

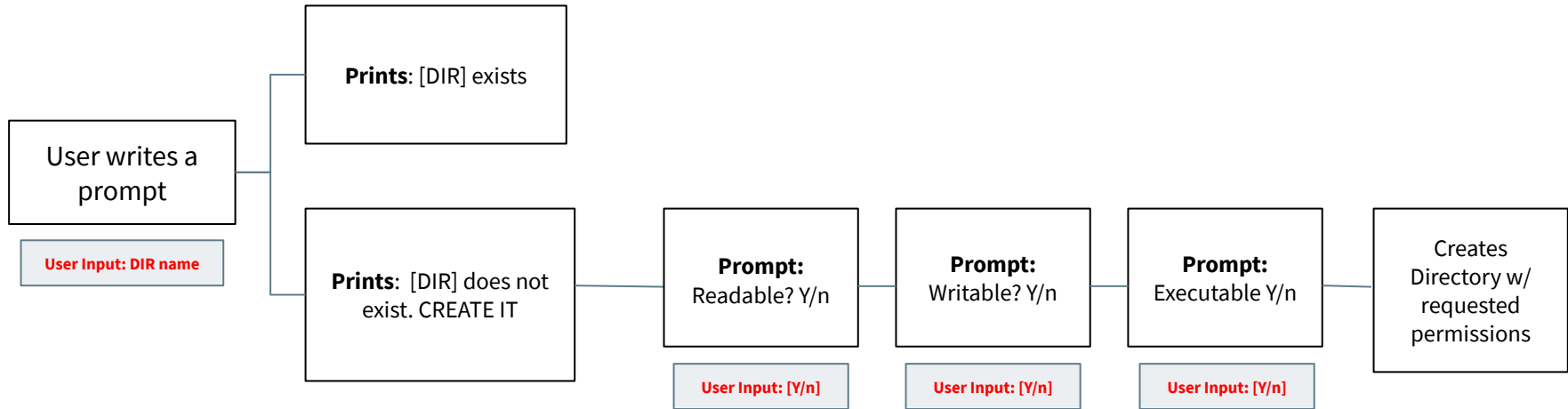
Operating Systems Project: mkch

Group 9:

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Our Change: mkch

- Combine the mkdir and chmod command that walks the user through a user-friendly experience.
- The person with owner access can customize the permissions of those in the user level.



Why we wanted to do this

- Read-write permissions are confusing and look mysterious \emptyset_\emptyset
- Convenience

mkch



```
ox:~$ mkdir -m777 newFolder
ox:~$ mkdir -m700 newFolder2
ox:~$
```

Needs Google to understand

Ugly ಥ_ಥ

Why 7?? What does that even mean??



```
root@clarissab-VirtualBox:/home/clarissab/Desktop# mkch test
[DIR] {test} does not exist, CREATE IT

Do you want to make {test} readable? [Y/n]: y
Do you want to make {test} writable? [Y/n]: n
Do you want to make {test} executable for everyone? [Y/n]: n
```

Very clear

Prettier ✿

Knows exactly what it means

Research Done

- GNU - Core Utilities
 - Manual - <https://www.gnu.org/software/coreutils/manual/>
 - GGSYW
- Kernel Modifications
 - Familiarity with the file structure and its libraries
 - GGSYW
- Kernel Build
 - Professor's Kernel Build post from April 2020.
 - GGSYW

GGSYW = Google Search, Github, Stack Overflow, Youtube, Wikipedia

Problems Experienced

Building the Kernel

Obsolete Instructions. Extremely time consuming.

Modifying the Kernel

Obsolete Instructions, total path-police, limitations

GNU-coreutils

Explored this a lot later.

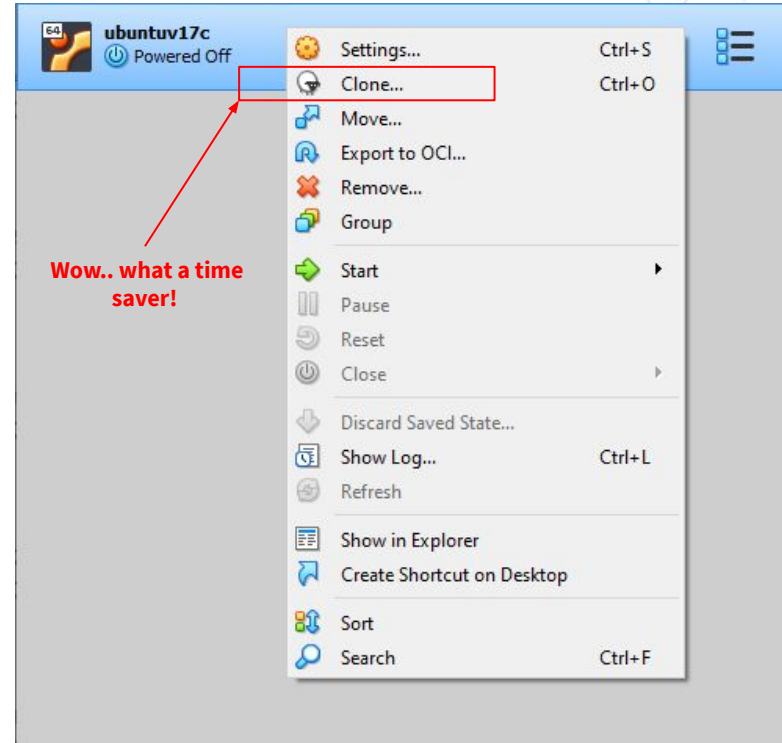
```
CC arch/x86/boot/compressed/misc.o
CC arch/x86/boot/compressed/cmdline.o
CC arch/x86/boot/compressed/error.o
OBJCOPY arch/x86/boot/compressed/vmlinux.bin
RELOCS arch/x86/boot/compressed/vmlinux.relocs
LZ4 arch/x86/boot/compressed/vmlinux.bin.lz4
MKPIGGY arch/x86/boot/compressed/piggy.5
AS arch/x86/boot/compressed/piggy.o
CC arch/x86/boot/compressed/early_serial_console.o
CC arch/x86/boot/compressed/kaslr.o
CC arch/x86/boot/compressed/ident_map_64.o
CC arch/x86/boot/compressed/idt_64.o
CC arch/x86/boot/compressed/pgtable_64.o
CC arch/x86/boot/compressed/sev-es.o
CC arch/x86/boot/compressed/acpi.o
LD arch/x86/boot/compressed/vmlinux
ZOFFSET arch/x86/boot/zoffset.h
AS arch/x86/boot/header.o
CC arch/x86/boot/compressed/ident_map_64.o
CC arch/x86/boot/compressed/idt_64.o
CC arch/x86/boot/compressed/pgtable_64.o
OBJCOPY arch/x86/boot/vmlinux.bin
BUILD arch/x86/boot/bzImage
Kernel: arch/x86/boot/bzImage is ready (#3)
MODPOST Module.symvers
drivers/video/fbdev/matrox/matroxfb_base.o: Invalid argument
make[1]: *** [scripts/Makefile.modpost:111: Module.symvers] Error 1
make: *** [Makefile:1401: modules] Error 2
ktacyama@ktacyama-VirtualBox: ~/linux-5.10.28$
```

```
OBJCOPY arch/x86/boot/compressed/vmlinux.bin
RELOCS arch/x86/boot/compressed/vmlinux.relocs
LZ4 arch/x86/boot/compressed/vmlinux.bin.lz4
MKPIGGY arch/x86/boot/compressed/piggy.o
AS arch/x86/boot/compressed/piggy.5
CC arch/x86/boot/compressed/early_serial_console.o
CC arch/x86/boot/compressed/kaslr.o
CC arch/x86/boot/compressed/ident_map_64.o
CC arch/x86/boot/compressed/idt_64.o
CC arch/x86/boot/compressed/pgtable_64.o
CC arch/x86/boot/compressed/sev-es.o
CC arch/x86/boot/compressed/acpi.o
LD arch/x86/boot/compressed/vmlinux
ZOFFSET arch/x86/boot/zoffset.h
AS arch/x86/boot/header.o
CC arch/x86/boot/compressed/ident_map_64.o
CC arch/x86/boot/compressed/idt_64.o
CC arch/x86/boot/compressed/pgtable_64.o
OBJCOPY arch/x86/boot/vmlinux.bin
BUILD arch/x86/boot/bzImage
Kernel: arch/x86/boot/bzImage is ready (#3)
MODPOST Module.symvers
drivers/video/fbdev/matrox/matroxfb_base.o: Invalid argument
make[1]: *** [scripts/Makefile.modpost:111: Module.symvers] Error 1
make: *** [Makefile:1401: modules] Error 2
ktacyama@ktacyama-VirtualBox: ~/linux-5.10.28$
```

```
arch/x86/lib/insn-evl.o
arch/x86/lib/usercopy.o
arch/x86/lib/usercopy_64.o
arch/x86/lib/lib.a
arch/x86/lib/msr.o
arch/x86/lib/built-in.o
include/generated/compile.h
init/version.o
init/built-in.a
vmlinux.o
vmlinux.symvers
module.builtin.modinfo
.tmp_vmlinux.btf
ld: arch/x86/entry/syscall_64.o:(.rodata+0x1120): undefined reference to `__x64_sys_hello'
BTF .btf.vmlinux.bin.o
tag_check_id_drift: subroutine_type id drift, core_id: 1170, btf_type_id: 1167, type_id_off: 0
libbpf: Unsupported BTF_KIND:0
btf_elf_encode: btf_new failed!
free(): double free detected in tcache 2
Aborted (core dumped)
[XDG_RUNTIME_DIR (/run/user/1000) is not owned by us (uid 0), but by uid 1000! (T
his could e.g. happen if you try to connect to a non-root PulseAudio as a root u
root@ktacyama-VirtualBox: /home/ktacyama/linux-5.10.28# make
CALL scripts/checksyscalls.sh
CALL scripts/atomic/check-atomics.sh
DESCEND objtool
DESCEND bpf/resolve_btfids
CHK include/generated/compile.h
CHK kernel/kheaders_data.tar.xz
LD [M] drivers/gpu/drm/amd/amdgpu/amdgpu.o
drivers/gpu/drm/amd/amdgpu/./amdkrnl/kfd_device.o: file not recognized: file for
mat not recognized
make[4]: *** [scripts/Makefile.build:430: drivers/gpu/drm/amd/amdgpu/amdgpu.o] E
rror 1
make[3]: *** [scripts/Makefile.build:496: drivers/gpu/drm/amd/amdgpu] Error 2
make[2]: *** [scripts/Makefile.build:496: drivers/gpu/drm] Error 2
ld: arch/x86/entry/syscall_64.o:(.rodata+0x1120): undefined reference to `__x64_sys_hello'
BTF .btf.vmlinux.bin.o
tag_check_id_drift: subroutine_type id drift, core_id: 1171, btf_type_id: 1168, type_id_off: 0
libbpf: Unsupported BTF_KIND:0
btf_elf_encode: btf_new failed!
free(): double free detected in tcache 2
Aborted (core dumped)
LD .tmp_vmlinux.kallsyms1
```

How Problems Were Mitigated

- Group 04 - solution to kernel build.
- Cloning the progressing successful VM machines.
- Professor's post on adding a kernel command (even though we did not use it.)
- Lots of trial and error and Stack Overflow



The background of the image is a light gray network diagram. It consists of numerous small circular nodes, some of which are highlighted with a darker gray border. These nodes are interconnected by a web of thin, light gray lines, creating a complex, organic pattern that resembles a molecular structure or a data network. The overall aesthetic is clean and technical.

DEMO

Takeaways

Terminal Familiarity



Kernel

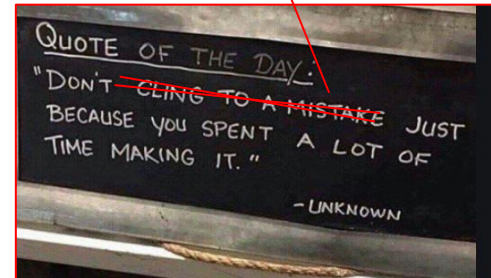
Core Utilities

Kernel

Core Utilities

Embrace the Change

“Don’t force the kernel
to work”



The background of the slide is a light gray network pattern. It consists of numerous small circles, some of which are solid gray and others are hollow with a gray outline. These circles are interconnected by a web of thin, light gray lines, creating a complex, organic structure that resembles a molecular or digital network.

THANK YOU
QUESTIONS AND COMMENTS