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Introduction to Operating System

NachOS Introduction

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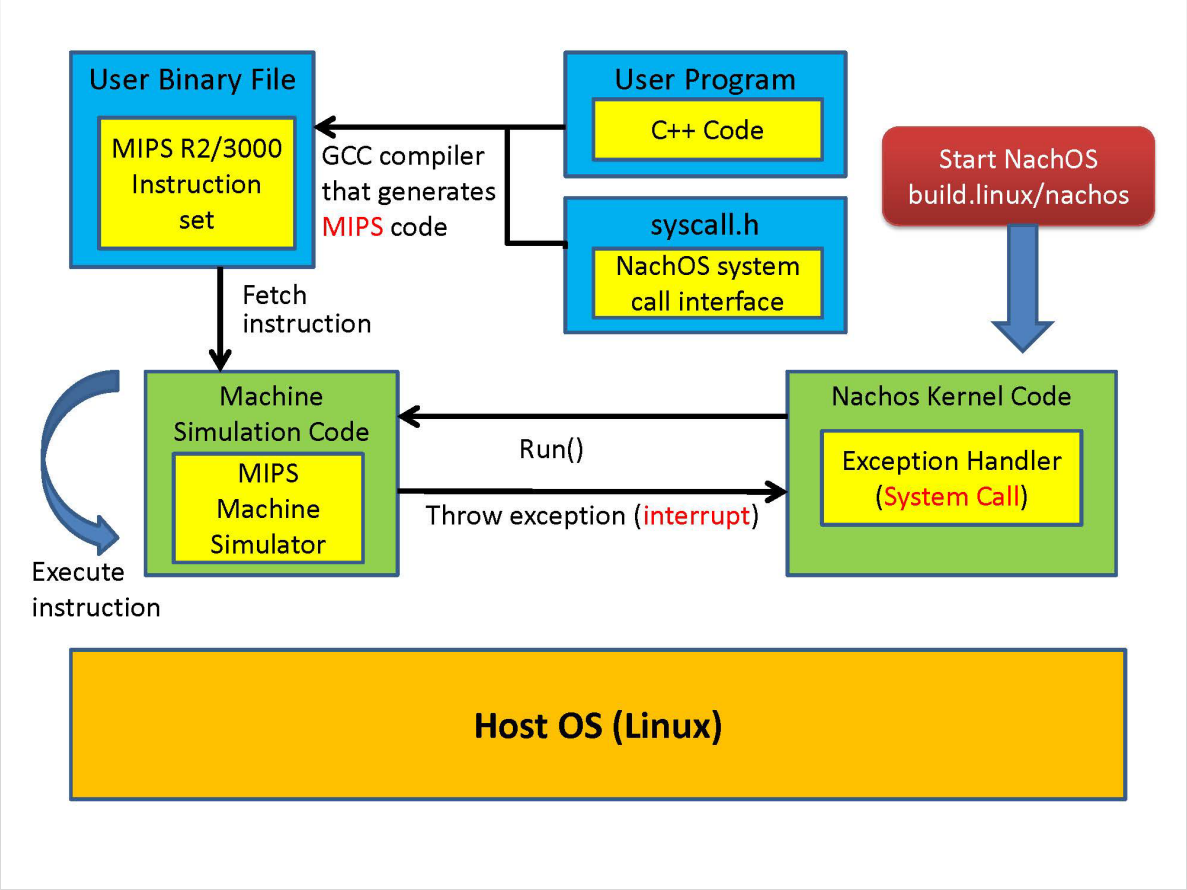
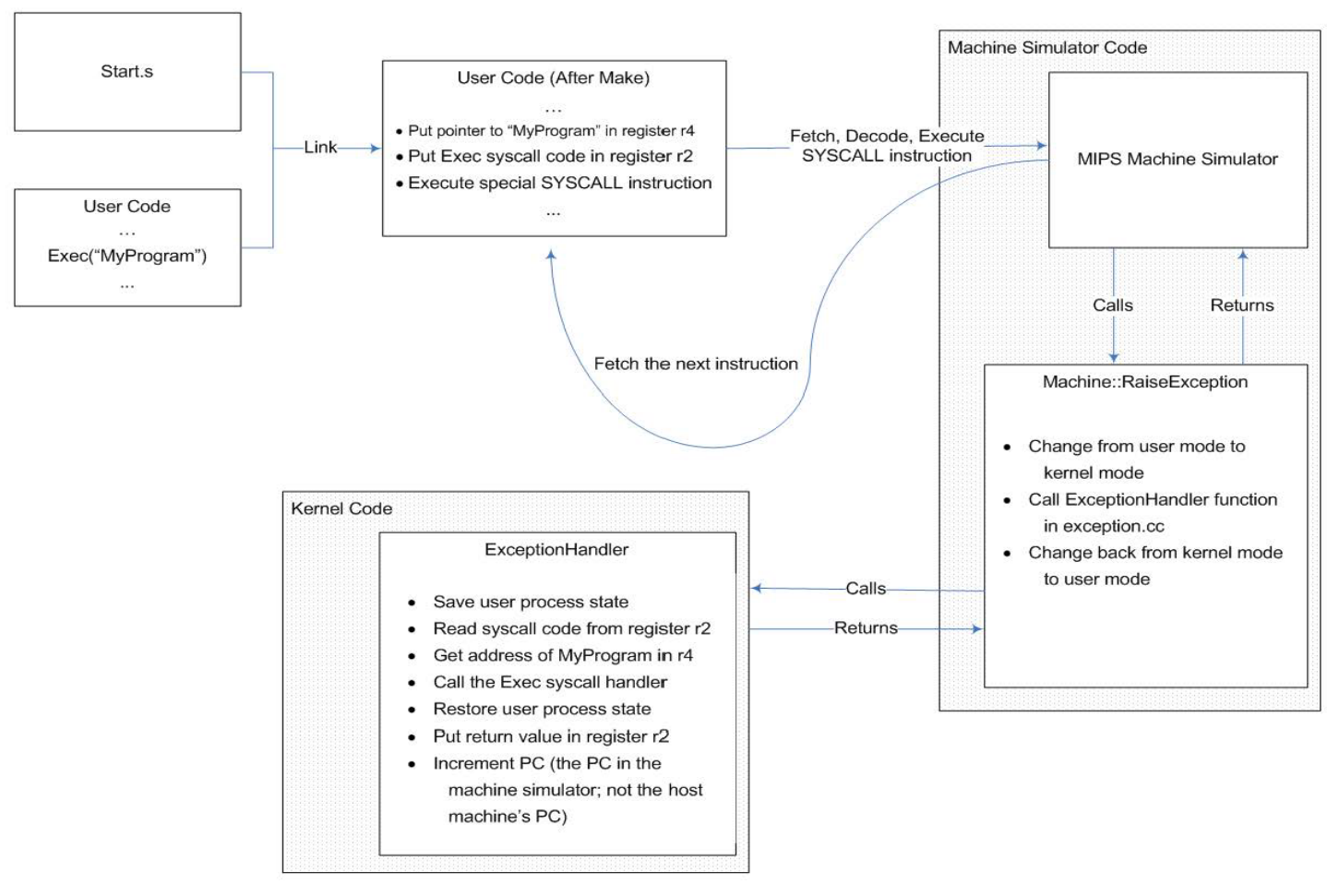
What is NachOS

- Not Another Completely Heuristic Operating System (**NachOS**) was designed by Thomas Anderson
- **Just a process** that runs on top of another OS and host machine
- Process contains the **kernel** (OS) and **MIPS code machine simulator** (virtual machine like **Java** except using MIPS code instead of bytecode)

NachOS


User Binary File
MIPS R2/3000 Instruction set
GCC compiler that generates MIPS code
User Program
C++ Code
syscall.h
NachOS system call interface
Start NachOS build.linux/nachos
Fetch instruction
Machine Simulation Code
MIPS Machine Simulator
Run()
Throw exception (interrupt)
Nachos Kernel Code
Exception Handler (System Call)
Execute instruction
Host OS (Linux)

System Call Example - The Exec System Call



Nachos Directory Structure Code

- lib/
  - utilities used by the rest of the Nachos code
- machine/
  - The **machine simulation**
- threads/
  - Nachos is a multi-threaded program. Thread supports are found here. This directory also contains the **main()** routine of the nachos program, in **main.cc**

Nachos Directory Structure Code

- network/
  - Nachos operating system support for networking, which implements a simple “post office” facility. Several independent simulated Nachos machines can talk to each other through a simulated network. Unix sockets are used to simulate network connections among the machines.
- filesys/
  - Two different file system implementations are here. The **real** file system uses the simulated workstation’s simulated disk to hold files. A **stub** file system translates Nachos file system calls into UNIX file system calls makefile.

Nachos Directory Structure Code

- test/
  - **User test programs** to run on the simulated machine. As indicated earlier, these are separate from the source for the Nachos operating system and workstation simulation. This directory contains its own Makefile. The test programs are simple and written in C rather than C++.
- userprog/
  - **Nachos operating system code** to support the creation of address spaces, loading of user (test) programs, and execution of test programs on the simulated machine. The exception handling code is here, in exception.cc.

Q & A

Thank you for your attention