

# Drug Enforcement Administration Office of Investigative Technology

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Emerging Communications

New York

April 8, 2010

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May Not Be Used Or Disclosed Outside DEA

# Next Generation Wireless (NGW)

Office of Investigative Technology  
Operational Support Unit

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- Emerging Communications Challenges
- Electronic Surveillance Reform
- Communications Records Exploitation

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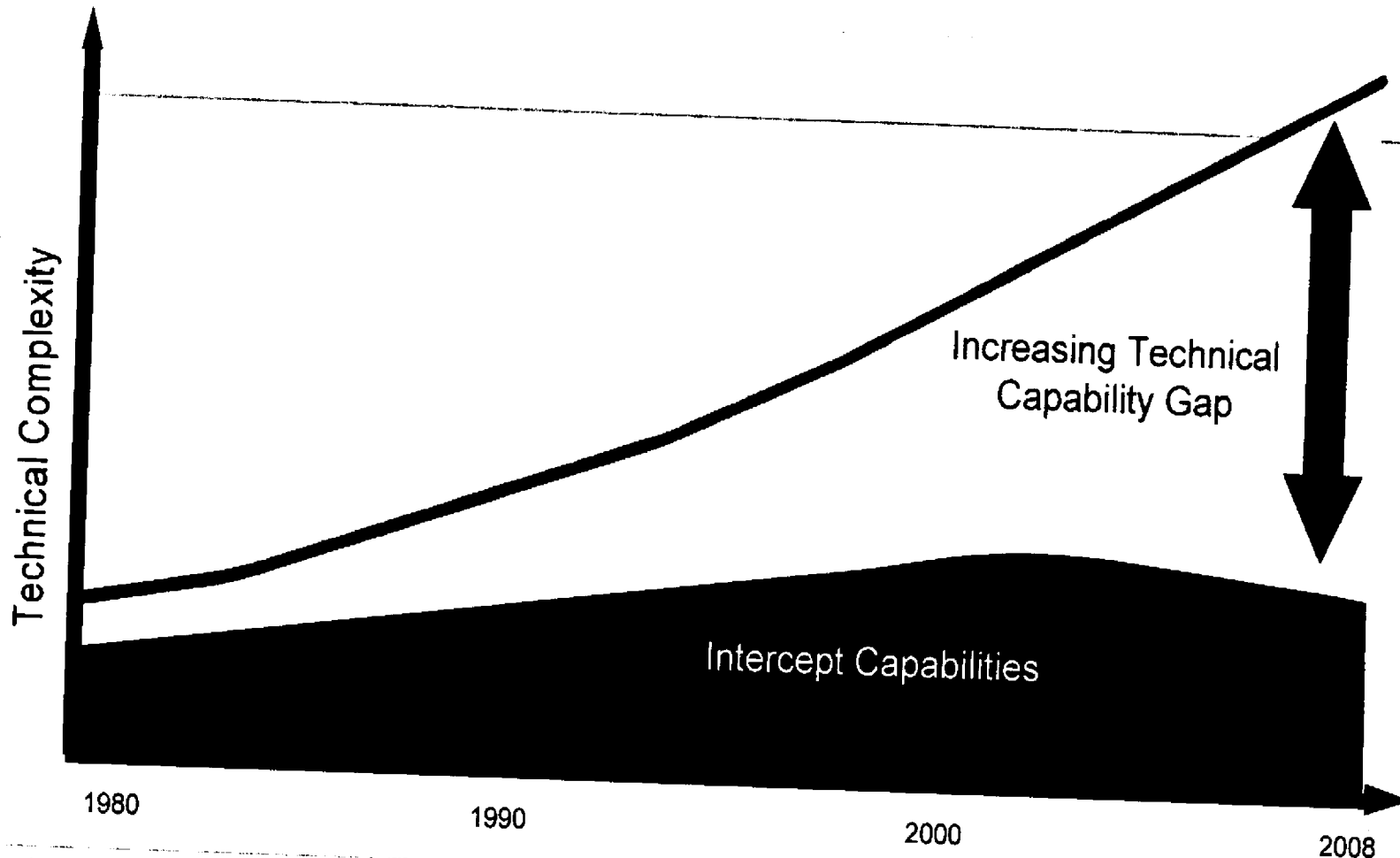
# Technology Transition

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- World-wide Industry full-scale convergence and transition from traditional circuit-switched communications to I.P. - based communications throughout the world.
- Wireless data (i.e., Smart-phones, mobile broadband) is driving the telecommunications industry and creating new revenues.
- Consumer's growing demand for wireless data services and computer-like capabilities (wireless apps) such as Skype, Facebook, email, Chat, IM, encryption, peer-to-peer, Location based Services (LBS), multi-media, VoIP.
- AT&T wireless data traffic is doubling every quarter and being driven by messaging, internet access, applications and related services.

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# ELSUR Capabilities



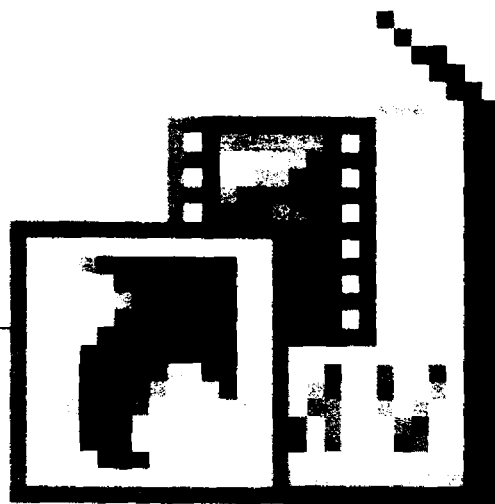
Analog Solid State Revolution

Digital Electronics and Computer Revolution

Telecommunications Revolution

Convergence of Wireless and Internet Technologies

Evolution of Technology



Did You Know-

# Definitions

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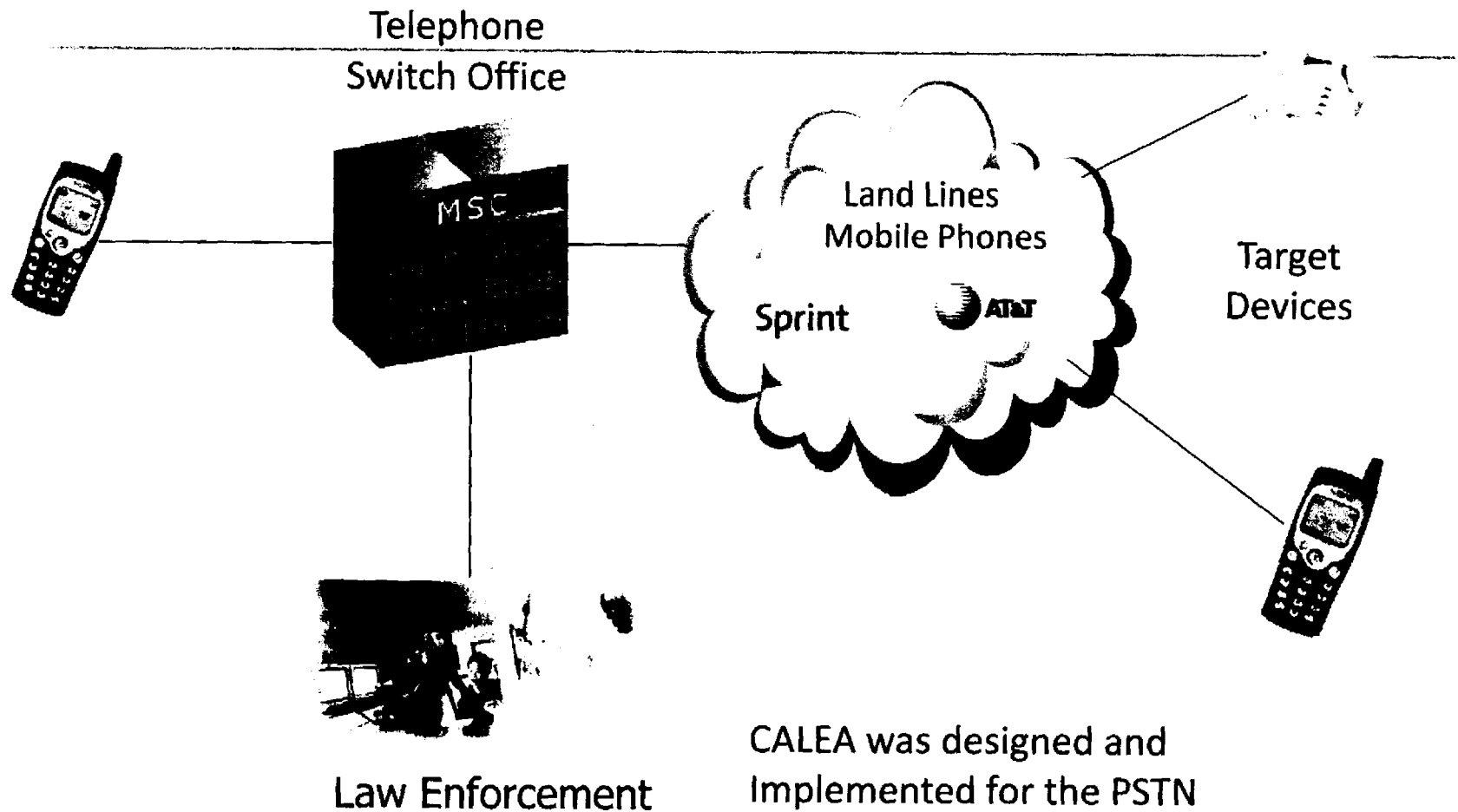
- Voice Over Internet Protocol – VOIP
- Smart-phone
- Public Switched Telephone Network – PSTN
- Circuit Switched – Traditional Telephone Comms
- Packet Switched – I.P. based - Data Communications
- Convergence
- App Store (Itunes, Google, RIM App World)
- WiFi

# Communications Assistance For Law Enforcement Act (CALEA)

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  - - Common carriers
    - Facilities-based broadband Internet access providers
    - providers of interconnected “Managed” Voice over Internet Protocol (VoIP) service.
  - All defined as “telecommunications carriers” for purposes of CALEA

# Traditional Switch Based Intercept



CALEA was designed and implemented for the PSTN Infrastructure depicted here.



# Emerging Communications Challenges

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- Target Mobility
- Target Identification (WiFi)
- IP Based Communications
- Peer to Peer Communications
- Multiple types of Broadband Services (e.g., Wireless, Cable, FIOS)
- Encryption
- Authentication
- Data Retention (Text Messages, I.P. Logs)
- (b)(5), (b)(7)(E)

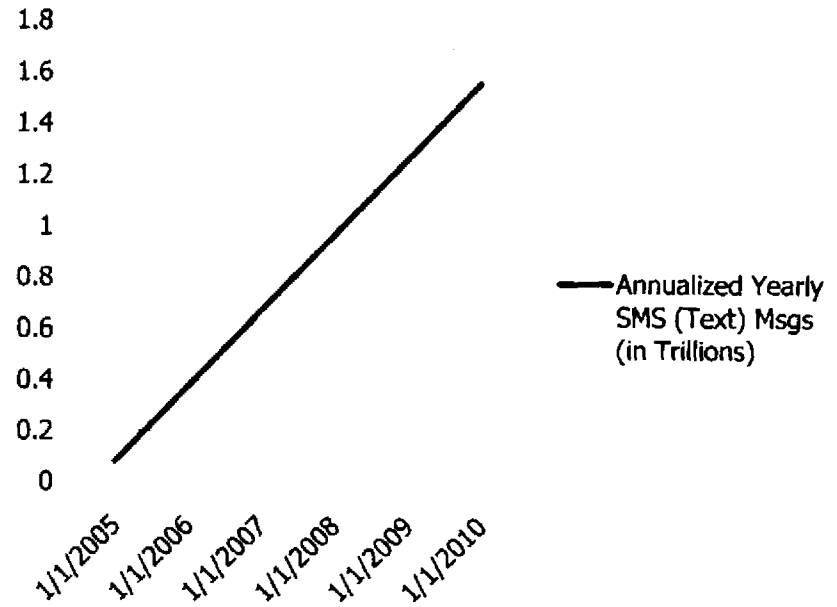
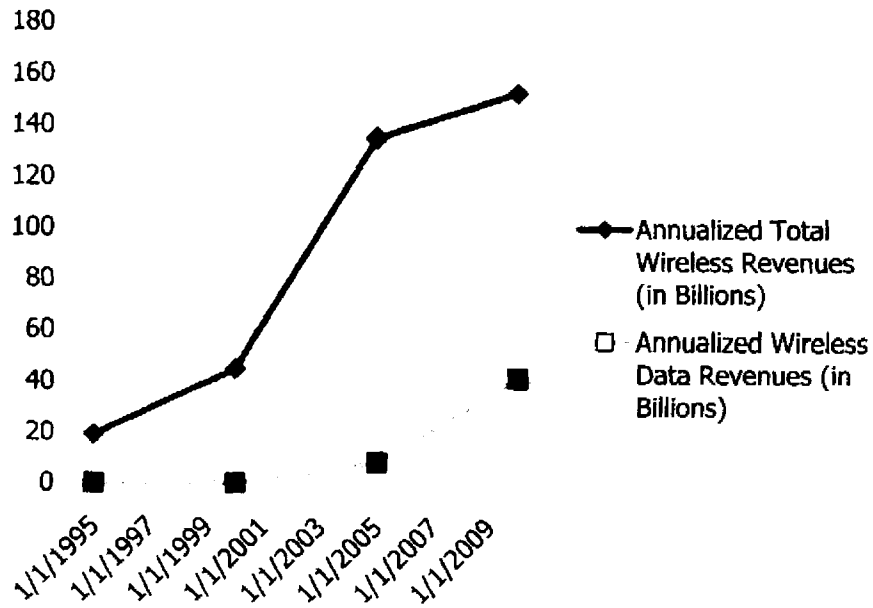
# Mobile Device Capabilities

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## ■ Hand-held gaming and Smart-phone Devices

- Voice over I.P. (VoIP)
- Email
- Text Messaging (SMS)
- Instant Messaging (IM)/ Chat
- 90+ different Voice over IP (VoIP) applications available
- Web-based Virtual Worlds. (Second life, World of Warcraft)
- Wi-Fi (b)(7)(E)
- 3<sup>rd</sup> party GPS Mapping Applications
- Social Networking (Facebook, Flickr, MySpace etc...)
- Web-based email (Hotmail, Yahoo etc.. )

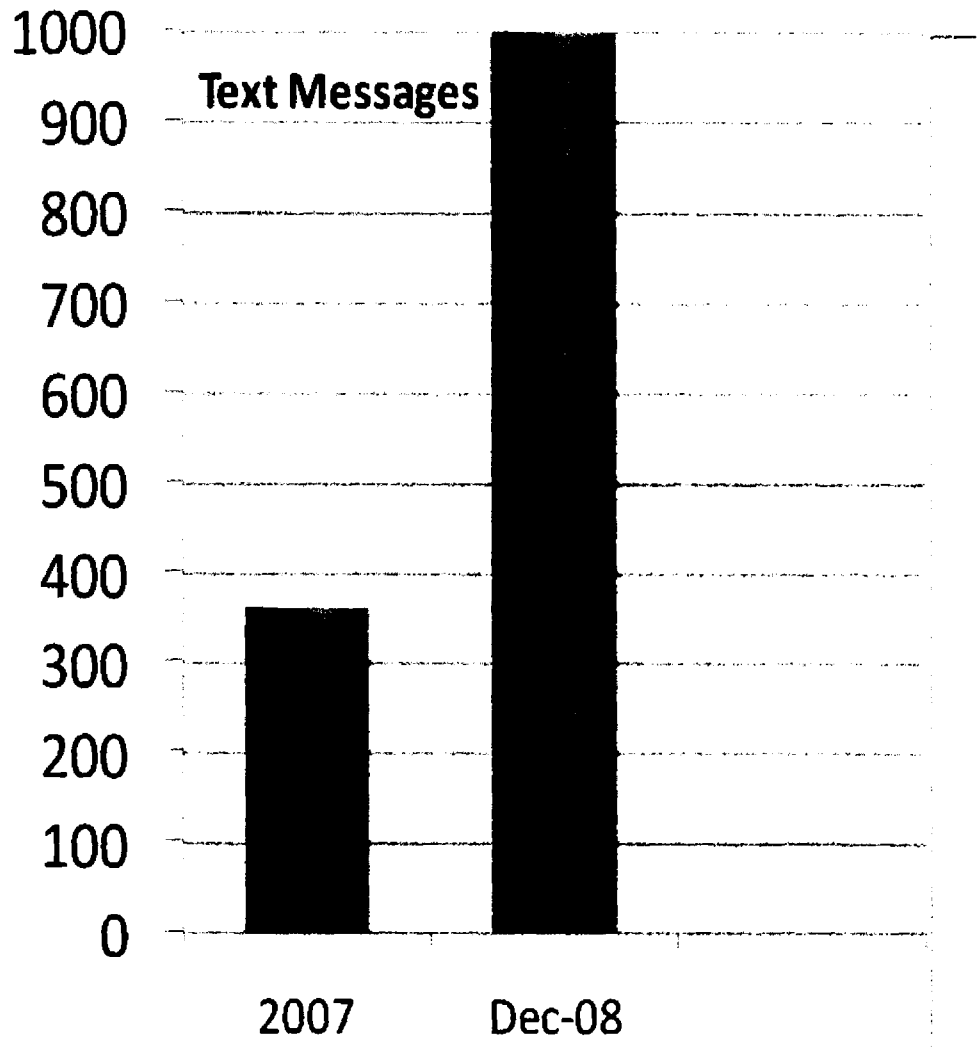
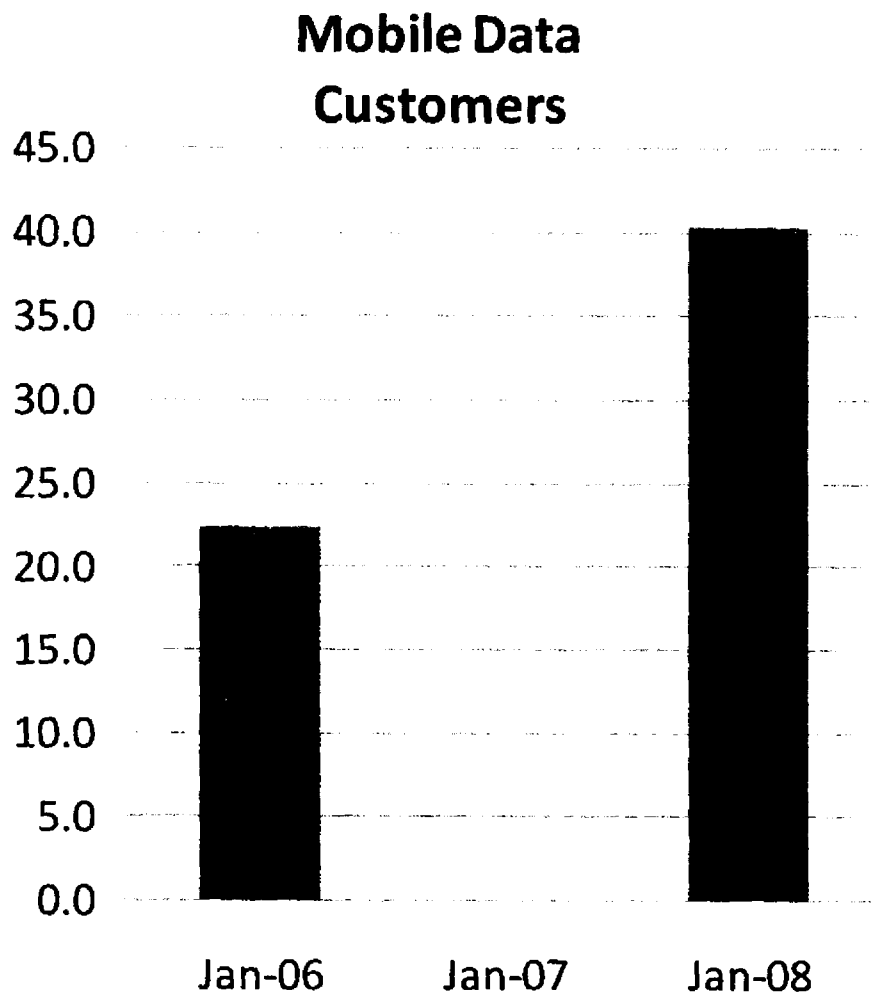
# WIRELESS EVOLUTION



year-end figures

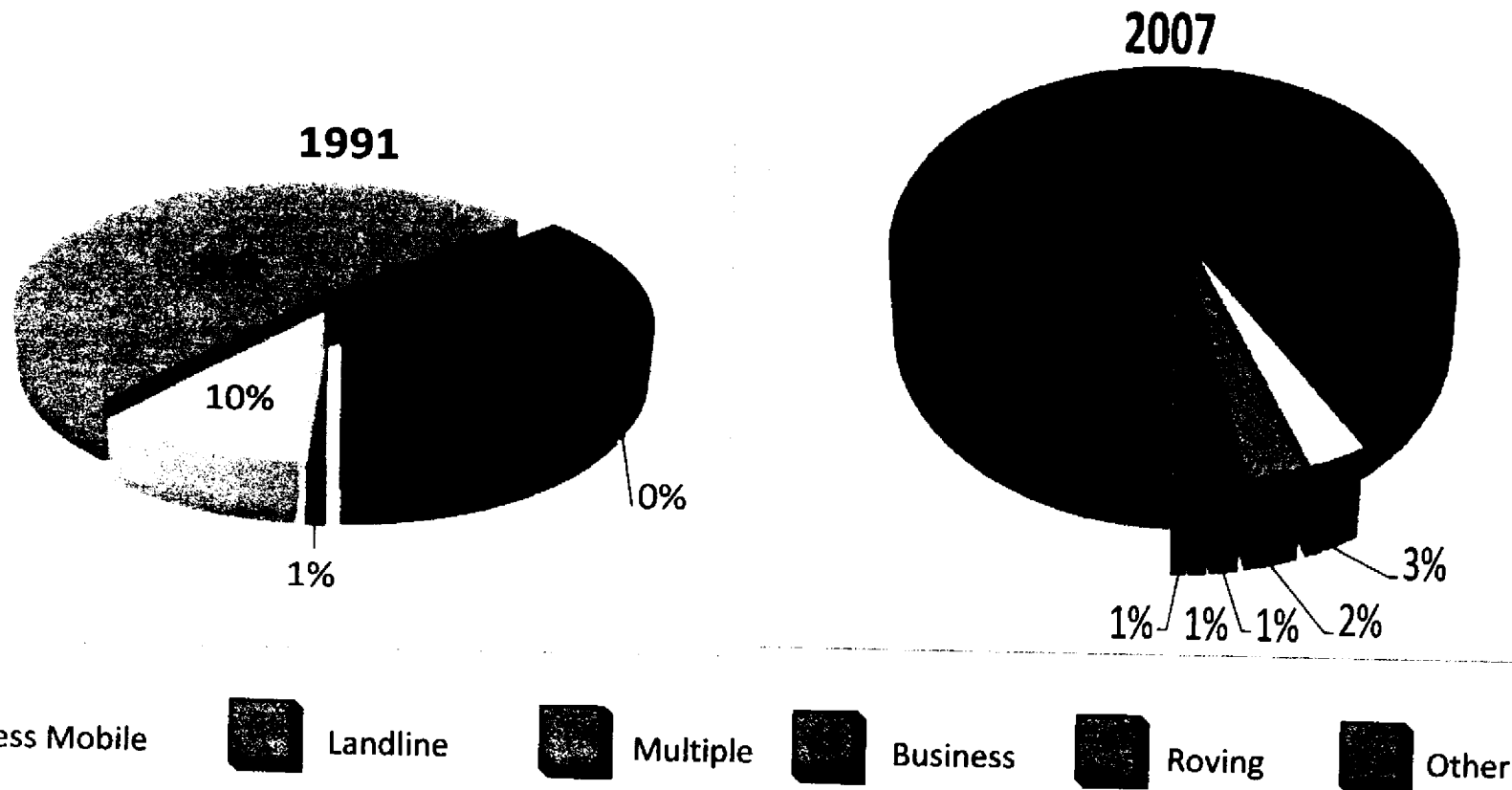
	Dec-08	Dec-09	Dec-00	Dec-05
Annualized Total Wireless Revenues	\$152.6B	\$113.5B	\$45.3B	\$19B
Annualized Wireless Data Revenues	\$41.5B	\$8.5B	\$211.2M	N/A
Annualized Yearly SMS (Text) Msgs	1.56T	81B	N/A	N/A

# Shift from Mobile Voice to Mobile Internet and Text Messaging- Data Communications



# Shift in Judicial Intercept Trends

Wireless communications technologies are the preferred Method of communications for drug traffickers



# Future Communications

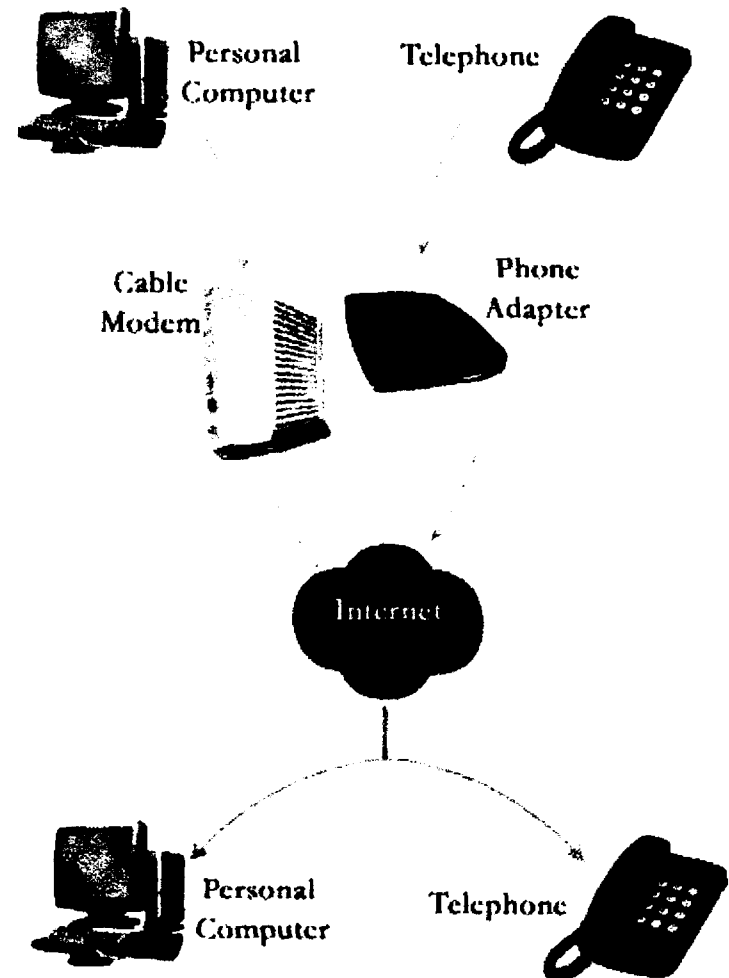


# Voice over I.P. (VoIP)

A communications method that converts analog voice to standard I.P. Language, so that it can be transmitted over the internet.

Managed VoIP: (Vonage, Magic Jack, Google Voice)

Unmanaged VoIP: (Skype, Fring, and other 3<sup>rd</sup> party Apps)



# Skype

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**An unmanaged provider of peer-to-peer global communications via the internet**



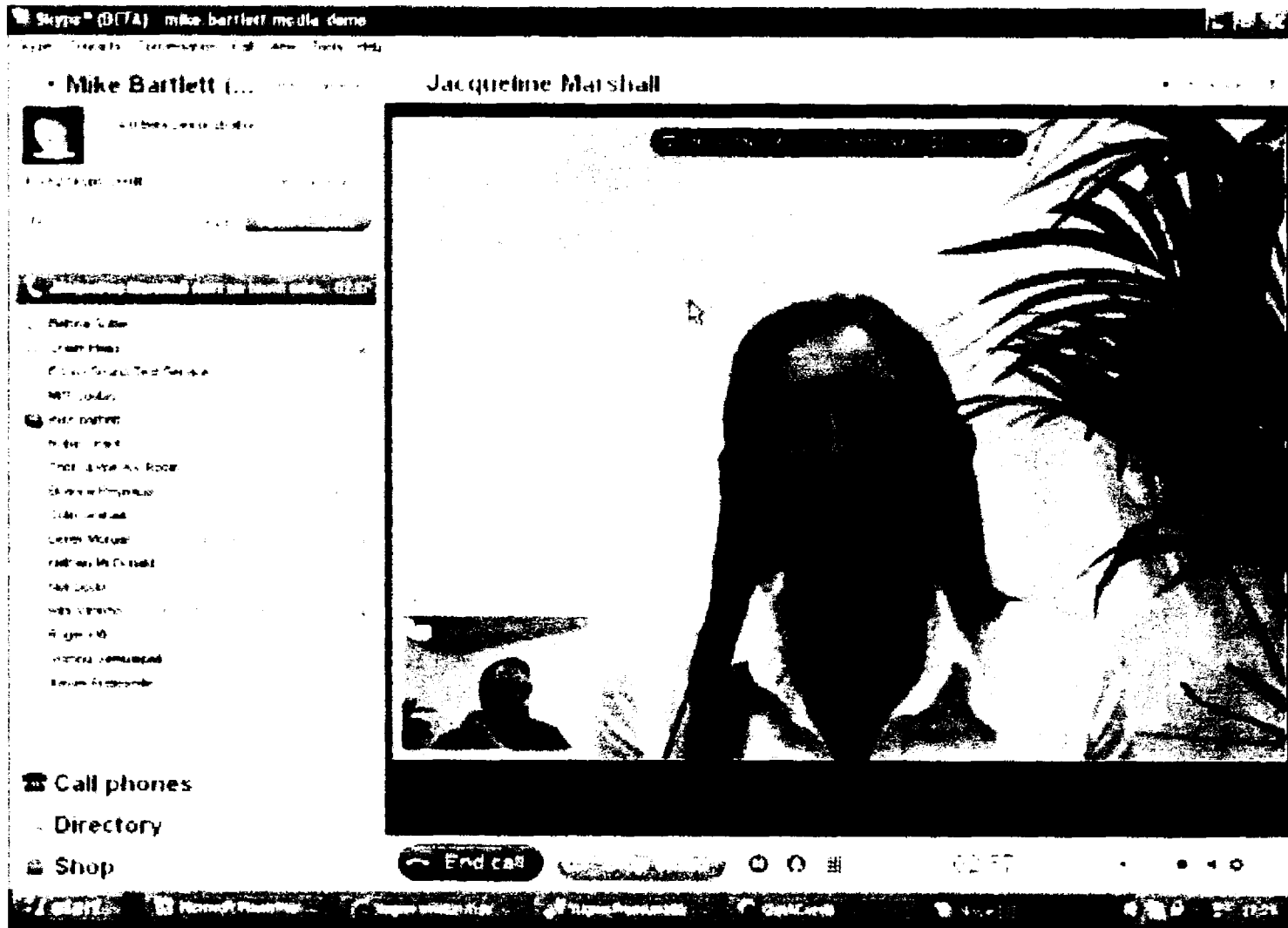
# Skype

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- Supports three primary methods of communications:
  - Skype to Skype: Free, Encrypted Computer to computer voice, chat, IM, video
  - Skype-Out: Unencrypted I.P. call to traditional telephone (cellular/ landline). CDR's and I.P. Logs available.. Cost per call.
  - Skype-In: Traditional cellular or landline unencrypted call to a Skype assigned number. Cost per call.



An unmanaged provider of encrypted peer to peer global communications via the internet



# Google Voice-Managed VoIP

www.zdsoft.com



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**Research in Motion**

**Blackberry**

**Records Exploitation**

# Blackberry

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A communication device developed by Research in Motion (RIM), Waterloo, Canada. Provides encrypted data communication services over wireless networks.

Not subject to U.S. CALEA laws.

Service is provided by multiple providers, internationally and domestically, such as AT&T, Verizon, T-Mobile, Sprint.

# Basic Architecture of Blackberry

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- BIS (Blackberry Internet Service):  
Provides subscribers with delivery of email messages, web-browsing. Blackberry.net (Encrypted email service hosted by RIM/) and integrated webmail accounts (Hotmail, Yahoo, Gmail...)

(b)(4)



# Basic Architecture of Blackberry

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- BES (Blackberry Enterprise Server).

Designed to establish encrypted, two-way communications between blackberry devices among user defined groups

(b)(7)(E)

- Also marketed to the public

(b)(7)(E)

# PIN to PIN Messaging

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- PIN to PIN Messaging.  
Encrypted peer to peer messaging between blackberry devices.
- Messages can be sent across networks, worldwide, via a central relay managed by RIM.

10/23/05



## What is **UBITRACK?**

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- **UBITRACK** is a tracking system that combines **GSM** and **GPS** technologies with internet, allowing in a fast simple way the **monitoring** and localization of **vehicles**, assets, and persons worldwide, in real time, 24 hours a day, 365 days a year.
- <http://www.ubitrackonline.com/gps/index.aspx>

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# I-Touch Demo

# I-Phone

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- A Smartphone manufactured by Apple Inc. and currently offered only through AT&T- (U.S.)
- Supports multiple applications through Apple iTunes that facilitate voice and data communications over the cellular and WiFi networks.
  - Skype, Fring, Free SMS, Email, Facebook

[REDACTED]

# IMSI & IMEI

An **International Mobile Subscriber Identity** or **IMSI** (pronounced /imzi/) is a unique number associated with all GSM and UMTS network mobile phone users. It is stored in the SIM inside the phone and is sent by the phone to the network.

**IMSI: 310 150 123456789**

**MCC 310 USA**

**MNC 150 AT&T Mobility**

**MSIN 123456789**

The **International Mobile Equipment Identity** or **IMEI** (pronounced /aimi : /) is only used to identify the device, and has no permanent or semi-permanent relation to the subscriber. However, the IMEI is valuable information for determining the types of applications and features the device can support.

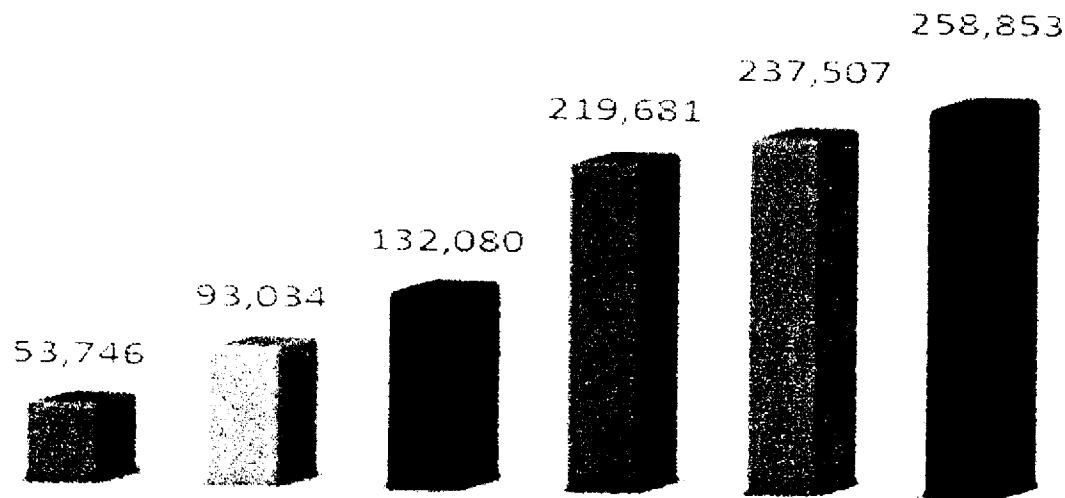
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# **Wireless Fidelity (WiFi)**

# Wi-Fi Cell Phones Expected to Double in Two Years

8-28-09 CIO.com

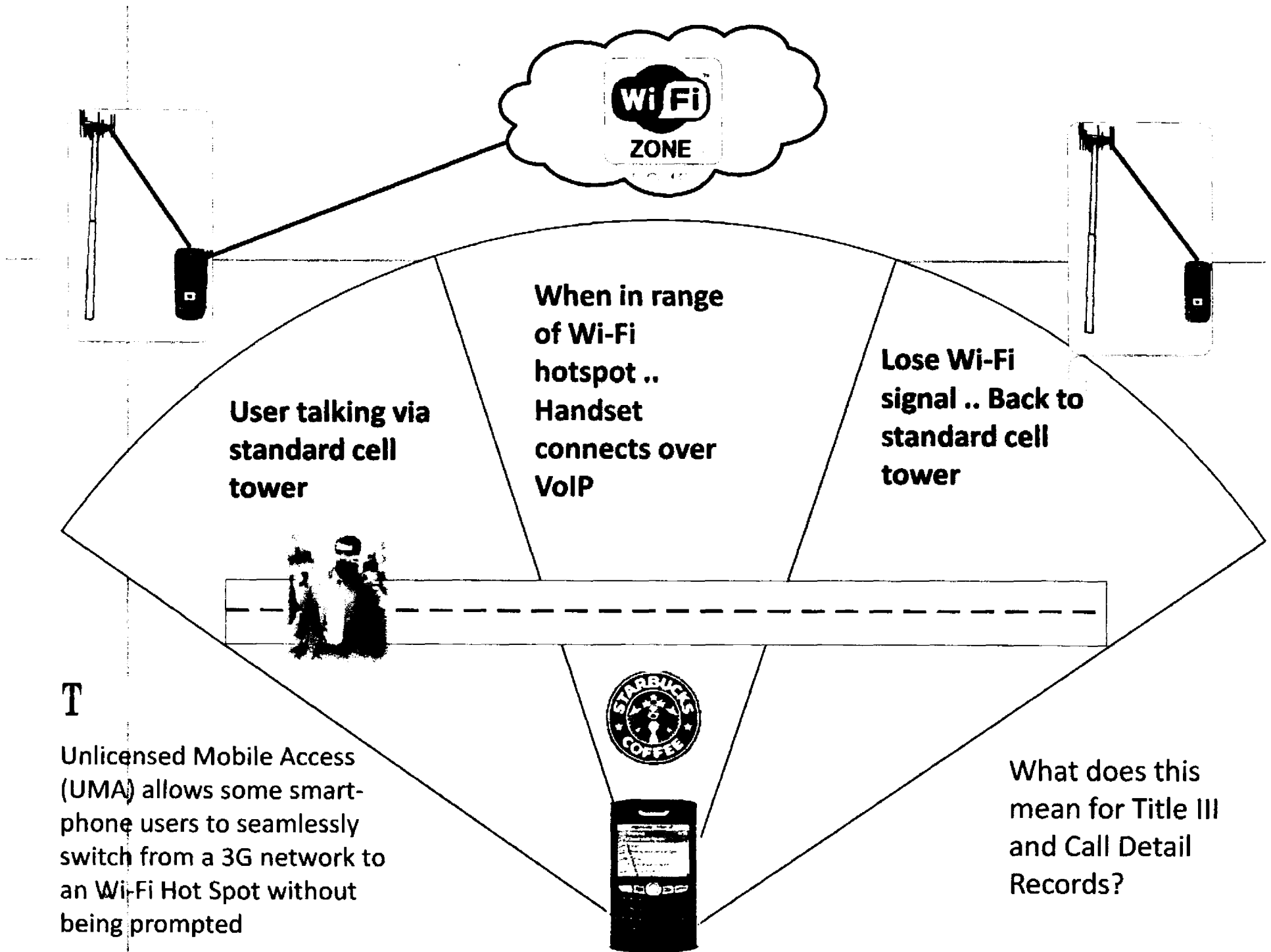
400% Growth in WW Public Wi-Fi Hotspots: 2004-2009 (June)



Source: JMWire, 2009

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**T** Unlicensed Mobile Access (UMA) allows some smart-phone users to seamlessly switch from a 3G network to an Wi-Fi Hot Spot without being prompted

What does this mean for Title III and Call Detail Records?

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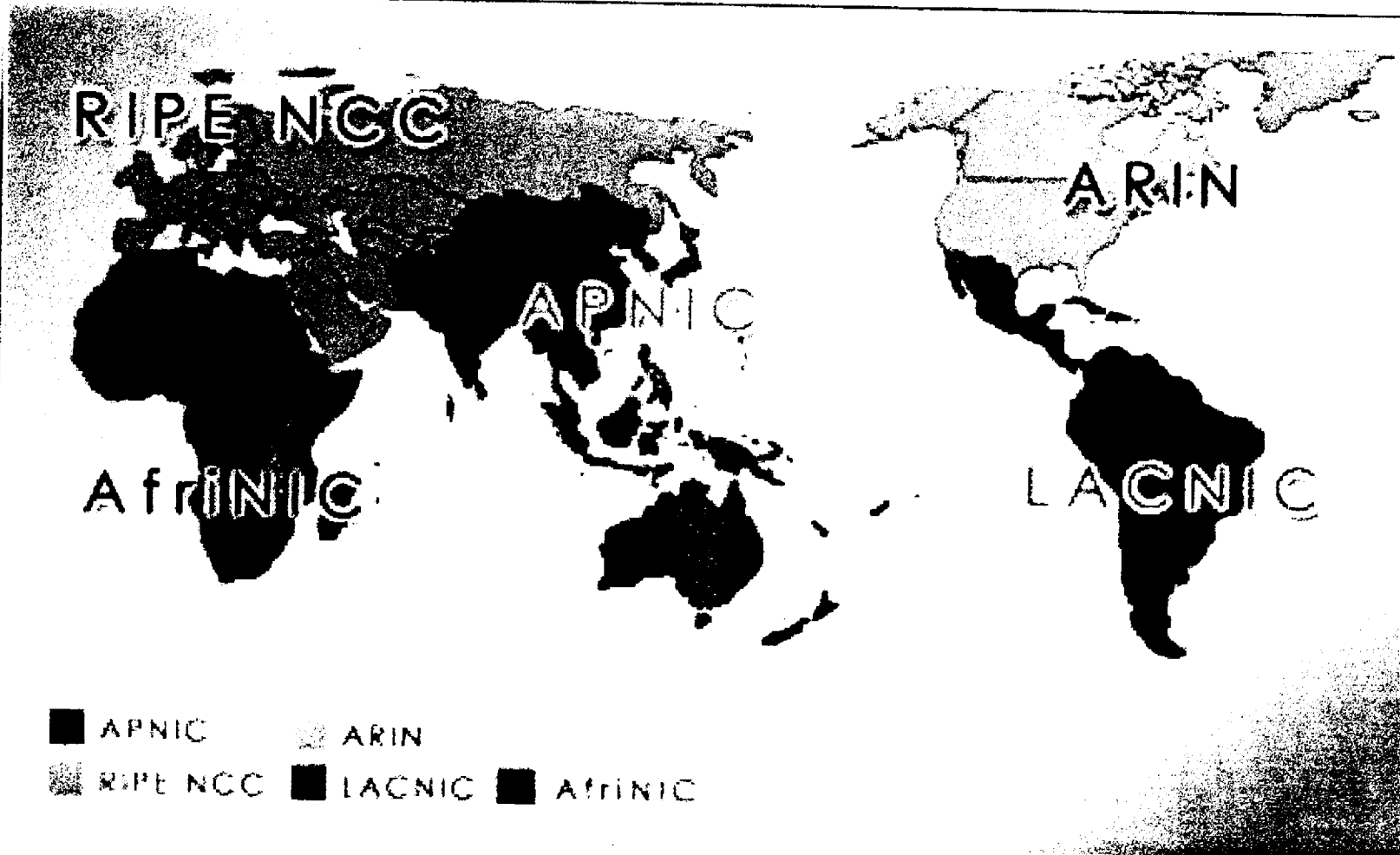
# **Internet Protocol Address**

**I.P. Address**

**Resolution**



# Other I.P. Address Registry Authorities




# Social Networking

- A social network service essentially consists of a representation of each user (often a profile), his/her social links, and a variety of additional services, such as pictures. Most social network services are web based and provides means for users to interact over the internet, such as e-mail and instant messaging
- Features offered by these sites, such as ease of use and user control of privacy settings, **offer an alternative means of communication to criminal entities.** Facebook, MySpace and Sonico, as well as others, offer features which give the user control of how they communicate and exchange information

The logo for the social network site hi.com, featuring the lowercase letters "hi" in a stylized, lowercase font.The logo for Facebook, consisting of the word "facebook" in a white, lowercase, sans-serif font on a black rectangular background.The logo for MySpace, featuring the word "myspace" in a lowercase, sans-serif font, with the tagline "a place for friends" and two stylized human figures below it.The logo for Sonico, featuring the word "sonico" in a lowercase, sans-serif font with a stylized "s" that incorporates a hand icon.The logo for YouTube, featuring the words "You Tube" in a lowercase, sans-serif font, with "You" and "Tube" separated by a red play button icon.The logo for Orkut, featuring the word "Orkut" in a stylized, lowercase, sans-serif font with a decorative flourish above the letter "k".

# Facebook

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- Exploiting social networking accounts allows law enforcement to obtain information to further an investigation, including associates (friends), email addresses, phone numbers, photos, credit card information, etc. 

(b)(7)(E)



- 2703c
- Preservation Letter
- 2703d
- Search Warrant

# Virtual Worlds Defined

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- A virtual world is an animated three-dimensional computer generated world that allow users the ability to interact within the environment by virtue of an avatar (computerized character that the user chooses to represent themselves).
- The user's avatar interacts and communicates with other users in the virtual world through VoIP and/or instant messaging.
- In simple terms, the avatar is a remote controlled character or proxy.

# Virtual Gaming Example

[www.zdsoft.com](http://www.zdsoft.com)



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# Summary

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**Q & A**

**Handouts**

# Drug Enforcement Administration Office of Investigative Technology



## Diminishing Electronic Surveillance Capabilities in the Communications Age

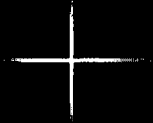
St. Louis Division

August 10, 2010

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# AGENDA



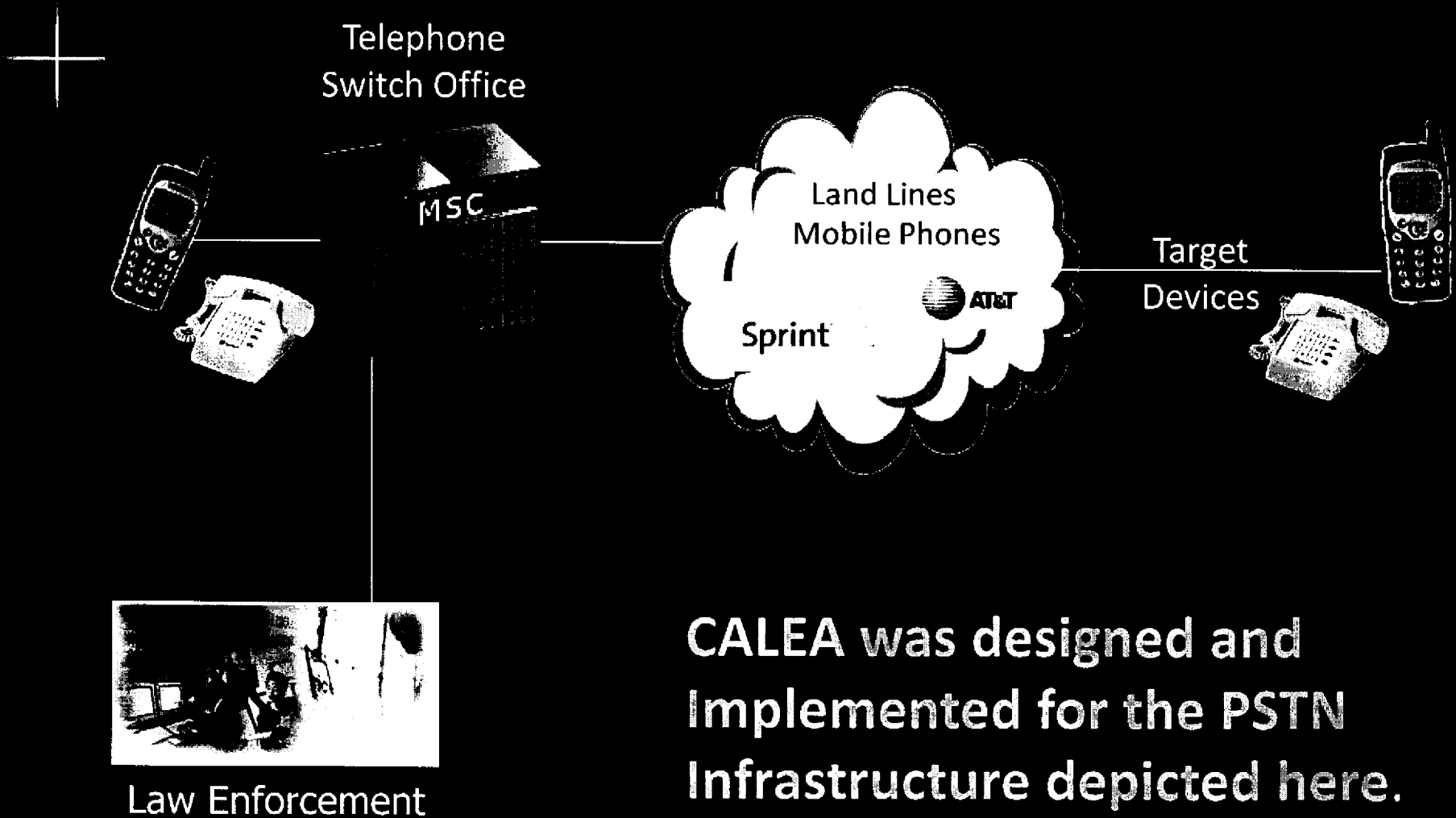
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- Convergence of circuit and packet switched technologies (2G, 3G, 4G).
- Emerging Communications Challenges
- Legal Challenges
- Resource Challenges

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# Traditional Switch Based Intercept 1994 Landscape



CALEA was designed and implemented for the PSTN Infrastructure depicted here.

# Drivers

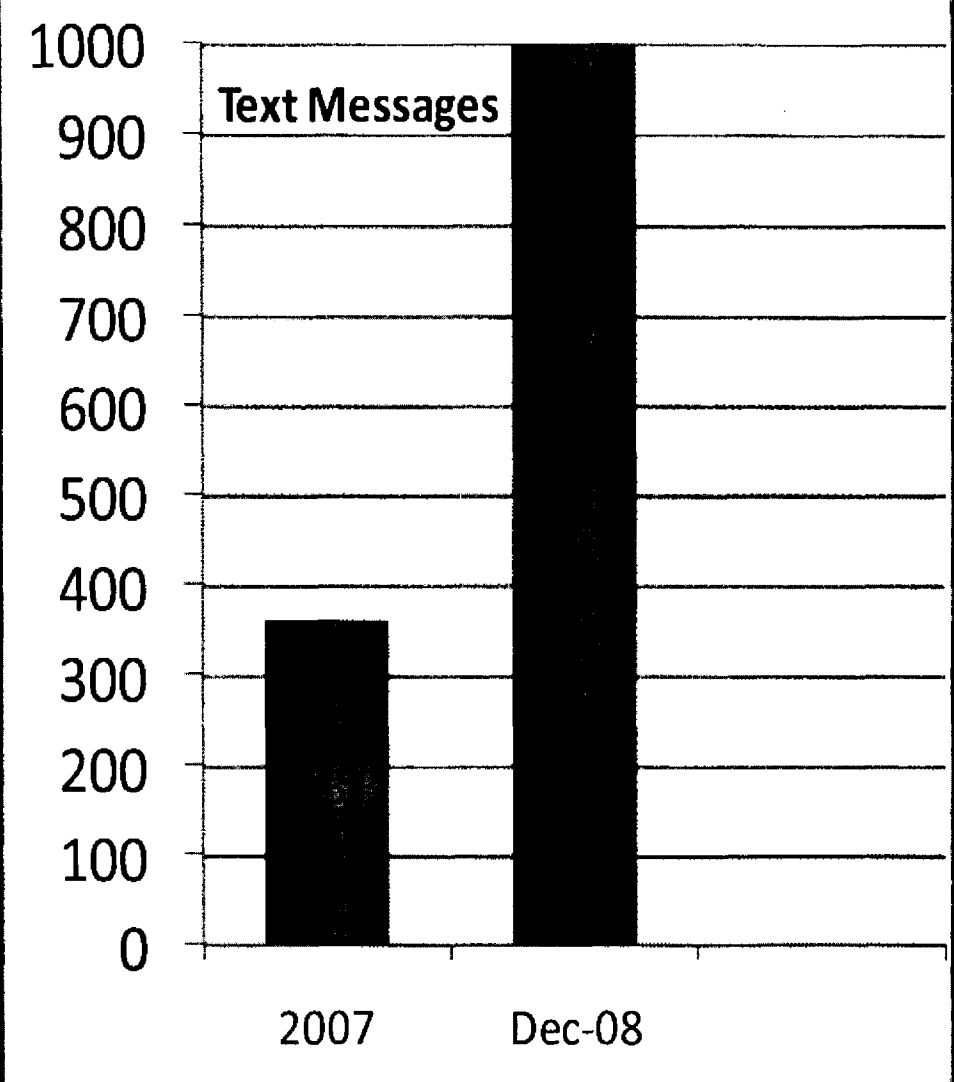
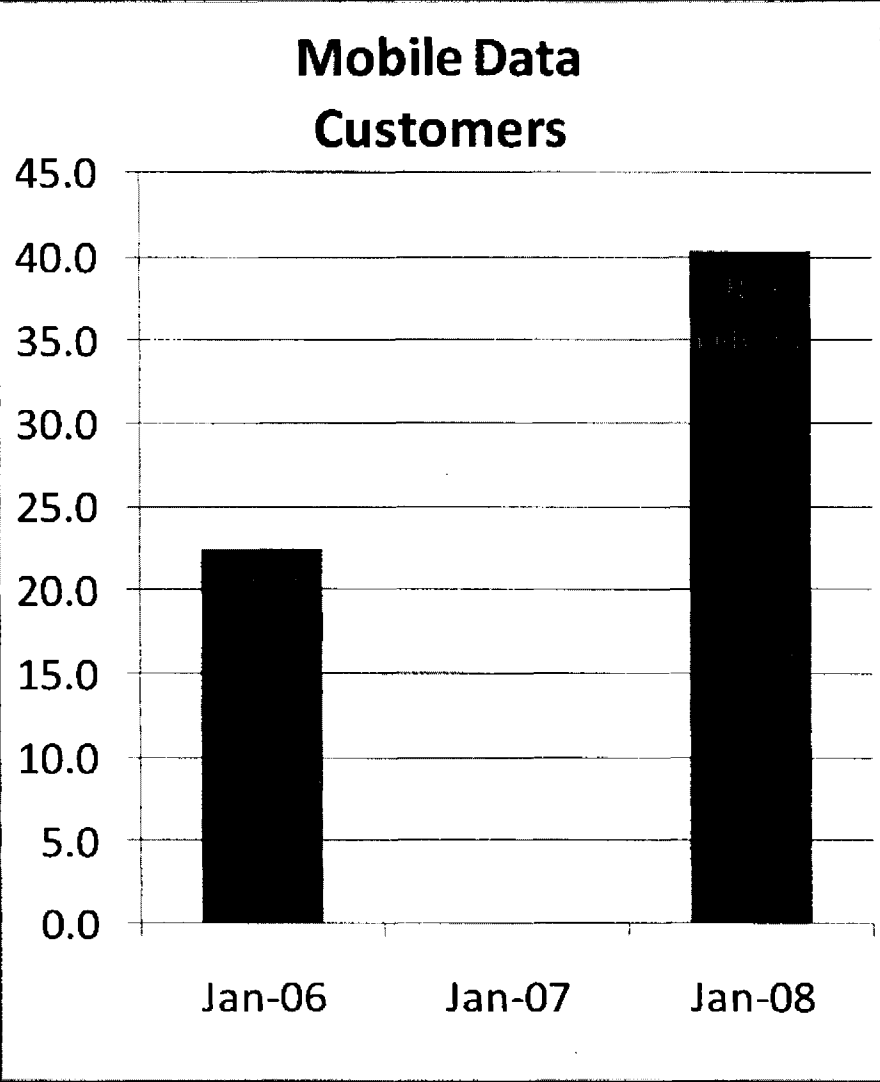
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- AT&T wireless data traffic is doubling every quarter and being driven by messaging, internet access, applications and related services.
- "Wireless data is driving the economy, Smartphone wireless connectivity is the answer." *Meredith Attwell-Baker, Commissioner Federal Communications Commission*

# Wireless Data Trends



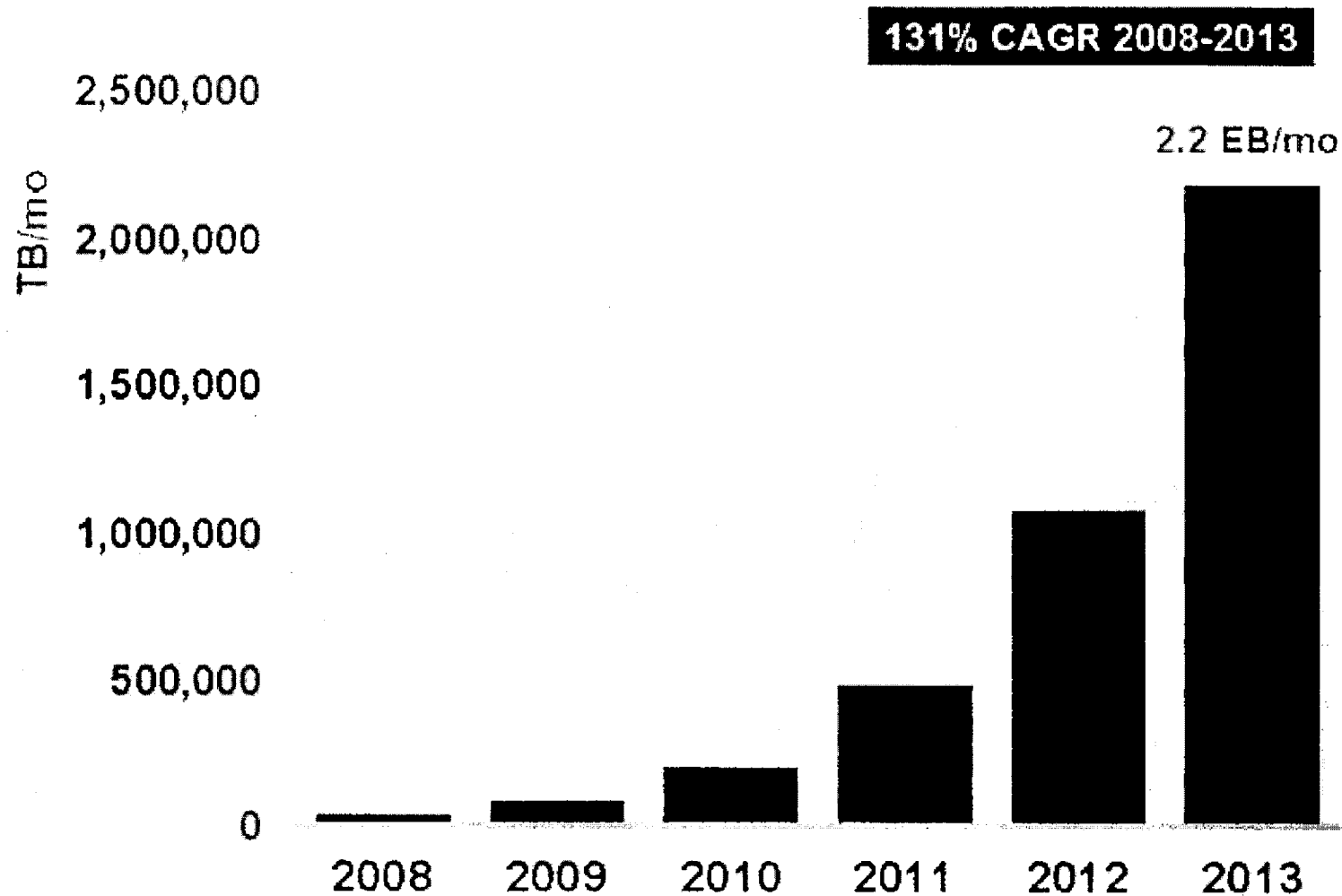
- Wireless data service revenues for the first half of 2009 climbed to more than \$19.4 billion—a 31% increase from the first half of 2008.
  - There are more than 276 million U.S. wireless subscribers.
  - More than 740 billion text messages were reported for the first half of 2009—breaking down to 4.1 billion messages per day— which is nearly double the amount of texts reported for the first half of 2008.
  - 1.1 trillion minutes were used in the first half of 2009—breaking down to 6.4 billion minutes-of-use per day.
  - More than 246 million data-capable devices are in the hands of consumers today. More than 40 million of these devices are Smart-phones or wireless-enabled PDAs and more than 10 million are wireless-enabled laptops, notebooks or air-cards

# Shift from Mobile Voice to Mobile Internet - Data Communications




# Global Mobile Data Traffic Growth

Mobile data traffic will increase 89% from 2008 to 2013



Source: Cisco Visual Networking Index – Forecast, 2008-2013

# Chasing Technology

- 
- Target exploitation in an IP world does not look the same as in a switched-based world.
  - Scale and pace of wireless IP communications technology is developing quicker than we can adapt to in light of current legislation and policies.
  - We need to improve our ability to respond to developing communications technologies through both resource allocation and legislative reform.

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# Technology Challenges Today

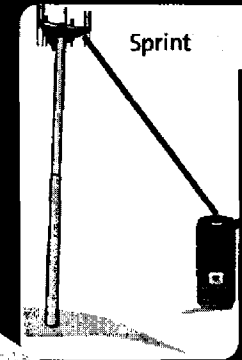
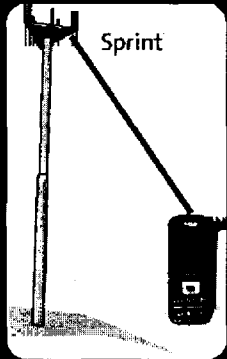


- Target Mobility
- Target Identification
- IP Based Communications
- Peer to Peer Communications
- Multiple types of Broadband Services (e.g., Wireless, Cable, FIOS)
- Encryption
- Authentication
- (b)(7)(E)

WiFi

ZONE

SOME



User talking via  
standard cell  
tower

When in range  
of Wi-Fi  
hotspot ..  
Handset  
connects over  
VoIP

Lose Wi-Fi  
signal .. Back to  
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tower



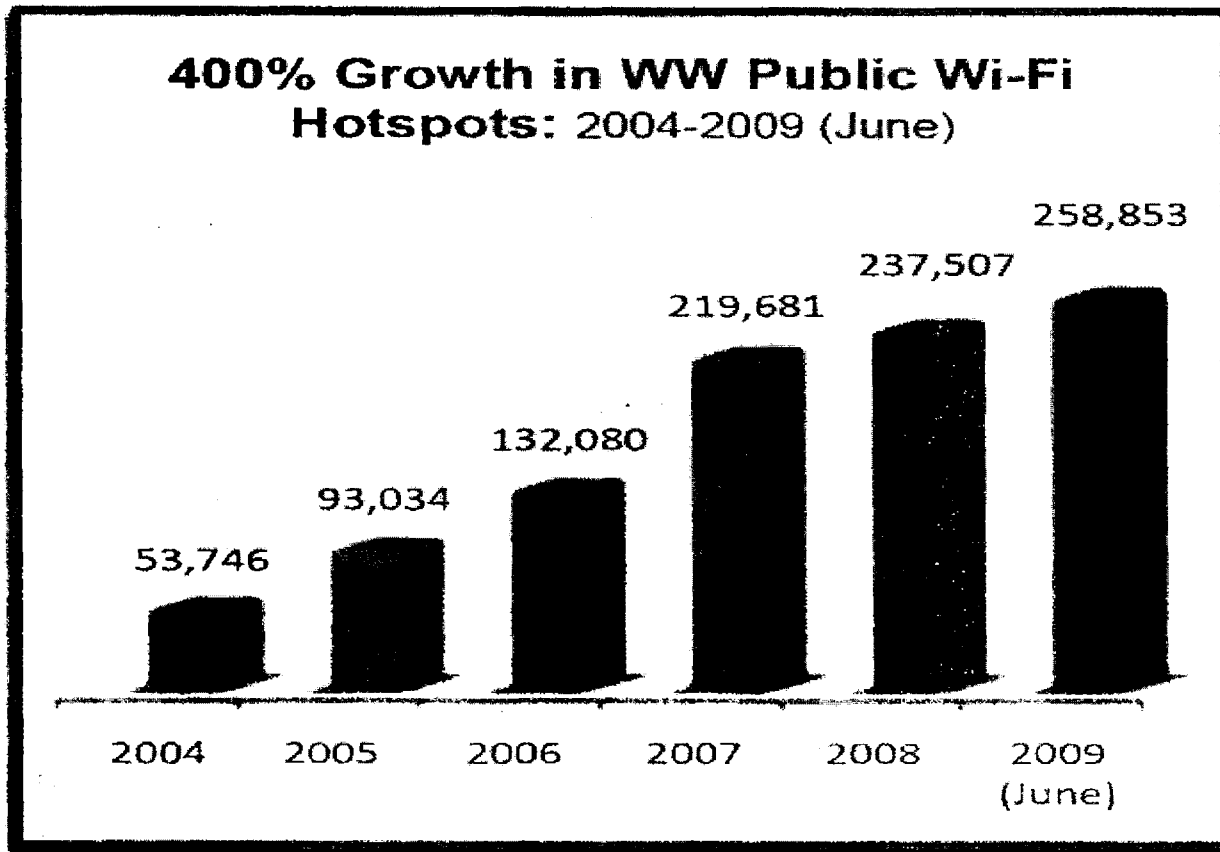
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# Wi-Fi Cell Phones Expected to Double in Two Years

8-28-09 CIO.com

## Worldwide Public Wi-Fi Hotspots: 2004-2009



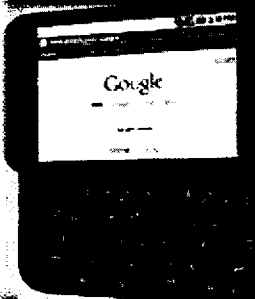
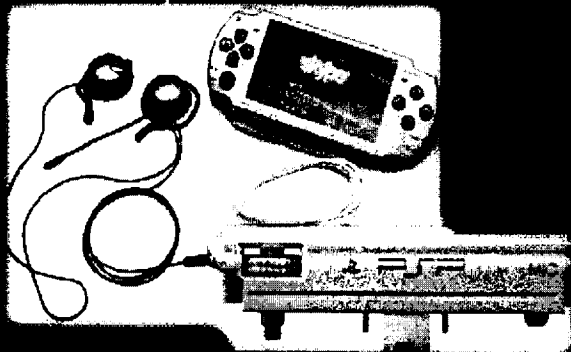
Source: JiWire, 2009

## Top 10 U.S. Cities for Public Wi-Fi: June 2009

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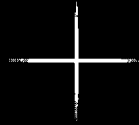
# Convergence of Smart-Phones, Game Stations, VoIP Applications and 3G/Wi-Fi Technology



# Smart-Phone Capabilities

## Mobile Data

- Smart-phone capabilities include:
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  - Text Messaging (SMS)
  - Instant Messaging (IM)/ Chat
  - 72 different Voice over IP (VoIP) applications available
  - Web-based Virtual Worlds. (Second life, World of Warcraft)
  - Wi-Fi (b)(7)(E)
  - 3<sup>rd</sup> party GPS Mapping Applications
  - Social Networking (Facebook, Flickr, MySpace etc...)
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**IS GOING DARK GOING  
ANYWHERE?**



# Drug Enforcement Administration Office of Investigative Technology



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Merlin Users Group

October 21, 2010

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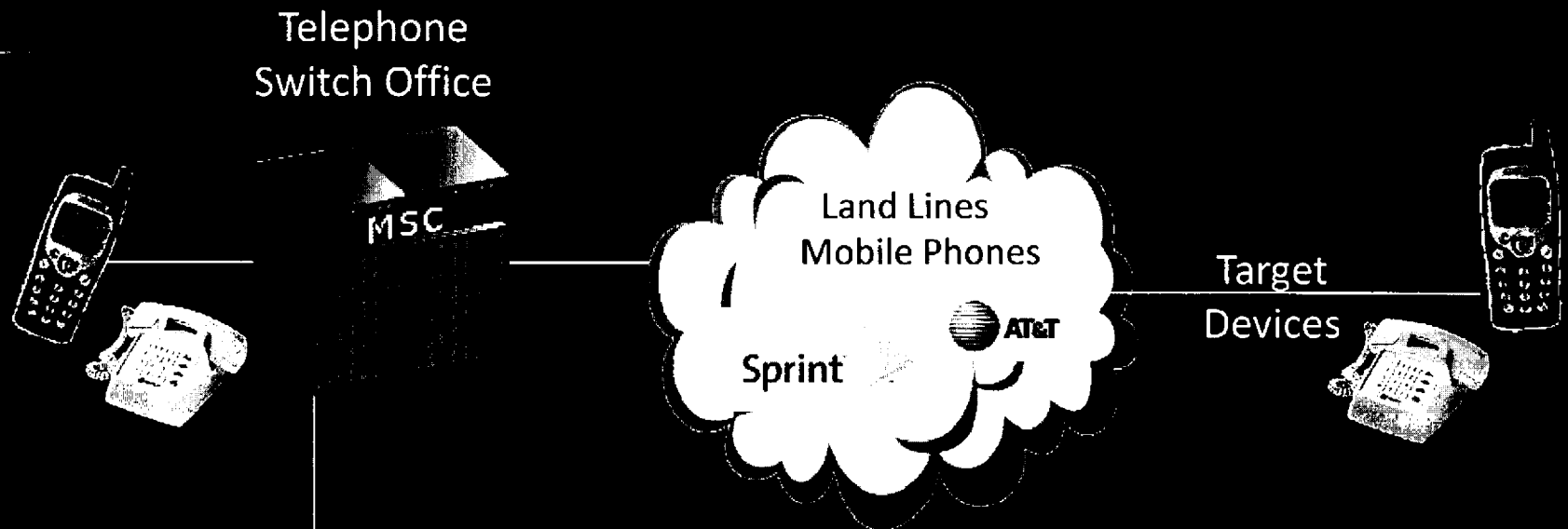
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Law Enforcement

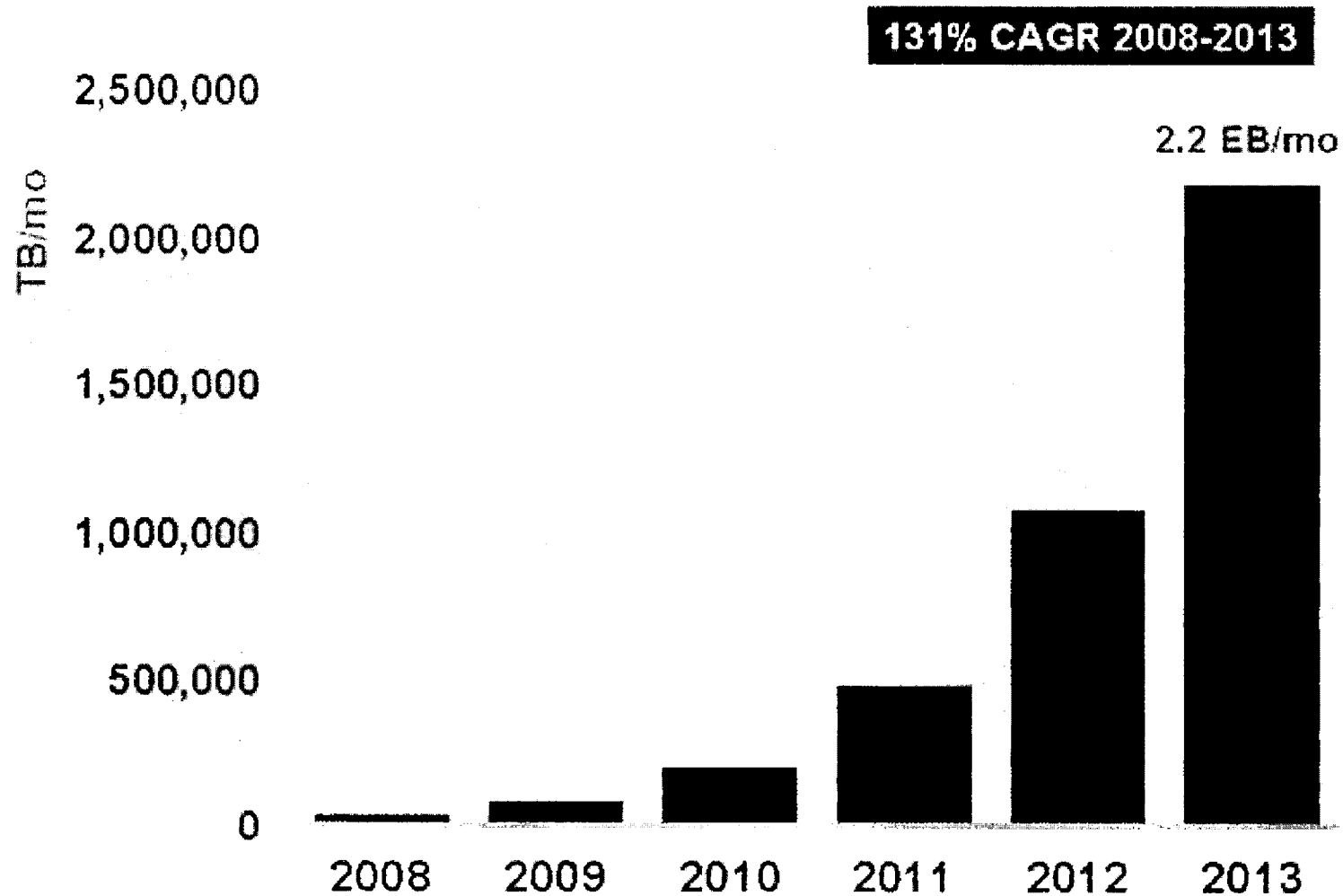
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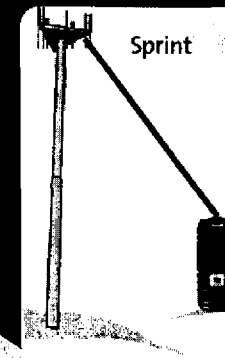
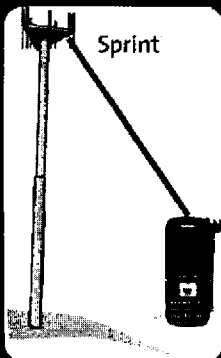
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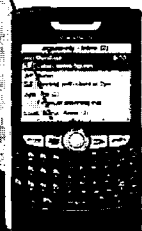
EDGE



User talking via  
standard cell  
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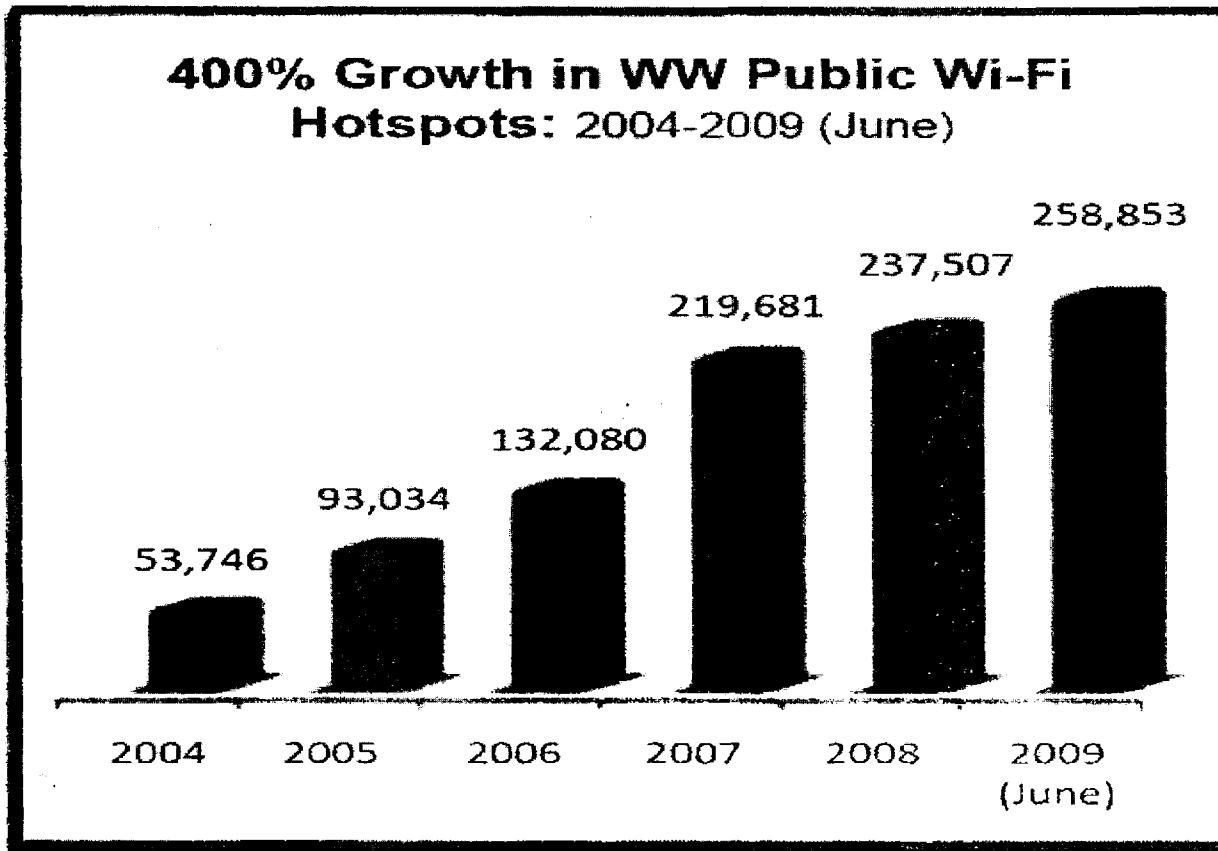
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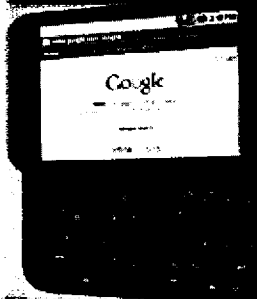
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