

CIS6930/4930 Mobile Networking - Spring 2010

Experiment 1

Due Date: April 21, 2010

Start Date: January 27, 2010

1 Introduction

This experiment will allow you to collect Bluetooth and Wi-Fi AP traces. These traces will be used in the upcoming experiments for this class and can be used by you for your projects.

The Bluetooth and Wi-Fi AP traces are combined together in a single file. Bluetooth trace is produced by the result of scanning all the visible Bluetooth devices; the Wi-Fi AP trace is produced by result of scanning all the Access Points visible. Bluetooth trace can give insights into encounter patterns and AP trace can be clubbed to get location information.

Please carry the device with you and run the scripts for as long as possible to get complete traces.

For collecting the device, come with all your group members to the office hours of the course TA to E309. If you have a question, please email Udayan Kumar (ukumar@cise.ufl.edu) or meet him during the office hours.

2 General Instructions

1. Do not exchange devices with anyone, this will insure that all the traces belong to your movement.
2. Check the battery indicators frequently and keep the devices charged up. A dead device also means loss of traces.
3. Periodically take a backup of the traces using any method suitable for your device.
4. You are also encouraged to keep a log of all the locations you visit, while carrying the device, this would give you a better sense of location, when doing the analysis.

3 Devices

Currently, we have 10 Openmoko devices and 13 Nokia Devices (N810 and N800) available for the checkout. Both kinds of devices run Linux and cross-compilers are easy to setup for both of them. We would like to give a single kind of device to the whole group, so that one group has to setup compilers for only one kind of device (Current experiment does not requires any implementation for the devices, but you may have to program them for future experiments/project) . However, it is acceptable to get both kinds of devices. Preference for the selection of the devices would be given on first come basis.

Below are the usage guides to Nokia and Openmoko.

4 Nokia N810/N800

Configuring Nokia's N810 to collect Bluetooth and WiFi Traces (<http://maemo.org/>).

4.1 Preliminary Settings & Checks

1. Boot the device using Power button on the top.
2. Click on the WiFi signal icon on the top right corner, adjacent to battery. Then click "Connectivity Settings", then click "Idle times" tab. Make sure "WLAN idle time" is select to "Unlimited". If not, select it from drop down menu and press ok.

3. Check “iwlist” is present. To check - click on the program menu ->utilities ->X Terminal. Run following commands
 - \$ root
 - \$ iwlist
 If it gives “command not found”, take the device to TA in the office hours.
4. Enable Bluetooth. Click “Settings” - >“Control Panel” - >“Bluetooth”. Make sure “Bluetooth On” & “Visible” is checked and device name is present (do not change the name, later it will help you to identify devices in the analysis).

4.2 Trace Collection Process

1. For trace collection, open the “X Terminal”. Enter “root” followed by “ls -lt” command and make sure scanner.sh/nokia8xx.sh file is present with executable permissions. Both file do the same stuff.
2. Run the script (./scanner.sh) to start trace collection process.
3. To stop it, press ctrl-c.

4.3 Transfer the file to laptop/desktop

1. The file names ”EncounterTrace.txt” is generated at /media/mmc2 location. To download it, connect your N810 to windows/linux machines. Browse the file in the /media/mmc2 location and copy to a desired folder.
2. You can also get it by **email attachment** via web-browser (by connecting the device to a wireless network).

5 OpenMoko

The OpenMoko Neo FreeRunner is a Phone that comes with GPS, WiFi, Bluetooth capability.

Before you start collecting the traces make sure following settings are configured on the Openmokos (<http://wiki.openmoko.org>):

5.1 Preliminary Settings & Checks

1. Boot the device using Power & Aux buttons together. From the Boot menu select ”Boot” and press Power Button to start the device. The installed linux take a minute to bootup.
2. Click Settings ->Connectivity,
3. Make sure - “WiFi Radio” in On. If not move the bar to the right.
4. Scroll down to Bluetooth Settings: Make sure “Bluetooth Radio” & “Visibility” is On. If not, move the bar to right. Click on “Quit” when done.
5. Now select “Power” from the Settings. In the Power Settings, make sure “Auto-Suspend” is “Off”. If not, move the bar to the left. Then Quit.
6. Always make sure the date and time are correctly set as per EST.
7. Always make sure these settings are in place if you have restarted the device.

5.2 Trace Collection Process

1. From the main menu, select “Terminal”. Once the application is running, select “Terminal Keyboard” from the list. To do it, click the “AB” link below vertical scroll bar on right.
2. Execute command “ls -ltr.” to make sure openmoko.sh script is present and its permission is set to executable.
3. Run the script using command - ./openmoko.sh. To stop the script, press “Power” button once and press close.
4. The trace file “EncounterTrace.txt” will be generated and saved at the location /media/mmc1. You can view this file using vi editor by opening a new terminal.

5.3 Transfer the Traces to your laptop/computer

To transfer trace file to your laptop/Desktop (with Linux installed), follow these commands

1. Open a terminal on your laptop, and run command “ifconfig”. It will show some output with interface names like lo0, eth0 etc.
2. Connect your openmoko to a usb.
3. run the same “ifconfig” command again and see which new interface is added, it should mostly be “eth1” or “eth2” like that. In some cases you may find “usb0” also.
4. Run following commands on your terminal. Replace the “\$1” with interface name (from the ifconfig command, usb0 or eth1 etc.)
\$ sudo ip address add 192.168.0.200/24 dev \$1
\$ sudo ip link set dev \$1 up
\$ sudo route add -host 192.168.0.202 dev \$1
5. now run command “ssh root@192.168.0.202” on the shell prompt. accept the certificate. when asked for password simply enter. Now you can see the file or directly edit the file using vi editor.
6. to download the trace file on your laptop, run “sftp root@192.168.0.202”. simply enter when asked for password. on the sftp> “mget EncounterTrace.txt” then enter sftp>“exit”. The file is downloaded in the current folder on your laptop/desktop.
7. Another way to get the file is by **emailing it as an attachment**. Open “Midori” browser, open your favorite email website and send the “EncounterTrace.txt” file as an attachment to yourself. (You may have to connect the device to a wireless network)

6 Parsers

For the purpose of analyzing the traces you may have to write a piece of code to parse the encounter file into a easily processable form. An example format after parsing can be like (for bluetooth trace) < Unix Time Stamp >< MAC ID >< Name >and (for AP trace) < Unix Time Stamp >< MAC ID of AP >

7 Deliverables

By the due date, you would have to submit the collected traces and devices to TA.