Question about BLE+ESB MPSL on NRF5340 network core





HI Devzone

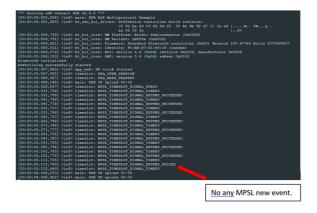
Before, our distributor FAE raised an issue regarding the implementation of BLE ESB MPSL on the 5340 network core. The details can be found at https://devzone.nordicsemi.com/support/316715.

In this ticket, Torbjørn provided an example to Jonathan, but after compiling the example, numerous issues surfaced. As a result, I conducted further testing based on Torbjørn's example. The example can be found at https://github.com/tool/ncs-esb-ble-mpsl-demo.

I found that when porting this example to the 5340, the following issue arises: According to the program logic, if MPSL_TIMESLOT_SIGNAL_EXTEND_FAILED occurs, it will trigger the MPSL_TIMESLOT_SIGNAL_TIMERO event. Additionally, if it is timeslot_extension_failed, the program logic will attempt to reapply for an MPSL_TIMESLOT_SIGNAL_ACTION_REQUEST.

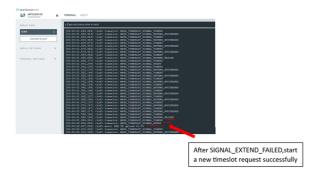
However, in the case of the 5340, the situation is different. When MPSL_TIMESLOT_SIGNAL_EXTEND_FAILED occurs, and after applying for MPSL_TIMESLOT_SIGNAL_ACTION_REQUEST, the Bluetooth protocol stack enters an abnormal working state. In this state, the thread functions normally, but the Bluetooth protocol stack does not respond to any events.

Abnormal state of NRF53:



Log for normal NRF52 conditions as shown in the diagram:





Question:

Could you please provide insight into what might be causing this situation? Or are there specific areas that need attention? I have tried enabling CONFIG_MPSL_LOG_LEVEL_DBG and CONFIG_BT_DEBUG_LOG, but there is no log output. Therefore, I am currently stuck at this point, unable to continue identifying the root cause of the problem.



Hi David

I have had it on my todo list to update this demo for the nRF5340 for a while, and finally started looking into it yesterday.

To be honest I didn't expect the sample would run at all on the nRF5340 netcore, but it seems it is able to run with relatively few modifications.

I was able to reproduce your issue, and managed to fix it by removing the normal Bluetooth configuration from the configuration and instead adding the configuration from the hci_rpmsg sample, inspired by this unofficial nRF5340 timeslot sample made by another Nordic developer.

You will find my modifications in the feature_5340_support_test1 branch <u>here</u>. Only the PTX sample is modified, to be able to run it on the nRF5340 netcore.

Please note there is still plenty of work left to have a reliable implementation (it asserts quite often), but the timeslot extend bug is not there and I can see that the ESB data is successfully received by the PRX.

With some luck I will be done with the nRF53 port by the end of next week.

Best regards Torbjørn





You welcome David, hopefully I will have some updates for you soon.

Were you able to run the code I shared already?

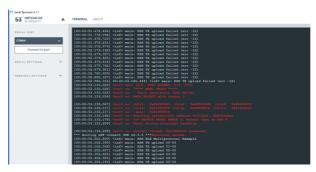
Best regards Torbjørn



7 days ago
Online David Duan
24 pts.

Hello Torbjorn

Thanks for your help. I test your sample feature_5340_support_test1. As you mentioned, the program can run but frequently reports assertions. I am currently attempting to add the Bluetooth part to your example. I hope that you will fully port this example to the NRF5340.



BR



<u>5 days ago</u>
Online <u>Torbjørn Øvrebekk</u>
20441 pts.

Hi David

Could you please try my latest commit to the feature_5340_support_test1 branch?

I discovered a conflict between the ESB library and MPSL, since they are both configured to use the SWI0 interrupt in the nRF5340. In order to fix this it is necessary to change these lines in esb_peripherals.h, and modify them to use a different SWI number (I tested with SWI3).

Then I was able to get ESB and BLE to run simultaneously.

Could you try this and see if it works for you also?

Best regards Torbjørn



5 days ago
Online David Duan
24 pts.

Hi Tobjorn

Thanks for your help, it is work. now i am tring to add the peripheral_lbs BLE HOST part into the NRF5340 app

core.





Hi David

All you have to do to run any BLE example on the appropriate is to include the following configuration, to ensure that the netcore won't be flashed with the default hci_rpmsg project:

For debugging purposes it is also possible to add an overlay to forward control of the LED pins from the appeare to the netcore, which can be done like this:

```
Fullscreen
   1 /{
   2
          gpio_fwd: nrf-gpio-forwarder {
               compatible = "nordic,nrf-gpio-forwarder";
   3
               status = "okay";
   4
               leds {
                   gpios = <&gpio0 28 0>, <&gpio0 29 0>, <&gpio0 30 0>, <&gpio0 31 0
   6
   7
              };
   8
          };
      };
   9
```

Best regards

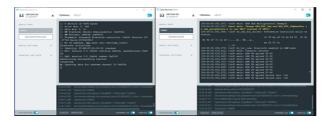
Torbjørn



4 days ago
Online David Duan
24 pts.

Hi Tobjorn

Thanks for your great help!!. now The ble + ESB is work in NCS 2.5



just for take note, i upload my app core application at here.

peripheral_lbs_app.7z

BR



15 hours ago Hung Bui 42921 pts.

Hi David,

Torbjørn is away for 2 weeks. Thanks for sharing the peripheral_lbs with us.

I hope you don't mind I shared it with another customer that doing exactly the same.

I assume everything works and the ticket can be closed now?

43 minutes ago
Online David Duan



Previewing Staged Changes