LigoPTP 5-N 20 km performance test in Hungary by a leading WISP - ZNET

Even though the LigoPTP RapidFire was just recently introduced, the new wireless backhaul device has already attracted a lot of attention. Impressive lab test results intrigued ZNET and they decided to run a 20 km link to see how it performs in the real world.

Link information:

Devices: LigoPTP RapidFire 5-N

Link distance: 19,6 km (12,2 mi)

Coordinates:
Device 1: 46°38'17.49"N, 16°50'16.64"E
Device 2: 46°26'53.20"N, 16°47'24.15"E

Landscape: flat

Other environmental factors: fog

Antenna: 34 dBi (120 cm) Grante HPA dual-pol dish

Link path analysis

Path profile between TX and RX sites

Site A

Site B

Normalized Height Referenced to LOS Path (Meters)

350

300

250

200

150

0   4   8   12   16

Distance between Tx site and Rx site (km)

● Point-to-Point Profile   — Line of Sight Path   — First Fresnel Zone   — 60% of First Fresnel Zone
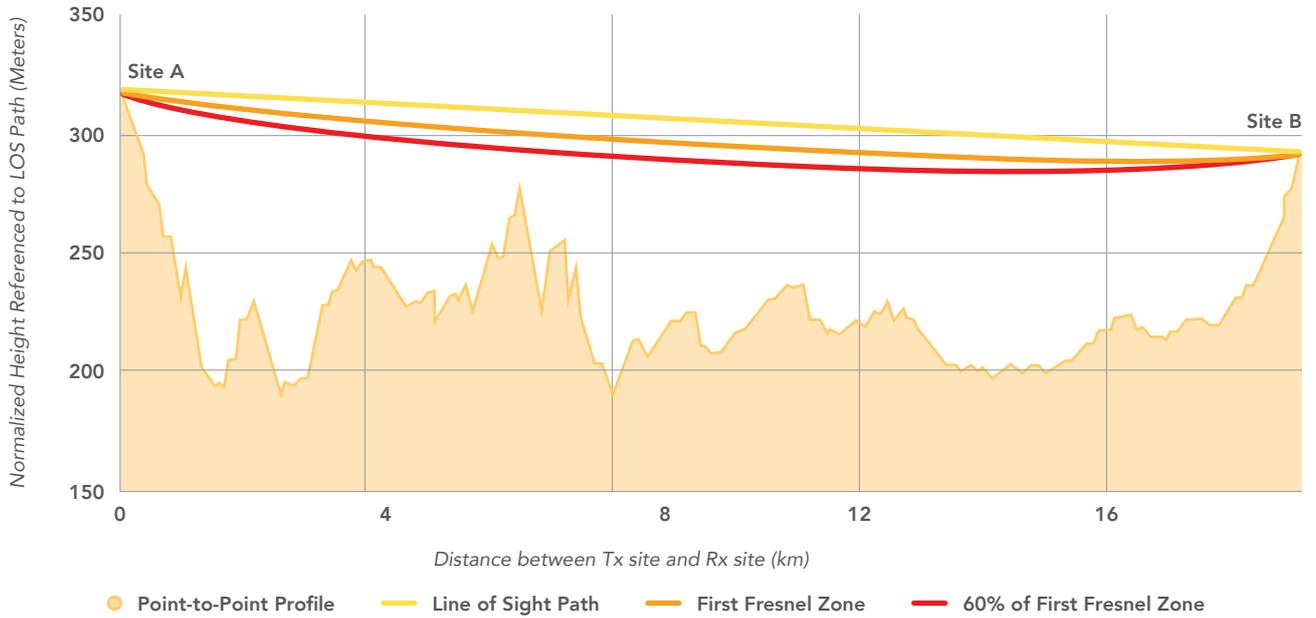
Spectrum analysis

The 5 GHz frequency range in the area where the link was installed had a considerable amount of noise. This screen shot illustrates the noise floor at the site. The LigoPTP RapidFire has a new, integrated spectrum analyzer, which illustrates not only waveforms of peak, average and current noise, but also a waterfall graph in order to see noise over time.
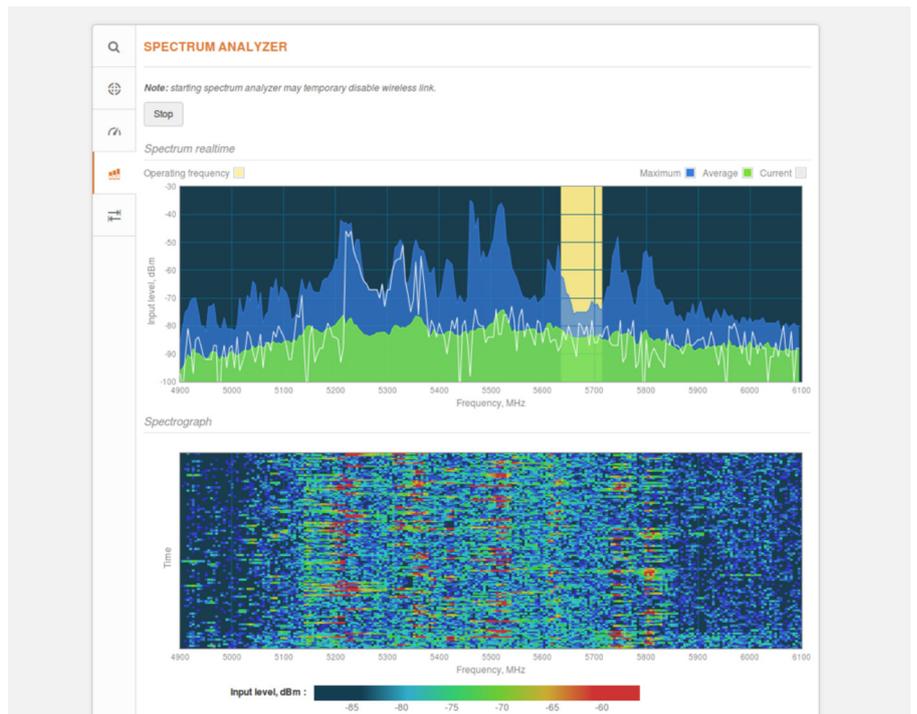
Link statistics

The signals achieved on both sides were in the -40 to -50 range and this allowed using the highest QAM 256 modulation even on a 80 MHz channel. Other statistical information about the link can be found in the screenshot of the new user interface above.
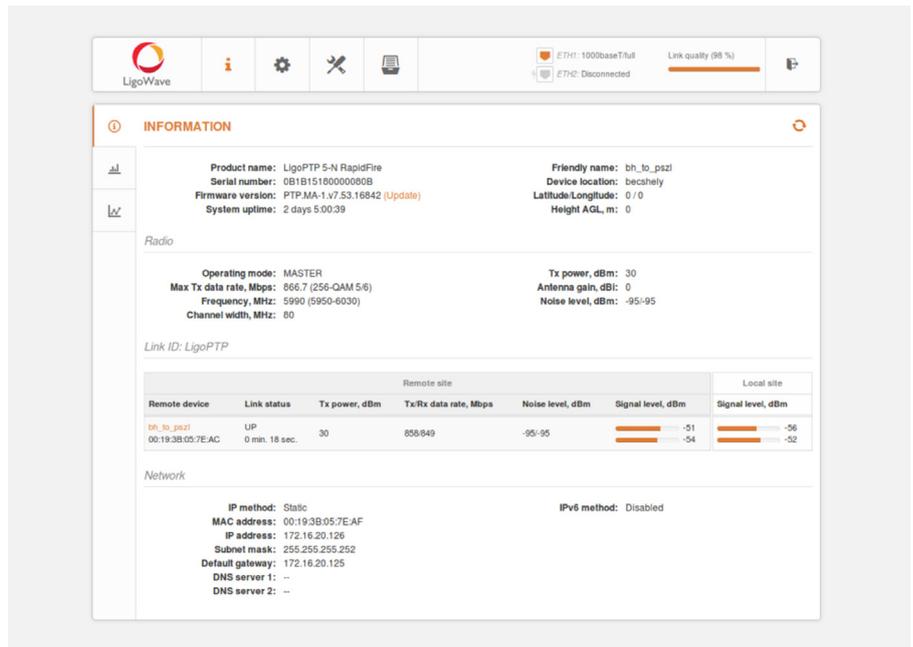
Link test

There are various ways to measure the throughput on LigoPTP RapidFire devices. One of them is using a link test from the tools section of the user interface. The screen shot shows the test results with different packet sizes. The max capacity in this case was 556 Mbps and the max PPS (packet per second rate) was 135,000. Alternatively, there is an Iperf tool running on the device that can be accessed via console. The table below shows link performance in different directions when generating UDP traffic.
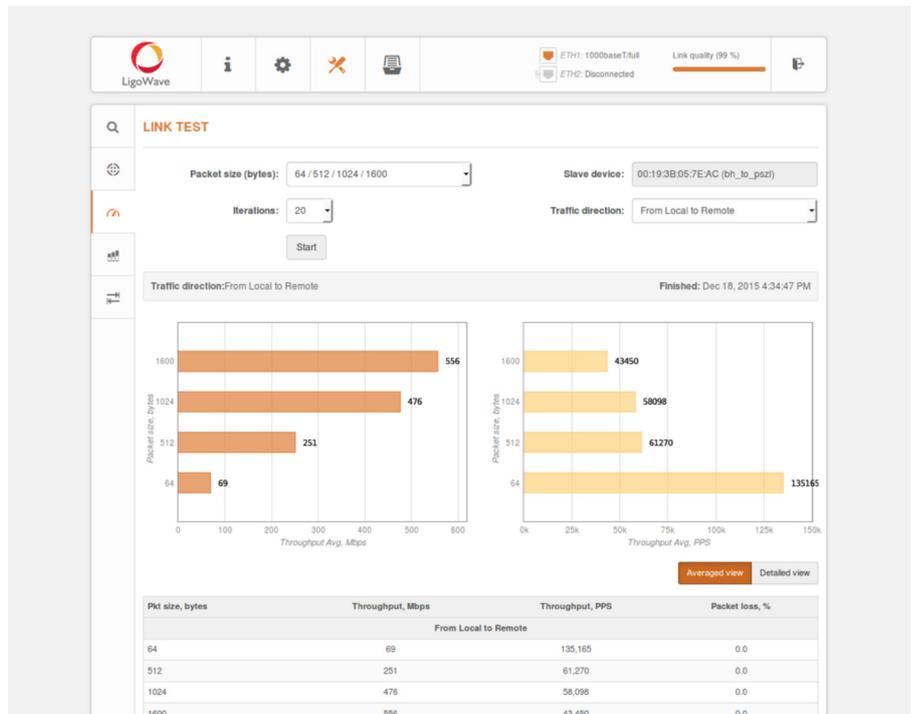
Test	Throughput, Mbps
Master → Slave, UDP, simplex	AVG 477, MAX 511
Slave → Master, UDP, simplex	AVG 466, MAX 502
UDP, duplex	AVG 443, MAX 490

ZNET was satisfied with the test results and will continue to use LigoPTP RapidFire devices in their network. LigoWave's distributor in Hungary, Accesspoint, is optimistic that this product will be the market leader for PTP applications there.