

Background

Located in central California, Camp Roberts is a California Army National Guard post. Camp Roberts is host to year round training of most California Army National Guard units and is one of the sites where the Tactical Network Topology (TNT) experiments are held by the Naval Post Graduate School and USSOCOM.





The Challenge

Unmanned perimeter surveillance and reliable communications in convoys and dismounted unit operations is a growing challenge for the military today. Existing solutions either do not offer mesh capability at all, or provide mesh capability but with poor non-line-of-sight (NLOS) performance, thus requiring many relays that become difficult to maintain while at the same time eating into the end-to-end bandwidth of the system.

In a combat scenario, poor or limited surveillance can mean the difference between life and death. Silvus, armed with its revolutionary mesh-capable SC3500 MIMO radio, ventured out to Camp Roberts as part of a TNT exercise to demonstrate the answer to the perimeter surveillance issue.

Silvus Solution

The setup comprised of 3 mobile cameras with a 500 kbps video per stream, 1 relay node, and 1 display node showing the video feed from all three cameras for a total of 5 nodes. The demonstration was conducted around the parade deck and barracks area of Camp Roberts. Figure 1 shows the five node setup operating in the 2.4 GHz ISM band. All nodes were initially deployed from the position of the Video Viewer and are as follows:

1. Mobile Video Source 1 
2. Mobile Video Source 2 
3. Mobile Video Source 3 
4. Relay Node 
5. Video Viewer 

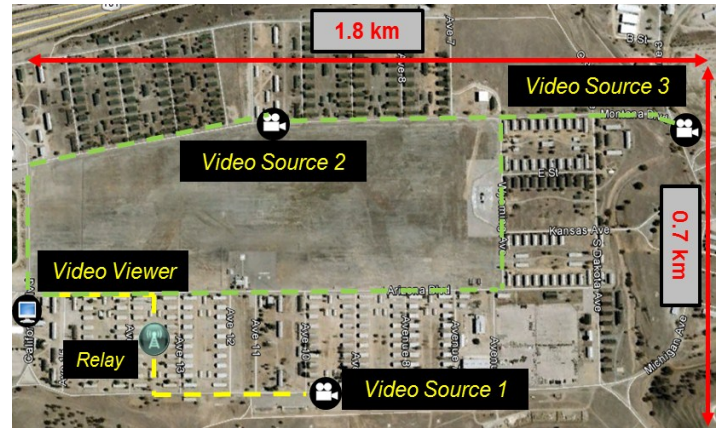


Figure 1. Node Deployment and Mobile Coverage at Camp Roberts, CA Barracks Area

The yellow dashed line shows the path of the Relay node and Video Source 1, with the Relay node stopping where it is shown in Figure 1. The green dashed line shows the path of Video Source 2 and Video Source 3 with Video Source 2 stopping where it is shown in Figure 1 and acting as a relay for Video Source 3. Video Source 3 went on to surveil the path shown by the green dashed line.

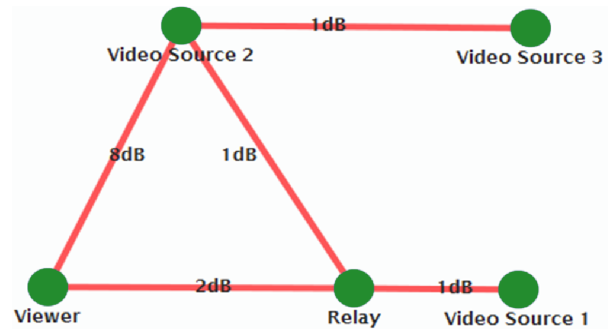


Figure 2. Network Topology

Figure 2 shows the topology of the network with all nodes located at the positions shown in Figure 1. In these positions, the aggregate network throughput was 2.5 Mbps.

Summary

Silvus successfully confirmed its ability to provide groundbreaking mesh-network surveillance at the Camp Roberts barracks area. Using five nodes in an ad-hoc mesh network, Silvus was able to surveil an aggregate distance of over two kilometers, non-line-of-sight (NLOS).