

# PINE TREE NETWORKS BUILDS INTERNET ACCESS NETWORK WITH ETHERNET

## A Carrier Class Ethernet Application

### TECHNOLOGY TODAY

Ethernet is almost universal in offices, but is an emerging technology in tariffed telecom applications. Ethernet offers ease of use, low cost, fiber media adaptability, and high-bandwidth flexibility. Where fiber media is available, Ethernet can complement a SONET ring in Metro Area Networks (MANs), providing both high availability and high bandwidth.

### ABOUT PINE TREE NETWORKS

Pine Tree Networks, Portland, Maine, is dedicated to providing reliable, affordable, integrated communications to its customers. Pine Tree ([www.pinetreenetworks.com](http://www.pinetreenetworks.com)) offers telecommunications solutions including local dial-tone, long distance, high-speed Internet access, web hosting, audio conferencing, and other advanced communications services.

### THE CHALLENGE

Pine Tree Networks used a SONET Ring to deliver both voice and internet access, but the demand for Internet service has grown to the point where the traffic on the SONET ring was congested. The Net to Net Technologies, Inc. ([www.nettonettech.com](http://www.nettonettech.com)) DSLAM sites in Pine Tree's Central Offices were being fed by two T1 lines, but available bandwidth was shrinking quickly. Pine Tree had fiber to its CO sites that could provide the bandwidth necessary to support the continued growth of its Internet services, but it needed an efficient way to utilize it.

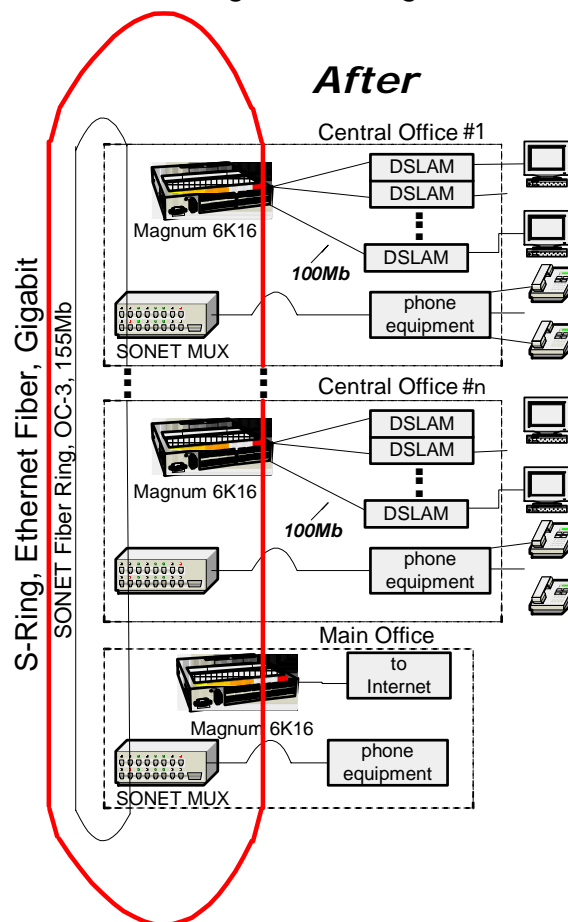
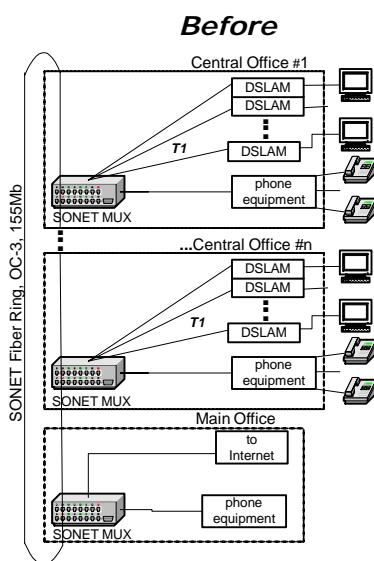
Pine Tree knew that any utilization of the fiber had to include a reliable service with redundant capabilities, built to telco equipment standards, for use in its Central Offices with dual -48VDC power input.

The company wanted to deploy a Gigabit ring to gain a minimum of 5x bandwidth improvement over the existing SONET OC-3 155Mb fiber ring.

The final requirement was that the new capability would interface to the Net to Net DSLAMs easily and cost effectively.

### THE SOLUTION

Pine Tree Networks decided to run a new Gigabit Ethernet network in parallel to their SONET ring. Ethernet proved to be a low-cost solution that provided a full 1 Gigabit (Gb) of bandwidth. By moving customers' Internet traffic to a separate network, Pine Tree reduced the bandwidth stress on the existing SONET ring and providing a fast, dedicated data path for the Internet traffic. Pine Tree Networks chose GarrettCom's Magnum 6K16 Managed Ethernet Switches and Magnum S-Ring Redundancy Manager software for the task. Magnum 6K16 Switches are installed in each Central Office to form a redundant Gigabit fiber ring.



## Pine Tree Networks, Carrier Class

### THE SOLUTION (continued)

The self-healing ring structure is controlled by the S-Ring software and provides redundant traffic paths to each Central Office.

Net to Net Technologies, Inc. makes the IP-enabled DSLAM equipment used to deliver Digital Subscriber Lines (DSL) to Pine Tree's customers. These are located in each Central office in Pine Tree's service area. Initially, the Net to Net DSLAMs were connected by two T1 lines which provided a 3Mb connection. With the Ethernet solution, each DSLAM is connected at 100 Mb (an improvement of more than 30x) into the fiber ring.

The DSLAMs plug into 100Mb ports on the Magnum 6K16 Switches in the Gb ring. The S-Ring Redundancy Manager software provides sub-second fault recovery if there is a break in the fiber ring. The modular 6K16 Switches also offer flexibility for expansion.

### THE RESULTS

With Ethernet service accessible in all COs, Pine Tree is able to manage the DSLAM sites more effectively and offer higher speeds to Internet access customers. The company has the flexibility to offer additional communications services in the future since the bandwidth bottleneck has been broken.

The Magnum 6K16 Switches come with comprehensive MNS-6K management software that includes Secure Web Management. SWM prevents eavesdropping, tampering and message forgery, allowing Pine Tree to manage the Magnum 6K16 Switches in each Central Office from remote locations via the Internet. SWM utilizes "https" security with authentication and encryption technology to provide today's best security for the switch management.

This new Gigabit Ethernet ring provides a significant increase in bandwidth and is a completely separate network delivering Internet service to business and residential customers. The S-Ring Redundancy Manager software provides high availability with self-healing from fiber ring media faults. The S-Ring system ensures fast and seamless fault recovery that is transparent to the user.

### ABOUT MAGNUM PRODUCTS

The **Magnum™ 6K16 Managed Switch** provides configurability for both fiber and copper ports, frequencies of 10 Mb, 100 Mb and 1 Gb, and comprehensive management software in a compact rack-mount package. Two units can fit side-by-side in a rack, simplifying redundant and hot backup systems in mission-critical applications. With options such as dual-source -48V and 24V DC power input, worldwide AC power, and front-to-rear fan cooling, the mixed-media Magnum 6K16 offers modular port configuration including 100 Mb user connectivity can Gigabit backbone ports, in half the space normally required.

The **Magnum S-ring™ Redundancy Manager** software, built upon networking industry standards, enables Magnum 6K Managed Switches to simplify and speed up recovery from faults in redundant Ethernet LAN configurations that use a ring structure.

**Magnum Secure Web Management (SWM)** offers users a safe and secure method for accessing and managing mission-critical Magnum 6K Switches over the Internet with the convenience of a graphical user interface, using Internet-proven authentication and encryption technology. SWM monitors Switch activity and supports changing configuration settings from a web browser.

### ABOUT GARRETTCOM

GarrettCom, Inc. is the leading manufacturer of industrial and carrier-class Ethernet LAN products. GarrettCom offers a comprehensive line of ETSI and NEBS-certified switches and hubs for use in industrial, telecommunications, power utility, transportation, COTS military and hardened factory automation environments. Industry standard software applications that are embedded in the company's MNS-6K Managed Networks Software support self-healing redundant rings and secure web-based access to local and remote networks. GarrettCom markets its products through resellers, OEMs, system integrators, and international distributors worldwide. For more information on GarrettCom and its products, visit [www.GarrettCom.com](http://www.GarrettCom.com).



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