

Доработка драйвера ENCI хост-контроллера в RTOS NuttX

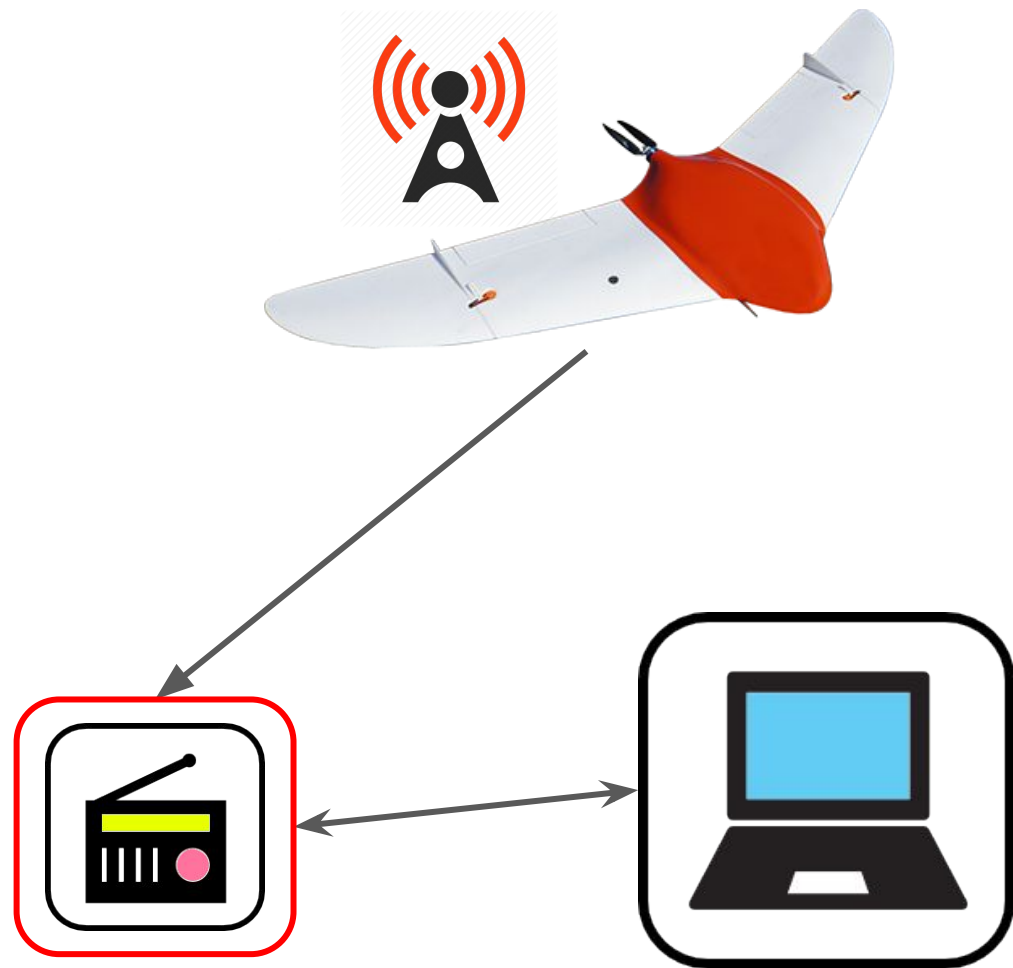
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Введение

- LPC43xx
- Хост-контроллер
- ENCI
- RTOS NuttX



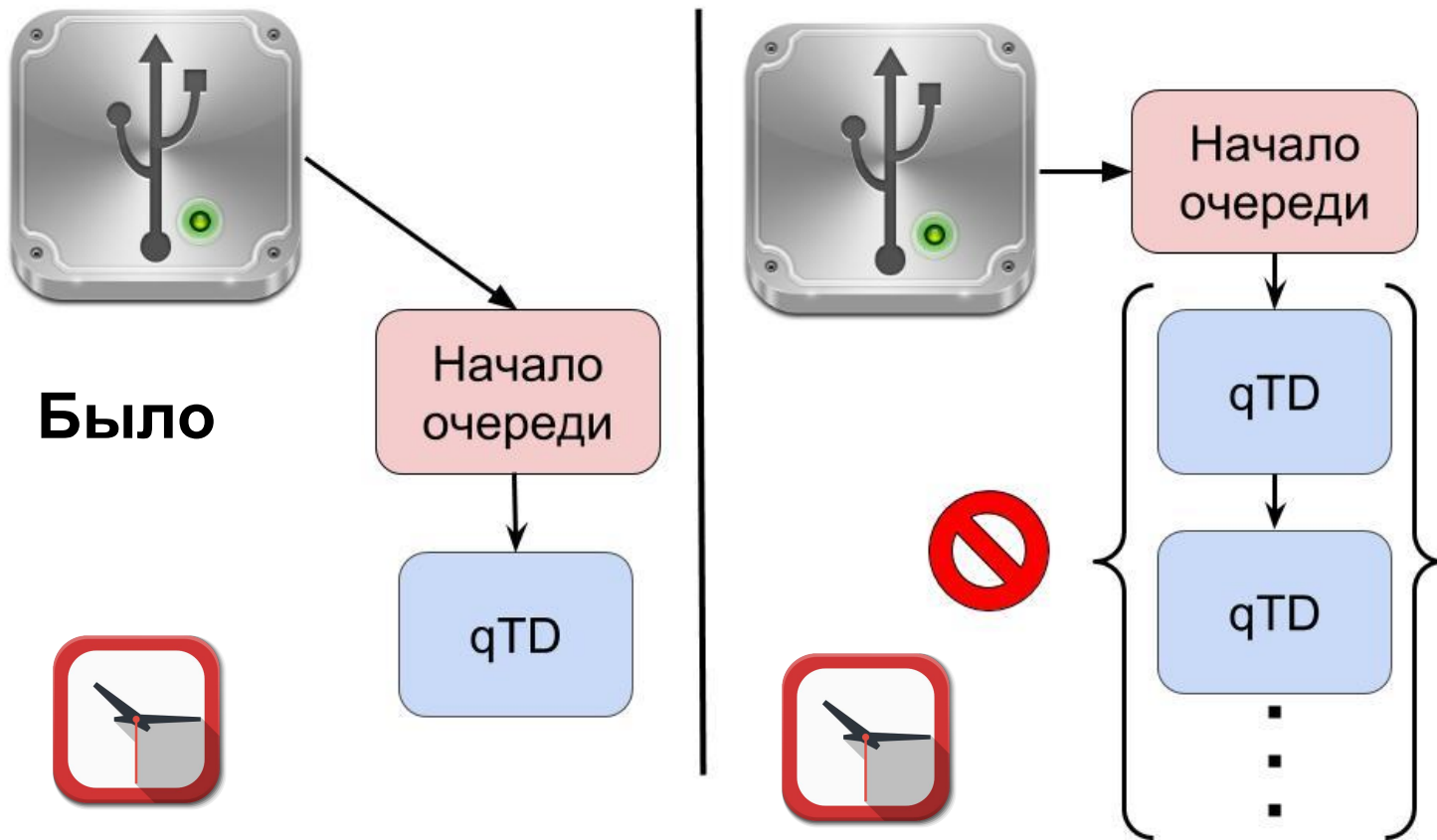
Постановка задачи

Проблема: при передаче информации на высокой скорости теряются данные

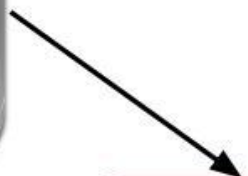
Задача: модифицировать драйвер EHCI хост-контроллера в RTOS NuttX

- реализовать поддержку длинных очередей запросов
- реализовать асинхронную обработку запросов

Существующее решение



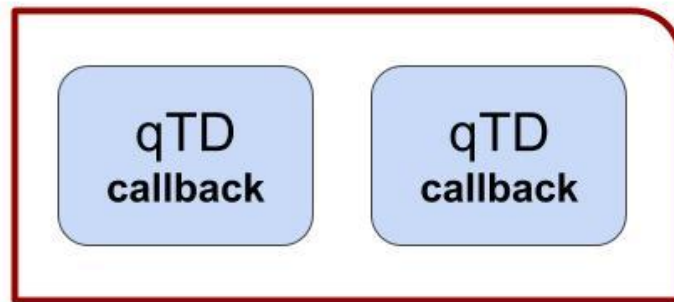
Предложение



Начало
очереди



qTD
callback



Сложности

- Выяснение причины ошибок на шине USB
- Отправка данных в callback'е
- Реализация IPC

Результаты

The image shows a Wireshark network traffic analysis window. The main pane displays a list of captured packets, all of which are DDIS (Data Display Interface Service) packets with PDUType: Unknown. The packets are numbered from 69662 to 69689 and all originate from 192.168.0.99 and are destined for 192.168.0.1. The packet list table is as follows:

No.	Time	Source	Destination	Protocol	Length	Info
69662	169.38108900	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Unknown
69663	169.38369500	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Unknown
69664	169.38408900	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Unknown
69665	169.38771200	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Unknown
69666	169.38809300	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69667	169.39073300	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69668	169.39114400	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69669	169.39474400	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69670	169.39509300	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69671	169.39771200	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69672	169.39812100	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69673	169.40170300	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69674	169.40209500	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69675	169.40471800	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69676	169.40510100	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69677	169.40871100	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69678	169.40911300	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69679	169.41171400	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Other
69680	169.41211700	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69681	169.41569000	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69682	169.41608700	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69683	169.41870400	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69684	169.41911100	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69685	169.42274800	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69686	169.42315200	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69687	169.42572500	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69688	169.42612100	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R
69689	169.42976200	192.168.0.99	192.168.0.1	DDIS	1358	PDUType: Record Query-R

Below the packet list, the packet details pane shows the following information for the selected packet (Frame 1):

- Frame 1: 282 bytes on wire (2256 bits), 282 bytes captured (2256 bits) on interface 0
- Ethernet II, Src: D-LinkIn e7:bf:91 (1c:bd:b9:e7:bf:91), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
- Internet Protocol Version 4, Src: 192.168.0.1 (192.168.0.1), Dst: 192.168.0.255 (192.168.0.255)
- User Datagram Protocol, Src Port: netbios-dgm (138), Dst Port: netbios-dgm (138)
- NetBIOS Datagram Service
- SMB (Server Message Block Protocol)
- SMB MailSlot Protocol
- Microsoft Windows Browser Protocol

The packet bytes pane at the bottom shows the raw data in hexadecimal and ASCII:

```
0000 ff ff ff ff ff ff 1c bd b9 e7 bf 91 08 00 45 00 .....E.
0010 01 0c 7a 57 48 00 40 11 3d 39 c0 a8 00 01 c0 a8 ..ZWB.@.#9.....
0020 00 ff 00 8a 00 8a 00 f8 36 da 11 0a 0f ca c0 a8 .....6.....
0030 00 01 00 8a 00 e2 00 00 20 43 41 43 41 43 41 43 .....CACACAC
0040 41 43 41 43 41 43 41 43 41 43 41 43 41 43 41 43 ACACACAC ACACACAC
0050 41 43 41 43 41 43 41 41 41 00 20 46 48 45 50 46 ACACACAA A.FHEPF
0060 43 45 4c 45 48 46 43 45 50 46 46 46 41 43 41 43 CELEHFCE PFFFCAC
0070 41 43 41 43 41 43 41 43 41 42 4e 00 ff 53 4d 42 ACACACAC ABN..SMB
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Новое

- Изучение драйвера хост-контроллера в NuttX
- Отладка кода для микроконтроллера LCP43xx
- Реализация IPC