

Complete Visibility for a White Rabbit Link with Garland Passive Test Access Point (TAP)

Introduction

With the evolution of advanced networks like 5G, gaining time and frequency distribution becomes a critical yet demanding part of a network infrastructure. New and developing architectures are challenged to improve network visibility and timestamping accuracy.

Seven Solutions' customers must provide a quality of service generally specified in a Service-Level Agreement (SLA) contract in the framework of Time as a Service model. End customers and service providers need a way of monitoring White Rabbit (WR) links to control the status of the synchronization. This is especially relevant in production networks or visibility systems where tapping strategic links is required for this purpose. Active components for tapping White Rabbit links are not an option since these components may contain bugs and introduce degradation of the synchronization. The purpose of this application note is to evaluate the behaviour of Garland Technology Network TAPs on both short and long-distance White Rabbit links. The parameters under study will be the following ones:

Synchronization quality: Accuracy and jitter. Monitoring and capture of the White Rabbit/PTP handshake.

Set-up

The network topology outlined in this brief tested the performance of a WR link with a Garland TAP. Garland Technology Network TAP is presented below:

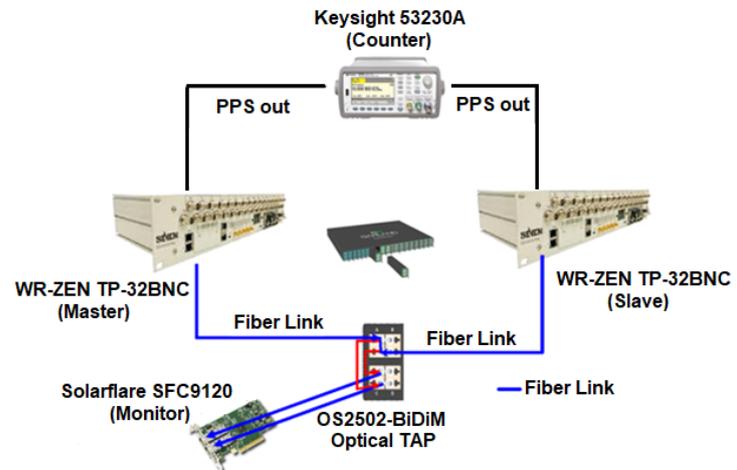


Figure 1: Set-up for the test

Results

The tables and graphs below show the synchronization performance results obtained from the previous set-up:

	Accuracy (ps)	Jitter (ps)	Peak2Peak (ps)	Test Duration
Without TAP	62	13	92	3 days
With TAP (short links) *	99	16	156	3 days
With TAP (long links) **	59	42	278	3 days

Table 1: Synchronization performance

*It considers 0.5m fibre links between the WR ZEN devices and the Optical TAP.

**It considers 50km fibre links between the WR ZEN devices and the Optical TAP.

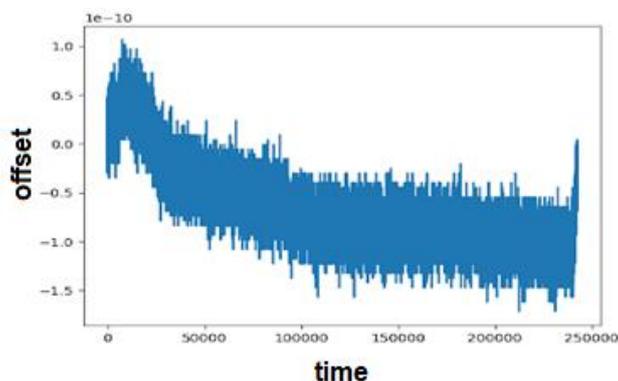


Figure 2: Long WR Link with TAP test results

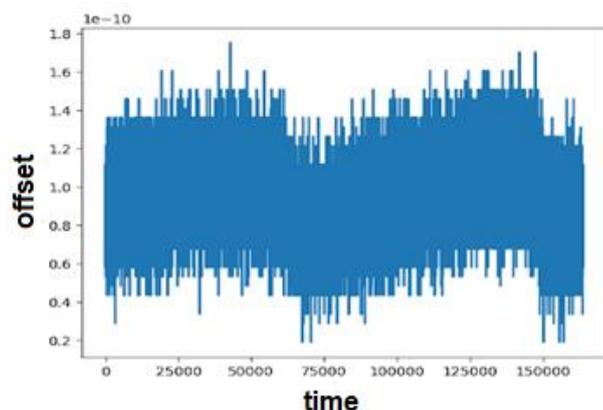


Figure 3: Short WR Link with TAP test results

Conclusions

The performance of the White Rabbit technology with Garland Technology's Passive Fibre TAP is remarkably good:

- The Garland Technology passive fibre TAP mirrors network data without affecting network traffic, providing complete visibility and high performance to the White Rabbit technology.
- Synchronization quality is good, with slight degradation not forcing any inconvenience for customers.
- The use of long haul WR links does not cause a severe impact on the performance of the system.
- Monitoring and capture of the WR/PTP handshake is 95% reliable.

About Garland Technology

Garland Technology is an industry leader delivering network products and solutions for enterprise, service providers, and government agencies worldwide. Since 2011, Garland Technology has developed the industry's most reliable test access points (TAPs) and packet brokers, enabling data centres to address IT challenges and gain complete network visibility. For more information or learn more about the inventor of the first bypass TAP, visit www.GarlandTechnology.com

About Seven Solutions

Seven Solutions is the global leader in ultra-accurate and deterministic time transfer and frequency distribution for industrial and scientific applications. For over ten years, Seven Solutions has worked successfully in cutting-edge projects from different sectors such as telecommunications, smart-grid, aerospace, defence, and scientific facilities (e.g., particle accelerators and radio-telescopes). From science as innovation engine, the company offers solutions towards a massive adoption of ultra-accurate timing to be exploited in finance, defence, Aerospace and enable next generation of mobile telecom infrastructure (5G). www.sevensols.com