Breaking Bluetooth By Being Bored

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Bluetooth

- IEEE 802.15.1
- Low Power / Short Range
- Ad-Hoc (Piconet)
- Deployed on over 1 billions devices worldwide

Obfuscation and Reconnaissance

Cloning/Spoofing Profile

- Bluetooth Profile:
  - Device Address, Device Class, Device Name
- Bluetooth Profile Cloning:
  - Modify host Bluetooth Adapter profile to match the profile of another device
  - Done manually using *hciconfig* and *bdaddr*
- Bluetooth Profile Spoofing:
  - Creating a misleading profile of host Bluetooth Adapter

SpoofTooph

- Automate / simplify Bluetooth profile modification process
- Useful for
  - Obfuscation
  - Impersonations
  - Observation
- 5 different modes

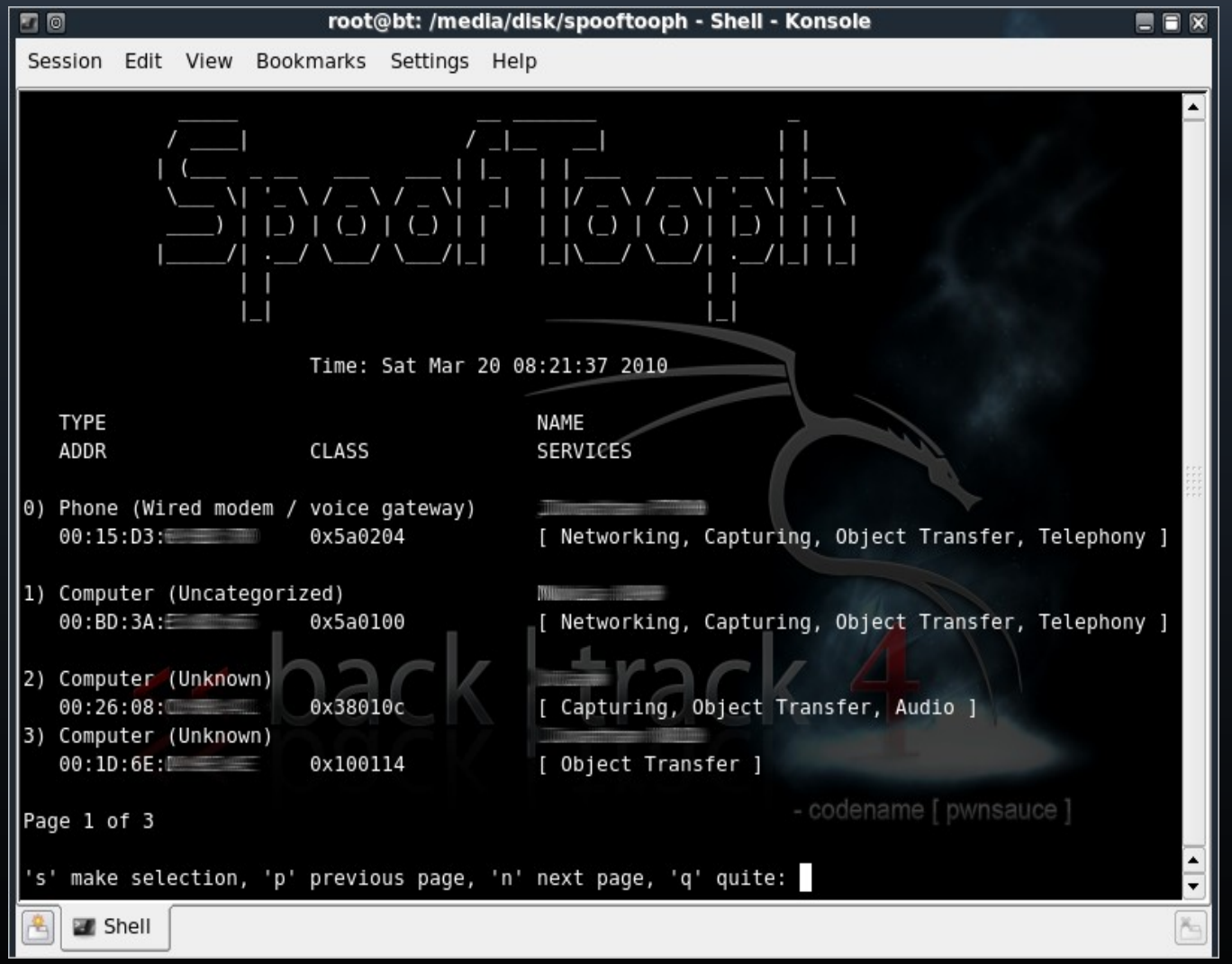
SpoofTooph

- Mode 1: > *spooftooph -i hci0 -s -d scan.log*
  - Scan local area for devices
  - Save list of devices found
  - Select a device from the list to clone
- Mode 2: > *spooftooph -i hci0 -r*
  - Randomly generate Bluetooth profile
    - Device Class – Random Valid Class
    - Device Name - 100 most popular Ameraican names + device type
    - Device Addr – Random MAC

SpoofTooph

- Mode 3: > *spooftooph -i hci0 -n new_name -a 00:11:22:33:44:55 -c 0x4a010c*
  - Specify Name, Class, and Address
- Mode 4: > *spooftooph -i hci0 -l scan.log*
  - Read in previously logged scan
  - Select a device from the list to clone
- Mode 5: > *spooftooph -i hci0 -t 10*
  - *Incognito*: Scan for devices every X seconds and clone the first profile on the list

SpoofTooph



Bluetooth Profiling Project

- Collect *Device Name*, *Device Address* and *Device Class* on as many devices as possible
- Same idea as Josh Wright's *Bnap,Bnap,* but collecting device profiles from others devices instead
- Collected over 1,500 device profiles so far

Bluetooth Profiling Project

- Use for this data:
  - Mapping the address range of Bluetooth
    - Improve Redfang discovery scans
    - Matching address range with device model
  - Research
  - Discovering information disclosure

Bluetooth Profiling Project

- Disclosure of sensitive information
- What information can be gathered from the device profile?
  - Can the Device Address be used to identify the device modes?
  - What can be extracted from the device name?

Bluetooth Profiling Project

- *Can the Device Address be used to identify the device modes?*
  - Yes, the addresses used for Device Address (MAC) are the same as those used by Ethernet or ZigBee
  - The first 24-bits are Organizationally Unique Identifiers (OUI), registered to specific entities, often often use a subset of those address ranges for a specific model of device
  - The reverse can be done to attempt to guess the address based on the device model

Bluetooth Profiling Project

- *What can be extracted from the device name?*
  - **First Name** – A first name, presumably the first name of the device owner.
  - **Last Name** – A last name, presumably the last name of the device owner.
  - **Nickname** – What appears to be a user name or 'handle'.
  - **Location** – Information that can be used to determine the location of the device.
  - **Device Model** – Identifying information that could lead to profiling the device as a specific model.

Bluetooth Profiling Project

- Percentage of devices names which disclosed sensitive information (out of the 1,500 profiles collected)

First Name	Last Name	Location	Device Model	Nickname / Handle
28.17%	18.76%	1.30%	70.54%	1.51%

Mall Nibbling

Dropping by your local mall to collect information on the cornucopia of Bluetooth devices.

Mall Nibbling

- Performing Mall Nibbling: Things to Know
  - Come equipped with a Class 1 bluetooth dongle (cantenna attachment optional, but recommended :))
  - Obfuscate your Bluetooth interface
  - While device discovery takes less then 2 seconds, getting the name of the device requires a follow up request. Plan on spending at least 1 minute per location for each scan.

Offensive

vCardBlaster

- vCard - “Virtual Business Card”
  - Used to exchange personal information
- Many Bluetooth devices allow exchange of vCards
  - Phones, PDAs, PCs, etc

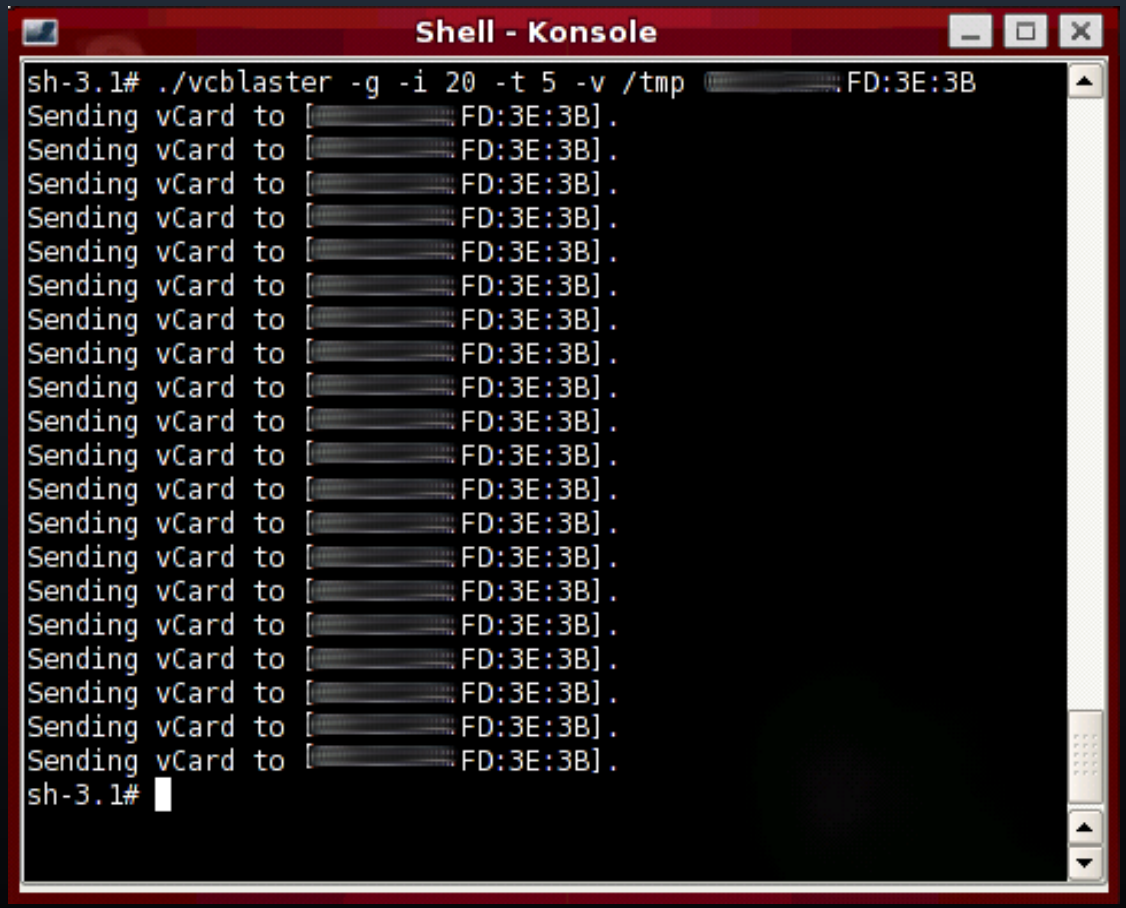
vCardBlaster

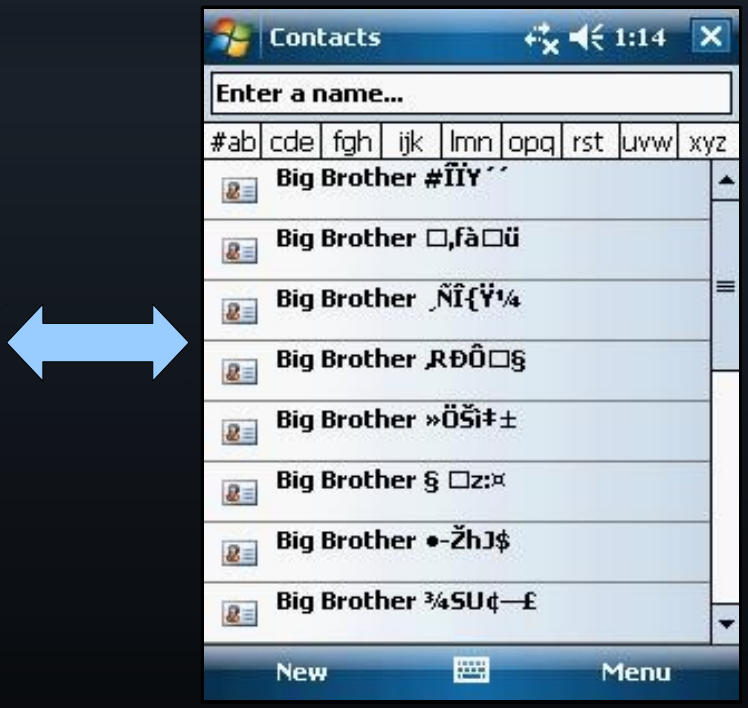
- vCardBlaster is capable of sending a constant stream of vCards over Bluetooth
  - Users can select a single target or attack all devices in range
  - vCards can be specified or generated by vCardBlaster

Bluetooth vCard Contact List DoS

- vCardBlaster can be used to preform a DoS on a Contact List
- Vuln:
  - Some devices, upon receiving a vCard, will automatically add the information to the local Contact List.
  - Each name provided in the vCard must be unique.
  - Sending a flood of vCards fills up the contact list with new false contacts

vCardBlaster





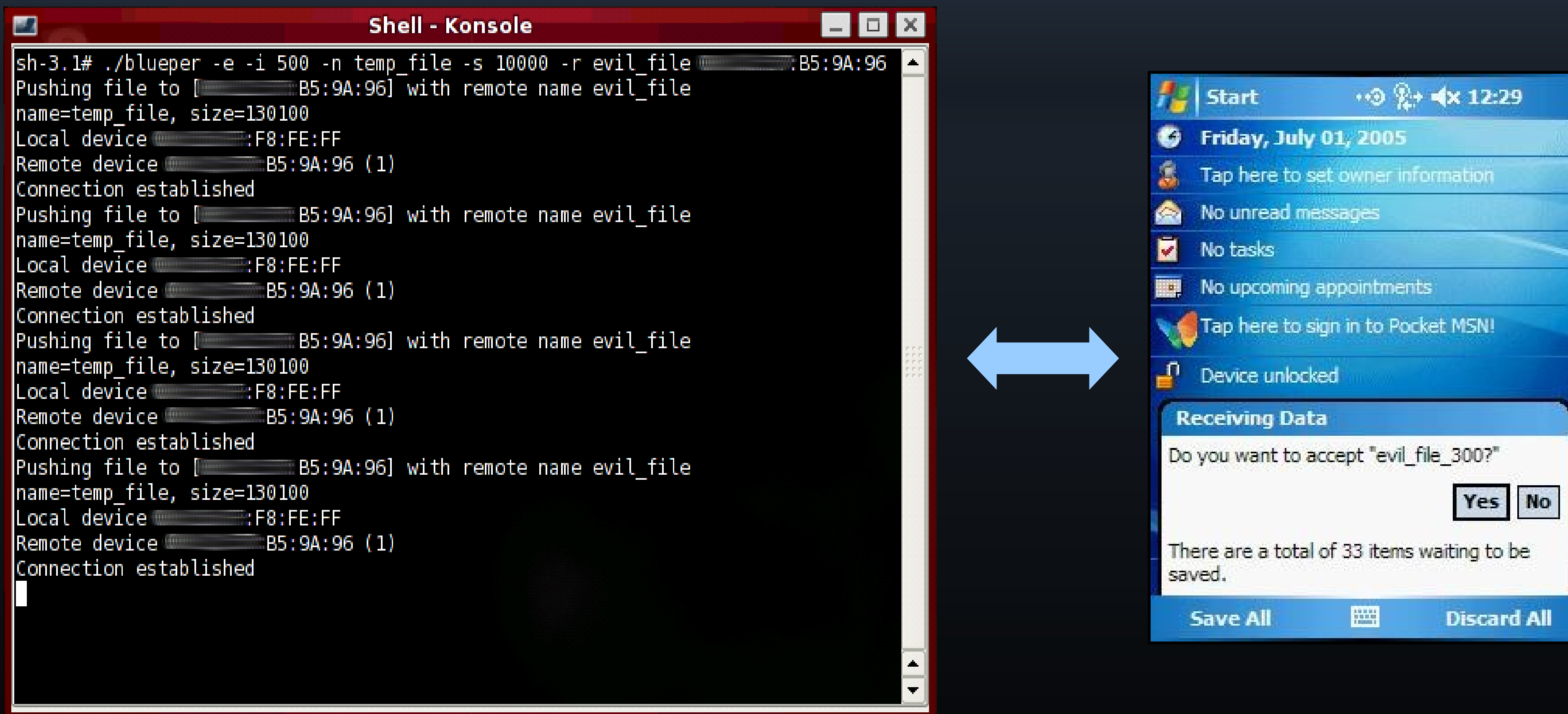
Blueper

- Blueper is capable of sending a constant stream of files over Bluetooth
  - Users can select a single target or attack all devices in range
  - Files can be specified or generated
  - User can specify file size

Bluetooth OBEX Disk Cache DoS

- Blueper can be used to preform a DoS using the systems caching of file data
- Vuln:
  - Some devices cache files sent over Bluetooth OBEX before prompting user to accept or reject the file transfer.
  - Sending files over extended periods of time can fill up disk.
  - It can cause system crash.

Blueper



Pwntooth

- Suite of Bluetooth attack tools
- Designed to automate multiple attacks against multiple targets.
- Comes bundled with tools like:
  - Bluetooth Stack Smasher
  - BT_AUDIT
  - Bluesnrf
  - Blueper / vCardBlaster

Pwntooth

- Pwntooth uses a user defined config file as an attack script
- This config file uses * as a wild card character for device address

pwntooth.conf

```
### hcitool info ###
hcitool info *

### sdptool info ###
sdptool records *

### bluesnarf ###
# ./bluesnarfer -r A-Z -b *

### bluetooth stack smasher ###
# ./bss -s 100 -m 12 -M 0 *

### carwhisperer ###
# ./carwhisperer 0 audio.raw recorded.raw * 7

### vCardBlaster ###
# ./vcblaster -g -t 10 *

### blueper ###
# ./blueper -e -s 1000 -t delete_me -n Update *

### psm_scan ###
# ./psm_scan -c -e 4095 *
```

Pwntooth

- Default config /etc/bluetooth/pwntooth.conf
- If a address device is detected in multiple iterations of scans, the attacks listed in the config file are only run the first time
- Example: Scan area 10 times and save output to logfile.txt using default config.

> *pwntooth -l logfile.txt -s 10*

Project Pages

www.hackfromacave.com

- SpoofTooph: http://www.hackfromacave.com/projects/spooftooph.html
- Bluetooth Profiling Project: http://www.hackfromacave.com/projects/bpp.html
- vCardBlaster: www.hackfromacave.com/vcardblaster.html
- Blueper: www.hackfromacave.com/blueper.html
- Pwntooth: www.hackfromacave.com/pwntooth.html