OPEN Compute Project®

OCP TAP Instrumentation and Measurement

Calnex

Anand Ram



I&M – Broad Work areas

- Testing Methodology
- Open source ecosystem for Measurement tools
- Collaboration forum testing related



Testing Methodology

- Project 1 Stress testing a Timing Receiver
- Using GNSS Simulator and Timing Measurement System
- Under Spoofing/Jamming and Degraded Conditions
- Demo showcased at WSTS Conference in Denver, May 2022
- Writing up test methodology to propose to OCP



Test Setup



Varying Satellite Strength & Position



Measure TE of 1pps with varying GNSS quality Measure of TE with Spoofing

Compute Project®



Signal Spoofing with Leap Seconds



Measure TE of 1pps with spoofing

@ 8000 seconds leap seconds occurs and disturbs the 1pps OUT



Loss of GNSS



Measure TE of 1pps with loss of GNSS signal Output from the atomic clocks stays constant



Open-Source Test Tools

- Project 1 Using TimeCard to measure 1PPS
- Compare with Timing Measurement System
- Initial comparison done next slide
- More detailed comparison work ongoing
- Need to explore Open-Source visualization and analysis tool



TimeCard & Sentinel Results





THANK YOU

