



D5 - Embedded GUI

Graphical User Interfaces for Embedded Linux

Objectives

- Understand the different layers associated with the graphic interface system
- Learn how to use the Linux frame buffer
- Discover the hardware abstraction layers
- Learn to use the main graphical toolkits (widgets) targeting embedded Linux
 - QT
 - FLTK
 - WxEmbedded
 - MiniGUI
 - ...
- Learn how to link commands to GUI elements

Labs are conducted on target boards, that can be:

Dual Cortex/A9-based "SnowBall" boards from ST-Ericsson, with Lauterbach JTAG probes.

Atmel ARM9-based boards, with Lauterbach JTAG probes.

We use the last linux kernel, as delivered on www.kernel.org.

Hardware

- A Linux PC for two trainees, with an ARM based target board
- Course material
- CDROM with documentation and tools used during the trainin

Prerequisites

- Knowledge of Linux user level programming ([see our D0 course](#))
- Knowledge of embedded Linux ([see our D1 course](#))

Plan

The various system layers used by GUIs

- Kernel drivers: frame buffer, direct access, ...
- Hardware abstraction layers: X, GGI, DirectFB, ...
- Graphical toolkits (widgets): QT, GTK, FLTK, ...
- Window manager: matchbox, sawfish, ...

- Desktop environments: GNOME, KDE, ...

The Linux frame buffer

- Selecting frame buffer support when building the kernel
- Generic VGA support, VESA
- Provided features

The hardware abstraction layers

- X: standard server and embedded-specific versions (tiny-X, Kdrive, Nano-X)
- GGI: generic multiplatform GUI (Linux, Windows, MacOS/X, ...)
- DirectFB: hardware acceleration above the frame buffer

The graphic toolkits (widgets)

- Trolltech's QT
- GTK (Gimp ToolKit)
- WxEmbedded
- FLTK (Fast Light ToolKit)
- MiniGUI
- Nano-X (ex MicroWindows)
- Standard "desktop" versions and embedded-specific versions
- Graphical GUI design tools: QT designer, Glade, FLUID...

Linking commands to GUI items

- Using fork and exec
- Pipe communication
- Integration with widgets

Embedded GUI distributions for Linux

- The "familiar project"
- GPE Palm Environment
- Qtopia
- Pixil

Renseignements pratiques

Duration : 3 days

Cost : 1850 € HT



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