

Secured campus wireless network at National Taiwan University of Science and Technology

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Case Study

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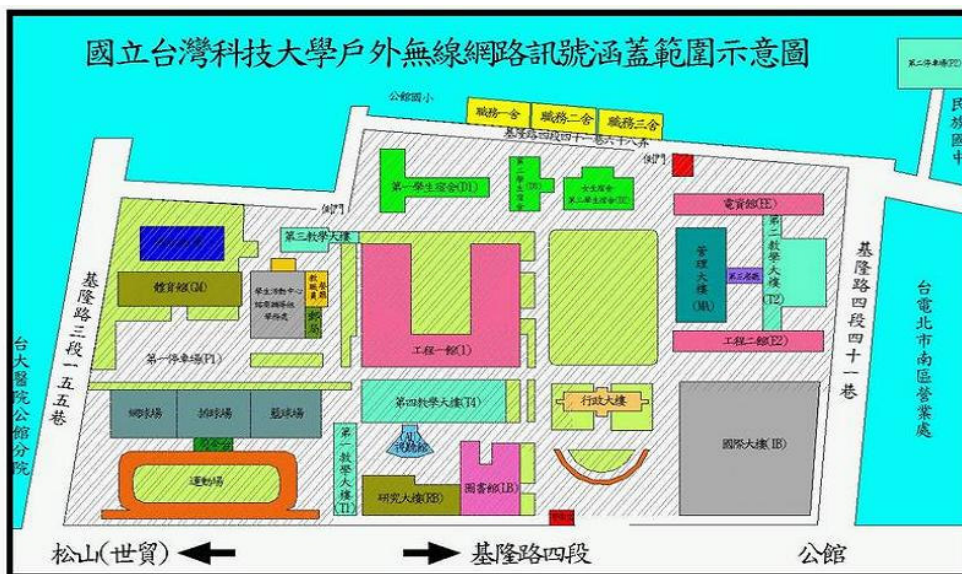
Project Overview:

National Taiwan University of Science and Technology is the nation's first professional technical institute for higher education. It includes Taipei and Chupei campuses that employ approximately 8,000 faculties and students.

The wireless deployment covers the entire Taipei campus which includes 17 buildings such as the administration building, classroom building, gymnasium, library, audio-visual center, students' dormitory, and the platform in athletic field. As for outdoor areas, signals should cover areas such as major roads to the campus and various outdoor activity places.

Adopted Facilities:

- ADSL connection
 - Cipherium Systems' Network Control System (NCS)
 - Cipherium Systems' Network Access Manager (NAM-A2000)
 - Indoor/outdoor Wireless Access Point
 - Long-distance Outdoor Wireless Bridge
- Outdoor Omni-directional/Directional Antenna



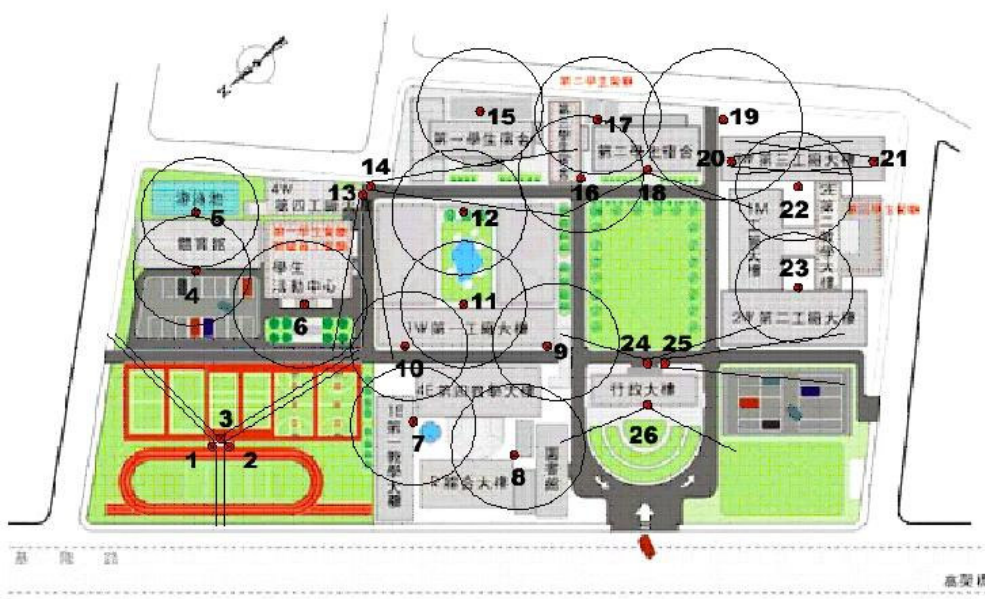
Deployment Requirement and Coverage

Areas

Deployment objectives:

In addition to setting up wireless network access points in the whole campus, NTUST's core principle for wireless network is to establish an authentication management system base on the concept of "distributed architecture" and "centralized management". The system can regulate access of the wireless network through Network Access Manager (NAM), and integrate existing wired network and authentication system by incorporating back-end Network Control System (NCS)

Wireless network control system not only needs to effectively prevent the invasion of unauthorized users, but also to monitor whether the connectivity between NAMs and APs is operating normally. In addition, the system should be able to instantly monitor, manage, and record on-line user status of wireless networks.



Case Study

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Faculties and students require neither change the computer settings, nor install extra software when using wireless networks. In other words, the wireless networks can be implemented on the existing infrastructure and same usage habits without sacrificing the security infrastructure and management mechanism for both user and administrator. Since NTUST aimed to implement wireless network covering entire campus, the management system was set to provide inter-segment roaming service in order to let faculties and students move around different zones without the need to re-login.

Requirement Summary:

- Provide a secured and simple wireless access to all faculties and students
- No need to change the facility and usage habits of users and network administrators
- No need to change the settings in the client device or to install extra software
- Instantly monitor, manage, and record on-line user status of wireless networks.
- Interoperable with existing wired network environment
- Compatible to the existing authentication system, and allows users to use the same account in both wired/wireless environments
- Provide inter-segment roaming service



Solutions and Strategies

Wireless Access throughout the campus:

With the goal of delivering the best connection service, the whole campus of NTUST has been covered by more than 600 indoor and outdoor APs. For such dense network coverage throughout indoor and outdoor environment, users in NTUST now can connect to Internet wirelessly everywhere.

Distributed Architecture, Centralized Management

The NTUST project selected a solution based on Cipherium's NCS and NAM-A2000 to support the authentication systems.

The major task of NCS (Network Control System), generally established in the control room of the computer center, is to define management policies. NCS can support various external authentication mechanisms, such as POP3 and POP3S, the most common seen in campus; and the universal RADIUS and LDAP/AD. Moreover, it can simultaneously support multiple authentication servers to carry out identification authentication. Network administrators only need to define different groups (such as visitors, students, teachers and staff) and appropriate management rules on NCS, and then categorize users into the defined groups to complete the integration of identification management.

The NAM (Network Access Manager) controls wireless network access for every building or area. NAM-A2000 can work with switch to segment the network into multiple VLANs and each VLAN can set up numerous management policies to maximize management flexibility in order to achieve the objective of a "distributed architecture and centralized management".

Case Study

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Inter-segment roaming:

Cipherium NAM-A2000 associated with NCS provides Inter-segment roaming, a convenient feature allowing faculties and students to roam among different VLAN segments in the campus without the need to re-login. With the support of inter-segment roaming, users will be able to stay connected without changing the original IP when moving to different access locations (such as changing classrooms during breaks)

Integrating existing network facility:

Cipherium NAM-A2000 associated with NCS supports common network standard architectures. For instance, the system supports bridge mode, satisfying the request of "no need to change the existing network architecture" for network administrators; as well as NAT/Router mode, allowing network administrators to fit the actual network environments accordingly.

No need to change network usages

With the support of IP Plug & Play function, faculties and students can connect to network wirelessly anywhere around campus, without making changes, altering settings or installing extra software on client computers. Users can get authenticated and then access network by simply opening the web browser; as easy as on the wired network.



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Benefits

Enhance learning competitiveness

According to a research report issued by Gartner, employees using notebook computer with a wireless communication function have demonstrated the growth range of productivity reaching 11 hours or more on average every week, compared to those using desktop computers. Based on this research, an improved teaching and learning result is to be projected once wireless network deployed to educational environments. Moreover, network access now is available in many scenarios such as outdoor teaching activity or field exercise that the service of traditional wired networks can not be reached.

Create e-commerce opportunities on campus

Through the service of wireless network, the school can provide more interaction activities with students, such as on-line registration, book order, exam, learning and teaching, on-line discussion, report submission, and final result announcement. Through schools' regular services for students to increase the association with students, not only can the campus administration efficiency be improved, but e-commerce and campus administrative matters can be more closely connected. As a result, the wireless network environment is not only an infrastructure, but also an establishment to create added values.

Resource is utilized and additional earning is gained

The usage of network resources in campus has obvious peak and off-peak hours (such as during the night, winter and summer vacations), schools may enhance peak time utilization to create new income opportunity. For instance, schools can combine wireless network services and classrooms rental as a bundle service; make public of campus wireless network resource for people in the neighborhood to promote friendly relations; or provide cross-school/region roaming paid services with other universities or hotspots to create new income.

Case Study

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Provide an innovative application platform

The hardware deployment of wireless network is only the beginning for wireless application, whereas proper management and full utilization are the ultimate goal. For example, during anniversary celebrations of schools, if the management system for sports games can cooperate with the wireless network with the ability of using it anytime and anywhere, the real time player management or result announcement can be carried out in stadiums. In addition, reporters can instantly feedback the results of various games, or live broadcast the games online, in which the wireless network has been utilized to create a new, convenient living or teaching platforms.