MinOS

Team members

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Environment

- based on GeekOS 0.3.0
- Language: C
- Emulator: BOCHS 3.2.6
- Compiler: gcc 3.4

MinOS supports...

- ELF file format
- Segmentation
- Threads
  - Kernel
  - User
- Semaphores
- (Preemptive) Scheduling
- Filesystem (in progress)

Semaphores

Bit Sets:

- semaphores are managed by bit sets
- a **system internal** bit set is used for managing the semaphores
- each **thread** has an **additional bit set** to mark allocated semaphores

Advantages over Lists:

- less memory consumption
- information is easier to retrieve

Scheduling

MINOS currently supports two different scheduling policies:

- **Round Robin**
- **Multilevel-Feedback**
  - several queues with descending priority
  - favors I/O bound processes
  - Problem: (CPU bound) processes may starve
  - our implementation avoids this problem

Demo (1)

Semaphores

- **sem1a.exe**
  - Tries to create more semaphores than the system is able to support
- **sem1b.exe**
  - Tests if the kernel destroys the semaphores not freed by the thread itself
- **sem2.exe**
  - Tries to create multiple semaphores with the same name

Demo (2)

Scheduling:

- **workload.exe**
  - is used for testing semaphores and scheduling algorithms
- **sched.exe**
  - Visualization of the chosen scheduling algorithm and quantum
- **starve.exe & block.exe**
  - Tests the system's ability to prevent starvation of processes

Thank you for your attention!