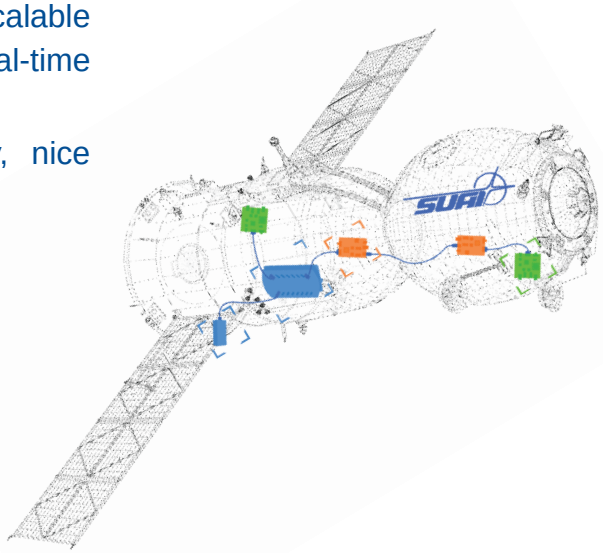
eidOS
embedded operating system

eidOS – fully domestic compact and well-scalable embedded operating system for real-time applications.

Microkernel architecture provides modularity, nice portability, extensibility and reliability.

Application area: aerospace onboard network systems and other embedded control systems.



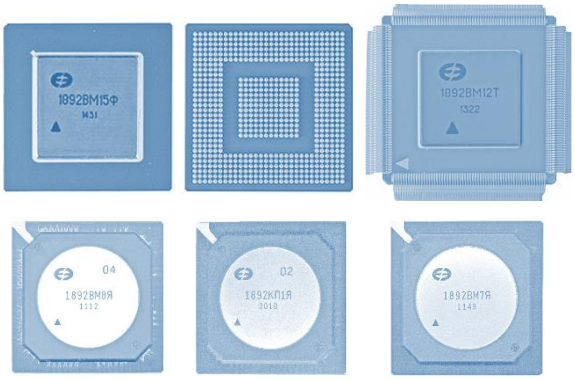
Key characteristics

- Microkernel architecture
- Preemptive multitasking
- Inter-task communication and synchronization: mutex, message
- Priority inheritance
- 2-level interrupt handling
- Extendability due to modular approach
- Low response time, footprint and performance overhead
- POSIX-compatible (incomplete): POSIX 1003.13-2003 PSE 51
- Scalable code in ANSI C

Supported hardware

Elvees multicore microprocessors (MIPS32):

- MC-24 (1892VM2YA)
- МСК-01 (1892HD2YA)
- MC-24R22 (1892VM8YA)
- МСК-022 (1892KP1YA)
- MC-0428 MFORCE (1892VM7YA)
- SWH-01
- MCT-03P (1892VM12T)
- MC-30SF6 (1892VM15F)



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Drivers and modules

- Timer driver
  (based on interval timer)
- UART driver
- C standard library (libc) module
- Dynamic memory allocation module

SpaceWire driver

- SpaceWire driver:
  - sending and receiving data (packets)
  - sending and receiving control codes (time codes, interrupt codes, acknowledge codes)

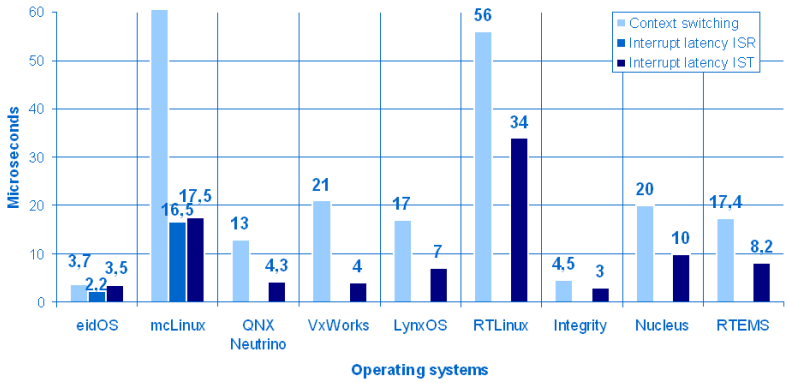
  Advantages :
  - Using the program buffer queue –
    preserve data when a channel is busy or no connection is available
  - Receive and transmit handlers :
    - Data - Second-level interrupt handlers (threads)
    - Control codes, connections, errors in channel - First-level interrupt handlers

    This approach provides a timely response to control codes
- RMAP (ECSS-E-ST-50-52C) module

Time characteristics

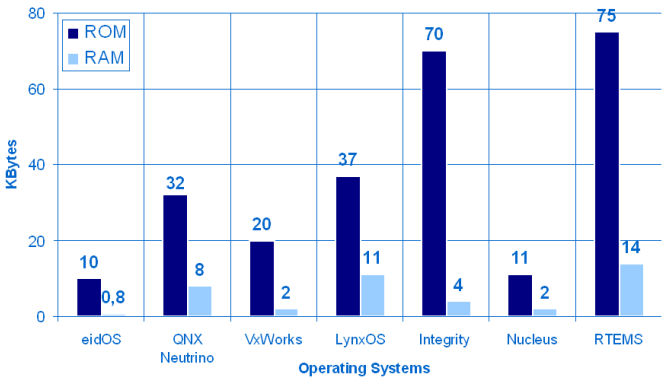
Hardware for measuring: MC-24EM SpaceWire board

CPU frequency, MHz	100
Context switch, µs	3,65
Interrupt latency ISR, µs	2,24
Interrupt latency IST, µs	3,48
Scheduling latency, µs	3,11



Memory requirements

- Minimum configuration:
  10 KBytes ROM, 800 Bytes RAM
- Kernel, SpaceWire driver, timer driver and several other modules:
  12.5 KBytes ROM, 6.5 KBytes RAM



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