HISTORIC INSTITUTION CONSERVATOIRE NATIONAL DES ARTS ET MÉTIERS (CNAM) TURNS TO ARUBA FOR CONNECTIVITY

musée des arts et métiers le cnam

"Docet omnes ubique" - the motto of the Conservatoire National des Arts et Métiers (CNAM) based in Paris; its objective to bring learning to everyone wherever they may be.

A public scientific, cultural and professional institution classed as a "grand établissement", the CNAM is ranked among France's top higher education establishments. Created in 1794 during the French Revolution, it has more recently led the revolution in use of wireless networking in education.

As early as 2003, the CNAM recognised the need for a extensive wireless network that would act as a platform for connectivity and provide an invaluable resource to students, staff, and visitors to the museum.

A wireless approach to the network appealed to the CNAM as it would offer a particularly discrete solution, essential in a historic building that includes a 13th Century Church. The wireless LAN would allow everyone flexible access to data services not only throughout the main buildings, but also at the CNAM's many remote locations.

With a total of 80,000 attendees, 10,000 graduate students, 7000 lecturers and 2000 staff, the build-out of an extensive wired network within its Paris headquarters – a scheduled historic building dating back to 1838 – was considered uneconomic and impractical.

Consequently some parts of the building did not have network access and lecture theatres particularly caused a problem; provisioning a high density of wired Ethernet ports would be expensive, yet utilization would be relatively low. A wireless network would provide flexible coverage allowing teachers to use the Internet and other networked applications during lectures to support their work, and it would meet the usage profile of students, many of whom already possessed wireless enabled laptops.

PLANNING AND BUILDING

Commencing with in-depth market research in 2004, the CNAM started trials of equipment from a number of wireless vendors. The decision to choose Aruba was based primarily on Aruba's Adaptive Radio Management (ARM), rich security functionality and ability to detect and neutralize rogue and interfering access points – an important capability given the CNAM's urban location. Deployment of fifty AP61 single radio access points (APs) and a 5000 series mobility controller commenced in early 2005 and the network was available to students and faculty shortly after starting the installation.

REQUIREMENTS:

- Able to deal with interfering networks & rogue access points
- Deliver separate SSIDs for different user communities to ensure separation and security of data of each through multiple VLANs across each SSID.
- Solution that automatically responds to changes in the RF environment and is simple to deploy
- Flexible platform that can accommodate changing needs and future applications
- Integral, easy to administer guest portal

SOLUTION:

- 2x Aruba 6000 mobility controllers equipped with M3 modules
- 1x Aruba 5000 mobility controller with SC2 module and line card
- 1x Aruba 2400 mobility controller
- 300 x AP61 Access Points
- PEF licenses
- WIDS licenses
- VoIP licenses

BENEFITS:

- Single infrastructure integrating voice and data delivery with high level of security
- Adaptive Radio Management (ARM) that offers simple deployment and ease of maintenance
- Secure separation of faculty traffic, student traffic, and guests
- Single point of management

"One of my objectives is to provide a level of security on our wired network that matches the security of my wireless network."

Denis Corée
CIO, Conservatoire National des Arts et Métiers

ARUBA networks

"One of the major differences between Aruba and other vendors was the adaptive nature of the radio management. Because the system is completely automated, we did not have to undertake a costly site survey which was a big advantage, especially considering the nature of the site," said Denis Corée, the CNAM's CIO.

Since 2005, the CNAM has expanded the network to a training centre in St. Denis outside Paris, to a school at Le Mans (l'Ecole Supérieur de Géométrie et Topographie) and now has nearly 300 Aruba access points in use, controlled from dual redundant 6000 mobility controllers, a redundant 5000 mobility controller and a 2400 controller at St. Denis.

DAY TO DAY OPERATIONS

The CNAM still relies heavily on Aruba's security capabilities to protect its students, faculty and visitors from intrusion and attack. Rather than use all APs in scanning mode (operating both as an access point and air monitor) the CNAM has dedicated nearly 1/3rd of its access points to operate in air monitor (AM) mode, continuously looking for threats and intrusion on the network. "CNAM is in the centre of the city and it is important for the network to protect itself against neighbouring networks, illicit or malevolent access," explained Denis Corée.

In addition to intrusion detection and prevention, the CNAM also recognised the importance of access control and audit trails, particularly with a network used by so many members of the public. Consequently an early decision was made to require all faculty members to access the network using 802.1x authentication and WPA2-AES encryption. Students are given a user name and password to access the network through a student guest portal, and visitors to the sites, or to the museum, can access webmail and the Internet through a Guest Portal integral to the Aruba solution.

While the network has expanded to multiple sites and more than 300 access points, management of the network has not been a problem for the CNAM. "Although we have grown the network significantly, and extended it to remote sites, the Aruba network has not been a burden on management or support. Today we run a network that is the primary access method for all of our onsite students, essential to our teaching, operating on three different sites. Day-today operations of the entire network take only 4 man hours per week," continued Denis Corée.

The CNAM's wireless network is now the preferred method of access to data sources by the students, and it is widely used by the faculty. The WLAN is considered an important resource as it allows students to work in all areas of the building, whether the area is part of the wired network infrastructure or not. Particularly, it allows the CNAM to move away from dedicated 'resourced' computer rooms to a model of flexible mobile use reducing capital expenditure and operational management costs associated with the wired network.

ORGANIZATION OVERVIEW:

The CNAM is a French institutionof long standing (1794) and deep scientific tradition. Today, 80 000 people are enrolled in the CNAM's professional and management development programs and 10,000 students are earning an undergraduate, graduate or doctoral degree. The CNAM held over 350 national and international conferences, managed over €5 million in research contracts and manages 14 patents.

The importance of choosing a solution that was flexible in its use, but also had the manufacturer's commitment to continued development, was identified by Denis Corée as particularly important. "The wireless network is clearly the primary connectivity method used by the students today, and the faculty follows close behind – they increasingly use the network as a teaching aid, for example, to access the Internet during class to illustrate their lectures. We've not only greatly extended the geographic spread of the network in the past four years, but the growing reliance on wireless for key applications used by both students and staff have meant we've benefited from Aruba's continued development of the product. We use and manage the network today in a way that is quite different to 2005; the intuitive, policy based management, and centralised architecture based on thin APs delivered by Aruba makes management of the wireless service easy."

SUMMARY

With an extensive wireless network now in place, attention is being turned towards future projects and innovative ways to further utilise the network. A voice over Wi-Fi pilot is already under way, and there are plans to utilise the real time location capabilities inherent to the Aruba network with asset tracking using RFID real time guidance for visitors and interactive Q&A as they move around the museum.

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www.arubanetworks.com

1344 Crossman Avenue. Sunnyvale, CA 94089
1-866-55-ARUBA | Tel. +1 408.227.4500 | Fax. +1 408.227.4550 | info@arubanetworks.com