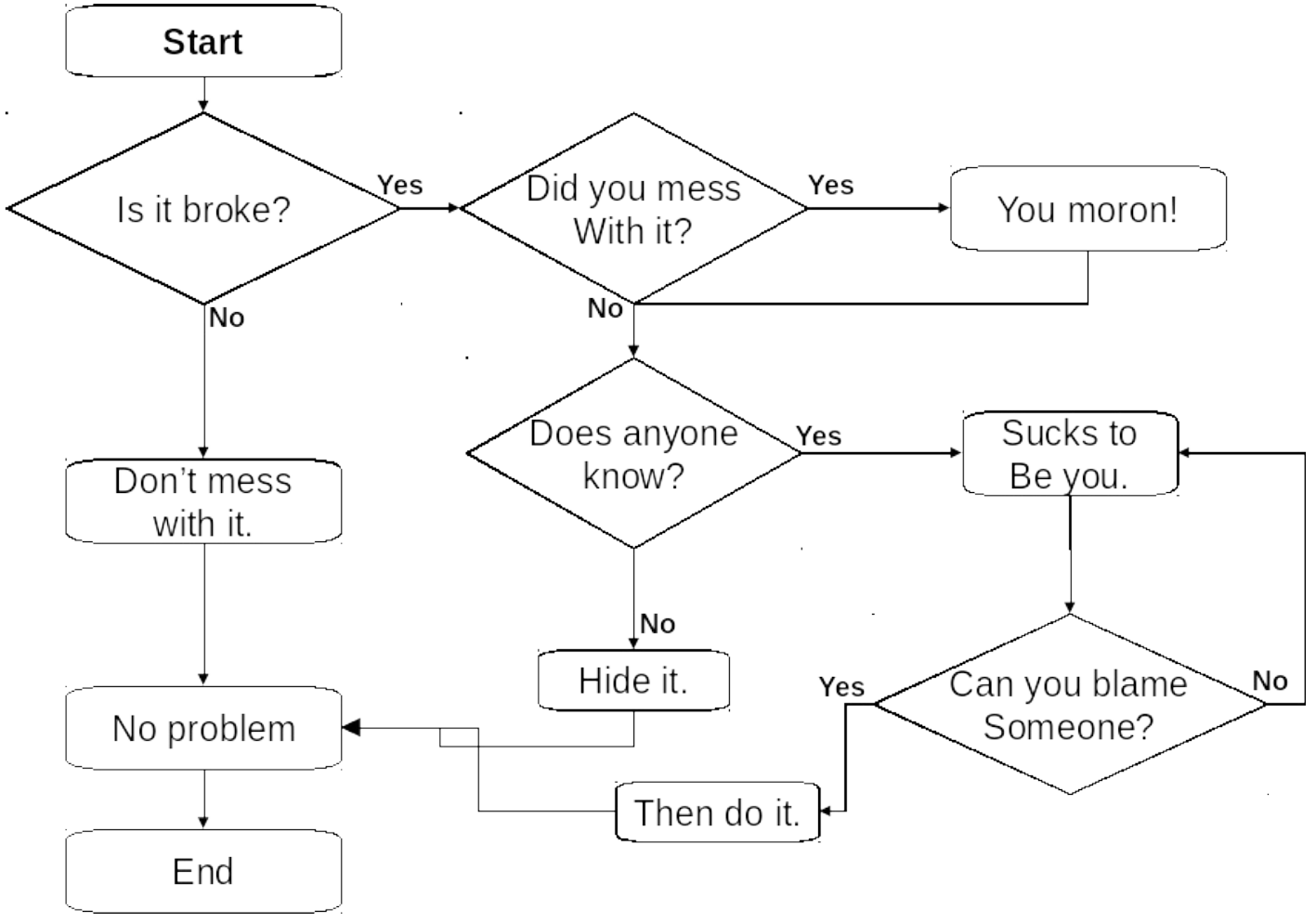
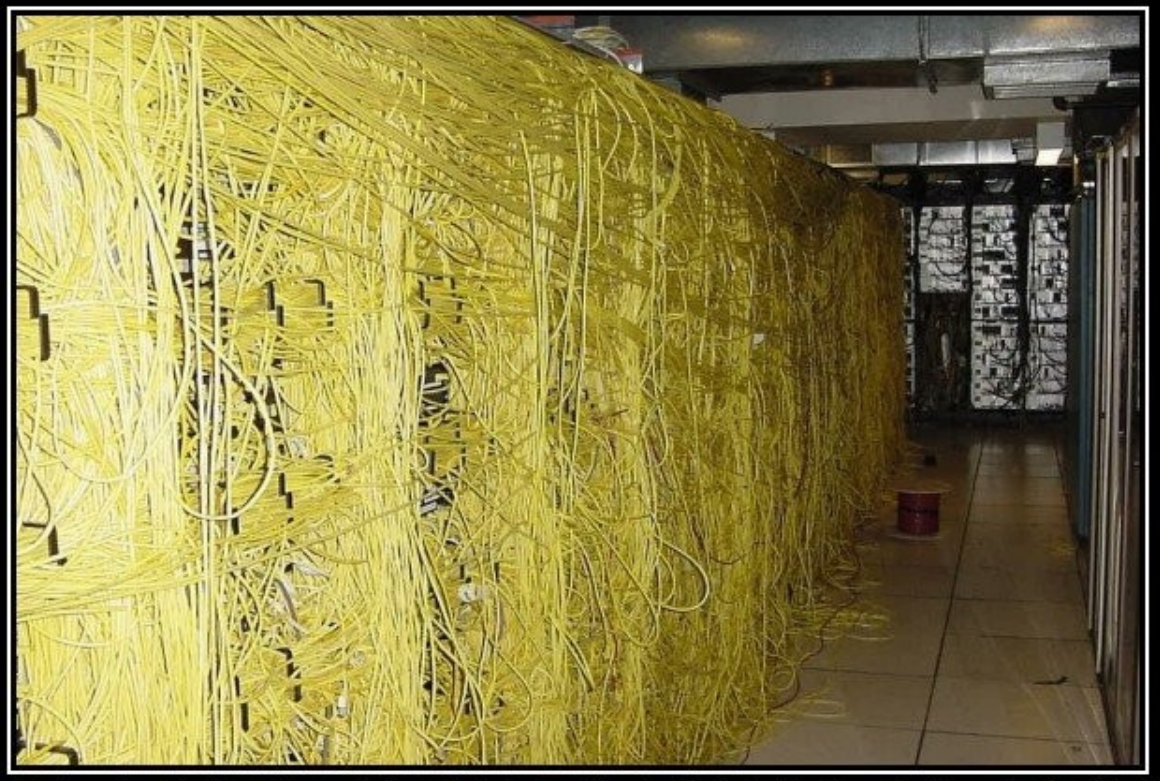
Troubleshooting

Linux System Administration
Spring 2023


Start
Is it broke?
Yes
Did you mess With it?
Yes
You moron!
No
No
Does anyone know?
Yes
Sucks to Be you.
Don't mess with it.
No
Hide it.
Yes
Can you blame Someone?
No
No problem
Then do it.
End

Basic Troubleshooting

- Does it have power?
- Is it powered on?
- Is there system activity?
- Is there console activity?
- Is it plugged into the network?
- Did you recently make changes?



A NETWORK CABLE IS UNPLUGGED

Telecom Lab Final

Troubleshooting Approach

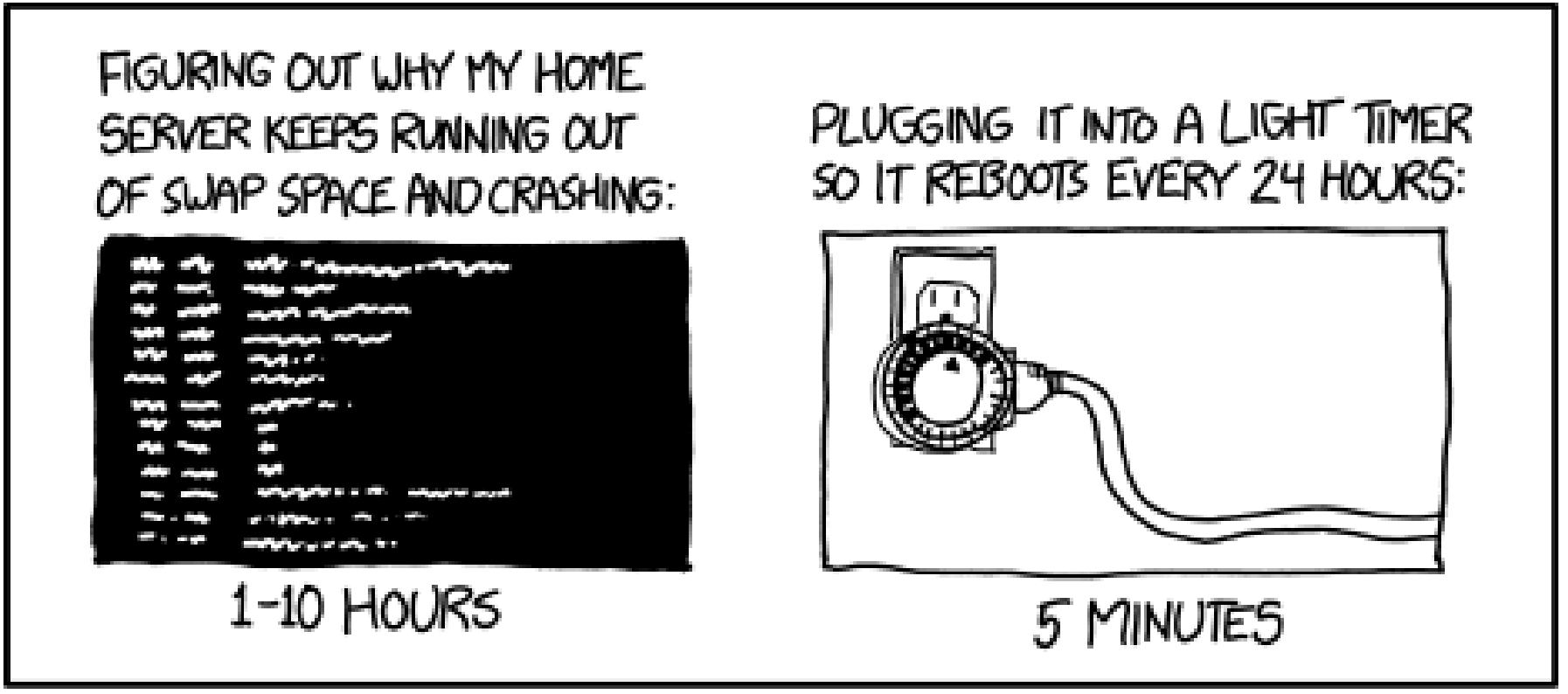
- Think before you do
  - Don't make the problem worse
- Be methodical
  - Identify symptoms
  - Brainstorm causes
  - Formulate hypothesis
  - Test hypothesis

Avoid Cargo Cult syndrome

- The solution makes no sense but it worked last time
  - Power cycle or reboot solves any problem
  - Treating the symptom instead of finding the source of the problem



Invest time in locating the cause



Memorable Errors/Solutions

- 1201 and 1202 program alarm
- SCE to AUX
- Main B Bus Undervolt
- Abort, Retry, Ignore.
- PC LOAD LETTER

Retrace your steps

- What system files did you touch recently?
  - Did you break a dependency?
- Problems with booting
  - `/etc/fstab` will hang when mounting disks
  - Default target
- Problems with networking
  - interface configuration (DHCP?)
  - routing
  - firewall

Trouble shooting power

- Is the UPS screaming?
- Is the power cord secure (both ends)?
- Are there lights on the server?
  - Which ones?
  - How about on the back?
  - What color are they?
  - Are you looking at the right server?

Trouble shooting booting

- Can you access IPMI?
- Do you have console access?
  - Is it stuck in BIOS/EFI?
  - Is it in rescue mode?
  - Is it running fsck?
  - Is it hung on mount? (bad `/etc/fstab`?)
  - Do you have a login prompt?

Trouble shooting networking

- Is the server up?
- Is it routing? Can you ping it?
  - Traceroute the path
- Can you ssh into the server?
- Can you access the service locally?
- Is it firewalled off?

Trouble shooting services

- Is it enabled on boot?
- Is it running?
- Can you restart it?
- Is there an error shown in the logs?
  - Bad/missing configuration file?
  - Is there a failed dependency?

Intermittent problems

- Brainstorm causes
  - Sometimes it helps to think of what must be correct for things to work vs. what could be broken.
- Look for a pattern
- Can you intentionally trigger the problem?
  - Can you rule out any causes?
- Test, measure, log, document

Trouble shooting pitfalls

- Always blaming one/the last issue
- Treating symptoms, not solving problems
- Changing more than one thing at a time
- Troubleshooting without a hypothesis
- Never figuring out the root cause

Troubleshooting Techniques

- Explain it to a 5 year old/rubber duck/grandma
  - Write an email explaining the problem
- Imagine your helper keeps asking why?
- What often goes wrong with this subsystem?
- How is this supposed to work?
- How is the current behavior different from what is supposed to be happening?

Document the Solution

- Sometimes lightning strikes in the same places



Sometimes the obvious works

- If it is smoking or on fire or water is pouring in, ***pull the power***
- The last thing you fooled with is the prime suspect
- After a power outage, a systematic reboot may work
  - You should fix dependencies to avoid this
  - Restarting key services may be enough

Debugging the DM network

- Recover Machine A first
- Make sure Machine A routes packets
- Verify critical services next
  - DHCP, ssh, DNS, NFS
- Verify other services
  - web, backup servers

Hints

- Be methodical
- Make sure you can recover a lost password
- Make sure you can access the console
  - VMRC works better than HTML
- Your lab notes and class slides is a handy guide
- D.F.I.U.