

Unlicensed and Unshackled: Latest, Newest, Coolest

Kenneth R. Carter

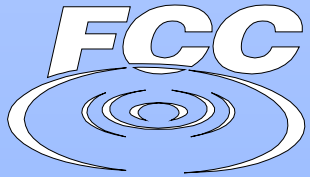
Counsel for Business and Economics

Office of Strategic Planning and Policy Analysis

Federal Communications Commission

April 16, 2004





Unlicensed and Unshackled



Federal Communications Commission
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445 12th Street, SW
Washington, DC 20554

OSP Working Paper Series

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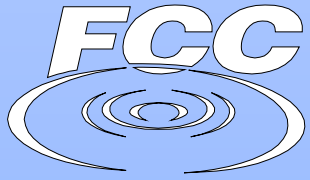
**Unlicensed and Unshackled
A Joint OSP-OET White Paper on
Unlicensed Devices and Their
Regulatory Issues**

May 2003

Kenneth R. Carter
Ahmed Lahjouji
Neal McNeil

Disclaimer

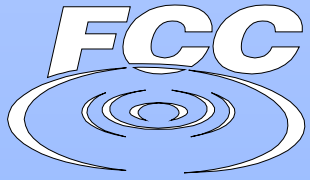
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Unlicensed Operation

*Exception: Unlicensed PCS at 1910 – 1930 MHz.

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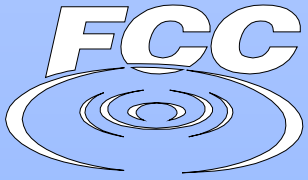


Unlicensed Operation

- Misnomer: Unlicensed Spectrum*

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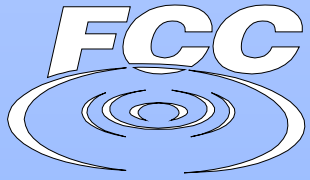
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Unlicensed Operation

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- Low Power Operation without a User License

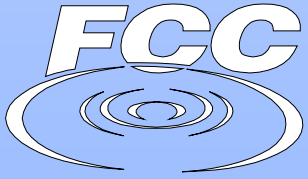
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- No Vested Right to Continued Operation

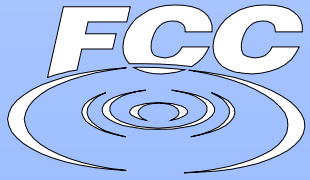
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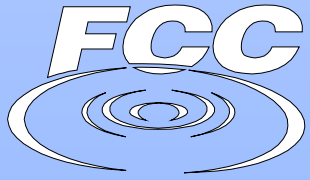
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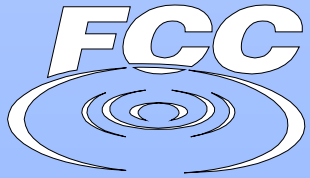
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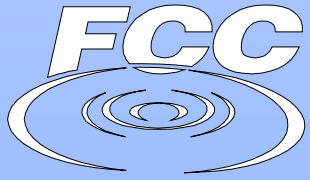
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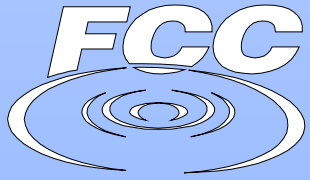
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- Must Receive Equipment Authorization before Marketing/Importation

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Unlicensed Devices Have Second Priority Rights

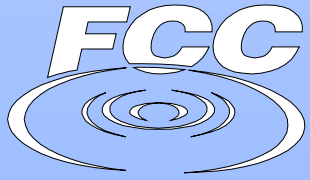
A Part 15 Prometheus steals spectrum from the gods.



Unlicensed Devices Have Second Priority Rights

- Why would anyone want to be a second class citizen of the ether?

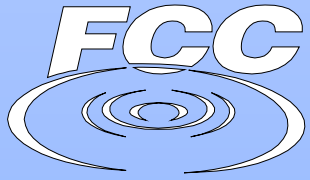
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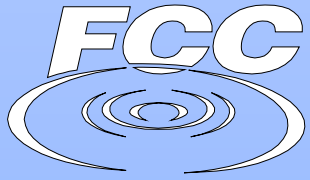
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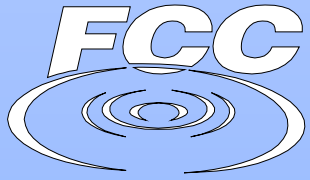


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Uses and Applications

Grill Alert Talking Remote Thermometer



Your steak is ready,
Mr. Marconi

Source: Brookstone

Cordless Phone



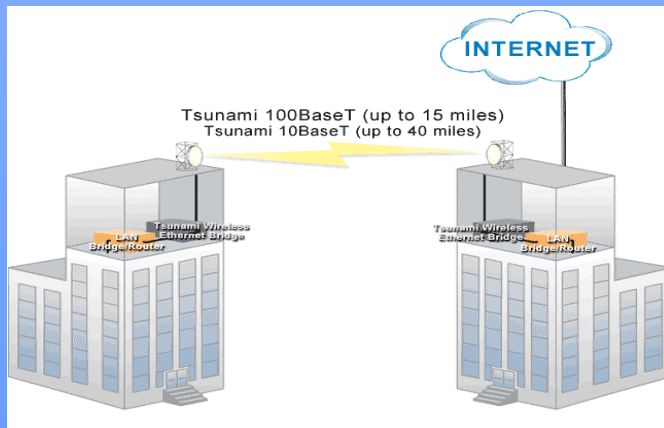
Source: Radio Shack

The M2A Pill

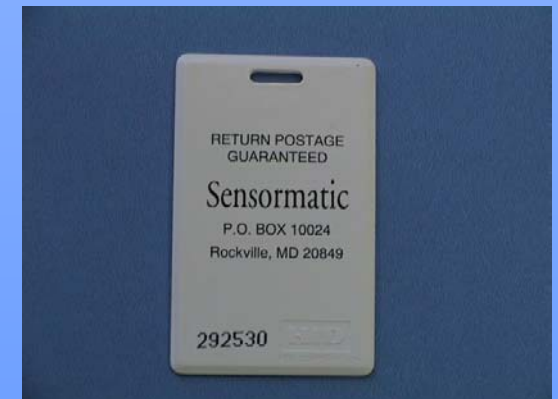


Source: Given

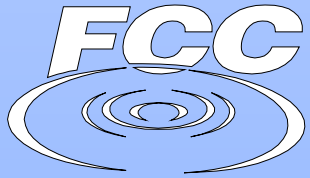
Wireless Ethernet Bridge



Source: Proxim

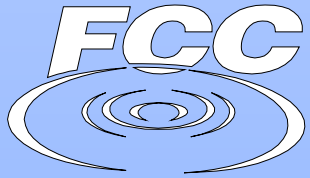


RFID Security System



Uses and Applications

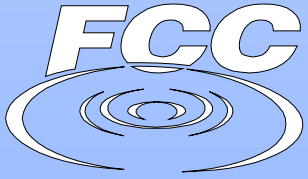
- Person to Person Communications
- Computer Networking and Peripherals
- Fixed Wireless Communications
- Monitoring and Identification
- Sensation, Detection, and Imaging
- Telemetry and Remote Control



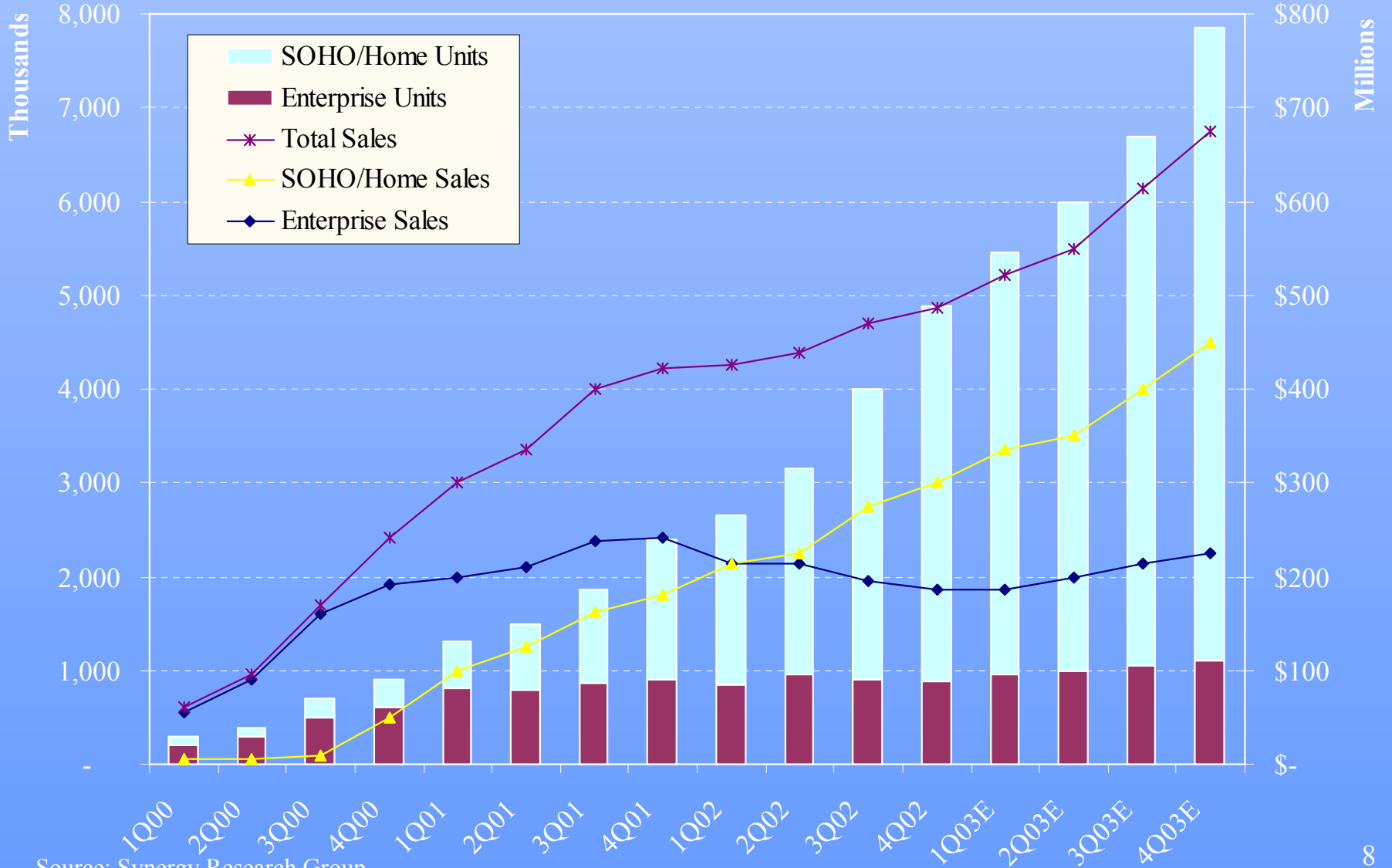
Person to Person Communications

- Voice and Text over short distances
 - Cordless phones, paging devices, walkie-talkies, baby monitors, and wireless microphones.
- Vocera
 - Uses Wi-Fi network to provide wireless PBX
 - No need for additional networking
 - Used in many hospitals

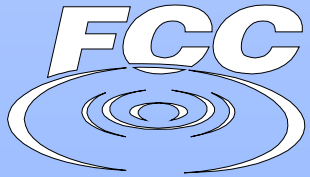




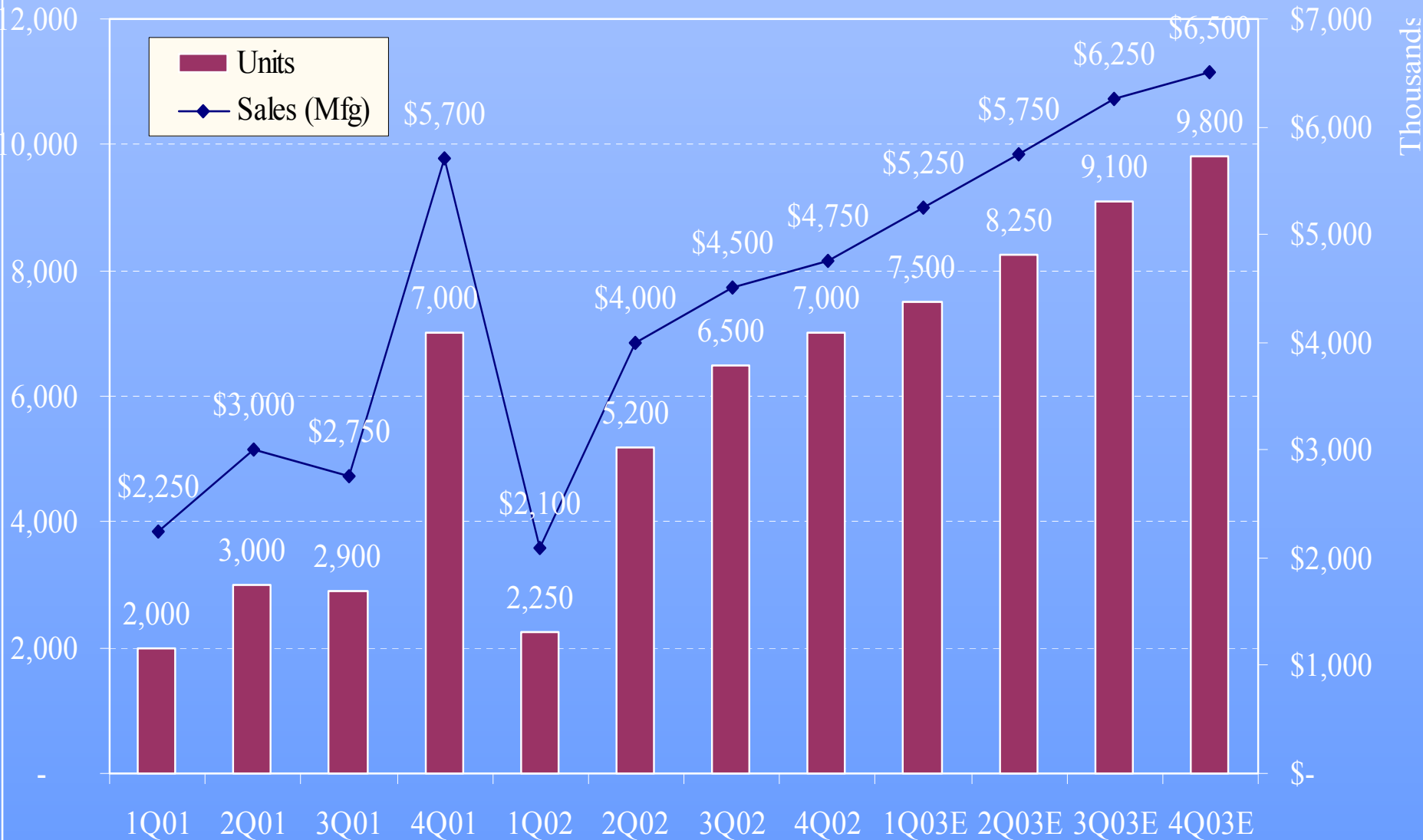
W-LAN Sales (2001 – 2003)



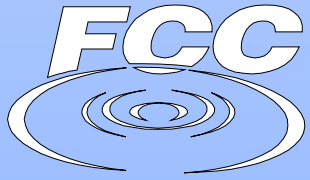
Source: Synergy Research Group



Voice Over W-LAN Phone Market



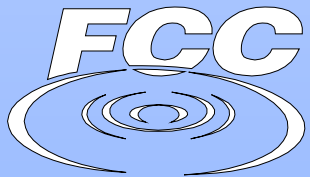
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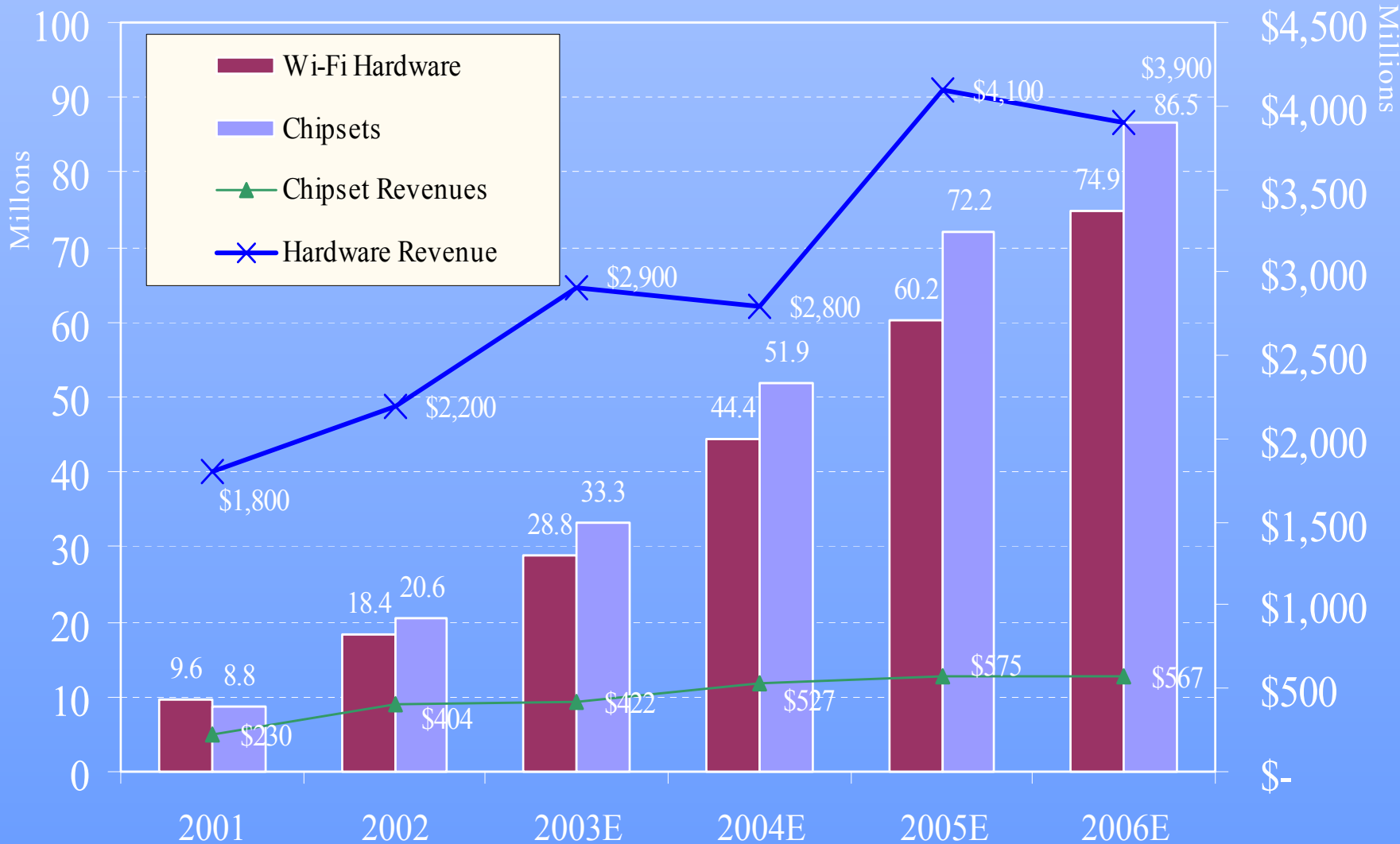
Computer Networking and Peripherals

- Share resources such as media, printers, & scanners
- Provide a broadband connection.
- Bluetooth
- Wi-Fi
- Wi-Max

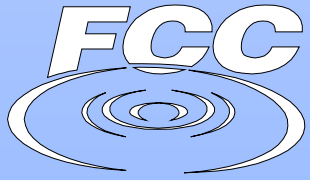




Wi-Fi Hardware and Chipset Sales (World-wide 2001-2007)



Sources: In-Stat/MDR, December 2002 & March 2003



Hot Spot Business Plans

Complementary



Would you like
Wi-Fries with that?

Aggregator



Subscription

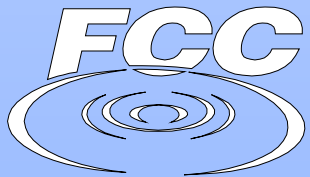


Pay per Flight



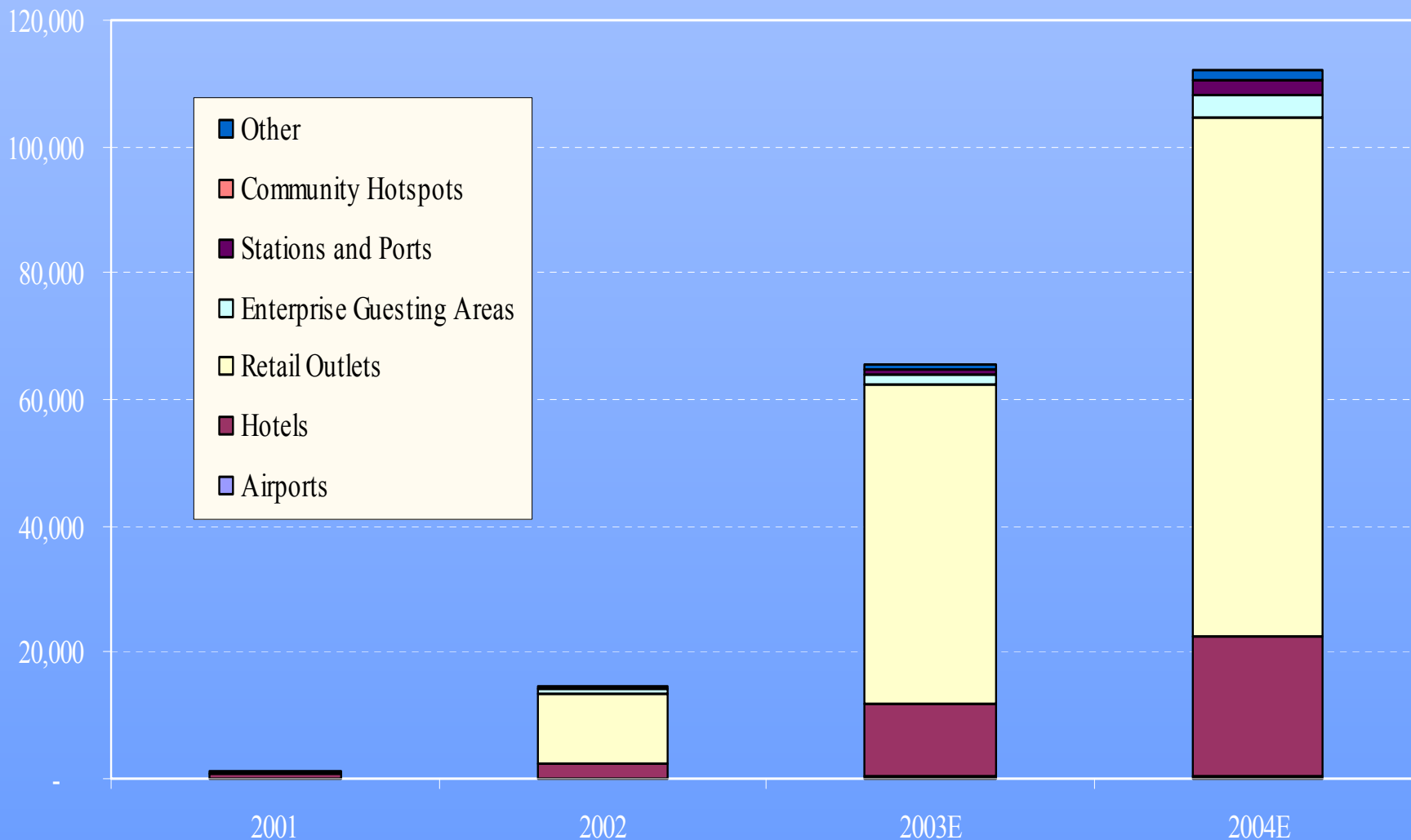
Coffee, Tea, or Wi-Fi?

Hotspots are not just for airports anymore...

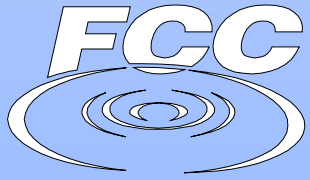


Wi-Fi Hotspots by Location

(Worldwide 2001-2004)



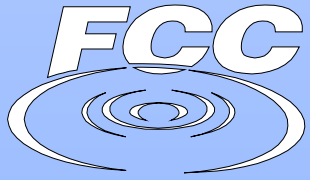
Source: Gartner Dataquest, June 2003



Computer Networking and Peripherals

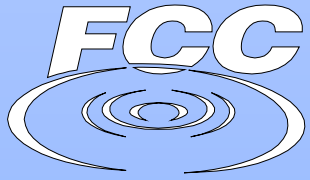
- Verizon is installing Wi-Fi in payphones in Manhattan, Brooklyn, and Queens
- Free for DSL customers
- 349 operational hotspots





Fixed Wireless Communications

- The radio equipment is a pure substitute for wires
- Employed when the cost of stringing wires is prohibitive
- More flexible than obtaining a license
- Uses:
 - WISPs
 - Wireless Lateral Links from Fiber Rings
 - Mobile Network Backhaul
 - Service Restoration and Temporary Communications
 - Alternative Infrastructure
 - LAN-to-LAN Bridges



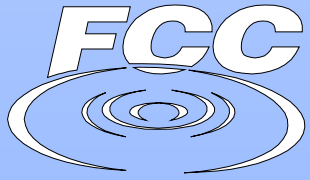
Terabeam Gigalink

- Millimeter wavelength (57.05 to 64 GHz)
- Speeds:



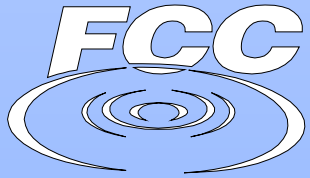
- Fast Ethernet (100 Mbps)
- OC-3/STM-1 (155 Mbps)
- OC-12/STM-4 (622 Mbps)
- Gigabit Ethernet





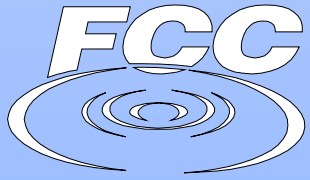
Monitoring and Identification

- The low power and localized range makes unlicensed devices well suited for monitoring and tracking when objects are in motion or too numerous to be physically touched or counted individually.
- RFIDs - “The New PC!”



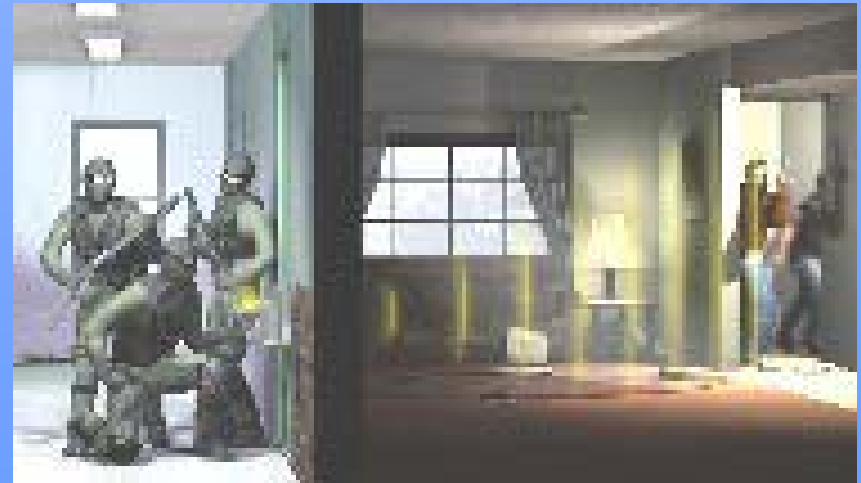
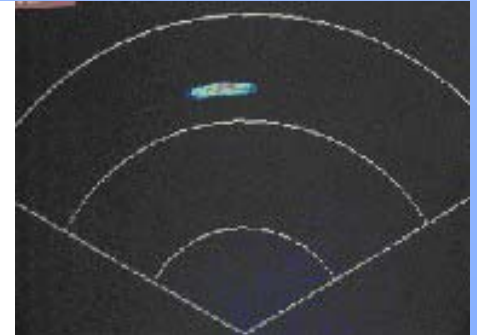
RFIDs

- \$91.5 million in 2003 to \$1.3 billion in 2008 for U.S. retail supply chain
- Helps retailers combat the \$31.3 billion of inventory lost
- Wal-Mart's mandated its suppliers to put RFID tags carrying EPCs on goods starting in 2005
- Nokia Unveils RFID Phone Reader
- Enables cell phones to scan RFID tags and transmit the data
- Oracle's Sensor-Based Services
 - Enables existing software products to incorporate data from RFIDs
 - Compliance with recent RFID mandates from Wal-Mart, the Department of Defense, Metro, Target, and others
- Bartech Systems - E-fridge minibar for hotel rooms
 - RFID sensors to detect the presence of food products
 - Monitor what's inside and when a guest has had a drink or snack notifies a central property management system via Ethernet or 802.11



Sensation, Detection, and Imaging

- A miniature radar to sense:
 - distance, motion, or the composition of materials
- Time Domain's RadarVision
 - Provides through-wall imaging for the military, law enforcement, and fire and rescue
 - The signal can penetrate most building materials





Telemetry and Remote Control

- Wireless telemetry is finding applications in:
 - Medicine
 - Household appliances
 - Alarm systems
 - All kinds of devices
- Cool Stuff!!

The M2A Pill



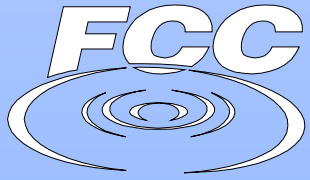
Unlicensed and Uncool



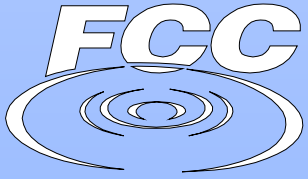
Talking Remote Thermometer



Source: Brookstone

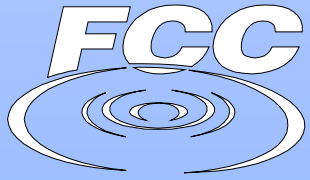


Summary



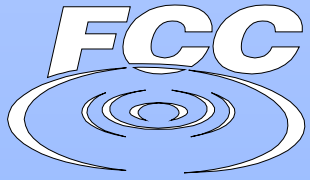
Summary

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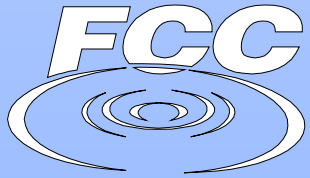
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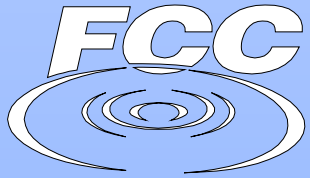
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- Benefits
 - Applications not achievable with wires
 - Where devices can tolerate an unprotected environment
 - Where license is not cost-effective
 - Flexibility and Innovation



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- Benefits
 - Applications not achievable with wires
 - Where devices can tolerate an unprotected environment
 - Where license is not cost-effective
 - Flexibility and Innovation
- Unlicensed operators are well behaved spectrum users
- Policy question: Which circumstances call for a licensed regime and in which is an unlicensed regime preferable?

Thank you!

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