

# **SpaceFibre interoperability testing in Dundee**

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# 1. Interoperability test in Dundee

## Date & Location

- STAR-Dundee Ltd. (Scotland)
- 17~19<sup>th</sup> Dec. 2012
  - 17<sup>th</sup> 18<sup>th</sup> AM: Inter-operability tests
  - 18<sup>th</sup> PM: Discussion
  - 19<sup>th</sup>: Additional tests



## Interoperability test between NEC board and STAR-Fire

- Sending SpW packets from NEC board to STAR-Fire
  - Packets were only transferred through VC0
  - Packets were transferred through VC0 under the following conditions,
    - Random data generator was enabled in VC2,
    - Error injection function was enabled in STAR-fire (BER:  $10^{-4}$ ),
    - Both random data generator and error injection were activated.
- The same tests for opposite direction (STAR-Fire→NEC board)
- Disconnection test

# 1-2. Test Results

## Results

- Interoperability between NEC board and STAR-Fire were established, except for the following three issues,
  - Disconnection,
  - Initialization sequence,
  - Broadcast layer.



## Issues

- Disconnection
  - Re-initialization succeeded.
  - Virtual Channel behavior was not as expected.
- Initialization sequence
  - Further consideration for the specification of link timeout is required.
- Broadcast layer compatibility was remained untested.

# 1-3. Discussion Items

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## 1. PHY, LANE layer

- Initialize sequence for TLK2711
- Word Synchronisation (5.10.4)

## 2. RETRY layer

- Deadlock

## 3. FRAMING layer

- Scrambling

## 4. VC

## 5. Others

- FCT
- CRC-16
- Operation Speed

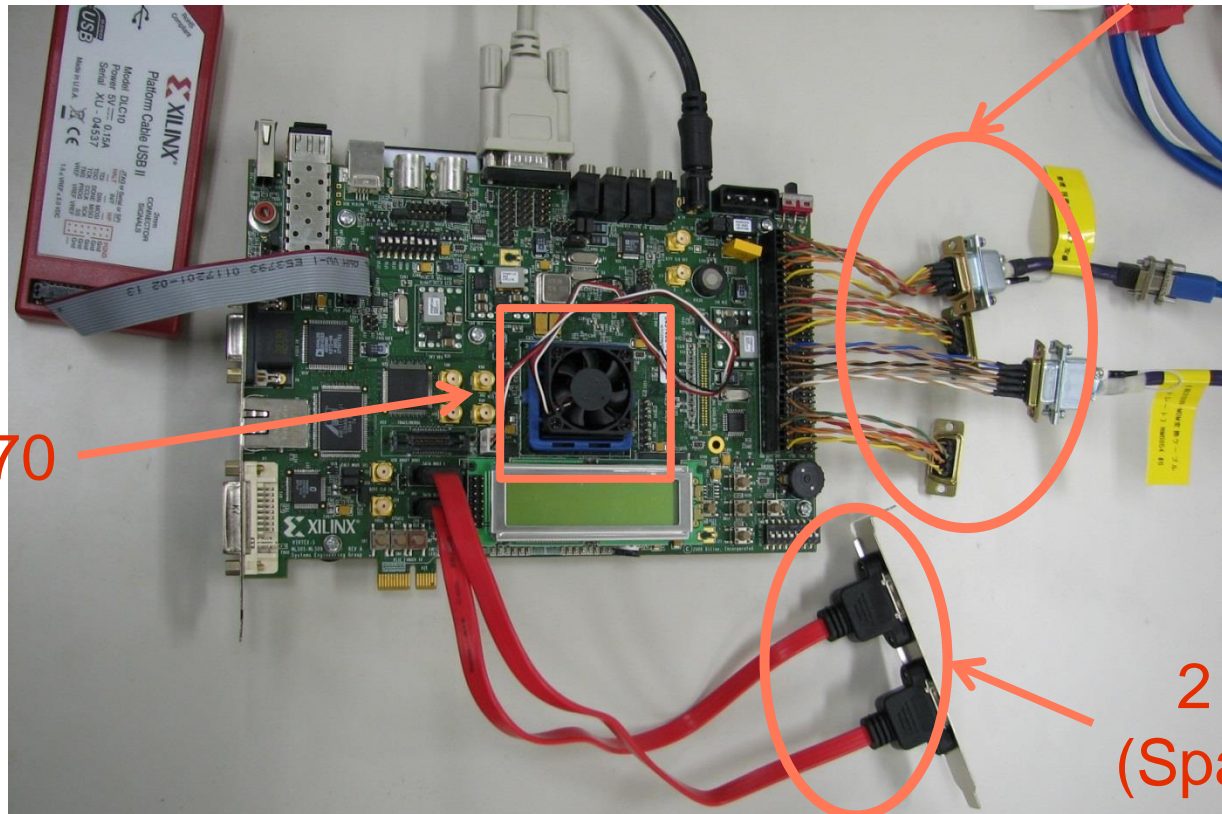
# 2-1. NEC board

All layers, except for multi-lane layer, has been implemented.

Xilinx, ML507 (Virtex-5 FX70)

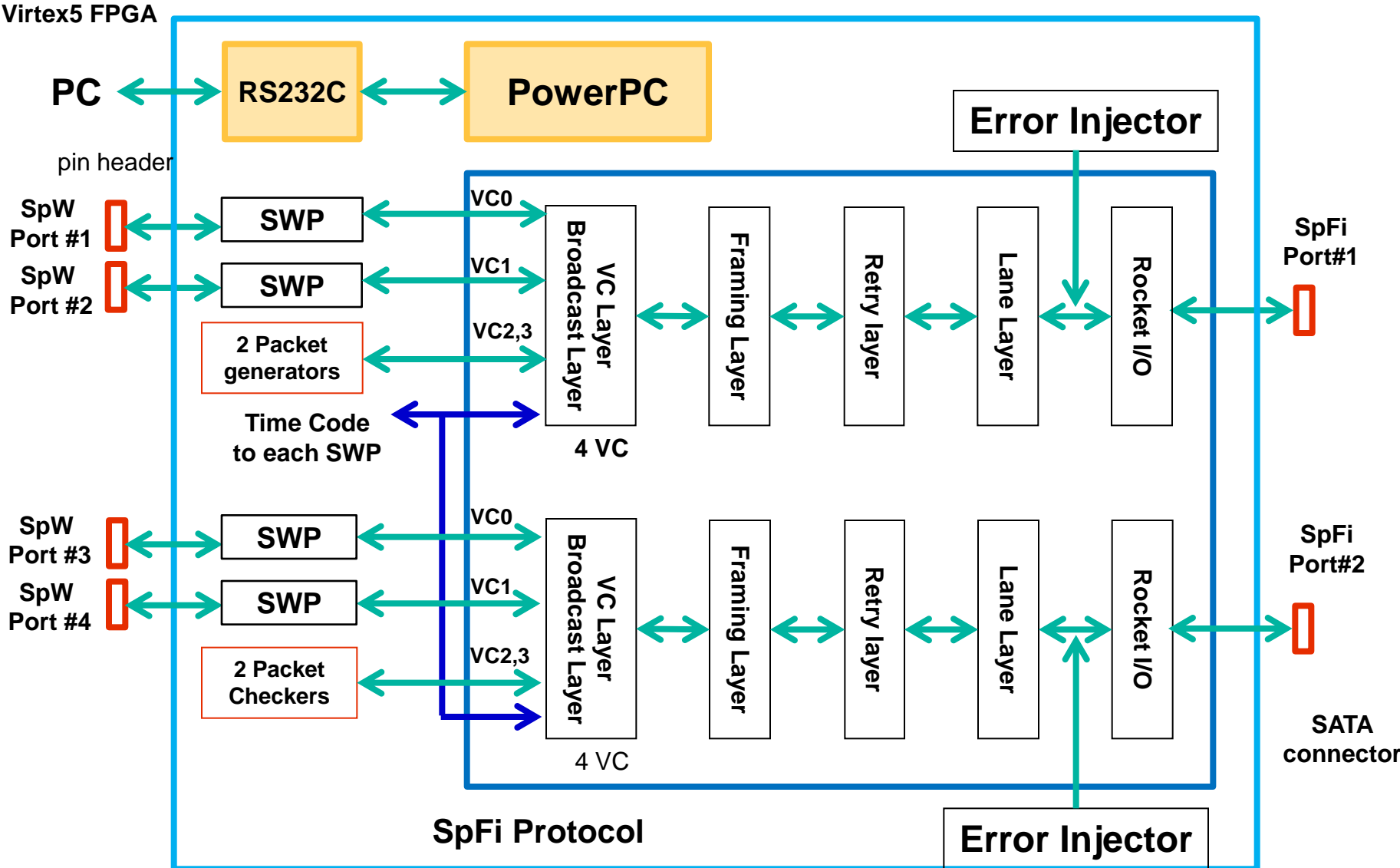
4 SpW Connectors

Virtex5 FX70



2 eSATA  
(SpaceFibre)

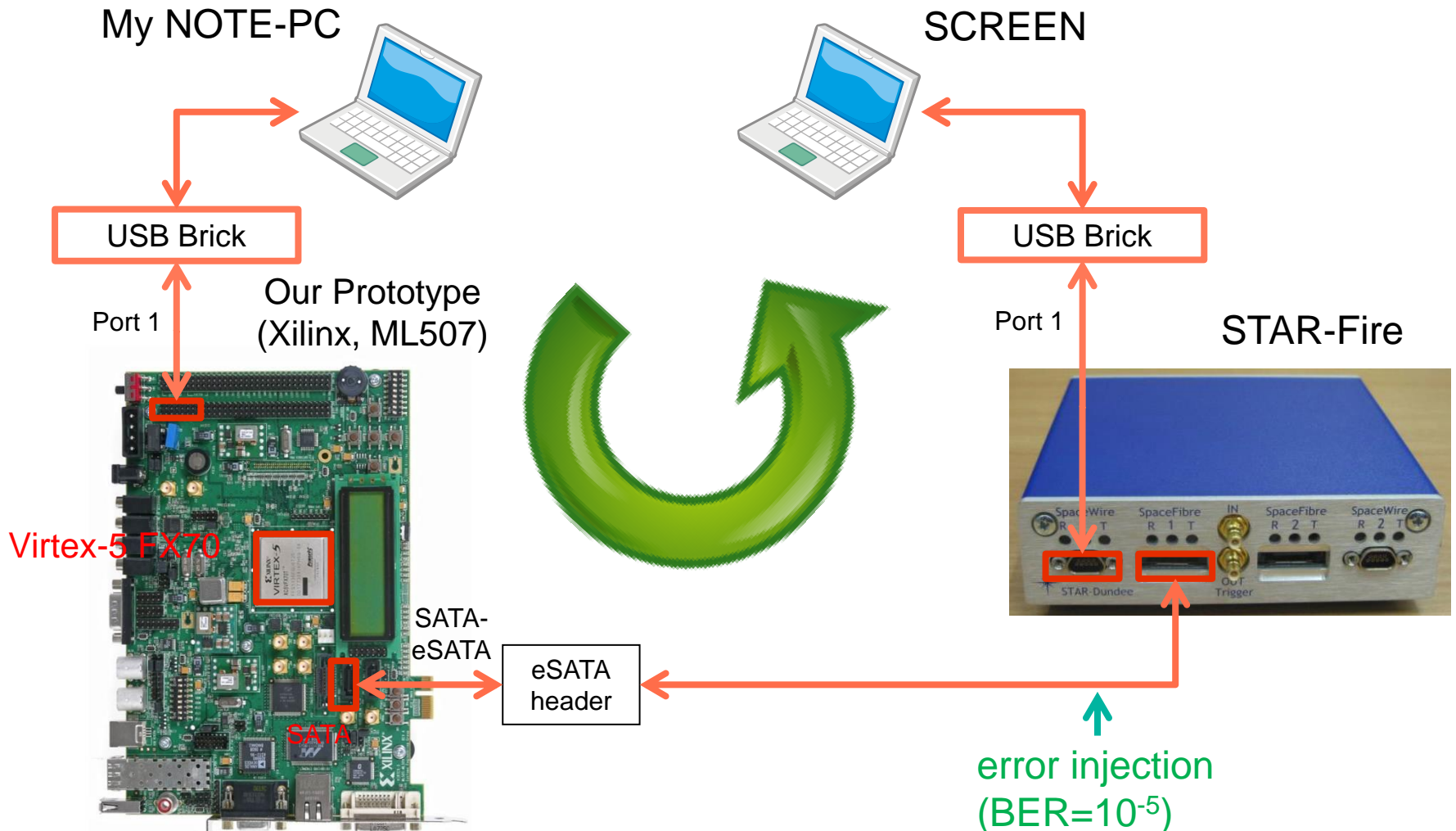
# 2-2. Architecture of NEC board prototype



SWP: SpaceWire Protocol Block

# 3. Demonstration

Transfer a JPEG file between two SpaceWire ports via SpaceFibre connection under error injection.



# Demonstration