TC COMMUNICATIONS®

Police Leverage Voice & Data Platform for Modernized Radio System

Case Study

The Challenge:
Searching for Cost Efficiency and Reliability

A Midwest communications company specializing in 2-way radio systems was looking to create a communications link to transport Ethernet, Analog and Dry Contact Channels between a county dispatch center and a police department radio control center.

The Ethernet channels would be used for police administration and the Analog and Dry Contacts over Ethernet were needed to operate a Police Public Safety Radio System. The dry contacts were needed to key the transceiver to either transmit or receive, since transporting the original radio system's pilot tone signals over Ethernet led to interference issues.

As a result, one dry contact channel was required along with each analog signal. Eight 4-wire and four 2-wire analog circuits were needed to connect to a Signal-to-Noise Voter,

and Dry Contacts were required to switch between Receive and Transmit on the 2-Way radio.

The ultimate goal was to find a managed, all-in-one-box Ethernet network solution that was both reliable and cost efficient.

The two control centers were linked by a leased fiber optic data path that connected to a Multi-Service Provisioning Platform (MSPP) and JumboSwitch's at each site. A JumboSwitch 10/100/1000M Ethernet card connects to the Police network.

Solution:
A Complete Solution

While an online research turned up a few low-end 1- or 2-channel Analog-over-Ethernet devices, it was clear that the most viable multi-channel Ethernet, Analog and Dry Contact solution for the application was the TC Communications' JumboSwitch Ethernet, Voice & Data Platform.

Objective

Transport Ethernet, analog and dry contact between the county dispatch and police radio control centers.

Products Used

- JumboSwitch®
- TC3841: Gigabit Ethernet Card
- TC3846-6: 4ch 600 ohm Analog and Dry Contact over IP Gateway

Key Benefits

- All required interfaces can now be operated on a single platform
- Increased bandwidth efficiency with port rate limiting

> "...and we have 0% packet lost so far in June. We've moved out phone lines off the old copper pairs, and onto the TC3846 modems, and are finally in full time production using them in our radio system. Our many thanks to you guys for your wonderful support, have never worked with a more responsive team. Please pass along our appreciation to your team.
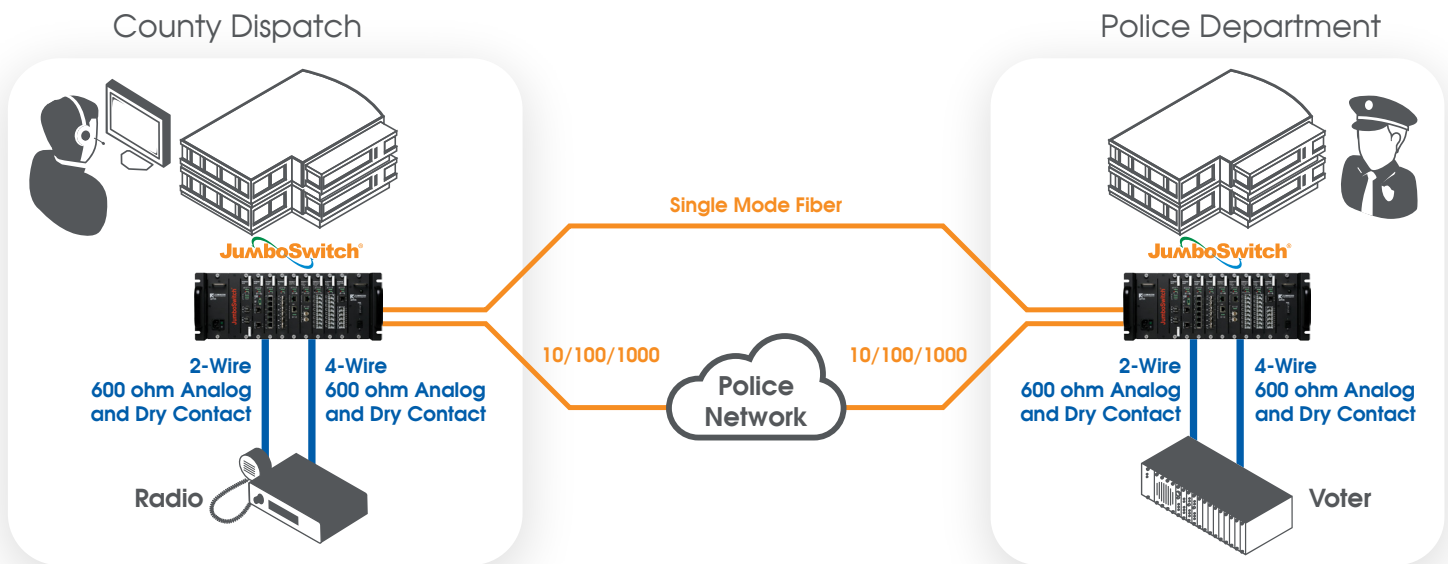>
> - Colorado Police

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Two 4U JumboSwitch chassis, one at the county dispatch center and one at the police department, were deployed adjacent to the MSPPs (see diagram below). The JumboSwitch's Analog and Dry Contact interface cards connected to a Motorola 2-Way Radio System on the County Dispatcher side, and then to a voter on the Police Department side (The voter uses digital signal processors to continuously select the receiver with the best Signal-to-Noise Ratio from multiple remote sites).

Each chassis was equipped with three 8-port Analog/ Dry Contact interface cards (TC3846-6) and one 6-port 10/100/1000 Ethernet Card (TC3841). The Analog and Dry Contact cards provide eight 4-Wire 600 ohm analog ports, four channels of 2-wire 600 ohm analog and 12 channels of bi-directional dry contacts to key the microphone/transmitter.

Results:
Higher Bandwidth Efficiency

In addition to offering all interfaces in a single chassis, the JumboSwitch delivered Ethernet Port rate limiting, management and self-healing ring redundancy. And because the entire Police Department only leased a total of 50 Mbps of bandwidth, the JumboSwitch's rate limiting feature turned out to be crucial. It boosted bandwidth efficiency and enabled the leased fiber to be proportionately shared between radio and other departmental network traffic (30 Mbps was required for Ethernet traffic and 20 Mbps for radio traffic).

County Dispatch

Police Department

Single Mode Fiber

JumboSwitch®

JumboSwitch®

2-Wire 600 ohm Analog and Dry Contact

4-Wire 600 ohm Analog and Dry Contact

10/100/1000

Police Network

10/100/1000

2-Wire 600 ohm Analog and Dry Contact

4-Wire 600 ohm Analog and Dry Contact

Radio

Voter

Enhanced Connectivity for Police 2-Way Radio System

About TC Communications

TC Communications specializes in TDM over IP network solutions including Analog Radio, Voice, Serial and T1 products. Applications include Leased Line Replacement, Voter Comparator over IP and Multi-Service communication networks. Focused on mission-critical applications, TC products are designed to help Public Safety networks transition to IP/Ethernet without replacing existing analog equipment. All services including engineering, manufacturing, and support located in Irvine, California, USA since 1991.