Operating Systems: NACHOS

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https://gforgeron.gitlab.io/se/

NACHOS

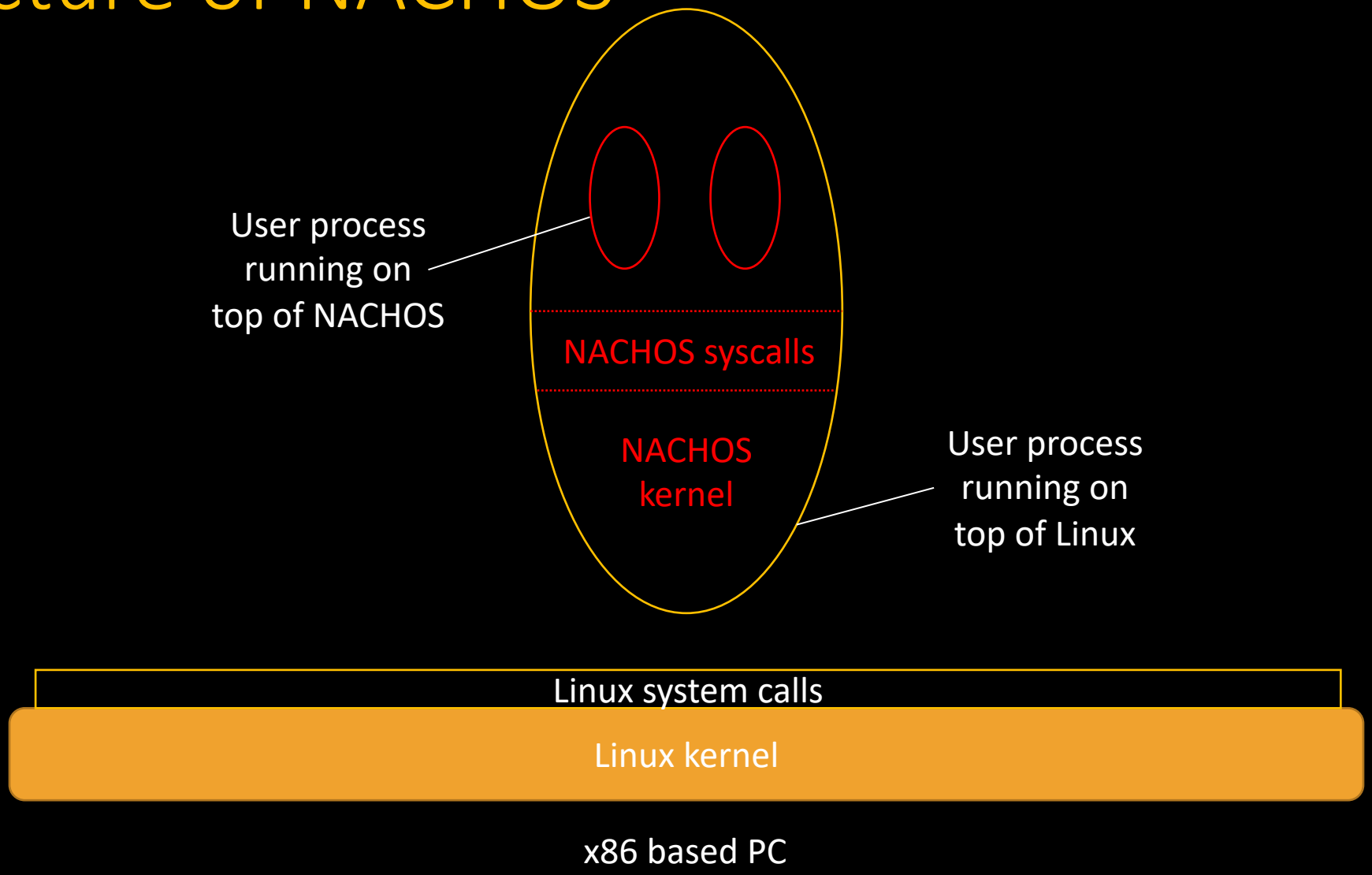
- Not Another Completely Heuristic Operating System
  - Instructional software for teaching operating systems courses
    - Thomas Anderson, The University of California, Berkeley
  - Note: we use a slightly modified version @ University of Bordeaux

- NACHOS is deterministic
  - Pseudo randomization
    - Each seed leads to a same execution
  - Muuuuuuuuch more convenient to debug!

NACHOS

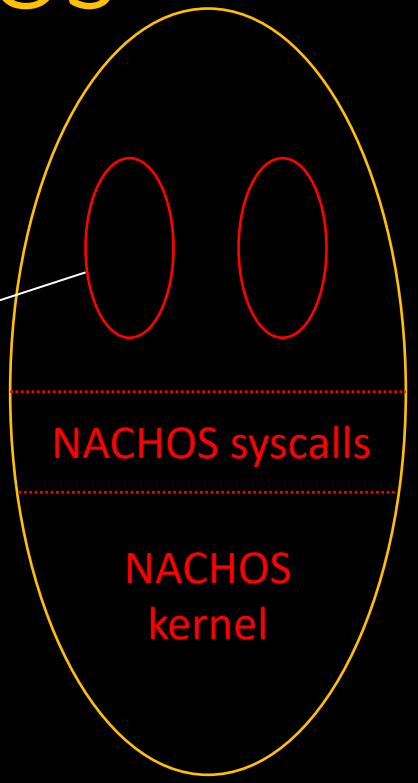
- The NACHOS simulator runs as a regular Linux process
  - Stopping NACHOS (if things go wrong) is harmless
  - Debugging NACHOS is as simple as using `gdb` ☺
- The NACHOS kernel is minimal
  - It basically features a Process Scheduler
- NACHOS can load and execute user programs
  - How can that be?

Structure of NACHOS



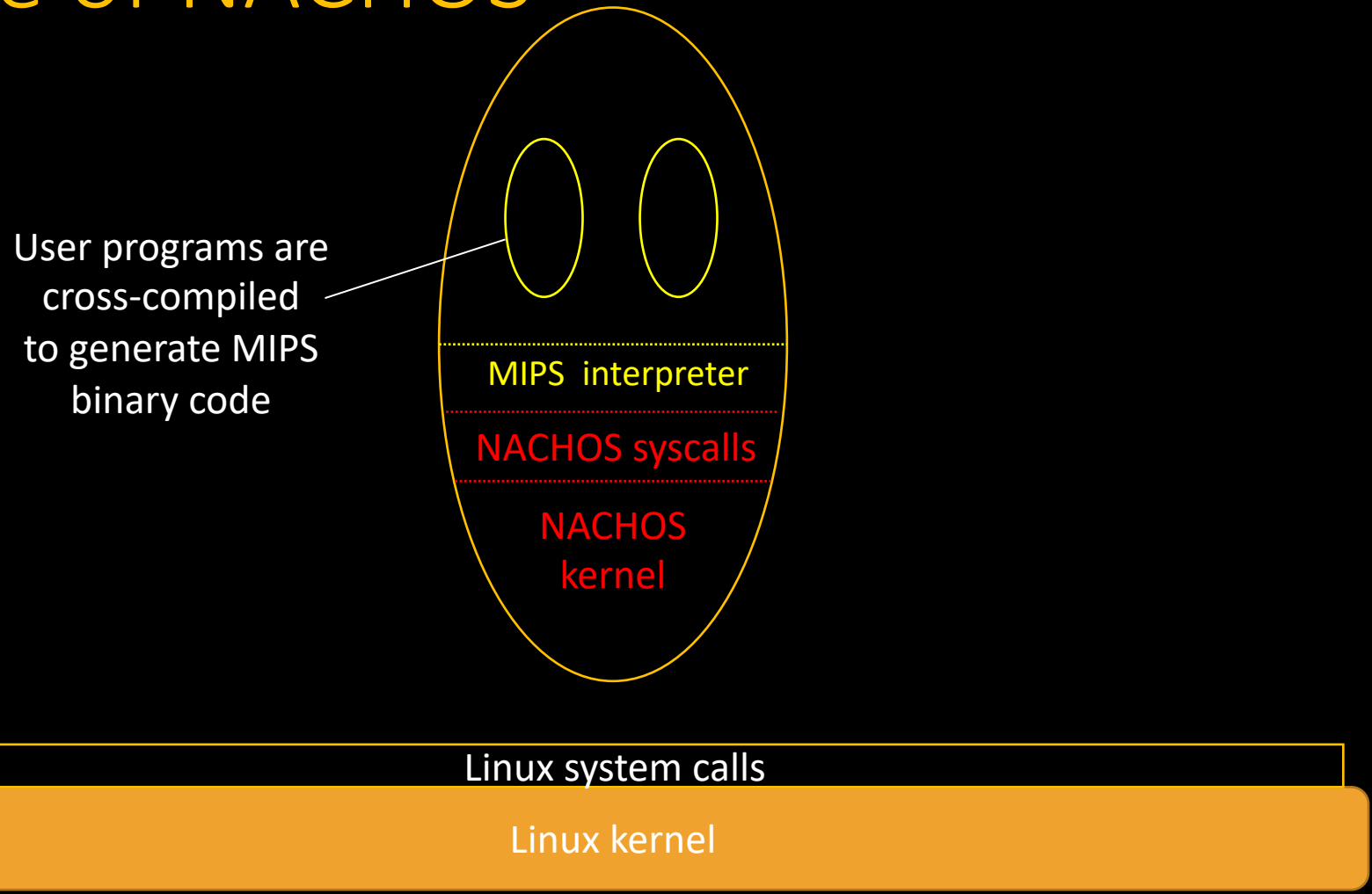
Structure of NACHOS

If this code raises an exception,
it will trap into the Linux kernel !
☹



x86 based PC

Structure of NACHOS



Hardware + Software simulation

- As a result, NACHOS also simulates the hardware
  - (Single) CPU
  - Memory
  - Timer
  - I/O console

- The corresponding code should never be modified

Structure of directories

- `nachos/code/`
  - Only a convenient (?) place to trigger the whole compilation process
- `nachos/code/threads/`
  - ‘make’ will only build a simple auto-test kernel
- `nachos/code/userprog/`
  - ‘make’ will build a version of NACHOS able to run user programs
  - E.g.

```
./nachos -x ../test/halt
```

- `nachos/code/test/`
  - Contains the source files of user programs
  - See `halt.c` for instance

Additional resources available on http://gforgeron.gitlab.io/se/