

ITEC 2210 3.0: System Administration Winter 2019

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Date/Time: Wednesdays, 16:00-19:00
Location: ACE 009
Office hours: DB 3043 - Wednesdays 15:00-16:00
Labs: DB 2114/2116

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

The background of the slide is a close-up photograph of an Arduino Uno microcontroller board. The board is blue and populated with various electronic components, including a black integrated circuit (likely the ATmega328P microcontroller), several resistors, and a USB Type-B connector. The text is overlaid on a semi-transparent dark grey rectangle in the upper-left portion of the image.

- January 9: today, first class
- January 16: first assignment posted
- January 30: first assignment due
- February 20: no lecture, reading week
- February 27th: midterm
- April 5-20: final exam to be scheduled

Class structure

- Weekly lecture: begins at 16:00
- Lab in 2114/2116: migrate during break, begin at ~18:00
- No labs scheduled for March 20 & 27, so we'll do full lectures and group presentations those days
- Groups of 3-4 for lab and presentation work. We'll split things up into roles for technical tasks, documentation, communication, and then rotate through roles

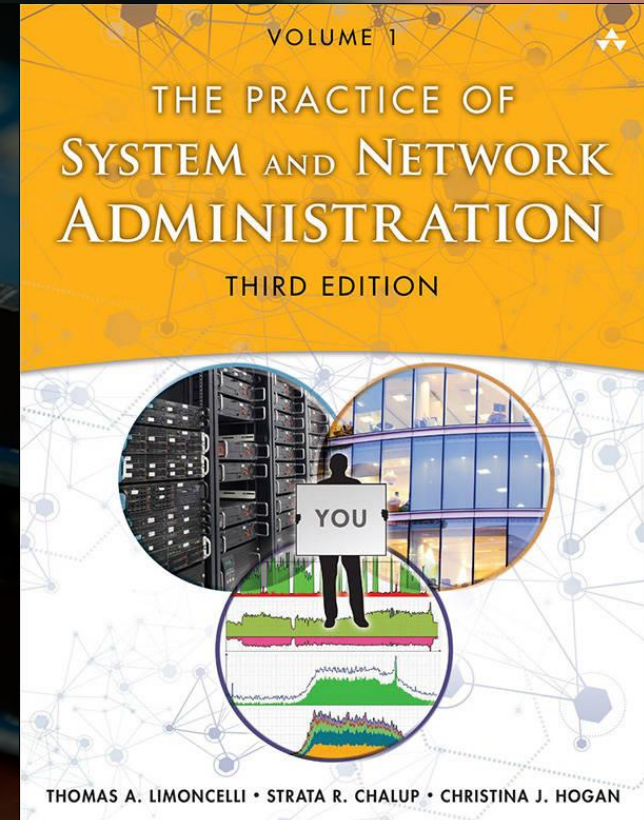
Class structure



- Presentations will be short and simple and focused on a specific tool of your group's choice (I'll provide suggestions)
- Designed to get everyone familiar with a wide range of tools over the duration of the course
- For example, a presentation will be 5-10 minutes at most, describing and demoing a utility like 'grep' or 'tail'

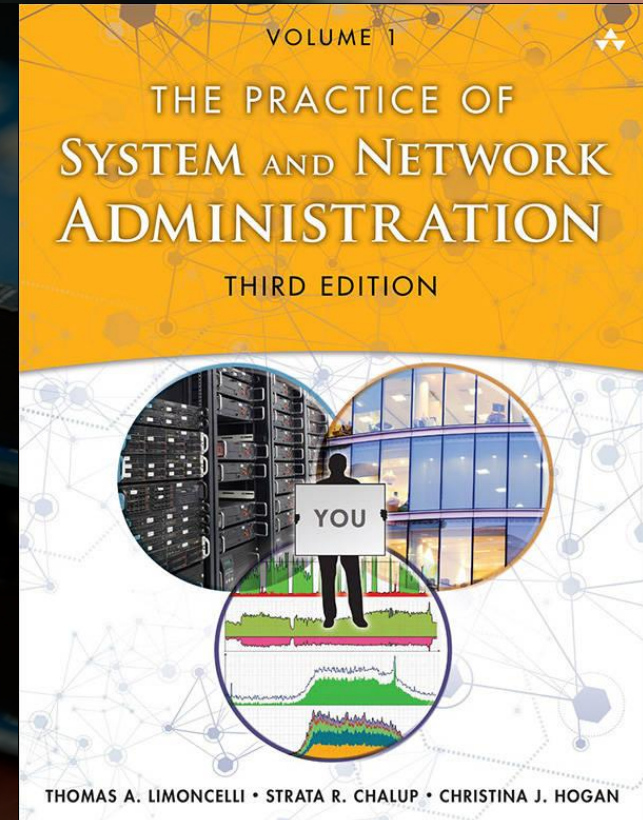
Textbook & Readings

- 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



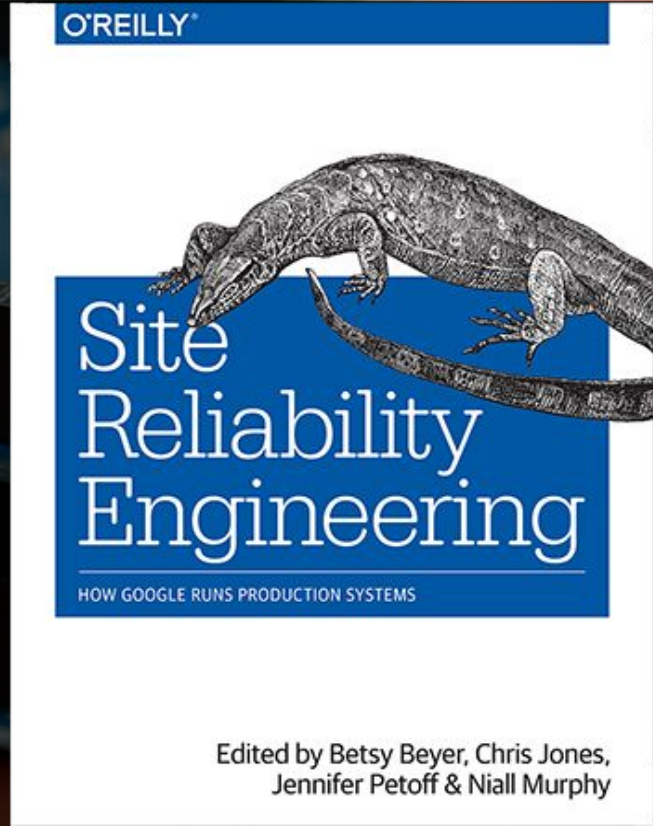
Textbook & Readings

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



Textbook & Readings continued

- Beyer, B., Jones, C., Petoff, J., & Murphy, N. (2016). *Site Reliability Engineering*. Sebastopol, CA: O'Reilly 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>



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.

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.

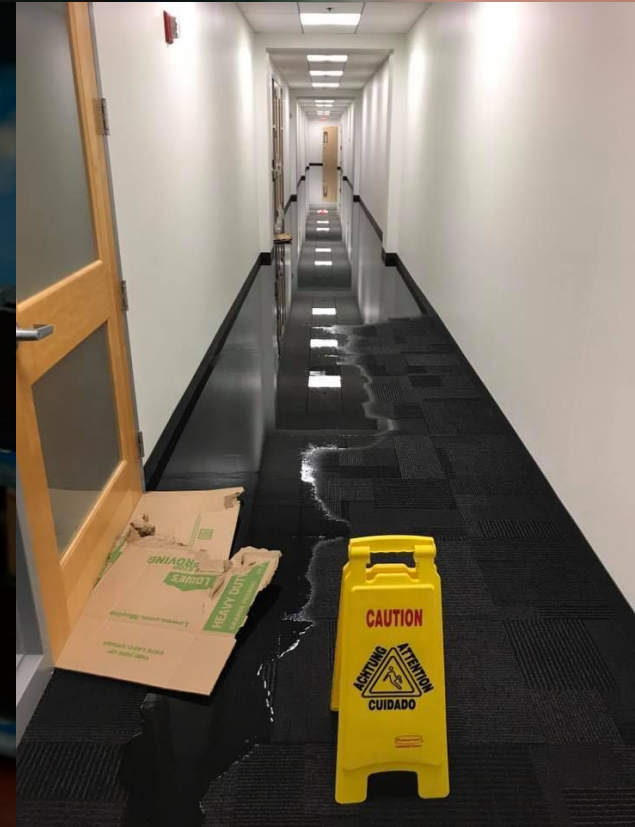
As a result, companies give SAs different titles. Sometimes, they are called network administrators, system architects, system engineers, system programmers, operators, and so on. (Limoncelli et. al, 2017, p. xli)

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?

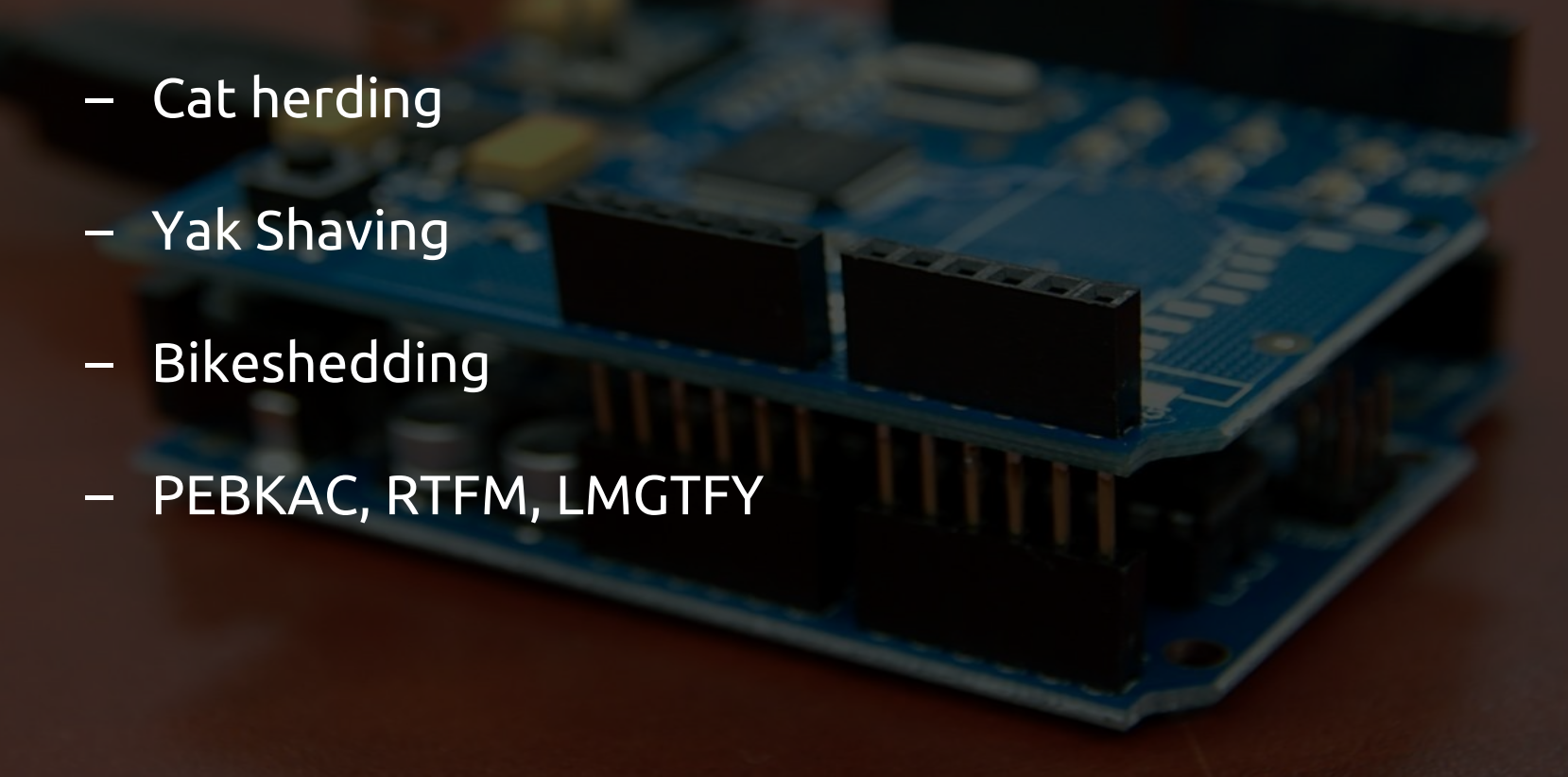


System administration definition



“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