

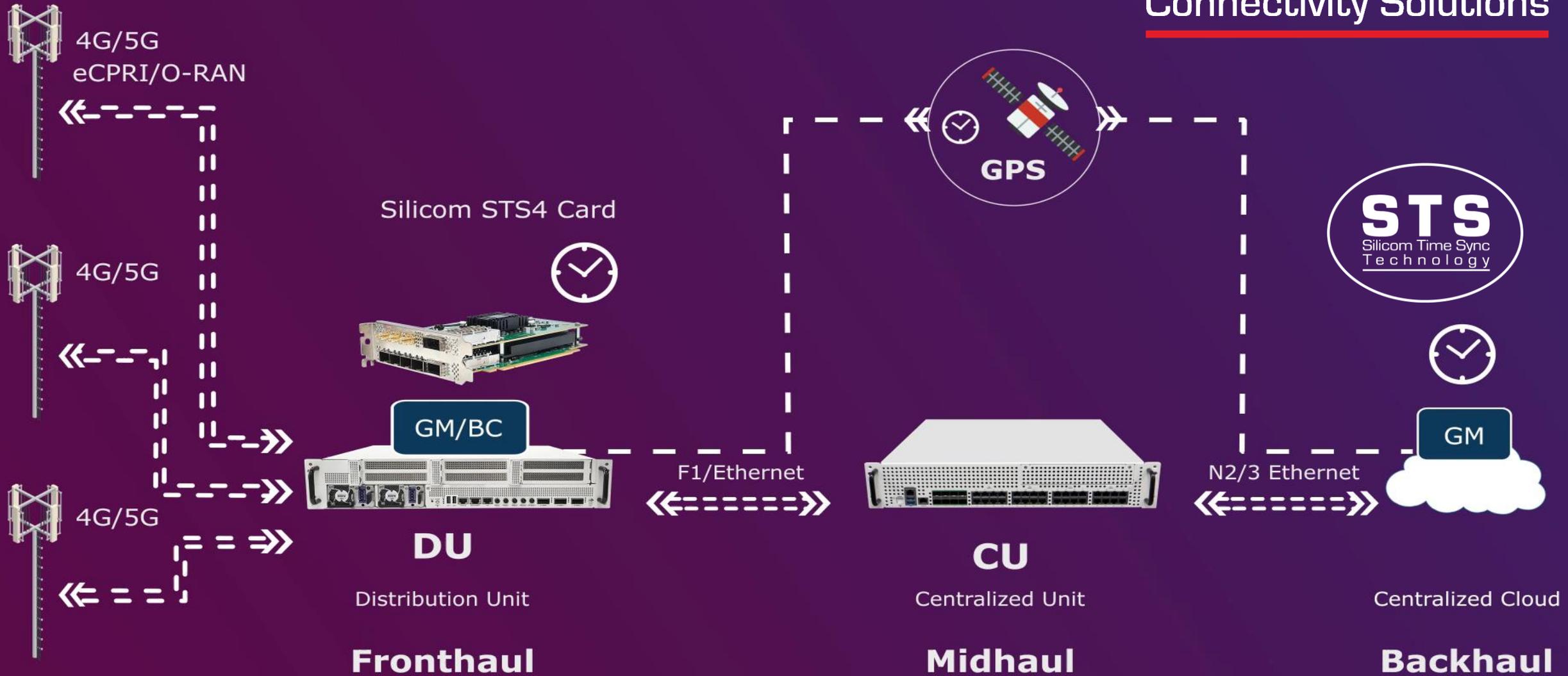
The background of the slide is a photograph of several rowers in a boat, captured in a rowing stroke. The image is semi-transparent and serves as a backdrop for the text.

Silicom Ltd.
Connectivity Solutions

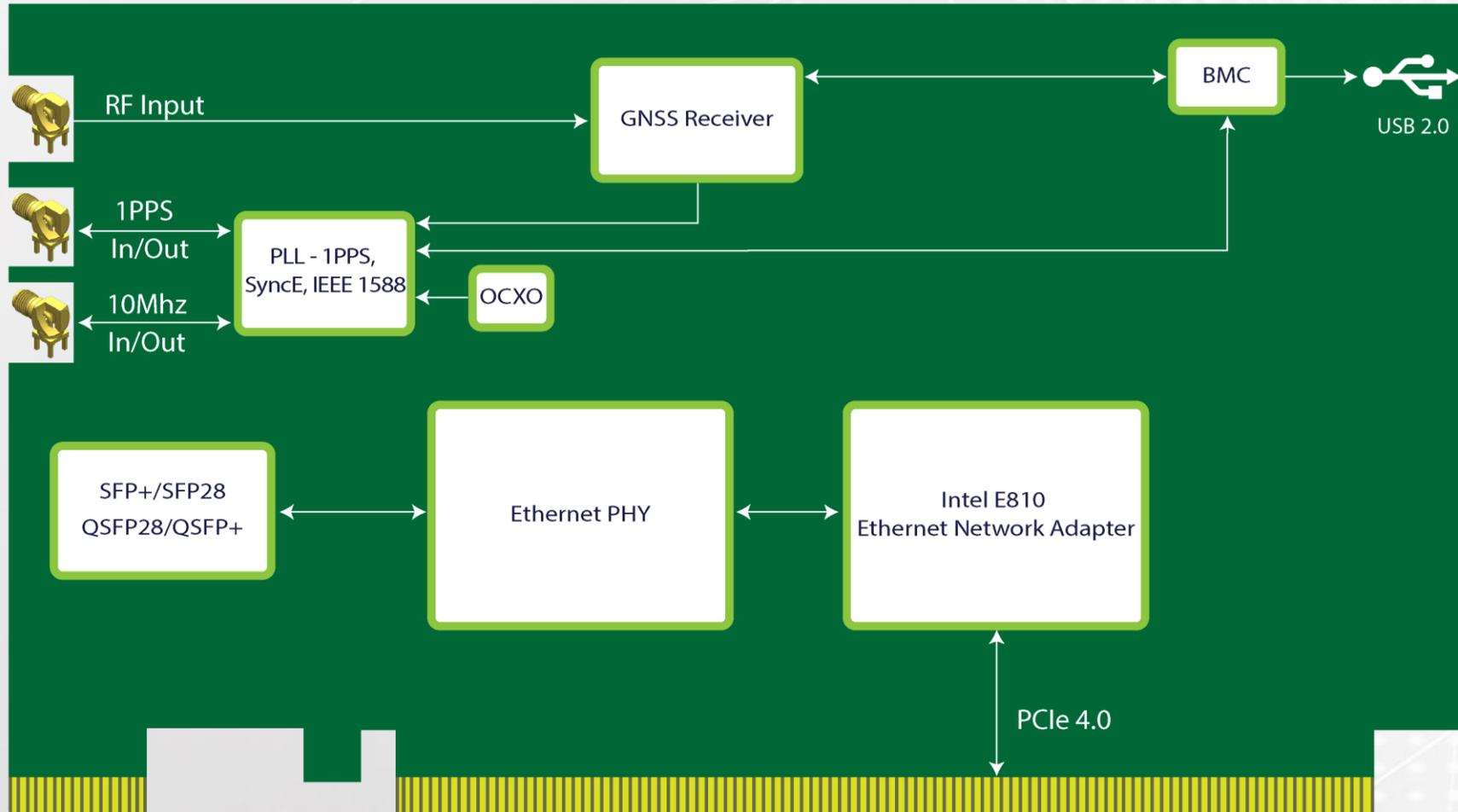
OPEN RAN VIRTUALIZED ARCHITECTURE FOR CONNECTIVITY & TIMING DISTRIBUTION

*Motti Goren, EVP Time Synchronization Division
ITSF 2022*

Reference O-RAN Architecture

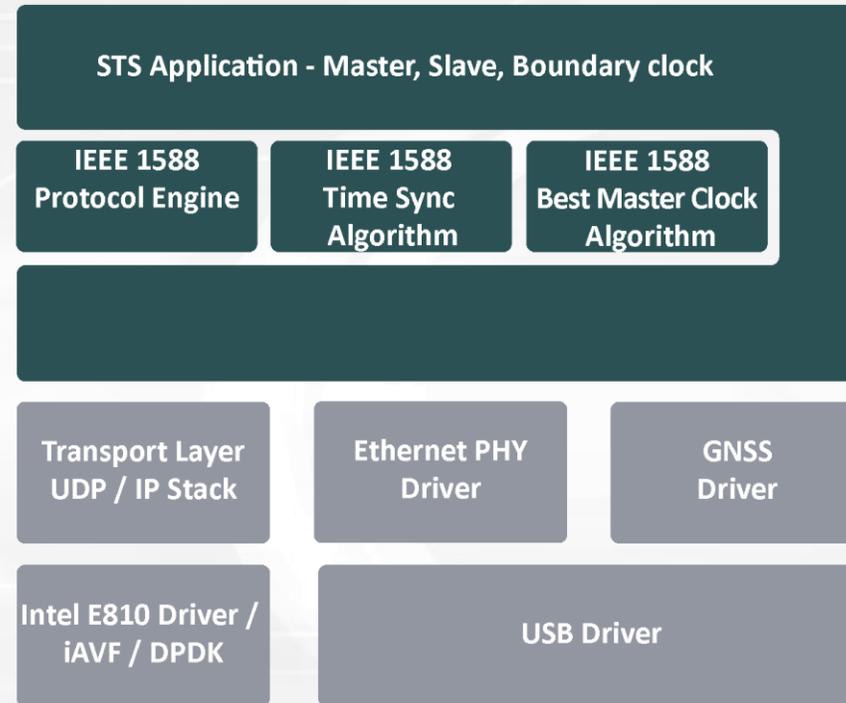


Silicom Time Sync NIC Architecture

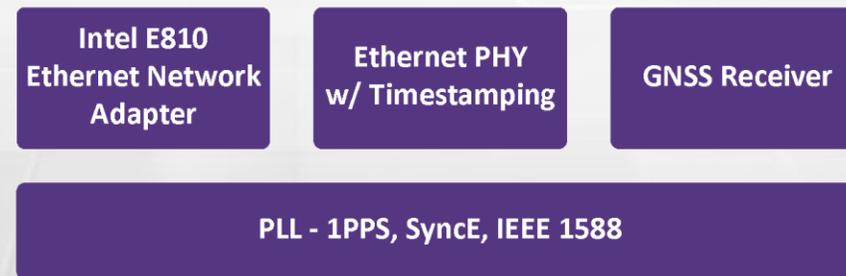


STS NIC - High Level Architecture – SW/HW

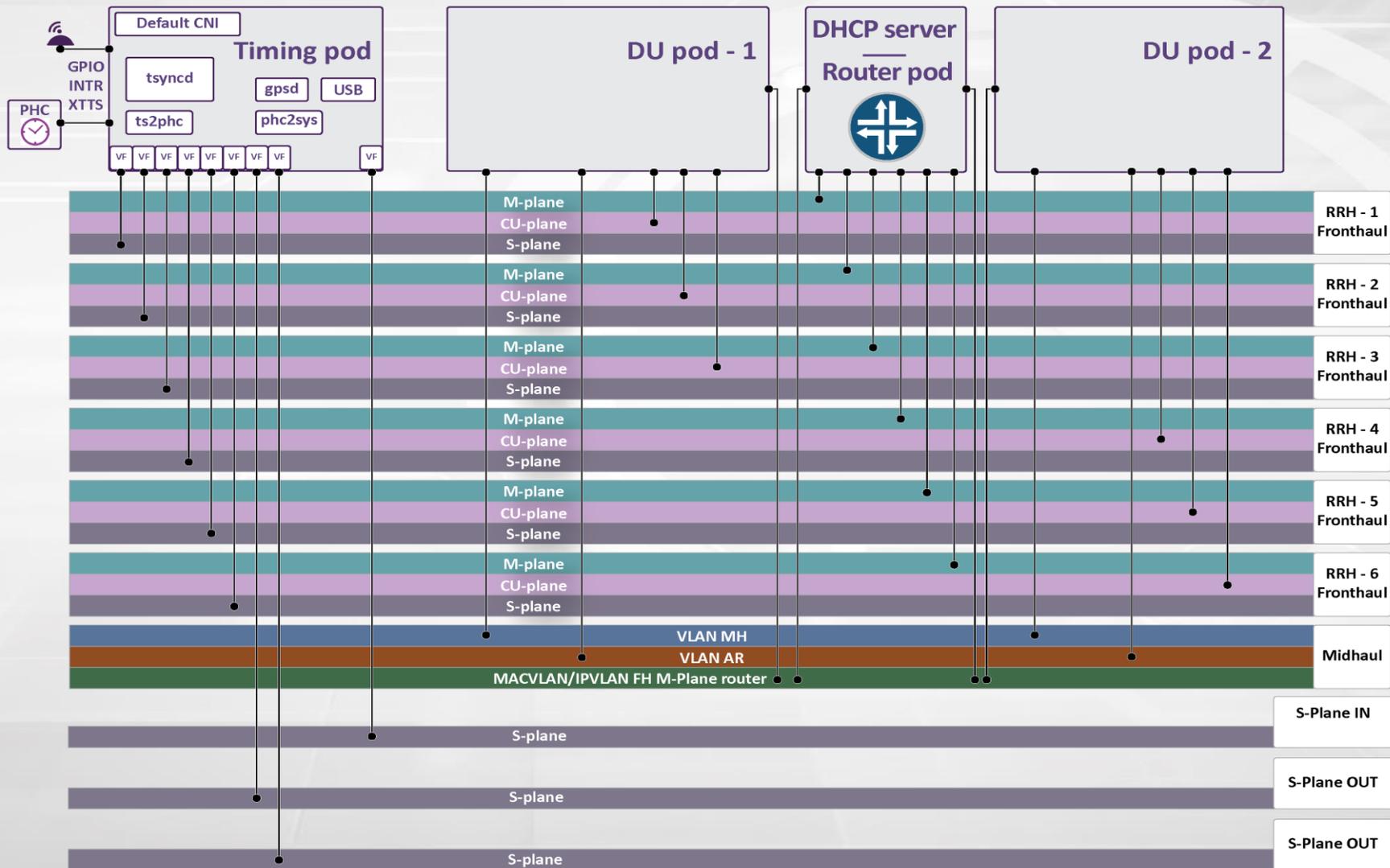
Host



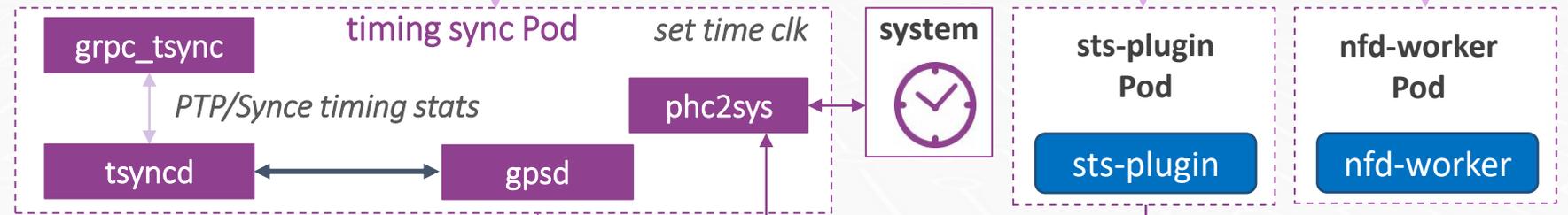
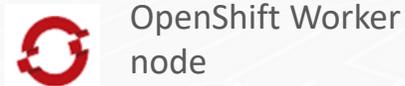
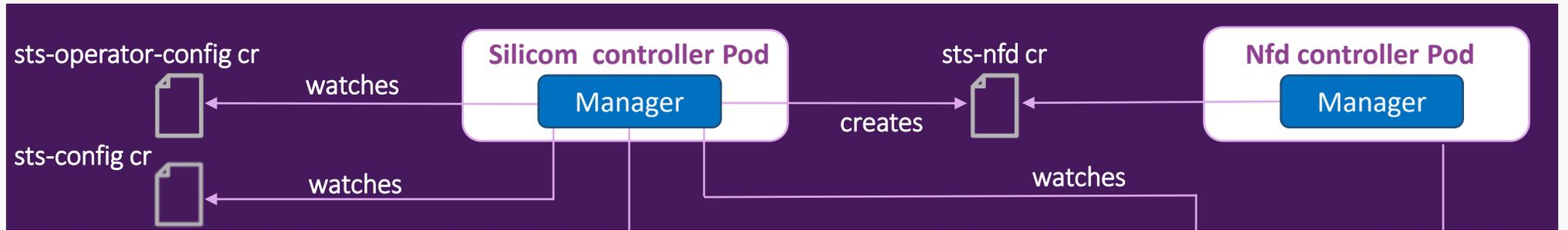
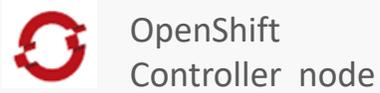
STS PCIe NIC



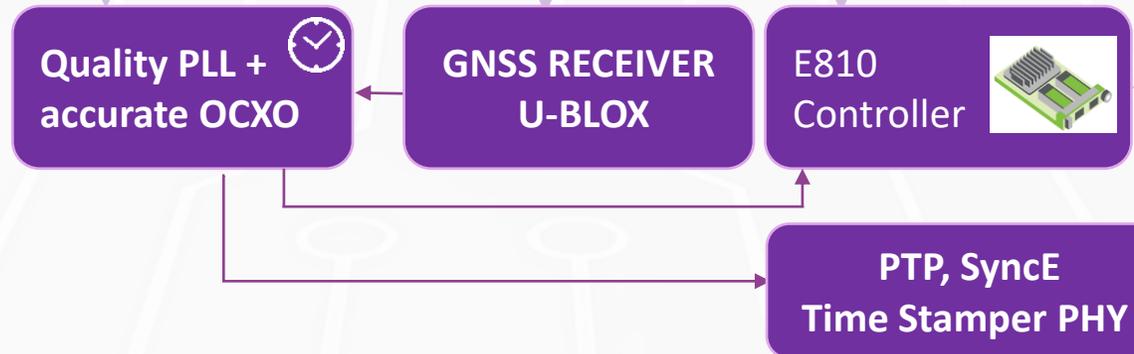
DU Server Architecture – An Example



Red Hat Openshift Reference Architecture



HW Clock adjustments */dev/ttyACM* */dev/ptp<x>* */sys/bus/pci*



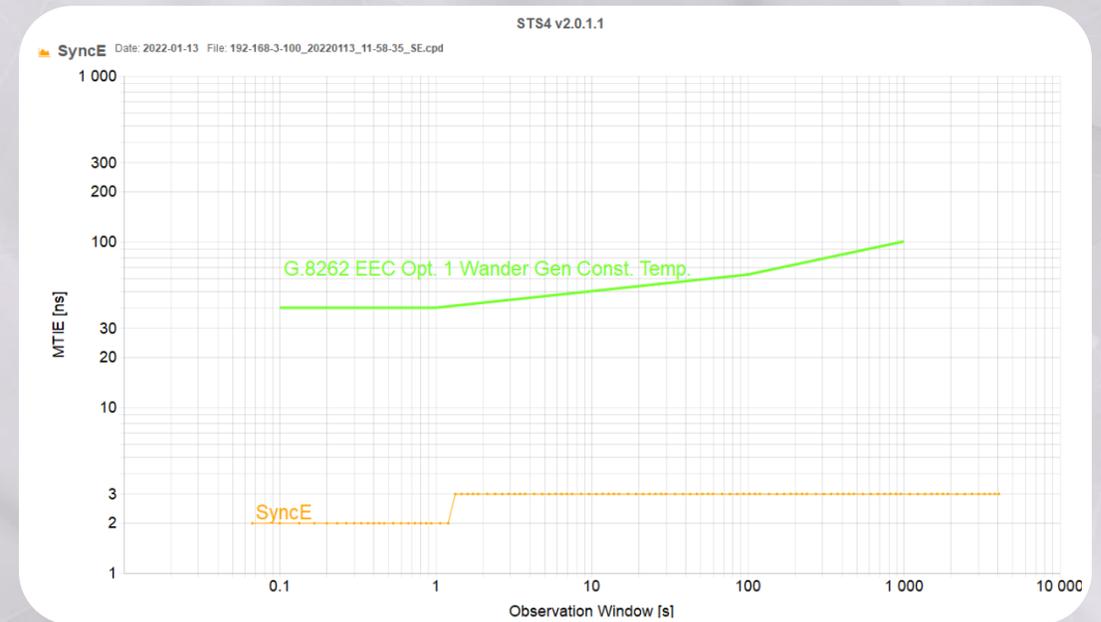
STS Silicom Card HW
Silicom Time Sync
Technology



<https://cloud.redhat.com/blog/a-guide-to-the-silicom-time-sync-sts-operator-on-openshift>

Compliance Report - G.8262

Wander generation – G.8262 Section 8.1



Compliance Report - G.8262

Wander tolerance – G.8262 Section 9.1

Noise transfer – G.8262 Section 10.1

Add Wander

Frequency Offset | **Wander Tolerance** | Wander Transfer | SyncE Transient

Single Table

| Enable | Frequency (Hz) | Amplitude (µs) | Dwell Time (Cycles) | Status |
|-------------------------------------|----------------|----------------|---------------------|--------|
| <input checked="" type="checkbox"/> | 10.00000 | 0.25 | 300 | 100% |
| <input checked="" type="checkbox"/> | 0.13000 | 0.25 | 10 | 100% |
| <input checked="" type="checkbox"/> | 0.01600 | 2.00 | 3 | 100% |
| <input checked="" type="checkbox"/> | 0.00080 | 2.00 | 3 | 100% |
| <input checked="" type="checkbox"/> | 0.00032 | 5.00 | 3 | 100% |
| <input type="checkbox"/> | | | | 0% |
| <input type="checkbox"/> | | | | 0% |
| <input type="checkbox"/> | | | | 0% |
| <input type="checkbox"/> | | | | 0% |
| <input type="checkbox"/> | | | | 0% |

(Frequency Range: 0.0001 Hz to 100 Hz)
 (Amplitude Range: 0.01 µs to 10 µs)
 (Dwell Time Range: 1 cycle to 500 cycles)

Lower limit of max tolerable sinusoidal input wander

Generate Wander | Stop Wander | Elapsed Time: 13493 s

OK

Add Wander

Frequency Offset | Wander Tolerance | **Wander Transfer** | SyncE Transient

Single Table

| Enable | Frequency (Hz) | Amplitude (µs) | Dwell Time (Cycles) | Status | Gain (dB) |
|-------------------------------------|----------------|----------------|---------------------|--------|-----------|
| <input checked="" type="checkbox"/> | 14.90000 | 0.25 | 511 | 100% | -23.05 |
| <input checked="" type="checkbox"/> | 10.10000 | 0.25 | 511 | 100% | -19.79 |
| <input checked="" type="checkbox"/> | 3.20000 | 0.25 | 480 | 100% | -28.61 |
| <input checked="" type="checkbox"/> | 1.00000 | 0.25 | 150 | 100% | -21.07 |
| <input checked="" type="checkbox"/> | 0.32000 | 0.25 | 48 | 100% | -26.34 |
| <input checked="" type="checkbox"/> | 0.10000 | 0.32 | 15 | 100% | 0.07 |
| <input checked="" type="checkbox"/> | 0.03200 | 1.00 | 8 | 100% | 0.08 |
| <input checked="" type="checkbox"/> | 0.01000 | 2.00 | 4 | 100% | 0.05 |
| <input checked="" type="checkbox"/> | 0.00320 | 2.00 | 4 | 100% | 0.02 |
| <input type="checkbox"/> | | | | 0% | |

(Frequency Range: 0.0001 Hz to 100 Hz)
 (Amplitude Range: 0.01 µs to 10 µs)
 (Dwell Time Max: 511 cycles)

Option 1 Transfer Characteristic

Status
 Measurement complete. Press Generate Wander to start new measurement.

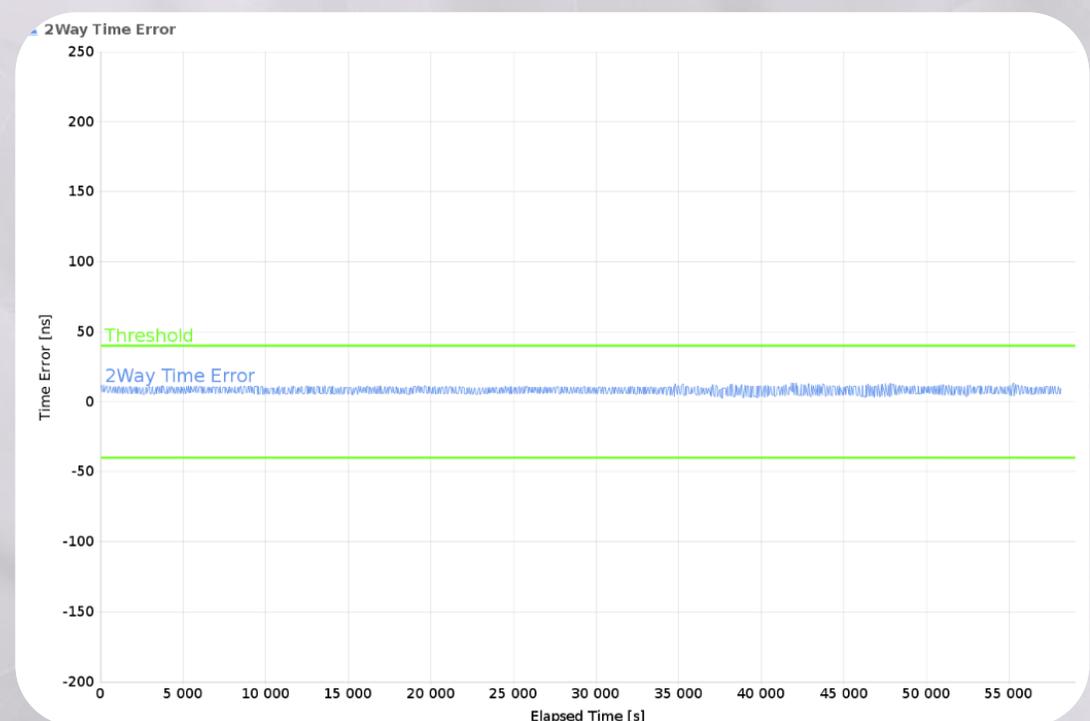
Use default calibration values

Calibrate | Generate Wander | Stop | Time Remaining: 0 s

OK

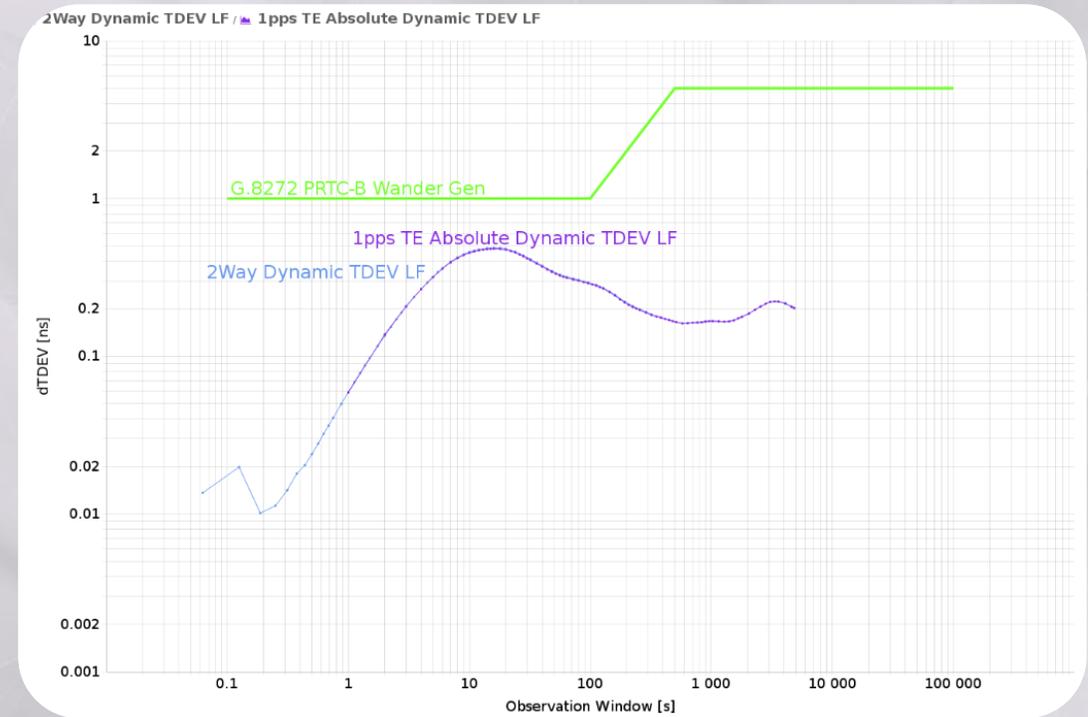
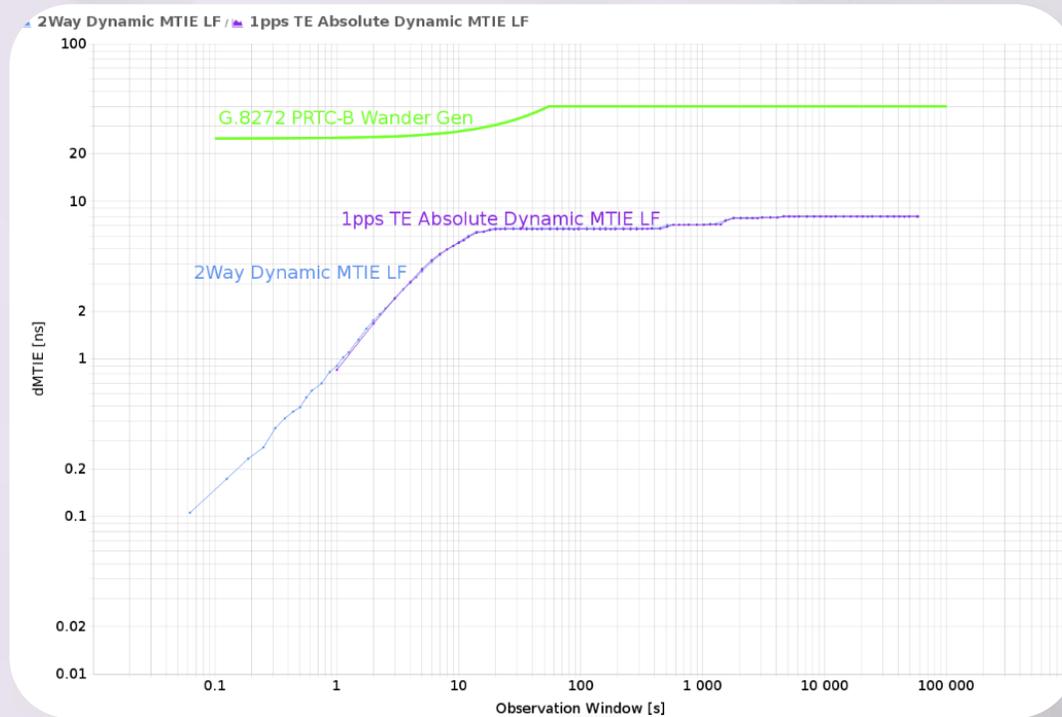
Compliance Report - G.8272 PRTC-B

| | |
|-----------------------------|---|
| Slot | 2Way |
| Description | |
| Measurement Start | 2022-06-12 14:06:26 (local instrument time) |
| Measurement Stop | 2022-06-13 06:15:21 (local instrument time) |
| Mask Time Error | 0.04 μ s |
| Mask Result | Pass |
| Mask Time Error (Filtered) | 0.04 μ s |
| Mask Result | Pass |
| Mask Avg Time Error (cTE) | 0.04 μ s |
| Mask Result | Pass |
| Mask Dynamic TE LF | 0.04 μ s |
| Mask Result | Pass |
| Mask Dynamic TE HF | 0.2 μ s |
| Mask Result | Pass |
| Mask Dynamic MTIE LF | G.8272 PRTC-B Wander Gen |
| Mask Dynamic MTIE LF Result | Pass |
| Mask Dynamic TDEV LF | G.8272 PRTC-B Wander Gen |
| Mask Dynamic TDEV LF Result | Pass |



Compliance Report - G.8272 PRTC-B

Wander generation – 2Way & 1PPS

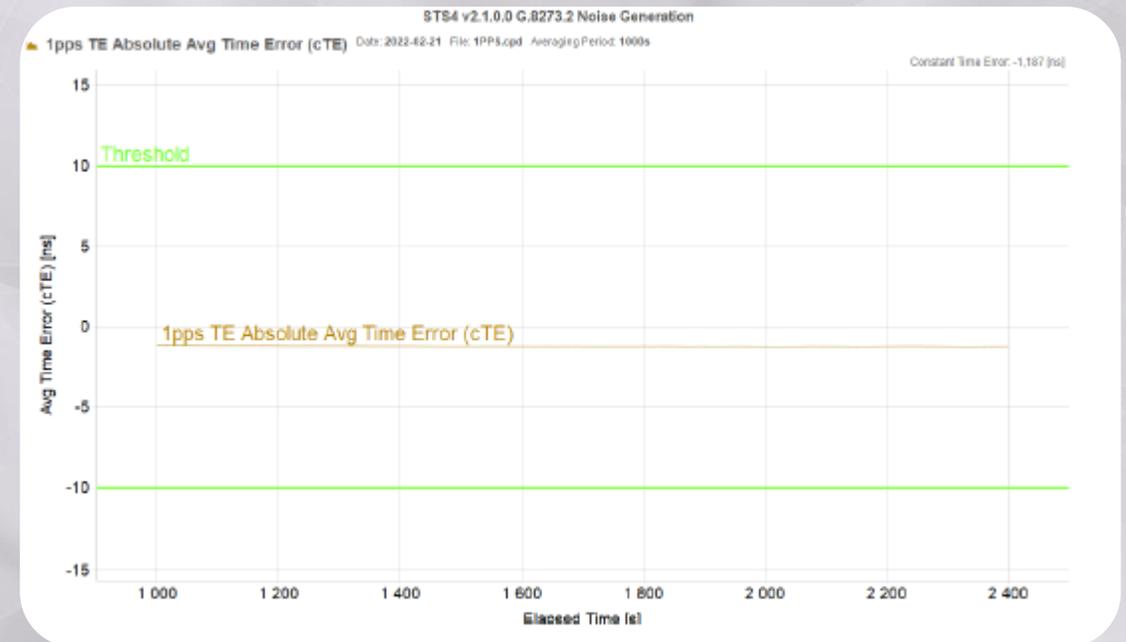


Compliance Report - G.8273.2 Class-C

Noise Generation - 2Way Avg Time Error (cTE)

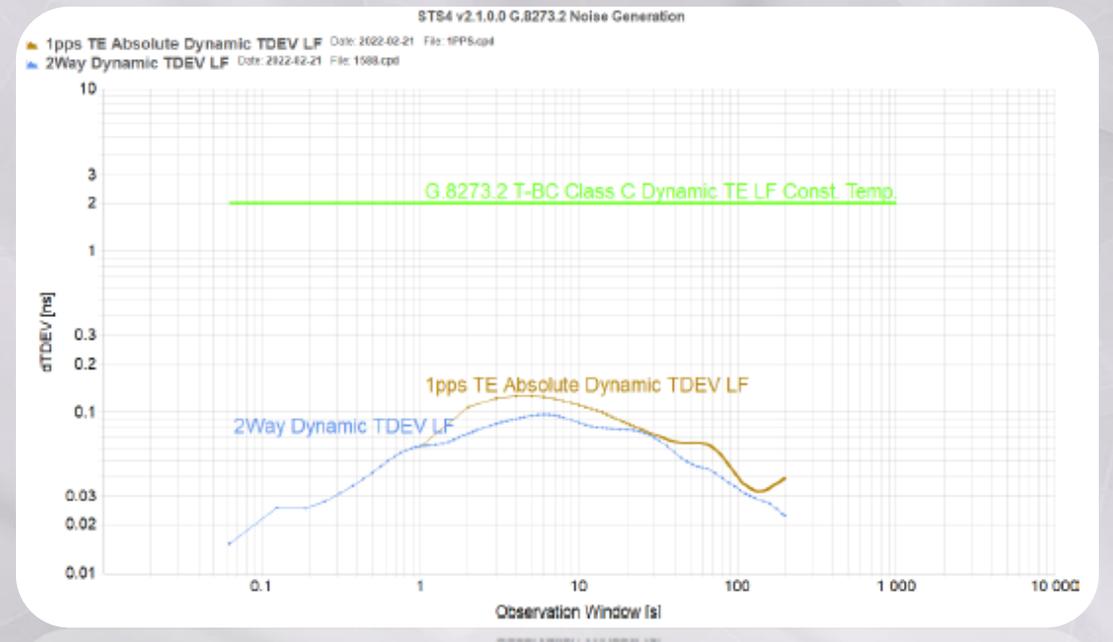
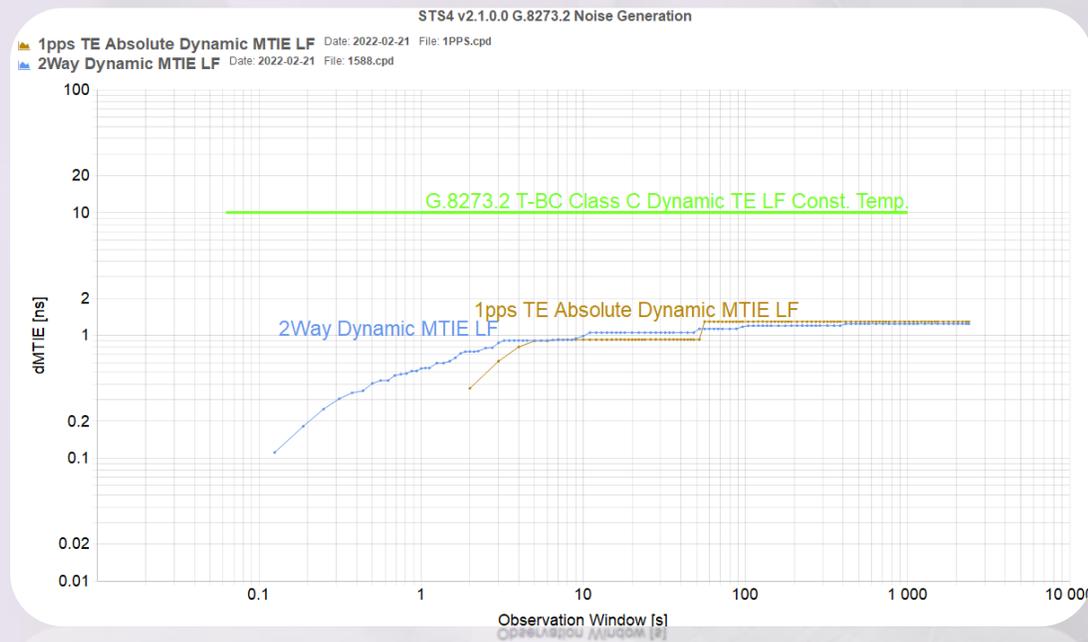


Noise Generation – 1PPS Time Error (cTE)



Compliance Report - G.8273.2 Class-C

Dynamic Time Error – 2Way & 1PPS





Accuracy Matters

Questions ?

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