Maemo programming

Mobile programming
26/3 - 2008

Agenda

• Introduction
  - What is maemo?
  - Maemo Platform
  - The Devices

• Software structure
  - The Linux kernel
  - GTK+
  - Hildon
  - D-Bus
  - X-server

• SDK
  - Scratchbox
What is Maemo

• A open source development community for internet tablets
• Nokia sponsored
• Platform for Nokia N800 N810
• Maemo.org:
  – Software “repository”
  – Wiki
  – Guides
  – Tutorials

Maemo platform

• Based on a Linux kernel
• GPL software
• Gnome mobile framework
• Standart linux tools
• Gtk and Hildon
The Devices

- Nokia N800 and N810
  - ARM 400 MHz
  - Touch screen
  - WLAN
  - Bluetooth
  - N810 GPS
  - N810 QWERTY slice keyboard

Software structure

Internet Tablet software structure:
• The Linux kernel
  – The basic component of Linux/GNU systems
  – Supports a very wide range of hardware components and architectures
  – Possible to choose only the needed components
  – Possible to extent a running kernel by loading kernel modules on the run
  – The Kernel is open source but some driver modules might be “binary blobs”
Software structure

- GTK +
  - GTK is a Graphical toolkit
  - Implemented in C but has bindings to other languages like C++ and Python

Hildon

- The window manager:
D-BUS

- Application “IPC”
- Let’s applications communicate in clear text, on a unified bus
- Independent of language (as long as the language has D-BUS support)

Software structure

- X-server
  - The underlying graphical render
  - Control resolution, mouse and keyboard
  - Commonly used in *nix systems
Software development kit

• Scratch-box
  – A virtual machine hosting the Maemo OS
  – Emulates i386 and arm
  – Each target can contain a customized Maemo OS
  – Develop and test applications in this framework
  – Debug features such as GDB

Software development kit

• Scratchbox
  – Is installed in a Linux environment
  – Start the framework by:
    • `sudo /scratchbox/sbin/sbox_ctl start`
  – Start working in Scratchbox by logging in:
    • `/scratchbox/login`
  – Setup and switch targets inside scratchbox by
    • `sb-menu`
Software development kit

• Test applications
  – Make a new X-environment
    • `Xephyr :2 -host-cursor -screen 800x480x16 -dpi 96 -ac -extension Composite`
  – Export the display within scratchbox
    • `export DISPLAY=:2`
  – Start the OS
    • `af-sb-init.sh start`
  – Start the application
    • `run-standalone.sh ./"application-name"`

Where to go from here?

• Maemo.org
  – Applications to the platform
  – Tutorials
  – Wiki
  – Training material
  – Garage
• Mobile Phone Programming by F.Fitzek & F.Reichert
Exercises

• Use the provided Ubuntu VM-ware image to port an existing application to the phone.
• The application is of your own choice, but be aware of limited libraries
• The ubuntu image is available on a dvd
  - User: jars
  - Pass: jars
  - Scratchbox is located in /scratchbox
  - Scratchbox contains the two standard images: i386 and ARM

References

• http://maemo.org/maemo_training_material/maemo4.x/
• http://www.gtk.org/index.html