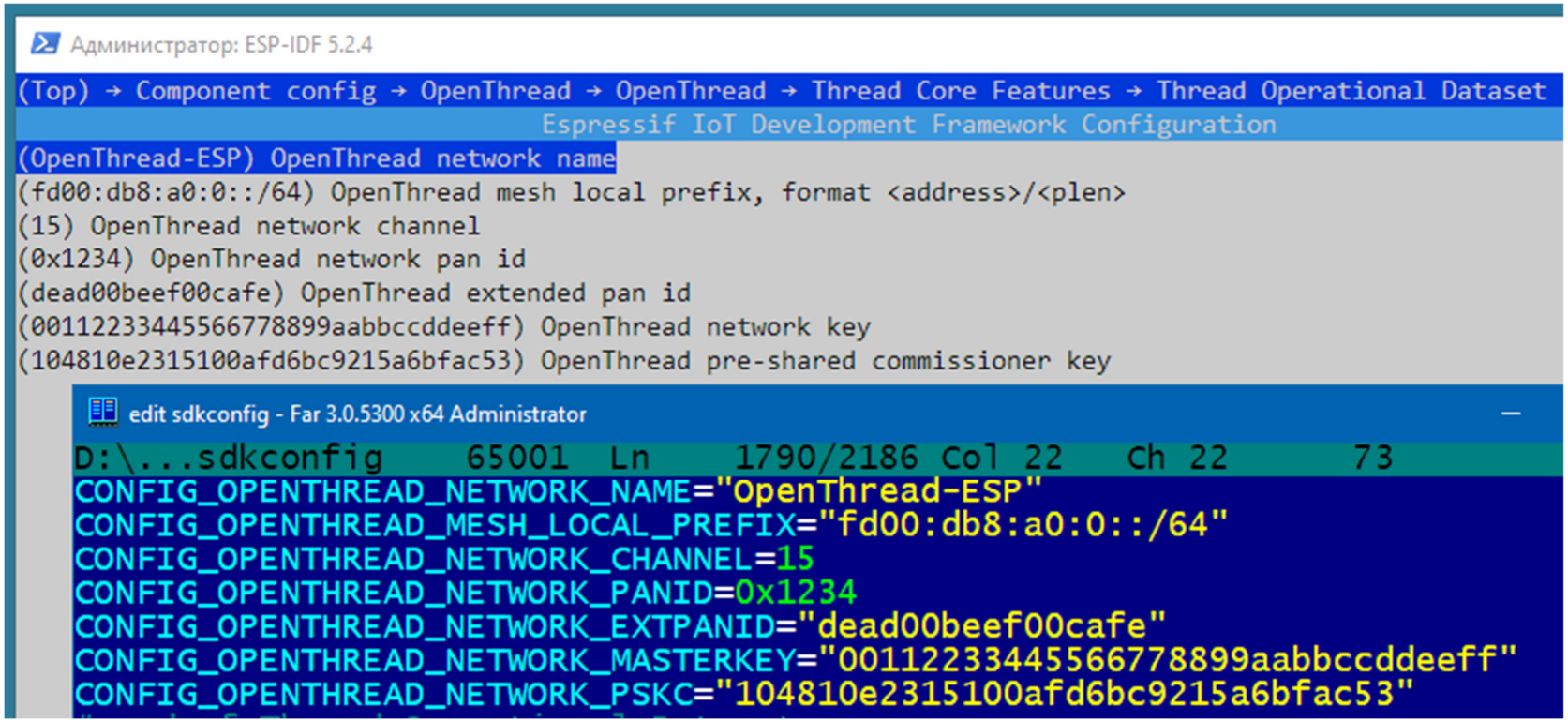
esp_otbr_menuconfig_02.png



esp_otbr_menuconfig_03.png



esp_otbr_menuconfig_04.png



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
```