Mobile Privacy: Tor On The iPhone And Other Unusual Devices

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Outline

• Mobile Phones (In)Security
• Tor On Mobile Phones And Other Strange Devices
• Tor On The Chumby One
• Tor On Maemo And The Nokia N900
• Orbot: Tor On Android
• Mobile Tor: Tor On The iPhone
Mobile Phones (In)Security
Mobile Phones Growth

- Computational power
- High speed data networks
- “Real” operating system
Phones Are Personal

- Raise hand who does not own a mobile phone
- We take them everywhere we go
- Never leave the house without it ;-}
Phones Are Critical

- Call logs
- Address book
- E-mail
- SMS
- GPS data
- Documents
- Calendar events
- Calendar tasks
- Browser history
- Browser cache
Too Much Trust

- Users trust their phone
- Phones trust the operator
- Operators trust themselves
- Users trust operators as well
Too Much Trust
Too Much Heterogeneity

• Closed communication protocols
• Heterogeneous networks
• Fragmented hardware landscape
• Many different operating systems
Architectural Issues

- Made for chatting and texting
- Keyboards adopted to the model
- Difficult passwords are... difficult!
Architectural Issues

- Phones are mobile devices
- Screen size is limited
- Checking important stuff is nearly impossible!
Who Own The Device?

- **Manufacturer / vendor**
  - “Apple iPhone banned for ministers” (CBS, 2010)
  - “Exercising Our Remote Application Removal Feature” (android-developers, 2010)

- **Carrier operator**
  - “BlackBerry update bursting with spyware” (The register, 2009)

- **Application developer**
  - “iPhone Privacy” (BlackHat DC, 2010)

- **End user**
  - We’re here!
Data (In)Security

- Data is stored in cleartext
- Blackberry and Nokia allows some sort of encryption
- Data access is an “all or nothing” approach
- Need permissions fine tuning
Communication (In)Security

- GSM has been broken
- UMTS is not feeling very well
- SMS has been abused
- MMS remote exploit for Windows Mobile, iPhone and many more
Communication (In)Security

- Bluetooth is dangerous
- WiFi offers a plethora of attacks
- NFC has already been worm-ed
- Operator injected HTTP headers
- SSL/WTSL heavy on lower end phones
To recap

- Mobile phones are everywhere
- Mobile phones are primarily designed for making calls and sending text messages
- Stored data can not be easily protected
- Communications need to be secured
Tor On Mobile Phones And Other Strange Devices
Tor Crash Course

How Tor Works

Alice → GUARD → MIDDLEMAN → EXIT → Bob

Dave → Jane

Tor node: +
Unencrypted link: →
Encrypted link: →
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Tor On Unusual Devices

- December 2007: iPhone
- December 2009: Chumby One
- February 2010: iPhone, again
- February 2010: Nokia N900
- March 2010: Android
Problems to address

- Available hardware
- Hosting operating system and code rewrite
- Installation process
- Graphical user interface
Tor On The Chumby One
Chumby One

- Hackable Linux device
- ARM CPU
- 64MB of RAM
- Made by bunnie of bunnie:studios and Jacob Appelbaum
Install: the hard way

- Install Chumby cross-toolchain
- Checkout sources
- make
- Unzip build on usb key
- Reboot Chumby with usb key inserted
Install: the easy way

- Unzip build on usb key
- Reboot Chumby with usb key inserted
Running Tor

- Swap file needed
- Configured as a bridge
  - Listening on TCP 443
  - Low consumption of resources
- No upgrade mechanism
- Unofficial support for 3G dongles
Achievements

- Running Tor on limited resources
- Easy install method
Tor On Maemo And The Nokia N900
Nokia N900

- Powerful ARM CPU
- 256MB RAM
- Tor in Maemo community
Install

• Enable extras-devel
  • Reported as dangerous!
• Look for Tor in the package manager
• Done!
Running Tor

• Just toggle it!
Achievements

- Easy install
- Easy upgrade
- First graphical controller application
Orbot: Tor On Android
Android

- Linux based operating system
- Many different devices
- Orbot built by The Guardian Project
Install

- Scan the QR code!
- Not yet in the Android Market
Running Tor

- Just toggle it!
- Easily configurable
- Runs as transparent proxy for rooted devices
Achievements

- Easy installation
- Highly configurable
- Transparent proxy
Mobile Tor: Tor On The iPhone
iPhone / iPod Touch

- Hackable Darwin (iPhone OS) devices
- Powerful ARM CPU
- 256MB RAM
Tor On Unusual Devices

- December 2007: iPhone
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The Original Port

- Made by cjacker huang
- Built for iPhone OS 1.1.1
- Tor sources patched to overcome firmware limitations
- Shipped with a copy of Privoxy
- Shipped with iTor.app controller
The Original Port

- cjacker huang disappeared
- iTor.app disappeared with its author
- Tor patches were still available in the main Tor source tree
Bringing Back Tor On The iPhone

- Open source toolchain
- SDK target: iPhone OS 3.1.2
- Cross-compiling from Slackware 13.1
Bringing Back Tor On The iPhone

- Built following Jay Freeman's conventions for Cydia packages
- Sources are an overlay for Telesphoreo Tangelo
- http://sid77.slackware.it/iphone/
The New Port

- Made by me :-P
- Built for iPhone OS 3.1.2
- Old patches no longer needed
- Shipped with a copy of Polipo
- Shipped with an SBSettings plugin
Running Tor

- Add my repository
- Install Tor Toggle
- Just toggle it!
Running Tor

- Client
- Relay
- Hidden Services
- Both via wireless and cellular data network
- iPhone OS should do transparent proxy
iPhone OS Limitations

- No support for SOCKS proxies
  - Run Polipo!
- No HTTP proxies for cellular data networks
  - VPN trick!
- No Tor-secure browser
Tor Limitations

• Cryptographically intense
  • Heavy on battery drain

• Cellular data networks aren't very Tor friendly
  • Rapidly changing IP addresses
  • Spot coverage
Development

- Still too much fiddling with CLI
- Need for a graphical controller, Vidalia style
- Need for a secure browser
Some Crazy Ideas

- Arm is working... somehow
- OnionCat looks promising
- Some work on ttdnsd
- Do you have a spare iPad?
Questions?

TOR
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