

A New Wireless Broadband Link Record of 245 km

“Network operators are doing much more than data transmissions. Just connecting to pass bits was not enough. Latency sensitive services such as voice and video require a high quality transmission link to provide clear connectivity. We needed to verify that the long range link would support voice services and high definition video in addition to data transmission.”

- BRUCE COLLINS, PTP PRODUCT MANAGER, CAMBIUM NETWORKS

WE'RE ALWAYS LOOKING TO PUSH THE LIMITS OF WIRELESS BROADBAND, REACHING

farther than ever before to provide high-quality connectivity where it previously did not exist. The first step in bringing connectivity to such locations is setting up a PTP link.

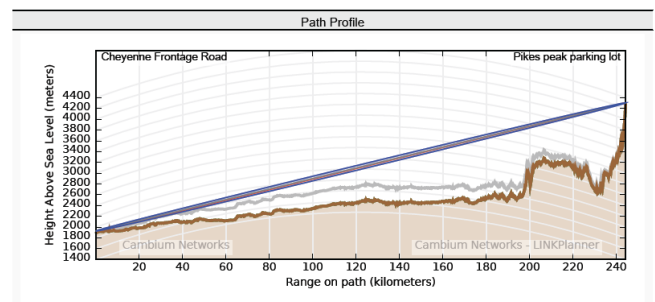
To demonstrate the capabilities of our latest PTP backhaul solutions, Cambium Networks connected a point-to-point link from the top of Pike's Peak, Colorado to just south of Cheyenne, Wyoming - a distance of 245 km (152 miles). For reference, that's about the same distance from Paris to Brussels. To make the link more challenging, the link's path passed directly over the densely populated Denver metropolitan area, where RF noise and interference had to be overcome. We added this complication to test our technology's ability to mitigate interference, in addition to its ability to provide voice and video connectivity over a great distance.

“Our Point-to-Point (PTP) solutions have more than five billion hours of field operations, and are deployed in thousands of networks around the world,” said Bruce Collins, PTP Product Manager. “Our engineers validated that the PTP 700 and PTP 650 now hold the record for very long range operations. With highly reliable, long range connectivity, there is not a place in the world beyond the reach of wireless broadband.”

Planning the Link

LIKE THOUSANDS OF NETWORK OPERATORS AROUND THE WORLD DO ON A DAILY

basis, the team used the LINKPlanner planning software to design the connection and determine the equipment configuration. LINKPlanner provided a detailed path profile of the link and determined that the PTP 700 and the PTP 650 operating in the 5 GHz unlicensed spectrum equipped with three foot dual polarity parabolic dishes would achieve the connection with sufficient fade margin for a reliable connection. LINKPlanner also provided the engineers a profile view of the link which took into account the antenna elevation and curvature of the earth.



LINKPlanner Profile

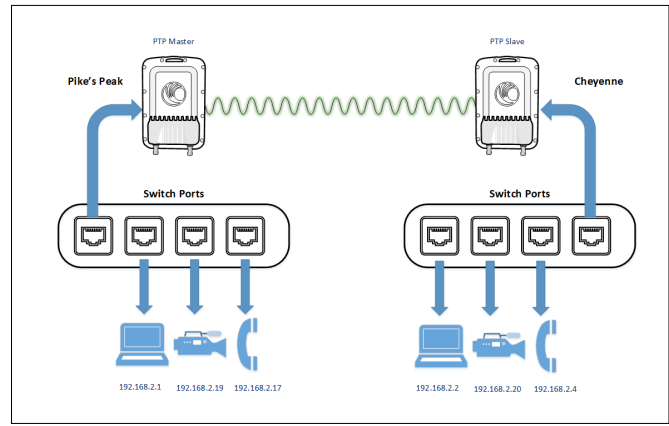
To validate voice, video, and data applications, the system was configured at each end as shown in the following diagram.

High Reliability by Design

“CAMBIUM NETWORKS’ PTP EQUIPMENT IS TESTED and designed to perform in challenging environments,” said Collins. “For the demonstration, we used modules straight from the assembly line. Customers have shared some great deployments with us where the system worked well in challenging situations, and we knew the performance on Pike’s Peak would match the LINKPlanner estimates.”

Other examples of challenging deployments:

Long Range VoIP	Proven with 105 kilometer link with a mining company to connect headquarters with remote field operations in the Republic of Congo.
Over Water	Proven with Reliance Industries Ltd, India’s largest private oil & gas company connecting two Floating Production Storage & Offloading (FPSO) facilities with 300 Mbps connectivity over 30 kilometers in a rough, salt water environment.
Extreme Heat	National Thermal Power Corporation (NTPC), India’s largest government power generation company connects multiple links in temperature ranges up to 125°F (+52°C).
Long Range Video Surveillance and Remote Access	A service provider in Tanzania provides remote access and video surveillance to the Ngorongoro Conservation area with 299 Mbps over 143 kilometers.



Link Diagram

Installation

THE ENGINEERS MET IN DENVER TO STAGE THE EQUIPMENT AND SEPARATED INTO TWO TEAMS - ONE TO PIKE’S Peak and one to Cheyenne. Installation was completed in less than an hour. “At the top of Pike’s Peak, we parked and started setting up the temporary mounts and other equipment. With limited mobile cellular communications at the summit, it was amazing when we connected the PTP 650 link and could communicate with clear voice and video directly with the remote team utilizing our VoIP gateway,” said Collins.



PTP Module at Pike’s Peak



PTP Module at Cheyenne

Result

THE PTP 650 AND PTP 700 SYSTEMS BOTH PROVIDED RELIABLE CONNECTIVITY AT A RANGE OF 245.8 km.

They delivered voice, video and data in a variety of channel widths, and all transmissions were consistently clear.



Video Transmission

“This is a great achievement. It’s longer than anything most network operators would ever need to build. Most links are from 4 kilometers to 20 kilometers, and are very easy,” says Collins. “By proving our technology at these extreme limits, network operators can deploy Cambium Networks PTP solutions with confidence.”