The Cisco Service Ready Architecture for Community College and Vocational Education

Community College and Vocational Education Challenges

In the United States from 2000 to 2006, there was a 10 percent growth in overall enrollment at two-year institutions, according to the most recent figures from the Department of Education. During the 2006-2007 academic years, 6.2 million students were enrolled in the country's 1,045 community colleges, 35 percent of all postsecondary pupils that year, according to a new National Center for Education Statistics study. Though full national figures for the 2007-2008 academic year are not yet available and most colleges only have estimates for their enrollments this fall, many colleges are projecting increases of around 10 percent over last fall.
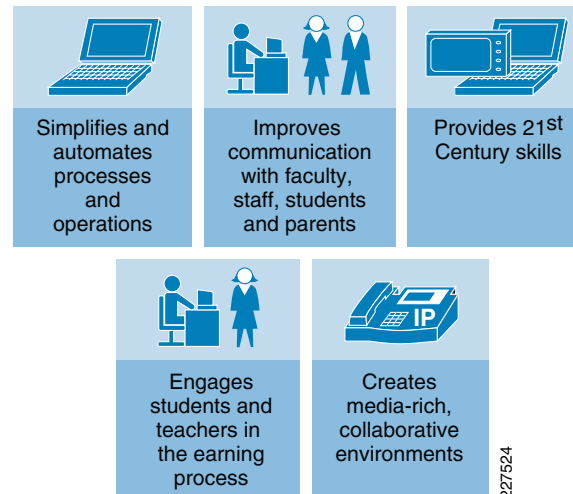
This increased enrollment presents new challenges for delivering educational course work. The demand for instruction is increasing at a pace that does not allow the brick and mortar campus to expand quickly enough to handle growth. Community colleges and vocational education institutions have turned to online learning as the predominant method of handling this growth. While online learning has helped to handle the increase demand, it has been criticized for lacking the face-to-face experience that traditional learning provides, as well as lower than traditional passing rates for students. These institutions are faced with the task of delivering a true virtual learning environment that delivers experiences that are comparable to the traditional environment. They must also allow for secure remote working environment for faculty and staff.

While community colleges and vocational education institutions are growing, their funding (like institutions of higher learning) is also being cut, so they have to do more with less. Operational efficiencies are being streamlined to allow these institutions to produce the same quality of education with fewer resources.

The rapid and expansive adoption of technology by students has led community colleges and vocational education institutions to offer connected classrooms and laboratories. Allowing the student to be connected to the network from the classroom or lab while receiving lecture has the benefits of mutual use of online resources. But it also requires these institutions to ensure that their networks are protected and that only authorized users are allowed access. Additionally, they must be able to control the use of applications and resources that reside on the network.

Since the incidents at Columbine and Virginia Tech, campus safety and security have become paramount to all educational institutions. Creating a safe campus is a major challenge for all community colleges and vocational education institutions. They must employ the right tools to ensure the safety of the students, faculty, and staff. The safety and security systems in place must allow campus safety personnel to respond immediately and effectively in the case of an incident. A safe campus environment is a key differentiator for student and faculty recruitment and is an integral part of the community that welcomes local citizens and contributes positively to the area in which it resides.

As the world changes and becomes "greener", educational institutions are put in the position of leading that cause. Students are overwhelmingly concerned about greenhouse gasses as well as energy usage. Educational institution facility managers must be able to strike the right balance between conducting business and optimizing energy use.

Simplifies and automates processes and operations

Improves communication with faculty, staff, students and parents

Provides 21st Century skills

Engages students and teachers in the earning process

Creates media-rich, collaborative environments

Budget reductions, increased enrollment, as well as limited staff are all business constraints that impact the ability of these institutions to effectively address these challenges. A well thought out plan that optimizes resources, minimizes costs, and allows for flexibility in implementation is needed to allow community colleges and vocational education institutions to achieve the vision of 21st century learning.

Vision for 21st Century Learning in Community College and Vocational Education

The 21st century learning environment will be an environment where anyone, from anywhere, at anytime can access jeducational resources. The traditional classroom will be extended by the use of online communities of learning. Students will be able to access their course work online, receive instruction by attending class either in person or remotely, and be able to retrieve the instruction at a later time through audio and video recordings augmented by online instructor and class notes.

This style of learning requires a collaborative environment in which instructors and students are not bound by geographic distances; students will be able to work together remotely to seamlessly complete projects and course work.

21st century learning will also be ecologically friendly by reducing the need to expand brick and mortar schools and commuting to campus to attend class. In addition, buildings and infrastructure optimized to reduce energy usage will all help reduce green house gasses and lead to greener and more energy efficient campuses.

Security, whether physical or logical, becomes increasingly important in the 21st century learning environment. Security elements will be ubiquitous across traditional and virtual campuses and will work in concert to provide a safer environment for all students, faculty, and staff.

Service Ready Architecture for Community College and Vocational Education

The Cisco Service Ready Architecture (SRA) for Community Colleges and Vocational Education is an architectural framework designed to assist community colleges and vocational education institutions in designing and implementing a network for the 21st century learning environment. The architecture is designed around solving complex business challenges that community colleges and vocational education institutions are facing. At its foundation is the SRA service fabric, which is a collection of features and technologies that serve to provide a highly available network that understands and adapts to the different services that it facilitates. The SRA for Community Colleges and Vocational Education solutions that utilize the service fabric were created to help community colleges and vocational education institutions:

- Create a 21st century virtual learning environment to enable highly interactive and collaborative learning and teaching experiences while delivering any content, anytime, anywhere, to any device.

- Increase operational efficiencies by using the network as a platform and optimizing data center design to extend cost reduction, improve utilization of under-used network capacity, and add flexibility to organizations through business process improvements.

- Design and implement secure connected classrooms that serve the educational needs of students and faculty by leveraging network and application control.

- Provide safety and security on campus by utilizing a platform architecture that proactively protects students, faculty, and staff.

- Allow for facilities management to interact with building controls, measure power consumption, and control energy output to reduce energy cost and carbon footprint, creating greener and more energy efficient campuses.

Operational Efficiencies

Community colleges and vocational education institutions are faced with the daunting task of doing more with less, facing explosive growth as budgets are reduced due to funding cuts. The Cisco SRA for Community College and Vocational Education leverages the use of the network as a platform to deliver an expanded array of college services and data center optimization as a means for creating operational efficiencies to reduce costs and capitalize on under-used network capacity.

Secure Connected Classroom

Providing connectivity to students while attending class is the foundation of 21st century learning, however it also poses many problems for community colleges and vocational education institutions. They must ensure that the person accessing the network should be allowed on the network and that the computer connecting to the network is free of viruses and other aliments that might adversely impact the network or others users. Secondly, while connectivity is provided, all steps should be taken to ensure the person connected is using the network for educational purposes and not illegal activities, such as sharing copyrighted material. Some community colleges and vocational education institutions chose to restrict the student to only access certain network resources while in class. The SRA details the implementation of Network Admission Controls, role-based access. and application controls to ensure a secure connected classroom.

Facilities Management

In response to energy costs, environmental concerns, and government directives, there is an increased need for sustainable and "green" college IT operations. Methods to measure power consumption and control energy output are now the focus of businesses worldwide, with all customers looking for a method to reduce energy costs and implement increased efficient operation. The SRA for Community College and Vocational Education focuses on Cisco EnergyWise and Building Mediator as solutions to help facility managers with this task.
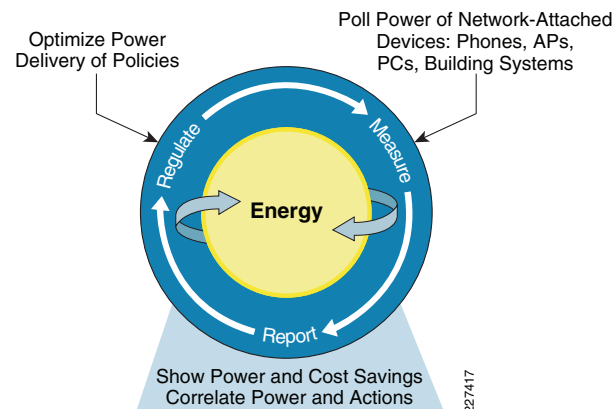
Virtual Learning Environment

One of the key challenges that face community colleges and vocational education institutions is extending their learning environments beyond the campus to allow for online/distance learning, professor collaboration, and anytime/anywhere access for students to obtain course and educational materials. This virtual learning environment is key in allowing these institutions to continue to grow at current rates and enhance the learning experience.

The SRA for Community College and Vocational Educations details several Cisco offerings for the 21st century virtual learning environment:

- Cisco Secure Remote Access
- Cisco Virtual Classroom
- WebEx Training Center
- Cisco DMS Video Portal

Campus Safety and Security

The Cisco Open Platform for Safety and Security is a platform architecture that proactively protects students, faculty, and staff through a scalable, tested network design. The architecture provides a more complete common operating picture, improves decision and response cycle times, and takes advantage of the network to expand the range and effectiveness of your emergency operations teams.

The platform takes advantage of a converged, IP network and:

- Increases student, faculty, and staff safety and security through emergency notification and early warning

- Improves risk mitigation by facilitating continuity of operations (COOP), crisis management, all-hazards incident response, as well as facilities and critical infrastructure protection

- Reduces cost of operations

- Overcomes interoperability issues

Service Ready Architecture Service Fabric

The service fabric is the foundational network on which all solutions and services build. It comprises local and wide area networking equipment, security appliances, and Unified Communications hardware that all work in concert to provide the fundamental network building block that all services utilize.

To learn more about the Service Ready Architecture for Community College and Vocational Education, visit http://www.cisco.com/go/education.