



**University System of Maryland
Academic Telecommunications System
(UMATS)**

Strategic Plan

Approved: December 7, 2000

Executive Summary

The use of technology in educational institutions continues to grow. Educational institutions need reliable and robust technology services to support teaching, learning, research, scholarship, and business activities.

The University System of Maryland Academic Telecommunications System (UMATS) was created to provide technology services to support the mission of its member institutions.

UMATS provides the technology infrastructure and services to:

- Connect potential students to member institutions through the Internet to provide recruitment information
- Connect students, faculty, and staff of its member institutions to the Internet to access Internet based electronic resources, information, and services
- Connect member institutions for research collaboration
- Connect students to video and Internet based distance education offerings of its member institutions
- Connect students to reengineered electronic business services of its member institutions
- Connect member institutions to shared resources and services
- Connect member institutions to the State of Maryland to conduct personnel and business transactions and services
- Connect member institutions to the next generation Internet infrastructure and services

The use of the Internet continues to increase dramatically. Educational institutions must continue to expand their technology infrastructure and campus connections to meet the increasing demands of students, faculty, and staff for Internet resources and services. With this exponential increase in demand is an exponential increase in cost to build and expand an educational institution's connection to the Internet. UMATS will continue to assist its member institutions by implementing cost-effective collaborative technologies.

Introduction

□ **Mission**

The mission of the University System of Maryland Academic Telecommunications System (UMATS) is to provide a seamless telecommunication infrastructure to the university community in order to support the institutional missions of teaching, learning, and research by providing customers with high quality, robust, scalable, and cost-effective digital telecommunications within the University System of Maryland (USM) and beyond. This infrastructure will support those multi-functional applications that require inter-institution connectivity and connectivity to locations outside of UMATS, using a variety of technologies and delivery methodologies.

□ **Vision**

UMATS will provide efficient and effective telecommunications services that are focused on the needs of its member institutions as they adapt to emerging technologies. UMATS will be a state of the art resource to its member institutions by providing adequate resources to support the business of education, research and health care. UMATS will work diligently to be inclusive to outside educational partners and find ways to bridge the geographic and social digital divide. UMATS will be a “state-of-the-art” telecommunications network that is forward thinking and recognized as a leader in telecommunications services within and outside the borders of Maryland. UMATS will be open to new ideas and challenges but remain cognizant that cost effective and technically sound networking is the best demonstration of leadership that will ultimately attract the best students, faculty, staff, and partners while extending critically needed technology services.

□ **Guiding Principles**

UMATS has developed a set of guiding principles for how networking technology should be created, managed, and supported. These principles will serve as the foundation of any technology development and will guide decisions on the suitability of future technology and their alternatives.

• **Reliability**

Reliable technology services will be developed, managed, and delivered via a solidly established, redundant, and robust core infrastructure. While complete redundancy to each institution is expensive, and in many cases unachievable due to the last mile of service and limited carrier competition, institutions should have the option to choose this approach, at their expense, if determine that it is necessary and available.

• **Cost-Effectiveness**

Networking services will be developed to provide cost-effective solutions for its member institutions through volume purchasing, sound engineering principles, partnering, and using existing State of Maryland contracts. UMATS must take advantage of educational discounts and working with the State to globally reduce cost for all member institutions.

• **Shared Governance**

The University System of Maryland Telecommunications Council (USMTC) was established to oversee the UMATS telecommunications infrastructure and operations, establish membership, define fair and equitable funding guidelines and access, and provide for the future needs of member institutions. A representative is appointed from each member institution to serve as a voting member of the Council.

Strategic Objectives

1. Provide quality services that are cost beneficial to member institutions

The underlining principle that has made UMATS a success is that the sharing of costs by member institutions has enabled all of the institutions to receive exceptional high quality services at costs that are far more attractive than if each institution were to procure these services separately. The future role of UMATS is to continue to position the institutions in a similar manner and provide state of the art technology that enables each of the institutions to meet their campus goals.

2. Provide collaboration capabilities

The UMATS infrastructure is a resource that helps to provide collaboration among its member institutions. Peer to peer USM collaboration is a dynamic process that changes by semester. Outreach and collaboration by campuses to outside partners is part of the Charter of UMATS. The services provided through UMATS encourage local, regional, and remote partnerships.

3. Provide technology planning and consulting

UMATS will continue to provide networking and technology planning assistance in the connection of each member institution to the UMATS infrastructure and services. UMATS is careful not to overstep the defined "line of demarcation" where the UMATS infrastructure ends and the infrastructure of the member institution begins. But if invited by the institution, UMATS will do all it can do to help an institution design and interface with the infrastructure of UMATS.

4. Explore technology partnerships

Continuing with an entrepreneurial spirit, UMATS will explore partnerships with vendors, organizations, institutions, and agencies to enhance UMATS technology services and reduce costs. UMATS will continue to introduce potential partners to member institutions and work diligently to extend an academic and research resource to these partners.

5. Plan the future direction of UMATS

The University System of Maryland Telecommunication Council (USMTC) will examine and set the future vision and direction of UMATS. Both the Operations and Engineering Committees will continue to examine new technology services, review operations, and make recommendations to the Council.

Tactical Plan

1. **Maintain and Enhance Internet Service**

UMATS will redesign its current infrastructure to provide increased Internet access to those institutions that anticipate growth. The minimum connectivity level to UMATS is T1 service with DS3 and OC3 being the other levels of connectivity for its member institutions. If campuses are to use the Internet for new applications they have identified, upgrading to the higher speeds will be necessary.

- **Support the Campuses in meeting the nine University System of Maryland (USM) Minimum Information Technology Standards**

UMATS is engaged in the USM Strategic planning process as a resource to support and assist in the implementation of USM Minimum Information Technology Standards:

1. A policy to assure that all students shall have access to a computer 24 hours a day, 7 days a week.
2. Each student with access to appropriate software and electronic learning materials to complete course assignments.
3. Students, faculty, and staff access to a campus network of adequate bandwidth connected to the Internet 24 hours a day, 7 days a week.
4. Faculty and staff access to appropriate computer technology in their offices or workplaces to do their work.
5. Access to email communications for students, faculty and staff and an explicit website policy as part of its campus technology policies.
6. An explicit training and support plan that will assure that all faculty, students and staff can take advantage of the computer technology available on their campus.
7. A technology plan for each campus, as well as the University System Office and the Board of Regents.
8. A cutting edge information services incorporating e-business to students, faculty and staff.
9. Access to the information technology equipment and services available to students, regardless of financial means, on their campus.

Campuses are networking their residential housing facilities, enhancing their computer labs, and updating their administrative and academic systems. Library services are no longer local services and are being reinvented based on content and material that is widely distributed among internal and external institutions. UMATS will play an integral part in assisting institutions in the development and delivery of technology services.

- **Assist Campuses with Proper Utilization of Their Infrastructure**

The need to provide Internet services to residential students adds a complexity of problems in monitoring, managing, and throttling student usage. UMATS will work closely with institutions that do not have the technical resources to monitor and throttle abusive users

- **Prepare the UMATS Infrastructure to be Internet2 Ready**

As of July 2000, UMATS is Internet2 Ready. Appropriate bandwidth has been allocated to allow those institutions that qualify for Internet2 to participate.

2. Maintain and Enhance Interactive Video Services

UMATS will continue to provide the following core of video services:

- Provide local dial-up access from all regions of the State to outside resources
- Coordinate classes between sister institutions
- Introduce potential partners within and outside of the USM
- Continue to maintain the web-based scheduling of classes and services
- Keep up to date on special pricing and updates for interactive video technologies and switching
- Use the volume of installed systems of the USM to create incentives from the vendors and manufacturers to upgrade USM systems at drastically reduced costs, and determine the best method to bridge all video protocols through a sophisticated switching technology that is based on international standards. UMATS will continue to support all standards based video, regardless of manufacturer.

3. Continue to Provide Collaboration Capabilities

The Telecommunications Council will continue to explore and cooperate with other educational institutions, allowing all to experience the advantages of a shared network resource.

4. Continue to Provide Technology Planning and Consulting for Member Institutions

The Council has to be able to assure its current member institutions that they will continue to receive the same or higher quality of service and that UMATS will continue to anticipate the needs and services of its member institutions. UMATS has and will continue to work with member institutions in the design and implementation of networks and emerging technologies. UMATS is sensitive to the needs of its member institutions and the “line of demarcation” that separates UMATS from the institution’s network infrastructure. Maintenance, configuration, and general network support will continue to be a responsibility of UMATS. Bandwidth monitoring and statistics will be available to its member institutions and an annual report of UMATS performance will be provided to the Council. UMATS will continue to provide IVN support, consulting, scheduling, equipment maintenance, and identify volume discounts to upgrade existing systems.

5. Continue to Explore and Expand Technology Partnerships

• **Maryland Digital Library**

The Maryland Digital Library reflects broad agreement and support among Maryland’s academic libraries about the resources needed in Maryland to make the ongoing transition to a digital library environment. Such an environment enables library users to gain access seamlessly to electronic resources as well as the substantial collections of more traditional forms of materials. The ability to use the UMATS network for transmission of these resources is critical to the success of this endeavor.

• **net.work.Maryland**

The State of Maryland has begun work on the design and implementation of a high-speed network called net.work.Maryland. This effort envisions a high-speed network with equitable access to network services regardless of location to State agencies, county government, county educational agencies, state higher education institutions, and others. UMATS will work with the State of Maryland to determine how this initiative can benefit the member institutions of UMATS.

- **Outside Partners**

UMATS will continue to play a significant role with outside entities in education and business. UMATS has established relationships with a variety of Maryland colleges and universities, regional centers, and businesses and helped coordinate USM resources to work with outside partners. UMATS has been inclusive and open with all of the Maryland Community Colleges and the Maryland Independent Colleges and Universities Association (MICUA). These relationships show a willingness to partner and to achieve enhanced distance learning and academic content.

6. Continue to Provide Technical Support to Information Technology Initiatives of the State of Maryland

UMATS has played a significant role in the design and request for funds for net.work.Maryland. The residual affect of this relationship has been the establishment of the current OC12 fiber ring, connectivity to Frostburg State University, and most recently the link between the University of Maryland Eastern Shore and Salisbury State University.

The relationship between the State and the university community has never been better, both from a technical and network perspective and in a collaborative role. UMATS will continue to be involved with the following State initiatives:

- The Information Technology Board and its Broadband Committee
- The Maryland Task Force on High Speed Networking and its Engineering Committee Consulting with the Governor and his Chief of Staff Major F. Riddick, Jr.
- The Maryland Higher Education Technology Policy Committee
- The Governor's annual Maryland Technology Showcase legacy initiative

7. Continue to Plan the Future Mission and Services of UMATS

The Telecommunication Council needs to continually review the operations and services of UMATS in light of changing technology and the needs of its member institutions. UMATS must provide reliable and quality services in order for member institutions to choose UMATS over receiving services directly from vendors.

The Telecommunication Council needs to continue to review the UMATS funding model, cost allocations, and contribution structure to insure adequate funding for the expanding needs of its member institutions.

8. Expand current UMATS membership to other institutions, organizations, and agencies: Maryland Educational Network

The next generation network to support education in Maryland must be all-inclusive and not limited to one segment. The vision for education in Maryland is a seamless system from K through gray. One vehicle for enabling this is to tie all educational institutions in the State together by a common data network. UMATS must be the vehicle to make this happen. UMATS will need to conduct a thorough business analysis to determine the cost for providing services to additional institutions.

UMATS Overview

The University System of Maryland Academic Telecommunications System (UMATS) provides a robust communications infrastructure, now serving primarily the institutions of the University System of Maryland (USM):

1. Bowie State University (BSU)
2. Coppin State College (CSC)
3. Frostburg State University (FSU)
4. Salisbury State University (SSU)
5. Towson University (TU)
6. University of Baltimore (UB)
7. University of Maryland, Baltimore (UM,B)
8. University of Maryland, Baltimore County (UMBC)
9. University of Maryland, College Park (UM,CP)
10. University of Maryland Eastern Shore (UMES)
11. University of Maryland University College (UMUC)
12. University of Maryland Center for Environmental Science (UMCES)
 - Appalachian Laboratory in Frostburg
 - Chesapeake Biological Laboratory in Solomons
 - Horn Point Laboratory in Cambridge
13. University of Maryland Biotechnology Institute (UMBI)
 - Center for Advanced Research in Biotechnology at Shady Grove
 - Center of Marine Biotechnology in Baltimore
 - Medical Biotechnology Center in Baltimore
 - Center for Agricultural Biotechnology in College Park
 - Center for Public Issues in Biotechnology in College Park
14. University System of Maryland Office (USM Office)

Cooperatively governed and funded, UMATS serves the telecommunications needs of academic and administrative users. These needs include academic program delivery, library services, Internet resources, easy access to remote resources such as supercomputers and Internet 2, and the many other communications and information requirements of students and faculty. The services offered include data transmission using the TCP/IP protocol and video services using a compressed Interactive Video Network (IVN) . Voice communication is not currently supported by UMATS.

Video Infrastructure and Linkages

There are currently 33 USM IVN sites and a dedicated link to the Baltimore Regional Community College Network. This dedicated link allows interconnections with seven additional community college sites. Dial-in/dial-out ports at each regional hub allows local dial-up connectivity to compressed video connections with any similar system, whether in Maryland or anywhere in the world. Each regional hub has a minimum of one video switch with adequate cross-over connections back to each hub (total of 5 video switches). The IVN network is configured to allow multiple site interconnections. The average number of sites per class is 3.5. Sessions with as many as six or seven participating sites are common. The current links between IVN sites and the core network use dedicated bandwidth so there is no contention with data traffic. Speeds on the video network are at the highest possible rates – nearly full motion video. The great majority of IVN sessions are for academic classes, but the system is used as well for training and for academic and administrative meetings.

Data Infrastructure and Linkages

Each USM institution has a high capacity link to the shared data network and the shared data network is connected to the commodity Internet. This data network supports library operations, which are all implemented in a single server located at College Park, as well as patron access to library information through the open Internet. It supports some administrative functions shared among institutions. Most importantly, it provides very high quality access to the World Wide Web for all USM students, faculty, and staff, as well as easy access to University resources by citizens of Maryland and others.

Physical Infrastructure

The UMATS infrastructure includes an optical fiber loop (OC12 or 620 Mb/sec) linking the University of Maryland, Baltimore (UMB); University of Maryland Baltimore County (UMBC); and the University of Maryland, College Park (UMCP). Approximately half of the fiber is donated to UMATS by the State and assigned to UMATS, while half is leased from AT&T Local Services. Leased lines fan out from hubs at College Park, Frostburg, Salisbury, and Baltimore to the other institutions (2 T1 lines or 1.544Mb/sec each). Typically, one T1 line is used for IVN and one for data. Several institutions connect to the hubs at DS3 levels (45Mb/s). The Frostburg DS3 hub is subsidized by the State for the foreseeable future. Although not a hub, Towson University interfaces at a DS3 level back to UMB (justified by its size and contribution to UMATS). UMES interfaces at a DS3 level back to Salisbury (subsidized by the State of Maryland for one year)

Institutional Responsibilities

Each individual institution is responsible for configuring, operating, and maintaining its internal network infrastructure. The responsibility of UMATS ends at the network equipment (routers and switches) that connects the institution to the UMATS communications lines. However, UMATS is based on standards and will provide advice and additional support on a case-by-case basis. UMATS does not provide or oversee content, but only the means by which it is distributed.

Funding

UMATS is currently funded with a 2/3rd contribution by the fourteen participating USM institutions and 1/3rd contribution by block sustainable support within the University System of Maryland's state-funded budget. The current institutional assessments are on a sliding scale, based on student population and operating budget. Funding in FY2002 will be based on Internet utilization, a static funding model for IVN (25%), and infrastructure that is based on the size of connection from the institution to the UMATS infrastructure.

Governance

UMATS is governed by the University System of Maryland Telecommunications Council (USMTC). Each member institution has a voting representative on the Council, which also includes non-voting members from other University-wide constituencies. These latter include the Council of University System Faculty, the Academic Affairs Advisory Council, the Administrative Computing Directors, the Academic Computing Directors, and the USM Libraries. The Council has a standing Operations Committee (of six Council members) that meets at least monthly and functions as an executive committee, and a standing Engineering and Design Committee (of eight expert individuals) that provides advice on technical issues and network development. The Director of UMATS functions as the executive officer and technical leader, and oversees day-to-day operations with the assistance of a small professional staff.