SIPC Introduction

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UNISOC (SHANGHAI) TECHNOLOGIES CO., LTD.

Revision History

Version	Date	Notes
V1.0	2019/06/03	Initial version.
V1.1	2020/01/01	• Update the template. • Add the applicable platform SL8563.
V1.2	2020/04/09	• Change the document name to *SIPC Introduction*. • Update the template.
V1.3	2021/02/25	Optimize description and update the format.

Keyword

Keyword: SIPC, Inter-Processor Communications.

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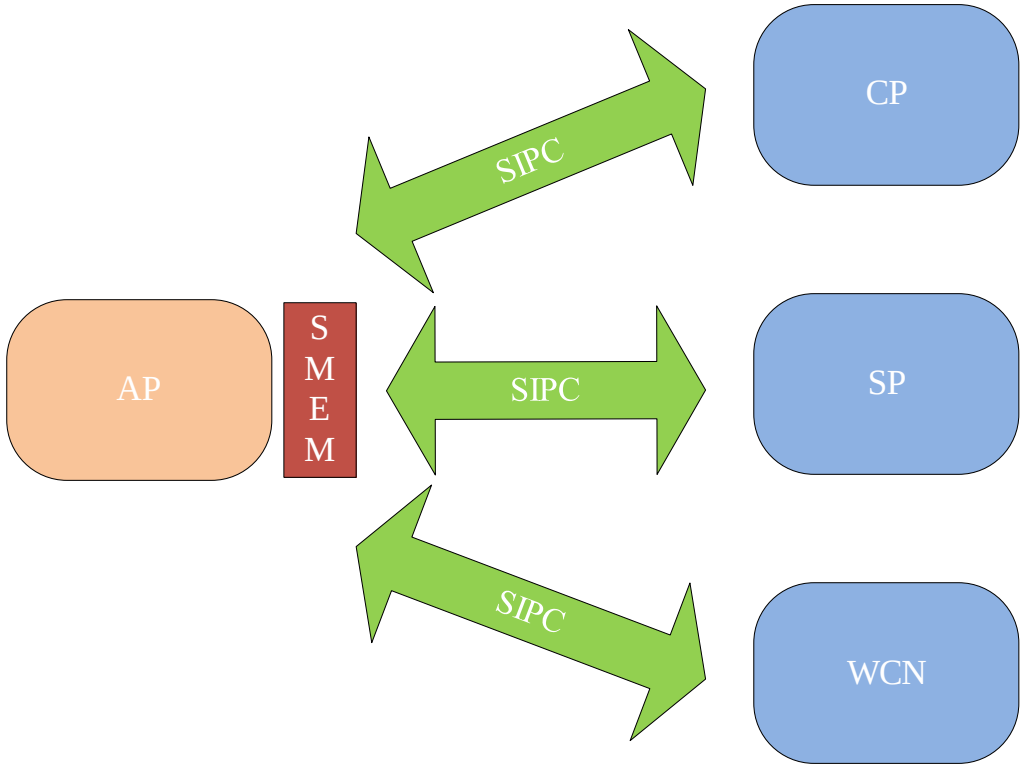
Introduction

Introduction

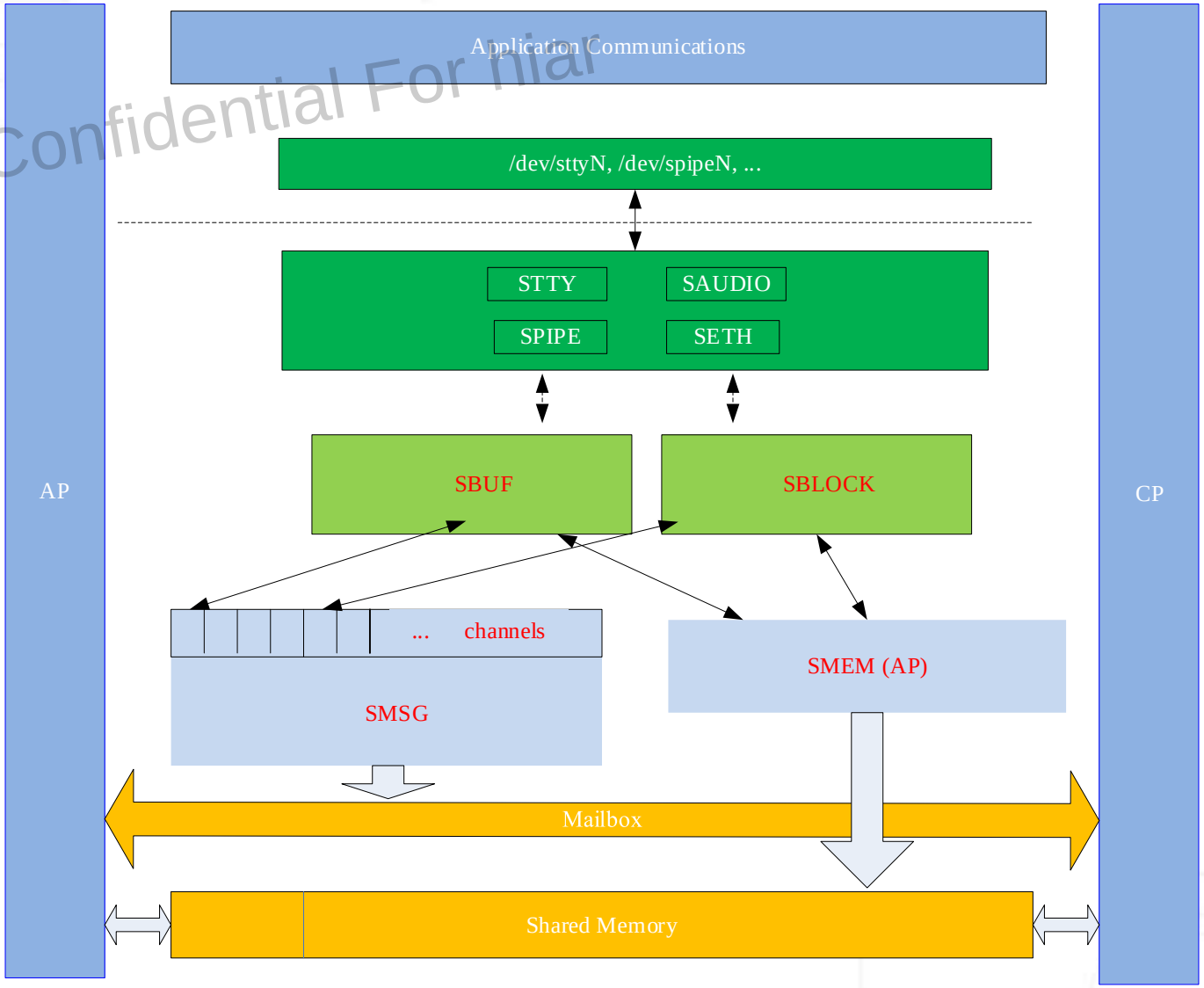
SIPC (Spreadtrum Inter-Processor Communications) is designed for the communication between UNISOC AP and other systems (CP, SP, WCN). As an underlying general module, SIPC uses mailbox and the shared memory to transfer SMSG and data among different processors.



Note: SP refers to Sensor Processor.

02 Module Design

Module Design (1/2)



Module Design (2/2)

- AP: Application Processor system
- CP: Communication Processor system
- SIPC: SPRD Inter-Processor Communication
- SMSG: a fundamental low-level message upon Mailbox
- SMEM: SIPC memory management module
- SBUF: SIPC FIFO buffer interface module
- SBLOCK: SIPC block interface module
- SPIPE/ STTY/ SAUDIO /SETH: they can be implemented based on SBUF and SBLOCK, and provide interface to user space.
- Mailbox: Logic control unit for multi-core communication

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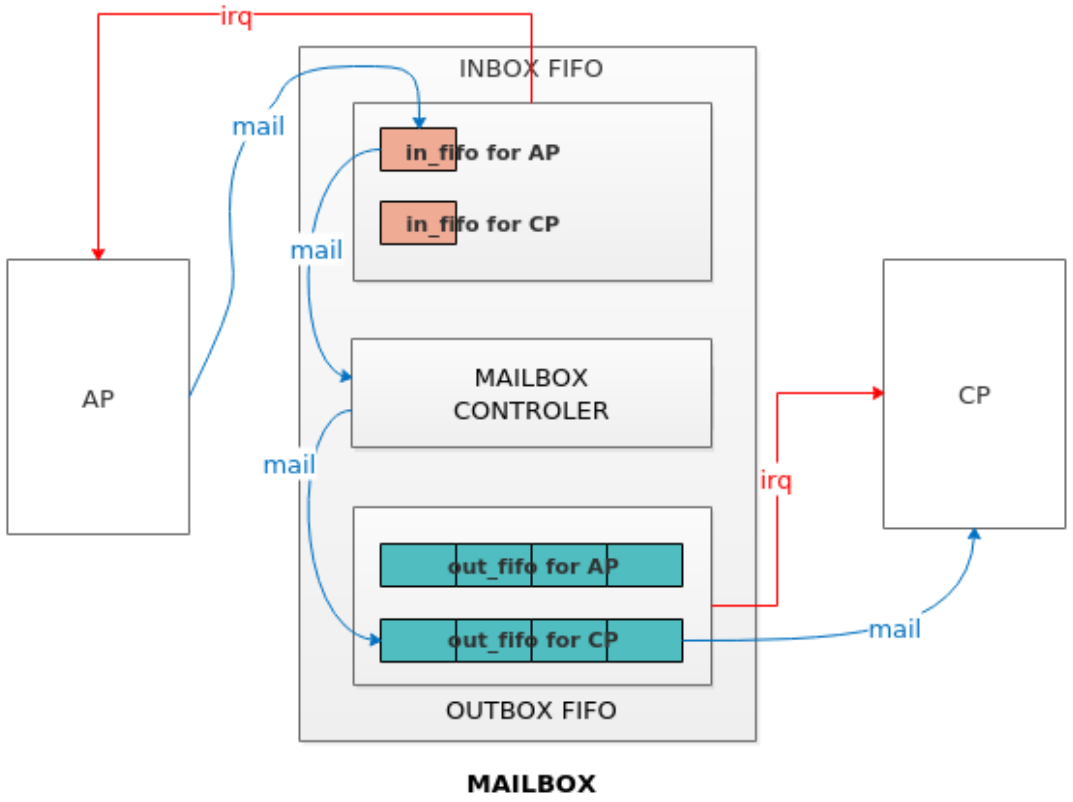
Mailbox

Mailbox

Mailbox is a logic control unit used for multi-core communication. In Mailbox, each core has its own inbox and outbox. To send mail, the core puts mail into its inbox, and to receive mail, the core gets mail from its outbox. Mailbox controller is responsible for mails between the two cores (getting mail from the inbox in the source core and putting it into the outbox in the target core).



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SMEM

SMEM

- SMEM is a module to manage the shared memory.
- SMEM is a memory allocator in AP side.
- SMEM directly manages the physical address space.
- CP (Client SIPC) can get the corresponding memory address via communication with AP(host client) by passing SMSG through Mailbox.

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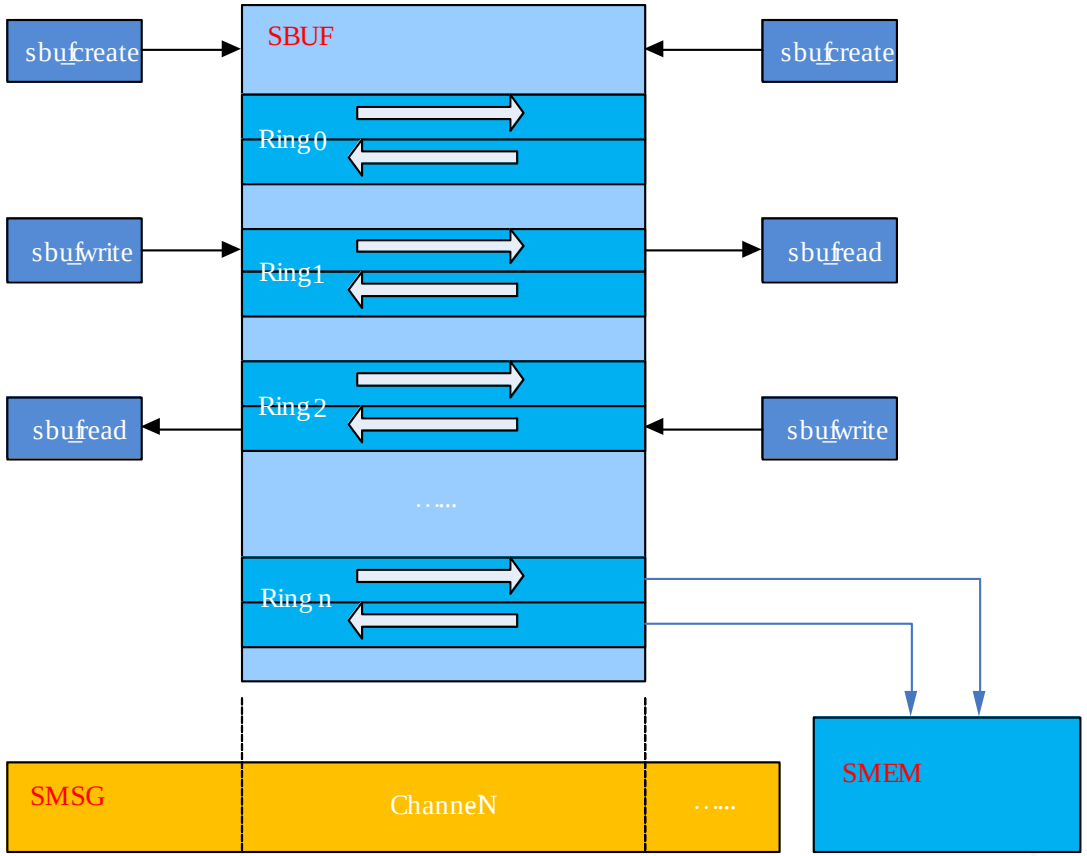
SBUF

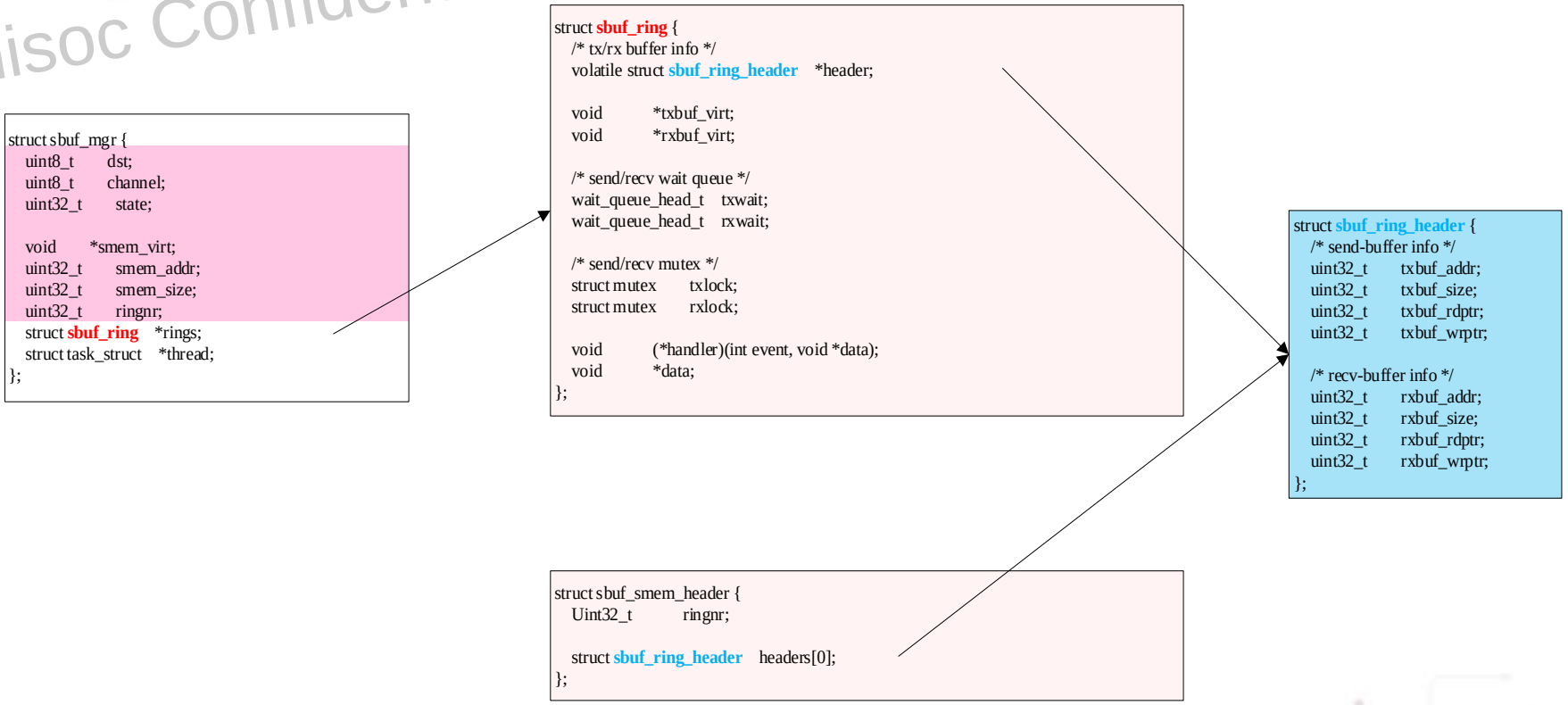
SBUF (1/2)

- SBUF is an interface that can implement multiple bi-directional FIFOs for AP and CP communication.
- A SBUF instance consumes a SMSG channel and builds multiple ring-buffers upon SMEM.



SBUF (2/2)

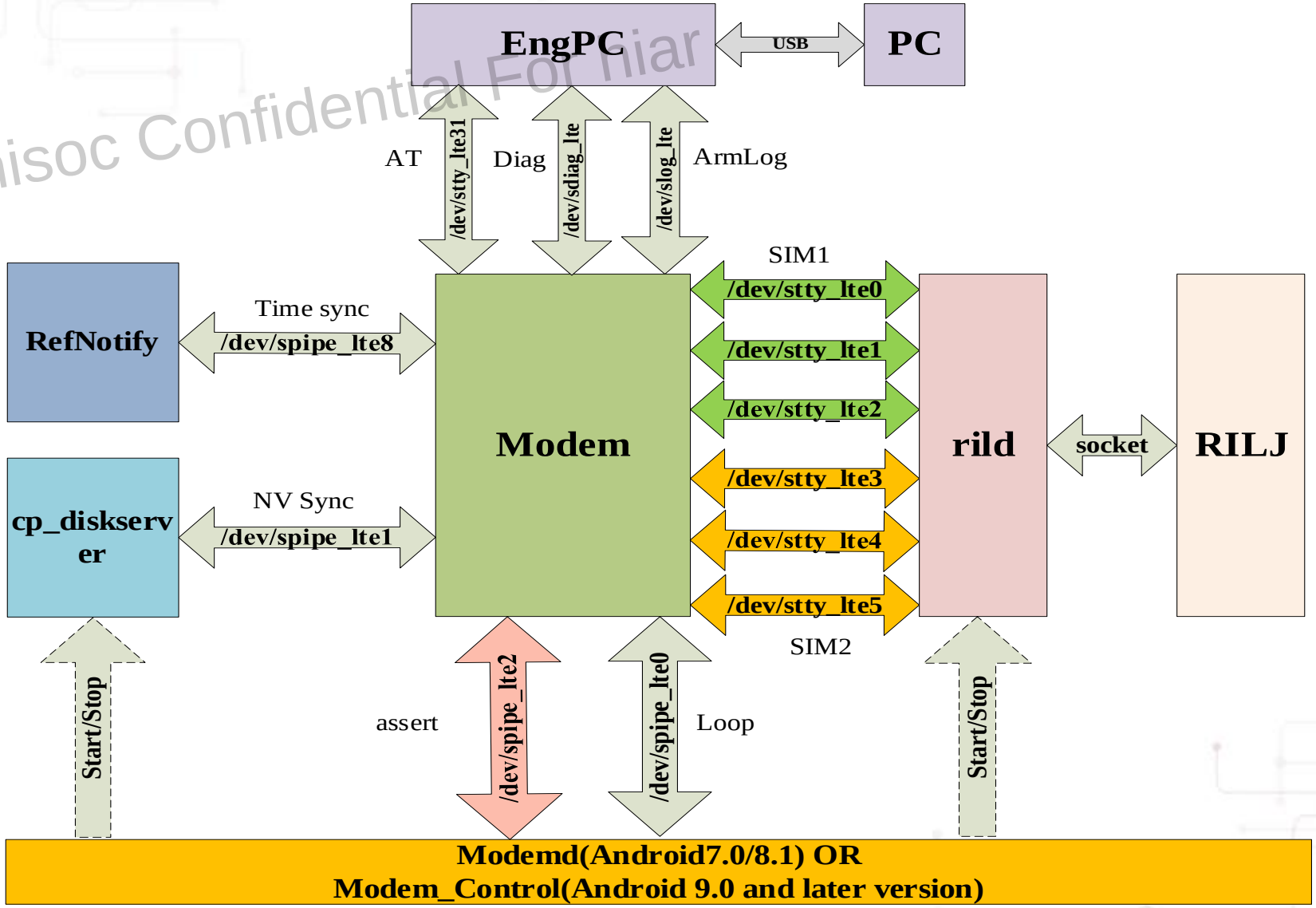
Data Structure



06

Common Applications

Common Applications-Android

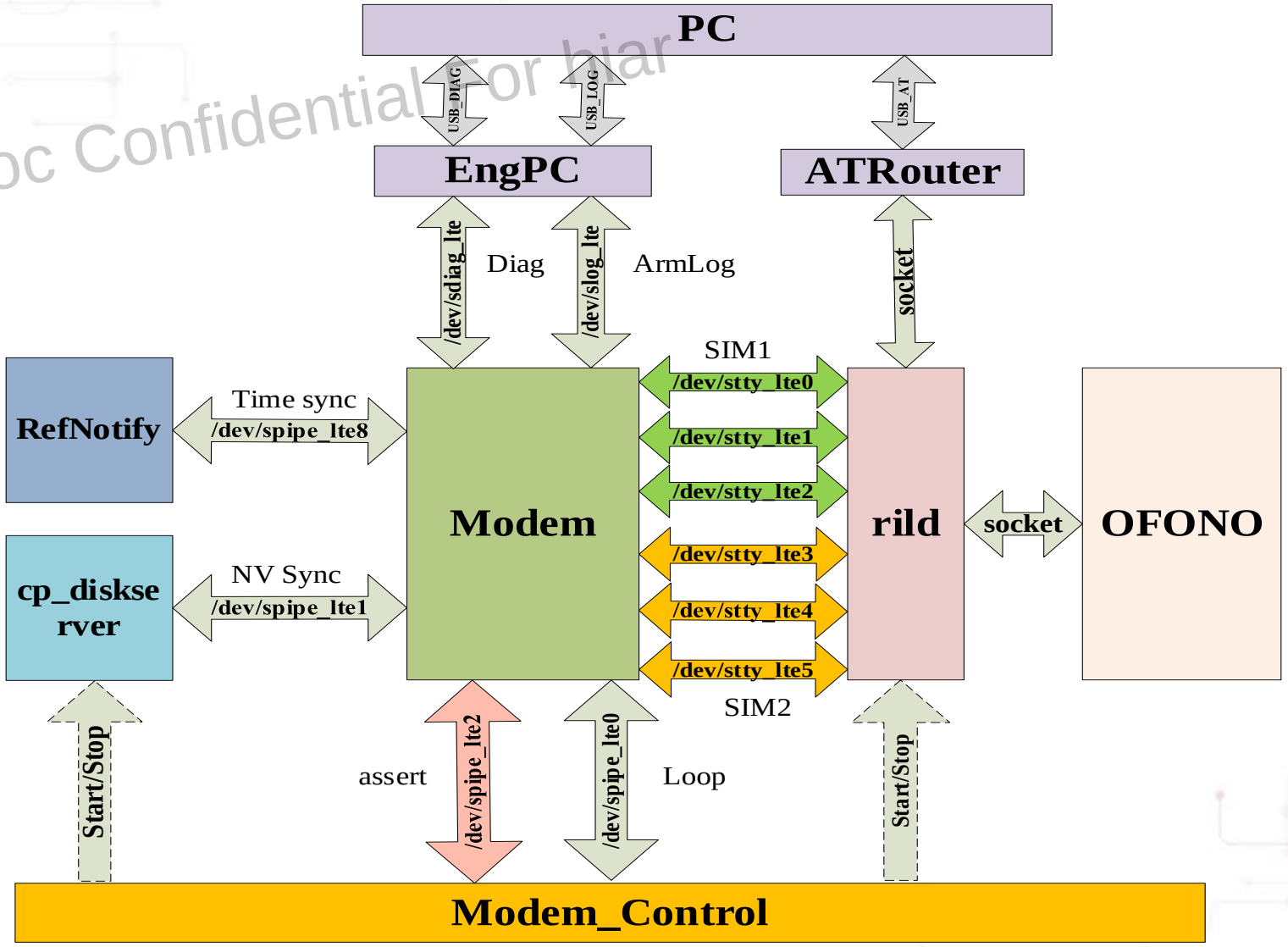


COM Port-Android

- **COM Port-Normal Mode**
  - SPRD AT (ONLY SC7731E)
  - SPRD DIAG(SENSOR HUB) (ONLY SC7731E)
  - SPRD LOG(AGDSP)
  - SPRD LTE AT -- AT Commands
  - SPRD LTE DIAG -- Diag Commands
  - SPRD LTE LOG -- Arm Log & Dsp Log
  - SPRD WCN AT
  - SPRD WCN DIAG
  - Android Phone: Android Composite ADB Interface

- **COM Port-Calibration Mode**
  - SPRD U2S Diag -- AutoTest/Pandora/Calibration

Common Applications-Linux



COM Port-Linux

- **COM Port-Normal Mode**
  - SPRD AT+MODEM+ECM
  - SPRD Log+AT+MODEM+ECM
  - SPRD DIAG+AT+MODEM+ECM
  - AT+MODEM+RNDIS
  - Log+AT+MODEM+RNDIS
  - DIAG+AT+MODEM+RNDIS

- **COM Port-Calibration Mode**
  - SPRD U2S Diag -- AutoTest/Pandora/Calibration

07

FAQ

FAQ

- **Modem Crash**
  - Init Fail
  - Modem Assert
  - Modem Block

  → Provide /proc/cpt/mem + ylog +modem log to analyze.

- **Modem Power**
  - Armlog On ⇨ Turn off all Log in YLog interface or use the User version to test.
  - Network Issues ⇨ Select data scenario in YLog Settings and provide corresponding Log to analyze.
  - Data Service On ⇨ Check APK's data behavior.

Thank You