Developer Builds University and Town with Single Network Infrastructure

Ave Maria Foundation lowers costs and improves services by integrating building systems onto a Cisco network.

EXECUTIVE SUMMARY
AVE MARIA FOUNDATION
• Connected Real Estate
• Florida
• 200 employees
BUSINESS CHALLENGE
• Reduce costs of installing separate and proprietary mechanical, electrical. And communications systems
• Free up staff time for higher value work by eliminating the need to physically monitor and maintain each separate system across a 908-acre campus
• Enable detailed monitoring of utility usage, so that power spikes or excess supply and expense can be tracked and financially reconciled with utilities
SOLUTION
• Deployed a campuswide intelligent information network based on Cisco solutions linked together across a rapidly scalable and reliable optical network
• Installed interfaces and sensors into all building systems to connect with Cisco end-to-end network
• Built a 24-hour network operations center on campus that controls and monitors all university communications and building operations from one location
BUSINESS RESULTS
• Saved over US$1 million in building costs by eliminating the redundant wiring and cabling of multiple isolated building systems
• Reduced staffing costs by enabling IT to assume tasks of building maintenance staff; estimated US$350,000 annually in human resource savings
• Enabled significant efficiencies in utility usage; estimated US$600,000 in annual savings

Business Challenge

The opportunity to build a university that is entirely new is a dream-come-true for a chancellor or university president with visions of innovative learning approaches or state-of-the-art facilities and classrooms. At Ave Maria University, now under construction on a 908-acre site about 30 miles outside of Naples, Florida, it is also a dream come true for the visionary chief building engineer.

"We are at a unique place in the evolution of real estate construction," says Bryan Mehaffey, VP of systems and engineering at Ave Maria University. "We are designing and building an IP interface into every building system across our university and are able to extend this capability into our town of Ave Maria. This is a new paradigm for the design and integration of building and communications systems and provides us the opportunity to achieve unprecedented new capabilities while drastically reducing costs."

The challenges that Ave Maria, and most developers, face when building real estate projects using traditional methods and processes include:

- **Costly to build**: Nearly 40 percent of each dollar spent on new buildings goes toward mechanical and electrical installations, such as lighting, cooling, heating, fire alarm, telephone, and/or cable. Some buildings can have up to 15 separate systems. Accounting for a sizable part of this cost is that each system requires its own proprietary, separate network of wires and cabling combined with proprietary protocols for control and communications.

- **Costly to staff**: The task of monitoring and managing many separate and isolated systems would have required that Ave Maria maintain a separate IT, Life Safety, and operations team with staff that is familiar with each proprietary system.

- **Difficult to monitor and manage**: Because of the cost to provide a separate external communications connection for each system in a traditional design, the Ave Maria operations teams would have lacked a centralized ability to monitor the operations of all systems, requiring manual visits to monitor or troubleshoot. This would not only have been time-consuming, it also would not have allowed for real-time monitoring from a central location, the ability to detect problems as they occurred, rather than later when further downstream damage or a secondary impact had taken place.

> **"By designing and building an IP infrastructure throughout every building and structure on our university and the nearby town, we have created a new paradigm for the design and integration of building systems. It provides us the opportunity to dramatically lower costs, improve services, and drive productivity increases on almost every level."**
> —**Bryan Mehaffey, VP of Systems and Engineering, Ave Maria Foundation**

Network Solution

With the foresight, and the pressures, of literally starting with a "green field" and myriad options available, Ave Marie investigated the market in search of a solution that could meet its needs. After all the other options failed to provide the complete solution that Ave Marie desired, the company decided to deploy a Cisco® end-to-end intelligent information network, from the optical network connecting the campus and town buildings, to the switches and wireless access points in each building, up to the IP phones on desks and in study rooms. The network in the near future can also extend into the nearby town of Ave Maria, where store owners and restaurants will have the option to easily connect their store systems for high-speed data transfer, voice, or Internet access across Ave Maria's IP-based network. With the advanced Cisco intelligent information network, the town's businesses can also have unprecedented opportunities to implement advanced capabilities available on the Cisco Human Network, from visual communications such as TelePresence, to Unified Communications for enhanced collaboration, to mobility for anywhere, anytime access.

Unlike most traditional building designs that include redundant wiring and cabling for each proprietary system, lighting, cooling, building access, fire protection, TV or Internet cabling, or twisted-pair phone wire, Ave Maria installed one IP network running over Ethernet cabling. All systems, devices, and sensors interface to the Ethernet network, reducing installation capital expense and enhancing visibility and collaboration between these systems. The benefits of this enhanced collaboration among the systems are envisioned to be far-reaching and are expected to continue to grow over time.

"Just one example of the power of enabling system interdependencies is the situation of a fire," says Tom Esch, president of Kent Technologies, a Cisco Gold Certified Partner and SMB Select Partner that is helping to build the converged IP network. "If a fire occurred in the library, for example, the fire system could immediately signal the air flow system to close the dampers, immediately restricting air flow. At the same time, it could signal the building access system to release all door locks. Elevators could be instructed to return to the nearest floor, open and cease operating, and video cameras could be instructed to begin recording at specific locations. At the same time, IP phone calls could be automatically generated to the fire department as well as to the tenants, faculty, students, and staff. This could all occur within seconds, helping to save lives and limit property destruction."

Although these functions and services have been operational in the past, it required a rigorous effort to collectively converge the proprietary systems and enable them to communicate effectively.

Business Results

The impact of Ave Maria's decision to install a common transport-based intelligent infrastructure throughout its campus and town will be far-reaching. Mehaffey estimates that Ave Marie saved over US$1 million compared with a traditional design by installing fewer networked systems and using a single-source solution.

As it completes the construction of the first phase of Ave Maria, however, the foundation is already seeing savings in the area of staffing. Today, the IT staff is handling many of the functions that previously required a multi-person, specialized engineering support structure. This has inspired the university to consolidate facility systems management and information technology functions into the Office for Systems and Engineering. Mehaffey anticipates that the university will save US$350,000 annually in human resource costs thanks to their Cisco intelligent information network.

One of the most powerful benefits of connecting all systems into a common, campuswide fiber-optic communications network is the ability to monitor and control all systems from a central location. Unlike traditional building designs that require physical visits by personnel to gather readings or confirm settings, Ave Maria closely monitors and controls all systems from its central command center, or even remotely on a wireless device or personal digital assistant, if needed. Ave Maria believes that this will enable them to staff their operations more effectively for greatest productivity.

"Recently I was drawing up the budget for next year's operating expenses, and our director of facilities was drawing up his budget," says Mehaffey. "We started comparing budgets and there was so much overlap, I just started slashing costs that the facilities staff once did but now can be handled by IT."

The new network will also enable much more efficient utility usage, eventually providing Ave Maria US$600,000 in annual savings, according to Mehaffey. This will be achieved through greater accuracy of the monitoring and control of the air conditioning and lighting systems, minimizing run times. It will also include cost controls through enhanced metering.

With the Cisco unified design providing the transport, Ave Maria can track energy costs on a granular level, enabling it to closely analyze consumption and the utility's supply, or oversupply, in detail.

"During construction a short while back, an enormous power surge occurred that sent voltage that melted one of our transformers," says Mehaffey. "I did not know what had caused the melting at the time that it happened. However, I went into my power management system and learned that there had been 641 power spikes over a set period. I also determined where the spikes happened, the voltage level, and how long they lasted. I was then able to go back to the utility with my detailed reports and request compensation.

"What is more, I also generate detailed reports of energy usage and I can reconcile these reports with what the energy company is charging me. By controlling usage, I anticipate a US$600,000 annual savings from this feature alone."

PRODUCT LIST

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- Cisco ONS 15327 SONET Multiservice Platform

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- Cisco Catalyst 3750 Series Switches

Wireless
- Cisco Aironet Access Points

Voice and Unified Communications
- Cisco Unified Communications Manager
- Cisco Unity Unified Messaging
- Cisco Unified IP Phones

Next Steps

As it nears completion of the first phase, Ave Maria University will begin to take advantage of its "meta directory" capability, which will enable the various university departments to share a common database for multiple operations. When the university sets up student accounts, for example, for food privileges or for building access or phone or Internet access, it will be able to do so quickly and efficiently. What typically requires many steps at universities that maintain separate systems to enter or remove data or maintain databases, a cafeteria or snack shop accounting application or database, for example, or a building access database, or a phone database, will now be handled through a single, common database. This will save administrative time by eliminating manual efforts or batch processing, and will enable Ave Maria University to provide fast, enhanced services to students and others.

Ave Maria is also looking forward to the first day of classes in Fall 2007 and the delivery of advanced services into the classroom as needed, such as on-demand or streaming video, easily enabled across the existing unified IP network.

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