TC COMMUNICATIONS®

Troy University Extends Ethernet Over DS3

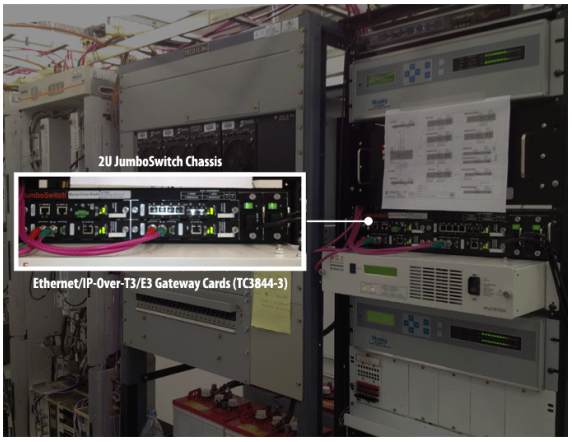
Case Study

The Challenge:
Extend Ethernet over DS-3 Microwave

Troy University in Troy, Alabama transports a wide array of applications over an extensive 13-node campus communications network that features DS-3 links between microwave towers.

Applications include file sharing, video, interactive video conferencing, surveillance, remote control, broadcast audio, hybrid digital broadcast audio, and Internet access at remote sites.

When the Dothan Campus, one of Troy's remote campus sites connected by a DS-3 microwave link, needed a television point of presence over Ethernet, it became apparent that the existing network connection didn't provide enough Ethernet bandwidth to support full motion video.



Application Diagram for Troy University

> *The way I see it, the efficiency and relatively low cost of the JumboSwitch solution allowed us to make the education dollar go much farther. We certainly don't have a million dollars to build out a new microwave network.*
>
> **- John Brunson**
> Chief Engineer for Video Conferencing
> Broadcast & Digital Network

Objective

- Extend Ethernet through microwave links
- Deploy hardware that could withstand harsh environments at various microwave sites

Products Used

- JumboSwitch®
- TC3841: Gigabit Ethernet Card
- TC3844-3: Ethernet over T3/E3

Key Benefits

- Increased usable bandwidth
- Phased out M13 muxes and routers
- Did not require additional communications infrastructure build-out
- Compatibility with existing equipment
- Multi-service ensured scalability for future applications

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Troy was using M13 multiplexer equipment combined with DS-1 "blades" in routers to transport 10/100 Ethernet over its DS-3 microwave links and the T1s limited bandwidth.

In considering alternatives to provide more bandwidth to its remote sites, Troy had two basic goals. According to John Brunson, Chief Engineer for Video Conferencing Broadcast & Digital Network, these were to A) Find a more efficient way to extend the Ethernet switch fabric through the microwave links, and B) Deploy rugged, industrial grade hardware that could withstand potential harsh environmental conditions at some microwave sites.

Solution:
Quality Equipment Delivering Immediate Results

The University chose industrial hardened versions of the JumboSwitch multiservice gigabit Ethernet platform, with a combination of copper Ethernet and Ethernet over DS-3 interface cards.

Once the Ethernet over DS-3 link was deployed, there was an immediate increase in available bandwidth. According to John, "We were able to increase the bandwidth to the Dothan Campus by a factor of 8 or 9."

The JumboSwitch installation brought additional benefits including:

- Taking care of fewer pieces of equipment.
- Accessing the Internet at remote sites, enabling staff to refer to technical manuals and perform software upgrades.
- Using Ethernet to do more with surveillance, telecommunications and monitoring.

Troy deployed JumboSwitch units at 13 nodes across its local campus network. The JumboSwitch nodes were fitted with a total of 16 Ethernet-over-T3 and three 6-port copper Ethernet interface cards. The Ethernet cards were used for existing wired connections and the Ethernet-over-DS-3 Cards for the microwave links.

Results:
Planning for the Future

The JumboSwitch proved to be a fitting solution for several reasons:

- It significantly increased usable bandwidth.
- It allowed Troy to phase out its M13 muxes and Routers.
- It enabled Troy to deploy more applications.
- It didn't require any additional build-outs to the communications infrastructure.
- It was compatible with existing legacy equipment.
- Its multiservice capability guaranteed scalability for future applications.

John echoed Troy's satisfaction with the JumboSwitch solution.

Future network plans include phasing out more M13 muxes and routers by transitioning remaining DS-3s to Ethernet, as well as adding applications such as high definition broadcast video transport.

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.

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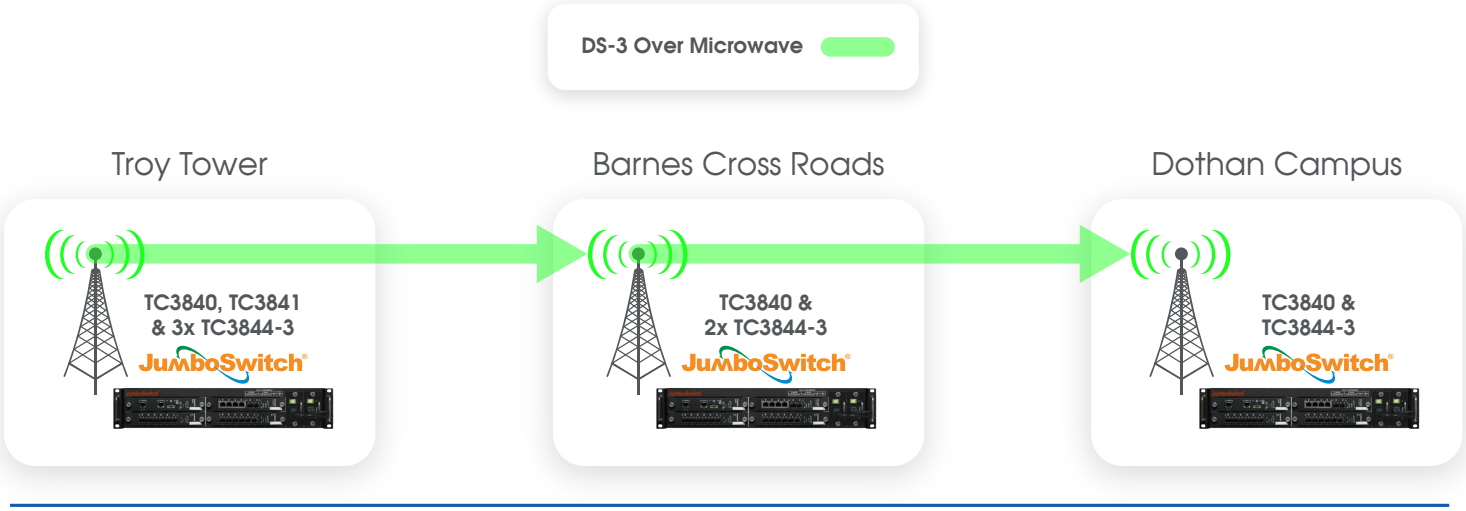
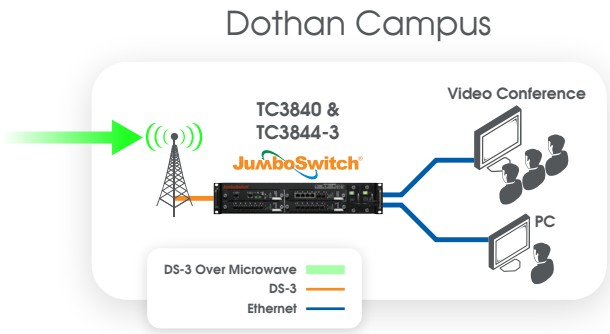
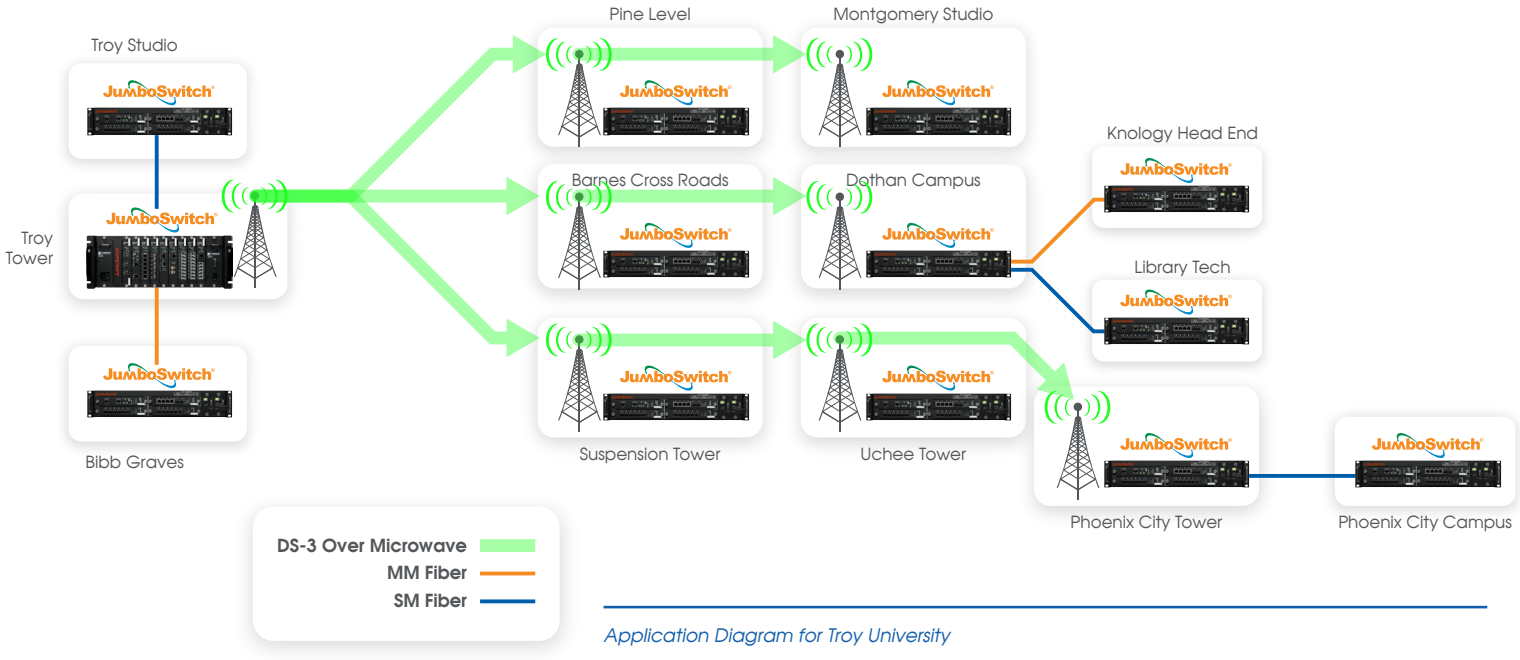


Troy Tower, Barns Cross Roads and Dothan Connection



Zoom in on Dothan Campus



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