

Chapter XXXII

Successful Implementation of Emerging Communication Technologies in a Mobile–Intense Organization: A Case Study of Sydney Airport

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ABSTRACT

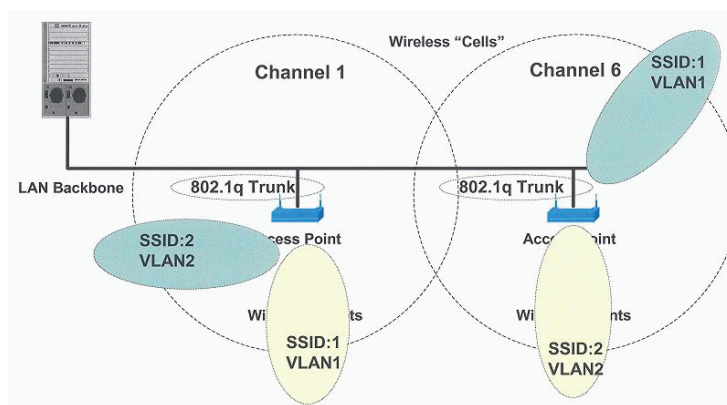
Wireless Technology is growing at a phenomenal rate. Of the many present challenges highlighted by the author, increased security is one of the main challenges for both developers and end users. This chapter presents this important security aspect of implementing a mobile solution in the context of Sydney International airport. After tackling initial challenges and issues faced during the implementation of wireless technology, this chapter demonstrates how security issues and wireless application were implemented at this mobile-intense airport organization. The decision to deploy and manage the wireless spectrum throughout the Airport campus meant that the wireless LAN had to share the medium with public users, tenants and aircraft communications on the same bandwidth. Therefore, this case study also demonstrates invaluable approach to protect unintended users from breach of existing security policies adopted by their corporate network. Authentication and data privacy challenges, as well as complete WLAN connectivity for tenants, public and corporate usage is presented in this case study.

INTRODUCTION

Sydney's International Airport forms the hub of aviation in the Pacific region. It is an 85-year-old site, approximately 8 kilometers from Sydney CBD. With 5 terminals with 34 international, 31 domestic, and 5 airfreight gates, it is the largest airport catering to

8.7 million international and 15.5 million domestic passengers per year (McCubben, 2003). As such, an acute need was felt to ensure a high level of timely and quality service to the entire infrastructure of the airport. Mobile technologies were considered as a crucial ingredient in provision of this service. This need continues to be corroborated worldwide; for

Figure 1. Typical wireless LAN topology



example, at the Airport Council International (ACI) World Assembly in Santiago in November 2000, the airport community expressed the importance of a wireless infrastructure at airports managed by the airport authority (Sydney Airport Corporation Limited, 2000). The following resolution was agreed upon:

Airport Operators should assert control over the use of Wireless Infrastructure at Airports, both inside and outside terminal buildings. Tenants, concessionaires and others should use a common infrastructure for wireless managed by the Airport Operator. In return for this exclusivity, Airport operators should constantly evaluate competing technologies, so as to maintain low costs, increased capacity and security in line with demand for the benefits of all tenants, concessionaires and others.

Meanwhile, in 1998, with the impending Sydney Olympics 2000, Sydney Airport Corporation Limited (SACL) was formed. SACL took it upon itself to embark on the challenge of becoming the sole provider of wireless infrastructure at the International Terminal and Airfield. Past experience indicated that business customers preferred to install their own networks, and wireless—still an evolving technology with no ratified security standards and ease of deployment—gave SACL a unique challenge. This chapter discusses in detail the successful deployment of mobile applications at the Sydney International Airport.

WLAN Architecture and Security Challenges

With a typical wireless LAN (WLAN; see Figure 1), transmitted data is broadcast over the air using radio

waves. With a WLAN, the boundary for SACL's network has moved and is now located in many airfield remote sites. In early 2001, SACL deployed some 120 access points within the International Terminal (Terminal 1) and at various sites on the airfield. Sydney Airport WLAN implementation in early 2001 deployed Cisco Aironet 350 Series Access Points. The IEEE 802.11b standard adopted uses the unlicensed 2.4x gigahertz frequency band, providing only three non-overlapping channels (1, 6, and 11) with data-rates of 1, 2, 5.5, and 11Mbps.

However, without stringent security measures in place, the wireless infrastructure is equivalent of putting Ethernet ports everywhere. Thus, SACL's wireless deployment challenge was to ensure that the implementation of the wireless network did not breach its existing security policies for the corporate network. SACL regards the wireless network infrastructure in much the same fashion as the Internet, an untrusted zone. Even with this view, SACL has still ensured that wireless network security protects Sydney Airport's wireless VLAN. The following outlines the type of wireless and network security utilized at Sydney Airport.

Network Architecture and Security Policy

An important decision when deploying a WLAN is how it will interface back into the corporate infrastructure. The Wireless LAN (WLAN) at Sydney Airport has been designed so that the WLAN infrastructure access is located outside the corporate firewalls (see Figure 2). This approach creates more administrative overhead, because of the need for configuration of the External

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