Serving 11 Institutions WebCT from a Central Location

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Background

The Appalachian College Association is a non-profit organization made up of 34 four-year colleges and universities in the central Appalachian region. The member institutions range from under 700 students to over 3,000 students within multi-campus environments. These colleges and universities are located in some of the most beautiful areas in the country, gently carved into the rolling Appalachian Mountains throughout a five state region. Its members share the goal of service to the people of the region through higher education and related services. The Association helps develop and share ideas, information, programs and resources to achieve its goals, which include promoting cooperation and collaboration among its member institutions to serve the people of Appalachia. The ACA functions independently of any one institution to serve all its members equally.

" The Appalachian College Association is an organization of independent liberal arts colleges which fosters cooperation and collaboration among its institutions for the mutual benefit of the member colleges and service to the people of Appalachia."

The ACA developed from a grant-funded project at the University of Kentucky over a 10-year period between 1980-1989. In 1990, the ACA became an independent organization, with its own tax-exempt classification status under Section 501(c)(3) of the 1986 Internal Revenue Service

Code. Six research universities in the region (University of Kentucky, University of North Carolina, University of Tennessee, West Virginia
University, University of Virginia, and Virginia Tech) are affiliated with the ACA. These institutions assist the ACA in reviewing grant and fellowship applications and conducting workshops. The ACA's assets have grown from less than $1 million to approximately $10 million due primarily to the generosity of the foundations that have continued to fund its programs to benefit central Appalachia.

During the initial period of service in the early 90's the Appalachian College Association focused on the support of our member institution's faculty, as this was the focus of the initial project leading up to the formation of the association. After realizing many successful projects in this area it became apparent that there were tremendous avenues available for expansion of the association's focus. The ACA slowly began to diversify the types of programs offered as well as the content within some existing programs. This diversification would lead to the formation of programs such as the "Central Library", the "Appalachian Collegiate Business Programs Association", "Virtual Center", "Laptop Lab", "Multi-Media Lab", the "Information Technology Collaborative Group" and the CTAAC (Collaborative Technology Application in Appalachian Colleges). Continuing to grow and expand these programs helped shape the future of the Appalachian College Association as they changed the way in which the ACA supported its faculty. Continuing the ACA's vision that faculty are key to a successful institution, but realizing that underlying technological foundations and infrastructures were extremely important to the success of faculty and the classroom of the future, caused the ACA to adopt a technology foundation that would serve to create new efficiencies in old programs and make the adoption of new programs more accessible.

New Developments

In our continuing efforts to provide increased technological opportunities to our member institutions the Appalachian College Association has spent considerable time over the past year exploring possibilities associated with the further development and sustainability of a centralized technology program. To promote collaborative ventures and the ability of our institutions to adopt and use new technologies, previously found too expensive or labor intensive for our small campuses, the ACA is working to build a technology center that would support multi-institutional services and training opportunities.

Services in use by one of our institutions are quite often in use at several other institutions within our member population, creating many opportunities for the ACA to reduce the cost of technology, increase the efficiency of some programs, and to promote a collaborative sharing nature among our 35 member institutions. In order to support and sustain services such as course management systems, library catalog servers, and student information systems, which are core campus services, the ACA technology center must employ the following key strategies.

At the physical level the center must provide a secure environment in which to house the equipment necessary to support the services implemented. This equipment must have electrical power available at all times, including emergency situations. There must be a reliable scheduled backup routine in which all essential data is archived to tape media and removed from the onsite

location. This equipment must also be highly available to the users via a connection to the Internet, in which several transport methods may be implemented including virtual private networking and secure socket layer encryption. Constant power and network connection, secure location and environment, and the consistent archiving of essential data are key physical attributes in which the ACA must operate services of this nature and importance.

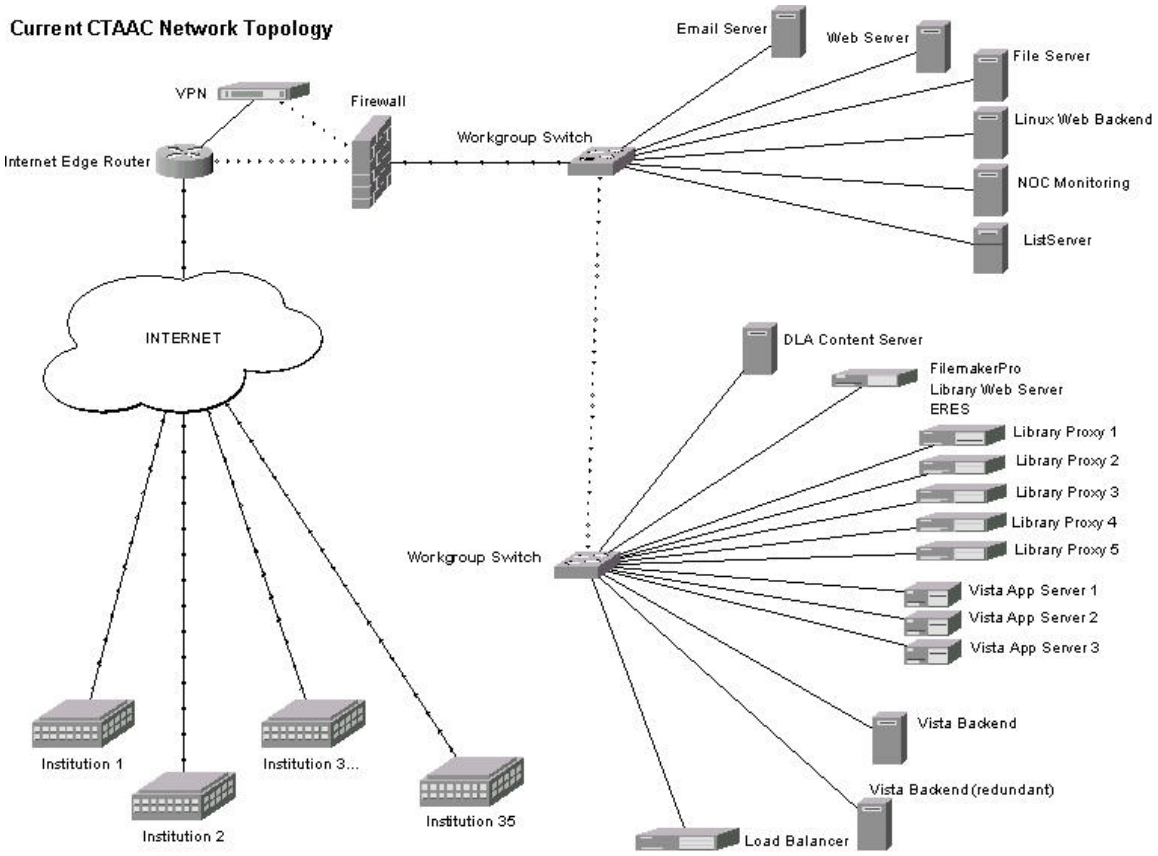
At the service level the center must provide timely response to support questions and offer the ability to provide remote access or management services for management of hosted services. If a particular service requires that a member institution will have an on campus administrator or will be responsible for minor service updates the center must support secure access to the service or equipment involved. Combining the physical with the service level the center will provide a reliable architecture for the development, implementation, and ongoing remodeling of services supported by this centralized model.

The requirements listed above pertain almost entirely to the basic principal of a highly available data center and do not even begin to reflect the requirements necessary to support an effective and successful collaborative higher education tool. Core campus services such as those listed earlier are important tools in the day-to-day business model of higher education. It is no different in our Appalachian institutions where high-end course management systems are becoming the expected and electronic resources available to students from our libraries are growing at a phenomenal rate and are deemed necessary by student expectations. To build collaborative tools that will satisfy the expectations of our member institutions the technology center must be extremely flexible yet in tune with the direction and focus portrayed by our member institutions.

CTAAC (Collaborative Technology Applications in Appalachian Colleges)

In central Appalachia, which contains all of the Appalachian College Association member institutions, technology enhanced education is a difficult subject. The value of this service is widely known and our institutions realize the advantages that might come from the adoption of certain current technologies being utilized by many other institutions in today's higher education market. However, seeing the potential and realizing the value of these opportunities does not, unfortunately, bring the cost of technology to an obtainable level for our institutions. Utilizing the power of 35 private liberal arts institutions, with some 38,000 students, and more than 2,500 faculty members the Appalachian College Association strives to bring this enhanced educational experience to our member institutions through collaborative communication, purchasing, and support.

In order to alleviate many of the cost limitations associated with the development and implementation of projects, which will provide application services for use by students and faculty, the Appalachian College Association has successfully built centralized academic systems for use by our member institutions. Adopted by many of our members and in use today are systems that range from the provision of library resources for off-campus students to systems that are the primary source of online course content. As the availability of these centralized applications grows and the feasibility of such programs increases one of our primary concerns is the ability of our members to reach the CTAAC center, which is home to the equipment that powers these critical services.



Over the past year the Appalachian College Association has worked to help our institutions gain control of mission critical bandwidth through the purchase of traffic shaping devices and caching equipment. Although these purchases have been instrumental in providing our institutions with the ability to control and prioritize critical traffic in "normal" circumstances the continuing increase of virus and Spam traffic has taken a toll on our ability to provide quality services to our institutions. This traffic utilizes an ever increasing portion of the costly bandwidth available to our institutions, thereby decreasing the amount available for academic use on the local campus and especially affects the use of the CTAAC services which many now consider mission critical services.

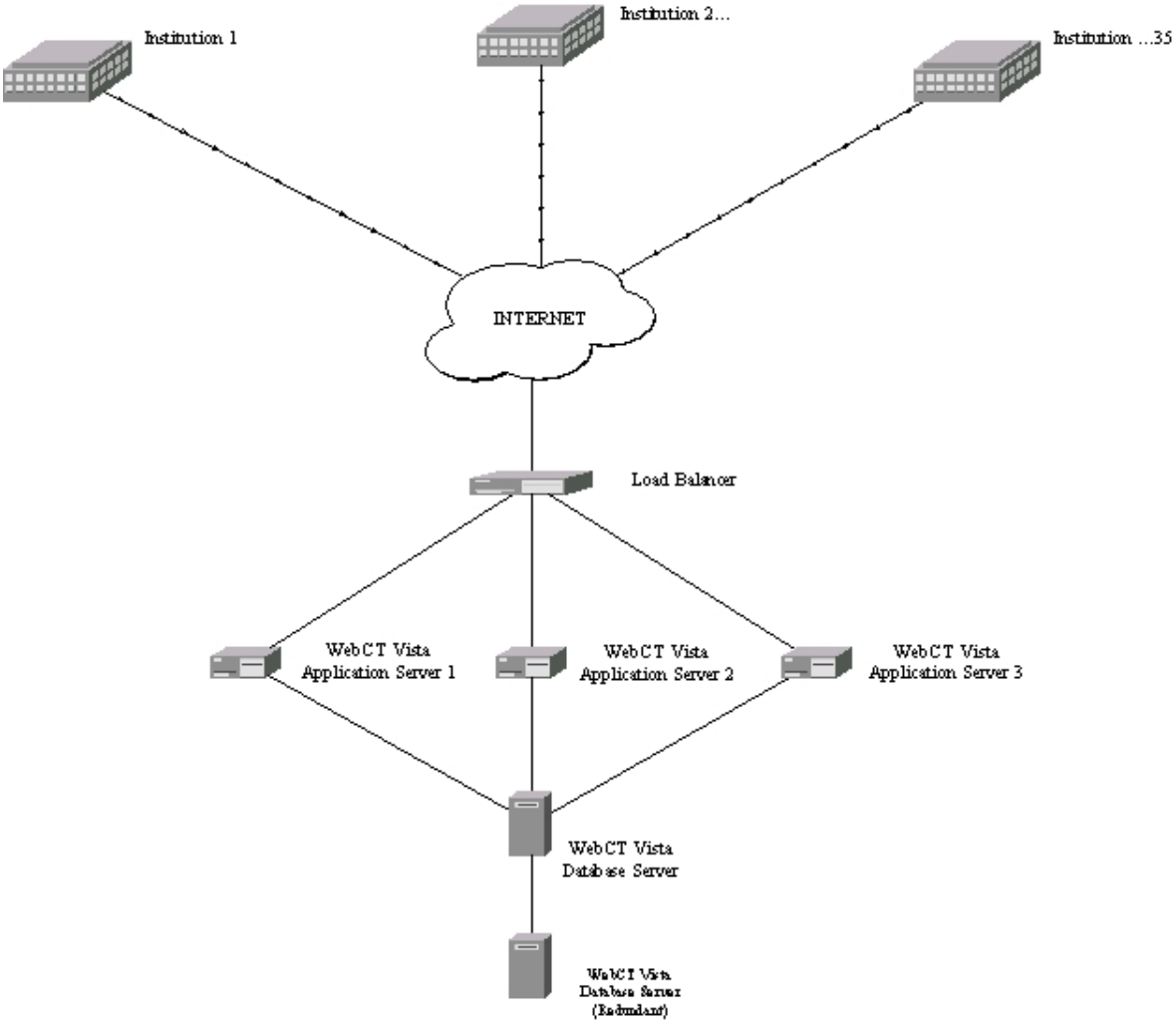
As we have found through countless conversations and meetings it would be nearly impossible for the association to create new bandwidth for our institutions through the implementation of a high-speed wide area network. In the future this could be a realistic possibility as costs decrease and would by far create the optimal situation. Although the future looks feasible the Appalachian College Association must continue to provide equipment that is of great value now, while simultaneously working from a long-range goal in which the services and equipment that currently serves our institutions will continue to be of essential value. Thus we have implemented devices that will help manage non-academic traffic, a value on any network, and application services that will only be enhanced by greater bandwidth. In order to continue our growth we must be aware of many avenues of communication and technology provision that will allow the continued use and improvement upon our current centralized service base.

WebCT VISTA

One of the largest projects currently under support and development by the CTAAC is the WebCT Vista, enterprise course management system. At the time of this writing the system supports 11 institutions and approximately 16,000 students. Each institution has appointed an administrator who works with students, faculty, and course designers on each campus and serves as the contact point for the CTAAC center. Every institution has an autonomous look and feel through the user interface, yet also has the ability to collaborate with others using the system through content sharing, course sharing and best practices scenarios on the backend content management system.

The Vista system consists of two pieces, a front-end application server and a backend oracle database server, which reside in the CTAAC data center. Each institution and system user connects to this system via the Internet, which allows for a wide variety of access locations and system support. Both the application server and the database server reside on Intel based dual Xeon processor systems with 4gbs of DDR RAM. These two systems run Windows 2000 Server and are interconnected via gigabit copper to achieve the communication level needed to support the transactions that take place between the two systems. The database backend, powered by Oracle, has approximately 300gb of drive space that is running on a raid five hot swappable drive system. Anticipating the possibility for large amounts of data we deployed a network attached storage file system with an extra 300gb of space for use by the database system. The application server stores little data but requires space available for the multiple logging facilities built into the front-end application system.

Over a three-month period we implemented the WebCT Vista system and began to bring institutions online. Several of the participating institutions were utilizing earlier versions of the WebCT course management campus edition and required course migration in order to convert existing content into courses available through Vista. During this implementation phase the local campus administrators were given the opportunity to attend a three-day training session designed to familiarize them with the system while teaching them how to design courses and adopt best practices relevant to the use and support of WebCT Vista. This training was considered a “Train the Trainer” scenario so that much of the ensuing faculty training could be distributed to the local campuses. However, after having used this scenario we are currently exploring the opportunities available through online resources for training faculty to use Vista. It has become evident that the on-campus administrators are utilizing much of their time to help faculty in mid development stages and are left with little time to configure structured sessions for new faculty.



With a system that supports multiple institutions, each with unique schedules and needs, it is extremely important to map out a structured maintenance schedule that will allow for maintenance windows and predetermined outages. This schedule was developed in conjunction with a backup strategy that allows us to do a full offline backup of the database server one time per week. In order to minimize downtime we perform nightly hot backups, in which the system remains functional and reserve cold backups for off peak hours, at this point Saturday evening starting at 1:00am. We have configured a weekly maintenance window, 8:00pm Friday through 8:00am Saturday, which allows us to perform routine service pack additions and small adjustments to the system. These maintenance windows serve as a scheduling guideline for faculty, so that large assignments and exams are not performed during these hours. We do however provide advanced warning of planned outages within our maintenance window but are unable to provide the extended advanced warning which would be needed for faculty syllabus planning, this shows the value of setting a probable maintenance window.

As with any single institutional implementation we strive to perform large system upgrades, which would possibly create extended periods of service outage, for break periods that are longer in nature, generally with the varying consistency of schedules among the participating institutions this time is during the summer. During the 2004 summer we will be upgrading the system

one full version and will be implementing a clustered front-end server architecture that will support the growth of participants expected. This new clustered system will include multiple application servers with load balancing capabilities as well as a second database server to create a redundant fail-over configuration. This system will then be capable of supporting all 35-member institutions and their 39,000 students.

As we bring the first year of this project to a close we have developed many interesting ideas about the provision of course management from a collaborative centralized model, some of which were good and some of which were not. As our service level grows and the participants increase we will undoubtedly face new issues and new problems, but it is our position that the communication channels supported by the association will allow us to overcome these occurrences and build upon them to enhance our ability to provide a diverse group of programs for our member institutions.