

# Security Architecture

## - Week 12 -

# Mobile Security

# Week 12

- High level review of week 10 and 11
- Week 12 assignment:
  - Securing Mobile Devices
- Lecture: Mobile Security
- Week 10 and 11 Quiz Reviews

# Defense In Depth

- Security Policy
- User Education
- Application Updates
- OS Patches
- Web Security
- Connection filtering
- Wireless Security
- Email security
- Email filtering
- Firewalls
- Anti-malware

# Defense In Depth

- Data Backup Local
- Backups offsite
- Clients
- Server
- Mobile devices
- Gateways
- PCs
- Spam detections
- Virus protection
- Phishing detection
- PDA, smartphones
- Security Best Practices

# Perimeter Security Topics - continued

- Control of Network Ports, Protocols, and Services
- Controlled Use of Administrative Privileges
- Boundary Defense
- Maintenance, Monitoring, and Analysis of Audit Logs
- Controlled Access Based on the Need to Know
- Account Monitoring and Control
- Data Protection
- Incident Response and Management
- Secure Network Engineering
- Penetration Tests and Red Team Exercises

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# Mobile Security

As mobile devices such as smart phones and tablet computers increasingly displace desktop computers and laptops in both business and personal use, protecting mobile computing is becoming an essential component in privacy and the protection of business information assets.

# Topics in Mobile Security

- What do we mean by mobile security?
- The rise of the Internet of Things (IoT)
- Mobile data communications
- Private mobile networks
- Mobile device risk profiles
- Managing mobile device security
- Limitation and vulnerabilities



# What is Mobile Security?

- Phones
  - PCS data communications
  - WiFi
- Wireless network access
  - Blue Tooth
  - WiFi
- Automobile communications systems
  - PCS

# What is Mobile Security?

**ROUGHLY HALF OF ALL  
AMERICAN ADULTS  
OWN A SMART PHONE.**



In the past year alone, our survey projects that at least


**7.1 MILLION**


smart phones were irreparably

**DAMAGED OR  
LOST OR STOLEN  
& NEVER RECOVERED.**

# Device Risk Profiles

We keep some very personal, private info and content on our smart phones.

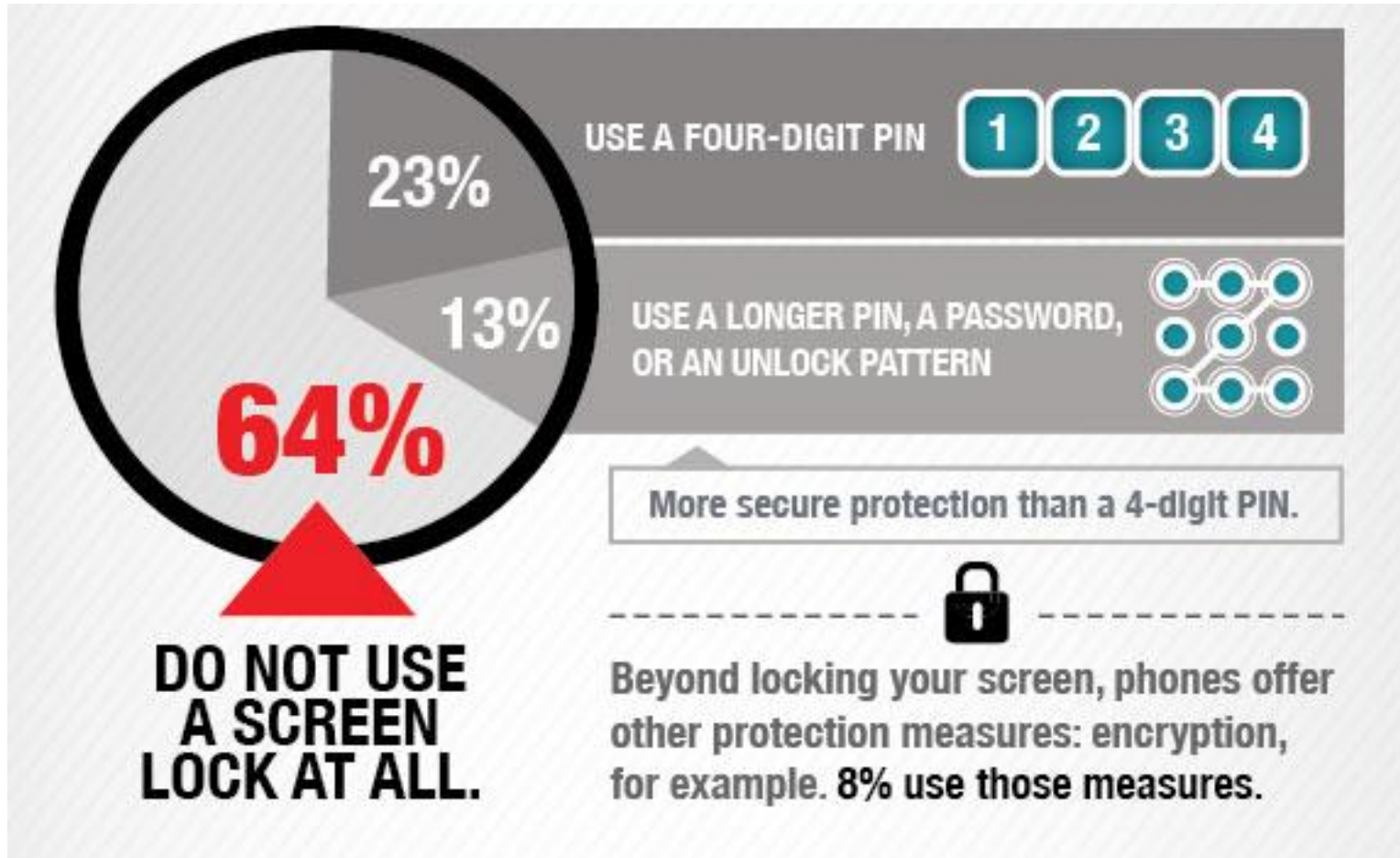
-  **PHOTOS**
-  **PASSWORDS**
-  **CURRENT LOCATION**
-  **FINANCIAL INFORMATION**



# What is Mobile Security?



# What is Mobile Security?



# What is Mobile Security?

**15%  
USE**

## ANTIVIRUS APPS

As with a computer, you can install **ANTIVIRUS APPS** that keep malware away from your smart phone.

**22%  
USE**

## PHONE LOCATOR

There's software that can locate your **LOST OR STOLEN** smart phone.

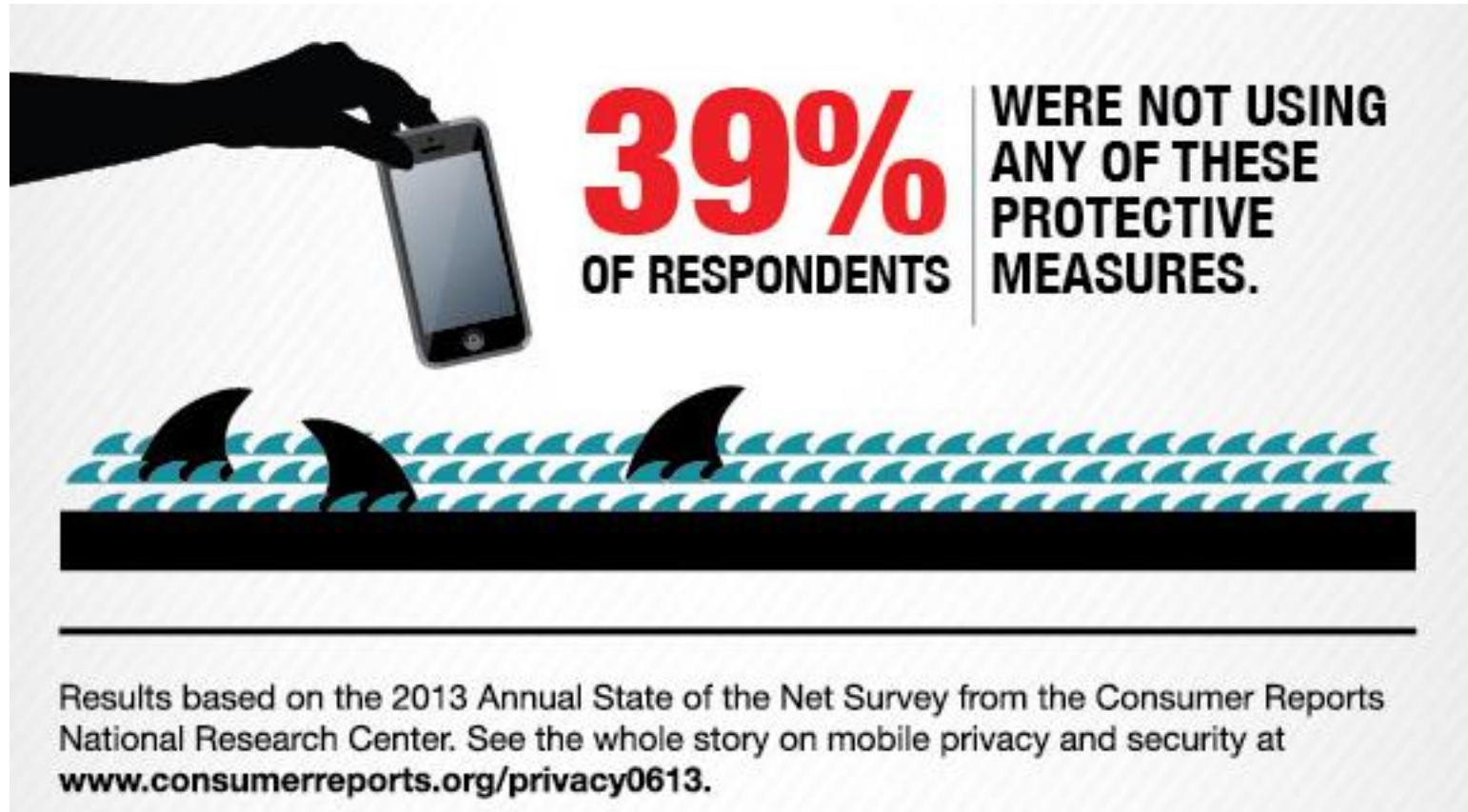
**8%  
USE**

## REMOTE WIPE

And some apps can **WIPE OUT THE CONTENTS** of your phone if it winds up in the wrong hands.



# What is Mobile Security?



# The Internet of Things (IoT)

- The sum of all connected things is estimated to reach 25 billion by 2020, a forecast said, reflecting the phenomenal growth of the Internet of Things (IoT).
- The number of connected devices that will be in use in 2015 will reach 4.9 billion representing a huge 30 per cent increase from last year, according to Gartner, a leading IT research and advisory company.
- Of that, 2.9 billion are those that will be in use by the consumer sector, while the automotive sector will record the highest growth rate of 96 per cent. As far as industrial sector is concerned, manufacturing, utilities and transportation are the top three verticals that will have 736 million connected things in use in 2015.



# The Internet of Things (IoT)

- Does the IoT include mobile devices?
- How do other devices (not phones or tablets) communicate
  - PCS
  - WiFi
  - example: intelligent printer
- Where does Bluetooth fit into this scheme?
- Private protocols
  - - marine
  - - military
  - - private corporations
- Using other peoples wireless networks
- Mobile privacy
- What protections exist?

# Mobile Data Communications

- Are cell phones secure?
- The rise of the Internet of Things (IoT)
- Mobile data communications
- Private mobile networks
- Mobile device risk profiles
- Managing mobile device security
- Limitation and vulnerabilities

# Private Mobile Networks

- Custom PCS systems
- Mobile VoIP on enterprise networks

# Mobile Device Risk Profiles

- Popular Phones:
  - Android OS
  - iOS
  - Windows
  - Blackberry
  - Others

# Mobile Device Risk Profiles

- Popular Phones:
  - Android OS
  - iOS
  - Windows
  - Blackberry
  - Others

# Mobile Device Risk Profiles

	Apple	Google	Samsung	BlackBerry	Microsoft
<b>Capability</b>	iOS 7, 8	Android 4, 5	Android 5 + Knox 2.4	BlackBerry 10 + BES12	Windows Phone 8, 8.1
<b>Encryption</b>	AES 256, user has no disable option	AES 128, user has disable option, only some models support encryption	AES 256, user has disable option, only Knox devices support encryption	AES 256, user has disable option in personal workspace	AES 256, user has no disable option
<b>FIPS 140-2 certification</b>	<b>Yes (Level 1)</b>	No	<b>Some models (Level 1)</b>	<b>Yes (Level 2)</b>	<b>Yes (Level 1)</b>
<b>Over-the-air data encryption</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
<b>S/MIME</b>	<b>Yes</b>	No	<b>Yes</b>	<b>Yes</b>	<b>Yes [2]</b>
<b>VPN</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes [2]</b>

[1] Added by some smartphone makers. [2] In Windows Phone 8.1 only (and VPN support is partial). [3] In secured container only.

# Mobile Device Risk Profiles

	Apple	Google	Samsung	BlackBerry	Microsoft
Capability	iOS 7, 8	Android 4, 5	Android 5 + Knox 2.4	BlackBerry 10 + BES12	Windows Phone 8, 8.1
Configure VPN	Yes	Yes	Yes	Yes	Yes [2]
Per-app VPN	Yes	Yes [3]	Yes	Yes	Yes [2]
Restrict/block app stores	Yes	No	Yes	Yes	Yes
Business licensing and provisioning	Yes	Yes [3]	Yes [3]	Yes	No
Restrict/block wireless LANs	Yes	No	Yes	Yes	Yes [2]
Configure allowable access points	Yes	Yes	Yes	Yes	Yes [2]
Signed apps required	Yes	No	Yes	Yes	Yes

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Capability	iOS 7, 8	Android 4, 5	Android 5 + Knox 2.4	BlackBerry 10 + BES12	Windows Phone 8, 8.1
Signed apps required	Yes	No	Yes	Yes	Yes
Selective wipe of business apps and data only	Yes	Yes [3]	Yes	Yes	Yes [2]
Remotely update business apps	Yes	Yes [3]	Yes	Yes	Yes
Secure boot	Yes	Yes [1]	Yes	Yes	Yes
Active Directory container signin	NA	No	Yes [3]	No	No
App sandboxing	Yes	Yes	Yes	Yes	Yes

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<b>Capability</b>	iOS 7, 8	Android 4, 5	Android 5 + Knox 2.4	BlackBerry 10 + BES12	Windows Phone 8, 8.1
App sandboxing	Yes	Yes	Yes	Yes	Yes
Disable copy and paste	Yes	Yes	Yes	Yes	Yes [2]
Disable iCloud/Microsoft Account/Google Account sync and storage	Yes	No	Yes	Yes	Yes [2]

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# Managing Mobile Devices

## Configuration

- Protection of lost or compromised devices
- Password enforcement
- Encryption enforcement
- Remote lock and wipe
- Remote email configuration
- Certificates for identity
- Remote connectivity configuration (such as for Wi-Fi and VPNs,
- Detection of compromised OSs (whether jailbroken, rooted, or malware-infected)

# Limitation and Vulnerabilities

## **Data Loss Prevention (DLP)**

- Privacy controls (such as for user location)
- Cloud-usage controls (such as for iCloud, OneDrive, and Google Docs)
- Email DLP controls (such as the ability to restrict email forwarding and to protect attachments)

# Week 10 and 11 Quiz Reviews