



**White Paper**

# **The Economics of Convergence for Higher Education Institutions**

**Brad Noblet**

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## Introduction

Technology convergence defines a multi-media environment where signals, regardless of type, are seamlessly exchanged between independent endpoints. Signals transported this way include services such as voice, video, quality audio, and data as well as location-based signals such as HVAC (heating, ventilation and air conditioning systems), security cameras, RF-ID asset tracking, proximity door lock systems, etc. Convergence, therefore, is independent of the signal format, transport media or receiving device.

## The Changing Landscape of Communications

Convergence, or the collapsing of multiple, disparate infrastructures into a single, homogeneous communications utility is changing the face of network infrastructure design. This once over-promised, under-delivered concept has finally found technology in the Internet Protocol (IP) that lives up to its claims.

The popularity of convergence is beginning to soar, and it is no wonder. The information technology (IT) world around us is beginning to converge. Everyday we see examples of devices such as Rim's Blackberry and the newly introduced Apple iPhone that are designed from the core to integrate or converge voice, video and internet (data) services on a single platform. At the same time, software applications on those devices are converging as well, requiring the communication of content between and among currently disparate infrastructures. The ultimate functionality of these separate applications will be required to deliver content through a single communications link, on demand to the users.

That said, there's an even more compelling reason for the popularity of convergence; the economic case. It seems obvious that when you collapse several things into one, savings will occur. With convergence, that premise remains absolutely true. Let's examine a few examples that prove the case.

## The Expense of Wiring Disparate Infrastructures

Most environments maintain three major infrastructures for voice, video and data transport. By converging them you will immediately eliminate the need for two thirds of the required wire, as well as the labor associated with terminating that wire.

Let's look at some typical figures. Labor rates for termination are typically \$68 per hour, fully burdened. On average, a technician can terminate one wire every six minutes (if they're accomplished!). And don't forget that both ends of the wire must be terminated. With a disparate infrastructure, it is common to deliver two telephone, two data and one CATV jack per location (wall plate). That represents five terminations which equals 30 minutes of labor per wall plate and 30 minutes in the wiring closet. With a converged infrastructure, you only need two terminations—and

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possibly only one. This reduction in wiring requirements cuts labor costs by a minimum of three-fifths by bringing the termination time down from 60 minutes to 24 minutes.

Let's use an example to understand the actual dollar savings of a 300 wall plate installation. In a disparate infrastructure, you would need five terminations per wall plate, or 1500 terminations. And, since you must terminate both ends of the wire, you effectively have a total of 3000 terminations. At six minutes per termination and a technician labor rate of \$68 per hour, that means a total cost of \$20,400. But if you were terminating only two wires per wall plate in an environment where voice, video and data are converged, that results in a cost of only \$4,080 for wiring, netting you a \$16,320 savings!

In a campus environment, it is not uncommon to see building wiring and termination costs anywhere from \$80,000 to \$150,000. Convergence has brought these costs to well under half that and often resulting in even greater savings.

## **Less Infrastructure Means Less Electronics**

With convergence, only a single IP transport is required. This means that services such as voice and video that ride on top of the data, the transport is basically free when compared to the disparate counterparts for voice and video. In addition, the complexity of the network is reduced with converged service along with the electronic hardware required to deliver that service. It is not uncommon to see a savings of 50% on converged electronics versus the disparate equivalent.

In addition, operating a single infrastructure as compared to three in the delivery of voice, video and data means there is less to maintain. You will even find there are other opportunities for infrastructure consolidation beyond the big three. These include, but are certainly not limited to, HVAC networks (climate control, heating, air conditioning), CCTV (security cameras) and proximity (RF-ID) door lock systems.

## **Labor Consolidation**

Each disparate system typically requires its own set of technician and engineering staff to operate and maintain the infrastructure. It is not uncommon to see between two and four technicians and one to two engineers per system. Often, as in the case of telephony, separate administrative staff is maintained as part of that legacy to support billing and customer service. Convergence on IP has allowed technician staff consolidation due to a common physical transport for both wired and wireless. Since both voice over IP (VoIP) and video over IP (VidIP) are utilizing servers running those services as applications, there is an opportunity to leverage existing systems administrations personnel (sys admins) to absorb those operations and maintenance duties. Total labor consolidation of greater than 40% is quite typical in most higher education institutions. Convergence also offers an opportunity to consolidate and reassign legacy staff whose function is no longer required.

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## The Converged Wireless Advantage

If the above cost savings aren't enough to convince you of the benefits of convergence for your institution, the real savings come when you enable convergence over wireless. Our society is truly mobile. Many people (especially your students!) consider the wired infrastructure to be extremely limiting and refuse to use it. The moment you offer wireless anywhere on campus, users want it everywhere and will stop plugging in to those wires and switches you just spent all that money to install. And, if wireless can offer the same services, did you really need those wires in the first place? Think about how much money you could save if you didn't have to wire any buildings. Wireless coverage can be installed for as little as 30% - 40% of the cost of wiring the same area. In addition, deployment times for wireless are much shorter than wiring by a measure of weeks or months—not days. Reducing installation time can result in considerable savings to the overall cost of a renovation or new construction project. Given project timeframes, it might mean the difference between providing or not providing service. With converged voice, video and data over wireless, full service delivery is complete on day one.

Wireless also has the advantage of enabling communications to many areas not accessible to wire. This will allow you to deliver a common user experience not matter what the venue. Recent advances in wireless location awareness coupled with server-based applications hold the promise of eliminating private, single-use infrastructure for emerging resource and asset tracking and their associated services.

### Summary

As we have discussed in this whitepaper, convergence can save your institution significant money. This savings is especially significant when the convergence is deployed over a wireless network infrastructure. At the same time, convergence will streamline your operations staff and dramatically reduce deployment times. Best of all, wireless convergence positions your institution's network infrastructure for the future when converged devices and applications are ubiquitous.

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## **Executive Bio of S. Bradley Noblet**

Brad Noblet is a veteran Information Technology executive of thirty years. His breadth of experience extends from managing the development, delivery and support of IT products to forming and leading major IT companies. Over the last six years he has successfully leveraged his industry management experience toward delivering high quality, visionary IT environments for Higher Education. During that time, Brad served as Dartmouth College's Director of Technical Services then becoming its CIO. At Dartmouth he was responsible for creating the College's and the industry's first enterprise class converged (voice, video and data) network in addition to advancing and managing its central IT operations. His vision for IT, reflected in the infrastructure, applications and services he deployed while at Dartmouth brought much recognition to the College from industry, Higher Education and the national press touting Dartmouth as a leader in IT.

A 1982 graduate of Indiana University at Bloomington in Computer Science, Brad was that school's Manager of Data Communications, with responsibility for the institution's statewide data network. He then left for private industry, working in product development and management for a number of hardware manufacturers including Codex Corp., Ungermann-Bass, Tandem Computers and the Wellfleet Communications division of Bay Networks.

At Ungermann-Bass, Brad served as Director of Engineering then General Manager of several business units. He is credited with the creation and development of Ungermann Bass' flagship product, Access/One, the world's first smart hub. He joined the Wellfleet Division of Bay Networks in 1995 as General Manager of that business unit delivering over \$600 million in annual revenue. He is credited with creating forty new products during his tenure at Wellfleet that resulted in growing its revenue by \$200M in less than two years.

Since leaving Bay Networks in 1998 and before joining Dartmouth in 2001, Brad was involved in a number of start-up ventures focused on the converged voice, data and wireless sectors. He is regularly quoted in industry journals and the national press, being touted as an expert in networking and provides consultation for several Fortune 500 companies and Higher Education institutions.

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## **About Aruba Networks, Inc.**

Aruba Networks provides an enterprise mobility solution that enables secure access to data, voice and video applications across wireless and wireline enterprise networks. The Aruba Mobile Edge Architecture allows end-users to roam to different locations within an enterprise campus or office building, as well as to remote locations such as branch and home offices, while maintaining secure and consistent access to all of their network resources. Using the Aruba Mobile Edge Architecture, IT departments can manage user-based network access and enforce application delivery policies from a single integrated point of control in a consistent manner. Aruba's user-centric enterprise mobility solution integrates the ArubaOS operating system, optional value-added software modules, a centralized mobility management system, high-performance programmable mobility controllers, and wired and wireless access points. Based in Sunnyvale, California, Aruba has operations in the United States, Europe, the Middle East and Asia Pacific, and employs staff around the world. To learn more, visit Aruba at <http://www.arubanetworks.com>.

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