Silvus Demonstrates Unprecedented Multi-hop Wireless Performance in Subterranean Environment

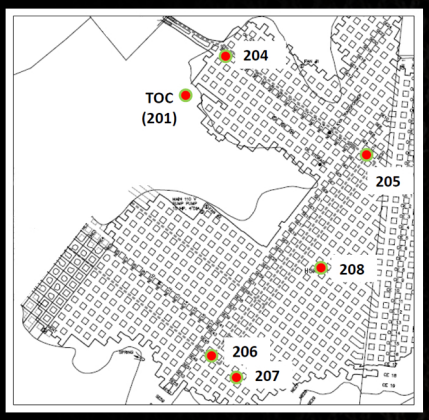

Figure 1. Node Locations

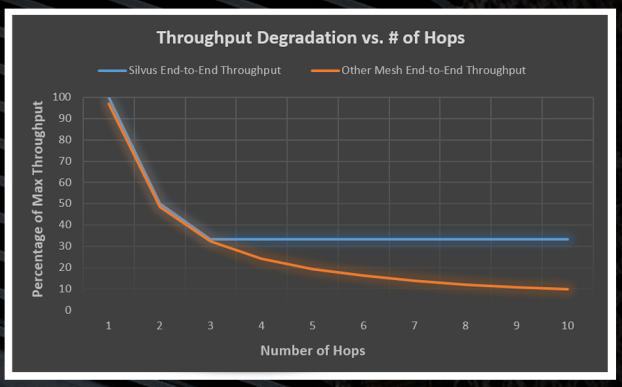

Figure 2. End-to-End Throughput over Increasing Number of Hops

Background

An independent third-party evaluator conducted a test event intended to evaluate the industry's leading Mobile Ad Hoc Networking (MANET) radios and their ability to provide continuous network communication in subterranean non-line-of-sight environments. The test was conducted within a large limestone mine consisting of 40ft x 40ft solid limestone columns, separated by 40ft each. A map of the mine test area can be seen in Figure 1.

Test Scenario

The trials consisted of two test scenarios with nodes placed in pre-defined locations as shown in Figure 1. The radio locations created a driving path that included several turns for a total distance of roughly 5000 feet. In the first test, a video stream from the vehicle was viewed at the TOC radio (201), demonstrating video resilience over handoffs. The second test aimed to characterize how throughput drops off over multiple hops using iPerf to generate and measure network traffic. For this test, we added a 7th radio and throughput was measured over 1,2,3,4,5 and 6 hops.

Silvus Results

Silvus deployed a network of Streamcaster ™ 4200 radios at the predefined locations and on the vehicle. With the vehicle driving throughout the mine and streaming a 5Mbps camera stream, the video viewed at the TOC was flawless, despite the handoffs over multiple hops. In the second test, the Silvus network demonstrated its 'Frequency - Re-use' capability to provide maximum throughput across the network over multiple hops. In other mesh networks, each time an extra 'hop' is added, the end-to-end throughput reduces. In Silvus mesh networks, 'Frequency Re-use' limits this throughput degradation after 3 hops. Figure 2 shows Silvus end-to-end throughput compared to other mesh providers.

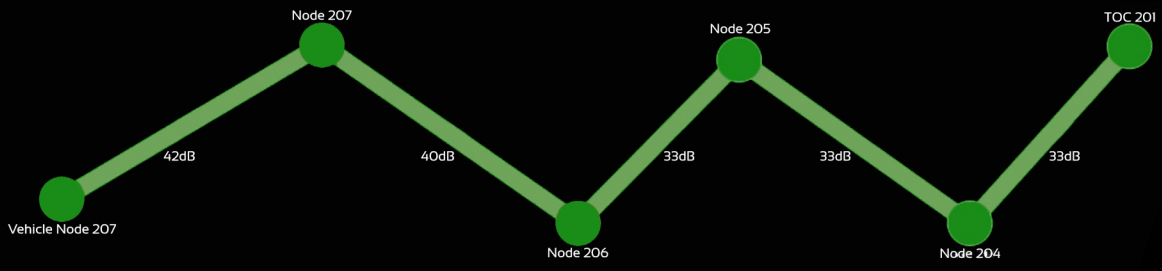

Figure 3. Network Topology

Summary

Silvus was the only radio provider able to demonstrate 'Frequency Re-Use' by showing an end-to-end throughput of 26Mbps over 6 hops - an effective 'spectrum usage' of 140%. Quoting the third-party evaluator:

"Compared with other radios, the SC4200 radios performed significantly better in video quality, with no pauses or dropouts"

SILVUS TECHNOLOGIES