Readout Performance Research

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Sheng Dong, CCNU

s.dong@mails.ccnu.edu.cn

Readout Performance

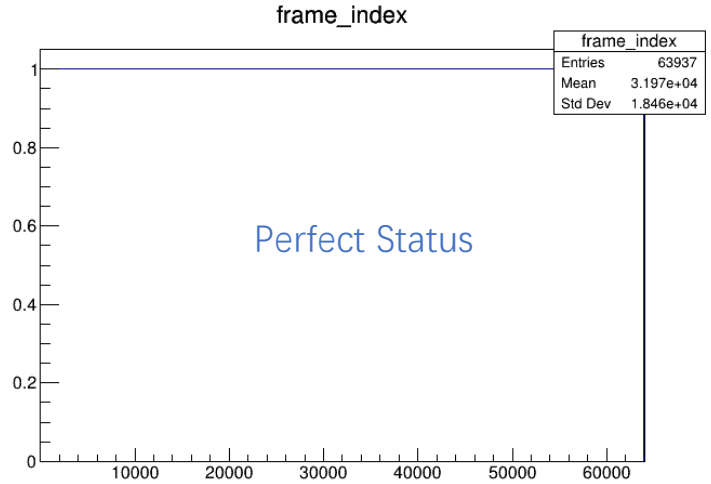
- Data loss may still occur during **long-term** operation.

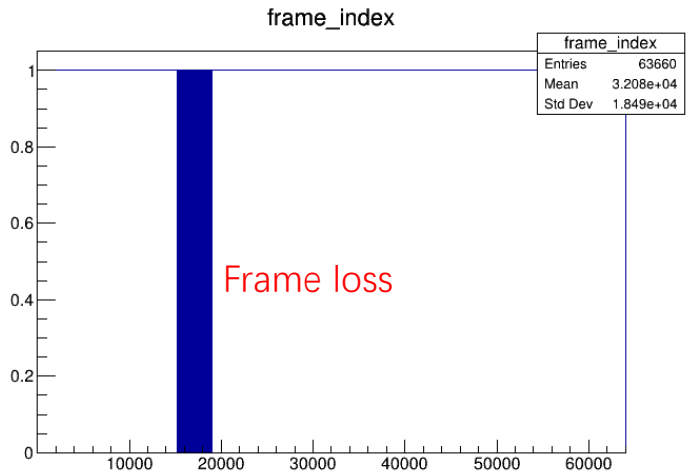
Test setup:

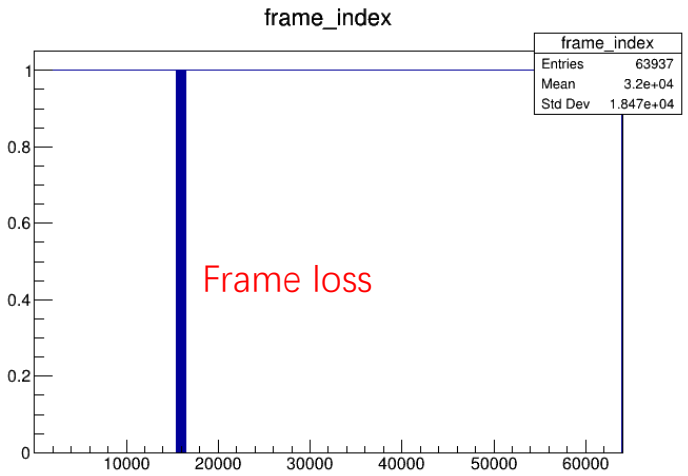
Data num per row: 4/48

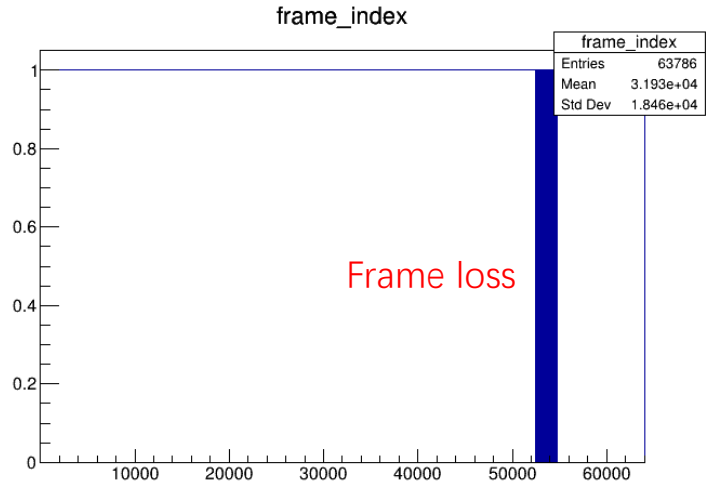
Frame number set: 64000

The performance is already improved by changing IPbus-Firmware settings, larger rx and tx buffer, more buffer numbers.





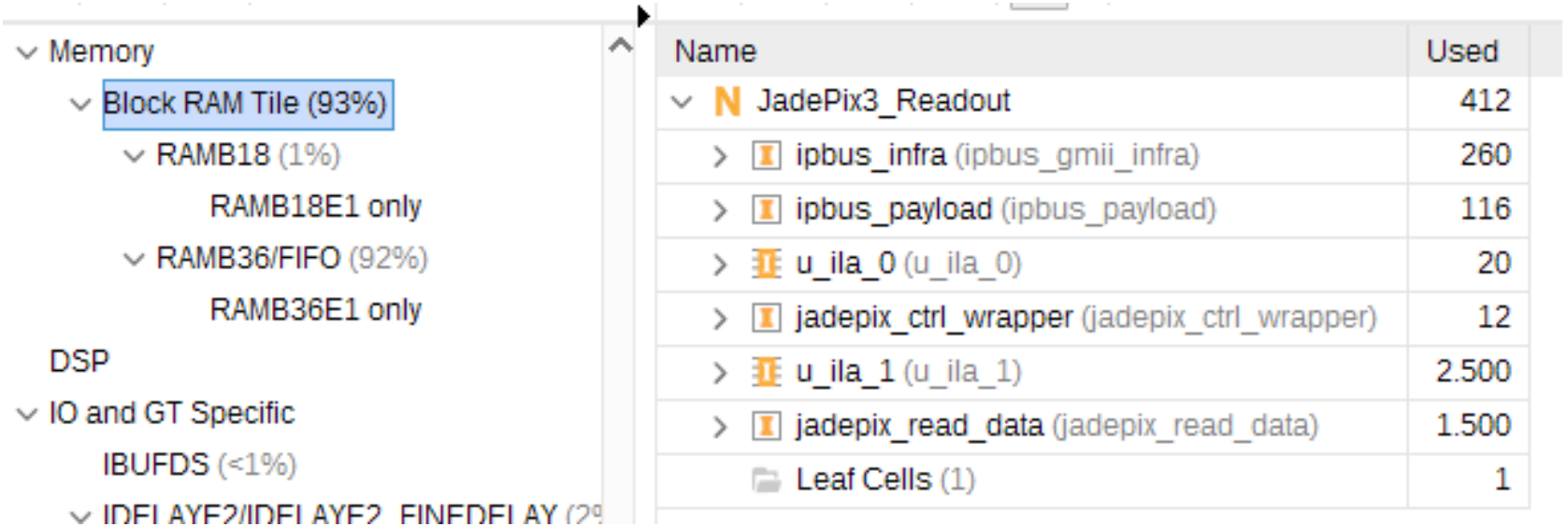




Jumbo Frame

- It looks like something **choked** on the PC side…
  - CPU caches?
- So try to use the **Jumbo Frame** to improve transmission quality.
  - MTU: 1500 bytes -> 9000 bytes (Linux)
  - FPGA:
    - BUFWIDTH changed, from 4 to 6
    - ADDRWIDTH changed, from 11 to 13
    - Because of this, the transfer speed drop down: 0.75Gbps -> 0.5Gbps (Same as official doc)
  - OS:
    - Set NIC MTU from 1500 to 9000
      - *sudo ip link set eth0 mtu 9000*
  - uHAL(Software): the software will do **fragment** things, the maximum data size in each UDP package we can get is still 1400 bytes.
    - **NOT** find the key yet, crated an issue on the ipbus-software github page.
      - https://github.com/ipbus/ipbus-software/issues/221

Backup



The costs of Block ram