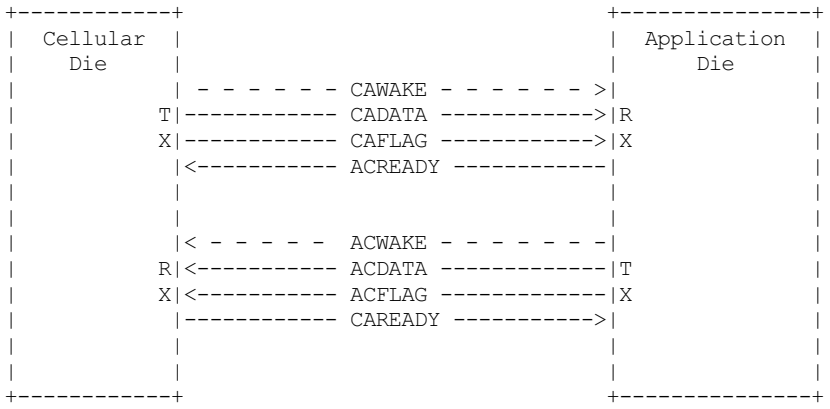
High Speed Synchronous Serial Interface (HSI)

Introduction

High Speed Syncronous Interface (HSI) is a fullduplex, low latency protocol, that is optimized for die-level interconnect between an Application Processor and a Baseband chipset. It has been specified by the MIPI alliance in 2003 and implemented by multiple vendors since then.

The HSI interface supports full duplex communication over multiple channels (typically 8) and is capable of reaching speeds up to 200 Mbit/s.

The serial protocol uses two signals, DATA and FLAG as combined data and clock signals and an additional READY signal for flow control. An additional WAKE signal can be used to wakeup the chips from standby modes. The signals are commonly prefixed by AC for signals going from the application die to the cellular die and CA for signals going the other way around.



HSI Subsystem in Linux

In the Linux kernel the hsi subsystem is supposed to be used for HSI devices. The hsi subsystem contains drivers for hsi controllers including support for multi-port controllers and provides a generic API for using the HSI ports.

It also contains HSI client drivers, which make use of the generic API to implement a protocol used on the HSI interface. These client drivers can use an arbitrary number of channels.

hsi-char Device

Each port automatically registers a generic client driver called hsi_char, which provides a charecter device for userspace representing the HSI port. It can be used to communicate via HSI from userspace. Userspace may configure the hsi_char device using the following ioctl commands:

HSC_RESET
: flush the HSI port

HSC_SET_PM
: enable or disable the client.

HSC_SEND_BREAK
: send break

HSC_SET_RX
: set RX configuration

HSC_GET_RX
: get RX configuration

HSC_SET_TX
: set TX configuration

HSC_GET_TX
: get TX configuration

The kernel HSI API

System Message: ERROR/3 (`D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\driver-api\(linux-master)(Documentation)(driver-api)hsi.rst`, **line 83**)

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```
.. kernel-doc:: include/linux/hsi/hsi.h
```

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   :internal:
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System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\driver-api\(linux-master)(Documentation)(driver-api)hsi.rst, line 86)

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```
.. kernel-doc:: drivers/hsi/hsi_core.c
   :export:
```