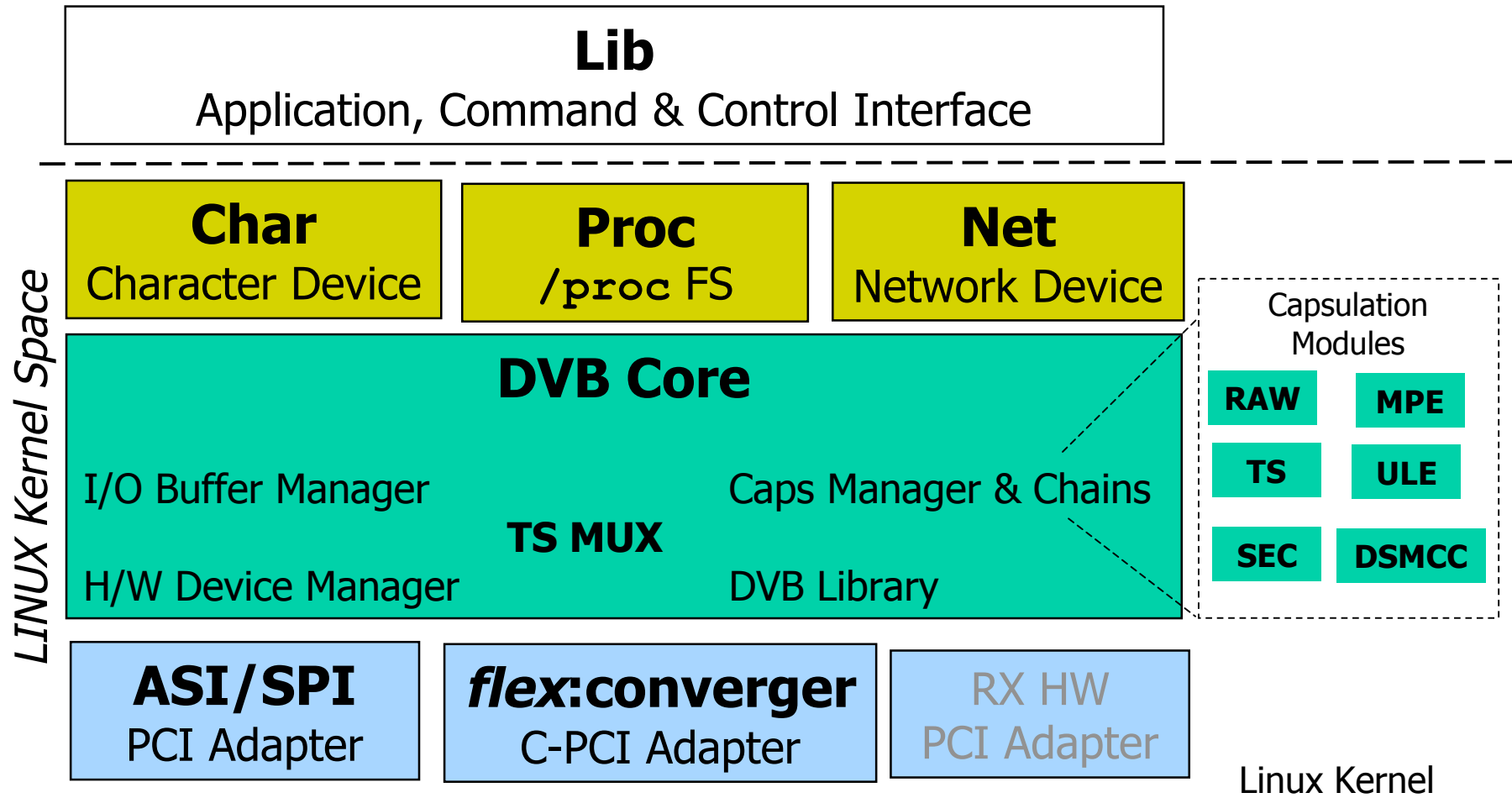# ULE Implementation Status
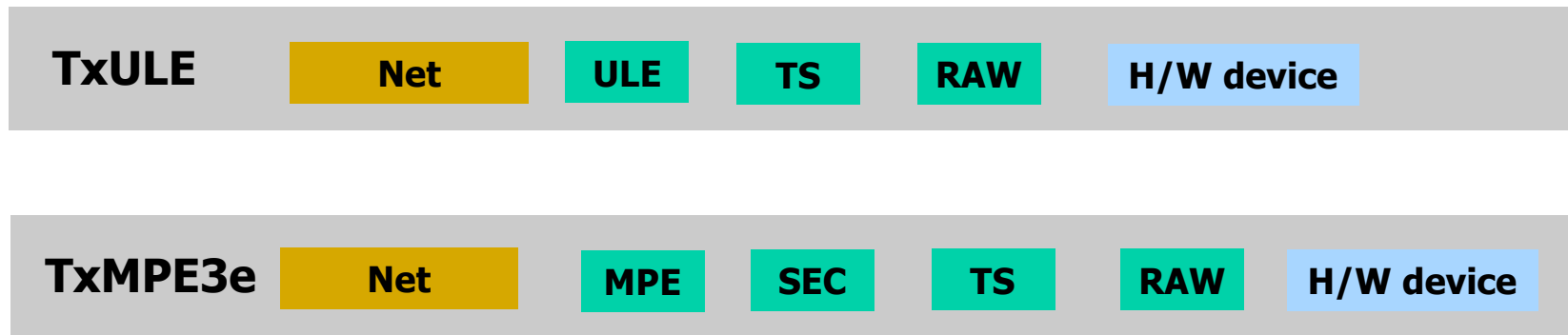## draft-fair-ipdvb-ule-01.txt

Hilmar Linder, Wolfram Stering

hl@gcs-salzburg.at

ws@gcs-salzburg.at

Internet
Broadcast Solutions

# IP/DVB Gateway SW Architecture

**Lib**
Application, Command & Control Interface

*LINUX Kernel Space*

**Char**
Character Device

**Proc**
`/proc` FS

**Net**
Network Device

**DVB Core**

I/O Buffer Manager

Caps Manager & Chains

**TS MUX**

H/W Device Manager

DVB Library

Capsulation Modules

**RAW**   **MPE**

**TS**   **ULE**

**SEC**   **DSMCC**

**ASI/SPI**
PCI Adapter

*flex*:**converger**
C-PCI Adapter

RX HW
PCI Adapter

Linux Kernel

Internet
Broadcast Solutions

# Flexible Capsulation Chains

**TxULE**　　Net　ULE　TS　RAW　H/W device

**TxMPE3e**　Net　MPE　SEC　TS　RAW　H/W device
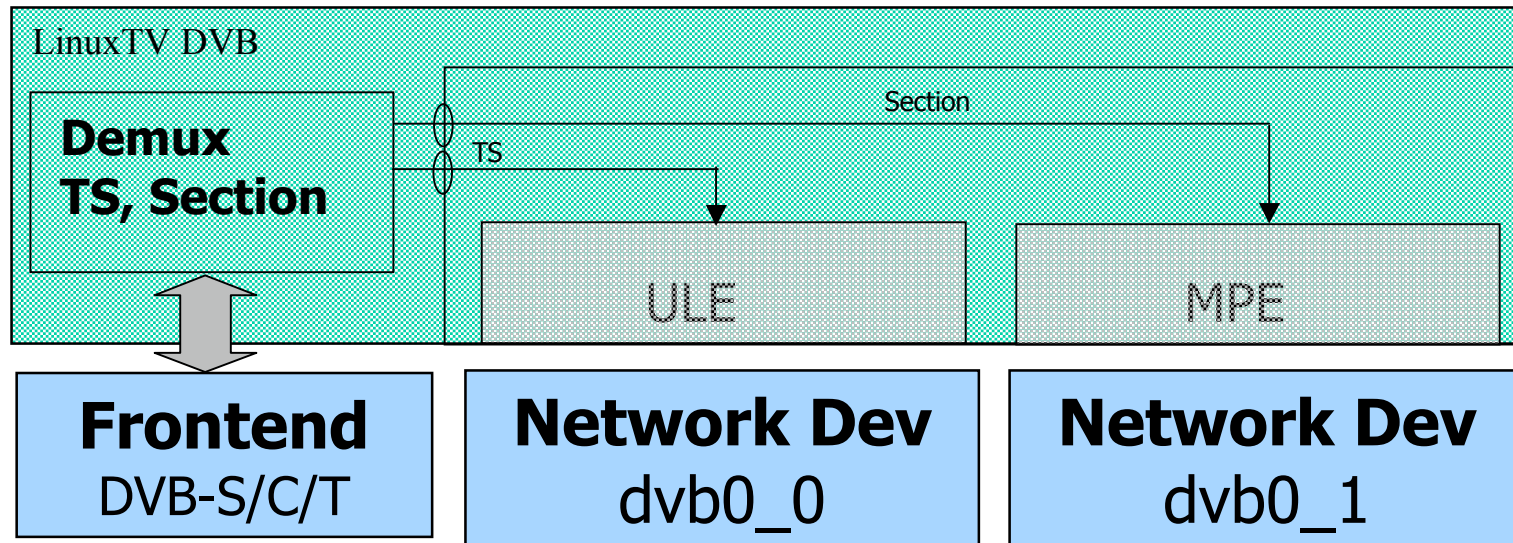
- A caps chain represents a sequence of encaps modules executed in the given order

- A caps chain is then attached to a network interface (i.e. forward IP packets from Net to H/W device using the given encaps chain)

Internet
Broadcast Solutions

# Technotrend Driver Architecture

- Modular design
- Implementation under GPL (www.linuxtv.org)

# ULE Receiver

- ULE decaps straightforward to implement
  - approx. 250 LOC

- Runs in parallel with MPE decapsulator
  - can create network devices for ULE and MPE

```
apps/dvbnet/dvbnet -a 0 -p 0x303 –U
ip a add 10.0.4.2/32 dev dvb0_0
ip link set up dev dvb0_0
```

- Hope to place driver in public domain

Internet
Broadcast Solutions

# ULE Changes

- CRC-32 same as ISO DSM-CC CRC Spec

- Stuff/PAD MUST be 0xFF

- Minor changes to clarify wording

- Experience will be fed into next rev of ULE ID

Internet
Broadcast Solutions