NGFI/RoE Proof-of-Concept (PoC)

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Next Generation Fronthaul Interface (COM/SDB/NGFI)
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Practical Assessment of IEEE1914 solutions

Looking at Functional Split/Performance/Synchronization and Timing

- A two pronged approach to the RoE solution makes sense to assess the specification discussions and the impact on practical solutions
- Why:
  - The adoption of the specifications will need
    - The specification to be clear and concise (well understood)
    - Practical solutions to be "reasonable"
      - Cost effective
      - "easy" to implement (low barrier to entry)
- A Proof-of-Concept allows these things to be investigated
  - Trying to implement to the specification raises detailed questions that can otherwise be missed
  - Practical trade offs need solutions

Key Items in PoC

There are a number of key items the PoC was produced to investigate.

- Ethernet Frame Structure
- Ethernet Frame Sequencing (sequence numbers)
- Synchronisation and Timing
- Layer 1 Offload partitioning

- Test Environment
  - Lab testing

Secondary Items in PoC

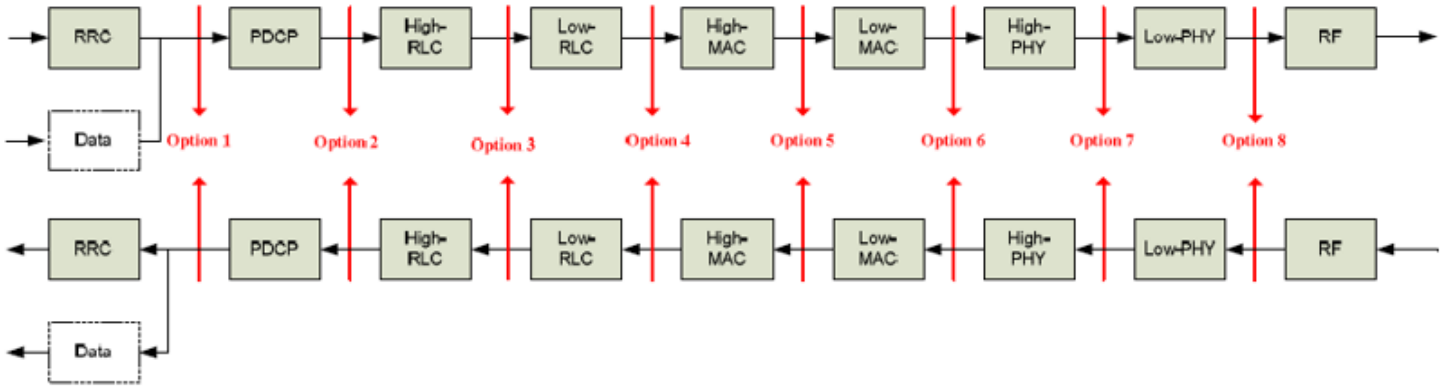
There are a number of things that can be configured locally, while we assess the Key Items.

The connectivity and routing exists to allow validation of message handling for :

- Configuration
- Link setup
- Link parameters
- C&M channel
- VSD channel

Split Options

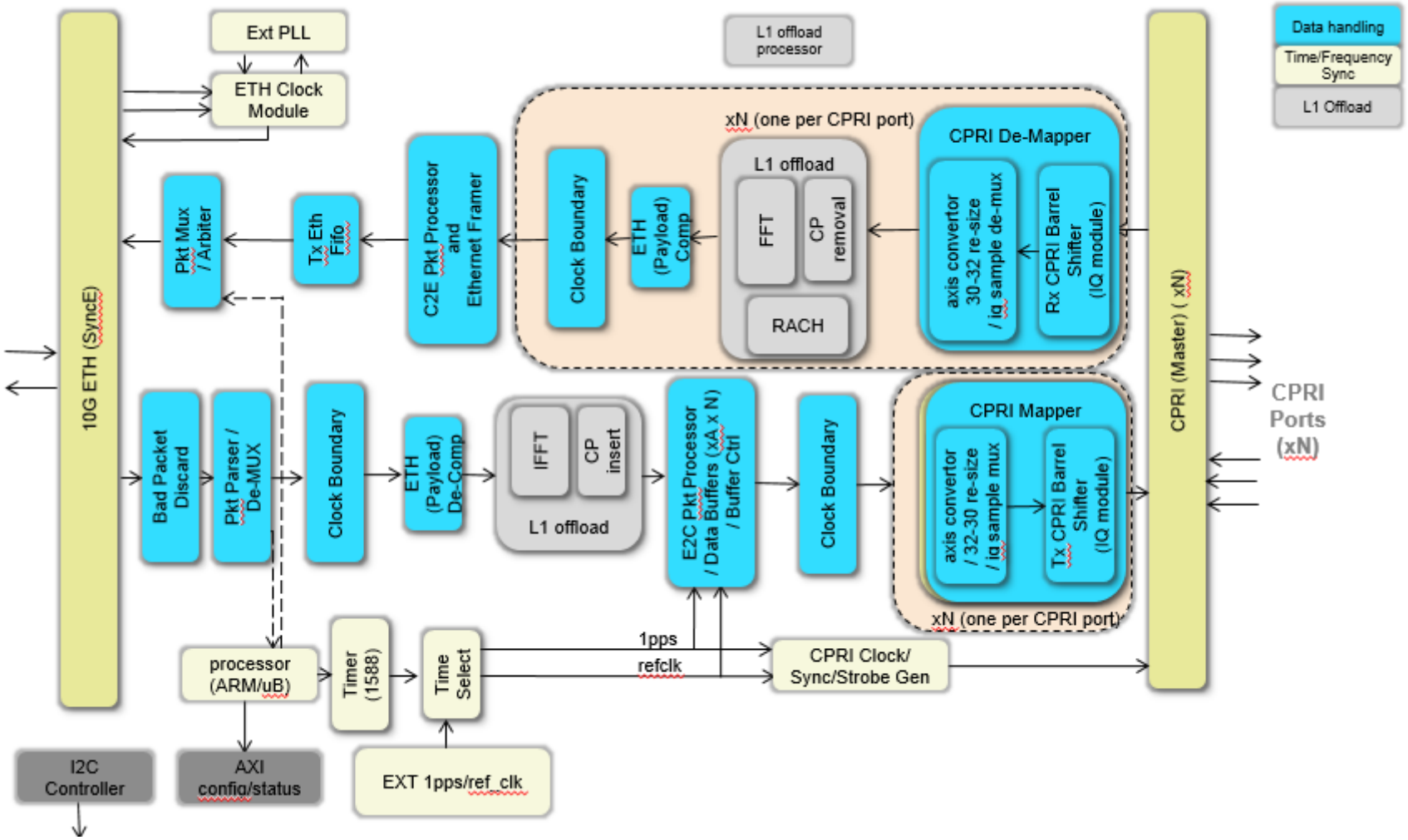
- The figure below is the main one we have discussed to propose functional splits



PoC Architecture

- The Functional Split Options of 7.1 and 7.2 align well with the functionality in the PoC
- The PoC architecture is generic to allow changes to be made.
  - New features inserted
  - Software repartitioning from eNodeB to PoC
  - Software/Hardware split assessment
    - Move between domains
    - Use hardware acceleration of software function

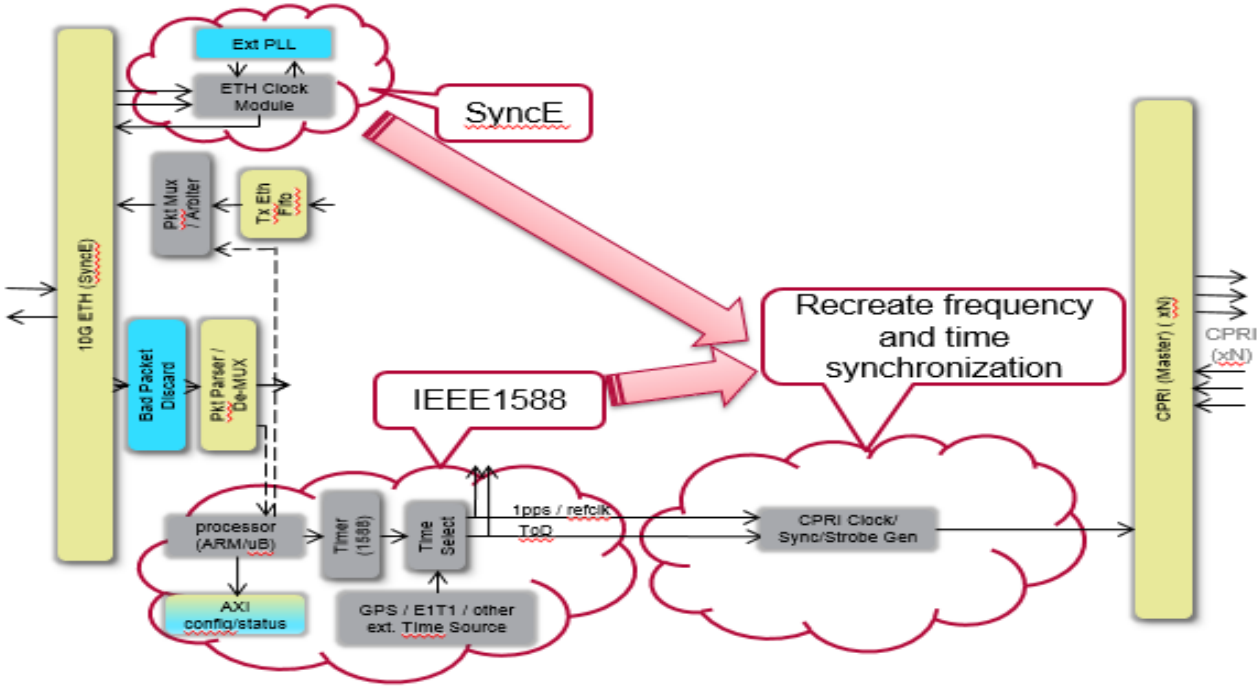
NGFI/RoE Proof-of-Concept



Timing and Synchronisation

The combination of SyncE and IEEE1588 are used to create the CPRI clock and timing

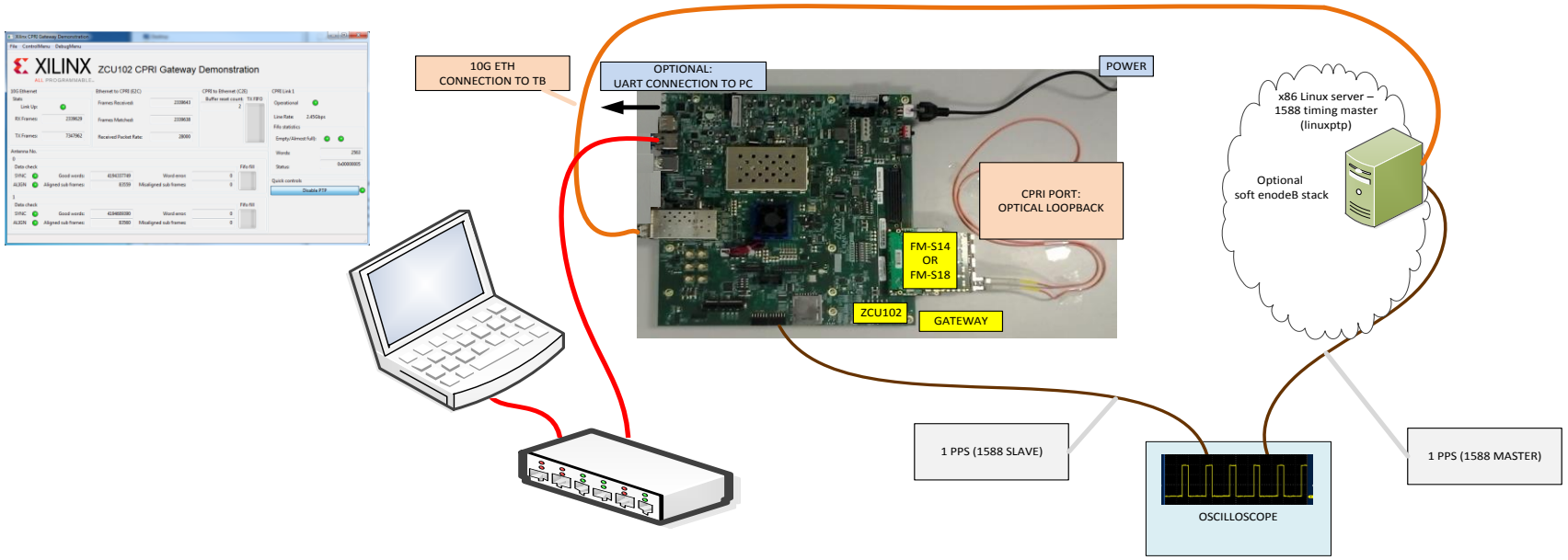
- 1pps accuracy of < +/-8ns achieved



Lab Setup

Practical setup to verify Data Integrity, Ethernet frame sequencing and Synchronisation and Time

- A more simple Data Path Integrity setup is also used.
- System Level Test would include RRH, UE's



System Test Environment

The acid test is to insert the PoC in-line with an operational system.

- This allows detailed investigations into the functional split
- This allows all system features to be implicitly integrated
  - Does the system still work

Functional Test

- Setup a system able to make a call

Performance Test

- Throughput