iPaq Intro, Python, and Connectivity

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Administration

- iPaq's and Mobile Phones very similar
  - both use python, bluetooth, internet
- This week:
  - Ipaq comments, Python, Network
    - Problem set, due in one week
- On your own, watch:
  - Jamey Hicks on "Linux on iPaq" (video)

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Setting up iPaq

- Why Linux?

- Why not Linux on newer models?

- Things particular to these iPaqs

  - batteries

  - no solid connections (check cables often)

  - when in doubt, reinstall

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Connecting to iPaq

- Serial cable (not usb)

  - after boot, can just login via some terminal program (minicom/hyperterm)

- ssh over the network

  - setup wireless connection to network

  - 'ssh -l root xxx.xxx.xx.xxx'

  - need ip address (do not need dns name)

  - make sure you are connecting to YOUR ipaq. Easy to mistype ip address.

Installing software

- /etc/ipkg.conf points to "feeds"

  - we will maintain our own feed

  - ipkg picks first matching file, not last while searching list of feeds

- Copy files to ipaq via

  - secure copy

    - "scp localFile.py root@ipaqip:/usr/bin/"

  - serial cable

    - xmodem/ymodem, sx on linux

Is your ipaq, your ipaq?

- Anonymous vs Personal handheld
  - Telephone example
    - Landline telephones are anonymous
    - Cell/Mobile phones are personal
- Tradeoffs
  - private state
    - can be lost or stolen; should be protected
    - setup overhead on user
    - daily underhead on user: setup once & forget
    - less dependent on connectivity
    - public/private keys easy to use once setup

Connectivity

- Ipaq: 802.11 (WiFi) or Bluetooth

- Mobile: GPRS (edge) or Bluetooth

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Go to Python Tutorial Slides

Let's go through the slides from the Zope corporation on an introduction to Python by the inventor of python, Guido van Rossum

Server Code

```python
import sys, socket

if len(sys.argv) < 2:
    print "usage: socketserver <port>"
    sys.exit(2)

# create the server socket
s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)

port = int(sys.argv[1])

# allow the socket to be re-used immediately after a close
s.setsockopt(socket.SOL_SOCKET, socket.SO_REUSEADDR, 1)

s.bind( ("0.0.0.0", port) )

s.listen(5)             # start the server socket

(client, address) = s.accept()
print "accepted connection from %s:%d" % (address[0], address[1])

while True:
    data = client.recv(1024)
    if len(data) == 0:
        print "connection with %s closed." % address[0]
        break
    sys.stdout.write(data)
client.close()
```

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Client Code

```python
import sys
import socket

if len(sys.argv) < 3:
    print "usage: socketclient <address> <port>"
    sys.exit(2)

s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)

s.connect( (sys.argv[1], int(sys.argv[2]) ) )

print "connected.  type stuff."

while True:
    data = sys.stdin.readline()
    if len(data) == 0:
        print "closing connection with server"
        break

    s.send(data)
```

Online Tutorials

- Tutorials

  - http://www.python.org/doc/tut/tut.html

  - http://diveintopython.org/

  - http://www.intelinfo.com/newly_researched_free_tra
    ining/Python.html

- use google or go to python.org

Discussion about network infrastructure

- Initialization

  - Network

    - Static IP, DNS server -- why IPv6 and why not

    - DHCP: get ip and dns server -- vast improvement

  - Servers

    - Feed, chat, device, anything new

    - too many servers & must always be up

  - What will naive user do?

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Let's design it right

- What do we want?

  - Everything should just work without setup

- Observation

  - most interaction is local

  - remote interaction is rare

  - overhead for rare cases is ok

- How to setup/find a server without a fixed name or ip address?

  - Interactive class discussion