



# **Wireless LAN Security and Management**

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## **Wireless Security a Concern**

- In the US, the public WLAN market is forecast to include 21 million users and to generate \$3 billion in annual revenues by 2007
- But 30 percent of enterprise network managers cite lack of security as main feature limiting enterprise deployment

# Wireless vs. Cellular?

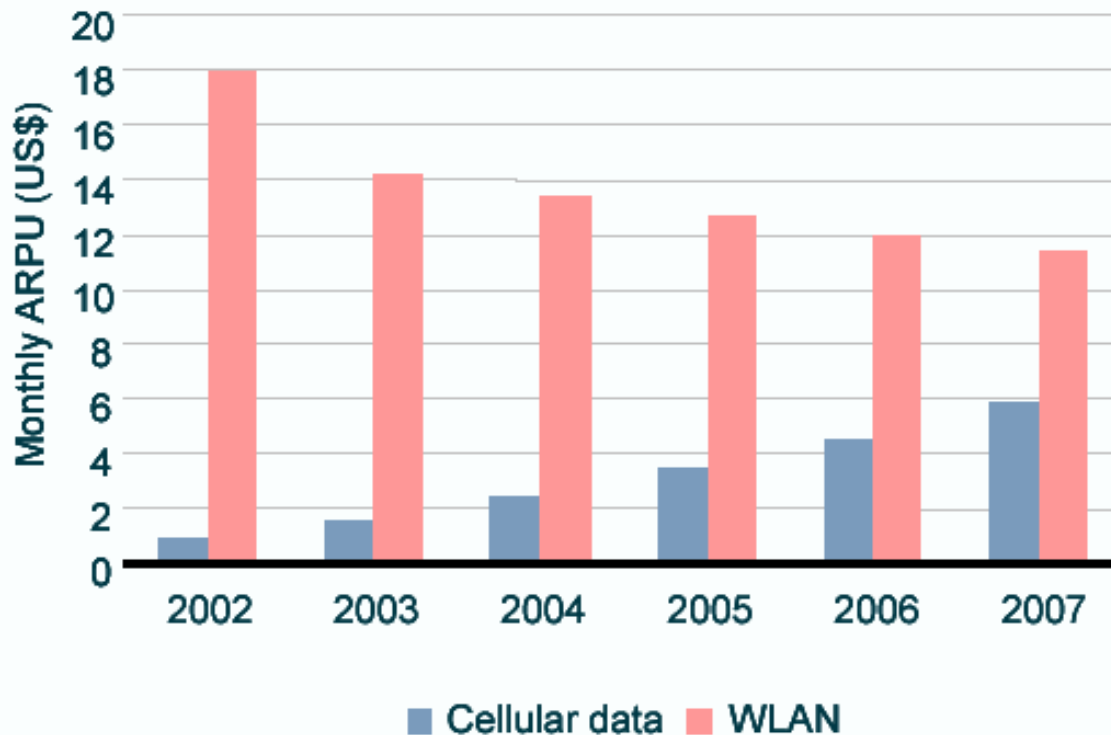


Exhibit 1: WLAN and mobile ARPU in the US [Source: MSDW, 2001 and Analysys, 2002]

# Wireless Consumer vs. Enterprise

- Consumer concerns:
  - Ease of use
  - Not security
- Enterprise concerns:
  - Security, security, security
  - Manageability
  - Reliability

## IEEE Standards

- Network standards developed by the IEEE include:
  - IEEE 802.1: Standards related to network management.
  - IEEE 802.2: General standard for the data link layer in the OSI Reference Model.
  - IEEE 802.3: Defines the MAC layer for bus networks that use CSMA/CD – basis of the Ethernet standard.
  - IEEE 802.6: Standard for Metropolitan Area Networks (MANs).

## What Is Wi-Fi?

- 802.11 refers to a family of specifications developed by the IEEE for wireless LAN technology.
- 802.11 specifies an over-the-air interface between a wireless client and a base station or between two wireless clients
- IEEE accepted the specification in 1997

## What Is Wi-Fi?

- Short for wireless fidelity
- Used generically when referring of any type of 802.11 network, whether 802.11b, 802.11a, dual-band, etc
- Term is controlled by the Wi-Fi Alliance

## What Is Wi-Fi?

- The 802.11 family:
  - **802.11** -- applies to wireless LANs and provides 1 or 2 Mbps transmission in the 2.4 GHz band using either frequency hopping spread spectrum (FHSS) or direct sequence spread spectrum (DSSS)
  - **802.11a** -- an extension to 802.11 that applies to wireless LANs and provides up to 54 Mbps in the 5GHz band, uses an orthogonal frequency division multiplexing (OFDM) encoding scheme rather than FHSS or DSSS



## What Is Wi-Fi?

- The 802.11 family:
  - **802.11b** (also referred to as 802.11 High Rate or **Wi-Fi**) -- an extension to 802.11 that applies to wireless LANs and provides 11 Mbps transmission (with a fallback to 5.5, 2 and 1 Mbps) in the 2.4 GHz band. 802.11b uses only DSSS. 802.11b was a 1999 ratification to the original 802.11 standard, allowing wireless functionality comparable to Ethernet.
  - **802.11g** – uses OFDM to provide 54Mbps in the 2.4 GHz band; backward compatible with 802.11b

## What Is Wi-Fi?

- 802.11g uses same 2.4GHz frequencies as 802.11b
- Adds orthogonal frequency-division multiplexing (OFDM) modulation like 802.11a (which uses 5GHz)
- 802.11g as fast as 802.11a – 52Mbps nominally



# Wireless Terms to Know

- 3G
- ad-hoc mode
- AP
- ARP
- authentication
- baseband
- CDMA
- cell
- DoCoMo
- EAP
- fixed wireless
- Fresnel Zone
- GPRS
- HiperLAN
- HomeRF
- IEEE
- IEEE 802.11
- IEEE 802.11a



# Wireless Terms to Know

- infrastructure mode
- L2TP
- LAN
- laptop
- Mobile IP
- OFDM
- OSI model
- PAN
- PDA
- RF
- roaming
- SMS
- TDMA
- text messaging
- VPN
- VSAT
- WECA
- WEP
- Wi-Fi
- Wi-Fi5
- WLAN
- WTLS

## **Wireless Security Alternatives**

- Wi-Fi Alliance recently introduced an interim security standard called **WPA** (Wi-Fi Protected Access)
- Replaces the highly crackable **WEP** (Wired Equivalent Privacy)
- **WPA** will be superseded by the **802.11i** protocol, probably by the end of next year



## For More

- For more of this presentation or to engage Mike Ellsworth to speak to your group, contact:

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