Prex Embedded Real-time OS

Smart. Simple. Secure.

Prex delivers extremely portable and realtime microkernel for embedded systems.

Prex is an open source, real-time operating system for embedded systems. Prex is designed specifically for tiny, resource-constrained platforms. It is written in 100% ANSI C and its microkernel is highly portable. Prex supports POSIX interface and it provides file systems, an embedded libc, and CmdBox which includes tiny versions of Unix utilities.

Key feature of Prex:

Real-Time:
A preemptive, multithreaded kernel provides the basis for robust, power-efficient and responsive Prex.

Memory Protection:
The system can be configured with MMU or without MMU. Its memory protection logic can prevent the entire system from any application faults.

Portability:
The microkernel has a well defined hardware abstraction layer in it, and thus the developer can easily port the kernel for the different architecture or platform.

License:
Prex is royalty-free software released under revised BSD license

Power Management:
Prex power management framework provides device/system power transition, power policy management, inactivity timer and automatic processor frequency control.

Security:
The microkernel provides the capability based security feature. The kernel or system servers can be protected by malicious applications. It also supports pathname-based access control.
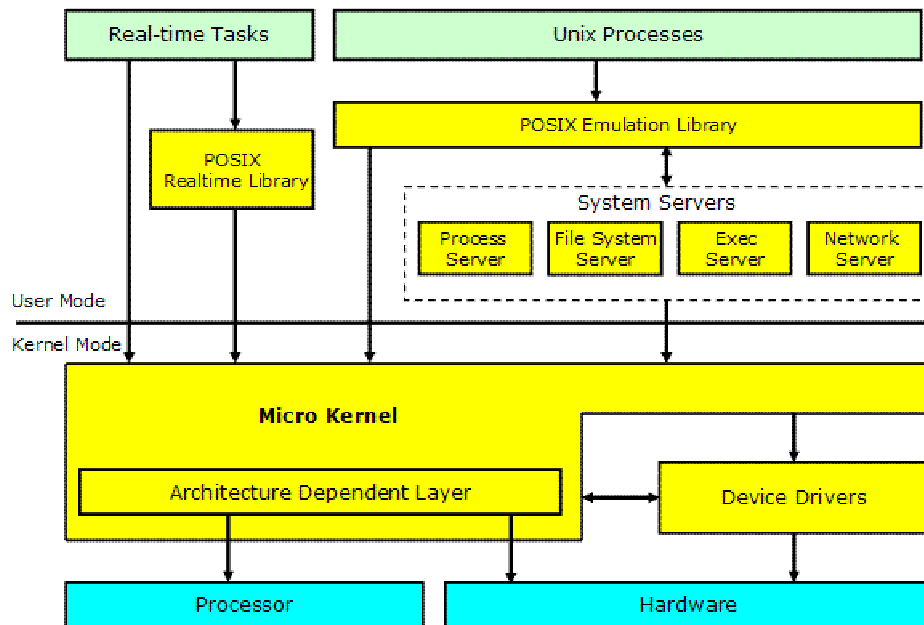
POSIX Support:
The POSIX emulation libraries allow the system to use the existing Unix application properties.

Small Footprint:
The size of a kernel module is only 25K bytes.

Prex Embedded Real-time OS

| Real-time Tasks | Unix Processes |

POSIX Emulation Library

POSIX Realtime Library

System Servers

| Process Server | File System Server | Exec Server | Network Server |

User Mode

Kernel Mode

Micro Kernel

Architecture Dependent Layer

Device Drivers

| Processor | Hardware |

Technical specifications:

Prex Microkernel
- Preemptive priority scheduling or FIFO scheduling
- 256 priority levels
- Fast context switching
- Memory protection
- Shared memory
- Synchronous IPC
- Fault trapping
- POSIX signal
- Counting Semaphore
- Condition Variables
- Mutex with priority inheritance
- Sleep timers
- One shot or periodic timers
- POSIX 1.e based Task capability

Device Driver
- Separated from kernel module
- Nested interrupt service routines
- Prioritized interrupt service threads
- Deferred procedure call
- Power management framework
- Dynamic voltage scaling
- TTY

Process Primitive
- Process ID
- fork
- exec

File System
- Multithreaded VFS framework
- Buffer cache
- FIFO / pipe
- RAM filesystem
- FAT filesystem
- Dev filesystem

User Applications
- Embedded libc
- CmdBox
- Tiny shell
- Terminal lock utility
- Software Installer
- Many sample applications

Supported Target
- ARM
- x86
- Power PC

http://prex.sf.net