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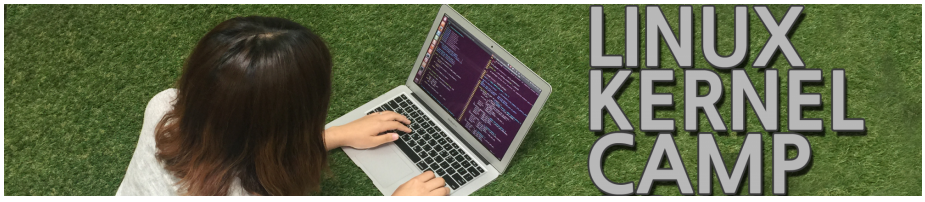

Figure 1: Camp main image

Memory management exercise file

Our team teaches OS memory technique in Linux as below:

- **What is in a page table entry (PTE)?** : first class
- **copy-on-write fork** : first class
- **on-demand page allocation - heap** : first class
- **on-demand page allocation - stack** : second class
- **guard page to protect against stack overflow** : second class
- **slab allocation** : second class ____

Basic camp tools guide

- gdb
- qemu

First class

Setup virtual box

GDB

Linux Debugging

QEMU

Second class

This page explain how to create the kernel debugging environment.

Basic Setup

- `$git clone https://github.com/kmu-camp2016/linux`
  `$git clone https://github.com/kmu-camp2016/qemu`

Camp Tools Guide

Camp Tools Guide

- gdb
- qemu

OS technique in Linux

- what is in a page table entry (PTE)?
- isolate process memory
- isolated address spaces
- isolate CPU
- on-demand page allocation
- guard page to protect against stack overflow
- copy-on-write fork
- demand paging
- use virtual memory larger than physical memory
- memory-mapped files

Virtual box

Linux kernel camp memory management

gdb

- `mkdocs build` - Build the documentation site.

  ```
  git clone https://github.com/kmu-camp2016/linux
  git clone https://github.com/kmu-camp2016/qemu
  ```

How to generate camp web site

- `mkdocs build` - Build the documentation site.
- You can see site directory.
- Change the git branch to gh-pages and then update your generated site.

Initial Setup

Basic Setup

- ```
  git clone https://github.com/kmu-camp2016/linux
  git clone https://github.com/kmu-camp2016/qemu
  ```

Build qemu

- `$./configure --disable-kvm --prefix=PFX --target-list="i386-softmmu x86_64-softmmu"`
- `#make`
  ```

Debugging

Linux kernel camp memory management

gdb

- `mkdocs build` - Build the documentation site.

```
git clone https://github.com/kmu-camp2016/linux
git clone https://github.com/kmu-camp2016/qemu
```

How to generate camp web site

- `mkdocs build` - Build the documentation site.
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gdb

GDB short manual

- `Ctrl-c`
- `c (or continue)` Continue execution until the next breakpoint or Ctrl-c.
- `si (or stepi)` Execute one machine instruction.

qemu

Qemu short manual

- `Ctrl-c`
- `info mem` Continue execution until the next breakpoint or Ctrl-c.
- `info pg` Execute one machine instruction.

kernel

Kernel short manual

- `make qemu`
- `make qemu-gdb` Continue execution until the next breakpoint or Ctrl-c.