MontaVista Mobilinux 5.0

montavista™

Mobile operating system and development environment delivers longer battery life, ubiquitous connectivity, fast performance, and NSA-level security

New MontaVista Mobilinux 5.0 is an optimized Linux operating system and development platform for wireless handsets and other mobile devices such as GPS devices, portable medical devices, and wireless point-of-sale terminals.

As a MontaVista commercial-grade Linux development platform, Mobilinux 5.0 provides the time-to-market benefits normally only found in proprietary development platforms with the customizability and control of an open-source Linux environment. Unlike freely-available source code, Mobilinux is productized, has been tested and hardened by MontaVista's best-in-class testing facilities, and is backed by MontaVista's advanced-level support.

Longer battery life

Fully configurable dynamic power management includes APIs that extend battery life to support power-hungry multimedia. In tests on a phone running a Texas Instruments OMAP 2430 processor, MontaVista's unique power management played MP3 music files five times as long as the same phone without MontaVista power management.

Built-in connectivity

MontaVista Linux can connect to more types of software and devices than any other Linux. Mobilinux 5.0 saves months of development time by providing out-of-the-box support for SDIO (Secure Digital Input Output), Wi-LAN/Wi-Fi over USB, Bluetooth over USB (supporting wireless headsets, headphones, and other items), USB On-The-Go, ALSA sound drivers, GStreamer, plus many new devices and the protocol stacks to support them.

Speedy startup

Phones using Moblinux 5.0 typically boot in less than 5 seconds and place a phone call in less than 10 seconds, three times faster than Symbian or Microsoft-based devices and three-and-a-half times faster than the Apple iPhone. MontaVista supports prelinking, so applications start quickly, enabling fast shut-down and resume from sleep in less than half a second.

Small footprint

Mobilinux 5.0 can be implemented in under 2 megabytes and, for a typical mobile phone with basic functionality, less than 14 megabytes. In addition, Mobilinux implements uClibc, LOT (Library Optimization Tool), XIP (Execute-In-Place), and other technologies to reduce application footprint size.

NSA-level mobile security

MontaVista Mobilinux 5.0 is the first mobile operating system to include MontaVista µSELinux, a compact version of Security-Enhanced Linux (SELinux), developed by the National Security Agency (NSA) to protect the confidentiality of messages and the integrity of files and system software. µSELinux prevents malware from taking control of a device, and it enables a single Mobilinux device to be used by users with different security roles to access multiple kinds of information with different security levels. This is the first availability of any form of SELinux for mobile devices. Only Mobilinux 5.0 can provide this degree of protection.

MontaVista Mobilinux 5.0

Integrated real-time response

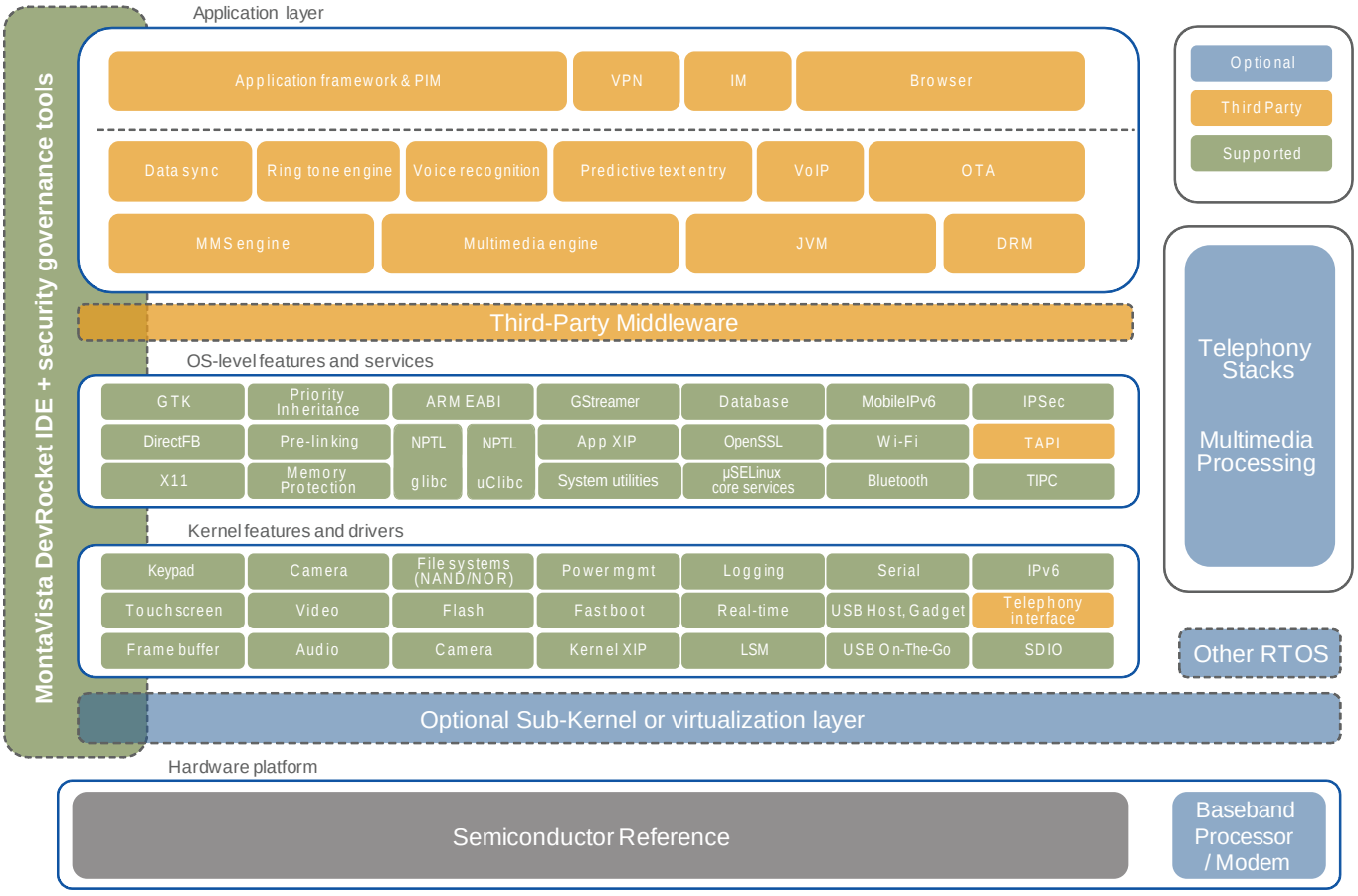
Mobilinux 5.0 is 100% native Linux with real-time performance features, including MontaVista enhancements plus integrated high resolution nanosecond timers (hrtimers) that avoid the compatibility and footprint headaches caused by double-kernel non-Linux add-ons. Additional real-time features include fast mutexes, threaded soft and hard IRQ handlers, and application-level priority inheritance and queuing, providing pre-emption response latency as low as RTOS latency.

BOM cost reduction

Given typical handset volumes, opportunities to reduce the bill of materials (BOM) cost can have a significant financial benefit. Most high-level operating systems have expensive hardware requirements. The advanced real-time technology in Mobilinux enables a single chipset to handle both baseband and application processing. Further, because MontaVista works with a wide range of processors, memories and boards, device manufacturers can choose the most cost-effective BOM components.

Multicore processor support

Mobilinux 5.0 supports both single-core and multicore processors, and supports devices built with multiple processing chips (such as phones using one baseband processor and one application processor) as well as synchronous and asychronous multiprocessing on integrated chips.



MontaVista Mobilinux 5.0 development platform

Better development environment

The device development tool chain for Mobilinux 5.0 is the first in the world to provide KGDB over USB. Traditional Linux debuggers require legacy serial ports, but phone miniaturization and cost reductions have eliminated those ports on many newer devices, thus disabling the ability of developers to run traces and diagnostics on their actual target devices. With KGDB over USB, Mobilinux 5.0 allows a debugger to connect directly to a device's USB port, allowing native debugging and tracing of both the kernel and applications to be done on the target device itself. In addition, Mobilinux 5.0 includes new platform development tools that enhance productivity for kernel-level work and new tools for application developers.

MontaVista DevRocket provides a comprehensive set of Eclipse-based development tools, including the Platform Development Kit (PDK) 5.0, which provides direct control over the MontaVista Linux development environment, and the Application Development Kit (ADK) 5.0, which provides the tools application developers need to get products to market quickly and efficiently.

- MontaVista PDK 5.0 provides everything required to create and deliver a MontaVista Linux-based development platform, including an industry-standard Eclipse IDE, broad CPU and board support, advanced analysis tools, target application packages, and complete source code.

- MontaVista ADK 5.0 is a graphical integrated development environment (IDE) based on industry-standard Eclipse, providing the tools needed to develop embedded applications built on the MontaVista Linux operating system. MontaVista ADK 5.0 hosts on the Linux, Microsoft Windows, and Sun Solaris operating systems, and the ADK supports integration with third-party Eclipse-based components and other tools.

About MontaVista Software

MontaVista Software, Inc. is the leading provider of Linux for intelligent devices and telecommunications infrastructure. MontaVista delivers commercial-grade Linux operating systems, time-saving development tools, expert support, and design and migration services. MontaVista has more than 400 partners, and thousands of companies use MontaVista embedded Linux to add functionality, increase reliability, reduce costs, and accelerate product development. MontaVista has offices in 15 countries. For more information, please visit www.mvista.com

SPECIFICATIONS

Linux kernel
- First mobile OS to support version 2.6.21

Architectures supported
- ARM: TI OMAP2430 and TI OMAP3430 reference platforms
- More platforms to follow in early 2008.
- Multicore processor support as well as single-core
- SoC support as well as devices built with multiple processing chips (such as a phone using one baseband processor and one application processor)

Libraries
- Glibc 2.5.90
- uClibc 0.9.29 with NPTL (Native POSIX Thread Library) and MTA
- Library Optimization Tool (LOT)

Security
- MontaVista µSELinux
  - o World's first SELinux for mobile devices
  - o Ports SELinux to ARM architecture
  - o Provides NSA-level security
  - o Verifiable mandatory access control (MAC)
  - o Protects the integrity of all system objects: files, network sockets, etc.
  - o Security governance tools include SLIDE integrated security policy development environment
- IPSec
- eCryptFS

Longer battery life
- Configurable dynamic power management
- Dynamic tick timer
- Tests show up to 80% less battery drain

Connectivity and I/O
- Pre-integrated connectivity and I/O drivers
- USB
- USB OTG (USB On-The-Go)
- USB Gadget
- Bluetooth
- Bluetooth over USB
- Wi-Fi over USB
- Wi-LAN over USB
- SDIO (Secure Digital Input/Output)
- TIPC
- D-Bus
- Sound drivers
- Graphics framework
- IPv6 certification ready

SPECIFICATIONS, CONTINUED

Graphics and multimedia
- Framebuffer
- DirectFB
- X Window System
- Gtk on DirectFB
- Gtk on X Window
- GStreamer
- VFP (Vector Floating Point) computation
- ALSA (Advanced Linux Sound Architecture)

Speed
- Fast boot (under 5 sec., place phone call in under 10 sec.)
- Fast app startup
- Fast shutdown
- Resume from sleep in less than ½ second
- Jazelle DBX Java acceleration framework (makes Java 5-10 times faster)
- Advanced real-time response (See below.)

Integrated real-time response
- MontaVista Linux preemptible kernel technology (100% native Linux; no double-kernel non-Linux add-ons)
- Real-time scheduler
- High resolution POSIX timers
- Threaded soft and hard IRQ handlers
- Application-level priority inheritance
- Priority queuing
- Robust mutexes
- Futexes
- Userland support
- Preempt_RT

Small footprint
- Can run in as little as 2 MB (OS + app)
- Typical mobile phone with basic functionality, less than 14MB
- Library Optimization Tool (LOT), uClibc, other footprint reduction technologies
- VFP (Vector Floating Point) computation
- Linux-Tiny
- 4kByte IRQ stack

Kernel and application development tools
- MontaVista DevRocket 5 Eclipse-based IDE
- First to provide KGDB/GDB over USB, which allows debugging and tracing of both kernel and apps to be done on the target device itself
- Many additional tools from MontaVista partners

System measurement tools:
- Kernel startup timing
- Execution tracing
- Performance profiling
- Memory usage

Application measurement tools:
- Performance profiling
- Memory usage
- Memory leak detection

Device management:
- View processes and change priority
- Remote file management
- Remote shell

Time-saving development tools:
- KGDB/GDB over USB, Ethernet, serial
- Automated remote debug
- Platform image builder
- LTTng (Linux Trace Toolkit Next Generation) support

Compiler optimizations:
- ARM EABI support for third-party tools
- Thumb mode
- Optimizations for ARMv5, ARMv6, and iWMMXt

Development environment hosts:
- Red Hat Enterprise Linux 3, 4 (32-bit & 64-bit); 5 (2008, 32-bit & 64-bit)
- SUSE Linux Enterprise Server 9 SP2
- SUSE Linux Enterprise Desktop 10, 10.1 (32-bit & 64-bit)
- Microsoft Windows 2000 SP4+, Microsoft Windows XP SP2+

Toolchain
- GCC 4.2.0
- TLS (Thread Local Storage)
- ARM EABI (Extended Application Binary Interface)

File systems
- XIP (Execute-In-Place) of kernel and applications
- PRAMFS (Protected RAM File System)
- SquashFS (compressed read-only file system)
- JFFS2 and YAFFS2 with support for NOR and NAND flash
- eCryptFS
- UnionFS

Support
- MontaVista Zone customer portal
- Hands-on training classes
- 24-hour email and phone support
- MontaVista Professional Services custom engineering
- Support and services from MontaVista partners

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