AP/ITEC 2210 3.0 A: System Administration Fall 2023

Instructor: Jamon Camisso
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Date/Time: Wednesday, 19:00-22:00
Location: Zoom / ACE 003
Office hours: Via Mattermost any time

Calendar Description

- Covers the fundamentals of server administration in both Windows and Linux (or Unix) environments

- Gives an overview of network operating systems and the tasks involved in operating system installation, configuration and maintenance

- Introduces knowledge of shell scripts (and automation)

Important Dates

- Sept 6: today, first class

- Sept 13: first assignment posted

- Oct 11: reading week, assignment 1 due

- Oct 18: midterm

- Dec 7-21: final exam, to be scheduled

Class structure

– Weekly class: begins at 19:00

– Will be a mix of in person and online

– Labs after slides portion of class

– Hoping to have a guest speaker on encryption, and possibly another at end of the term for Kubernetes
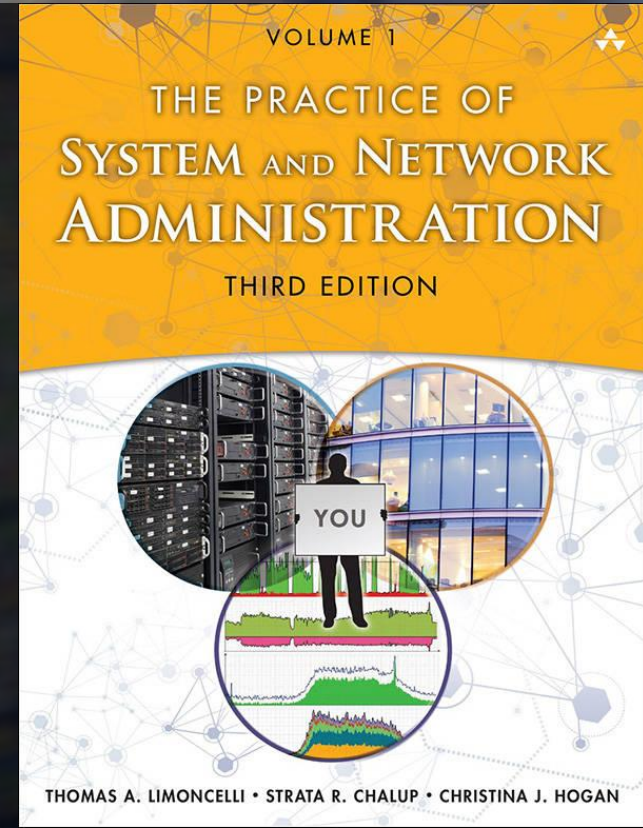
Class structure

– Some classes will be carried out remotely, since many system administration jobs are remote

– Attendance is expected as if it is a normal lecture

– The idea is to be flexible, more convenient than commuting to campus, and to get familiar with using video conferencing as part of the work of system administration

– I will give a week's notice beforehand - plan accordingly
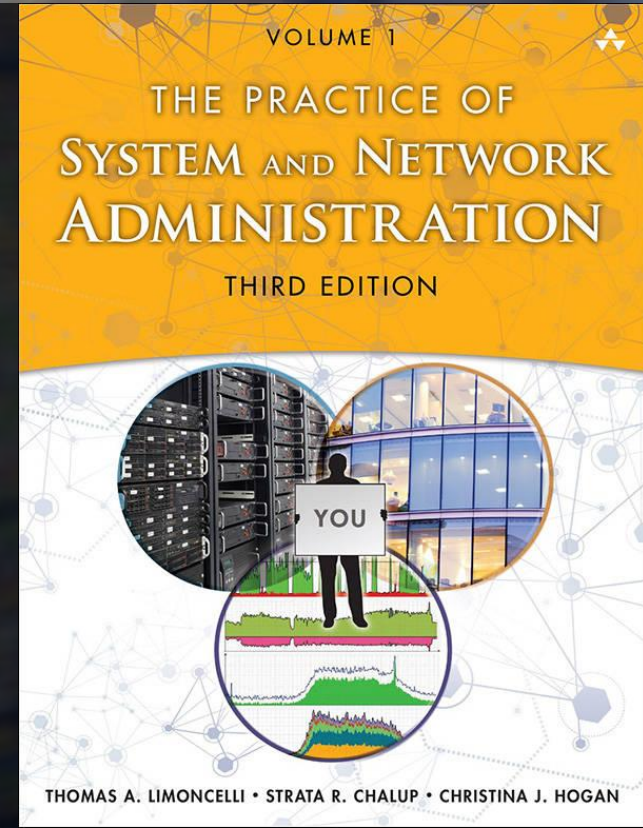
Textbook & Readings

– Required text: Limoncelli, T., Hogan, C., & Chalup, S. (2017). *The practice of system and network administration (3rd ed.)*. Boston: Addison-Wesley.

– Will refer to as "PSNA", e.g. PSNA 3,5 for chapters 3 and 5, PSNA 16(p283-291) for chapter 16, pages 283-291

Textbook & Readings

– Covers topics like:
- Infrastructure as code
- Hardware, service, and capacity planning
- Ticketing systems
- Documentation
- Change management
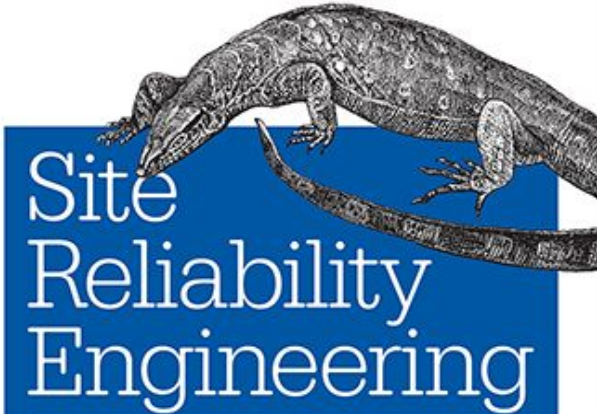- Maintenance and deployment strategies
- Time management

VOLUME 1

THE PRACTICE OF
SYSTEM AND NETWORK
ADMINISTRATION

THIRD EDITION

YOU

THOMAS A. LIMONCELLI • STRATA R. CHALUP • CHRISTINA J. HOGAN

Textbook & Readings continued

– Beyer, B., Jones, C., Petoff, J., & Murphy, N. (2016). *Site Reliability Engineering*. Sebastopol, CA: OReilly Media.

– Will refer to as "SRE", e.g. SRE 1,2 for chapters 1 and 2

– Available free online: https://landing.google.com/sre/book.html

O'REILLY®

Site Reliability Engineering

HOW GOOGLE RUNS PRODUCTION SYSTEMS

Edited by Betsy Beyer, Chris Jones, Jennifer Petoff & Niall Murphy

Recommended Readings

- Linux Foundation, Russell, R., Quinlan, D., & Yeoh, C. (Eds.). (2015). *Filesystem Hierarchy Standard*. Retrieved from http://refspecs.linuxfoundation.org/FHS_3.0/fhs-3.0.html

  - Standard for Linux filesystem layout. Most distros (Arch, Debian, RedHat, SUSE, Ubuntu, etc.) will adhere to this standard. See also '*man file-hierarchy*'

- Nemeth, E., Snyder, G., Hein, T. R., & Whaley, B. (2012). *UNIX and Linux system administration handbook*. Upper Saddle River, NJ: Prentice Hall.

About Me

- 20+ years of System Administration
  - Started in 2nd year University

- Worked for Federal Government in Ottawa (remotely)
- Worked for TVO here in Toronto
- Worked at Canonical on Ubuntu Linux
- Worked at DigitalOcean as a Developer Educator (tutorials)
- Work at Chainguard currently
- (This is not on the exam, sorry ;)

So what is system administration?

So what is system administration?

If you asked six system administrators to define their jobs, you would get seven different answers. The job is difficult to define because system administrators do so many things. An SA looks after computers, networks, and the people who use them. An SA may look after hardware, operating systems, software, configurations, applications, or security. An SA influences how effectively other people can or do use their computers and networks.

A system administrator sometimes needs to be a business-process consultant, corporate visionary, janitor, software engineer, electrical engineer, economist, psychiatrist, mindreader, and, occasionally, bartender.

As a result, companies give SAs different titles. Sometimes, they are called network administrators, system architects, system engineers, system programmers, operators, and so on. (Limoncelli et. al, 2017, p. xli)

My description

- Technical aspect: TCP/IP, web servers, databases, mail servers, DNS, encryption, firewalls, security, backups, ticketing systems, hardware, scripting, automation

- Social aspect: expert communication required. So much of the day to day is deciphering, scoping, and working with other people's requirements

- Psychological: being prepared, willing, even eager to confront unexpected challenges when running computing infrastructure on behalf of an organization

My description continued

- It is about calm, methodical thinking under pressure

- Systematic, repeatable approaches common tasks and troubleshooting problems as they arise

- For example, how do you handle a flood in your datacentre or office?

System administration definition

"We have a very general definition of system administrator: one who manages computer and network systems on behalf of another, such as an employer or a client. SAs are the people who make things work and keep it all running." (Limoncelli et. al, 2017, p. xli)
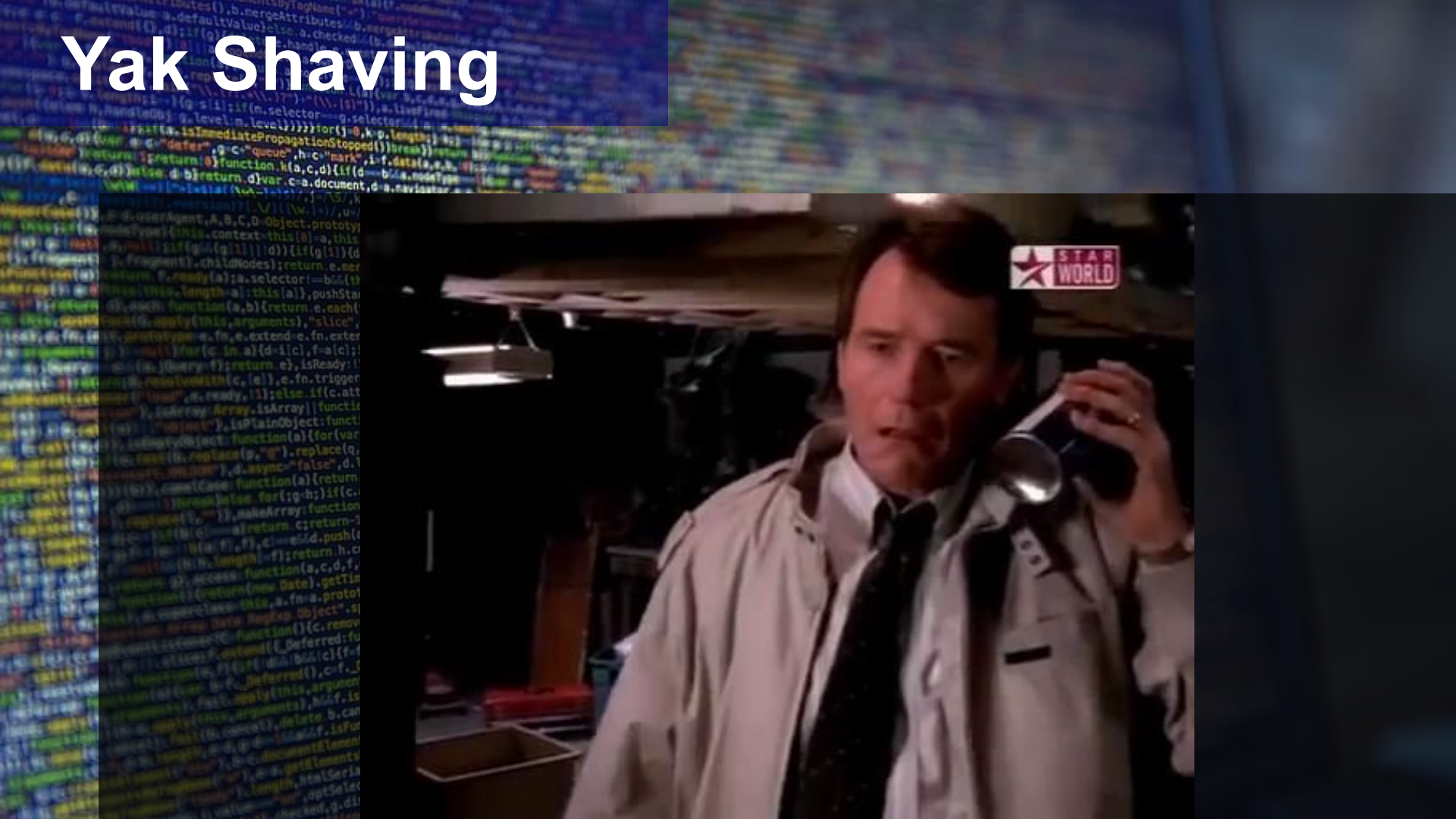
Technical terms you'll encounter

- Cat herding

- Yak Shaving

- Bikeshedding

- PEBKAC, RTFM, LMGTFY

Cat Herding

Yak Shaving

Yak Shaving

- Yak Shaving

- "You see, yak shaving is what you are doing when you're doing some stupid, fiddly little task that bears no obvious relationship to what you're supposed to be working on, but yet a chain of twelve causal relations links what you're doing to the original meta-task."

- Brown, J. H. (2000, February 11). GSB: 5:30pm, 7ai playroom [Yak shaving]. Retrieved from http://projects.csail.mit.edu/gsb/old-archive/gsb-archive/gsb2000-02-11.html

Bikeshedding

– Bikeshedding

– "Parkinson shows how you can go in to the board of directors and get approval for building a multi-million or even billion dollar atomic power plant, but if you want to build a bike shed you will be tangled up in endless discussions." - http://bikeshed.com/

– See also Parkinson's Law of Triviality
  ○ https://en.wikipedia.org/wiki/Law_of_triviality