eCos® Portfolio

Services

- BSP development, porting, enhancements and customization
  - Boot loader
  - Kernel porting
  - Device drivers
  - File systems
- Development and porting of protocol stacks
- Physical validation
- Integration and maintenance with third party BSP
- Compliance testing

Focus areas

- Smart card readers
- Secure storage devices
- Communication device
- Networking

Overview

eCos® is an open source, real-time operating system intended for embedded applications. It is widely used in product lines such as gaming consoles, communication gateways and biometric access systems.

Making use of its rich expertise in creating eCos BSPs for various hardware platforms, Aftek has developed wide variety of solutions for customers. These solutions include embedded devices such as smart card reader, secured storage device and networking & communication devices.

Aftek Expertise

eCos versions: eCos1.3, eCos2.0

Architectures and Processors

- Application processors - ARM (ARM7, ARM9)
- Configurable processors - Xtensa (Diamond DC232L)

Boot Loaders

- AftekBoot (Aftek proprietary boot loader)
- RedBoot™

Device Drivers

- Displays - Character LCDs, On-screen display
- Memory devices - Flash, SDRAM
- Communication peripherals Bluetooth, Ethernet, Near field communication (NFC)
- Bus interfaces - USB host and device, SDIO, Smart card (ISO7816-3 T=0, T=1), I2C, SPI, RS-232, RS-485
- Flash file systems - JFFS2
- Disk file systems - FAT32
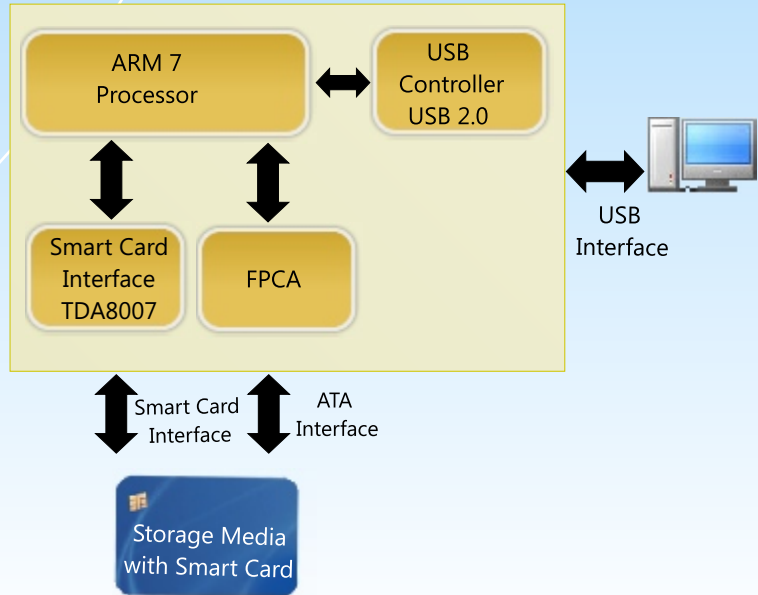- RAM file system - RAMFS

Protocol Stacks

- Bluetooth - lwBT stack (with OBEX layer), SIM access profile (SAP), File access profile (FTP)
- USB - Mass storage, CCID
- TCP/IP
- NFC - Reader / writer mode, card emulation mode

Case Studies

Secured Storage Device (Compact electronic reader)

It is a USB composite device with two different interfaces mass storage and CCID. The reader authenticates the user before providing access to data stored on the storage media. This device supports AES based data encryption and PKI authentication.

- Aftek ported eCos 2.0 RTOS on hardware platform based on Atmel AT91FR4042 processor.
- eCos port was optimized for memory footprint and enhanced USB throughput.
- Developed customized boot loader.
- Developed device drivers for USB device, smart card (ISO7816-3 T = 0, T = 1) and flash memory.
- Developed an application which controls access to a secure partition of the storage device after authenticating a user through the smart card.

eCos®2.0 Kernel for Tensilica Diamond™ DC232L processor

The Diamond Standard processor series from Tensilica is based on Xtensa LX2 architecture. Xtensa based configurable processors have a rich feature set, low power requirements and high configurability. Used along with a configurable operating system such as eCos, very efficient products can be developed by including support for only required features in hardware as well as software.

- Aftek ported eCos® 2.0 RTOS on DC232L platform based on an Xtensa core.
- Developed a board support package consisting of device drivers, flash file system (JFFS2) and FreeBSD TCP/IP stack.
- Developed device drivers for Ethernet controller, flash memory and serial UART.
- This BSP reduces cost and time-to-market for new products.