## README..txt

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=== Start ===

If you have compiled CAIF for modules do:

\$modprobe crc\_ccitt
\$modprobe caif
\$modprobe caif\_socket
\$modprobe chnl net

=== Preparing the setup with a STE modem ===

If you are working on integration of CAIF you should make sure that the kernel is built with module support.

There are some things that need to be tweaked to get the host TTY correctly set up to talk to the modem.

Since the CAIF stack is running in the kernel and we want to use the existing TTY, we are installing our physical serial driver as a line discipline above the TTY device.

To achieve this we need to install the N\_CAIF ldisc from user space. The benefit is that we can hook up to any TTY.

The use of Start-of-frame-extension (STX) must also be set as module parameter "ser use stx".

Normally Frame Checksum is always used on UART, but this is also provided as a module parameter "ser\_use\_fcs".

\$ modprobe caif\_serial ser\_ttyname=/dev/ttyS0 ser\_use\_stx=yes
\$ ifconfig caif\_ttyS0 up

PLEASE NOTE: There is a limitation in Android shell. It only accepts one argument to insmod/modprobe!

=== Trouble shooting ===

There are debugfs parameters provided for serial communication. /sys/kernel/debug/caif\_serial/<tty-name>/

- \* ser state: Prints the bit-mask status where
  - -0x02 means SENDING, this is a transient state.
  - 0x10 means FLOW\_OFF\_SENT, i.e. the previous frame has not been sent and is blocking further send operation. Flow OFF has been propagated to all CAIF Channels using this TTY.
- \* tty\_status: Prints the bit-mask tty status information
  - -0x01 tty->warned is on.
  - $-0x02 tty \rightarrow low_latency is on.$
  - 0x04 tty->packed is on.
  - 0x08 tty->flow stopped is on.

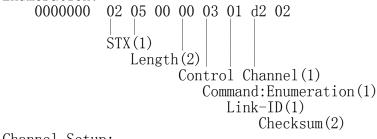
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- 0x10 tty->hw\_stopped is on.
- $-0x20 tty \rightarrow stopped$  is on.
- \* last\_tx\_msg: Binary blob Prints the last transmitted frame.

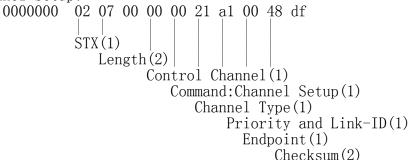
This can be printed with

\$od --format=x1 /sys/kernel/debug/caif\_serial/<tty>/last\_rx\_msg. The first two tx messages sent look like this. Note: The initial byte 02 is start of frame extension (STX) used for re-syncing upon errors.

- Enumeration:



- Channel Setup:



\* last rx msg: Prints the last transmitted frame.

The RX messages for LinkSetup look almost identical but they have the bit 0x20 set in the command bit, and Channel Setup has added one byte before Checksum containing Channel ID.

NOTE: Several CAIF Messages might be concatenated. The maximum debug buffer size is 128 bytes.

- == Error Scenarios:
- last\_tx\_msg contains channel setup message and last\_rx\_msg is empty -> The host seems to be able to send over the UART, at least the CAIF ldisc get notified that sending is completed.
- last\_tx\_msg contains enumeration message and last\_rx\_msg is empty -> The host is not able to send the message from UART, the tty has not been able to complete the transmit operation.
- if /sys/kernel/debug/caif\_serial/<tty>/tty\_status is non-zero there might be problems transmitting over UART.
   E. g. host and modem wiring is not correct you will typically see tty\_status = 0x10 (hw\_stopped) and ser\_state = 0x10 (FLOW\_OFF\_SENT). You will probably see the enumeration message in last\_tx\_message and empty last rx message.