IT 609
Network and System Administration

Course Welcome

Tuesday August 31, 2021

Section Overview

- Housekeeping Mechanics
- Syllabus Review
- Calendar Review
- General Overview of the Course
- DevOps versus Administration
- Best Practices

Housekeeping

- Getting to know you
  - Discord; Email; Phone
  - Office Hours
- Classes:
  - Begins at 5:40 pm and ends at 7:30 pm
  - Tuesdays and Thursdays
- Office Hours are:
  - After class, 7:30 pm to 8:00 pm
  - Wednesday, online via Discord, 6:00 pm to 7:00 pm
  - By Appointment

Who Am I?

- Jon Coleman (jec1112@unh.edu)
- Day job – SoNH
- Over 35 years Industry Experience
- Private, Public, Government, Military
- Consulting/Contracting
- Databases, Informatics, Data Model Mapping (Patent)

Course Administration

- Canvas (mycourses.unh.edu)
- Communications:

  Email to jec1112@unh.edu with [IT609] in subject
- Distance Learning

  Sometimes, we may need to use alternate forms of course delivery and communication (Discord, Zoom).
  - Canvas will be our bulletin board of information.
  - “There is no such thing as a snow day.”

General Overview of Course

- Lectures, Assignments, Projects, Presentations, Final Project
- In Class – Lecture, Examples and problem solving, Hands-on
- Bring a laptop/remote connectivity device
- If there is something that you hear about that sounds interesting, bring it up and we'll discuss

Syllabus Details

- PDF document on Canvas
- Calendar PDF document
- Discord
- myCourses

Syllabus Topics
Introduction

- Course, Objectives, Tools (Wireshark, VirtualBox, Puppet, Docker, etc.)
- DevOps versus Administration
- Best Practices

Syllabus Topics
Computer Systems Hardware

- System Hardware Basics: Processors, Memory, and Architecture
- Virtualization of Desktops
- Storage Technologies
- RAID
- Data Center Design and Practices
- Cloud-based Services

Syllabus Topics
OS Features and Issues

- File System Organization
- Windows, Linux, macOS as examples
- Operating Systems Management
- Applications Management

Syllabus Topics
Virtualization, Clouds, and Containers

- Virtualization of Servers
- Cloud-based Services
- Containerization
- Operating Systems Virtualization
- Applications Management Virtualization

Syllabus Topics
Networking Technologies

- The Stack review and Binary Numbers
- Transport-TCP & UDP
- IP-Addressing, ARP, TCP/IP, IPv4, and IPv6
- Ethernet and Wi-Fi

Syllabus Topics
Networking Administration

- Wide Area Networks & Local Area Networks
- Internet Routing and Management
- Domain Name Resolution
- Network Troubleshooting and Tools

Syllabus Topics
System Administration Practices

- Security Issues
- Authentication and Authorization
- Ethics
- Disaster Recovery

Introduction

DevOps versus Administration

Terminology

- **DevOps** – a combination of the terms “Development” (Dev) and Operations (Ops)
  - IT is a practice, process, or philosphy not a specific thing, job, or framework.
  - There is no specific definition for the term as it varies according to the situation it is applied to.
  - It aims to shorten the SDLC, provide continuous Delivery, and maintain High Quality.
  - Key principles are shared ownership, workflow automation, and rapid feedback cycles.
  - So, it is a specific set of practices and tools used to effect substantive changes in the way products are delivered (implying continuous integration and delivery/deployment – CI/CD).

Terminology

- **Administrator** – Responsible for the configuration, operation, maintenance, and security of a system within a fixed set of performance, budgetary, and resource requirements.
  - It is a specific and definable job.
  - There are many types – System, Network, Database, Security, Web, etc.
  - Need to be a problem solver (typically under duress).
  - Breadth of knowledge is as important as depth.
  - Need to be organized.

Introduction

Best Practices

Best Practices

"A best practice is a method or technique that has been generally accepted as superior to any alternatives because it produces results that are superior to those achieved by other means or because it has become a standard way of doing things, e.g., a standard way of complying with legal or ethical requirements."

-Wikipedia

Best Practices

- How does something become best practice?
  - Says who?
  - Governments - NIST, ITIL (UK)
  - Industry groups
  - Vendors/publishers
  - Locally developed
- Do best practices change?
- “The” best practice vs. “A” best practice

Best Practices
CIS Controls & Benchmarks

- CIS - Center for Internet Security

"CIS Controls and CIS Benchmarks are global industry best practices endorsed by leading IT security vendors and governing bodies."

-CIS: (https://www.cisecurity.org/cybersecurity-best-practices/)

Best Practices
NIST

- NIST - National Institute of Standards and Technology

> “For 20 years, the Computer Security Resource Center (CSRC) has provided access to NIST's cybersecurity- and information security-related projects, publications, news and events. CSRC supports stakeholders in government, industry and academia—both in the U.S. and internationally.”
>
> -NIST: (https://csrc.nist.gov)

Best Practices
ITIL

- ITSM - IT Service Management
- ITIL - IT Infrastructure Library

> "ITIL advocates that IT services are aligned to the needs of the business and support its core processes."
>
> -AXELOS: (https://www.axelos.com/best-practice-solutions/itil/what-is-itil)

Best Practices
Why?

- Money!
- Just one second…

http://www.internetlivestats.com/one-second/

Homework Assignment

- Get on to Discord
- Get on to myCourses