

Delaware State University Computing and Telecommunications Current Capabilities

Information technology is infused within almost every aspect of higher education. The significance of its impact is no longer in question. Also not in question is the need of administrators and faculty to plan and allot appropriate monies for continuous reinvestment in technology throughout their respective institutions, especially in the area of information technology infrastructure. In line with the above, Delaware State University has invested in a Cisco Layer 3 Gigabit Switched Virtual Network (GSVN)

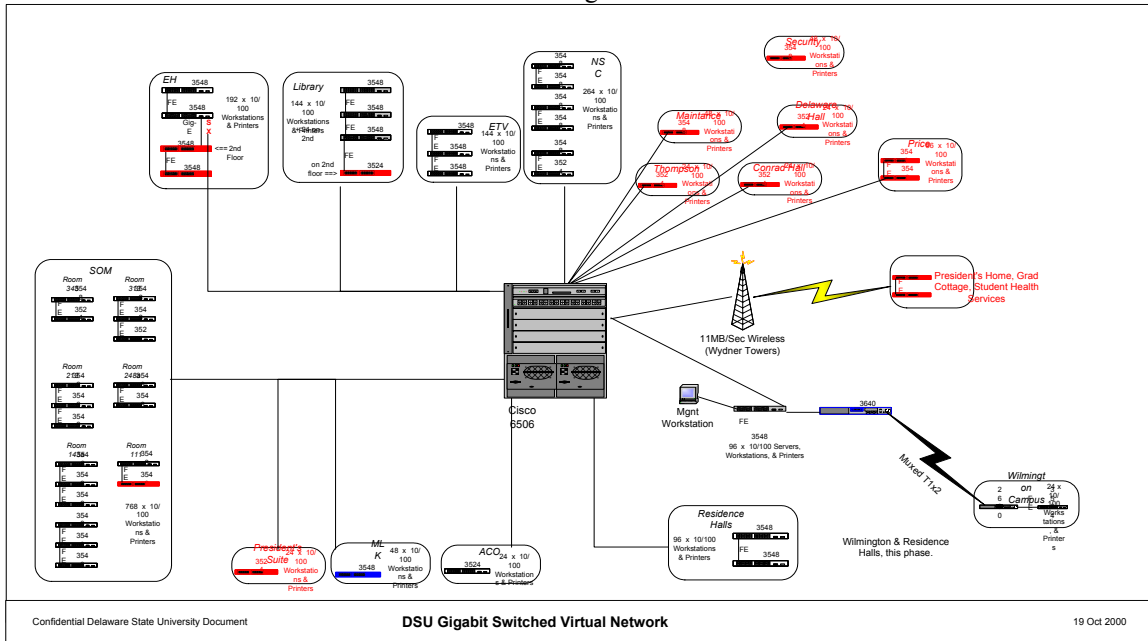
A switched virtual network differs from shared networking such that each personal computer, host resource, and server connected to it has dedicated access and egress to the network. Personal computers are typically connected to workgroup switches, which are then connected to very high speed switches in lesser numbers at higher data rates. These higher speed switches are typically referred to as being part of the network core. Servers and devices demanding high speed access to network resources are also typically connected into the core. In addition to the above, specialized network devices called routers are connected to the core as well. Most enterprise class networks are at least partially switched in the above manner.

The DSU Layer 3 GSVN differs from legacy networks as follows:

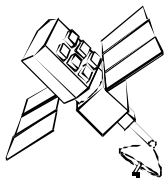
- The DSU GSVN operates at gigabit speeds to all mission critical servers and all workgroup switches at gigabit speeds. Unlike older legacy network core technologies, such as ATM, the gigabit core does not have to perform any packet-to-cell switch translation at egress to the core, thus eliminating a significant performance bottleneck.
- Previously, personal computers either attached to switch ports via shared hubs or at 10 megabit (MB) per second. Personal computers are now connected to workgroup switches at 100MB/Sec, a 10 fold increase in raw aggregate throughput into the network.
- Due mainly to its size, our switched network actually consists of many switched networks interconnected at various points. This is required in order to manage traffic flows across the entire infrastructure. Previously, a special network device called a router was used to copy data between the various switched networks. These routers were separate devices with limited knowledge of the switched network (Layer 2). Conversely, the Layer 2 network had limited knowledge of the routers (Layer 3). The above resulted in performance problems between networks via overburdened routers. This performance issue has been eliminated by the combination of Layer 2 and Layer 3 technologies into what is known as a Layer 3 switched network. Now, the router has been integrated directly into the network core. Traffic flows move faster as a result of a lesser number of decisions required for traffic flows in software which result in a much higher number of packets processed per second. The end result is a remarkable improvement in performance

to networked applications.

Please note Figure 1 below



In the past, voice, data, and video were each managed by separate networks. Each network was tuned specifically for the type of traffic it would carry. Maintaining different networks by traffic type proved both expensive and difficult to manage. The new DSU Layer 3 GSVN is capable of supporting mixed traffic classes on the same infrastructure. The end result is a single network capable of supporting voice, video, and data. It is now possible to build and deploy applications such as video streaming, voice over IP and other time sensitive applications accessible by standardized internet protocols. Prioritization of traffic based on the type of application can now be employed, thus insuring quality of service level required by applications which are isochronous in nature.



The University's CATV plant has an antenna approximately 80 feet high and a satellite disk array (downlink only) that provides television service to the campus through the campus fiber optic network. The University has contracted with Comcast Corporation for video services with over 60 channels of programming, four of which are reserved for intra-campus broadcasts of video tapes or other programming of local origin for classroom instruction and other purposes. Additionally, there are multiple sites on campus which offer two-way video capabilities. The University Extension program has satellite downlink capability at the Ulysses S. Washington Jr. Cooperative Extension Center & Herbarium and the MBNA America building has uplink and downlink capability.

The University has implemented video conferencing technology within the MBNA building, the Washington Building, and the Grossley Hall IT training center. These conferencing systems enable faculty and staff to communicate via video to other learning institutions, the community, and private sector via ISDN and internet technologies.



The university is committed to raising the level of technology to its highest standard, in keeping with its own agenda. It is our vision, that the future of communications at Delaware State University empower the institution's forward thrust. The Office of Telecommunications came into existence in September 1999 to provide a unified telecommunications technology capability for DSU. The core technology of the University telecommunications operates through a SIEMENS Hicom 300 System. The technology utilizes direct inward dialing lines (DID) to provide campus phone services. The SIEMENS Hicom system control unit has the capacity of 10,000 individual phone ports. This SIEMENS system is interfaced to the Lucent Octel 250 & 350 Voice Mail Messenger units. The Lucent Octel 250 unit provides voice mail for the faculty and staff, while the Lucent Octel 350 unit serves resident student population. The systems are interfaced into an integrated voice mail unit that allows faculty, staff, and students to share a state-of-the-art telecommunications system. The University has in production several VOIP (Voice Over Internet Protocol) phones running through the SIEMENS Hicom 5500 system. This state-of-the-art merged network allows the University to be a BETA test site for advancing telecommunication technology through integration of data networks and voice networks. This partnership with SIEMENS has significantly improved the telecommunications systems at Delaware State University.