

IT341

Introduction to System Administration

Chris Kelly

cg.kelly2013@gmail.com

Goal of This Course

- The goals of this course are
 - To teach you how to setup and configure a Linux Server
 - To learn some of the basic management principles involved in system administration
- The goal of this lecture is to let you know how this course will be conducted

Format of the Course

- This is a **lab** course
 - I will speak briefly at the beginning of each class
 - but most of the class time you will spend setting up a Linux server
- I will be here to help you with any issues that may arise
- **HINT:** When issues do arise, it is to your great benefit to resolve them sooner, rather than later.
- The bulk of the course will consist of your lab reports for a series of projects, working in teams of two
 - Each team will choose a Windows machine in this Lab

Format of the Course

- On that machine you will be running **VMWare**
 - VMWare is virtualization software
 - You will setup and configure a virtual Ubuntu server using VMWare
- Though you will be working on the projects in *pairs*, you will be graded *individually*
- Each of you must keep an ongoing record of what you are doing in the form of ***lab reports***
- Also, you will need to read a number of chapters in *The Practice of System and Network Administration*, and submit ***summaries*** of what you have read

Format of the Course

- In addition to the aforementioned, there will also be:
 - **Individual assignments**
 - **Midterm exam**
 - **Final exam**
- The exams' questions will be taken/derived from material covered in...
 - Lectures
 - The Petersen textbook

Projects

- The core of this course is your work on a series of projects
- You will be working in teams
 - Each team will consist of two people, no more and no less
 - The only exception will be if there is an odd number of students in the class
 - In this event, one student will work alone
 - You and your teammate will choose a machine in this lab.
 - The machine will be one of eight: **it21** - **it28**
 - You will choose your team and machine via the provided sign-up sheet
- There, you will use VMWare to create a virtual **Ubuntu** server on this machine

Projects

- Depending on your course section and chosen machine, you will be assigned a team name -- which will be on the sign-up sheet, as well.
- In the **first** project, you will create a basic Ubuntu server installation
- Through subsequent projects, you will add more and more features and services to this installation
- You will become more comfortable and familiar with
 - the server...
 - and its components

Administrator's Log

- One of the most important things you can learn from this course, is the importance of keeping a written record of what you have done
- A system administrator will usually do this in the form of an **administrator's log**
- When you change a machine you administer - or something significant happens on it - you should make a note in your admin log
- Changes to a machine's configuration can cause problems, that may not appear until months afterwards

Administrator's Log

- If you forget what you changed and when, you will struggle figuring out what to do next
- This is particularly important when you solve a problem
 - First, if the problem occurs again, the existence of a previously documented solution will save you the trouble of looking it up again
 - Second, the solution could affect other aspects of the system, making a clear record even more important

Lab Reports

- For IT341, you must keep an administrator's log - which will consist of the "daily entry" portions of your lab reports
- Each lab report will be due by a particular date and time - to be eligible for credit.
- Each team member must write his or her own lab reports separately
 - Even though you are working together and documenting the same things
 - Even though you may share data such as command line output and rough notes

Lab Reports

- Duplicated text (other than command line output) between team members' lab reports will be considered **plagiarism**
- These must be kept in your **it341/reports** directory, inside your home directory on the CS department network - not on your VM!
- The lab reports must be text files (**report_XX.txt**)
 - **XX** stands for the project number
 - For a *single-digit* project number
 - **XX** will be the project number preceded by a 0
 - Example: **report_05.txt**

Lab Reports

- For a double-digit project number
 - **XX** will be the project number
 - **Example: report_11.txt**
- When you are signed into Linux, the file paths will probably look something like this: **~/it341/reports/report_XX.txt**
- You should make an entry in the log for each day you work on the machine
 - This work will usually be done during class
 - ...but you may sometimes come in outside of regular class meetings or work remotely
 - Regardless, that day's work should get an entry

Lab Reports

- While working, you may choose to keep rough notes
 - ...but those are to help you remember what you did and recall observations.
 - **The entries in your lab report should be more refined!**
 - You should complete your entries as soon as possible, after doing the work.
- Note: There is no need to include class notes in your log, nor should you do so - except as it pertains directly to project work.
- In addition to the daily entries, at the end of each lab report, you will answer a series of **discussion questions**.

Lab Reports

- Read the lab report specifications for further details
- There is a link to the specifications on the class web page, under the **Course Components** section

Individual Assignments

- Although you will work on the projects as a team of two, each of you must complete occasional individual assignments by yourself
- They are not technically "homework", but you may be able to finish some of them at home
- You will find the list of assignments on the course web page
- You will work on the first assignment today (or next class period) after I have finished speaking

Individual Assignments

- The first assignment is to
 - complete the Unix Apply Process for this course
 - set up a special text file for e-mail
 - send me an introductory e-mail
- I can help you with this, as needed

Course Textbooks

- The two textbooks for this course are quite different
- *Ubuntu 16.04 LTS Server: Administration and Reference* describes how to set up and configure an Ubuntu Server
 - It will help clarify many of the *technical* steps we go through during the course
 - Do not neglect this reading!
 - By the end of this weekend, you should have read the first two chapters
 - The good news: You need **not** summarize these readings

Course Textbooks

- *The Practice of System and Network Administration* is written by veteran system administrators
 - It contains practical advice for system administrators, gleaned from experience
 - Reading this book will help you become a better system administrator
 - **These** are the readings that you will summarize

Chapter Summaries

- Throughout the course, I'll assign chapters to read from *The Practice of System and Network Administration*, along with suggested summary completion dates.
 - You will find the reading schedule on the course web page.
 - We may have some discussion on these chapters, if we have time
- You will find a link to the specifications for the chapter summaries on the course webpage
 - under the Course Components section
 - under the Chapter Summaries section
- You should get started on these ASAP!

Working in Pairs

- For your work on the projects, you will be working in teams of two
- Soon, you will choose
 - Your *partner* for this work
 - The *machine* in this lab you will use
 - You will do this using the provided *sign-up sheet*
- **it20**, **it30**, and **it31** are special machines:
 - *You should not touch them!*
 - However, you will occasionally **ssh** into **it20**

Working in Pairs

- On your physical machine, you and your partner will create a single virtual machine using **VMWare**
 - Obviously, there will be some differences from using a physical machine,
 - but much will be the same because you are still emulating physical hardware
- Though you will be working together on the projects, you will be graded individually
- Please remember this last point, in particular, so that you do not end up in a situation that looks like plagiarism!

Working on the Command Line and with Configuration Files

- Since most of you have taken IT 244 (or possess some equivalent), you know that the command line is a user-hostile environment
 - On Linux and Unix machines, almost all system administration work is done at the command line
 - Almost all configuration information is stored in text files
- All of the project work you do in this course, therefore, will be done at the command line

Working on the Command Line and with Configuration Files

- You must be very *careful* about what you type at the command line
 - If you mistype or misspell a single character, your command will not work the way it is supposed to
 - As such, you must be extremely careful when changing these files
 - A single typo could cause a Linux service on your machine to fail
- *You should reconsider taking this course if...*
 - You did not do well in IT244 or struggle with the command line
 - You are unable to quickly and easily recall the material learned in that course

Working on the Command Line and with Configuration Files

- Since there are two of you working on the projects
 - One person should enter the commands and edit the config files
 - While the other should check the commands and file edits for accuracy
 - The two of you are expected to occasionally switch roles so that you can experience both sides

Do You Have Enough Time to Do the Work for This Course?

- Many of you work, either part time or full time
 - This cuts down on the time you have for class work
 - ***You should not be taking this course if you do not have enough time to do all the work***
- In this course, you will be configuring an Ubuntu server
 - As previously mentioned, the command line is user-hostile
 - Moreover, configurations and installations will require considerable attention to many *small details*
 - Project completion will require you to *read and follow given directions* closely.

Do You Have Enough Time to Do the Work for This Course?

- Finally, you need to understand how individual project tasks relate to the *grand scheme* of things
- In addition, doing well in this class will require a higher quality of submitted work.
 - You must both *understand* the material well and *express* yourself well
 - Do you have the time and energy to bring your work to a level sufficient to achieve your desired grade?
- If you sign up for more work than you can achieve in the time you have, you are cheating yourself
 - Many people in this country rush to get a degree, but haven't done enough work to digest the material
 - Those people invariably set themselves up for failure

Attendance

- At each class I'll take attendance
- I do this to:
 - Learn your names
 - Have a record
- Your attendance will not affect your grade directly
- However, if you find yourself struggling with the material and have not been coming to class, I'll be less sympathetic!

Course Documents

- Everything I create for this class is made available online
 - All of it can be accessed from the Class Page:
<http://www.cs.umb.edu/~ckelly/teaching/it341>
 - You should bookmark this page because the page will function as our syllabus, instead of a paper syllabus
 - It is a lot of material, but you should at least get to know the layout
 - That way, you will know where to look for information you need
 - This is much quicker than sending an e-mail and awaiting my response

Course Documents

- The "***Course Policies***" section will give you a good idea of my rules and expectations. That section also contains some supplementary information you should check out.
- The schedule will feature links to class notes, along with reading assignments - including your chapter summaries
- The "***Projects***" section will feature descriptions of each project as they come up
- Similarly, links to assignments may be found in the "***Assignments***" section

Course Documents

- Many terms we encounter in this class can be found on the *Definitions* page:

[http://www.cs.umb.edu/~ckelly/teaching/it341/
local_assets/files/common/data/linux/
linux_sysadmin_definitions.html](http://www.cs.umb.edu/~ckelly/teaching/it341/local_assets/files/common/data/linux/linux_sysadmin_definitions.html)

Taking Notes

- Although I make my notes available in PDF form, I want to encourage you to take notes in class
 - Studies have shown that students learn more when they take notes, even if they never look at their notes again
 - Other studies have shown that the more activities and senses are engaged when you learn something, the greater your likelihood of remembering
 - Writing notes engages another part of your brain, which increases recollection
- All of you should take notes

Taking Notes

- Probably the best practice would be for you to print the notes before coming to class.
- That way, you can write your own notes in the margins, along with any questions you may have.
- **Note:** Sometimes PDF content may differ from slides as presented in class!

Textbooks

- There are two textbooks for this course:
 - *Ubuntu 16.04 LTS Server: Administration and Reference* by Richard Petersen. (ISBN: 193628068X)
 - *The Practice of System and Network Administration* (3rd Edition) by Limoncelli, Hogan and Chalup. (ISBN: 0321919165)
- You may be able to obtain electronic copies of each of these...

Cheating

- All students are expected to follow the University's Code of Student Conduct
- You will find this at http://www.umb.edu/life_on_campus/policies/community/code
- The Computer Science Department has the following policy on cheating
 - You will be given a score of **zero** if you cheat on any assignment, quiz or test
 - If you cheat a second time you will receive an **F** in the course
 - If you cheat a third time you can be **expelled** from the University

Cheating

- I put a great deal of work into my courses, and I ask you to respect that work by not cheating.
- **Important:** *It is the **student's** responsibility to know what constitutes academic dishonesty - at this university and in this class. Lack of knowledge that something constitutes an academic honesty violation **will not** be accepted as a valid excuse.*

Grading Policy

- All homework and exams are subject to the honor code
- Plagiarism is not allowed in any form
- Grades will be computed as follows
 - **Lab Reports:** 50%
 - **4 Assignments:** 15%
 - **Chapter Summaries:** 10%
 - **Midterm Exam:** 10%
 - **Final Exam:** 15%

Grading Policy

- Final number grades will be translated to letter grades as follows:
 - **A** 93.3 and above
 - **A-** 90 to 93.2
 - **B+** 86.7 to 89.9
 - **B** 83.3 to 86.6
 - **B-** 80 to 83.3
 - **C+** 76.7 to 79.9
 - **C** 73.3 to 76.6
 - **C-** 70 to 73.3
 - **D+** 66.7 to 69.9
 - **D** 63.3 to 66.6
 - **D-** 60 to 63.3
 - **F** Below 60

Accommodations for Disabilities

- The school is legally obligated to try to accommodate students with disabilities
- If you have a disability you can get help from Ross Center for Disability Services
 - **Location:** Upper Level of the Campus Center, Room 211
 - **Phone:** 617-287-7430
 - **Web Site:** <https://www.umb.edu/academics/vpass/disability/>
- After you have discussed the matter with them, see me
- They will usually draft a letter explaining any accommodations you should receive.

Accommodations for Disabilities

- You should get this letter to me ASAP!
- If you require extra time for an exam, then it is your responsibility to arrange for this at least a week in advance!
- Also, you may wish to check out the page containing my own notes:

[http://www.cs.umb.edu/~ckelly/teaching/common/
data/disability.html](http://www.cs.umb.edu/~ckelly/teaching/common/data/disability.html)

Communications

- All communication outside of class will be conducted through *email*
- For regular contact, we are going to use your **@umb.edu** or **@cs.umb.edu** email
- The *first* assignment will include setting up email
- I will use that account when sending you a personal email concerning the class or any class-wide announcements outside of class.
- If I have sent you an email about something concerning the class, I'll assume that you have been given adequate notice

Communications

- If you have a question, email me at cg.kelly2013@gmail.com
- Please be sure to:
 1. Use a descriptive, meaningful subject line
 2. Begin the subject with **IT341:**
- Failing to include #2 is effectively the same as not having sent the e-mail at all!
- Don't hesitate to contact me if you are stuck and/or need help with something.
- Others might be having the same issue!

Office Hours

- My office is **S-3-130**
- My official office hours will be posted on the course web page
- You do not have to make a special appointment to see me during office hours - just drop in!
- If you need my help and cannot make it to office hours, contact me and we'll work something out