SC26 Network Research Exhibition: Demonstration Publishable Abstract

SCinet Research Hotel Precision Time Plugfest

SC26 SCinet Xnet team

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Abstract

The SC26 SCinet Xnet team is building a White Rabbit subnanosecond time synchronization network between the SCinet NOC and SCinet Research Hotel. Xnet team's focus will be on experimentation with perfSONAR one-way active measurement protocol traffic getting timestamped via FPGA. This NRE will allow technologists outside of the main Xnet effort to experiment with the SC26 White Rabbit infrastructure at SCinet Research Hotel. This "Precision Timing Plugfest" initiative will create an environment where SCinet's multivendor integration spirit is alive & well, without adding additional demands to the Xnet project scope.

Goals

1. Create a space at SC26 Research Hotel where attendees with precision timing capable hardware may access the 1PPS, 10Mhz, PTP and White Rabbit timing infrastructure provided by Xnet team
2. Pre-cable appropriate connectivity and coordinate with SC26 SCinet Research Director to ensure any gear getting plugged & unplugged into this space is within compliance of SCinet policies
3. One of the NRE participants will likely bring an Oscilloscope with them to demonstrate sync quality. When this happens, it will be announced in SCinet Slack so that any SCinet volunteers & students who may have a precision timing need at their home institution can gain experience and witness the multivendor interop
4. (stretch goal) Build a small-scale replica of an electronic trading platform with algorithmic trading system client to compare & contrast the Financial Technology use-case of PTP with the use-cases present in Research & Education Networks

Impacts

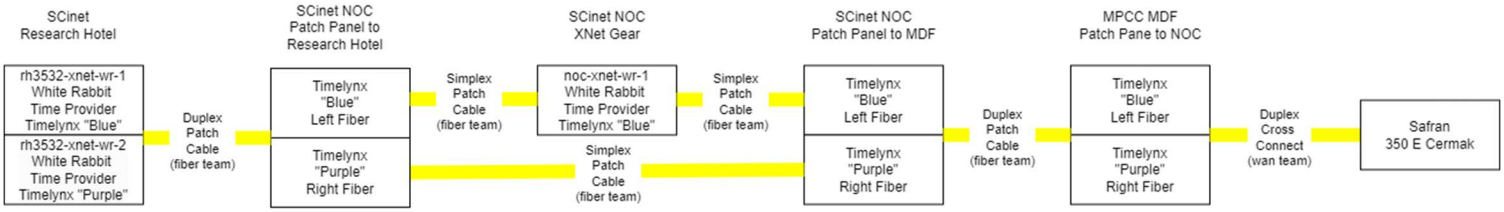
Subnanosecond timing networks are common in two places: particle accelerators and trading floors. R&E networks are now adopting it for quantum networking, distributed sensing & high-fidelity network measurement, while financial technology engineers have spent years running PTP in production. These communities rarely cross paths, but Chicago is home to both, and SC26 puts them in the same exhibit hall. This NRE gives SCinet's R&E experts along with Chicagoland's FinTech community a shared, hands-on space to plug in hardware, compare operational practices, and learn from each other in a way that would be difficult to arrange anywhere else. Along the way, we'll document multivendor precision time interoperability and give SCinet volunteers direct exposure to timing gear they're increasingly likely to interact with at their home institutions.

Resources

This NRE will utilize the connectivity requested in NRI111, and hardware contributed to SCinet Xnet team.

Involved Parties

- Mark Notarus
- UIUC FinTech Lab
- SCinet Xnet Team


SCinet
Research Hotel
rh3532-xnet-wr-1
White Rabbit
Time Provider
Timelynx "Blue"
rh3532-xnet-wr-2
White Rabbit
Time Provider
Timelynx "Purple"
Duplex
Patch
Cable
(fiber team)
SCinet NOC
Patch Panel to
Research Hotel
Timelynx
"Blue"
Left Fiber
Timelynx
"Purple"
Right Fiber
Simplex
Patch
Cable
(fiber team)
SCinet NOC
XNet Gear
noc-xnet-wr-1
White Rabbit
Time Provider
Timelynx "Blue"
Simplex
Patch
Cable
(fiber team)
Simplex
Patch
Cable
(fiber team)
SCinet NOC
Patch Panel to MDF
Timelynx
"Blue"
Left Fiber
Timelynx
"Purple"
Right Fiber
Duplex
Patch
Cable
(fiber team)
MPCC MDF
Patch Pane to NOC
Timelynx
"Blue"
Left Fiber
Timelynx
"Purple"
Right Fiber
Duplex
Cross
Connect
(wan team)
Safran
350 E Cermak